Tina D. Purnat
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Managing Infodemics in the 21ˢᵗ Century

Addressing New Public Health Challenges in the Information Ecosystem

Springer

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Tim Nguyen is the Head of Unit for High Impact Events in the Department of Epidemic and Pandemic Preparedness and Prevention of the WHO Health Emergencies Programme (WHE) in Geneva, Switzerland. His team manages: (i) the WHO Information Network for Epidemics (EPI-WIN), a platform to unite the work on managing disease info-demics during emergencies, and (ii) the strategic global governance of pharmaceutical interventions including pandemic influenza and smallpox vaccine as well as influenza antivirals. He joined WHO in 2006, initially working as a Technical Officer in the Yellow Fever Programme which managed an initiative funded by the GAVI Alliance to provide 40 million doses of vaccine

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Abbreviations

API	Application Programming Interface
ASHA	Accredited Social Health Activists
ATM	*A*utomated Teller Machine
CDC	Centers for Disease Control and Prevention
CILIP	Chartered Institute of Library and Information Professionals
CNECT	Communications Networks, Content and Technology
COM-B	Capability, Opportunity, Motivation, Behaviour
COMBI	Communication for Behavioural Impact
COVID-19	Coronavirus Disease-2019
DG	Directorate-General
DG COMM	Directorate-General for Communication
DG CNECT	Directorate-General for Communications Networks, Content and Technology
DG SANTE	Directorate-General for Health and Food Safety
DRC	Democratic Republic of Congo
DSA	Digital Services Act
EC	European Commission
EDAP	European Democracy Action Plan
EEAS	European External Action Service
EPI-WIN	Information Network for Epidemics – WHO
EPPM	Extended Parallel Process Model
ER	Emergency Response
ERC	Emergency Risk Communication
ETC	Ebola Treatment Centre
EU	European Union
FE	Further Education
FLICC	Fake Experts, Logical Fallacies, Impossible Expectations, Conspiracy Theories, Cherry Picking
GCS	Government Communication Service
GHSI	Global Health Support Initiative
GPS	Global Positioning System

HCD	Human-Centred Design
HE	Higher Education
HLS-EU	European Health Literacy Survey
HPV	Human Papillomavirus
HX	Human Experience
ICCPR	International Covenant on Civil and Political Rights
ICT	Information and Communications Technology
IoT	Internet of Things
ITU	International Telecommunication Union
JRC	Joint Research Centre
KAP	Knowledge, Attitude and Practices
MERS	Middle East Respiratory Syndrome
MOOCs	Massive Open Online Courses
mRNA	*Messenger R*ibonucleic Acid
NGO	Non-governmental Organization
OECD	Organisation for Economic Co-operation and Development
OHCHR	Office of the United Nations High Commissioner for Human Rights
OTT	Over-the-top (media platform)
PPE	Personal Protective Equipment
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
PCR	Polymerase Chain Reaction
PDA	Personal Digital Assistant
PHSM	Public Health and Social Measures
QR	Quick Response
RAS	Rapid Alert System
RCCE	Risk Communications and Community Engagement – WHO
REACT	Repetition, Empathy, Alternative explanations, Credible sources, Timely responses
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome-C*oronavirus-2*
SDG	Sustainable Development Goal
SMAPP	System-Managed Access-Path Protection
SOP	Standard Operating Procedure
SOR	Stimulus Organism Response
SPP	Spokesperson Service
SG.STRAT	Strategic Communication, Task Forces and Information Analysis
TIP	Tailoring Immunization Programmes
TTP	Tactics, Techniques and Procedures
WHO	World Health Organization
WHO-EARS	Early AI-supported Response with Social listening – WHO
WMA	World Medical Association

Chapter 1
Infodemic Management in the Twenty-First Century

Sylvie Briand, Sarah Hess, Tim Nguyen, and Tina D. Purnat

1.1 Definition of an Infodemic and the Evolving Information Ecosystem

> An infodemic is an overabundance of information, accurate or not, in the digital and physical space, accompanying an acute health event such as an outbreak or epidemic. (World Health Organization n.d.-b)

An infodemic is not limited to mis- and disinformation but includes all types of information within the information ecosystem.[1] A person's information ecosystem refers to the complex, dynamic infrastructure, sources, and relationships through which information flows and reaches an individual. It includes the digital and physical environments, is influenced by interactions with the health system, is related to social dynamics, health behaviours, and information-seeking behaviours, and acknowledges the structural barriers that can affect access to information.

During an outbreak or an emergency, it is natural, and expected, that with an increase in uncertainty and fear, people seek information differently; they will access different sources, talk more to others about the disease and its impact, and

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[1] Misinformation is incorrect or misleading information which can be differentiated from disinformation that is shared with a deliberate intent to deceive for political, financial, or ideological gain (Wardle and Derakhshan 2017).

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listen to opinions, thoughts, and community leaders (Seeger et al. 2020). In such circumstances, people also tend to generate and disseminate information more. The change in information-seeking behaviour that is experienced at the individual level is reflected in changes in the overall information ecosystem. New sources of health information emerge and existing sources transform. There is the simultaneous dissemination of accurate information, misinformation, disinformation, and outdated information from multiple channels. In this context, it is difficult for anyone to identify trustworthy sources, process the information, and make autonomous and informed decisions regarding health-seeking behaviours, services, and interventions. Often, there is a concurrent alteration of the perception of risk (Bhuiya et al. 2021; Erchick et al. 2022; Patterson et al. 2022; Priesemann et al. 2021), which can compromise how health information and guidance are accepted and acted upon.

1.1.1 Characteristics of an Infodemic

- *Individuals have challenges accessing or receiving credible, accurate health information*

This is especially true for communities that are hard-to-reach, who do not have reliable internet access, or who face other access barriers including, for example, people with disabilities, where content is unavailable in appropriate languages, or existing policies exclude certain people from healthcare access.

- *Individuals have challenges discerning between low-quality and higher-quality health information*

Educational status is linked to literacy, including digital, health, media, and information literacy. Inequities in literacy impact abilities to navigate the information ecosystem and differentiate between different types of health information. The sheer volume of information also makes distinction among low-quality, inaccurate, and credible information difficult.

- *Individuals do not always know what health guidance applies to them*

As both the outbreak and the emergency response evolve, so will the science and guidance, which requires issuing updated guidance for different populations. If this is not well executed, this can lead to confusion among individuals and communities who may not understand why there has been a change in guidance or know how to act on the new guidance. Additionally, outdated or contradictory health guidance and unbalanced media reporting can further sow confusion and create feelings of mistrust towards authorities and health services.

- *Individual and community information-seeking and health-seeking needs are constantly changing*

Questions, concerns, narratives, information voids, and circulating mis- and disinformation accompanying an outbreak change, because people's worries and priorities change. Health systems need to ensure that updated communications and guidance address these needs promptly and in a focused and tailored way specific to particular audiences or risk further erosion of trust.

- *Individuals try to make the best health decisions they can for themselves and their families, even if only with limited or low-quality information*

Those caught up in emergencies do not always have accurate information and can be influenced by their previous experience in the health system, their trust in government, and the opinions and actions of their family, friends, or community leaders.

The COVID-19 pandemic presents an unrivalled example of an infodemic. During the pandemic, the generation of scientific evidence and information increased and was distributed widely in both pre-print and publication versions, making it difficult to assess the quality of information. Numerous experts and scientists aired their views and opinions, stimulating a polarised discourse around many pertinent subjects, both offline and online. This was accompanied by an increase in media coverage, with highly sensationalised and potentially manipulative content. Credible health information was 'lost in the noise', and in many settings, the questions and concerns of individuals and communities went unaddressed, creating further space for rumours and myths. This infodemic overwhelmed many individuals, as well as the health systems trying to promote public health guidance and health services.

1.2   Potential Harms Caused by Infodemics

Infodemics are not a new phenomenon and have been witnessed during previous outbreaks of diseases, including Zika, Ebola (World Health Organization 2019), polio, and measles (Datta et al. 2018). For example, during the Yellow Fever epidemic in Angola in 2016, there was a rumour that following vaccination, people could not drink alcohol or might suffer from infertility. This had a negative impact on vaccine coverage, especially in young men (UNICEF n.d.).

An infodemic can cause significant harm to the health of individuals and communities, social cohesion, and the response to the epidemic. However, these dangers are avoidable if certain elements of an infodemic are addressed. The list below details these elements in descending order of magnitude in terms of volume but in increasing magnitude for potential for harm (see also Fig. 1.1):

The infodemic is made up of more than misinformation

Health systems have more influence here   Less influence here

| ? Questions | ☹ Concerns | Information Voids | Misinformation | Disinformation |

Growth of narratives and if sustained, increasing potential for harm
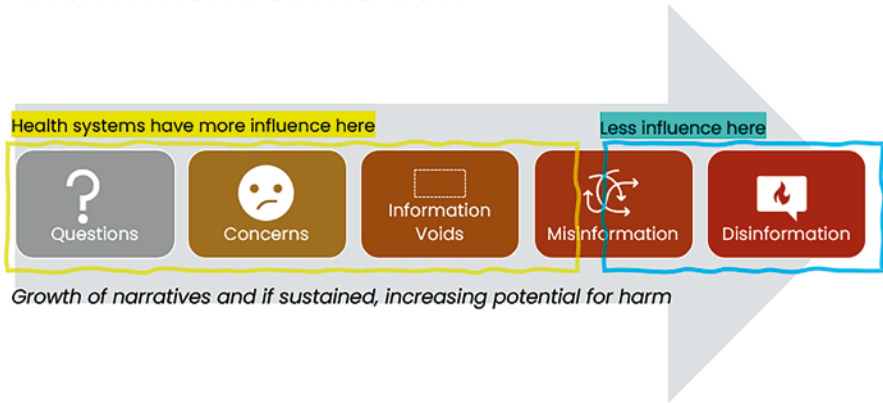
Fig. 1.1 Elements of an infodemic – narratives grow from questions into concerns, information voids, and, if sustained, into mis- and dis-information. The arrow from left to right indicates a growing potential for harm to health and well-being. (Source: World Health Organization (n.d.-b)

- *Questions*

When people do not understand, they ask questions of their friends, family, acquaintances, organisations, and networks they trust. Questions that are not identified, understood, and addressed can evolve into concerns.

- *Concerns*

Questions without satisfactory answers, or with worrying answers (e.g. answers that do not provide solutions or protective actions), can become concerns. Concerns can also reflect frustration or anxiety about a health system's response and serve as a warning signal that population needs are not being adequately met. Concerns, suspicions, and misperceptions are often shared among different groups, which can then become an easy target for sensationalist media coverage and purveyors of mis- and disinformation.

- *Information voids*

These occur when people actively search for information and cannot find an answer from a credible source. Information voids can be identified by monitoring what type of health information is being searched for and rapidly developing content to meet those information needs. Misinformation often appears when information voids are not filled.

- *Misinformation*

Misinformation can be packaged in emotionally compelling ways to speak to the values of specific individuals and communities in formats that are easy to share. Most people who share misinformation are not aware that it is misinformation. Misinformation can be addressed by understanding why a particular piece of

misinformation, or narrative containing misinformation, has been shared widely, to whom and by whom, and by listening to affected individuals and communities, engaging with them, and improving science translation efforts to clarify and address misperceptions.

- *Disinformation*

This is false information created or disseminated with an intention to harm. Disinformation is often motivated by economic or political profit, and is re-shared by people who either believe it or identify with a particular cause. This can include conspiracy theories, calls for violence, or deliberate attempts to erode trust in health services or government. Addressing disinformation requires a more comprehensive approach that may go outside of the health system, legal or consumer protection intervention.

- *Narratives*

As more people become concerned about a specific topic, the discussion that is generated can become a narrative. Narratives are trending topics discussed offline, online, and in the media, and can be influenced by social, political, and economic factors. Narratives shift over time, often in response to national emergency response efforts. Narratives can be positive or negative and can contain accurate and/or inaccurate information. Understanding the values that underpin narratives can be helpful to inform communication efforts.

The different elements of information that make up the infodemic can impact a person's knowledge, awareness, beliefs, intent, and even behaviour at both an individual and a population level. For example a certain narrative can impact adherence to public health and social measures (PHSMs) that have been put in place during an epidemic to slow or stop transmission. This occurred during the early stages of the COVID-19 pandemic when a common narrative emerged (Basch et al. 2021), stating that COVID-19 only affects older people, which led to a lower risk perception among young people and a lack of adherence to PHSMs.

An infodemic can also result in direct harm to health, such as use of unapproved treatments that have been advertised as cures. These are predominantly linked to misinformation. For example, early in the COVID-19, pandemic methanol was touted as a treatment, resulting in a large number of deaths in Iran (Hassanian-Moghaddam et al. 2020). Furthermore, fear and uncertainty associated with an epidemic can lead to behaviours that are not protective of health either for the individual or for the community. This type of behaviour was displayed during the COVID-19 pandemic when individuals who were at low risk from severe disease purchased and hoarded face masks, thus depriving highly exposed caregivers from essential protective equipment. Infodemic management insights can shed light on the drivers, barriers, and enablers of such behaviours, while effective communication can minimise the impact of fear and uncertainty by addressing people's questions, concerns, and information voids.

Infodemics can impact trust in the health system. If the needs of communities are not understood, and the response is not tailored to specific contexts and concerns, there will be a misalignment between the health system and the community. Health systems and public health authorities may deliver inappropriate solutions that are

not accepted by communities. Authorities may then assume that a low uptake of PHSM is due to other factors such as misinformation, and then seek to address that misinformation rather than the acceptability and feasibility of recommendations. This will increase a community's perception that the health system or authority is not responsive. For this reason, meaningful communication and engagement of communities in the design and implementation of an epidemic response is a critical part of infodemic management.

Stigma and discrimination are directly linked to infodemics during epidemics. In most epidemics, there will be certain at-risk groups, such as international travellers during COVID-19 or men who have sex with men during mpox multicountry outbreak. It can be complicated to deliver sensitive, nuanced communication about the risk without increasing stigma or vilifying certain populations. Many healthcare workers also experienced stigma, exclusion, and even physical violence during the COVID-19 pandemic (Bagcchi 2020; Dye et al. 2020; Nashwan et al. 2022). This was in part due to poor messaging and communication, as well as the increased risk of infection for healthcare workers from SARS-CoV-2 through increased exposure to the virus being interpreted as healthcare workers being a source of the virus. Similarly, many health workers delivering or promoting COVID-19 vaccination experienced violence, which was often linked to conspiracy theories about government motives behind advocacy for specific vaccines or prioritisation of specific populations.

1.3 The Importance of Trust in Epidemic and Pandemic Response

The information ecosystem during epidemics is complex, involving large volumes of rapidly generated and disseminated information, a multitude of contradictory voices, sensationalised media content, layers of contextual factors influencing understanding and culture, emotional factors such as anxiety or anti-government sentiment, and all meeting with differing levels of scientific literacy, health literacy, and digital literacy.

For individuals to adopt, change, and sustain new behaviours during epidemics, they need to be aware of the recommendations; understand the context and rationale behind the recommendations; trust the authority/messenger recommending them; and have the ability to enact the recommendations in their living/social/work/faith setting. Trust is an invaluable social capital and is fragile at the best of times. During epidemics, trust in institutions, science, and decision-makers is at even greater risk.

1.3.1 Trust and Science During Epidemics

During epidemics, the volume and speed with which scientific evidence is generated, analysed, published, and shared increases exponentially. During the first couple of months of the COVID-19 pandemic, more than 20,000 articles related to

COVID-19 were published (Teixeira da Silva et al. 2020). Many publications were of suboptimal quality and lacked scientific rigour, leading to misinterpretation of results, confusion, and diminishing trust in science. For example an article published in a reputable journal on the use of hydroxychloroquine as a treatment for COVID-19 (Mehra et al. 2020) was retracted and rumours ensued, stating that scientific information was being manipulated by health authorities. Mistrust in science, and secondarily in the authorities that promote the science, is difficult to shift once established. Communities may refuse PHSM or even come into conflict with other communities or groups. In this way, we see how the infodemic can aggravate social discomfort. This is supported by an increased interest from the media and 'citizen scientists' with little formal scientific training interpreting low-quality studies to support their views.

