Advancing infodemic management in risk communication and community engagement in the WHO European Region
Implementation guidance
ABSTRACT
This document provides guidance for national health authority focal points in risk communication and community engagement on preparedness and response for infodemic management in the WHO European Region, particularly in the context of the COVID-19 pandemic.

KEYWORDS
INFODEMIC
COVID-19
COMMUNICATION
MISINFORMATION
HEALTH COMMUNICATION
INFORMATION-SEEKING BEHAVIOUR

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## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AIRA</td>
<td>Africa Infodemic Response Alliance</td>
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<tr>
<td>IM</td>
<td>infodemic management</td>
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<tr>
<td>RCCE</td>
<td>risk communication and community engagement</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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Artefact: item created as part of an infodemic incident, including messages, images, video, audio, online accounts and online groups.

Behavioural and cultural insights: a technical area of work within WHO on knowledge derived from the social sciences and health humanities that elucidates the drivers and barriers to achieving the highest attainable standard of health.

Botnet: a network of private computers infected with malicious software and controlled as a group without the owners’ knowledge, e.g. to send spam.

Campaign: long-term, organized sets of infodemic incidents.

Community engagement: “a process of developing relationships that enable stakeholders to work together to address health-related issues and promote well-being to achieve positive health impact and outcomes. Goes hand in hand with risk communication within public health emergency preparedness and response” (1). Supporting or working with communities to improve their health.

Conspiracy theory: “a speculative or fantastical claim of the existence of a conspiracy. A conspiracy often features a secret, proactive, planned, multi-stage deception that will involve the harm of a given individual or group of people, often to the benefit of another” (2). “The typical explanation of an event or process which attracts the label ‘conspiracy theory’ is an explanation that conflict with the account advanced by the relevant epistemic authorities” (3).

Disinformation: incorrect, misleading or misattributed information circulated with a specific, often political, agenda. It includes incorrect, misleading or misattributed information but can also include information that is true but artificially amplified and manipulation of information on individuals’ searches, sharing and consumption.

(Google) dork: a search string with advanced search operators to find information that is not readily available on a website.

Incident: short-term bursts of infodemic activity (typically 1–3 days) consisting of a visible set of artefacts (e.g., hashtags, images) that support one or more narratives, with which multiple infodemic behaviour may be associated (e.g., artificial amplification of narratives).

Incident management support team: the team that provides day-to-day technical and operational support to the national incident management team for all its critical functions, in both regional and headquarters offices for graded emergencies.

Incident management system: the standardized structure and approach adopted by WHO to manage its response to public health events and emergencies and to ensure that it follows best practice in emergency management (4).

Incident management team: national team responsible for managing and implementing the WHO response to an emergency, structured on incident management system functions and sub-functions. The size and composition of the team is flexible and may vary according to the context.

Infodemic: excess information, including false or misleading information, in digital and physical environments during an acute public health event (5).

Infodemic harm: adverse effects caused, or potentially caused, by an infodemic to individuals, communities, health responses and related processes.

Infodemic management: systematic use of risk- and evidence-based analysis and approaches to prepare for and manage an infodemic to reduce its impact on public health. Includes continuous surveillance and preparedness, also after an infodemic aspects of health emergency preparedness and response plans.
Infodemiology: study of infodemics and responses to them (6).[^1]

Information landscape: the communication and information systems available in an area, including the flows of communication, emotions and group interactions within which infodemics exist.

Information void: the gap between a community’s demand for information and publicly available, evidence-based communication that emerges with evolving public demand for information, questions and concerns.

Malinformation: genuine information that is shared with the intent to cause harm.

Manipulated media site: website that includes misinformation, often created as part of a “pink slime” network of misinformation or conspiracy websites; known around 2017 as “fake news site”.

Misinformation: incorrect, misleading or misattributed information circulated without an underlying agenda or intent to harm.

Narrative: the core of a story told to explain events, identity (“identity narrative”) or a sense of belonging or not belonging to a community or group (in-group and out-group narratives).

Red teaming: a form of readiness simulation exercise, which involves pursuing the objective opposed to that of emergency response authorities and partners.

Response landscape: systems for activities for preventing, mitigating or removing the effects of an infodemic, including groups that could respond to infodemic risks and current and potential actions that could reduce those risks.

Risk communication: exchange of real-time information, advice and opinions among experts and people facing threats to their health or economic or social well-being to enable them to take informed decisions for their health; includes community engagement for public health emergency preparedness and response.

Risk landscape: information on phenomena (artefacts, campaigns, accounts, networks) capable of causing infodemic harm.

Rumour: unverified information; may occur outside infodemics and may or may not be true: e.g., a rumour could be part of misinformation or could be issues in a public health response that were not previously known.

[^1]: An alternative definition of infodemiology is provided by Gunther Eysenbach (6). Although this definition is useful and predates WHO’s work on the COVID-19 infodemic, the WHO definition is used in this document for consistency.
FACT: MYOCARDITIS FOLLOWING VACCINATION WITH mRNA VACCINES IS VERY RARE, AND USUALLY MILD.

THE FREQUENCY OF MYOCARDITIS (INFLAMMATION OF THE HEART MUSCLE) FOLLOWING NATURAL INFECTION WITH SARS-COV-2 IS ABOUT SIX TIMES HIGHER THAN FROM VACCINATION.

MYTH: mRNA COVID-19 vaccination often causes myocarditis among athletes.
Executive summary

During the COVID-19 pandemic, both reliable, evidence-based information and rumours, conspiracy theories and mis- and disinformation have circulated in unprecedented volume, variety and speed. Although this infodemic is not exclusively a digital phenomenon and its main challenges have long historical roots, the COVID-19 infodemic is unequalled in size and scope.

WHO is responding to this challenge with intense work to manage the resulting health risks, by establishing a new scientific discipline and area of work, which it has called “infodemic management” (IM). This pioneering work has included a series of conferences, a research agenda, a competence framework, new software, training to build capacity and publishing new research. This new, fundamentally interdisciplinary area of scientific inquiry and operational implementation draws on areas that include data science, epidemiology, behavioural science, media science and user experience.

With its operational and functional structures and expertise, the WHO Regional Office for Europe, which supports Member States in the European Region, has integrated IM into its long-standing expertise in risk communication and community engagement (RCCE), strengthened RCCE approaches for, for example, social listening, community engagement, capacity-building, measurement, evaluation and learning. The value of IM for RCCE in the Region is especially salient in the areas of management of rumours and mis- and disinformation. The Regional Office has also created links with other divisions and technical areas of work, notably Digital Health and Behavioural and Cultural Insights.

The aim of IM in the WHO European Region is to detect, assess, analyse and respond to infodemic risks and to maintain and strengthening national and regional (sub) systems by providing training and broader capacity-building. The aim of IM, like RCCE and the overall COVID-19 response, is to hasten the end of the pandemic and “build back better” for future health emergencies.

This guidance is based on the latest evidence and practical experience with IM in the WHO European Region and is designed to provide stakeholders with operational support for IM preparedness, readiness and response in public health emergencies. The intended readership is mainly response authorities, stakeholders and partners in countries in the Region in both the coordination and operations, including in communities. It provides practical ways to guide IM and best practices in the technical area of RCCE. Rather than offering specific, one-size-fits-all recommendations, it offers options and approaches that may be applied in each context. The guidance applies primarily to the WHO European Region because of differences among the WHO regions in organizational, structural, cultural and other dimensions of implementation of RCCE and IM, although other regions, headquarters or other stakeholders may use, apply or adapt it. For examples of how IM is implemented in the major WHO offices, see Annex 1.

The theoretical framework of the document contextualizes core concepts for the WHO European Region, including rumours, mis- and disinformation, information voids, big data’s “three Vs” (see below); describes the information ecosystem and its three components (information, risk and response); and provides guidance on measuring infodemic response. The core of the document details how IM is embedded into and benefits from the umbrella of RCCE in the WHO European Region and describes two RCCE models: the emergency cycle (with its phases of prevention, preparedness, readiness, response and recovery) and the four core capacities of RCCE (transparency and early announcement of a real or potential risk; coordinating public communication; listening through two-way communication; and selecting effective channels and influencers). The conclusion of the document briefly summarizes the importance of IM and adds areas for further contributions and development of this work. Four annexes provide further support, including quick-start guides on maintenance and response, and further reading.

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2 For an overview of the research and other publications, activities and approaches to IM at global level, see Annex 1.
3 For an overview of highlights, activities and approaches to IM in other major WHO offices, see Annex 1.
Introduction

During the COVID-19 pandemic, both reliable, evidence-based information and rumours, conspiracy theories and mis- and disinformation have circulated in unprecedented volume, variety and speed. At the same time, the information demanded by vulnerable populations and their concerns have evolved rapidly, such that scientists and communicators sometimes struggled to keep up, creating information voids that provided fertile grounds for more misinformation.

Topics that have gained or regained prominence during the pandemic include the supposed risks of 5G technology (7), misinformation about COVID-19 vaccines (8) and fake cures (9); two notable examples of the last are the rumour that ingesting medicinal alcohol could kill the virus and the similarly fake recommendation of injecting or ingesting bleach (10, 11). Although the infodemic is not exclusively a digital phenomenon, online and social media play a large role in disseminating and “mediating” it (12). In addition, while infodemics during health emergencies have historical roots, the COVID-19 pandemic has given rise to conditions for “a perfect storm of conspiracy theory and misinformation” (6).

WHO is responding to this challenge with intense work to manage the resulting health risks, by establishing a new scientific discipline and area of working, which it has called “infodemic management” (IM). This pioneering work has included a series of conferences, a research agenda (14), a competence framework (15), new software (16), training to build capacity (17) and new research.5

IM is an interdisciplinary area of work and is based on areas such as behavioural science, data science, epidemiology, media science and user experience. In view of its global outlook and its operational and functional structures and expertise, the WHO Regional Office for Europe has integrated IM into its long-standing expertise in RCCE, adding further strength and new approaches to existing work in, for example, social listening, community engagement, capacity-building, measurement, evaluation and learning. The Regional Office has also formed links with other divisions and technical areas of work, notably Digital Health and Behavioural and Cultural Insights.

Through IM responses in the framework of RCCE, the Regional Office is drawing attention to the observation that “an integral part of risk communication involves identifying and countering misinformation and disinformation, the impacts of which can be extreme and immediate” (21). Additional links between RCCE best practices and new IM approaches include:

- ensuring that at-risk populations have the information necessary to take informed decisions to mitigate the effects of a health hazard and take protective and preventive measures (22);
- “proclaiming the uncertainty” (23) and/or “communicating in uncertainty” (24); and
- addressing and filling gaps in evidence and available information tailored to at-risk communities (information voids) (25).

In its response to the COVID-19 infodemic, the WHO European Region has focused on social listening and monitoring of online signals (including rumours, misinformation and disinformation), their effects on people’s knowledge, beliefs and behaviour and managing the resulting health risks throughout the emergency with prevention, preparedness, readiness, response and recovery. The aim of IM in the European Region is to detect, assess, analyse and respond to infodemic risks while maintaining and strengthening national and regional (sub)systems with training and broader capacity-building. Every part of a health system can be affected by and interact with an infodemic, including responding to rumours based on genuine community concerns. This design is therefore collaborative, with connections to other parts of the health system and the pandemic response.

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4 For an analysis of different approaches to the size, novelty and significance of the infodemic phenomenon see reference 7.

5 Without citing the entirety of the published research, two noteworthy special issues on infodemics are cited in references 19 and 20.
Within the COVID-19 response, IM has the same goal as the RCCE pillar and the incident management system as a whole: ending the pandemic and “building back better” to ensure improved management of health risks in future health emergencies, including pandemics.6

This guidance is based on the latest evidence and practical experience with IM and RCCE in the WHO European Region. Its aim is to provide operational support on IM preparedness, readiness and response related to COVID-19. Its intended readership is mainly response authorities, stakeholders and partners in Member States who are coordinating and implementing the response, with mention of work at local and community levels.7 The document offers practical advice, tools and references to inform and strengthen national IM activities in the RCCE and overall pandemic response.

The document offers specific guidance on operationalizing IM in teams and offices of different sizes and capacities, including those in which these activities may be conducted by focal points who also cover other areas of RCCE and external communication. Rather than offering specific, one-size-fits-all recommendations, the document offers options and approaches that stakeholders may apply in their context. The guidance applies primarily to the WHO European Region because of differences among regions in organizational, structural, cultural and other dimensions of implementation of RCCE and IM, although other regions, headquarters and other stakeholders may use, apply or adapt it. For examples of how IM is implemented in the major WHO offices, see Annex 1.

Although the guidance addresses the COVID-19 infodemic, most of the principles, tools and practices apply equally to infodemics associated with other outbreaks or health emergencies.

Structure of the document

This introduction is followed by a section on the theoretical framework of the guidance, which defines and contextualizes core concepts, describes the information ecosystem and its three constitutive landscapes (information, risk and response), followed by a section on measuring IM response. The core of the document describes how IM work is embedded in RCCE in the European Region, with the two models used: the emergency cycle and the core capacities operationalized in the RCCE work streams:

- planning and internal coordination;
- partners, networks and external coordination;
- community engagement;
- formative research and analysis;
- media, materials and message production; and
- capacity-building.

The first part of the document describes broadly how IM is used in various phases of an emergency, while the second shows how those actions support the four core RCCE capacities and operationalize the support in standard RCCE work streams. The conclusion briefly summarizes the importance of IM and describes areas for further contributions and development of this work. A list of references and four annexes provide further information, including IM quick-start guides on maintenance and response and further reading.

Each section of the guidance may be more or less relevant, depending on the reader’s needs and capacity. The aim is to describe the work of various RCCE professionals, from those who manage IM full-time at regional or national level to those at national and subnational levels for whom IM is a small part of their job. The following order of reading is proposed according to the reader’s profile:

- “I cannot devote much time to IM, but I have a problem and just need to get started”. Start with the quick-start guides in Annex 2.
- “I’m setting up a response to an infodemic for a community, country or region, and I have resources available for that, including people, time and the ability to set up and maintain tools”. Start with the quick-start guides, then move to the advice on partners, choice of tool and localization and then further, depending on the context.
- “I’m part of an RCCE team responsible for IM in a region, connecting and supporting work among countries”. It is recommended that you read the whole document.
- “I’m curious about IM, what the WHO Regional Office for Europe’s IM team is doing, and how my work in RCCE, communication or public health broadly connects with IM”. Review relevant sections of the sections “Infodemic management in the emergency cycle” and “Infodemic management within risk communication and community engagement” and perhaps the quick-start guides.

More details on organizing different profiles can be found in the section Organizing large numbers of responders.

6 For an overview of how IM fits into RCCE and the Incident Management Support Team structure, see the section on infodemic management in the emergency cycle, below.
7 For a discussion of the tiers of response involved in infodemic management, see the section on organizing large numbers of responders.
Considerations
When reading the guidance, the following considerations should be kept in mind.

- **Risk-based approach:** The infodemic is approached as a health risk. Thus, for proper prioritization of response work, those risks should be assessed, including how they affect different vulnerable groups. Focusing on the highest risks will ensure that the most vulnerable are supported first.

- **Planning, preparedness and readiness:** It is advisable to create IM connections and broad (chapters of) planning documents before a crisis emerges. At a minimum, these include listing stakeholders and contacts, mapping the information ecosystem and ensuring understanding of basic response and mitigation.

- **Adaptation:** The advice given below should be adapted to the country, community, situation and available resources; IM does not have to be complicated or involve expensive tools.

- **Coordination:** Coordination and planning with any local experts will amplify the impact.