When a new pathogen emerges, little is known. It is only as the epidemic develops that knowledge of the disease and strategies to manage it increase. However, this time lag between emergence of a pathogen and knowledge generation and guidance development can be perceived by communities as incompetence or ignorance. While the rapid and transparent sharing of scientific information on open access platforms can shift this perception in the scientific and medical community, the speed of publication must not happen at the expense of rigour (e.g. peer review and editorial validation). Furthermore, even with high-quality scientific publications, intentional efforts are needed to translate the science into different contexts and cultures in order to make the science relevant and actionable. This can be supported by interventions to build scientific literacy, as this will enable an understanding of the iterative process of evidence generation, interpretation, and evaluation, which, in turn, helps to build trust in science and resilience to misinformation (World Health Organization n.d.-a).

1.3.2   Trust and Communities

Pandemics and epidemics are evolving situations characterised by high levels of uncertainty and variable levels of societal and individual-level disruption due to the impact of the disease itself, as well as the interventions (PHSM) put in place to stop transmission. Trust is an essential part of the epidemic response. However, trust is complex; it can take a long time to build but can be destroyed very quickly. It is context specific and dynamic. Trust in institutions and leadership can wax and wane as an epidemic or pandemic evolves and information changes. Traditional risk communication aims to encourage change in people's behaviours to protect their own individual health and that of their community. Less considered is the impact of these changes on social cohesion, on broader mental health and well-being, and on people's trust in authorities.

Within each information ecosystem, there are trusted voices (individuals or institutions) that influence communities and individuals. Where there is mistrust in governments, there will be challenges to an epidemic response. This is especially true if the words or commitments made by health authorities are not followed by

appropriate action or if public health recommendations are unimplementable in a person's setting or with the resources available. For example, during the COVID-19 pandemic, certain politicians were exposed as hosting parties and dining in restaurants despite the social distancing and entertainment closure measures. When decision-makers do not lead by example, trust in authority figures decreases.

Trust needs to be understood and strengthened between crises precisely because it is at risk during crises. There are sources of trust and protective factors of trust; there are also those that protect trust and those that destroy it. For example it is more common to trust someone known or someone with legitimate knowledge and authority such as a doctor or caregiver. Building trust is an important component of epidemic and pandemic preparedness efforts, particularly for leaders and decision-makers. Trust is an underpinning value of all infodemic management approaches and is considered a valuable social capital that must be nurtured.

1.4   Strategies to Manage Infodemics During Health Crises

Infodemic management requires a comprehensive understanding of infodemics, the overall information ecosystem, and the interdependency with epidemics (Rubinelli et al. 2022; World Health Organization 2020b). Infodemic management includes the following 4 essential components:

- *Listening to concerns*

Listening increases understanding of the concerns of communities, the contexts within which they live, and their experience and knowledge related to the outbreak or epidemic. Listening is the first step towards formulating interventions, guidance, and communication in a way that is more relevant, implementable, and acceptable to communities. For this reason, infodemic management prioritises listening. In the current information ecosystem, much listening can occur on social media platforms, and incorporating sentiment analysis to social digital listening can generate useful insights. Other offline or interpersonal platforms for listening can be built into physical spaces such as workplaces, health or community centres, places of worship, or schools. For social listening to be useful and effective, however, it needs to happen in real time and must also be grounded in an analytical framework that makes it possible to operationalise the knowledge that is generated rapidly.

The World Health Organisation (WHO) has invested in the development of taxonomies and methodologies for integrated analysis and infodemic insights generation (World Health Organization and Organisation mondiale de la Santé 2022), as well as online social digital listening tools (WHO-EARS n.d.) that are being refined to enhance listening at a global, regional, or national level. It is possible with these tools to understand the prevalent questions, concerns, information voids, narratives, and circulating mis- and disinformation within certain population groups.

In general, during epidemics, questions can be grouped into four categories: the disease (its symptoms, the sequalae); cause and aetiology of the disease (e.g. the

virus) and explanation of the disease (why me, why us?); treatments; and public health interventions (personal protective equipment, vaccines, masks, etc.). By grouping questions in a limited number of categories, health authorities can prepare communications that are tailored and encompassing at the same time.

- *Communicate risk and translate science*

Risk communication is a core capacity within the monitoring and evaluation framework of the International Health Regulations (World Health Organization 2005). At certain times in history, health authorities have been inclined to hide the facts regarding an outbreak or epidemic. Aside from the negative impact on trust and legitimacy, this approach would be impossible to maintain in the current information ecosystem. Regular, transparent, communication that acknowledges uncertainty is most certainly a more effective method of reassuring communities and keeping them informed. Effective risk communication is always timely, accurate, credible; shows empathy; promotes action; and is delivered with respect. Risk communication must include efforts to translate scientific concepts into messaging that is understandable and relevant to target audiences. Science translation is challenging in epidemics where the science evolves quickly and is generated rapidly. Interventions may need to be adapted based on evolving evidence and there is a risk that without appropriate communication, these changes are misinterpreted. Translating science into operational knowledge is, to an extent, an art that combines not only an excellent understanding of scientific phenomena but also an ability to share knowledge in a format that can be understood and operationalised. WHO has developed strategies to support science translation, such as 'Science in 5', EPI-WIN webinars, and regular press conferences. These events have made it possible to inform different communities and networks of evolving knowledge.

- *Promote resilience to misinformation and disinformation*

In many circumstances, individuals are able to differentiate between correct information and misinformation. During an epidemic, people tend to seek information actively, thereby increasing their exposure to all types of information. In addition, fear and uncertainty impact a person's ability to analyse information objectively. Infodemic management includes dimensions of preparedness such as strengthening health and digital literacy. These capacities are often under-valued as epidemics are considered rare events and the perception of risk decreases sharply once the crisis has passed.

To build resilience to misinformation at an individual level, it is important to strengthen an individual's ability to distinguish between accurate and inaccurate information; recognise media manipulation; and successfully debunk misinformation with friends and family. However, at a community level, resilience to mis- and disinformation requires structural approaches. A resilient community has both access and ability to disseminate credible, accurate information that is tailored and acceptable to the population. A resilient community also has a localised ability to fact-check claims, has access to trusted messengers who have been trained in effective infodemic management principles, and has a feedback loop with the health system to share rumours, questions, concerns and elicit rapid responses.

• *Engage and empower communities*

Active engagement of communities is essential to epidemic response. During an epidemic, there is individual experience and responsibility, as well as community/collective experience and responsibility. In the current information ecosystem, the concept of communities is evolving. In localised epidemics, geographical communities are an important focus. However, in the hyper-connected modern world, each individual belongs to multiple communities, including traditional communities (neighbours, friends, family); virtual communities (social media platforms and networks); and communities defined by similar vocations or interests (faith, sport, workplace).

Community engagement in the twenty-first century must account for this new network structure and WHO has formed different global networks that enable the engagement of different types of communities: for example a Health in the World of Work Network that connects employers, business associations, and labour unions to discuss the preparedness and response to infectious diseases in the workplace. Another example is the WHO Faith Network that includes faith-based organisations and religious leaders that work together to support the engagement of faith partners in local responses to epidemics and pandemics. Youth are another important constituent with whom WHO works closely in infodemic management, for example through the WHO Youth Council and the Collaboration with International Federation of Medical Student Associations.

These WHO networks represent not only a new approach to community engagement but also are platforms for two-way dialogue, knowledge exchange, and science translation. The co-development of technical guidance (World Health Organization 2021b) within these networks to ensure that technically correct recommendations can also be properly adapted to different contexts, settings, and cultures is an important step towards increasing the reach and relevance of WHO's messaging. Without the knowledge, expertise, and experience of these networks feeding into the 'operationalisation' of scientific knowledge and technical guidance, there is a risk that it remains too technical or its implementation is not feasible (Fig. 1.2).
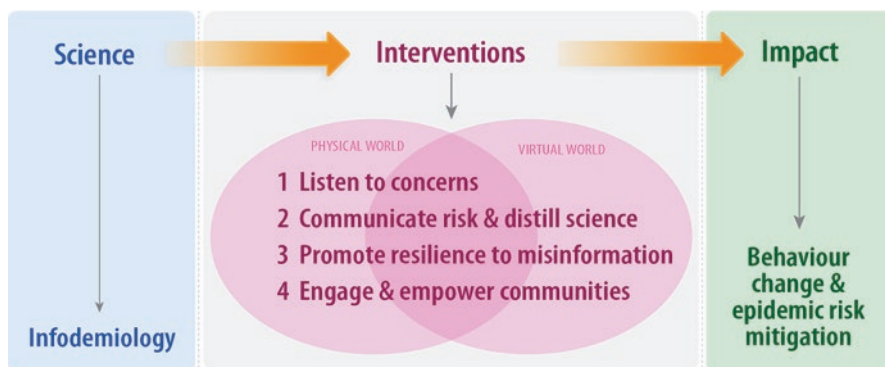
Fig. 1.2 Infodemic management – from science to interventions in order to have impactful behavioural change and epidemic risk mitigation. (Source: WHO n.d.-b)

1.5 Tips to Implement Infodemic Management

Infodemic management is a public health practice which must be embedded within health system structures. This is important for the effective monitoring of information and for generating insights, producing high-quality communications and programming, adapting the design and application of infodemic interventions, and promoting the resilience of communities and networks. Infodemic management must account for each person and their ability to use the tools and strategies available to manage the infodemic within their own information ecosystem. There is also a need for institutions, decision-makers, and those with influence to shoulder their civic and moral responsibility in managing infodemics. There are many tools and resources developed by WHO that can support infodemic management activities for a diversity of stakeholders (Fig. 1.3).

In the modern digital information environment, it is insufficient to focus solely on the dissemination of health information as a strategy to reach people with public health recommendations (World Health Organization 2021d). Successful infodemic management, while reliant on multi-stakeholder engagement, must be health-authority-led and requires a comprehensive strategy that includes the following practical steps:

(i) *Engage health workers in infodemic management*

Health workers are often the first point of contact that an individual will have with the health system. In addition to the vital services they deliver, health workers play a critical role in communication, allaying fears, and understanding individual and community information needs during epidemics. Health workers can be
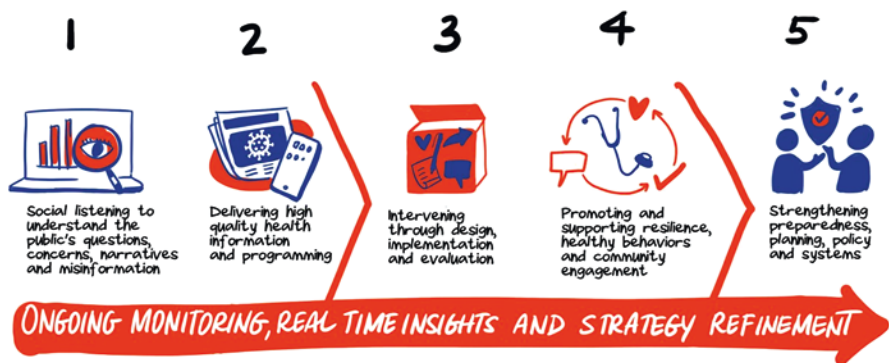
Fig. 1.3 WHO infodemic management process in a health authority. (Source: World Health Organization 2021c)

supported in this role through expanded pre-service, in-service, and continuing education training opportunities that include evidence-based 'listening and responding' techniques (e.g. motivational interviewing) and misinformation management techniques. These techniques may be specific to the carer-patient interaction but could also be expanded to include interactions with the broader community (OpenWHO n.d.). For each health event, health workers will require updated tools and resources for addressing the event-specific misinformation narratives and responding to frequently asked questions (World Health Organization 2022a). As the infodemic management response matures, health workers could also receive training in techniques and approaches for monitoring infodemic-related indicators relevant to the country, context, and epidemic (World Health Organization 2022b).

(ii) *Improve the quality, accessibility, and acceptability of health information*

Infodemic management requires a multisector response. All people, institutions, governments, and networks can contribute towards managing the infodemic. However, national health authorities retain the primary responsibility for ensuring that all people have access to the right information, in the right format, and at the right time.

As a baseline, health authorities must ensure all interventions during epidemics and pandemics are evidence based and accompanied by transparent communication. In addition, communication should be tailored to different audiences, languages, and cultures. An infodemic will impact different communities in different ways. Certain groups such as migrants, minority language communities, and hard-to-reach populations may be more vulnerable during an infodemic due to limited or restricted access to credible, accurate information or to a platform for voicing concerns and questions. This isolation may impact the uptake of (possibly) already limited health care and acceptance of PHSM.

Infodemic management requires that these communities are identified and supported through intentional and respectful efforts to facilitate listening, increase access to credible health information, and build resilience to misinformation. Often peer-to-peer approaches (Chaney et al. 2021) are effective in these situations and, thus, those involved in infodemic management are encouraged to prioritise and sustain partnerships with trusted decision-makers and community leaders, including the following: the identification of communities disproportionally affected by infodemics; the co-development of efforts to increase resilience to misinformation among communities; the establishment of safe platforms (virtual and physical) for dialogue and learning; and the provision of resources to carry out infodemic management interventions.

It is widely acknowledged that health information travels further when people adapt and share it. This form of knowledge generation can be encouraged by disseminating health information in formats designed for reuse and sharing, as well as being meant for digital spread through social networks. Inaccurate, stigmatising, or potentially harmful content can be replaced by accurate, high quality-content that has been adapted and repurposed (World Health Organization 2021a). Strategically, it is important, therefore, for health authorities to build mutually respectful

partnerships with new types of communities both online and offline to foster a healthier information environment, such as professional networks, dating social networks, and interest-based social networks (World Health Organization 2022a).

Media, including journalists, are key partners that can be encouraged to avoid over-sensationalised content, use a range of trusted sources, uphold impartiality, and employ a proactive approach to addressing common rumours, information gaps, questions, and concerns. The education, telecommunications, food and medicine, and consumer protection sectors can also be engaged in infodemic management; for example health literacy and digital literacy built into education curricula, food and medicines safety organisations partnering with programmes that provide access to credible health information, and the private sector called on to link to government public health sites or other credible websites or posts and content related to the emergency or health topic (World Health Organization 2021e).

(iii) *Take actions to build a positive digital information ecosystem*

Digital platforms can be an ally when managing an infodemic, and digital tools such as SMS-based prebunking courses, next-generation conversational chatbots that mimic natural human conversation, and gamified learning through apps are available for refinement and dissemination (World Health Organization 2021d).

Simple actions such as reviewing, updating, and translating national or local public health authority websites and increasing their social media presence will make health information easier to find and more accessible to local populations. Content should also be adapted to mobile devices, which are used by the majority of people worldwide to search for health information (World Health Organization 2021a).

In addition, efforts to remove outdated health guidance and information that could cause confusion and fuel misinformation are simple but effective in 'cleaning' the digital information ecosystem (World Health Organization 2021a). Other opportunities include the establishment of partnerships with fact-checking organisations, social media platforms, and media to promote accurate, credible information, prioritise communications from trusted voices and sources, and invest in mis- and disinformation monitoring. In the digital ecosystem, it is also important to ensure policies and strategies are in place to protect trusted voices and sources from harassment and trolling, all while protecting 'freedom of expression' and avoiding where possible the exclusion of dissident voices.

(iv) *Establish an infodemic workforce for rapid infodemic insights generation and response*

Although many health authorities are already responding to health misinformation, few have designated infodemic management staff or teams. Initial efforts to establish an infodemic workforce can include the upskilling of existing staff, and the provision of resources and capacities to implement basic infodemic management interventions. Subsequent steps will include the development of a human resource plan, based on a competency framework to implement the infodemic management strategy (World Health Organization 2021c). Once the human resources have been identified and trained for flexible deployment within the emergency

response structure, health authorities can develop SOPs for rapid infodemic insights development for high priority public health issues: for example SOPs to mitigate the impact of the infodemic in the context of a specific treatment or health-promoting behaviour (World Health Organization and Organisation mondiale de la Santé 2022).

(v) *Establish and develop infodemiology – a transdisciplinary approach to info-demic management*

Infodemiology is a new scientific discipline that brings together a large variety of scientific disciplines to address the complexity of infodemic management. It includes elements of data science, epidemiology, physics, chemistry, anthropology, behavioural sciences, sociology, psychology, philosophy, political science, and communication. Investment in research is needed to increase the evidence base for infodemic management, including, but not limited to, exposure to information, effectiveness of interventions and policies, impact of health misinformation, and the effectiveness of strategies, tools, and interventions (World Health Organization 2020a, 2021d).

1.6   Conclusion

Infodemic management is still a developing field of public health practice. There is still much to learn about how human populations communicate during acute health events, both online and offline, and how this affects behaviour and resilience both of individuals, communities and health sytems when faced with epidemics and pandemics. A universal lesson from the COVID-19 pandemic is the importance of preparedness. The next pandemic will be accompanied by an infodemic. Pandemic preparedness includes preparedness for infodemic management, and the building of a community of practice and research is the first step towards the development and evaluation of effective evidence-based measures and practices to detect, understand, and respond to infodemics.

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Chapter 2
Key Concepts and Definitions in Infodemic Management

Atsuyoshi Ishizumi and Brian Yau

2.1 Introduction: Overview of WHO Infodemic Management Framework

Key terms defined in section: *infodemic, infodemic management.*

Infodemic management is an amalgamation of a wide range of disciplines. It is also a relatively new practice compared to other public health functions and has a rapidly growing scientific evidence base. Due to the nascent and transdisciplinary nature of infodemic management, it is important to have a harmonised understanding and agreed language when discussing key concepts. This chapter will specifically explore how we can conceptualise and operationalise the key concepts that underlie each stage of the infodemic management framework (World Health Organization 2020a).

Before we consider the framework, however, we must first define the main problem it aims to address – the infodemic. An infodemic is best regarded as too much information, including false or misleading information, within digital and physical environments during a disease outbreak. It makes it difficult for people to find information to better protect themselves and their communities, leading to risk-taking behaviours that can harm health or increase mistrust in health authorities (Calleja et al. 2021; World Health Organization 2022a). From this definition, infodemic management can then be defined as the systematic use of risk and evidence-based analysis and approaches to manage the infodemic and reduce its impact on health behaviours during health emergencies (World Health Organization 2022a). The infodemic management framework illustrates the different steps involved in successful infodemic management (World Health Organization 2021a).

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2.2   Social Listening and Infodemic Insights – Questions, Concerns, Narratives, and Misinformation

Key terms defined in section: *social listening, information void, confusion, rumours, mis/disinformation*.

The implementation of social listening is one of the first activities that infodemic managers should consider. It is an essential step because it helps you to better characterise a population's concerns and worries, to understand the questions, and, thus, frame risk communication messages accordingly. It also enables the collection and analysis of data that can be used to inform the subsequent stages of the infodemic management framework. The conventional definition of social listening comes from the business world, where it has been used to track online conversations among consumers about a certain brand or product to inform marketing, branding, or other sales strategies. Although we sometimes employ similar social listening methods in infodemic management, our definition and approach are more expansive. Social listening in infodemic management can be defined as any form of data collection and analysis activity conducted across social media, traditional media, and when integrated with other data sources, such as user search trends, epidemiological data, and socio-behavioural data, it yields infodemic insights to identify, categorise, and understand the concerns and narratives expressed. Social listening and infodemic insights use an integrated method for public health analysis and insights generation to inform evidence-driven infodemic interventions (Purnat et al. 2022).

There are many different challenges that constitute an infodemic and we can apply social listening and infodemic insights to track and understand them. Information voids, for example, occur when there is a lack of reliable and accessible health information, which can consequently lead to anxiety or confusion among the affected population or provide a fertile ground for rumours. Information voids are often a result of the inability of health authorities to quickly disseminate information due to inadequate evidence (Calleja et al. 2021). Confusion, in this context, can be understood as difficulty in understanding publicised health information or the inability to discern the best course of action for protecting one's health during an infodemic.

There are also more obvious challenges associated with infodemics, such as misinformation and disinformation. The former refers to information that is false but not intended to cause harm. The person disseminating misinformation may believe it to be true (World Health Organization 2020b). Disinformation, conversely, is false information that is deliberately created or disseminated with the express purpose of causing harm where the person disseminating disinformation knows it to be false (World Health Organization 2020b). Lastly, rumours refer to unverified information that can either be true or false (World Health Organization 2020b). Social listening and infodemic insights are a useful tool for monitoring and assessing all of the above, but we cannot address infodemics with social listening and infodemic insights generation alone.

2.3 Delivering High-Quality Health Information and Programming

Key terms defined in section: *evolving science, outdated information, risk communication, changing guidance, trusted messenger, pretesting, co-development, vulnerable communities, debunking*.

In addition to understanding the public's concerns and questions via social listening and infodemic insights, another important role public health can play during an infodemic is that of ensuring delivery of high-quality health information and health programming. High quality can be defined in various ways, and is particularly difficult to achieve during an infodemic. For instance, when responding to a novel public health threat that requires new scientific investigations and knowledge, people are likely to struggle with what we may call evolving science, a state in which the scientific evidence base relating to a specific topic is constantly being updated at a rapid pace. This can easily lead to public confusion, as the imperative to replace outdated information with new evidence or reinterpretation becomes greater. In these instances, it becomes increasingly important to adhere to the principles of risk communication, or the real-time exchange of information, advice, and opinions between officials and people who are facing the emergency (World Health Organization 2022b).

Even if risk communication is implemented appropriately, as a consequence of evolving science and outdated information, changing guidance released by health authorities that repeatedly undergoes updates can add to people's confusion or anxiety and requires ongoing engagement with the community of concern. In such situations, it is particularly important to leverage networks of trusted messengers who are considered by members of the community to be credible sources of health information. Examples of trusted messengers include physicians, faith leaders, or co-workers. However, we need also to remember that those whom the health authority thinks are trusted messengers may not always be considered well-respected or trustworthy by those receiving the message. This means that infodemic managers must identify trusted messengers specific to the community in which they are working and avoid making any assumptions.

Evidence suggests that the use of trusted sources and channels can be effective in addressing mistrust or misinformation, especially when working with vulnerable communities who may be disproportionately affected by health emergencies and infodemics (Dada et al. 2022; van Prooijen et al. 2021). Messages should be subject to pretesting when possible before dissemination. Pretesting refers to the process of examining the acceptability, understandability, and potential effectiveness of health communication materials before they are officially released to the public, and ideally includes direct input from members of the affected community. These types of participatory processes that involve trusted messengers and community members in decision-making are known as co-development, and lead to community ownership and contextually appropriate interventions (World Health Organization 2017).

Furthermore, strategies for delivering health information to members of vulnerable communities should be prioritised, as they are more likely to experience

barriers to accessing accurate and timely information that can promote healthy behaviours. There are additional challenges in collecting social listening data in these communities due to factors such as their unique information environment or inherent mistrust of health authorities. Examples of communities susceptible to infodemics include ethnic or racial minority populations that have experienced historical health inequities, migrant communities without access to routine health services, or the elderly who may lack digital and data literacy.

Although misinformation and disinformation are merely one part of the plethora of challenges that constitute an infodemic, they can sometimes hinder the delivery of health information or programmes. Responding to specific pieces of mis/disinformation may not always be as practical or effective as addressing the root causes of these problems, such as information voids or poorly delivered health information. Nonetheless, on occasion, it may be necessary to directly manage misleading or incorrect claims that have spread widely. This process is known as debunking: providing corrective information that reveals the falsity of misinformation or disinformation *after* people have been exposed to it (World Health Organization 2020b).

2.4   Intervening Through Design, Implementation, and Evaluation

Key terms defined in section: *integrated analysis, behavioural models and theories, human-centred design, monitoring and evaluation, strategy refinement*.

The delivery of high-quality health information is an integral part of infodemic management, but the sole reliance on health communication is often insufficient. When countering infodemics, we must also develop and implement data-driven interventions that go beyond the delivery of information. Analysis of social listening data should be carried out in such a way that generates recommendations for action that public health authorities, or other organisations, can develop interventions or base decisions about programmes on. Infodemic management interventions are strategies, policies, or health programmes designed to identify, address, or mitigate the harms of an infodemic and may include, but are not limited to, science and knowledge translation, design of the information environment, community engagement, design and quality of health service delivery, updates to health guidance, or capacity building to build resilience to misinformation.

An important approach for deriving actionable recommendations is what is known as integrated analysis, using social listening and other data sources, not only that obtained from monitoring social media, but which through integrated analysis and infodemic insights generaiton also incorporates both quantitative and qualitative interpretations of the synthesised material. Since most data sources and listening tools used for infodemic management have some degree of limitation, relying on a single data source is likely to result in biased or misleading recommendations,

which, in turn, leads to suboptimal interventions or programmes. To avoid this, human analysts, who are ideally well-versed in quantitative and qualitative indicators, are recommended as the drivers of data triangulation and synthesis of infodemic insights.

Another essential aspect of intervention development is ensuring that it is informed by behavioural models and theories to the fullest extent possible. Usually, the final goal of infodemic management interventions is to induce positive health behaviour change among the community of focus, whether it be increasing vaccine uptake or reducing incorrect use of masks. Therefore, it is critical that interventions are designed and deployed based on theoretical frameworks used in public health, and more specifically in the discipline of social and behavioural sciences.

There is a wide range of behavioural theories and models, ranging from frameworks that have been used extensively in public health such as COM-B (WHO Regional Office for Europe 2019; World Health Organization, Food and Agriculture Organization, UNICEF 2012; Michie et al. 2011), to more recent ones such as nudge theory or the Fogg Behavior Model (Agha et al. 2019; Thaler and Sunstein 2008). Where possible, it would be valuable to identify a behavioural scientist who can help you or your infodemic management team in selecting the appropriate framework and applying it during intervention development. Regardless of which framework you choose, it is important that it is applied to the infodemic management workflow early in the process so that it can guide data collection activities, for example, through developing a survey instrument based on theoretical constructs.

Furthermore, infodemic managers may also want to consider employing human-centred design (HCD) when developing interventions. HCD is a problem-solving approach revolving around the principle that successful solutions are created with the needs and wants of the end user in mind (Adam et al. 2019). This process involves understanding the problem you are trying to address from the perspective of the community member, empathising with their needs, and co-creating intervention ideas through their inputs. Even if it is not feasible to implement the entire HCD process, it would be worthwhile keeping the basic principles of HCD in mind as you design interventions so that they are more likely to be effective and widely adopted by target community members.

Once interventions have been developed and are ready for launch, their rollout and impact should be tracked and assessed systematically using the guiding principles of monitoring and evaluation. Monitoring informs programme planning through ongoing and periodic data collection that measures the progress of intervention implementation, including process indicators such as how well the intervention is reaching its target audience. Evaluation entails assessment of the intervention's impact, both in terms of effects on health outcomes and cost-effectiveness. Monitoring and evaluation indicators should be designed and incorporated into programme planning early on, ideally during the intervention development stage. These indicators should be tracked and analysed periodically to inform continuous strategy refinement, whereby interventions are quickly adapted to the changing needs of target communities.

2.5 Promoting and Supporting Resilience, Health Behaviours, and Community Engagement

Key terms defined in section: *community empowerment, community engagement, information equity, health/digital/data literacy, social inoculation*.

Successful infodemic management is not only defined by a health system's ability to deliver high-quality information and implement effective interventions, it also involves empowering individuals and communities to navigate an infodemic. Empowerment of community members should be conducted through the framing of access to reliable health information as a right (World Health Organization 2021b). A key factor in achieving community empowerment is community engagement, the process by which communities, organisations, and individuals build a long-term relationship with a shared vision for the benefit of the community (World Health Organization 2020b).

At every step and level of infodemic management, we should seek opportunities for community involvement and collaboration, especially when dealing with vulnerable communities. Bidirectional relationships between health systems and community members are vital to achieving information equity, where everyone has equitable access to acceptable, relevant, credible and current health information regardless of language, age, race, or other sociodemographic characteristics.

In order to support resilience during infodemics, we must also build and promote literacy at the individual level. In the context of infodemic management, there are different types of literacy that are interrelated and all of them are important. Health literacy is the degree to which people are able to access, understand, appraise, and communicate information, and to engage with the demands of different health contexts in order to promote and maintain good health across the life-course (Dodson et al. 2015; World Health Organization 2020b). Digital literacy refers to people's awareness, attitude, and ability to use digital tools to identify, access, manage, integrate, evaluate, analyse, and synthesise digital resources, construct new knowledge, and communicate with others appropriately (Martin and Madigan 2006; World Health Organization 2020b). Similarly, data literacy includes skills and thinking that revolve around undertaking everyday activities such as searching, evaluating, interpreting, and citing data, while also being able to critically think about digital rights, privacy, and the mechanisms of the online ecosystem (Carmi et al. 2020; World Health Organization 2020b).

A promising strategy for promoting literacy and resilience is "social inoculation" (Lewandowsky and van der Linden 2021), an approach that is arguably more important than debunking, because it can help prevent mis/disinformation from spreading in the first place. "Social inoculation" is a concept that comes from social psychology and is based on the idea that we can pre-emptively build resistance to mis/disinformation that one may encounter in the future (McGuire 1961; Roozenbeek et al. 2020). It works by identifying and deconstructing hoaxes, myths, or other types of incorrect claims to which we can potentially be exposed so that our psychological susceptibility to taking them at face-value is reduced. Infodemic

interventions that incorporate "social inoculation" can come in a variety of forms, such as an online game that teaches players common disinformation techniques, or pre-emptive "inoculation" messages that highlight scientific consensus (Basol et al. 2021; Cook et al. 2017).

2.6 Strengthening Preparedness, Planning, Policy, and Systems

Key terms defined in section: *whole-of-society approach, routinised social listening*.

The terminology and definitions introduced in this chapter demonstrate that infodemic management requires multidisciplinary collaboration and a whole-of-society approach. As infodemic management is an important public health practice that should be considered as essential as other interventions such as vaccination during an epidemic response. Infodemic management plays a significant role during the whole epidemic and pandemic prevention, preparedness response, and recovery cycle. A key part of preparedness strengthening efforts will be to increase the degree of coordination between stakeholders across the whole of society, including, but not limited to, WHO, its Member States, scientific, professional and public health institutions, private sector communication and telecoms companies, state communication bodies, search engines, civil society, academia, frontline health workers, and others, all the way down to the grassroots level of neighbourhood mutual support groups (World Health Organization 2020c). Ideally, a public health system that has a high level of infodemic preparedness conducts routine social listening, intergrated analysis and infodemic insights activities on an ongoing basis, similar to the way in which well-functioning health systems have robust surveillance mechanisms. In such a system, infodemic management insights are regularly discussed with stakeholders who, in turn, are also able to act regularly on recommendations to improve programmes and communication strategies.

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Chapter 3
People's Experience of Information Overload and Its Impact on Infodemic Harms

Theresa M. Senft and Sharon Greenfield

3.1 Introduction

In 2020, WHO approved "infodemic" as an official health topic, defining it as "an overabundance of information – some accurate and some not – that occurs during an epidemic" (WHO 2021, p. x). During an infodemic, we work to protect ourselves and our communities from low-value disinformation, including misinformation, mal-information, and outdated information. However, just as importantly, we also find ourselves faced with the task of managing what can feel like an onslaught of accurate and vetted high-value information.

The popular term for this onslaught of low and high value material is 'information overload', and Bawden and Robinson (2020) provide a useful definition:

> Information overload can best be seen as the situation which arises when an individual's efficiency and effectiveness in using information (whether for their work, studies, citizenship, or life generally) is hampered by the amount of relevant, and potentially useful, information available to them. (p.13).

Hartog (2017) sees information overload as a concept blending two realities that must be considered in parallel: our external encounters with information and our internal responses to it. Sometimes these responses manifest in a cognitive state such as confusion, disorientation, or fatigue. At other times, they appear as an emotion such as frustration, embarrassment, or helplessness. When amplified through the internal states of anxiety or distrust, or when exacerbated by external circumstances such as poverty or trauma, our internal responses to such information

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overload can trigger behaviours, with the potential to jeopardise our own health, and the health of others.

The range of reactions triggered by overload can be significant and at times contradictory. For some of us, it leads to hesitancy, paralysis, and avoidance around decision-making. For others, it encourages defensiveness, denial, and aggression in the face of new health guidance and directives. Overload can also lead to so-called compulsive doom-scrolling on the phone, while, for others, overload triggers the impulse to attend a so-called 'COVID Party' because they *"know they are going to get infected anyway."*

3.2 Public Health Challenge of Information Overload

Over the past 20 years, information overload has attracted the attention of healthcare organisations and researchers. During the period 2000–2018, 31 empirical studies were conducted in the area of health information overload (Khaleel et al. 2020), and a number of researchers have made connections between information overload and doubts about vaccines and vaccination programmes (Betsch and Sachse 2012; Cheung 2021; Nazaroff 2021; Wheeler and Buttenheim 2013). Honora et al. (2022) note that during the COVID-19 pandemic, information overload was linked to a number of resulting behaviours: hygiene care intention (Farooq et al. 2021), unusual purchase activity (Laato et al. 2020a), self-isolation intention (Farooq et al. 2020), and unverified information sharing (Laato et al. 2020a).