- **Community empowerment:** Working with communities will help build resilience to infodemics, including by increasing literacy, skills and connections to information infrastructure.

- **Bounds and assumptions:** Mitigation of and responses to mis- and disinformation occur within larger systems that include many different types of organization and activities. This guidance is practical, intended for RCCE professionals and is based on the assumption that regulation, e.g., government misinformation response policies, will be conducted elsewhere.
Theoretical framework

Before IM is operationalized in the context of public health emergency response and specifically for RCCE, some key concepts and best practices should understood. These include the overall goals of IM in the emergency cycle and generally how those goals are translated and embedded into RCCE core capacities and work streams at different phases of the cycle.

Defining an infodemic

WHO defines an infodemic as “excess information, including false or misleading information, in digital and physical environments or landscapes during an acute public health event” (5, 27). An infodemic could be just an overabundance of information, but, in most cases, this is exacerbated by rumours (unverified information), misinformation (false information) and disinformation (deliberate attempts to change beliefs, emotions, trust and community cohesion by falsifying information, sources, popularity and other aspects of the information landscape).9

Although technically outside the short definition of an infodemic, another important factor is information voids: gaps in publicly available, evidence-based communication because of evolving public information demands, questions and concerns. Such voids occur frequently during an emergency as science struggles to keep up with public and media demand for information. For this reason, emergency RCCE places a premium on the ability to “speak in uncertainty” (24) and “communicate, or proclaim, the uncertainty” (23). Infodemics occur in both digital and offline environments. For the latter, community engagement is of particular relevance, and offline community feedback is combined and triangulated with digital sources of data and used in making decisions during the response.

Trust at the core

A crucial element also outside the definition of an infodemic is trust. In the work of the Regional Office on RCCE, trust among emergency responders and communities that are affected or at risk plays a central role, and an infodemic is no exception. Communities must be able to trust that the work of response authorities will take their concerns and risks seriously and reflect them in the response. Response authorities, in turn, must trust the communities they serve to take informed decisions for their health and should not assume too quickly that there is no valid reason why a community is not immediately following health guidance. While RCCE strongly emphasizes building, earning or restoring trust, IM complements the model by addressing factors and actors that intentionally or unintentionally harm the trust. By doing so, IM enhances the RCCE function, from one-sided trust-building to two-sided trust management, throughout the emergency cycle, including between infodemics.

As the saying goes, trust comes on foot but leaves on horseback. It takes time, resources, good faith, engagement and delivery of responsive services to build trust between response authorities and affected communities. RCCE and IM experts are responsible for keeping the trust alive during but especially before and after emergencies, when attention and therefore resources may be lower.

Understanding an infodemic: the information ecosystem

A number of models show how information moves among communities. For the purpose of this guidance, two operational models are the most useful for describing the “what” and the “how” of an infodemic.

- Object-based models describe the elements of an infodemic, which include people, groups, behaviour, incidents, narratives, content (e.g., messages, images, hashtags) and the relations among them. These include Francois’ Actor Behaviour Content model, Pamment’s Actor Behaviour Content Degree Effect model, Terp et al. AMITT STIX-based and behaviour-based models and Carley et al. BEND behaviour models (29). These models are useful for analysing incidents and sharing information among incident responders rapidly (infodemic response).
Ecosystem models describe environments or landscapes in which infodemic objects or artefacts occur. For analysis of the information ecosystem, this guidance addresses three interrelated landscapes: information, risk and response. These are all interconnected, and understanding and improving each helps to strengthen health information systems.

Information

The information landscape comprises the communication and information systems available in an area. It includes the flows of communication, emotions and group interactions in which infodemics exist. This landscape includes trustworthy sites and sources of information that are relevant to the subject (e.g., health) and locations of interest. The actual channels used differ by country, region and demographics. Mapping of the information landscape informs infodemic managers about the channels people use to look for and share information and how information flows among them, including which organizations and user accounts can disseminate information to large numbers of people (“superspreaders”) and which are more trusted or repeated by large numbers of people (“influencers”).

Many actions to mitigate and respond to infodemics rely on understanding and management of the information landscape. For example, to respond to a piece of misinformation with a counternarrative, it is often necessary to understand where and how people seek information and how they share information.

Overabundance of information

Data scientists talk about the “three Vs” problem of big data: volume, velocity and variety. To understand the flows of information and disinformation across the Internet in order to inform an IM response, responders must be able to handle data that are:

- large in volume,
- updated and moved rapidly within information landscapes (accounts, groups, platforms) very quickly, and
- diverse with regard to format, platform, languages, sources and other dimensions.

During crises, including outbreaks, natural disasters and large-scale health emergencies, the three Vs increase information flow beyond the capacity of human analysts, responders and the general public to make sense of it. This is the “excess of information” from the definition of an infodemic.

In parallel with the excess is a corresponding increase in health information-seeking, as people facing a risk to their health seek information to help them make decisions, share with others or reinforce their already-held positions on health matters. This abundance generates information voids (see below) and is often accompanied by increased emotion (e.g., fear, anxiety) about a health topic and, increasingly, as health-related disinformation increases, about identity and group membership.

Several information channels

As information channels often combine and reinforce one another, mapping of the information landscape requires an inventory of those channels and their interactions. For example, information on social media is often picked up by traditional media and then repeated back to social media. Thus, even for areas for which social media coverage is limited (e.g., geographically or linguistically), narratives from social media will be available on other channels.

Traditional mass media include newspapers, radio (including community radio) and television. Many countries have spectrum licensing agencies that hold lists of television and radio stations, and journalists’ associations often have lists of newspapers and the areas they cover. Online information channels include social media (e.g., Facebook (Meta), Twitter), online newspapers, websites, messaging services (e.g., WhatsApp) and other spaces in which people interact, including multiplayer games, forums and messaging boards.

Other information channels that are usefully included in a summary of an information landscape are word-of-mouth and more formal interactionssuch as town halls, theatre and protests.

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10 For an example of a country landscape summary, see Fig. 10.
11 Not to be confused with the epidemiological use of the term “superspreading events”
12 A fourth V, veracity, referring to “questions of trust and uncertainty with regards to data and the outcome of analysis of that data”, is sometimes added. See, for example, reference 31. A fifth V that has also sometimes been added is value, “the ability to transform a tsunami of data into business”; see, e.g., reference 32.
13 These services are sometimes called “dark social media”, as it is difficult to track conversations in them and to do so legally such as in conformity with the General Data Protection Regulation of the European Union.
Influencers and information sources
Information spaces usually have “influencers”: sites, channels and accounts that are more trusted than others or the content of which is more widely shared than others. Influence can be measured in many ways (33). A measure of influence can be established by looking at user accounts as a network, with connections that include behaviour such as following, retweeting, quoting, commenting and “like”ing, which indicate how far new information from a user can spread through the network, which in turn is influenced by whether the user links a number of communities. These should be considered when looking at graphs of connected accounts.

Influencers, especially social media influencers, often have access to large, strategically connected networks, audiences or vulnerable communities and may be able to identify rumours and concerns and help to persuade people in their audiences and communities to act. Influencers with larger followings might be health agencies, bloggers, celebrities or media personalities. Influencers in smaller communities range from religious leaders to librarians and shopkeepers.

In a healthy information landscape, reliable influencers and channels disseminating evidence-based, trustworthy information are more trusted than mis- and disinformation influencers and channels. To strengthen an information landscape, these actors usually amplify or set up and maintain trustworthy and trusted sources of information before a health emergency, serving at-risk communities, fact-checking teams and other infodemic responders.

Practically, influence is exerted both online and offline, and a summary of an information landscape should include not only influencers but also the characteristics of their audiences and communities. For example, an influencer in a small, vulnerable community may be more useful to a response than an influencer with a large following that does not face a similar level of risk.

Communities
Infodemics, like epidemics, start and end in communities – groups of people who may or may not be spatially connected and could be local, national or international but who share common (specific or broad) interests, concerns or identities, without precluding significant heterogeneity (34, 35). To manage trust between communities and response authorities effectively, the authorities must understand community dynamics, power structures and flows of information and be committed to support and collaborate with communities rather than taking a top-down approach. The offline components of infodemics in particular cannot be managed appropriately without genuine, thorough community engagement.

Information voids
Any health emergency engenders uncertainty in affected populations, exponentially increasing concern, raising questions and a demand for information. As it takes time to accumulate scientific data and to prepare evidence-based guidance and messages, there are almost always gaps between information demand and supply, which are referred to as “information voids”.

Emergency RCCE emphasize the importance of “speaking in uncertainty” and “communicating or proclaiming uncertainty”. One formula for speaking in uncertainty is as follows (36):

1. Announce what is known.
2. Announce what is not (yet) known.
3. Communicate what is being done to find out.
4. Advise what at-risk communities can do to protect themselves in the meantime.

Information voids that are not addressed or filled rapidly are likely to generate rumours and misinformation and are a favourite target for disinformation. An effective strategy to mitigate this dynamic is to use social listening, media monitoring, community feedback and formative research, including behavioural insights, to recognize evolving community concerns in order to respond rapidly.

Risk
In traditional risk management (34), risk is defined as a function of the probability of an adverse health effect and the severity of that effect (37). For IM, prioritization according to risk directs limited resources to the artefacts that are most likely to have the greatest negative effect on health. Other important considerations in risk are the targets of harm and their vulnerability, timing (e.g., when events are likely to happen, as some events naturally disappear after hours, weeks or months) and the drivers of the effects and probabilities of risks (38).

An infodemic risk landscape is a map of the artefacts and narratives that together generate the harm of an infodemic, the accounts that broadcast them, the people or actors behind them (both nefarious and neutral) and the potential harm of information overload, inaccurate information and information landscapes that are difficult to navigate.
Risk features of infodemics
Signals of problems in the context of an infodemic include the following:

- Content: an increase in false narratives, rumours and stories about a current health situation.
- Context: a mismatch between information-seeking behaviour (including levels of trust and the channels in which information is sought) and information-posting behaviour and availability.
- Behaviour: infodemic techniques including fake experts and manipulated media websites that seed or promote false narratives; coordinated inauthentic behaviour that creates greater popularity of false narratives than usual; and the spread of false narratives into community discussions.
- Risk: the degree to which an incident is or could affect a community combined with the numbers potentially affected by the incident gives an estimate of relative risk. Nationally, regionally or globally, infodemics are generally at scale: a conspiracy rumour that is rarely repeated is not a signal of a problem in the context of an infodemic, but spread of that rumour into the wider popular narrative and negatively affecting health behaviour is. Scale is also relative: issues that do not affect many people might nevertheless significantly harm a smaller community.

The risk landscape includes objects that contribute to an infodemic, such as artefacts, narratives, incidents and campaigns. Each may be linked to a specific moment or events or occur in the background.

- “Incidents” are events of concern. Examples include simple incidents, such as a rumour passed around a community through messaging apps, or more complex incidents in which many narratives spread across social media, traditional media, messaging apps and word of mouth through many communities and in many languages.
- Artefacts are the visible objects in an infodemic. They include content – messages, images, video and audio recordings – and also context – online accounts, URLs, groups and connections between objects.
- Narratives are the stories – true, inaccurate and false – contained in rumours and misinformation.
- Campaigns are longer-term, organized sets of infodemic incidents.

Inaccurate information
While infodemics include excess information and voids, much of the potential harm in an infodemic is due to various kinds of inaccurate information. Rumours, for example, are unverified pieces of information. “Misinformation” is defined as incorrect, misleading or misattributed information circulated with no underlying agenda. “Conspiracy theories” are alternative explanations for events that are not always founded in reality. WHO’s RCCE team has long-standing expertise in rumour management in health emergencies, when their volume, velocity and variety tend to multiply. Although much attention is focused on preventing or reducing the spread of rumours, anthropological perspectives frame them as a valuable window on public sentiments:

“(…), a means of seeking answers where official sources are not delivering, for collective sense-making in the face of uncertain risks, and as a beacon signaling new information of an unforeseen risk not yet recognized through more formal channels (39).”

Drivers of rumour and creation and sharing of misinformation include rapid changes in response, uncertainty about the location of outbreaks, who is susceptible and varying levels of trust in governments, health authorities and other providers of health information and response. Rumours thrive in the absence of early, regular, transparent communications. The Regional Office for Europe is conducting a study of uncertainty created by scientific communications methods and how they feed into rumours and misinformation.

Disinformation
Disinformation is similar to misinformation but with a specific, often political, agenda. Disinformation includes incorrect, misleading or misattributed information but can also include real information that is artificially amplified with harmful intent (malinformation) and manipulation of individuals’ information-seeking, -sharing and consumption behaviour.

Disinformation is based on false sourcing, amplification or other “hacks” of the information landscape to manipulate peoples’ beliefs, emotions or sense of belonging to in-groups and out-groups. The messages and images used in disinformation are often real, truthful (or mostly truthful, with some misinformation) but used out of context, mislabelled or amplified to create emotive responses and affect behaviour.

Although RCCE covers “good faith” actors in the information space who have the public’s best interest at heart, of which there are many, and the harm...
of infodemics is generated by a simple excess of information, not every messenger in an infodemic is benign. Distributors of disinformation may have powerful political, financial or other motives that conflict with public health goals. Attribution of disinformation and its intent are usually difficult to determine, and valuable effort can be consumed in responding to an ongoing disinformation incident. It is therefore advisable to prioritize the potential targets of disinformation and improve their information landscape.

Harm of infodemics

Infodemics and related processes change behaviour to produce adverse effects or “infodemic harm” (40). Infodemic harm is generated by information overload and voids and also by rumours, misinformation and disinformation. Individual categories of harm include psychological (e.g., health information-seeking anxiety) and physical (e.g., using fake COVID-19 cures that result in poisoning). Other types of harm are due to reduced uptake of vaccination and other protective measures.

Institutional harm includes impacts on communities, national health and economy, global health and development. As national health authorities and health-care workers are trusted sources of health information, an infodemic that reduces that trust can hamper pandemic responses. Direct infodemic attacks can not only reduce trust in their expertise and work but can also instil doubt in health-care workers’ minds about the guidance and scientific evidence. Like all human beings, they are also susceptible to the dynamics of an infodemic, including disinformation tactics. Resilience to infodemics must be built, e.g., by training

Infodemic risk assessment

While few comprehensive, specific methods are available for risk assessment in IM,16 some useful resources include:

- UNICEF: Vaccine misinformation field guide (41)
- FullFact: A framework for information incidents (42)
- Global disinformation index: Rating disinformation risk: The GDI methodology (43)
- The adversarial misinformation and influence tactics and techniques (AMITT) framework (44)

Useful evaluations to be conducted include the risk posed by an infodemic incident, risk reduction and any additional risks introduced by the infodemic incident response.

Risk perception = hazard + outrage

Seminal RCCE literature used by the Regional Office includes the traditional definition of risk as a function of probability and adverse effect and also the different ways used by experts to quantify risk and public understanding of risk. Peter Sandman coined the formula “risk = hazard + outrage” (45), in which outrage accounts for the greatest deviation of public perception of risk from experts’ risk assessment, driven by factors such as familiarity, natural versus industrial and other markers (46). This formula and the subsequent four strategies for risk communication apply to the response to infodemic risks. Use of RCCE strategies to identified infodemic risks increases the alignment of risk perception with risk assessment and improves the appropriateness of communities’ responses to infodemic risk.