The sharp rise in people's social media consumption throughout the COVID-19 pandemic has been identified as a major contributor to the rise of information overload (Global Web Index 2020). While it is common to see communication upticks during emergency events (Laato et al. 2020a; Mertens et al. 2020), early research showed that COVID-19 information shared over social media frequently overwhelms users and has a strong impact on their psychological well-being (Islam et al. 2020).

Wurman (1989) suggested that the continual cry to *"do your own research"* has brought back the concept of information anxiety. He went on to explain that anxiety was based on "the ever-widening gap between what we understand and what we think we should understand. It is the black hole between data and knowledge" (p.34). An extreme form of this anxiety can be seen in a condition known as cyberchondria, defined as an obsessive online search for health-related information (Gaspar et al. 2021). Cyberchondria generally takes the form of a fixation with searching for specific symptoms and tends to have the negative effect of "highlighting those symptoms in the searcher's mind and leading to an escalation of concern about that symptomatology" (Gaspar et al. 2021, p.49). In a recent study on vaccine scepticism (Honora et al. 2022), researchers concluded that cyberchondria had raised fears as to the safety of the COVID-19 vaccine.

Among health workers, information overload also seems to be the new normal. In 2020, 4 months into the pandemic, researchers conducted a PubMed search for

academic publications related to COVID-19 (Valika et al. 2020). They found nearly 8000 articles on COVID-19, while similar searches for SARS and MERS yielded 277 and 58 articles, respectively. Since then, there have been approximately 10,000 new COVID-19-related publications added to public repositories each month (Chen et al. 2021).

The remainder of this chapter considers the benefits and drawbacks of two popular public health approaches to overload: emergency response and risk communication. We advocate broadening approaches in two ways. The first involves adopting a conceptual framework that views information overload as a techno-social phenomenon; the second adds an infodemic management approach to overload and links this to existing emergency response and risk communication measures. We find ourselves in agreement that while managing mis- and disinformation are critical elements of infodemic hygiene, "too much good information … needs more research attention on the way it affects behaviour" (WHO 2021, p.3).

Regarding the public health interventions that point to, monitor, or attempt to intervene in that "good information," we agree with citizen advocacy group All Tech is Human (2022) that, "We need to be talking about, engaging with, and designing technology in a way that is aligned with our needs as humans, not users" (p.7).

3.3 Overload: Emergency and Risk Communications Approaches

Since its inception, WHO has been managing public concerns around information overload throughout a range of epidemics, including smallpox, HIV/AIDS, H1N1, Ebola, Zika, and now COVID-19. WHO's *Public Health Agenda for Infodemic Management* (2021) points out that from a public health perspective, an overload of so-called good information presents a paradox. For researchers working with tools designed to synthesise and curate large amounts of data, "too much information is a far better situation than a lack of information and scientific evidence" (WHO 2021, p.2). For most of the world, however, overload represents a burden rather than a benefit.

Bawden and Robinson (2020) state that "One answer to this paradox may be another; the paradox of choice…" (p.21). If we think of citizens as health advice consumers, it is worth noting studies of online shopping behaviour that show anxiety can increase in line with the number of alternative choices of brand (Li 2017). However, while too many choices during shopping can lead to anxiety, too many choices in an emergency setting can lead to far worse consequences.

3.3.1 Emergency Response Approaches

One of the oldest public health approaches to information overload in the context of health crises might be termed an emergency response (ER) approach. As emergency patient care focuses on interactions that tend to be local, immediate, and person-to-person, overload is often conceptualised in terms of managing time and location issues. A classic example is the question of how a paramedic ought to answer the question, *"How am I doing?"* when asked by a severely injured person in an ambulance versus how to answer the same question when asked by families of patients in intensive care units (Regaira-Martínez and Garcia-Vivar 2021).

It appears that emergency workers during COVID-19 similarly had to opt to manage overload issues through considerations of time and space. A recent example of such an ER strategy is from workers who created a 1-page centralised document, termed a quicksheet, and placed them around their medical facilities, enabling clinicians to access the latest COVID-19 guidelines, policies, and practical information quickly (Poonia and Rajasekaran 2020). A more technologically savvy strategy at a large urban hospital involved placing QR code stickers throughout the Emergency Department so that anyone with a phone could access a single-page website with the most recent and relevant COVID-19 updates (Baugh et al. 2021).

3.3.2 Risk Communication Approaches

The second approach to overload is one we might term the risk communication approach. WHO defines risk communication as the exchange of information, advice, and opinions between experts, community leaders, or officials, and those at risk in order to facilitate understanding and adoption of protective behaviours. Like ER, Risk Communications and Community Engagement (RCCE) acknowledges how overload can result from messages being delivered at the wrong time, in the wrong place, or in the wrong format. Indeed, a hallmark strategy of RCCE is clear delivery of core messages. Here, classic communication guidance prevails (Vraga and Jacobsen 2020). We are advised to keep messages as simple and clear as possible (CDC 2010; Heath and Heath 2007; Maibach 2012), share the most important information first (Holsanova et al. 2006; Pöttker 2003), craft a message to appeal to a target audience (CDC 2010; Heath and Heath 2007), and promote concrete actions (Witte 1994, 1995).

An important feature of RCCE is its emphasis on establishing community trust, especially among those who have been historically marginalised. Low levels of trust and confidence can affect group uptake and adherence to public health advice and interventions. From an RCCE standpoint, overload might occur due to how the message is delivered (for instance, using unfamiliar vocabulary) or because the perceived identity of the messenger is in question (it is hard to understand a message if you have doubts about the messenger). Even if a message is clear, and a messenger

is trusted, overload can still occur due to the style in which a message is delivered, for example being given too quickly or being delivered in what is perceived as a condescending tone.

3.3.3   Existing Limitations

There is near-universal agreement that public health communication during COVID-19 and beyond should be accessible, comprehensible, tailored to its audience, and integrated into a framework of community participation (Montesi 2021). However, there will always be limits as to what can be done using information deficit paradigms: that is the belief that information and education are sufficient to change human behaviour (Luetz et al. 2020). As Montesi (2021) points out,

> years of research in the health sector show that human behaviour tends to be irrational, governed by social norms and driven by motivations that do not necessarily and exclusively derive from access to scientific and authoritative information. (p.3).

To understand why this is the case, Sect. 3.4 now delves deeper into the question of what information actually is and how it works at both an individual and group level. For this, we draw on a range of thinking in the areas of cognitive science, behavioural psychology, communications theory, and digital design. We begin by asking whether information overload is best thought of individually (as a cognitive event or an emotional state), socially (as a problem, with content delivered to specific audiences by specific messengers), environmentally (dependent on the constraints, options, and resources we have at hand in the moment), or all of these.

3.4   Understanding Information Overload

The concept of information overload first became popular in the 1970s, when Toffler (1970) defined it as "the excessive flows and amounts of data or information that can lead to detrimental computational, physical, psychological, and social effects" (p.311). With the rise of social media and virtual collaborations, the concept has made a recent comeback (Roetzel 2019).

While it may feel more practical to think about information overload in terms of poorly placed, timed, or delivered communication in need of correction, this understanding is incomplete. We know from personal observation that individuals can react to the same content, volume, timing, and presentation of messages in wildly different ways, with behavioural responses as varied as their reactions. What is needed is a conceptual understanding of overload that accommodates these differences.

One attempt to do just this is the Stimulus Organism Response (S-O-R) Framework, which conceptualises information overload as looping of sorts, in

which stimuli (messages, messengers, and physical conditions like pain) impact organisms (individuals or groups), that trigger responses (thoughts, emotions, behaviours). As Soroya et al. (2021) note, although S-O-R is used most frequently in studies of consumer behaviour, (Chopdar and Balakrishnan 2020; Gao and Bai 2014; Xu et al. 2014), it has more recently been used to better understand public behaviour during COVID-19 (Laato et al. 2020b; Zheng et al. 2020).

While there is significant value to the S-O-R Framework, it seems to have limitations when faced with the techno-social realities of information circulated via social media. Those familiar with debates about cancel culture understand that we are not just generating, receiving and circulating messages in digital environments. We are also coaxed, encouraged, and manipulated into engagement with technologies expressly designed to amplify emotions on the move, at times morphing what began as an emotional exchange between two individuals in the company of friends into a full-blown internet movement with thousands of participants.

3.4.1   Emotional States

To illustrate this sort of understanding as a techno-social loop, we have created the illustration (Fig. 3.1), displaying an individual with emotional states in the centre. A common understanding of information is that it can make us feel in a particular way. Research has found that negative states created through the emotional loops of overload can have adverse implications for psychological well-being (Jones et al. 2021).
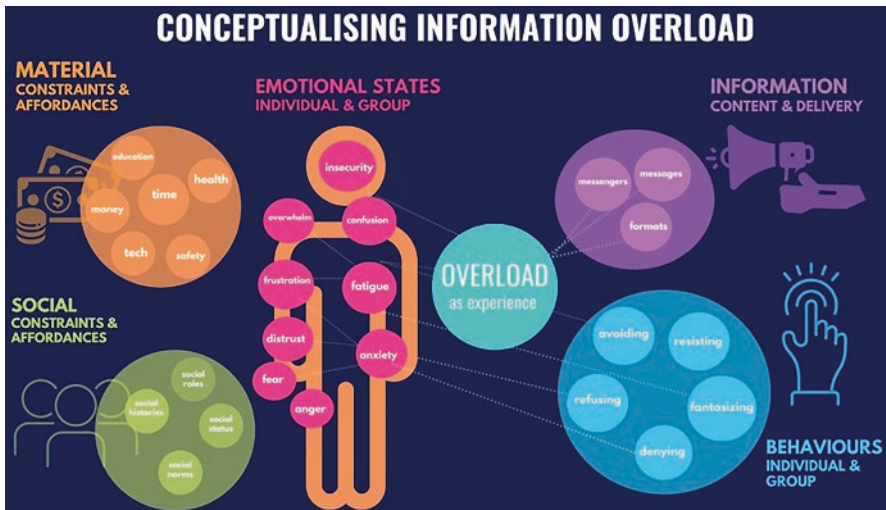

Fig. 3.1 Conceptualising Information Overload. (Source: Image created by Terri Senft; Creative Commons Attribution-ShareAlike 4.0 International License. https://creativecommons.org/licenses/by-sa/4.0/)

However, anyone who has ever had to read instructions on a package while in an emergency situation knows that pre-existing emotional states can, and do, affect how we experience information.

In Fig. 3.1, we highlight some possible pre-existing emotional constraints that might impact how someone receives a piece of information, including insecurity, confusion, fatigue, anxiety, feelings of being overwhelmed, frustration, distrust, fear, and anger. As one example, anxiety levels brought upon by negative sentiment of COVID-19-related social media content can be seen to trigger avoidance, which can then lead to loss of vital important community information (Fu et al. 2020).

Emotions can trigger behaviours in individuals. When related to overload, these behaviours can range widely. However, there is one thing they all have in common: in some way, they all represent attempts to soothe, lessen, or eliminate negative emotions. Our behaviours are also shaped by our environmental constraints and affordances: that is the limits and opportunities in whatever context in which we find ourselves operating. When it comes to information overload, the most significant environmental factors relate to materiality and sociality.

3.4.2 Material Affordances and Constraints

Material constraints and affordances refer to external environmental elements such as financial security, time, health, education, and safety. All of these impact how incoming information can be processed. Examples of an individual with a material constraint include being too unwell or too overworked to process additional incoming information fully. An individual with a material affordance might be someone with access to a teacher or family member who can help translate a health directive into more everyday language for better comprehension. The degree of technological literacy someone has can also be understood as a material constraint or affordance (Allen and Shoard 2005).

Certainly, technology belongs to the world of material affordances and constraints. There is a wealth of research underscoring the impact of the digital divide on information overload among cancer patients (Jiang et al. 2019), as well as literature documenting the cognitive and emotional toll of living among ambient, "always on" devices (Misra and Stokols 2012). Although it could use updating, the Perceived Information Overload Scale remains an interesting intervention in this regard. Adapted from the Cancer Overload Scale, the Perceived Information Overload Scale asks people to respond to questions about their interactions with "cyber-based" sources of stimulation such as computers and mobile phones, as opposed to "place-based" sources of stimulation such as offices or home environments (Misra and Stokols 2012).

3.4.3 Social Affordances and Constraints

Social constraints and affordances refer to things such as our social roles, social histories, social norms, and social status. Being a part of a group that speaks the same language or shares the same faith can create a sense of social normalcy. If an individual has a social role or social status within a culture that formerly limited information, literacy, or perceptions of belonging, information overload can result (Ndumu 2019). Additionally, a growing body of evidence shows that nationalism can be related to distrust of international organisations and law (Herrmann et al. 2009; Von Borzyskowski and Vabulas 2019).

3.4.4 Behavioural Responses

Scientific research has yet to prove a clear causal link between emotions and actions: different people can, and frequently do, act differently while experiencing the same emotions. That said, research has long shown that negative emotions associated with information overload can shift the quality of an individual's decision-making (Speier et al. 1999). Figure 3.1 highlights some common adverse behavioural responses to overload, including avoiding, fantasising, resisting, refusing, and denying the information and the messenger conveying the information. During COVID-19, researchers have linked overload to irrational actions such as panic buying and engaging in bogus precautionary medical measures (Bermes 2021). When linked to information fatigue, overload can lead to information avoidance (Guo et al. 2020), passivity in information searches, and increased distrust of information in general (Ganggi 2020; Lehman and Miller 2020). This, in turn, can create environments ripe for misinformation (Guo et al. 2020).

3.5 Information Overload: an Infodemic Management Approach

In this section, we now sketch the outlines of what might be called an infodemic management approach to overload. As noted from the techno-social perspective, the reach of networked communications is a double-edged sword. On the one hand, messages placed on digital platforms, enhanced by technological mechanisms such as engagement algorithms, newsfeed collation, and trending topic alerts, can be spread quickly to communities, both online and offline. On the other hand, communities find themselves with limited capacity to control the quality, volume, and pace of messages they receive each day on devices and platforms owned by private companies who view them as primarily consumers and not members of the public requiring care. The unnecessary deaths of thousands of Iraqis who ingested

methanol believing it to be a cure for COVID-19 (ABC News 2020) is just one example of what happens when a relatively small number of people experiencing negative emotions such as anxiety engage in socially contagious behaviours, impacting many beyond one's immediate circle.

An infodemic management approach to overload aims to remain constantly vigilant in the face of these realities. Every day a story appears in the news showing how digital communications companies are aware of, struggle with, shift blame or, sometimes, completely deny even the most rudimentary obligation of care to the public they serve. When it comes to public health measures, this digital burden of care is taken up by infodemic management.

Building on precepts from emergency response infodemic management stresses, the importance of responding to issues such as overload with well-timed, data-supported interventions is clear. According to the *Research Agenda for Infodemic Managers*, this includes delivering "the right information at the right time in the right format" so that people are "informed and empowered to adopt behavioural practices during epidemics to protect their health, that of their loved ones and their communities" (WHO 2021, p.IV).

From risk communication, infodemic management takes as axiomatic that communication without trust will fall on deaf ears. In the context of social media, this means heeding warnings from citizen organisations such as All Tech is Human (2022) that efforts to secure public trust cannot stop at the level of local communities. It must extend to every technological interaction with which we find ourselves engaged, including news, shopping, socialising, learning, accessing health services, sharing medical records, and engaging in contact tracing.

The *HX: Aligning Our Tech Future with Our Human Experience* report (All Tech is Human 2022) articulates six main principles to secure this public trust. The first of these, participatory design, is meant to "balance the power between those who create products and the people and communities that consume or utilize the products" (p.13). From an overload perspective, the argument here is that when communities receive training in how to design and deploy media to others, they themselves organically become more discerning and self-regulating media consumers. WHO is shortly releasing a participatory design toolkit focused on infodemic management, piloted by the humanitarian group MercyCorps in Haiti, Puerto Rico, Iraq, and Northern Nigeria (WHO EPI-WIN 2021).

The second principle, prioritising public good over profits, relates to the third, which states content moderation is always a trade-off (All Tech is Human 2022, p.15). Charged with protecting the public from health dangers associated with managing too much information, officials can advocate for government power to use blocking, censoring, filtering, or other limiting measures to better control what can be seen on digital platforms. All Tech is Human (2022) points out the inherent dangers to rights of free speech and individual expression rights that come with such government power but concedes that leaving matters entirely in the hands of corporations is not the answer either. An infodemic approach in this case might work directly with receptive partners on individual platforms, raising concerns and developing projects in tandem with community and engagement teams. An example

dealing specifically with overload is WHO development of the COVID-19 Chatbot on WhatsApp (WHO News Room 2020).