Response

As in public health emergency response and RCCE overall, managing an infodemic requires a whole-of-society approach, with cooperation across disciplines, groups, sectors and communities. It requires that individuals learn to stop and assess “news” before they share it and that policy-makers improve the range of possible responses. Understanding community information landscapes, information gaps and how best to fill them and supporting or co-creating community capacity to respond to infodemic risks are crucial.17

In most countries, several groups find, analyse and respond to information. Groups with complementary skills and interests can increase response coverage (e.g., the number of narratives analysed and addressed), with more efficient use of limited resources. Most countries have teams working on IM. These include fact-checking organizations, government groups and media teams. Regional and international organizations search for infodemic artefacts and narratives and respond to them at different levels. As many of these organizations have specific skills, focuses or geographical areas of operation, mapping and working with these groups can broaden the range of alerts and responses.

16 One is being developed, entitled “WHO field guide for assessing infodemic risk and preparedness”.
People who are active in IM in each region or country may include:

- government counter-misinformation teams: in an information technology department or any department dealing with information and the public;
- United Nations agencies and other international organizations: WHO, UNICEF, United Nations Educational, Scientific and Cultural Organization, United Nations Development Programme, International Federation of Red Cross and Red Crescent Societies, at headquarters, regional and country levels;
- media and journalist groups: e.g., BBC Media Action, Internews, European Federation of Journalists, which are linked to news organizations and journalism schools;
- organizations dedicated to fact-checking and disinformation analysis and response;
- community response groups;
- influencers.

Different organizations and groups work on different aspects of IM. Some work to improve understanding of the landscapes in which infodemics occur; many work to build community resilience by training communities and influencers and building networks of trust. Other teams track infodemic artefacts or create tools, processes and data feeds for use by IM mitigation and response teams.

**Response activities**

Response actors should be able to use their information and risk and response landscapes to identify and prioritize activities according to risk, the available capacity and resources and the likely impact. Time should also be considered a resource, as the extent and intensity of activities for response are different from those for prevention and preparedness.\(^{18}\)

IM is a combination of responding to infodemic artefacts and narratives and making the local information landscape more resilient to an infodemic. Most of this work will be based on narratives, creating trusted places online that issue messages and counternarratives that negate rumours and misinformation narratives.

**Organizing and understanding the response landscape**

While infodemic response need not involve many people or a large budget,\(^{19}\) it may be helpful in mapping a response landscape to consider the functions of infodemic responders, which can be organized into four tiers \((47, 48)\):

- **Tier 1: triage.** Teams collect data through social listening, tip lines and online searches and highlight the data that are of interest to people who will sift through information or respond to rumours and misinformation. Triage teams generally produce lists of interesting datapoints, e.g., a datapoint plus summary and tags, for other teams to work on or visualizations of data, sources, hashtags and other features of interest to infodemic researchers and responders. Large organized teams produce some form of “ticket” containing this information; other teams post information online, e.g., on websites and by e-mail. The time for action is usually minutes to hours. See also Formative research and analysis below for details of such activities.

- **Tier 2: incident response.** Teams investigate the datapoints highlighted by triage teams or tip lines, adding more details, including connections to narratives, information sources and counternarratives, and potential remedies and responses. These teams usually post their results on online pages, organize their own responses (e.g., amplifying related information or creating counternarratives) and send information to other teams (including social media platforms) that can also create evidence-based responses. The average time for action ranges from hours to days. See also Media, materials and message production below.

- **Tier 3: Subject matter experts.** These people usually have more expertise in infodemic response and conduct deeper analyses of the underlying mechanisms and information ecosystem, seeking indicators of new activity and planning longer-term mitigation and responses. Tier 3 usually produces longer reports on infodemic incidents and conditions. The timescale is usually days to months. Relevant sections of this document for these activities include Community engagement, Guidance and research production and Capacity-building.

- **Tier 4: Coordination.** Teams or individuals in this tier coordinate the activities in the other three tiers, with each other and with other teams and organizations. The main document for tier 4 responders is an infodemic response plan that lists connections, data sources and activities for monitoring, responding and sharing information. This background work tends to be continuous. See Planning and internal coordination and this section.

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\(^{18}\) For a more detailed analysis of IM activities during different phases of an emergency cycle, see Infodemic management within the emergency cycle.

\(^{19}\) See, for example, Partners, networks and external coordination, below.
Many organizations have two or more of these tiers, some focus on one, and different organizations may have widely different team structures and methods for handling information. Each of the tiers interacts with the others and uses knowledge about the infodemic (artefacts, narratives, incidents, campaigns, influencers, community segments) and about health responses, the geographical area covered, demographics and other relevant factors. Even when an IM team or organization is not overtly organized into tiers, it is worth assessing which tiers are present in the team, their inputs and outputs and the activities at each level. Understanding stakeholder capabilities and shortfalls can help ensure focused, prioritized, adequate IM. An example of an IM team in a Member State in the European Region is shown in Fig. 1.

Measuring infodemic management
IM response is measured at two levels:

- the overall effectiveness of the system (e.g., people, groups, processes, tools) in reducing infodemic risk in its area and
- the effectiveness of the response to individual infodemic incidents.

Monitoring and evaluating an IM response indicate which interventions are most effective, any additional resources and training required and lessons for future IM activities. It is a false economy not to assess and evaluate an IM response, as it is not known whether an action is likely to be effective or to cause further harm and can lead to use of resources for actions that have been tested elsewhere by a potential partner.

Two resources that can be used for monitoring and evaluation are:

- the WHO MEL manual (49): measurement, evaluation and learning for communication campaigns and activities, which reviews evaluation of communication campaigns and activities, constructing effective indicators, collecting and analysing data and formulating lessons; and
- the International Health Regulations (2005) (IHR) monitoring and evaluation framework (50): States Parties (IHR signatories) have access to this framework, which describes approaches to reviewing implementation of core public health capacity. Two procedures for reviewing COVID-19 responses are provided:
  - COVID-19 intra-action reviews (51): conducted during a COVID-19 outbreak in a country by a small group of COVID-19 responders applying public health response pillars; and
  - IHR after-action reviews (52): qualitative reviews of actions taken to respond to an event in order to identify best practices, lessons and gaps in a country’s public health emergency preparedness and response capacity as part of continual improvement and collective learning.
Infeção humana por vírus MONKEYPOX
Advancing infodemic management within risk communication and community engagement

The text below describes how the concepts of IM in the theoretical framework are embedded and advanced in RCCE in the WHO European Region. IM and RCCE have the same overall goal: ensuring that communities at risk can take informed decisions about their health by effective exchange of information between experts and affected populations (risk communication) and strengthening trusted relationships and collaboration between response authorities and the communities (community engagement).

In the context of the COVID-19 pandemic, IM contributes to broader RCCE and response to end the pandemic and “build back better” by:

- maintaining and strengthening IM (sub)systems within RCCE, by capacity-building, mobilizing human and financial resources and instituting infrastructure and best practices;
- detecting infodemic risks before they cause harm (for prevention) and in real time (for response);
- assessing and analysing infodemic risks and potential responses (including standard RCCE responses); and
- taking appropriate, timely action for mitigation and response within the legal, jurisdictional and policy frameworks and constraints of each responding team.

IM in the WHO European Region addresses these objectives in all phases of an emergency, from prevention through preparedness and readiness, response and recovery. By contributing new elements and strengthening existing ones in the various standard RCCE work streams, IM contributes in significant, structural ways to strengthening the core capacities and concrete work of RCCE.

Infodemic management in the emergency cycle

The emergency cycle

Although every public health emergency is specific, generally, each passes through various phases, which may overlap and sometimes repeat (53, 54). The emergency cycle is as follows (see also Fig. 2):

1. **Prevention**: Reduce the likelihood and potential impact of a future hazard. Many health emergencies can be prevented or quelled before they cause extreme damage; for example, vaccination is a preventive measure against emergencies due to outbreaks of infectious diseases.

2. **Preparedness**: Reduce the impact of an imminent or expected hazard by improving response systems. Health emergency preparedness in Europe consists of ensuring that all countries in the Region have the capability to manage any type of health emergency; for example, by ensuring that enough trained spokespeople are available, a country is better prepared for an RCCE response when an emergency strikes.

3. **Readiness**: Reduce the impact of an imminent or expected hazard by practising and testing response systems and skills. Capability built during preparedness is tested and practised to ensure a timely, effective, efficient response. This involves drills, simulations and other exercises and ensuring sufficient resources that can be rapidly scaled up as necessary.

4. **Response**: Reduce the impact of a materialized, recognized hazard. Effective emergency response includes life-saving health interventions and ensuring that affected populations have timely access to high-quality health services. A classic example of an RCCE response is timely public announcement of a health risk to populations at risk.

5. **Recovery and evaluation**: Evaluation reduces the likelihood and impact of future hazards (and is part of prevention). Once the peak of a crisis has passed, recovery includes remaining on the ground, sustaining work and “building back better”, including by evaluating the response and implementing lessons...
through case studies, documents and processes such as the intra-action and after-action reviews of the IHR monitoring and evaluation framework (50–52). Evaluation, including by documenting lessons, should be done not only during recovery but at all phases, particularly the response phase and especially during protracted emergencies.

The components of IM work in each phase of the emergency cycle are visualized in Figs 3–7. The activities listed may be necessary at any time during an emergency, but they are grouped to the times in the life-cycle at which they usually apply.

An infodemic objective can be identified and summarized for each of these emergency cycle phases as shown in Table 1.

**Table 1. Summary of infodemic objectives for each emergency cycle phase**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention</td>
<td>Work with partners to strengthen information and response systems before an infodemic occurs and also after recovery.</td>
</tr>
<tr>
<td>Preparedness</td>
<td>Understand the current information, infodemic risk and response landscapes, and ensure resources if an infodemic is anticipated or imminent.</td>
</tr>
<tr>
<td>Readiness</td>
<td>Practise infodemic skills, and test plans, processes and systems in drills, simulations and tabletop exercises, including viewing an infodemic incident from the point of view of people and the entities and objects involved in its creation (“red teaming”).</td>
</tr>
<tr>
<td>Response</td>
<td>Respond to an infodemic with information and risk interventions, including ensuring that affected populations have timely access to high-quality health information.</td>
</tr>
<tr>
<td>Recovery</td>
<td>Record the lessons learnt; support ministries of health in organizing lower-intensity monitoring before the next infodemic. Leads to the prevention phase.</td>
</tr>
</tbody>
</table>
Prevention activities are usually conducted when there is no current or anticipated emergency and can be carried out at varying levels of intensity (Table 2). Their focus is on building infrastructure so the organization can respond rapidly if an infodemic occurs. They include capacity building to ensure that the organization has trained people, processes, tools, culture, connections and other resources available for a response if necessary. They also include academic research, knowledge-sharing and advocacy for IM as an integral part of emergency response and communication.

Prevention can be ensured in any period of non-emergency.
### Table 2. Suggested prevention activities at basic, intermediate and advanced level

<table>
<thead>
<tr>
<th>Level</th>
<th>Suggested prevention activities</th>
</tr>
</thead>
</table>
| Basic     | List what you could do and who you could contact in an emergency:  
- Nominate an infodemic contact.  
- Identify and contact infodemic responders and/or coordinators in the area (from the list of stakeholders).  
- Identify and contact internal teams who could participate in an infodemic response.  
- Encourage staff, national health staff, health influencers and communities to attend infodemic training. |
| Intermediate | Build awareness and contacts before an emergency, comprising at least the following:  
- Map your information ecosystem information, risk and response landscapes. Check responders’ websites to evaluate the types of rumours and misinformation in your area. List the types of health narratives seen and any communities being targeted.  
- Identify or arrange for translation and localization of resilience-building tools, including games and training materials as necessary and possible.  
- Identify or arrange IM training for staff and health authority responders.  
- Identify or arrange IM awareness sessions for internal teams who could be part of an infodemic response.  
- Connect infodemic monitoring groups, response groups and health authorities, perhaps through an IM seminar or tabletop exercise. |
| Advanced  | Improve your infodemic mitigation and response systems, comprising at least the following:  
- Improve the information ecosystem landscape assessment with a desk survey, country data analysis and semi-structured interviews or workshops with potential responders.  
- Identify gaps between potential infodemic risks and available mitigations and responses, the focus of gaps (e.g., politics rather than health), response activities, communities served, languages available.  
- Assess the resilience of communities at risk to infodemics. Reinforce their resilience by training in influence literacy, games and co-created plans. Arrange for translation and localization of training materials as necessary and possible.  
- Coordinate (or join if they already exist) response capacity-building, including training, and response community-building. Localize guides to your own information ecosystem (consider country, languages and community specificities).  
- Coordinate (or join if they already exist) improvements to information ecosystems, including helping to build trust in and the reach of national health influencers (identify positive health influencers from the list).  
- Maintain a library of common infodemic techniques, narratives and responses. Test and improve them in tabletop exercises and simulations.  
- Ensure that drills and simulation exercises are included in IM plans. Include IM components in wider exercises for emergency readiness skills and simulations.  
- Integrate and connect IM infrastructure and listening systems into relevant segments of the national health emergency response infrastructure. Assess the suitability of the available tools for the communities, channels and languages with which you will work and monitor, and arrange for translation and localization as necessary and possible.  
- Include IM planning in relevant national and international planning, budget cycles, including pandemic preparedness and response plans.  
- Work with researchers to improve IM knowledge and responses. Publish peer-reviewed, scientific, grey and other literature and guidance.  
- Advocate for appropriate financial and human resources for IM. |
The aim of preparedness activities is to increase the capacity to manage an anticipated or imminent emergency and these activities can be carried out at various intensity levels (Table 3). They include planning the response to the team’s capacity and the incident; creating or updating summaries of information and risk and response landscapes; and ensuring connections to communities and other stakeholders, tools and information sources.
<table>
<thead>
<tr>
<th>Level</th>
<th>Suggested preparedness activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>Update your connections:</td>
</tr>
<tr>
<td></td>
<td>• Update lists of local infodemic responders, coordinators and internal contacts.</td>
</tr>
<tr>
<td></td>
<td>• Identify local sources of credible health information for the anticipated or imminent emergency.</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Map your current landscape, and build response plans for the new emergency, comprising at least the following:</td>
</tr>
<tr>
<td></td>
<td>• Update your information ecosystem information, risk and response landscapes for the emergency. Identify all the potential stakeholders in your area who could detect, analyse, respond to or mitigate the infodemic, including coordination bodies.</td>
</tr>
<tr>
<td></td>
<td>• Work with positive health influencers, if necessary, to increase trust and visibility and/or fill information voids. Check that influencers and responders are in contact.</td>
</tr>
<tr>
<td></td>
<td>• Help health authorities to identify means for mitigating infodemics, plan the response, and make contacts with communities and responders.</td>
</tr>
<tr>
<td></td>
<td>• Work with community support leaders to identify potential rumours or misinformation in the infodemic and/or any need for support in community-led infodemic responses. Identify communities at risk, including health communities (e.g., health worker groups, parents, carers), and work with them to describe communication channels and styles, identify influencers, design mitigations and tailor responses.</td>
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<tr>
<td></td>
<td>• Identify alert, monitoring and analytical tools appropriate to your information ecosystem (e.g., languages, communities, risk profile) and resources (e.g., time available per week). Set up the tools.</td>
</tr>
<tr>
<td>Advanced</td>
<td>“De-risk” the ecosystem, comprising at least the following:</td>
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<tr>
<td></td>
<td>• Use your response landscape to identify potential partners in mitigation and response. Contact them, and assess their activities and resource levels. Identify positive and less-positive health influencers in communities and regions. Identify any gaps between potential risks and their mitigation and response.</td>
</tr>
<tr>
<td></td>
<td>• Create an IM mitigation, monitoring and response plan with partners: include processes, contacts and resources. Plan divisions of work between the office and partners, including regional and international responders.</td>
</tr>
<tr>
<td></td>
<td>• Set up processes and a toolkit for your area, paying attention to issues such as coordination, localization, channels and community needs.</td>
</tr>
<tr>
<td></td>
<td>• Find and fill information voids.</td>
</tr>
<tr>
<td></td>
<td>• Produce counternarratives and “pre-bunking” materials.</td>
</tr>
</tbody>
</table>

Pre-bunking, or inoculation, is preparing before an anticipated narrative becomes widespread by, for instance, creating and publicizing information relevant to the narrative. It is important to avoid publicizing the incorrect narrative. Instead, the correct information should be made available.
Readiness activities are conducted to test IM activities, skills, resources and knowledge about an infodemic, to improve team responses to an ongoing or potential infodemic and these activities can be carried out at various intensity levels (Table 4). They include exercises ranging from tabletop run-through to full simulations and “red teaming”: running an exercise in the roles of both infodemic creators and responders to gain insights into events and anticipate future infodemic narratives and incidents.

Readiness activities should take an all-hazards approach to ensure that they are cost-effective (especially in under-resourced settings) and allow systems to practise for all relevant hazards.

Table 4. Suggested readiness activities at basic, intermediate and advanced level

<table>
<thead>
<tr>
<th>Level</th>
<th>Suggested readiness activities</th>
</tr>
</thead>
</table>
| Basic  | Practise how you would respond to an infodemic incident:  
• For an existing incident, consider how you would respond. Who and where would you find alerts, analysis and response materials? Who should you alert? Will you require translations or other modifications to the response materials? |
| Intermediate | Test your response plan: as basic, comprising at least the following:  
• Test listening systems and tools, and validate the information, risk and response landscapes for incidents modified for the new emergency. Address any gaps identified (e.g., the channels, languages and sources of alerts). |
| Advanced | Test your response systems, comprising at least the following:  
• Run drills and simulation exercises. Involve key response partners, communities, leaders and influencers in the design and execution of drills and exercises as co-organizers, participants and red-team role-players.  
• Test standard messages and materials and message production, clearance and dissemination procedures with communities and health responders. Use the outcome to improve the materials and processes. |
Response activities comprise managing an active infodemic and these activities can be carried out at various intensity levels (Table 5). They include managing the information landscape to reduce the numbers of “spoof” (false) sites and information voids and a cycle of detecting, assessing and responding to incidents. As mentioned above, it is important to document and implement lessons learnt during the response, especially for longer emergencies.
Table 5. Suggested response activities at basic, intermediate and advanced level

<table>
<thead>
<tr>
<th>Level</th>
<th>Suggested response activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>Support responders</td>
</tr>
<tr>
<td></td>
<td>• Monitor the activities of external and internal infodemic responders. Connect them, and route urgent alerts among them if necessary.</td>
</tr>
<tr>
<td></td>
<td>• Ensure that counter-messaging resources are available in local languages.</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
</tr>
<tr>
<td></td>
<td>Implement your monitoring and response plans, comprising at least the following:</td>
</tr>
<tr>
<td></td>
<td>• Activate infodemic partnerships and response actions.</td>
</tr>
<tr>
<td></td>
<td>• Ensure that health authorities monitor and respond as appropriate to misinformation that affects their operation and trust in them and to infodemic narratives in health-related forums.</td>
</tr>
<tr>
<td></td>
<td>• For communities with the necessary resources, monitor and respond as appropriate to misinformation that affects their operation and trust in them and to infodemic narratives in health-related fora. Low-resource communities should report infodemic artefacts and narratives to responders.</td>
</tr>
<tr>
<td></td>
<td>• Produce or request counternarratives and pre-bunking materials.</td>
</tr>
<tr>
<td></td>
<td>• Manage the unmitigated impact of risk by monitoring responder sites, social listening feeds and media landscapes, alerting internal and external partners as necessary.</td>
</tr>
<tr>
<td>Advanced</td>
<td>Coordinate the response, adapting it as necessary, comprising at least the following:</td>
</tr>
<tr>
<td></td>
<td>• Collect and analyse data in time to inform the infodemic response.</td>
</tr>
<tr>
<td></td>
<td>• Route information requests and responses between internal and external partners.</td>
</tr>
<tr>
<td></td>
<td>• Help health authorities and responders to adjust plans as landscapes, conditions and needs change.</td>
</tr>
<tr>
<td></td>
<td>• Conduct rapid research to answer questions and improve guidance relevant to the response.</td>
</tr>
<tr>
<td></td>
<td>• Find and respond to information landscape issues, including new information voids.</td>
</tr>
<tr>
<td></td>
<td>• Run further training on, e.g., tools, processes, as necessary.</td>
</tr>
<tr>
<td></td>
<td>• Monitor internal issues, including staff stress and security issues.</td>
</tr>
</tbody>
</table>
Recovery and evaluation

Recovery activities are conducted after an infodemic or as an infodemic slows down and these activities can be carried out at various intensity levels (Table 6). They include archiving materials that could be used for both research and at the beginning of the next infodemic response, conduct intra- and after-action reviews to learn and respond to lessons learnt, and reduce or adapt activities to maintain lower-intensity capacity over time. As mentioned above, evaluation and learning should be ensured throughout the cycle, especially during the response, to learn lessons.

Recovery also includes bridging to “build back better”, by increasing community resilience to infodemics and managing information landscapes to ensure that misinformation and disinformation are less effective.

These activities include training communities, influencers and the media to manage their own responses to infodemic incidents, building trusted sources and channels for health information and regularly checking for new information voids and “spoof” sites. The training should address digital, science, information and health literacy at various levels, including in school curricula in the longer term.

The recovery phase will usually lead to a new non-emergency prevention and preparedness phase.

Table 6. Suggested recovery activities at basic, intermediate and advanced level

<table>
<thead>
<tr>
<th>Level</th>
<th>Suggested recovery activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>Store lists of useful contacts.</td>
</tr>
<tr>
<td></td>
<td>• List the information sources, contacts and tools that you used in your infodemic response.</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Archive materials, and record the lessons learnt:</td>
</tr>
<tr>
<td></td>
<td>• Review the materials produced, and create a library of infodemic narratives and responses, highlighting any that are applicable to infodemics in general.</td>
</tr>
<tr>
<td></td>
<td>• Archive data and information produced during the response.</td>
</tr>
<tr>
<td></td>
<td>• Run or attend a session to listen to partners and communities. Summarize activities, list lessons learnt, resource gaps and the measures that were most effective.</td>
</tr>
<tr>
<td></td>
<td>• Write an after-action report.</td>
</tr>
<tr>
<td>Advanced</td>
<td>Build back better:</td>
</tr>
<tr>
<td></td>
<td>• Start adapting tools, processes and other means to fill gaps found during the response.</td>
</tr>
<tr>
<td></td>
<td>• Publish case studies.</td>
</tr>
<tr>
<td></td>
<td>• Keep training materials updated; run semi-regular training sessions according to new research.</td>
</tr>
<tr>
<td></td>
<td>• Plan continuous contact with staff, communities and responders to ensure capacity when the current infodemic recedes.</td>
</tr>
<tr>
<td></td>
<td>• Maintain a background level of readiness through activities such as training, papers and regular contacts.</td>
</tr>
</tbody>
</table>
Infodemic management within the core capacities and work streams of risk communication and community engagement

With a broad understanding of how IM priorities change during the different phases of the emergency cycle, those priorities can be seen in overarching RCCE core capacities and operationalized in standard RCCE work streams.

Four core capacities of RCCE

In the IHR (55), risk communication is listed as one of eight core capacities that the 194 States Parties are committed to strengthening (56, 57).21 The updated Joint External Evaluation tool (58) and the States Parties annual reporting tool (the main instruments for establishing criteria to evaluate progress in meeting the commitments to the IHR (2005)) include a focus on community engagement, and practitioners increasingly agree that the two parts of RCCE are indivisible. Four core RCCE capacities for national capacity-building have been identified and refined by the Regional Office over time (59, 60), each with relevant application to IM (Fig. 8).

1. Transparency and early announcement of a real or potential risk: Maintaining the public’s trust throughout an emergency requires constant transparency, including providing timely, complete information and advice about a real or potential risk and its management, acknowledging gaps in evidence and information and making an effort to find out more.

   - **RCCE components:** standard operating procedures and other decision-making principles for message production, clearance and distribution; policies for speaking in uncertainty; capacity to draft effective messages tailored to cultural, religious, ethnic, linguistic and literacy dimensions; availability of spokespersons.

2. Coordinating public communication: Proactive public and internal communication and coordination with partners before, during and after an emergency are crucial to ensure effective, consistent, trustworthy risk communication that both provides information and addresses public concerns.
• **RCCE components**: availability of RCCE focal points and capacity for response; established coordination structures and procedures; availability of community networks.

3. **Listening through two-way communication**: Community voices must be at the heart of any health emergency response, as it is essential to know how people understand and perceive a given risk and their beliefs and practices in order to target them effectively.

   • **RCCE components**: various forms of data collection, analysis and dialogue, including qualitative and quantitative research, social listening and media monitoring and effective two-way community feedback channels.

4. **Selecting effective channels and influencers**: The community should be a true partner in the response. The existence of such a partnership often determines the success of a response. The right channels and influencers to reach target audiences depend on the local context and are usually those already used by that audience.

   • **RCCE components**: mapping channels (web, social media, traditional media (radio, television, print), SMS) and influencers (health workers, religious leaders, young people, journalists, civil society organizations, local authorities) for each target audience and forming partnerships and relationships with them.

The four core capacities focus on earning, restoring and building trust between emergency responders and communities at risk, while IM complements the model by adding factors and actors that intentionally or unintentionally harm the trust. In doing so, IM changes the RCCE function from one-sided trust-building to two-sided trust management.

**From capacity to work streams**

To operationalize the four core capacities listed above, a number of work streams can be identified:22

• **Planning and internal coordination**: to achieve effective, efficient IM by ensuring that work is strategic, in line with relevant WHO and other plans and documents, and communicated and advocated clearly with internal stakeholders and effectively monitored and evaluated to ensure delivery, any necessary adjustments and documentation of lessons learnt;

• **Partners, networks and external coordination**: to increase the impact by identifying synergy, areas for joint work and avoiding overlap and advocating externally for IM activities and the COVID-19 response more broadly;

• **Community engagement**: to make communities, influencers and civil society organizations resilient to infodemics by designing IM solutions with communities, tailoring them to the health information requirements of the community, combining scientific soundness and cultural relevance;

• **Social listening, formative research and analysis**: to establish collection of the necessary, sufficient data and analysis to inform infodemic response actions, ensure efforts are responsive to evolving community and country needs, as well as to ensure evaluation of process and impact;

• **Media, materials and message production**: provide information in response to infodemic artefacts (including via the media, social media and web and other channels used by target audiences) so at-risk populations are able to take informed decisions to protect themselves and others and the public reputation of response authorities is protected and strengthened;

• **Capacity building**: strengthen country IM capacity to improve sustainability of efforts and impacts.

While some of these activities contribute mainly to one of the four RCCE capacities, some are part of more than one, and capacity-building is necessary for all four RCCE capacities.

The results of applying IM within these RCCE capacities, work streams and activities, and mapping them throughout the emergency cycle can be seen in Table 7 and are further elaborated and operationalized for the Regional Office’s RCCE work in subsequent sections.

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22 Work streams based on the communication pillar strategy of the WHO Regional Office for Europe’s Incident Management Support Team in 2021 (internal draft).

24 ADVANCING INFODEMIC MANAGEMENT IN RISK COMMUNICATION AND COMMUNITY ENGAGEMENT IN THE WHO EUROPEAN REGION: IMPLEMENTATION GUIDANCE
### Table 7. IM by RCCE work stream for each emergency cycle phase

<table>
<thead>
<tr>
<th>RCCE work stream</th>
<th>Emergency cycle phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention (reduce likelihood of a future hazard and mitigation)</td>
<td>Preparedness (reduce potential impact of an imminent or expected hazard by improving response systems)</td>
</tr>
<tr>
<td>Planning and internal coordination</td>
<td>Connect IM planning to national and international planning and budget cycles, including, e.g., COVID-19 country preparedness and response planning.</td>
</tr>
<tr>
<td>Partners, networks and external coordination</td>
<td>Coordinate capacity-building for synergy and to avoid duplication and competition.</td>
</tr>
<tr>
<td>Community engagement</td>
<td>Assess and reinforce resilience of community at risk to infodemics, including by training in IM literacy. Connect community feedback channels to data collected by listening.</td>
</tr>
<tr>
<td>Formative research and analysis</td>
<td>Integrate and connect IM infrastructure and listening systems into relevant segments of the national health emergency response infrastructure. Map information, risk and response landscapes.</td>
</tr>
<tr>
<td>Media, materials and message production</td>
<td>Maintain a library of common infodemic narratives and known responses.</td>
</tr>
<tr>
<td>Capacity-building</td>
<td>Long-term training and capacity-building, including IM in RCCE and other relevant activities. Advocate for financial and human resources.</td>
</tr>
</tbody>
</table>
Planning and internal coordination
Workstream objective: Achieve effective, efficient IM impact by ensuring that efforts are strategic, in line with relevant WHO and other guiding plans and documents, communicated and advocated clearly among internal stakeholders and effectively monitored and evaluated to ensure delivery and any necessary adjustments. See Table 8 for suggested actions.

Table 8. Suggested actions for planning and internal coordination by emergency cycle phase

<table>
<thead>
<tr>
<th>Planning and internal coordination : Suggested actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention</td>
</tr>
<tr>
<td>Connect IM planning to relevant national and international planning, e.g., processes, budget cycles, including, e.g., COVID-19 country preparedness and response planning.</td>
</tr>
<tr>
<td>Preparedness</td>
</tr>
<tr>
<td>Create a plan that is realistic for your office resources and ecosystem. Planning includes identifying potential partners and prioritizing activities for each level and actor (subnational, national, regional, global, partners).</td>
</tr>
<tr>
<td>Readiness</td>
</tr>
<tr>
<td>Ensure that drills and simulation exercises are included in plans. Include IM components in wider emergency readiness skills and simulation exercises.</td>
</tr>
<tr>
<td>Response</td>
</tr>
<tr>
<td>Implement monitoring and response plan. Adjust if necessary. Monitor for internal issues, e.g., staff stress and security.</td>
</tr>
<tr>
<td>Recovery and evaluation</td>
</tr>
<tr>
<td>Plan to maintain a background level of readiness by training, papers.</td>
</tr>
</tbody>
</table>

IM relies on human analysts and responders who use infodemic processes, standards and responses. By taking a risk-based approach, responders can prioritize limited resources. This means working from reducing the likelihood of harm rather than finding and addressing all possible data.

Tools
An infodemic response can be run by Google search and a spreadsheet; however, it is much easier to use a set of tools. One tool is unlikely to be enough. Tools might also have to be adapted to the target location and languages. For more details on tool selection, see the section on Tools.

Measurement, evaluation and learning
To ensure that IM is working as planned, activities must be measured and evaluated, and any lessons learnt should be incorporated into updates and corrections. See also Measuring IM response above.

Partners, networks and external coordination
Work stream objective: Multiply impact by identifying synergy and areas for joint work and avoiding overlap; advocate externally for IM activities and COVID-19 responses more broadly. See Table 9 for suggested actions.