The fourth principle, digital citizenship, "considers the impact of digital technologies on a range of human rights – including children's rights – which include rights of conscience, expression, access, participation, association and protection." For HX, digital citizenship also includes "the digital, media and social literacies of the digital age – as well as the digital divide. (All Tech is Human 2022, p.16).

WHO will soon release a toolkit focused on teaching adolescents to measure and report on teen sentiment around health measures using a method called a rapid online interaction community assessment. This method was recently piloted during the CDC's Teen COVID-19 Vaccine Confidence Assessment in San Mateo California. In a first-ever effort to enlist young people as co-researchers, the CDC worked with teens from the Mid-Peninsula Boys and Girls Club, asking them to gather peer sentiment regarding vaccines both from their offline peers and from online teen exchanges on platforms such as Tik Tok and Instagram. One interesting finding of this study was that for many teens, "*too much information*" had a social dimension, being frequently used as a way to bring up topics normally seen as too personal, deep, or politically polarising in environments where people were generally trying to relax and have fun (Senft 2021).

The fifth principle, tech augmentation, is guided by the question, "What is lost – and what is gained – by digitizing human connection?" (All Tech is Human 2022, p.17) and can be seen in connection with the sixth principle, tech and well-being. Here, well-being is understood as "workplace culture, work/life balance or integration, digital wellness, and mental health. It also includes issues of diversity, equity, and inclusion and other elements of community building" (p.18). An example of a programme designed to encourage public health workers to grapple with these is WHO's Global Infodemic Manager Training, which includes a three-week simulation exercise in which trainees must work in transnational teams (operating in different time zones) over WhatsApp to respond to a series of emergency infodemic-related events occurring in a fictitious location. At the end of the 3 weeks, the team must have developed and then deliver a video pitch of evidence-driven policy recommendations for intervention to a fictional Minister of Health that trainees are instructed has a short attention span (WHO 2021).

3.6   Conclusion

This chapter has considered information overload as a component of infodemics. After detailing the upsurge of information overload during the COVID-19 pandemic, we explored the advantages and limitations of two popular public health approaches to information overload: emergency management and risk communication. While acknowledging the ongoing importance of treating overload via appropriate timing and placement of messages, as well as the critical importance of forging bonds of community trust related to messengers and messaging, we argue

that these tactics alone are inadequate to address the nature of the digital realities of intentional algorithmic amplification of human emotional states online. To address these issues, we call for an infodemic management approach in which information overload is conceptualised as a techno-social dynamic that moves us from personal encounter with messages and messengers into digitally, and otherwise, networked responses that can (at times) tip into dangerously contagious behaviours.

Regarding interventions, we understand why public authorities (health and otherwise) may be tempted to treat information overload through advocating for state-run censorship, filtering, and other content moderation methods. Nonetheless, we advise adoption of a more balanced approach, where a desire to protect the public does not eclipse the human right to individual free speech and expression. For inspiration, we look to the principles of emerging citizen advocacy movements such as Human Experience Design. For many of us who must use digital media to work, study, receive news, or connect with loved ones over a distance, advice to manage information overload by simply logging off feels out of touch with reality. We advocate health interventions over digital platforms and in local environments that centre on public good rather than corporate priorities and that still respect the fact that many people have little choice but to live at least some of their lives online. In this way, we can help communities build resistance to health information overload during the ongoing COVID-19 situation and in the future.

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Chapter 4
The Information Environment and Its Influence on Misinformation Effects

Check for updates

Claire Wardle and AbdelHalim AbdAllah

4.1 Introduction

By early 2019, social media platforms had started to make some tentative changes to their content moderation policies around vaccine-related health misinformation in response to the measles outbreaks in the USA (DiResta and Wardle 2019). However, the COVID-19 pandemic created an unprecedented situation where stronger action was required. As a result, many of the platforms instituted a range of new policy changes designed to mitigate the impact of COVID-19-related misinformation. Although these policy changes have resulted in key anti-vaccine misinformation accounts being de-platformed, as well as egregious falsehoods being labelled or removed, health misinformation remains a problem on all platforms (Krishnan et al. 2021).

Health misinformation is not only a platform issue. The past two years have demonstrated the impact of low-quality research, as well as the spreading of conspiracy theories by political elites, particularly when these are amplified through newspapers, television networks, and radio stations. In parallel, health misinformation continues to proliferate through conversations around the dinner table and at the school gate. In this chapter, we will focus on explaining the complexity of the current information environment and the challenges that have been exposed during the COVID-19 global public health crisis for those working to mitigate the impact of the infodemic.

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4.2   The Information Environment

The information environment is a term used frequently to describe the infodemic but with no clear or agreed definition. There are a number of characteristics within the concept, however, that are critical to an understanding of the current crisis. Firstly, information is transferred through communication, which can be understood through answering five questions: Who? Says what? In which channel? To whom? With what effect? (Lasswell 1948). Certainly, the final question is very difficult to measure (as we discuss below) and, as a result, sweeping generalisations are too often made about the impact of different messages. In order to capture these five questions, Neil Postman (1970) used the metaphor of a media ecology, focusing on understanding the relationship between people and their communications technologies through the study of media structures, content, and impact. More recently, Luciano Floridi (2010) attempted to emphasise the ways in which the information environment constitutes '*all informational processes, services, and entities, thus including informational agents as well as their properties, interactions, and mutual relations*' (p. 9, emphasis in original).

Terminology around the problem of misinformation has also multiplied and two major analogies are frequently used: that of information warfare (Schwartau 1993), using militarised language and metaphors; and that of information pollution (Phillips and Milner 2021). Wardle and Derakhshan (2017) coined the term 'information disorder' as a way of capturing the different characteristics of the current information environment, with an emphasis on types, elements, and phases.

The modern information environment is complex. In 2022, 62.5% of the world's 7.9 billion people are reported to be internet users and 58.4% of the world population are reported to be using social media (We Are Social 2022). Media outlets are increasingly using paywalls for their business models, and artificial intelligence and advertising to grow their audience and attract traffic to their content (Reuters Institute 2022). Audiences are also increasingly using closed messaging apps to consume and share news. In Brazil alone, 38% of the population uses WhatsApp to share news (Kalogeropoulos 2021).

The COVID-19 pandemic struck in this complex information environment and, as a result, created an infodemic (WHO 2020). With the uncertainty that came with the pandemic, alongside the increasing public demand for information, conspiracy theories and misinformation found fertile ground in which to flourish. One data point for the scale of misinformation is the work done by fact-checkers during this period. The Coronavirus Facts Alliance, coordinated by the International Fact Checking Network, produced more than 16,000 fact-checks in over 40 languages, covering more than 86 countries since the onset of the pandemic (Poynter 2022).

The real-world harm of these rumours and falsehoods quickly became clear when claims started to lead to property damage, serious injury, and loss of life. In Iran, misinformation directly led to the death of a number of people who drank toxic methanol thinking it would protect them from COVID-19 (AlJazeera 2020). In Nigeria, the USA, and a number of countries in South America, cases of

chloroquine poisoning were reported, linked to the statement by former US president Donald Trump that had said it could treat COVID-19 (Busari and Adebayo 2020). In the UK, the Republic of Ireland, and the Netherlands, numerous 5G towers were torched because vigilantes believed they were spreading the coronavirus (AP News 2020).

It is important to remember that misinformation has impeded public health responses in the past. For example, in 2003, there was a boycott of the polio vaccine in five northern Nigerian states because it was perceived by some religious leaders to be a plot to sterilise Muslim children (Ghinai et al. 2013). That action led to one of the worst polio outbreaks on the continent and set back wild polio eradication in Africa by nearly two decades. The information environment back then, however, was different from the one we are living in today. The speed that information travels and its real-life impact now is much more acute.

4.3 Challenges Posed by the Modern Information Ecosystem

The networked information ecosystem provides innumerable benefits, most notably giving previously unheard voices a platform and a mechanism to connect (Shirky 2008). However, as has been witnessed over the past few years, this is also leading to a number of serious unintended consequences, particularly in terms of false or misleading information resulting in confusion and dangerous behaviours (Office of the Surgeon General 2021). Over the past few years, it has become increasingly clear that there is no quick-fix.

As we consider the long-term work necessary for understanding and responding to these consequences, we face a number of significant challenges, with three in particular that require consideration within the specific infodemic context: (1) the asynchronous nature of information environments; (2) the difficulties associated with researching these issues due to the complexity of the information environment; and finally (3) the fact that disinformation flows across borders seamlessly, whereas responses are too often organised by nation states.

4.3.1 Asynchronous Nature of Information Environments

The pre-internet design of official communications was top-down, linear, and hierarchical. Limited numbers of news outlets played an inflated role in shaping the way people understood the world. It was designed so that a few trusted messengers – spokespeople, politicians, and news anchors – had the authority to disseminate messages to audiences. While communication theorists in the 1970s (Morley 1974) and 1980s (Hall 1980; Hartley 1987; Katz 1980) challenged the idea that this was a purely passive relationship, emphasising that audiences were active and able to read texts in an oppositional way, the restricted number of outlets, channels, and spaces

where people could access information significantly limited the amount of information conveyed and, in almost all cases, guaranteed that only accurate information was being shared.

The advent of the internet transformed this status quo, allowing audiences to become active participants in the creation and dissemination of information. Critically, however, those in official positions today still rely heavily on the traditional model of communication, thinking of the internet as a way to distribute messages more quickly, and to more people, rather than as an opportunity to truly take advantage of the participatory nature of the technology. So, while a news outlet or health authority will use Facebook, Twitter, or Instagram to reach audiences, its use is too often restricted to us simply a 'broadcast' mechanism (Dotto et al. 2020).

In contrast, disinformation actors fundamentally understand the mechanics of the internet and the characteristics that make people feel part of something (Starbird et al. 2021). The most effective disinformation actors have understood that community is at the heart of effective communications. Therefore, they have spent time cultivating communities, often by infiltrating existing ones (Dodson et al. 2021), and creating content designed to appeal to people's emotions (Freelon and Lokot 2020). They also provide opportunities for people to manifest their identification within that community by creating authentic content and messaging. Through that process, they become trusted messengers to recruit and build up the community further. The result is engaging, authentic, dynamic communication spaces, where people feel heard and experience a sense of agency.

Comparing official information environments with communities where disinformation flourishes provides a stark contrast. Official environments are ostensibly more traditional in the sense of being built on facts, science and reason, and rely heavily on text. They are also often structured top-down and rely on people continuing to trust official messengers. The other is built on community, emotion, anecdotes and personal stories, and tends to be far more visual and aural. The characteristics of these spaces align perfectly with the ways in which communities connect offline. They also align closely with the design of social platforms where algorithms privilege emotion and engagement (Schreiner et al. 2021).

Perhaps what is most critical to recognise here is that disinformation actors continue to find vulnerabilities in the traditional information environment. They are also aware that there is less understanding of the dynamics of a networked environment by official messengers who, unfortunately, still prepare as if it was 1992 rather than 2022. For example, disinformation actors will search for statistics or headlines that can be shared without context to tell a worrying or dangerous story, knowing that while it is accurate within the full context, when there is only a visual or headline (which is often all that is shown on social platforms), it will be the misleading content that takes hold (Yin et al. 2018).

Disinformation actors instigate dialogues in order to create opportunities to advance their opinions; for example, they pose a simple question on Facebook, such as asking whether people are concerned about vaccines impacting their fertility, and then utilise the comments by pushing bogus or misleading research that can lead people to reach false conclusions (DiResta 2021). Alternatively, disinformation

actors can target journalists by pretending to be trusted sources but push false anecdotes or content in the hope that it will be covered by an outlet with a larger audience than that which they personally have access to (McFarland and Somerville 2020).

4.3.2   Difficulties of Researching the Information Environment

As already stated in Sect. 4.2, the information environment today is incredibly complex. Those studying media effects have continued to struggle with the challenges of measuring audience consumption of different media products (Allen 1981). While there have been ways of measuring television and radio exposure, understanding levels of engagement has always been problematic. For example, if someone has the television news on in the background all day, does it have the same impact as someone sitting down to watch their favourite hour-long soap opera in the evening? More challenging, of course, is an understanding of the intersection between traditional media content and offline conversations with peers. Back in the 1950s, Paul Lazarsfeld and Elihu Katz (Lazarsfeld et al. 1944; Katz and Lazarsfeld 1955) described a two-step flow theory, which incorporated the concept that ideas were rarely transmitted directly to audiences and, instead, people were persuaded when those same ideas were passed through opinion leaders.

The problems emphasised by communication scholars for decades are now complicated further by the intersection between off-line communications and professional broadcast media with online spaces, whether they are websites accessed via search engines, posts on social networks or closed groups on Facebook, or messaging apps such as WhatsApp, Telegram, or WeChat (de Vreese and Neijens 2016).

Globally, people are spending, on average, 170 min online every day, with an additional 145 min on social media (Statista 2021). For the majority, this time is being spent on smartphones rather than desktops. In addition, everyone's daily diet of online activity and consumption is different. No two people's search histories, newsfeeds, or chat history look the same. As such, there is no effective method for collecting an accurate picture of what people are consuming, and from where, without which makes measuring the direct impact of messages a seemingly impossible task.

Researchers are doing their best to unpick these dynamics, but they face serious challenges. It is incredibly difficult to access data from social media platforms. The one exception is Twitter, where the platform either releases particular datasets or researchers are able to access the 'firehose' of tweets relatively easily (Tornes 2021). As a result, the vast majority of research on misinformation focuses on Twitter. While better than nothing, Twitter is, however, not the most popular platform and is rarely used in many countries (Mejova et al. 2015).

While it is possible to conduct some research with Facebook and Instagram data, it is limited by what is available via Crowdtangle, a tool owned by Facebook. However, this has been documented to have a number of limitations by researchers and journalists attempting to use it to undertake research. YouTube research is also

possible, but again not easy. Those who have studied the platform have focused more on the impact of the algorithm on search results.

In many parts of the world, the most popular digital platform is WhatsApp (Statista 2022). However, the encrypted nature of the platform means research is seriously limited and reliant on tiplines or joining groups, both of which have significant limitations in terms of sampling. More importantly, the absence of engagement data means it is impossible to see how many people have viewed a particular post.

Much work has been done in terms of attempting to pressure platforms into sharing data (EDMO 2022). Certainly, there are very significant issues around privacy that have to be addressed. The ability to identify someone via the information they search for or consume is disturbingly easy. As such, platforms have pushed back on ethical grounds with regards to sharing data without the required protections in place. Social Science One,[1] a project in partnership with Facebook, is one example of a comprehensive and sophisticated attempt at providing necessary protections. However, although the data was shared after a complex de-identification platform was built, problems with the data were revealed in 2021 that undermined the whole exercise (Timberg 2021).

There have also been interesting attempts at citizen science approaches to studying the platforms. For example, ProPublica and The Markup, two US-based non-profit newsrooms, built browser extensions, the 'Political Ad Collector' (Merrill 2018) and the Citizen Browser (The Markup 2020), respectively. These browser plugins require user agreement to share the results of the content that appears on platforms via their browsers. It is a potentially promising avenue, but building an acceptance of 'donating your data' to science seems to be a long way off.

4.3.3   Cross-Border Disinformation Flows

The networked information environment is borderless. While languages work as something of a preventative measure, diaspora communities encourage the flow of information across borders (Longoria et al. 2021). In a world of visuals, memes, diagrams, and videos (with automated translated closed captions), a rumour can travel from Sao Paulo to Istanbul to Manila in seconds. For example, researchers have been able to track the transnational flow of rumours between Francophone countries (Smith et al. 2020). Genuine information can also travel but without context, or with mistakes in translation, it can turn into a rumour or piece of misleading information just as fast.

Disinformation actors use this situation to their advantage. The anti-vaccine movement, in particular, has been seen to build momentum in one place before taking advantage of personal connections in other countries via closed groups and

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[1] https://socialscience.one/

large accounts. For example, research by First Draft analysed the ways in which anti-vaccine disinformation narratives flowed from the USA to western African countries (Dotto and Cubbon 2021). That such a process was taking place also became clear during the measles outbreak in Samoa in spring 2019. US-based anti-vaccine activists were infiltrating Facebook groups in the island nation to push rumours and falsehoods about the efficacy of vaccines against the disease. This activity was judged to have directly impacted subsequent vaccine uptake (BBC News 2019).

Over the past two years, there has been significant evidence of anti-mask and anti-vaccine activists based in the USA pushing narratives in western Europe and Australia. The conspiracy theory QAnon, which started as a specifically US phenomenon, has also been transported to many locations around the world, with different countries and cultures focusing on the parts of the conspiracy that resonate most strongly. Unfortunately, while disinformation flows across borders, this is much less common in terms of accurate information. Anti-disinformation initiatives such as fact-checking groups or media literacy programs, government regulation, and even funding mechanisms are almost entirely organised around nation-states.