Table 9. Suggested actions regarding partners, networks and external coordination

<table>
<thead>
<tr>
<th>Partners, networks and external coordination: Suggested actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention</td>
</tr>
<tr>
<td>Coordinate capacity-building for synergy and to avoid duplication and competition.</td>
</tr>
<tr>
<td>Preparedness</td>
</tr>
<tr>
<td>Identify potential preparedness and response partners, their activities and resources. Identify and address potential gaps in preparedness and response (e.g., activity, communities, languages). Contact potential partners, plan together, implement preparedness actions (reducing likelihood of risk).</td>
</tr>
<tr>
<td>Readiness</td>
</tr>
<tr>
<td>Involve response partners in drills and simulation exercises.</td>
</tr>
<tr>
<td>Response</td>
</tr>
<tr>
<td>Activate partnerships and response actions (manage remaining unmitigated risk).</td>
</tr>
<tr>
<td>Recovery and evaluation</td>
</tr>
<tr>
<td>Involve partners and stakeholders in lessons learnt and “building back better.”</td>
</tr>
</tbody>
</table>

Collaboration is essential. IM and response are most effective when several organizations and communities work together, as some will be more efficient in identifying rumours and misinformation and others in analysis. Some groups can respond in ways (e.g., platforms to remove content, influencers who reach larger numbers of people) that others cannot (Fig. 9).

Part of mapping the response landscape for a country, subject area or other is knowing which groups are already working on an infodemic, which have capabilities that could be useful in an infodemic response and how they’re already connected.
Working with other teams

Fig. 9. Map of sample IM partner and stakeholder for a country

Fig. 9 shows a typical situation for a country that already has a misinformation response infrastructure. Misinformation response groups, platforms, communities, government, media and others all coordinate with each other or through coordinating groups, which might be an international nongovernmental organization or a government programme. If coordination is already in place, your role is to determine how your work fits into the landscape and how best to work with the groups to reduce the infodemic risk in your area.

In some areas and countries, there is no misinformation response infrastructure. The responsible organization should be identified and supported with training, by other possible groups or groups in other countries. Responders should be put in contact with the government and other bodies to start a response.

Organizing large numbers of responders

Some infodemics require a large team of responders or connections with other infodemic response groups, usually in order to build an effective response that reduces the overall risk of the infodemic. Large teams are often used during times of high infodemic activity, when the volume, velocity, variety and veracity of information become too great for one team to handle or to ensure coverage of an infodemic by teams with different specialities. This format is familiar to crisis mapping organizations, information security operations centres and disaster response bodies.

Yellow, mis- and disinformation response groups; orange, platforms; green, other responders; pink, government bodies; blue, coordinating groups; links, organizations working together.
Working alone
Some misinformation response teams are strong enough to work alone, without collaboration with other teams. This is rare; even large platform teams work collaboratively. Even if work is done alone, perhaps because of time pressure or the sensitivity of the material being handled, it is useful to be aware of the work of other groups and of potential partnerships if necessary. See Table 10 for suggested actions.

Community engagement
Work stream objective: Make communities, influencers and civil society organizations resilient to infodemics, and involve communities in designing IM solutions for health, combining scientific soundness and cultural relevance.

Table 10. Suggested actions for community engagement

<table>
<thead>
<tr>
<th>Community engagement: Suggested actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention</strong></td>
</tr>
<tr>
<td>Assess and reinforce the resilience of communities at risk to infodemics, including by training in IM literacy. Connect community feedback channels to listening data collection.</td>
</tr>
<tr>
<td><strong>Preparedness</strong></td>
</tr>
<tr>
<td>Identify communities at risk, and identify their communications channels, styles and influencers, co-develop messages, and tailor mitigations and responses.</td>
</tr>
<tr>
<td><strong>Readiness</strong></td>
</tr>
<tr>
<td>Involve communities, leaders and influencers in the design and execution of drills and exercises as co-organizers, participants and/or role-players.</td>
</tr>
<tr>
<td><strong>Response</strong></td>
</tr>
<tr>
<td>Communities with the necessary resources should monitor and respond appropriately to misinformation that affects operation and trust and to infodemic narratives in health-related fora. Low-resource communities should report infodemic artefacts and narratives to responders.</td>
</tr>
<tr>
<td><strong>Recovery</strong></td>
</tr>
<tr>
<td>Involve partners and stakeholders in lessons learnt and “building back better.”</td>
</tr>
</tbody>
</table>

As mentioned under the theoretical framework, infodemics start and end in communities, who are groups of people who may or may not be spatially connected and could be local, national or international but share common (specific or broad) interests, concerns or identities. To ensure trust between communities and response authorities effectively, authorities must understand community dynamics, power structures and flows of information and be committed to support and work with communities, rather than taking a top–down approach. The offline components of infodemics in particular cannot be managed appropriately without a genuine, thorough effort at community engagement.

Areas for IM with and for communities include the following:

- **Listen to communities**, their concerns, who and what they trust and how they access and share information. Understand why a message might be particularly damaging for a community and why the people in the community might be inclined to believe it. Connect digital and offline information systems.
- **Clearly communicate risks and scientific information in places and ways that are accessible to communities**. Go where they seek information, or build information sites that they trust, including both digital/online and in-person/offline sources and systems. Empower community leaders and influencers with the necessary information and skills. Communicate in a culturally appropriate way or in a way that allows the community to meaningfully understand.
- **Help communities to become resilient to the risks of infodemic**: Conduct media and IM literacy training to help communities deal with the infodemic.
- **Involve communities in decision-making and planning**: applies at all phases of the emergency cycle.
- **Empower communities**: share tools and resources to empower communities to conduct IM for themselves.

These are often not “grand” actions. Simple training and information in the languages and information channels that communities use, links to trusted sources of information, listening tools like HealthBuddy+ (61, 62) can all help communities to find and share trusted information during an infodemic and become more resilient to the risks.

Example: it can be as simple as translating an article debunking a rumour to a social media group.

A Muslim religious leader promptly tackled misinformation that vaccines are dangerous by sharing the Regional Office’s evidence-based guidance on social media with other Muslim leaders.

Full context: A religious leader shared an article containing misinformation about vaccine in a WhatsApp group that included 400 senior Muslim leaders, representing a community of 2 billion people. Sheikh Ra‘ed Bader demonstrated that the content of a translation from a reliable source in Arabic was misinformation. The Regional Office advised on the approach to be taken. If the action had not been fast enough, the misinformation would have been included in religious rulings and spread to billions of Muslims around the world. This collaboration helped to prevent leaders from publishing a ruling on the basis of misinformation.
Formative research and analysis

Work stream objective: Establish necessary, sufficient data collection and analysis for an infodemic response and to ensure that the actions respond to the evolving situation in communities and the country. See Table 11 for suggested actions.

Table 11. Suggested actions for formative research and analysis

<table>
<thead>
<tr>
<th>Formative research and analysis: Suggested actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention</strong></td>
</tr>
<tr>
<td>Integrate and connect IM infrastructure and listening systems into relevant segments of the national health emergency response infrastructure. Map information, risk and response landscapes.</td>
</tr>
<tr>
<td><strong>Preparedness</strong></td>
</tr>
<tr>
<td>Survey landscapes: information, risk, response. Write a response plan: processes, contacts, resources. Identify the tools appropriate for your information ecosystem (e.g., languages, communities, risk profile) and resources (e.g., time available per week).</td>
</tr>
<tr>
<td><strong>Readiness</strong></td>
</tr>
<tr>
<td>Test listening systems and tools, and validate information, risk and response landscapes in drills and simulation exercises. Address any gaps.</td>
</tr>
<tr>
<td><strong>Response</strong></td>
</tr>
<tr>
<td>Establish necessary, sufficient data collection and analysis to inform infodemic response actions and ensure that they respond to the evolving situation in communities and the country.</td>
</tr>
<tr>
<td><strong>Recovery</strong></td>
</tr>
<tr>
<td>Record the lessons learnt. Start adapting tools, processes and other work to fill gaps found during the response.</td>
</tr>
</tbody>
</table>

IM is a continuous activity. New narratives and artefacts appear continuously and must be addressed in a timely manner. Setting up a process, even a simple one, such as “Every morning, we check the monitoring tool outputs for new narratives”, helps with continuous collection and analysis of data to inform the response.

Map landscapes

Another important aspect of formative research is mapping the information, risk and response landscapes. The first part consists of a desk survey of the information, risk and response landscapes, followed by semi-structured interviews with infodemic responders and targeted organizations and communities. The interviews provide a detailed overview of information, risk and response landscapes for planning and action and often surprises, such as misinformation channels that are not identified in a desk survey.

- **Information landscape**: the communication and information systems in the area and the flows of communication, emotions and group interactions within which infodemics occur.
- **Risk landscape**: the harm, propagation channels and causative mechanisms of infodemics.
- **Response landscape**: the systems for the activities used to mitigate or remove the effects of an infodemic. Understanding who might be involved in an IM response is as important as understanding the information and risk landscapes. They include groups that could prepare for and respond to infodemic risks and the current and potential actions that could be taken to reduce those risks.

Resources for use in a desk survey include:

- **Information landscape**
  - Desk survey: e.g., the Hootsuite/WeAreSocial internet report (63) with sections per different countries. The figures show social media trends what may not affect how people post, seek, and share information online. but nevertheless provide a starting point for more information.
  - The Reuters Digital News Report (64) is similar but covers fewer countries.
  - Connections: Ask social listening and IM groups in the country about the information channels that people use to access and share information and how they use them.
  - Formative research: Add questions about social media habits and information sought in surveys.
- **Risk landscape**
  - Annual studies of social media manipulation by the Oxford Internet Institute (e.g., 65).
  - NewsGuard’s misinformation tracking centre, which lists known disinformation and junk news sites.
- **Response landscape**
  - Infodemic response organizations, fact-checkers and related groups working in the country.
  - For more details of partners and stakeholders, see the section Partners, networks and external coordination below.
Social listening
Understanding the information landscape of target audiences and communities is essential for IM, RCCE and the broader emergency response. Social listening captures online, offline and actual conversations in communities. The systems should therefore also be connected to feedback mechanisms to capture information shared by community members with those who serve them.

Communities should be asked how they seek, access and share information and the filters they use. The emotional reactions of people to information should be observed. The community structure, including the people, accounts and organizations that are influential must also be observed.

Social listening online will be assisted by the landscapes. Much of life is represented online, and there is a lot of noise, some intentional, most not, around health information. Social listening for IM seeks signals of community concern, rumours, trends and coordinated inauthentic activity.

Internet and media monitoring
Monitoring involves active searches for potential infodemic artefacts and narratives in traditional media, social media and the wider Internet. Traditional media organizations (e.g., television, radio, newspapers) often have websites and social media accounts that can be included in general Internet searches. This can be supplemented by monitoring traditional media or signing up for alerts from groups such as media monitoring agencies.

Online searches with search engines such as Google provide a first check of Internet information sources. A prebuilt set of Google search strings, or “google dorks”, can narrow a search to specific topics, communities or countries. Some basic dork examples are:

- **vaccination OR vaccine OR vaccinate** – returns one or more of the search terms;
- **vaccination OR vaccine OR vaccinate AND COVID-19** – returns one or more of the vaccine keywords as well as COVID-19;
- **“COVID-19 vaccination”** – returns exact sentence or combination of search terms;
- **vaccination site:.co.uk** – returns results from websites from a specific domain or website;
- **intitle:vaccine** – returns pages with “vaccine” in the title;
- **inurl:vaccine** – returns pages with “vaccine” in the web address.

To start building dorks, Google’s advanced search page is an easy-to-use interface. It also offers a dropdown list of languages and locations to restrict searches geographically.

By combining search operators, large, complex queries can be built with highly specific results. For example, vaccination OR vaccine OR vaccinate site: facebook.com returns pages with one or more of the three keywords in the domain (in this case, Facebook).

Searching social media, e.g., to see what communities are talking about online, is similar. Most social media companies have a search box on their platform that allows use of some or all of the listed search operators.

Monitoring risk
The risk landscape is monitored with mainly the same tools as monitoring the information landscape but with some changes and additions:

- **Channels and routes**: Misinformation and disinformation are usually posted and shared in the same spaces as information, but there are also dedicated sites that may be on channels that are not included in common monitoring tools, and special tools and techniques may be necessary to monitor them for new rumours and narratives.
- **Sources**: In many countries, there are known sources of misinformation, including manipulated media websites selling “cures” or other products or amplifying false health or medical narratives.
- **Artefacts**: The types of mis- and disinformation artefacts to check include messages, images, videos and audio (e.g., phone messages).
- **Narratives and rumours**: Misinformation is often formed around narratives, e.g., “garlic cures COVID-19”. As narratives are often reused among countries, communities and events, monitoring known narratives and new ones in neighbouring communities, regions, countries and even globally can be useful in monitoring risk. Rumours are a form of narrative but are usually based on uncertainty or lack of information.
- **Target segments**: Creators of disinformation often target specific segments of society. Health-care workers have been targeted in infodemics, as have other segments of society for specific concerns (e.g., children) or behaviour (e.g., vaccine hesitancy).
Improving the information landscape

Mis- and disinformation rely on propagation of narratives across channels. Finding the source and distribution mechanisms includes searching for information voids (where people seek information that is not there) and information placed in them and for artefacts such as accounts and websites that “spoof” genuine information providers.

It is often impossible to manage all of each landscape simultaneously. A good set of IM tools can help to better understand where risks are high and where a response is likely to succeed. The tools used must be appropriate. Tool categories are shown in Fig. 10. Questions to be asked include:

- What are your requirements? A simple toolset that is used regularly is more valuable than an expensive toolset that is unused.
- Do you have the resources to install, use and maintain the toolset, including people, money and technical knowledge?

An initial set of tools may be selected during planning and updated with time. Many tools are available for IM, including for:

- **Internet monitoring**: looking for trends, known narratives, new narratives and risk activity in social media, websites and other places in which people seek and share information online.
- **Media monitoring**: looking for trends, known narratives, new narratives and risk activity in traditional mass media, including newspapers, radio and television. Some monitoring can be covered by searching media Internet sites.
- **Monitoring other channels**: Messaging apps and word-of-mouth misinformation cannot usually be tracked with Internet monitoring tools. Surveys, chatbots and other social listening tools can be used to surface infodemic narratives and artefacts in these “dark” channels.
- **Analysis**: making sense of the often-large volumes of data produced by monitoring. Analytical tools include tools to support teams of human analysts to share information; text analysis tools help to identify and track narratives, and graph analysis tools help to map information flows, find influencers and identify and track coordinated online activity.
- **Message-based responses**: ensuring that pre-bunking, debunking and other messages reach community segments via the channels they use or trust in forms with which they are familiar (e.g., languages, message styles, literacy levels, cultural appropriateness).
- **Other responses**: sharing infodemic artefacts with platforms and other responders.

To make the most of each tool, they must often be “localized”, a new use of this word to mean adapted to the relevant community, culture, language and other specificities. They should also be adjusted to locally relevant vocabulary, slang, idioms and even non-text elements like emojis. Localization issues to be aware of include:

- **Language localization** (66): Most localization is based on language. Many tools allow selection of language and alphabet, both where users interact with them and in the languages and alphabets used to set up, monitor and create graphs and other outputs. In some cases, further language localization is required, often in translating words and phrases used in a tool, which might be done in the country.
- **Algorithm localization**: many algorithms (the rules used in computers to, e.g., make estimates, solve problems, summarize data) are designed for a limited set of locations, languages and demographics (e.g., US English), which limits their usefulness for other datasets. For example, a text analysis algorithm may include a list of English “stop words” (such as “and”, “a”, “it”) as filters, and a similar list in a local language might have to be found or created and imported into the algorithm. Stopwords ISO is a useful, extendable resource for stopword lists in several languages (67).
- **Algorithm fairness**: another area in which the capabilities of tools may differ according to language, region and use. This is a large area for determining whether there is human bias in any algorithm training created. 25

**Visual localization**: the user interface of the tool appropriate for its audience, e.g., contains images that exclude population segments or colour schemes with negative associations in the area, including colours favoured by local political parties (71). Mock-ups or screenshots should be tested with potential users and local communities.

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25 Algorithm bias and fairness is a growing field. See examples in reference 69. An overview of the field is given in reference 70. Examples include text-based alerting systems that miss misinformation signals for a country because they were not trained with data targeting minority populations or in their languages or dialects.
Media, materials and message production

Work stream objective: Provide information in response to infodemic artefacts (including via the media, social media and web and other channels used by target audiences) so that populations at risk can take informed decisions to protect themselves and others and the public reputation of response authorities is protected and strengthened. See Table 12 for suggested actions.

Table 12. Suggested actions regarding media, materials and message production

<table>
<thead>
<tr>
<th>Media, materials and message production: Suggested actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention</strong></td>
</tr>
<tr>
<td>Maintain a library of common infodemic narratives and known responses to them.</td>
</tr>
<tr>
<td><strong>Preparedness</strong></td>
</tr>
<tr>
<td>Find and fill information voids. Produce counternarratives and pre-bunking materials.</td>
</tr>
<tr>
<td><strong>Readiness</strong></td>
</tr>
<tr>
<td>Test standard messages and materials and procedures for message production, clearance and dissemination. Use the outcomes to improve the materials and processes.</td>
</tr>
<tr>
<td><strong>Response</strong></td>
</tr>
<tr>
<td>Find and fill information voids. Produce counternarratives and pre-bunking materials.</td>
</tr>
<tr>
<td><strong>Recovery</strong></td>
</tr>
<tr>
<td>Review materials produced. Update the library of infodemic narratives and responses, highlighting any new ones that are applicable to infodemics in general.</td>
</tr>
</tbody>
</table>

Useful resources for addressing practical aspects of debunking, pre-bunking and counternarratives are listed in Annex 2.

Debunking, pre-bunking and counternarratives

Management of infodemic risks involves a combination of responding to infodemic events and building resilience to infodemics. Responses can include various kinds of counter-messaging, which is produced in a flow similar to that for RCCE messages and materials. Listening and other data are used to understand the purpose or outcome of the communication, and then messages are crafted, reviewed, shaped into one or several communication products, disseminated via the right channels and evaluated for impact.

When RCCE messaging must take into account behavioural science (the kinds of approaches and messages most likely to encourage behaviour associated with better health outcomes) for IM messages, a number of effects must be considered, which are associated with the unique features of infodemics, how people consume and process mis- and disinformation and the more and less effective ways of (counter)messaging them.
Narratives are summaries of the stories that we tell ourselves about the world. Examples include rumours like “garlic cures COVID-19”. Narrative management is one of the most useful means to counter inaccurate or false information in an infodemic. The information and risk landscapes include the narratives that are circulating in a community, including inaccurate and false narratives. It is possible to predict the narratives that might be used in a community by analysing those that have been used in similar circumstances (e.g., other health events) or are circulating in other communities or countries or anticipating likely narratives before an event such as a vaccination drive or election.

Pre-bunking, or inoculation, is preparing before an anticipated narrative becomes widespread by, for instance, creating and publicizing information relevant to the narrative. It is important to avoid publicizing the incorrect narrative. Instead, the correct information should be made available.

Capacity-building
Work stream objective: Strengthen country IM capacity to ensure the sustainability of efforts and impacts. See Table 13 for suggested actions.

Capacity-building includes training responders, influencers and communities in the languages and styles in which they work to sustainably strengthen IM and foster infodemic resilience. With understanding of the information, risk and response landscapes, a tailored capacity-building plan will fill any gaps in response capacity. In the broader sense, advocacy and resource mobilization are necessary to ensure the right amount and kinds of IM capacity.

To understand requirements for IM training and capacity-building, build on the information in the three landscapes described under Planning and internal coordination.
Welcome to HealthBuddy+
Your personal COVID-19 expert!

Tips on making your summer fun and safer
Click here to find out...
Conclusion

The COVID-19 pandemic added new urgency to managing the exploding volume, velocity and variety of health information of varying veracity. While the health risks associated with infodemics of this kind are by no means new, the unprecedented scope and scale of the COVID-19 infodemic has seen a concomitant increase in infodemic risk, hazard and (potential) harm. Since the beginning of the COVID-19 pandemic, the WHO Regional Office for Europe has built on and combined work in the fields of RCCE and infodemiology and ensured use of best practices from new areas like data science and information security to advance and accelerate the response of the international health emergencies infrastructure to the COVID-19 infodemic at all levels, from the global to subnational, and preparation for the next one.

This document provides practical, operational guidance on implementing and further strengthening this work in the WHO European Region for both coordination and operational emergency response authorities, stakeholders and partners in Member States in the Region, including communities. It demonstrates how IM can be integrated and advanced into the RCCE infrastructure to manage new and existing health risks, with possible connection to other technical areas, including digital science and behavioural and cultural insights. Rather than specific, one-size-fits-all recommendations, the document offers options and approaches for application to each context and requirement.

The document is not the definitive work in this area. The authors hope that the ideas presented will further discussion in this rapidly developing area of work and connect it to relevant work in rumour management and social listening and thus ensure effective support to operationalize regional, national and subnational initiatives while improving the sustainability of the renewed effort.

Further research and guidance will be conducted in the WHO European Region in applying best practices in IM to evidence-based RCCE risk assessments, ecosystem mapping and analysis and strengthening data collection and analysis for monitoring, evaluation and learning. The last is salient, as specific methods for evaluating IM are not yet sufficient. IM is already strengthening RCCE in many ways, including by changing the model for unidirectional trust-building to a two-sided model of trust management and also by adding tools, principles and best practices from listening and big data to modernize significant aspects of RCCE.

The authors’ ambition is that this document will provide the first building block for sustained IM in the WHO European Region and ready-to-use tools for national and subnational actors at various levels of involvement, complexity and resource availability. They further hope that the overview of approaches to IM in the major WHO offices (Annex 1) will inspire further thinking, evolution and innovation in these areas based on the pioneering work of the WHO team on IM at headquarters.

Infodemics will probably continue to recur during large-scale health emergencies. It is thus not a question of “combating” or “eradicating” infodemics and their artefacts, but rather managing the resulting risks to public health. When IM capacity is strengthened throughout the emergency cycle, supporting core RCCE capacities and strengthening its work streams in concrete ways, the infodemic can be managed and, with it, health emergencies.

26 Highlights, activities and approaches to IM in other major WHO offices, are described in Annex 1.
27 It is probably wise to exercise caution in applying martial or epidemiological analogies to this phenomenon (72).


32. Volume, velocity, variety and value are the five five keys to making big data a huge business. Bilbao: Banco Bilbao Vizcaya Argentaria, SA; 2017 (https://www.bbva.com/en/five-vs-big-data/).


Annex 1. Infodemic management in major WHO offices

The body of this document describes advances in IM in one technical area (RCCE) and one WHO region (European). To provide a broader overview, this annex highlights resources, approaches and ways of working at WHO headquarters and in the regional offices.

WHO headquarters

From the beginning of the pandemic, WHO in Geneva led the building of a coalition of experts, scientists and practitioners on the topic of IM. The work addressed restructuring of the entire information ecosystem, including finding and filling information voids, conducting “infoveillance” and scientific research into the connections among information systems and corresponding health practices and outcomes.

Work at global level also included conferences, a research agenda and a competence framework, new software tools, training and new research, as well as partnerships throughout the United Nations system for countering mis- and disinformation. At global level, IM includes data science, epidemiology, behavioural science, information and media science, human-centred design and implementation research and user experience.

WHO and United Nation (UN) information products


• WHO fifth infodemic management conference meeting report: steps toward measuring the burden of infodemics. Geneva; World Health Organization; 2022 (https://www.who.int/publications/i/item/9789240047174).


• UN Interagency Dialogue on Disinformation and Data Transparency. Selection of data from online platforms that would enable better understanding of disinformation online and efforts to counter it. Draft paper for discussion [website]. New York: United Nations; 2021 (https://www.un.org/techenvoy/content/digital-human-rights).


• COVID-19 weekly epidemiological and operational updates:


Peer-reviewed articles with WHO authors


WHO Regional Office for Africa

Africa Infodemic Response Alliance
The WHO Regional Office for Africa has been active in the area of IM since early in the pandemic. One of the highlights was establishment of a network, the Africa Infodemic Response Alliance (AIRA) (1), to share proven facts on safety and health and to counter dangerous health misinformation. AIRA brings together fact-checking and media organizations, big data, artificial intelligence and innovation bodies and leading intergovernmental and nongovernmental organizations working in public health to respond to infodemics.

Viral Facts Africa
The Regional Office and AIRA launched Viral Facts Africa (2) an African initiative to combat health misinformation online (3). Viral Facts leverages information from a network of 14 organizations to counter health misinformation as it spreads and to “inoculate” people against falsehoods. The initiative engages health fact-checkers, explainers, “myth busters” and misinformation literacy messages that are optimized for sharing on Facebook, Twitter and Instagram. Between June 2021 and April 2022, Viral Facts Africa produced 305 pieces of digital content, with an average monthly reach of 16.4 million views.

Country highlights
After establishment of the regional networks, several countries launched initiatives:

- In Angola, Factos Saude (4) and a specialized infodemic management unit were established to track misinformation in any type of health emergency.
- In the Democratic Republic of the Congo, social listening was integrated with community feedback (5) collected via the Kobo toolkit for real-time data collection.
- In Guinea and Kenya, working groups are being created to address COVID-19 misinformation and information voids online and offline.
- In Nigeria, various training courses and workshops on IM are planned.
Social listening reports

- AIRA produces a weekly infodemic trend report (6), which is a weekly analysis of information from online platforms (EARS, Newswhip, Google Analytics, CrowdTangle, Twitter, RCCE Collective Service reports) and the off-line community feedback analysis produced by the International Federation of Red Cross and Red Crescent Societies (a member of AIRA).

- The reports are used regularly to produce communication materials, including in Angola, the Democratic Republic of the Congo, Guinea, Kenya and Nigeria.

WHO Regional Office for the Americas/ Pan American Health Organization

Strengthening RCCE and generating vaccine demand

The infodemic of misinformation about COVID-19 vaccines and the associated vaccine hesitancy have required strong collaboration and implementation of IM, demand generation, risk and crisis communication and community engagement. The Pan-American Health Organization has held workshops for communicators and journalists on issues related to COVID19 (7) vaccines to ensure that these opinion influencers are equipped with the tools and knowledge to report on this topic responsibly and accurately. Sessions were also held with national personnel on strategies for generating vaccine demand. The Organization also organized Twitter and Facebook Live sessions, in which experts talked to the public about COVID19 vaccines and responded to questions and doubts. Additionally, the Organization established a website specifically on COVID-19 vaccination (8), which is continually updated with information and resources for different audiences. The Organization also updates national response agencies and immunization programmes about emerging reports of adverse events after vaccination and vaccine safety concerns on two dashboards, one on COVID-19 vaccine doses administered in the Region (9) and the other on the efficacy and safety of COVID-19 vaccines (10).

With the arrival of COVID-19 vaccines and the launch of vaccination campaigns, the Organization supported countries in communication to highlight the importance of vaccines in tackling the pandemic. Public service announcements and videos related to COVID-19 vaccination were aired by various radio and television stations to ensure wide dissemination of the importance of vaccination and to correct misinformation. As booster doses of the vaccines were introduced, vaccination campaigns prioritized vulnerable populations.

Communication material was translated to reach indigenous populations in various countries in the Region. Testimonials from medical experts were used to increase acceptance of COVID-19 vaccines in key social structures such as teachers’ federations, trade unions and academia. The success with indigenous communities (Takana, Ese Eja and Cavineño) in the Amazon area of Pando, Bolivia, gave rise to communication strategies for other rural areas. In Guatemala, the Regional Office supported a national ethnoanthropological evaluation (11) to understand barriers to vaccination and factors associated with hesitancy. The results informed national COVID19 vaccination communication campaigns.

Anti-infodemic Virtual Center of the Americas

The Anti-infodemic Virtual Center of the Americas is project proof of concept developed by the Pan-American Health Organization in collaboration with the Center for Health Informatics, a WHO Collaborating Centre on Information Systems for Health at the University of Illinois, USA. With a combined structure of artificial intelligence and human intervention, the aim of the Center is to strengthen the capacity of decision-makers by systematic generation of information that allows rapid decisions and tactical adjustments of public health policies, strategies and programmes throughout their implementation, thereby improving their acceptance, efficiency and effectiveness.

The big data analytical model developed for the Anti-infodemic Virtual Center (12) should detect, process and develop tools for response to relevant dis-, mis- and malinformation with a potential negative public health impact both in countries and in the Latin America and Caribbean region as a whole.

The objectives of the Anti-infodemic Virtual Center are to:

- provide strategic guidance for strengthening detection, analysis and management of epidemiological data, unstructured data, digital health solutions, the Internet of Things and scientific information;
- identify and provide guidance in use of non-traditional data sources, structured and unstructured, for rapid strategic decision and policy-making in public health and optimize acceleration of digital transformation of the Region’s health systems; and
- guide and monitor implementation of proof of concepts associated with big data analytics and IM topics.
The Regional Office has issued a number of peer-reviewed and grey literature publications including:


**Additional guidance**


WHO Regional Office for the Eastern Mediterranean

In the WHO Eastern Mediterranean Region, IM has included:

- Capacity building in the Islamic Republic of Iran [13].
- Setting up fact-checking web platforms in Lebanon [14].
- Producing regional intelligence reports related to COVID-19 and monkeypox with five countries (Egypt, Iraq, Jordan, Morocco and Yemen) in the Region featured in the WHO EARS platform [15].
- Finalizing a training package for regional RCCE focal points on use of free-access platforms for online social listening. The package provides step-by-step guidance on use of publicly available online tools (e.g., Google Trends, Talkwalker, Crowdtangle) to support and complement local media monitoring in guiding response activities.
- Two articles published in the Eastern Mediterranean Medical Journal:

WHO Regional Office for Europe

In the WHO Regional Office for Europe, the following IM activities and functions were established at the start of the COVID-19 pandemic:

- fact-checking and false information reporting mechanisms;
- social listening tools augmented with artificial intelligence;
- media and social media monitoring programmes, multi-stakeholder coordination initiatives and national regulatory frameworks for information integrity underpinned by the principle of freedom of expression; and
- promotion of digital health literacy and inoculation interventions against misinformation, which both improve the ability of people to spot misinformation.

As elaborated in this document, IM in the Regional Office has been integrated into RCCE, with strong links to the Digital Health programme as well as the Behavioural and Cultural Insights flagship initiative.

Work is done both on- and off-line to protect health, increase the effectiveness of disease prevention and control and help empower communities to navigate future infodemics with greater resilience. IM, like RCCE, focuses on building and maintaining trust between communities that are at risk or affected and health authorities and extends the work by protecting trust from intentional and unintentional damage.

IM in the WHO European Region detects, assesses, analyses and responds to infodemic risks while also maintaining and strengthening national and regional systems with training and broader capacity-building. With these strategies, IM intends to hasten the end of the pandemic and “build back better” for future health emergencies.