Finally, while platform content moderation is starting to catch problematic content in English, we are aware that it falls short in other languages and cultures (Horwitz 2021; Wong 2021). Other than those headquartered in China, all social media platforms are based in Silicon Valley in the USA. As such, most of the research is being undertaken in the USA, and many of the initiatives are US based and funded by US philanthropists. This disproportionate response around one language, and one country, means the complexity of this truly global, networked problem is being overlooked and misunderstood.

4.4   Conclusion

We need to build an information environment where those relying on disseminating accurate messaging recognise the need to understand the networked dynamic attributes of today's communication infrastructure. There needs to be new ways of making communication peer-to-peer, engaging, participatory, and where people feel they are being heard and have a part to play. Content needs to be much more visual, engaging and authentic to different communities, rather than designed top-down for mass broadcast and dissemination.

All those working in the information environment, from journalists, to health authority spokespeople, to healthcare practitioners, need to be trained in the mechanics of the modern communication environment so they are prepared for all the mechanisms that are being utilised.

While social media platforms should continue to be pressured to build systems for independent research that protects the privacy of users, there also needs to be more creative mechanisms for building research questions with impacted communities so that consent can be built in from the very beginning. Bringing people into the

research process not only allows for more innovative research to take place, but asking people to be involved in the collection and sharing of their data will play an important role in terms of educating people about the ways in which algorithms impact what they see. This should also help kick-start a conversation about the type of information people are seeing on their social media feeds, what they think is appropriate, and what is not.

Disinformation actors generally think globally, either from the start of their campaigns, or by taking advantage once they see that disinformation has taken off and crossed borders. Platforms, too, are globally focused, potentially avoiding individual jurisdictions. Yet our responses to disinformation are too often at the national level and have a disproportionate focus on the USA. The response needs to be as global as the problem.

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Chapter 5
Fighting the Fallacies: The 'Infodemic' and the European Commission

Marcos Barclay, Istvan Perger, and Matteo Salvai

5.1 Introduction

This chapter offers a short reflection on the experience of fighting COVID-19 mis- and disinformation from the perspective of a strategic communications team at the European Commission (henceforth referred to as the Commission). The authors speak in a personal capacity and do not represent an official position of the Commission. The period explored runs from the start of the pandemic until the time of writing in February 2022. The authors work in the Directorate-General for Communication in a unit dedicated to strategic communication, communication governance, and disinformation response. This chapter cannot fully represent the depth and breadth of operations and experience throughout the Commission and the European institutions during this period.[1]

For the EU, vaccine-related mis- and disinformation struck at the core of its fast developing role in pandemic management, thereby hitting what was arguably an

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[1] For instance our work is limited to coordinating the internal communications response to mis- and disinformation within the EU, while EEAS focuses on foreign information manipulation and interference. DG CNECT centres its attention on working with the private sector, and developing updated rules for the online world. Council working parties such as the Horizontal Working Party on Enhancing Resilience and Countering Hybrid Threats and Working Party on Information discuss issues at Member state level.

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institutional soft spot in the space between regulation and fighting external information manipulation and interference. In this complex institutional landscape, our work led us to take an internal coordination function, knitting together different aspects of the EU's communication work on COVID-19 disinformation.[2]

Our aim is to offer an (albeit subjective) account of how these different activities came together and interacted during this period to react to this challenge. Its value, we hope, will be in providing a record for future colleagues and practitioners on the institutional, political, policy, and communication challenges for responding to an 'infodemic' in an organisation such as the EU.[3] The intensity of the crisis so far has already led to several lessons being learnt and important innovations introduced, which we wish to preserve with a view to building resilience and ensuring preparedness for future crises. For a more general readership, we offer a compressed summary of the EU's many strands of work in this field.

5.2   Three Pillars of the EU's Disinformation Fighting Operation

Before delving into our experience of the infodemic, it is necessary to give some background on our work and how it fits into the bigger picture of the EU's operation to tackle disinformation. Since 2015, the EU's work has evolved organically across broadly three pillars. The pioneer in the field was the European External Action Service (EEAS) and its Strategic Communications Division, with its initial mandate to address Russia's ongoing disinformation campaigns (European Council 2015, p. 5). From this, it has continued to build and expand its work to tackle foreign information manipulation and interference (EEAS 2021a). Under the guidance of the Directorate-General for Communications Networks, Content and Technology (DG CNECT), a second pillar covers work with the private sector. Online platforms including Facebook, Google, Twitter, Microsoft, and TikTok are encouraged to play their part in preventing the spread of mis- and disinformation through commitments made under the self-regulatory 'Code of Practice on Disinformation'.

To complement these efforts, the Commission's communication teams have been analysing, reacting, and de-bunking EU-related mis- and disinformation for many years. These initiatives have been, perhaps, less visible for being decentralised and tailored to local contexts and policy areas. In the context of the pandemic, the urgency of the situation raised important questions about how to address new challenges properly. Through the Commission's 'internal Network against Disinformation', these decentralised capacities were therefore brought closer together in an attempt to meet the scale of the threat.

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[2] Any subsequent uses of 'we' or 'us' are to be understood as referring to the team working on disinformation communication coordination in the Directorate-General for Communication's (DG COMM) sector for 'governance, strategic coordination, and disinformation response'.

[3] Our interpretation of this term will be detailed in Sect. 5.3.

    The authors of this chapter worked on the coordination of this Network during the pandemic. In this chapter, we explain how we approached the questions raised by the infodemic and how we responded through the Network. The questions are still very much open, but we hope our experience might advance the conversation further about how institutions can consolidate their communication capacities in order to meet such a threat.

    It is important to stress that our perspective is just from one 'pillar' of the EU's operation, centred on communication through the 'Network against Disinformation'. The work of our colleagues in EEAS, DG CNECT, DG SANTE,[4] and other teams was also significant, and they will have their own equally important experiences to relate. We give due reference to their work while focussing on internal coordination, which we are most qualified to write about.

5.3 Evolution of the Infodemic

Our infodemic experience can be divided roughly into two halves: before and after the vaccine approvals and rollout. For us, the first half of the infodemic ran from March 2020 to December 2020 and the second 'vaccine half' ran from December 2020 to the time of writing.[5] Though by no means easy, the first half of the info-demic presented more conventional problems regarding transmitting factual infor-mation publically, while the second half introduced more complex dynamics.

5.3.1 Narratives Before Vaccine Rollout

Below is a summary of some of the main narratives we encountered before the authorisation of safe and effective COVID-19 vaccines, as well as during the initial rollout across EU countries:

- *Conspiracy Narratives*
    The pandemic is an evil plan by a secret group of individuals for some malign end. Frequent culprits cited included the World Economic Forum, Bill Gates, 'big pharma', China, secret societies, and, sometimes, even the EU. The most dangerous varieties involved some sort of denialism about the virus and its dangers by dismiss-ing it as a hoax.

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[4] Directorate-General for Health and Food Safety.

[5] February 2022.

- *Breakdown of EU Solidarity*

  After initial accusations of a lack of solidarity among Member States, false stories continued to circulate about the hoarding of supplies (masks, personal protective equipment) at the expense of some Member States.

- *False Remedies*

  A number of miracle cures spread quickly, such as drinking hand soap to kill COVID-19 and other false advice. These threatened to give people a false sense of security. Even worse, examples led to fraud and scams involving fake therapies, as well as physical harm or death.

- Vaccine Critical/Refusal/Denialism Content

  Even before the vaccine rollout, scare stories circulated on the potential harm of a future vaccine, including death, cancer, infertility, a change in DNA, and a host of other already well-documented false claims.

- *Blaming the Pandemic*

  Connected to conspiracy narratives, some of these blamed the pandemic on certain groups such as migrants (Butcher and Neidhardt 2020). Some of these narratives led to hate speech.

Initial Response

Responses to the narratives outlined in the first half of the infodemic called on more conventional methods. While conditions were arguably at their most dangerous given the state of fear and confusion among the general population, the problem to be addressed concerned the difficulty in ascertaining the accuracy of information given the large quantities that were circulating. In a sense, this was a more straightforward problem to deal with than that which we saw later during the vaccine stage, even if there were still many unknowns. Conventional methods of proactive communication, amplifying reliable content, and de-bunking were adequate for reinforcing essential information and dispelling prevalent myths:

- *Proactive Communication*

  The Commission's social media accounts in the Brussels headquarters or via Commission representations in the Member States, relevant Directorate-General (DGs),[6] as well as EEAS accounts publicised a wealth of material communicating information on non-pharmaceutical health measures such as hand washing and physical distancing, while reassuring citizens through stories about recovery measures being taken by the EU. Community managers were aided with extensive Q&A repositories that were regularly updated and reviewed for accuracy as information changed. Social media assets were also shared widely among teams in headquarters and among representations to aid proactive communication as much as possible. This included photos, videos, and graphics. Personal messages by experts and

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[6] Directorates-General (DGs) are the Commission's departments in charge of a certain policy field.

health professionals, as well as prominent figures such as President Ursula von der Leyen reinforced the tone. By October 2020, proactive communication on the importance of vaccination had already begun. A landmark corporate campaign on the NextGeneration EU recovery plan also ran in parallel, which contributed to the overall positive tone in the Commission's communication efforts in this period.

- *Debunking*

While the overall balance of communication output was more strongly in favour of proactive communication in this initial period, some direct de-bunking was necessary in the most egregious cases of mis- and disinformation. Our team set up a dedicated page on the EU's Europa webpage (European Commission n.d.-a) listing a number of the most prevalent claims with short de-bunks and counter-narratives. The structure of these de-bunks followed the de-bunking method recommended by Stephen Lewandowski in the *De-bunking handbook* (Lewandowsky et al. 2020). This page was translated in all 24 EU languages, providing a central resource accessible to citizens across the Union. The page was promoted on social media and served as a reference point for de-bunking by Commission community managers.

- *Resilience Building*

Resources were provided for key stakeholders to help them in their own fight against mis- and disinformation. DG SANTE produced a social media toolkit for healthcare professionals (European Commission 2020a). The toolkit provides handy tips on how to successfully navigate social media for healthcare professionals when combatting vaccine mis- and disinformation. Our team published a toolkit for teachers called *Spot and fight disinformation* (European Union n.d.) to help secondary school teachers introduce pupils to disinformation topics and build up their resilience against it.

5.3.2   Narratives After Vaccine Roll Out

December 2020 marked a turning point in our pandemic experience that coincided with the approval of vaccines in Europe and the announcement of the first deliveries. Unlike the mis- and disinformation narratives in the first half of the infodemic, the issue of vaccines was much more complex and required deeper thinking as to how respond.

Vaccine mis- and disinformation is not new, and certainly not exclusively a phenomenon of this pandemic. The Commission has been monitoring vaccine confidence for a number of years to inform vaccination rollout, address waning confidence, and mitigate the damaging effects on vaccination uptake (de Figueiredo et al. 2020). Part of the reason for the particularly challenging COVID-19 vaccine rollout is that vaccine mis- and disinformation touches on vitally important issues for the EU in its new role in pandemic management such as vaccine procurement and approval. This topic, therefore, posed a particularly pertinent problem from an EU communications perspective.

A further and more general reason is that while vaccines represent a single issue, they concentrate a number of other social and political issues touching on both national and international concerns. For example, fears about how much to trust governments and big companies. While these issues were certainly present before the vaccine rollout, the issue of vaccines and their urgency seemed to condense these previously diffused issues into one very tangible problem. Consequently, narratives surrounding vaccines took on a much more charged tone. Vaccines were like a proxy for citizens' mixed feelings towards authorities and their ability to lead them through the crisis, encompassing their suspicions, expectations, and hopes. One could say that the decision to take the vaccine was to some extent like casting a vote in an unofficial referendum on whether you trusted your government, leaders, and institutions. Again, given the EU's role in pandemic crisis management, this also presented an important challenge. The initial delay and difference in timings in the vaccine rollout between countries added to the pressure. By way of illustration, below are some of the main themes we encountered in this 'second half':

- *Vaccine Critical Content*[7]
  Several varieties of these narratives exist:

  (i) *Vaccines as experimental* – Many users were suspicious of the quick turn-around of vaccines and potential dangers from new mRNA technology. Some believed this would change DNA (see also 'conspiracy narratives'). The speed with which COVID-19 vaccines were developed also created suspicion.
  (ii) *Vaccine side effects* – In addition to themes covered above, claims about different dangers came and went with the news cycle. AstraZeneca was painted as unsafe for a variety of different demographics. Heart issues, particularly myocarditis in young men, became a particular focus. Exaggerated accounts about the prevalence of blood clots were also widespread. Stories about vaccines as dangerous for adolescents and children proliferated as approval came in for these demographics.
  (iii) *Vaccines do not work/are useless* – Connected to the vaccines as experimental narratives but also including narratives connected to COVID-19 denialism, these narratives suggest that vaccines were not necessary.
  (iv) *Vaccines cause death* – In a similar vein, but even more extreme, with claims about vaccines leading to death through a range of maladies such as cancer or COVID-19 itself.
  (v) *Falsified/concealed data* – As vaccines rolled out across the world, different data sets by different health authorities came out. The differences, and the difficulty of interpretation, created an opening for manipulation of the data to claim that the vaccines were not working, or were even causing harm. In more extreme cases, certain sources claimed that the data was being totally made up by authorities.

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[7] It is important to note that legitimate concerns were sometimes mixed up in this otherwise misleading content.

- *Conspiracy Narratives*

As described in the conspiracy narratives section for the first half, but with a focus on vaccines. Conspiracy ideologists claimed that vaccines were a conduit for secret plans involving microchips, 5G, mind control, big pharma, and other far-fetched ideas. Speculation about the interpretation of data also featured heavily.

- *Encroaching Totalitarianism*

In close connection to conspiracy narratives, many sources made claims that COVID-19 and health measures such as vaccines were a pretext for encroaching government control and intervention by big tech and big pharma. Some of these narratives were linked with the widespread anti-lockdown protests seen at the end of 2021 and the beginning of 2022. The most extreme versions denied the reality of COVID-19 or combined with other anti-vax narratives. Again, data was used in questionable ways in support of these narratives.

While these were among the main themes we encountered, it is worth noting that these narratives are often intermeshed and interlinked. Different elements from each reinforce aspects of others. Even if different narratives can contradict each other, the 'interoperability' of these elements seems to create a self-reinforcing bubble for those who consume this content. The fluid nature of this content allowed sources to harness events in the news cycle and find angles to criticise vaccines, such as celebrities falling ill. A strong conspiratorial tone is often the glue that holds together all these elements.

5.4   The Infodemic for the EU

To understand how we approached these issues, we need to first explain the conceptual background for what we understand as disinformation and the infodemic in the context of the EU's competencies and the political mandate under which we were operating. WHO's concept of an infodemic was included by the Commission in the June 2020 Joint Communication with EEAS on COVID-19 disinformation (European Commission 2020b). In this document, the WHO definition features as a reference point.

WHO defines an infodemic as the phenomenon of

> too much information including false or misleading information in digital and physical environments during a disease outbreak. It causes confusion and risk-taking behaviours that can harm health. It also leads to mistrust in health authorities and undermines the public health response. (WHO 2021)

If we break this down into its constituent elements, we can begin to see how the infodemic touched upon the EU's work and its competencies.

5.4.1   Where

In terms of geographic scope, for us (DG COMM)[8] 'the information environment' encompasses the EU's information environment, meaning the physical but primarily online information sphere in EU Member States.

5.4.2   What

Next, we need to understand the Commission's framework for what counts as false or misleading information (European Commission 2018a, p. 2). The joint EEAS and Commission 2018 *Action Plan against Disinformation* is a key document European Commission (2018b). While 'false' and 'misleading' are terms that appear in our official documents, they feature as part of comprehensive definitions of mis- and disinformation. By disinformation, we understand verifiably false or misleading information that is created, presented, and disseminated for economic gain or to intentionally deceive the public, and that may cause public harm.

Misinformation is also false or harmful but can be shared or produced in good faith. This covers aspects of what we understand as 'false', but with greater emphasis placed on harm and intention. This also hints at what we understand by the more complex idea of 'misleading'. Until recently, our notions of what is 'misleading' have been understood primarily in epistemic terms and only secondarily in terms of behaviour. In the *European Democracy Action Plan* (EDAP), the official scope has been expanded, rebalancing existing definitions with greater acknowledgment of the importance of behaviour (European Commission n.d.-b).

Two further categories capture the ways in which disinformation can be connected to activities that cause harm to the information environment without prejudice to their veracity. An 'information influence operation' describes coordinated efforts by actors that use 'deceptive means' (as opposed to only deceptive content) to influence a target audience. These actors can either be foreign or domestic. A second category of 'foreign interference in the information space' refers to 'coercive and deceptive efforts to disrupt the free formation and expression of individuals' political will by a foreign state actor or its agents'. The emphasis for the latter category is on external manipulation of the information environment and interference in the way societies conduct their public discourse. Both these additional categories are more agnostic to epistemic questions. Instead, they capture a focus on behaviour rather than on content and the various tactics, techniques and procedures

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[8] For other bodies such as EEAS, there may be a different sphere of concern, for example material originating from outside the EU.

(TTPs) that can be used to manipulate the information environment and to damage it for malign purposes.[9]

5.4.3   Why

Under the above framework, it is clear in what ways content, which could count as mis- or disinformation, presents a threat to supporting EU Member States in keeping citizens safe, as well as ensuring good governance in the midst of the EU's fast developing role in pandemic management. As per the WHO's infodemic definition, the EU had a stake in tackling information that 'undermines the public health response'. Two political developments are worth highlighting in this respect: first, the EU was central in facilitating the joint procurement of vaccines; second, the EU's role in assisting recovery efforts.

Most notable is the NextGeneration EU package. This initiative took the step of financing EU funding by issuing common debt whose proceeds could be disbursed as grants or favourable loans to Member States. The EU was also at the heart of European level crisis management such as coordinated action on external, and in some cases even internal, borders, vaccine certificates and ensuring supplies of equipment. Underlying these innovations, a changed political climate saw a more general expectation from citizens that the EU step up and play its part in the health crisis, whatever its formal competencies.

The potential impact of the infodemic on these functions was made explicit in March 2020 when the European Council recognised the need to "resolutely counter disinformation with transparent, timely and fact-based communication on what we are doing and, thus, reinforce the resilience of our societies" (Joint Statement of the Members of the European Council 2020). Fighting disinformation was then included in the European Court of Auditors initial review of the EU's contribution to the public health response to COVID-19 (European Court of Auditors 2021a, p. 45). In the June 2020 *Communication* on COVID-19 disinformation, this commitment was reinforced through resolutions to step up coordination and collaboration between European institutions and Member States on disinformation. In the December 2021 *Council Conclusions*, this commitment was reiterated with special reference to combatting vaccine hesitancy due to disinformation (European Council 2021, p. 1).

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[9] Following the tasking of the EDAP, the European External Action Service, in close cooperation with the European Commission, EU Member States, and international partners, is discussing an updated conceptual definition of 'foreign information manipulation and interference' to even better capture the full range of behavioural aspects.

5.5   Response to Vaccine Mis- and Disinformation

As we have shown, the false and misleading narratives in the 'second half' of the pandemic concerning vaccines were among the most relevant for the EU in its fast developing pandemic management function. This challenge, however, presented a new and deeper set of disinformation problems and questions for our strategic communications work. We can describe this shift in quantitative and qualitative terms. Quantitatively, the sheer volume of material exceeded that which had been seen on any one issue previously. It was simply too much for any one team to take on. Qualitatively, the nature of the content touched upon issues not only of urgent importance for health security, but also, uniquely, for safeguarding trust in the EU given its expanding and critical role.

To understand how these questions presented themselves to us, we have to look deeper into the resources the EU already had.

5.5.1   European External Action Service

In the March 2015 *European Council Conclusions*, heads of state and government called for the creation of a new strategic communication capability in the European External Action Service (EEAS), "to challenge Russia's ongoing disinformation campaigns" (European Council 2015, p. 4). This development was important for explicitly granting one of the European institutions a mandate to address disinformation from foreign actors. In December 2018, the EEAS and the Commission published the aforementioned *Action Plan against Disinformation* (European Commission 2018b). As a joint document, it formally strengthened cooperation and information exchange between the two institutions and with Member States and envisaged closer integration of the EEAS's work with that of Member States through the establishment of a Rapid Alert System (RAS). The RAS allows EU institutions and all EU Member States to share information and analysis on a daily basis, as well as instantly alert each other in case of foreign information manipulation and interference, including disinformation. Information sharing also involves material for response purposes, including on proactive communication, as well as discussions on the EU's overall framework to tackle the threat.

The development of the EEAS's Strategic Communication (Stratcom) Division (EEAS 2021a) and success in leading the EU's efforts to tackle foreign information manipulation and interference, including disinformation, meant that it was well prepared to face external threats represented by the infodemic. For example, EEAS was able to provide special reports on information manipulation from external sources related (EU vs. DISINFO 2021) to the pandemic, as well as handling conspiracy narratives (EEAS 2021b). Its EUvsDisinfo project, in particular, was crucial in raising awareness of foreign actors trying to exploit the pandemic for their own gain (EU vs DISINFO n.d.). These measures were important for putting on public record the role of foreign actors in manipulating the information environment during the

pandemic and the potential impact of such activity. In addition to this, the cooperation within the RAS between Member States and EU institutions allowed for the exchange of information on threats and sharing of best response practices.

5.5.2 Working with the Private Sector – DG CNECT

In parallel to the development of a strategic communications capability to tackle foreign information manipulation and interference, including disinformation in the EEAS, the EU has enhanced the options and tools available to collaborate with online platforms and the advertising sector to fight online disinformation.

In 2018, the DG CNECT facilitated a process under which major researchers and stakeholders in the field of disinformation elaborated and devised an effective instrument to counter online disinformation by proposing a *Code of Practice on Disinformation*. The first worldwide example, the *Code*, is a self-regulatory instrument whereby signatories such as Facebook, Twitter, Google, Microsoft, and TikTok have made commitments to reduce the distribution of disinformation online.

Two years on, under the auspices of EDAP, the Commission has proposed detailed guidance to address the shortcomings of the original *Code of Practice*, to strengthen it, and make it an even more effective instrument to fight disinformation. In particular, the revised *Code* will include broadened participation, and aims to become a co-regulatory instrument within the upcoming update of the online rules foreseen within the Digital Services Act (DSA) (European Commission 2021). This would give the Commission enforcement powers with regards to the very large online platforms. At the time of writing, the *Code's* stakeholders are busy preparing a strengthened version, which will be presented in Spring 2022.

Thanks to this sustained cooperation with the platforms, DG CNECT was able to work with the *Code of Practice's* signatories to participate in a COVID-19-disinformation-reporting programme. As part of this programme, the signatories reported on actions taken to combat COVID-19 mis- and disinformation on their platforms, in particular by promoting authoritative content and updating policies in order to reduce the distribution of disinformation (European Commission n.d.-c).

5.5.3 Network Against Disinformation

The Commission's communication apparatus is divided between teams based in different services with mandates for a particular policy area, and a central operation in the Directorate-General for Communication (DG COMM). DG COMM is in charge of the overall coordination and governance of the Commission's communication actions with citizens (as the 'domain leader' service), as well as for liaising with the Commission Representation Office in each of the Member States. It also contains the Commission's spokesperson service (SPP).

These various arms of the Commission's communication infrastructure work in a decentralised manner, with different teams taking on initiatives to combat EU-related information manipulation and interference, including disinformation in their area of policy competence. The April 2018 *Communication* on disinformation recognised that in parallel to EEAS's strengthened mandate, and in light of the new *Code*, the Commission needed to "strengthen its strategic communication capability by first reinforcing the internal coordination of its communication activities aiming at tackling disinformation" (European Commission 2018c). Accordingly, an internal *Network against Disinformation* (referred to from now on as 'the Network') was mentioned in the subsequent December 2018 *Action Plan* as a bridge between the EEAS's strategic communication work and the communication apparatus of the Commission (European Commission 2018a). Hosted by a small team in DG COMM's strategy and corporate campaigns unit, the Network was set up with a view to the 2019 European elections, bringing together the institutions' communication services and ensuring the regular flow of information on threats and the exchange of best practices. In addition to representatives from each Commission Directorate-General and Commission representation, the EEAS, the European Parliament, the Economic and Social Committee, and Committee of the Regions all participate in the Network. External speakers also feature regularly, including experts from EU agencies, academia, and think tanks such as the Oxford Internet Institute and the European Policy Centre, as well as colleagues from other institutions, including the UN, and from the private sector, such as YouTube.

5.6   Questions Posed by the Infodemic

Given this institutional context, the first and most obvious question raised by the infodemic was how to fill the space in between tackling foreign information manipulation and interference (EEAS) and the regulation of the platforms (CNECT). In this space, we find mis- and disinformation originating and circulating within Europe on COVID-19. While in normal times this space might be filled by a decentralised set of teams working in their particular area, the sheer scale and seriousness of the infodemic required a more coordinated and comprehensive approach with policy experts at its core.

The severity of the threat for the EU is doubly important if we recall that vaccines hit at the heart of the EU's fast developing role in pandemic management. This, therefore, raised the question of how to leverage a decentralised network of actors to understand and address a challenge that exceeds the capacities of any one element in the network. A second and related challenge is making sure everyone is on the same page. Given that the issue affects multiple areas of competence, how do you ensure everyone shares the same understanding of the threat? Once you have consensus, how do you ensure that the right people respond quickly, and in a way that is coherent and consistent with everything else going on? Third, how do you

make sure all the actors who are involved in the response are trained and prepared to take action as necessary when the time comes?

These are just some of the questions raised by an infodemic level event. While the parameters are particularly relevant in our institutional context, other large organisations with similarly diffused capabilities have faced, or will face, similar coordination challenges from an interdisciplinary challenge such as the infodemic. In Sect. 5.7, we detail our solutions and lessons learned.

5.7   A New Mandate for the Network

To realise the objective of a more coordinated approach, it was decided that the Network against Disinformation should be upgraded with a mandate to maximise the combined power of the participating communications teams. The intention was to leverage the collective resources of these teams in order to mount a response equal to the challenge. A review from the European Court of Auditors that coincided with this period also emphasised the need for clearer and more accountable coordination structures for tackling disinformation (European Court of Auditors 2021b).

Following consultation with members of the Network, a mandate was drafted to enable this upgraded collaboration. Under the new arrangement, the Network is able to convene working subgroups that gather expertise on specific thematic areas. Thanks to a streamlined channel of communication with senior Commission leadership, these groups can now seek approval to launch disinformation-fighting activities and pool resources across Directorate-Generals and other services more effectively. This is key to the empowerment of cross-service collaboration and the breaking down of silos. Importantly, while these subgroups help concentrate knowhow and resources, they also preserve the autonomy of the participating teams. Thus, it was understood that the advantages of a decentralised approach could be preserved.

One key subgroup formed through this mandate was a 'vaccine disinformation' subgroup. The subgroup meets regularly to discuss the latest trends emerging online on COVID-19 disinformation addressed towards the EU and to coordinate communication responses. Knowledge is pooled through an internal weekly report compiled and distributed by DG COMM, with input from EEAS to the other services of the Commission, as well as other EU institutions. This effort synthesises the main narratives detected, and is combined with quantitative insights provided by the Commission's Joint Research Centre (JRC). The purpose of the report is to give an overview of identified false or misleading top-level narratives and assess the risk level these narratives pose. It also provides links to fact-checks – wherever available – and, thus, empowers recipients to respond appropriately through debunking or other methods.

5.8   Results

If the infodemic presented a quantitatively and qualitatively escalated threat, how well did these new ways of working help deal with the problem? On the qualitative side, the vaccine subgroup facilitated the production of the weekly report, which streamlined a common situational awareness that could be developed and disseminated among key actors. This addressed the problem that different teams were seeing diverse aspects without knowing what to respond to, if, indeed, they should respond at all. This was a problem engendered by the overwhelming and crosscutting nature of vaccine mis- and disinformation, often exceeding the competency and expertise of any one team. The report made clear for everyone what the many threats were for the week and offered a rationale as to what sort of response would be appropriate, at what level, and using what sort of language. Very often this was more about explaining when not to respond as much as when to respond. This helped bring some clarity and organisation among operational communication teams in the face of a threat, which might otherwise leave everyone paralysed. This proved to be useful for community managers of the central EC accounts in replying adequately to comments. Overall, this internal coordination work was complementary to the RAS, which also facilitated collaboration and situational awareness among Member States, as well as discussion specifically about response options for foreign information manipulation and interference.

On the quantitative side, work is still ongoing. The sheer volume of material in the infodemic means that we are constantly presented with moving targets and it is hard to work out which narratives are having the most impact and, therefore, warrant attention. Nevertheless, we are making progress in this field with a combination of automated and human intelligence methods.

5.9   Lessons Learnt

- *Teamwork Needs Structures*
  From these new 'official' working methods, unofficial and often very effective personal connections were forged. These were often more important than the official coordination structures. Yet, without these structures, these relationships would not have flourished. Thanks to these interactions, very fast and flexible reactions could be determined among teams, especially in moments of sudden change such as the emergence of new variants or concerning new mis- and disinformation narratives.

- *Situational Awareness*
  It proved to be very beneficial to have an instrument to pool open-source intelligence that could then be shared among all teams. For us, it was a weekly report, but developing some other equivalent instrument would be valuable in similar situations.

- *Clear Leadership*

  Combatting mis- and disinformation is seldom as black and white as correcting wrong information. Harmful narratives are often effective not just because of their false content but because of how they leverage social and cultural discontent, often political in nature. Clear political leadership is needed to define what counter-narratives are appropriate when the damage goes beyond simply whether a claim is true or false.

- *Realism*

  Public communication focused on the promise of herd immunity with 70% vaccination coverage. This created a problem for managing expectations when the milestone was reached, but the crisis did not show signs of subsiding.

- *Internal/External Nexus*

  In many cases, stories would emerge outside EU countries but quickly become prevalent within the EU. This meant that in practice, very close coordination was needed between the Commission and EEAS. In a national context, this would require cooperation between a foreign ministry and a health ministry, as well as a central coordinating body. Breaking down silos in order to deal with such transversal issues is crucial.

- *Empowering Interdisciplinary Work*

  Such collaboration not only needs to be facilitated but empowered so that mandates can be issued for joint projects where necessary. This can pose institutional complications when policy competences are strictly divided. This is what our mandate for the 'Network against Disinformation' attempted to overcome. Working out a framework for such collaboration is important before a crisis hits.

5.10   Conclusion

Overall, we can say that while our work is not over, the infodemic prompted deeper thinking about how we organise proactive and strategic communications and make ourselves resilient in the face of overwhelming threats. For the EU, vaccine-related mis- and disinformation not only struck at the core of its fast developing role in pandemic management, it also hit an institutional soft spot in the space between regulation and fighting external information manipulation and interference. The need for quick and coordinated large-scale reactions prompted the Commission to streamline internal processes to enhance collaboration for quicker and more targeted responses. In this way, our otherwise separate teams were able to exceed the sum of their parts in fighting this overwhelming threat. The solution of the upgraded Network facilitated this outcome by making better use of existing resources and building situational awareness through better pooling of knowledge across departments.

Undoubtedly, even more is needed in order to meet a threat of this scale that is also constantly evolving. However, as is also evident from the institutional and policy background in this chapter, there are inherent constraints in what an organisation such as the EU is able to do. So, while we try our best, it is important to keep in mind these limitations and balance them against the importance of other actors such as national administrations and other organisations. Nevertheless, if we acknowledge these constraints and consider the EU's menu of responses to disinformation 2 years on, we can say with confidence that the trial by infodemic has resulted in a more consolidated operation, which makes its already impressive defences more complete and robust. Time will tell how well we are prepared for the next crisis.

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Chapter 6
Smart Health! Expanding the Need for New Literacies

Kristine Sørensen

6.1 Introduction

New innovations are driving a transformation of health systems from provider-driven marketplaces to people-centric health eco-systems, moving away from reactively treating and preventing illness to promoting health and well-being proactively. Increasingly, patients are becoming engaged and responsible for their own health through the added value provided by new technologies. Digitalisation has transformed relationships within the health sector as patients become more self-reliant, better-informed, and comfortable finding information independently. More than two billion searches are launched on Google daily, with healthcare being the second most searched topic (Luxembourg 2018). This interest encourages health-care providers, insurance companies, pharmaceutical industries, and the health eco-system in its entirety to become more 'Smart!'