Highlights of the Regional Office’s work in IM are:

- Training more than 500 participants in 11 countries in the Region, including national health authorities, journalists and academics, in three modules:
  - Leadership: equip national health authorities and partner organizations at managerial and policy-making levels with background infodemic and technical skills to engage and manage national and subnational stakeholders at operational level;
  - Response: provide IM responders (national health authorities and partner organizations at operational level, civil society organizations, researchers) with advanced technical skills and knowledge of tools that will enable them to better understand, respond to and recover from infodemics;
  - Coordination: facilitate network building and planning among national health authorities, WHO country offices and partner organizations at operational and managerial levels and also among national entities involved in IM at operational level (e.g., fact-checkers, misinformation and disinformation researchers, journalists);
• Establishment and maintenance of the COVID-19 chatbot HealthBuddy+ (16) in partnership with UNICEF, reaching nearly 600,000 users and 5 million interactions;

• Initiation of a European Infodemic Preparedness and Response Alliance, building on the example of AIRA in the WHO African Region; and

• Publication of original research, including:

WHO Regional Office for South-East Asia

Activities and achievements

IM in the region comprised:

• Infodemic intelligence report and data management: weekly monitoring of online conversations and insights related to COVID-19 in all countries in the Region (except the Democratic People’s Republic of Korea); regional and national data are analysed, and relevant regional and country office teams are supported in addressing situations as necessary; all reports and documents produced are internal, but a summary is published in weekly COVID-19 situation reports (17).

• Experience sharing: discussion of national challenges and best practices for use by other countries in managing infodemic challenges at regional RCCE meetings and webinars.

• Joint initiatives with civil society organizations to address rumours and misinformation (e.g., developing and disseminating communication materials, partnering with community and religious leaders and influencers to amplify technically sound, context-appropriate messaging).

• A Quick guide to available infodemic intelligence resources (internal) to support country office RCCE teams in social listening with publicly available tools in the absence of paid subscription-based tools and/or mechanisms.

Approach, including units and divisions involved

IM is currently led by the RCCE team within the Country Health Emergency Preparedness and International Health Regulations unit of the WHO Health Emergencies programme. Products are shared within the Programme with the COVID-19 Incident Management Support Team (composed of Health Emergencies technical staff and staff from other units and divisions, including from Vaccine Preventable Diseases and Health Systems), country office focal points and partners. As part of the RCCE portfolio, IM is integrated into other RCCE sub-areas, including working with civil society organizations.

As we advance IM in the Region, it will be integrated more practically and deeper with other technical areas.

Plans

Advancing IM in the South-East Asia Region will initially comprise ensuring that tools and mechanisms are in place and strengthening regional and country capacities to utilize or implement such mechanisms. The activities for the next 2 years are as follows.

ACTIVITY 1: Access to systematized mechanism for digital listening

During disease outbreak responses – whether of emerging infectious diseases like COVID-19 or other communicable diseases – it is essential that systems for dynamic listening be in place so that health authorities can answer people’s questions, address their worries and counter misinformation, disinformation and malinformation that may affect their actions.

With the fight against infodemic concentrated in social media, a comprehensive tool for digital listening is necessary. Currently, the Regional Office relies on weekly COVID-19 infodemic intelligence reports produced by an external contractor, which are based on an algorithm jointly developed with the regional RCCE team. This is, however, limited to pre-set COVID-19-related insights, so that ad-hoc COVID-19-related topics that are not included cannot be searched through the same external contractor under the current contract; real-time listening data cannot be gathered; and insights on non-COVID-19-related health topics cannot be obtained with the same mechanism. In addition, publicly available resources for digital listening (i.e., Crowdtangle, Imperial College London’s YouGov’s COVID-19 Public Monitor and Facebook Data for Good) are limited to COVID-19, carry data only from selected countries in the Region and/or provide data not obtained in real time. As in-house WHO digital listening tools remain limited, it is proposed to contract a third-party provider. A number of international
companies offer comprehensive services that can be
tailored to the requirements of the WHO South-East
Asia Region. Access to the tool will be provided to
regional and country offices and (selected) RCCE focal
points. Country office colleagues will be able to support
their ministry of health counterparts and national
and subnational RCCE partners by providing country-
specific reports and presentations. The tool will be
set up for the functions listed below, including events-
based surveillance, especially for events that are not
yet officially reported by a government or for which
information is not yet available, with a specific listening
algorithm, if possible, mainly using Boolean search:

- COVID-19 subtopics, including localized listening;
- other public health emergency topics and
  subtopics; and
- ad-hoc or event-based listening.

Regional and country office focal points will develop a
set of algorithms and simultaneously set up and maintain
country-specific, country-owned digital listening
“searches.” This will ensure that localized and more
real-time listening mechanisms are in place for national
priorities.

**ACTIVITY 2:**
**Strong regional and country human resources capacity for all phases of infodemic management**

To ensure that tools and mechanisms are functioning,
the capacities of the people operating them must be
developed and enhanced. The following capacity-building
activities are proposed for relevant regional office and
country office focal points and their ministry of health
counterparts.

- Comprehensive, hands-on training courses on use
  of the digital listening tool for regional office and
  selected country office focal points: the regional
  RCCE team focal point will support RCCE focal points
  in country offices with sparse staffing in use of the
  tool, as necessary.

- Infodemic management training, including data
  assessment and response to misinformation and
disinformation for country office focal points and
  their ministry of health counterparts. If only some
  topics are covered, training would be integrated
  into planned RCCE training in October 2022; more
  comprehensive IM training in use of the module will
  require more days.

- Presenting infodemic data to technical country office
  focal points and their ministry of health counterparts,
  which can be conducted online

- Managing a COVID-19 vaccine infodemic for
  country office focal points and their ministry
  of health counterparts.

**ACTIVITY 3:**
**Regional and national partnerships on infodemic management**

During a regional meeting to strengthen implementation
of the risk communication strategy for public health
emergencies in the Region by learning from best practices
and lessons from the COVID-19 response, held in August
2021, Member States, partners and members of the WHO
secretariat agreed to establish an “infodemic alliance”
(1) among regional and national partners. The model
of the WHO African Region, AIRA, was cited as a helpful
reference for a robust regional IM system. The network
will be formalized by developing a framework and
agreeing on terms of reference for potential institutional
members of the network. The goal is to establish and
maintain the network and ensure that it functions and
is recognized like other WHO partnerships, such as
collaborating centres, the emergency communication
network and emergency medical teams.

Similar mechanisms could be established at national
level, for which WHO could provide support.

**WHO Regional Office for the Western Pacific**

**Background**

For several years, the Regional Office has been
responding to rumours and mis- and disinformation
associated with various outbreaks, including influenza,
measles, dengue, Middle East respiratory syndrome and
other emerging infectious diseases. During the COVID-19
pandemic, IM has been led by the risk communication
team in the Country Health Emergency Preparedness
and International Health Regulations unit of the WHO
Health Emergencies Programme, in coordination with
the communications unit in the Regional Director’s Office.
The regional COVID-19 Incident and COVID-19 vaccine
Incident management support teams have ensured
coordination and streamlining of RCCE with technical
areas of the response.
Strategic communication is identified as a key priority in *For the Future*, the vision for WHO’s work with Member States and partners in the Western Pacific Region adopted in 2019 (18), as it can influence the perceptions, decisions and actions of governments, health workers and communities. The Regional Office is using the “communication for health” approach (19), in which communication is used to achieve specific health outcomes. This is currently particularly critical, as trust in mainstream media and public institutions is challenged, and vast volumes of information are shared online, including mis- and disinformation.

**Approach**

The Regional Office’s work on IM during the COVID-19 pandemic within the “communication for health” approach (19) has addressed the following:

- Collecting insights and tracking rumours and mis- and disinformation through infodemic intelligence reports and data management. The Regional Office produced weekly internal reports of the results of monitoring of online conversations and insights related to COVID-19 in all the countries and areas in the Region. The data were triangulated with other sources of data and used for informed decision-making at regional and country level. The reports and data were shared with Member States, and discussions were held to adapt communication plans, strategies and materials. Throughout the pandemic, the Regional Office has invested in building the skills of WHO teams in countries and representatives of Member States in using relevant software and interpreting the results.

- Providing mentorship and support to country offices to strengthen multisource social listening systems, build capacities and skills and advocate for sustained resources at country level.

- Establishing partnerships with digital platforms such as Facebook, Twitter and Google to address issues categorized as harmful for the general public and implementing strategies to combat their spread. For example, Crowdtangle reports from the Meta partnership were used to monitor trends in misinformation, and Facebook Data for Good were used to monitor overall trends.

- Establishing mechanisms for smooth, effective information-sharing with multisectoral partners and stakeholders to ensure synchronous approaches and accurate messages and prevent information voids and ambiguity where possible through meetings and webinars with regional partners as the situation evolved.

- Engaging with nongovernmental and civil society organizations to plan and implement joint initiatives to address rumours and dis- and misinformation, such as by engaging with influencers to amplify messages.

Significant learning over time has enhanced the Region’s expertise and capacity to respond, especially since COVID-19 highlighted a new information landscape. The role of social media is greater than ever, and the capacity of teams working in this area has been critical for sharing accurate information, countering mis- and disinformation and promoting protective and preventive behaviour. As IM advances in the Region, more lessons will be identified, the capacities of WHO and Member States will be improved, and application will be extended to other diseases and future events.

**Country highlights**

After establishment of a Regional network of partners in the area, several national initiatives were implemented for systematic detection of and response to to rumours and mis- and disinformation. Some examples are given below.

**Cambodia**

- Weekly monitoring of online conversations and insights related to COVID-19 conducted with the support of the Regional Office and regular social listening and monitoring of the Ministry of Health’s social media accounts. Insights and data were analysed, and support was provided to address emerging issues and design a strategic approach if necessary. Coordination with health partners was essential in tracking and addressing rumours and misinformation through community engagement networks and with digital interventions. For example, vaccine hesitancy was identified as a critical issue among pregnant women and elderly populations in early 2022. The WHO Country Office supported the Ministry of Health in conducting rapid community discussions to understand their concerns, barriers and drivers and applied the insights and other social listening insights to review and reframe messages and tools, including strengthening community engagement through local authorities and faith-based leaders to address vaccine hesitancy among at-risk groups, which may have contributed to an increase in the acceptance and coverage of COVID-19 vaccines.
Another application of social insights was for sustained adherence to public health and social measures, which remains high despite the lifting of Government restrictions. Regular situation reports, meetings with operational partners and engagement with the media and the private sector strengthened the combat against rumours and mis- and disinformation.

The WHO Country Office also supported development and use of sector-specific RCCE standard operating procedures for, e.g., traditional markets, prisons, garment factories, restaurants and pubs as a result of signals picked up during online and offline monitoring.

Philippines

Online listening was conducted regularly to identify signals related to COVID-19 in general and also conversations about adverse events after vaccination on platforms such as Meltwater and Crowdtangle.

The WHO Country Office supported the Department of Health in various ways:

- developed a decision tree (20) to classify the impact of posts, maintained a dashboard (21), and liaised with Meta for customized Crowdtangle reports;
- provided technical support for issues and crisis management in high-impact vaccine-related events, including social listening and detecting and responding to emerging challenges;
- developed and implemented training of spokespeople for the Department of Health nationally and sub-nationally to ensure timely, effective information-sharing and accurate media reporting on COVID-19; and
- produced talking points for Department of Health townhalls on responsible media coverage of adverse events after vaccination.

Viet Nam

The cornerstone of effective collective action has been comprehensive, credible communication to all members of society. The Government actively engaged the media and supplied them with timely, clear, accurate, consistent information to prevent and address rumours and mis- and disinformation. Media partners were regularly briefed on the latest COVID-19 situation in Viet Nam and globally; the status of implementation of activities, guidelines and directives from the Government; and addressing rumours and mis- and disinformation.

The WHO Country Office supported the Ministry of Health in social listening and identifying social media content containing inaccurate and misleading information. The WHO RCCE team then worked with the country to develop and disseminate timely, appropriate information, education and communication materials.

Social listening reports and publications

- Bi-weekly listening reports:
  - Produced a bi-weekly social listening report on several online platforms, including Meltwater, Crowdtangle, Johns Hopkins COVID-19 dashboard, Our World in Data, RCCE collective services and Early AI-supported Response with Social Listening (EARS).
  - Malaysia, the Philippines and Viet Nam regularly shared reports from multi-source listening with their ministries of health.

- Dark social research report: Coordinated dark social research was conducted in late 2021 and early 2022 to review best practices and the potential of dark social channels to spread accurate information to prevent and respond to rumours and mis- and disinformation during health emergencies.

- Social and behavioural insights: Commissioned a series of large-scale regional surveys (five rounds of a survey with Ipsos for behavioural insights and two rounds of a survey with ORB International on vaccine confidence) in 2021–2022 of knowledge, attitudes and behaviours related to COVID-19, public health and social measures and vaccination. Insights were collected, analysed and shared with countries to inform decision-making and address rumours and misinformation about COVID-19 transmission, protective behaviour and treatment.
Campaigns
For more than 2 years, the Regional Office has run communication campaigns to promote accurate information and counter rumours and inaccurate information. To support IM, “Vax Facts” campaigns were run to combat common misinformation and address people’s concerns about COVID-19 vaccines picked up through social listening. A series of videos was developed in which experts from WHO answered common questions (22). These were shown at events and disseminated by organic social media sharing and through ad credits. In addition, the Regional Office responded to questions posted on Facebook to dispel rumours and keep people informed by re-directing people to relevant pages on the Regional Office website, such as fact sheets, questions and answers and advice on COVID-19 for the public.

Country offices also ran campaigns to address public concerns in their contexts. For example, Cambodia used evidence collected by multisource social listening in a “COVID-19 awareness campaign – A shared responsibility of all” (23) in August 2021 to promote adherence to public health and social measures and increase COVID-19 vaccination uptake. The Ministry of Health of Malaysia implemented an innovative “Champions against COVID-19” campaign (24) in early 2022 involving about 10,000 community members. It included information and materials on preventing the spread of rumours and misinformation and enhancing effective communications through a variety of channels and influencers.
Additional references


18. For the future: towards the healthiest and safest Region: a vision for the WHO work with Member States and partners in the Western Pacific. Manila: WHO Regional Office for the Western Pacific; 2020 (https://apps.who.int/iris/handle/10665/330703).


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All online references were accessed 2 August 2022.


22. Outbreaks and emergencies [website]. WHO Western Pacific Region (https://www.who.int/westernpacific/emergencies/).


Quick start guide: IM maintenance and prevention

The maintenance stages of IM – prevention, preparedness, readiness, recovery – help a team to prepare for future infodemics and decrease their effects on health outcomes. This quick-start guide describes a set of simple activities and references, including:

- WHO: “How to report misinformation online” (1)
- UNICEF: “Vaccine misinformation management field guide” (2)
- Internews: “Rumour tracking methodology” (3).

The notes below combine advice from those guides and from practical experience with IM.

Landscapes

**RCCE checklists for assessing infodemic risk**

In a desk survey, sketch the information, risk and response landscapes in your geographical area and communities. Then, talk to communities, infodemic responders and health-care workers in your area to verify the landscapes and add information.

**Sketch the local information landscape with a desk survey** (to determine where to look for issues and to plan information to reduce the infodemic risk)

- Where are people searching for health information?
- Which search terms are people using to look for health information?
- On which channels are people posting health information?
- On which channels are people sharing health information?
- Which languages are people using to access and share health information?
- Which sites and accounts are influencers in the health information space?
- Which health topics are people generally talking about and asking questions about?
- What offline information-sharing is there?

Look for platforms (e.g., Twitter, Facebook) and groups (e.g., forums, Facebook groups) and for trusted sources (e.g., websites, accounts) and influencers (trusted accounts that can disseminate messages to large numbers of people).

Map local responses to infodemics and misinformation with a desk survey (to understand what is already being done to combat an infodemic in your area).

- Which groups are actively working to detect and counter misinformation and health rumours in your area? Identify IM groups and organizations active in the area. Note: some groups may cover several countries and territories.
- Identify other groups that could contribute to infodemic mitigation and responses.

**Summarize the local infodemic risk with a desk survey**

- Which health misinformation narratives have been seen previously in the country (consult fact-checker sites and reports and similar sources)?
- On which channels has mis- or disinformation been posted or propagated (e.g., social media, traditional media, word of mouth, health-care-focused websites)?
- Are specific communities (e.g., parents, health-care workers) targeted with health misinformation? Is it different for different communities?
- What appears to be driving health misinformation? Are groups actively coordinating health misinformation? Is it for financial gain? Are there concerned people who need better access to credible information?
What kind of infodemic behaviour is seen? Examples include fake experts, botnets.

What harm is likely to occur from this mis- or disinformation?

Which national health sector may be at risk? Are any public health communities, actors or institutions likely to be or are being targeted specifically?

Start building or becoming part of the response community, and extend your knowledge with workshops and semi-structured interviews to meet potential partners and learn more.

- Meet with existing infodemic responders, targeted organizations and communities.
- Run a workshop or infodemic exercise to increase knowledge-sharing.
- Use semi-structured interviews to fill gaps in your knowledge.
- Draw the connections among groups, including group-of-group coordinators.
- Assess the response capacity of the group of groups.

Semi-structured interview: assess how you could work with a potential stakeholder.

(Use this to understand what potential partners can do, and make connections before a crisis occurs.)

- Does this group have a particular focus (e.g., women, faith), political orientation, geographical focus or scale (global, regional, national, subnational)?
- What is this group’s capacity and influence?
- What types of activities does this group conduct? Are they collecting examples, conducting analyses or responding to the infodemic? How do they respond?
- With which other groups is this one working with and how?
- How does my organization’s focus and mandate complement or overlap with this group? What are the potential areas of partnership and collaboration?

Map infodemic risks against response capacity, and highlight any gaps in coverage.

- What major IM risks can be identified in your country’s landscape?
- How does IM response capacity currently address those risks?
- Are there large gaps that should be filled? List any shortfalls and ideas for resources to cover them.

Resources

**RCCE checklists for resourcing your infodemic team**

Determine realistically the resources you have to work on IM.

**Build partnerships**

- You don’t have to do everything. If groups are already responding to an infodemic in your area, determine how to partner with them.

**Listen to communities**

- Connect community feedback channels to other sources of data and listening.
- Consider setting up ways for communities, other affected groups (e.g., health-care workers) and the public to report infodemic narratives and artefacts. This could be an e-mail address, a tip line, online form or social media account. It might already exist in your organization, e.g., in the form of community information posted to a chatbot like HealthBuddy+ (4).

**Assess the audience and the requirements for training**

- Which groups or actors are best positioned to respond according to the response gap analysis?
- What kinds of additional support and training do they require to fill the identified gaps sustainably?

**Assess resource requirements**

- Are sufficient resources available to implement a capacity-building plan to address the gaps?
- If additional resource mobilization is required, which donors or funders are active in this area, and what kinds of information and messages are necessary to inform them?

**Decide on a toolset**

- List the tools you will need. Use this to choose an appropriate set of tools.
- Ask yourself whether you should localize your tools
- Is the tool available in the necessary languages and alphabets?
- If not, does the tool have options for internationalization and localization ("i18n and L10n" in computing terms (5)), or can you add a file for a new language (usually containing translations of words and phrases used in the tool)?
- If not, are there other ways of making them usable in your target languages?
• Are images, colours and other visual elements in the tools appropriate to your location, and, if your language is written right-to-left, is that reflected in the visualizations that you use?
• When working with machine learning tools, determine whether they have been adapted to local languages and uses.

**Plan monitoring and evaluation**
- Draft a response plan
- Draft a monitoring and evaluation plan.

**Prevention**

**RCCE checklists for infodemic prevention**
Mitigation reduces the potential impact of current and future infodemics by improving information and response landscapes.

**Improve the information landscape**
- Monitor and “patch” your information landscape.
- Help improve the visibility and accessibility of credible information sources.

**Empower communities**
- Conduct training in media and IM literacy to help communities deal with infodemics.
- Inoculation against misinformation (pre-bunking). There are various definitions of pre-bunking. In this document, the definition used is for training, e.g., training the public in how antivaxxers and others influence them. Others include games and identifying and training influencers.

**Improve the response landscape**
- Train yourself. Attend IM training sessions.
- Train others. Run training sessions for local staff and communities.

**Closing down and learning from an infodemic response**

**RCCE checklists for closing down an infodemic response**

**Capture what you have learned**
- Write a note on lessons learnt immediately after an infodemic for use in the next infodemic.

**Plan how to maintain capacity between infodemics**
- Write down what you could do in the coming months to improve the next response. These could include training, building datasets, building more connections and simulations.

**Maintaining IM awareness between infodemics**

**RCCE checklists for maintaining between-infodemic awareness**
Between infodemics, IM work is likely to comprise monitoring your landscapes for new changes, checking for new infodemic events, training staff, and maintaining tools.

**Build IM into your diary**
- Check regularly for infodemic artefacts, narratives and responses, and update the desk survey landscapes.

**Improve your infodemic capacity**
- Keep doing “something” in IM even between infodemics. This will make it easier to increase to a full IM response when necessary. The “something” could be training, practising with health misinformation or conducting exercises to see what might have to be adjusted.

Collaboration is important. Find groups, communities and coordinators working on IM in your area, and find ways to share information between and during infodemics.

**Quick start guide: IM response**
This section refers to several quick-start guides on IM activities during the emergency response phase:
- WHO: “How to report misinformation online” (1)
- Vaccine misinformation management field guide (2)
- Internews: “Rumour tracking methodology” (3).

The notes below combine advice from those guides and from practical experience with IM.
Stage 0: Understand the infodemic

RCCE checklists for understanding an infodemic
Your task is to reduce the effects of an infodemic on a health event. Understanding the information ecosystem will help avoid common issues such as managing only effects that are readily visible, trying to solve issues beyond your focus or investigating interesting data that will not markedly reduce the infodemic risks.

Describe the focus
• List the specific epidemic, the specific geographical area (e.g. a country) and/or specific communities.

Assess your infodemic risk
• If you have followed the checklist on understanding infodemic risk, update it. If not, do so.
Suggested reading includes the section of the Vaccine misinformation management field guide (2), “Vaccination in information age”, the section in How to report misinformation online (1), “Social media communications landscape” and the section in Rumour tracking methodology (3), “Understanding context and community”.

Stage 1: Plan

RCCE checklists for planning an infodemic response
Plans change with time but are still useful for determining the size of the response.

List the resources you have for IM
• People: how many people, how many hours per week and how many people are available if you are overwhelmed?
• Allies: IM-related groups working in your country or area; communities that could provide tips or amplify messages.
• Budget: If there is no budget for tools, use existing tools for, e.g., monitoring, or people who could install or maintain tools.

Decide the topics of interest
• Which geographical area and aspects of health are to be covered?
• Which communities are to be helped?
• Identify misinformation about your own organization.

List where most people share information, rumours and misinformation
• Which social media sites? Which messaging systems? Which traditional media (e.g., newspapers, television, radio)?
• Which languages?

Decide on a toolset
• Which tool will you use to search for infodemic narratives and objects?
• Which tool will you use to seek infodemic narratives and objects (if you do this)?
• Which tool will you use to analyse the results of the searches?
• Where and how will you store the results?
• How will you share the results?
Suggested reading on planning a response include the Vaccine misinformation management field guide (2) section “preparation”, the Rumour tracking methodology (3) sections “project planning and setup”, “A1: rumour tracking form”, “A2: rumour database”, “A3: letter of understanding for data sharing” and “A4: job descriptions for team”.

Stage 2: Monitor

RCCE checklists for monitoring an infodemic
Misinformation is contained in messages and other artefacts, narratives and stories.

Know what you’re looking for
• Narratives: rumours and false stories about a current health situation. These often include emotional words to increase engagement. Response groups in and near your country usually have websites that list these.
• Narratives that attack the credibility and reputation of the responder groups. Your communication team will usually know about these.
• Fake experts and manipulated media websites that create or boost narratives. Response groups often mention these, and sites like HealthGuard maintain labelled searchable lists, although country coverage may vary. These places often have emerging narratives.
• Search terms. Use your topics list and narratives to create a set of search “dorks”.
Text, images, video, audio, groups and others online that support and boost narratives

- Coordinated inauthentic behaviour
- Know what you can ignore
- Examples: a rarely repeated conspiracy rumour is not a signal of an infodemic; however, a rumour that spreads into the wider popular narrative and negatively affecting health behaviour is a signal.

Organize monitoring
- Set up a social media monitoring system, such as regular use of Google dorks or a system designed to find and present relevant narratives and data.
- Monitor known sources of, e.g., rumours, misinformation sources, narratives, artefacts, hashtags, channels.
- Monitor response. Many groups are likely to respond to an infodemic: monitor their outputs to improve the visibility of misinformation and disinformation. For more, see section Partners, networks and external coordination.
- Monitor social media regularly and collaboratively. Small teams do not have the resources to do so continuously. Solicit tips from your team, the public and other monitoring groups.
- Monitor where conversations are found, and respond. Monitor a channel on which misinformation is being posted, searched or shared either directly or by asking people to send tips. Monitoring where the conversations are found provides a better chance of finding and filling information voids.

Suggested reading includes Vaccine misinformation field guide (2) sections “Listen”, “A2: set up basic social listening”, How to respond to vaccine misinformation (1) online section “Core principles of SM monitoring and prevention”, Rumour tracking methodology (3) section “3: collecting rumours”.

Stage 3: Understand

RCCE checklists for understanding infodemic data
Understand your findings before acting on them, i.e., determine the content and the risks of ignoring a rumour or misinformation and of responding to it.

Assess data
- The Vaccine misinformation field guide suggests “5 pillars of verification”: provenance, source, date, location and motivation.
- How far has the rumour spread and to which communities?

Assess risk
- What could be done about the rumour or misinformation?
- Will your planned response make the rumour or misinformation more visible to communities?

Suggested reading includes Vaccine misinformation management field guide (2) section “understand”, Rumour tracking methodology (3) section “4: analysing and fact checking”.

Stage 4: Respond

RCCE checklists for responding to infodemic incidents
If appropriate, respond to misinformation. Mitigation is almost always appropriate.

Pre-position materials
- Prepare for misinformation narratives by learning from earlier nearby incidents.
- Ensure messaging before an event, and use it to gain the information space before misinformation creators do.
- List local infodemic narratives and known responses to them.
- Produce counternarratives and pre-bunking materials.

Respond appropriately
- Debunk only if you have to.
- Amplify truthful messengers whenever possible.

Mitigate regularly and collaboratively
- Look for and plan to fill information voids.
- Look for and report, e.g., accounts and groups used in misinformation.
Suggested reading includes Vaccine misinformation management field guide (2) sections “engage”, “A3: 5 tips to make your content more sticky”, “A4: examples of inoculating messages”, “A5: example performance/outcome metrics”, How to respond to vaccine misinformation (1) online sections “Decision trees for when to respond”, “evidence-based guidance for when response needed”, “examples of how to respond with evidence-based messages” (“inoculation/prebunking”, “debunking misinformation”, “responding with empathy, facts, and support”), Rumour tracking methodology (3) sections “5: sharing outputs”, “A5: editorial guidelines”.

References


Top tips for navigating the infodemic

1. Assess the source: Who shared the information with you and where did they get it from? Even if it is friends or family, you still need to vet their source.

2. Go beyond headlines: Headlines may be intentionally sensational or provocative.

3. Identify the author: Search the author’s name online to see if they are real or credible.

4. Check the date: Is it up to date and relevant to current events? Has a headline, image or statistic been used out of context?

5. Examine the supporting evidence: Credible stories back up their claims with facts.

6. Check your biases: Think about whether your own biases could affect your judgment on what is or is not trustworthy.

7. Turn to fact-checkers: Consult trusted fact-checking organizations, such as the International Fact-Checking Network and global news outlets focused on debunking misinformation.
Annex 3. Further reading

WHO pages and publications


• Risk communication and community engagement in emergencies [website]. Copenhagen; WHO Regional Office for Europe; 2022 (https://www.who.int/europe/emergencies/our-work-in-emergencies/risk-communication).


Publications by partners and others


Academic publications


Annex 4. Methods

To provide coordinating and working response authorities, stakeholders and partners in WHO European Region Member States with operational support on IM preparedness, readiness and response related to COVID-19, the authors conducted a literature review of IM and RCCE in the Region and informal peer interviews and peer reviews of early drafts.

Literature review

The aim of the literature review was to establish and update information on IM and RCCE in the European Region, with a focus on operational and implementation resources. The review consisted of a broad online search in two academic and general purpose search engines (Google Scholar and Google) and a focused review of publications by known experts in the two areas.

Online search in academic and public databases

The first step consisted of searches for keywords in the definitions of IM and RCCE (see glossary), including “infodemic”, “misinformation”, “disinformation”, “rumour management”, “fake news”, “information overload”, “information overabundance”, “risk communication” and “community engagement”. In addition, to ensure coverage of current and previous WHO publications, the keywords were combined with “WHO” and variations (e.g., “World Health Organization”, “World Health Organisation”).

The keywords were entered into Google Scholar and Google, peer-reviewed literature and meta-analyses being prioritized over primary data publications. The relative novelty of the WHO approach to the infodemic meant that few “meta-publications” were identified, although some (e.g., the work of the academic consortium for infodemic.eu) provided useful critical discussion and historical positioning of new initiatives and work.

The authors reviewed the results of the search, including lists of references for a “snowball” approach to the second step of the literature review.

Known expert literature review

The authors conducted a second, focused review of publications and models from expert institutions and authors based on their familiarity with work on RCCE and IM and on the results of the snowball strategy from the online search. The authors comprised teams in WHO headquarters and the Regional Office for Africa, including work by the African Infodemic Response Alliance, work by First Draft such as understanding “information disorder” (1); work by Lewandowsky et al (2) on debunking; work by Meedan (3) on mis- and disinformation management; work from FiveBy (4); and work by the Health Evidence Network research team at the WHO Regional Office for Europe on a historical perspective of infodemics for the soon to be published Health Evidence Network synthesis report 76 (Hen Evidence Network, WHO Regional Office for Europe, unpublished data).

For the review of studies by known experts, the following models were found to be particularly relevant to the current document:

- the “three Vs”, as found in work from the University of Washington, United States (5);
- the triple landscapes of the infodemic (information, risk and response), as in work by FiveBy (4);
- narrative-based models, including the ABC model (actors, behaviour, content) in work by Camille François (6), the ABCDE model (actors, behaviour, content, degree, effect) in work by James Pamment (7), and the BEND model in work by Kathleen Carley (8);
- fact-checking models in work by Full Fact (9), UNICEF (10), the Global Disinformation Index (11), Ryerson University (12) and Internews (13); and
- the DISARM framework (14).
References


11. We exist to disrupt online disinformation [website]. London: Global Disinformation Index; 2022 (https://www.disinformationindex.org/).


Digital solutions to health risks raised by the COVID-19 infodemic

Policy brief
The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

**Member States**
- Albania
- Andorra
- Armenia
- Austria
- Azerbaijan
- Belarus
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Cyprus
- Czechia
- Denmark
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Kazakhstan
- Kyrgyzstan
- Latvia
- Lithuania
- Luxembourg
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