6.2 Smart Health!

With the development of information technology, the concept of Smart healthcare has gradually evolved. Smart health is recognised as a new form of healthcare, which pertains to devices, sensing, computing and communication technologies, software/hardware modelling, and system architectures towards personalised, pervasive, participatory, predictive, preventive, programmable, and perpetual healthcare. Smart health builds on the new generation of information technologies, such as the internet of things (IoT), big data, cloud computing, and artificial intelligence, to transform the traditional medical system in a comprehensive way, making

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healthcare more efficient, more convenient, and more personalised (Tian et al. 2019). The key approaches of Smart health covers eHealth and mHealth services, electronic record management, smart home services, and intelligent and connected medical devices. However, to fully benefit from Smart health, and avoid any detrimental impact from challenges such as the infodemic, the development of new competencies and capacities is necessary among populations, as well as among professionals working in the health eco-system.

6.2.1   eHealth

A key concept used in health systems today includes eHealth, which, according to the World Health Organization, can be defined as, 'the use of information and communication technology (ICT) for health. Examples include treating patients, conducting research, educating the health workforce, tracking diseases and monitoring public health' (World Health Organization 2016). The European Medical Association highlights the value of eHealth as beneficial for 'the entire community by improving access to care and quality of care and by making the health sector more efficient. This includes, for example, information and data sharing between patients and health service providers, hospitals, health professionals and health information network, electronic health records, telemedicine services, portable patient-monitoring devices, operating room scheduling software, robotised surgery and blue-sky research on the virtual physiological human' (European Medical Association 2021). 'The goal of the EU concerning eHealth is the improvement of EU residents' health by using eHealth tools that provide instrumental information between countries when needed. To guarantee this improvement, the EU wants to enhance eHealth tools and make them more effective, user-friendly, and more widely accepted by patients and professionals. Moreover, the EU aims at increasing the quality of healthcare and enabling better access by incorporating eHealth into general health policy (ActiveAdvice 2017). However, according to the World Health Organization, the successful investment in eHealth entails far more than just the acquisition of technology. A holistic view is needed with regards to the impact and changes required to organizational processes, structures, roles, standards and legislation, as well as consideration of the specifics of human resources, education, reimbursement and the culture of those who will be utilizing the eHealth services – any of which can serve to derail initiatives if neglected (WHO 2016, p. xi).

6.2.2   mHealth

The term mHealth is short for mobile health. According to the World Health Organization, the use of mobile wireless technologies for public health, or mHealth, is an integral part of eHealth, which refers to the cost-effective and secure use of

information and communication technologies in support of health and health-related fields (World Health Organization 2018). Moreover, the WHO Global Observatory for eHealth (2011) describes mHealth to be the 'medical and public health practice supported by mobile devices, such as mobile phones, patient-monitoring devices, personal digital assistants (PDAs), and other wireless devices'. Besides using mobile phones to make calls and send text messages, mHealth includes the use of more complex technical features and applications such as telecommunications (3G and 4G), GPS, and Bluetooth technology. The increase of mobile telephone subscriptions across the world is predominantly happening in low- or middle-income countries – countries in which people are more likely to have access to a mobile telephone than to clean water, a bank account, or electricity (World Health Organization 2018).

6.2.3 Building Capacity: Opportunities and Challenges in the Information Age

The challenge of capacity is complicated by the challenge of change, with new technologies for information and communication regularly redefining what it means to be literate. The exponential digital development has a profound impact on how people are enabled to find, understand, appraise, and apply information in all forms to manage health and navigate health services, as well as deal with the magnitude of information available. There is a need for the acquisition of a new set of knowledge and skills to accommodate the challenges and opportunities that arise with the evolution of the digital space, including

- Health literacy.
- Science literacy.
- Digital literacy.
- Information literacy.
- Media literacy.

Applied to the field of health, all these literacies are closely associated with each other. As relational concepts, which can be considered from both an individual perspective and a system perspective, they are cultural-sensitive and vary between and within countries.

This chapter aims to introduce and explore why health, science, digital, information, and media literacy are all key to facilitating Smart health and creating new models of health based on personalised, pervasive, participatory, predictive, preventive, programmable, and perpetual health services. Teaching and the maintenance of a variety of literacies in the population is one of the long-term strategies to ensure it remains resilient in the face of the infodemic and is better equipped to achieve appropriate health behaviours.

6.3 New Competencies to Accommodate Health in the Twenty-First Century

'Traditionally, literacy has referred to the ability to read and write. A literate person can communicate effectively through writing and assimilate information from reading. However, in today's technology-driven world, the word literacy has expanded to encompass an ability to communicate effectively and absorb information through a variety of mediums. The term multiple literacies (also called new literacies or multi-literacies) recognises that there are many ways to relay and receive information and that students need to be proficient in each one' (Bales 2019). Therefore, 'to become fully literate in today's world, [people must adapt and] become proficient in the new literacies of 21st-century technologies' if they are to be empowered and enabled to engage actively in society at all levels (International Reading Association 2009).

'There is extensive debate about what [these] new literacies are, [with] terms being used to mean different things to different people. However, there are at least four common elements that apply to nearly all of the current perspectives being used to inform the broader dimensions of new literacies research (Coiro et al. 2008):

1. The Internet and other ICTs require new social practices, skills, strategies, and dispositions for their effective use.
2. New literacies are central to full civic, economic, and personal participation in a global community.
3. New literacies rapidly change as defining technologies change.
4. New literacies are multiple, multimodal and multifaceted; thus, they benefit from [the application of] multiple lenses when seeking to understand how to better support students in a digital age' (International Reading Association 2009).

For the sake of meeting the demands related to digitisation of health services, and to deal with the increasing threats from infodemics, the various identified categories of literacies (Sect. 6.2.3) are introduced and explained.

6.3.1 Health Literacy

Health literacy is a composite term to describe a range of outcomes of health education and communication activities. It encompasses people's knowledge, motivation, and competencies to access, understand, appraise, and apply health information to form judgements and make decisions in everyday life concerning healthcare, disease prevention, and health promotion in order to maintain or improve quality of life (Sørensen et al. 2012). It is a modifiable determinant of health, which is often negatively associated with various adverse health outcomes such as higher health-care costs, financial deprivation, low education, and social status (Sørensen et al. 2012). Health literacy develops over the life course and is influenced by personal,

situational, and societal factors. Literacy is associated with health service use and health costs, health behaviour and health outcomes, participation, and empowerment, equity, and sustainability (Sørensen et al. 2012) (Fig. 6.1).

For instance, health literacy empowers people to handle health information in all its forms and participate in health communication through various channels. Understanding and making informed decisions about health issues requires strong health literacy skills based on the ability to obtain, communicate, process, and understand health information and services (Nutbeam and Muscat 2021). Health literacy also includes such health behaviours as knowing how to describe symptoms, where to find adequate help for health issues, how to understand medical information, and how to safely manage the use of medication (Paasche-Orlow and Wolf 2007).

Another commonly used approach considers health literacy from three perspectives: functional health literacy, interactive health literacy, and critical health literacy (Nutbeam 2000, 2008).

- *'Functional health literacy* reflects the outcome of traditional health education based on the communication of factual information on health risks and on how to use the health system. Such action has limited goals directed towards improved knowledge of health risks and health services, as well as compliance with prescribed actions.
- *Interactive health literacy* is focused on the development of personal skills in a supportive environment. This approach to education is directed towards improving personal capacity to act independently on knowledge, specifically to improve motivation and self-confidence to act on advice received.
- *Critical health literacy* reflects the cognitive and skills development outcomes, which are oriented towards supporting effective social and political action, as
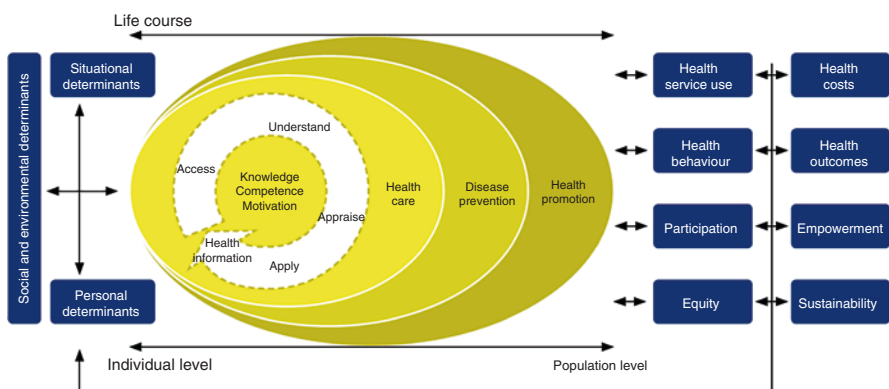

Fig. 6.1 The conceptual model of health literacy derived from the European Health Literacy Project (Source: Sørensen et al. 2012; Adapted from Sørensen et al. 2012. Figure 1. Some modifications were made. https://doi.org/10.1186/1471-2458-12-80, licensed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/2.0))

well as individual action,' thus including taking social responsibility and thinking beyond one's personal perspective (Nutbeam 2000, p. 265).

Poor health literacy is an under-estimated, global challenge. Poor health literacy has been described as the silent epidemic and a public health challenge in itself (Sørensen et al. 2015). There is substantial evidence of the relationship between health literacy and health outcomes from Asia, Europe, and North America, indicating that 20–60% of these region's populations may possess limited health literacy skills (Duong et al. 2017; Rudd 2007; Sørensen et al. 2015).

The Information Age, which is characterised by the idea that access to, and the management of, information is a defining factor for human knowledge, attitudes, and behaviour, puts a heavy demand on people and systems. Health literacy is necessary to make sense of the magnitude of information. In addition, it may have both direct and indirect enabling and hampering effects on an individual's health. People's personal world of information is constantly evolving through time and has a significant influence on behaviour (Azzopardi-Muscat and Sørensen 2019).

6.3.2 Digital Literacy

Digital health literacy and internet connectivity have recently been acknowledged as 'super social determinants of health' in that they have implications for the wider social determinants of health (Sieck et al. 2021). Digital literacy can play a powerful role in helping people connect, learn, and engage with their community and create more promising futures. Digital literacy is the ability to navigate our digital world using reading, writing, technical skills and critical thinking. It is using technology such as a smartphone, PC, or e-reader to find, evaluate, and communicate information. According to WHO, the term 'digital health' refers to 'the field of knowledge and practice associated with any aspect of adopting digital technologies to improve health and incorporates the subdomains of eHealth, medical informatics, health informatics, telemedicine, telehealth and mHealth, as well as data-analytics, big data and artificial intelligence' (World Health Organization 2021). To build digital capacity in organisations and communities, it is recommended that there is a focus on six action areas (Beetham 2015):

- ICT proficiency (Functional skills).
- Information, data, and media literacies (Critical use).
- Digital creation, problem solving, and innovation (Creative production).
- Digital communication, collaboration, and participation (Participation).
- Digital learning and development (Development).
- Digital identity and wellbeing (Self-actualising).

Digital technologies can be used to strengthen health institutions and systems (USAID 2020), including:

- *Client-oriented technologies* – such as those that provide compliance reminders for appointment and treatment, transmit health-event alerts, and/or transmit payments or vouchers.
- *Provider-oriented technologies* – such as those that support the identification and registration of clients, clients' health records, communications, and decision-making for health-care providers, referrals, planning and scheduling, training, and the management of laboratory tests and results, diagnostics, imaging, and 'virtual health', including remote monitoring and telemedicine.
- *Manager-oriented technologies* – such as those that support the management of human resources, supply-chains, notifications of public health events, civil registries and vital statistics, public- and private-sector health funds, and facilities.
- *Data-services-oriented technologies* **–** such as those that enable the collection, management, analytics, coding, exchange, interoperability and use of data, and location-mapping (USAID 2020).

6.3.3   Information Literacy

Access to relevant, reliable, unbiased, up-to-date, and evidence-based health-care information is crucial for the public, patients, and health personnel for every aspect of health. It is related (but not limited) to health education, informed choice, professional development, safety and efficacy of health services, and public health policy (World Medical Association 2019). However, health information is only useful if it is timely, updated, understandable, accurate (Royston et al. 2020), and it is aligned with individual and cultural values. If public health information and knowledge has no meaning for certain populations, it is likely that they will not use it to inform their health decisions. Achieving this understanding requires empowerment of the public and patients, as well as health workers, with the information literacy they need to recognise and take up their rights and responsibilities to access, use, and provide appropriate services and to promote health and prevent, diagnose, and manage disease (World Medical Association 2019).

Information literacy is the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to reach and express informed views and to engage fully with society (Wilson et al. 2011). As seen in relation to related literacies, the field of information literacy has also undergone a discursive shift from perspectives based on functional skills to a perspective that sees information literacy as a sociocultural practice, where becoming information literate is mediated though interactions in social settings (Lloyd et al. 2014). Meeting the information needs of the public, patients, and health-care providers is a prerequisite for the realisation of the UN Sustainable Development Goals, quality universal health coverage, and mitigation of the hampering impact of infodemics.

6.3.4   Media Literacy

Within their 'Media and Information Literacy' framework, UNESCO provides a curriculum for teachers and education professional to address media literacy and information literacy learning in schools. Media literacy can be defined as understanding and using mass media in either an assertive or non-assertive way, through an informed and critical understanding of media, the techniques they employ, and their effects. Moreover, it can be described as the ability to read, analyse, evaluate, and produce communication in various forms of media, such as television, print, radio, and computers. It is also explained as the ability to decode, analyse, evaluate, and produce communication in a range of forms (Wilson et al. 2011).

Often the various types of literacies are seen as closely linked or used interchangeably. The British Library and Information Association through their Information Literacy Group, for instance, highlight that if the concept of information literacy is applied to any given health context, it is a synonym for health literacy (Coonan et al. 2018). In practice, it may also be combined and presented as media health literacy (Levin-Zamir and Bertschi 2018).

6.3.5   Science Literacy

Scientific literacy, or science literacy as it is often called, concerns the ability to use scientific frameworks to make decisions that are based on facts, research, and knowledge. More specifically, it can be defined as 'the ability to creatively utilise appropriate evidence-based scientific knowledge and skills, particularly with relevance for everyday life and a career, in solving personally challenging yet meaningful scientific problems as well as making responsible socio-scientific decisions' (Holbrook and Rannikmae 2009). Carlgren highlights problem-solving, critical thinking, oral and written communication, as well as the ability to interpret data as the four core aspects of science literacy (Carlgren 2013). Lastly, according to the OECD's *PISA 2015 Assessment and Analytical Framework*, science literacy can be defined as 'the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen' (OECD 2017).

With regards to conflicting information, scientific literacy is key to supporting people's understanding of their environment and their own health processes, especially in current times when media and social media have an all-pervasive influence on people's lives (Mohan et al. 2020). This concept includes inquiry concerning reviewing beliefs, accumulating the facts, being able to discern fact from opinion or myth, and using those facts to make an informed decision. Being scientifically literate enables people 'to engage in reasoned discourse about science and technology [based on the] competencies to:

• Explain phenomena scientifically – recognise, offer and evaluate explanations for a range of natural and technological phenomena.

- Evaluate and design scientific enquiry – describe and appraise scientific investigations and propose ways of addressing questions scientifically.
- Interpret data and evidence scientifically – analyse and evaluate data, claims and arguments in a variety of representations and draw appropriate scientific conclusions' (OECD 2017, p. 15).

6.4 Expanding Capacity to Enhance Multiple Literacies

People and patient's empowerment can be enhanced through smart technology that makes them less dependent on health professionals, enabling them to manage their health around the clock more easily, inform themselves, and share experiences. In this respect, education and taking ownership are the main drivers of patient engagement. Improving the capacity of people to utilise smart technology is necessary but nevertheless, of itself, insufficient (Luxembourg 2018). Capacity-building can be defined as the process of developing and strengthening the skills, instincts, abilities, processes, and resources that organisations and communities need to survive, adapt, and thrive in a fast-changing world. An essential ingredient in capacity-building is transformation that is generated and sustained over time from within; transformation of this kind goes beyond performing tasks to concepts of changing mindsets and attitudes (United Nations Academic Impact n.d.). Tapping into the digital world may help democratise people's health through increased access to information regarding healthcare, disease prevention, and health promotion. From a societal point of view, however, it is paramount for everyone to build capacity at all levels – individual, organisational, commercial, technical, and political – so that people can withstand its inherent pitfalls (Azzopardi-Muscat and Sørensen 2019).

An example of applying a systemic approach to developing system capacity is laid out in the framework on health literate systems (Sørensen et al. 2021). This addresses eight systemic capacities – 'the workforce, organisational structures, research and knowledge development, financial resources, partnerships, leadership and good governance, technology, and innovation – as well as people-centredness based on user engagement and enabling environments… [The outlined] systemic transformation can be multiplied and sustained over time' (Sørensen et al. 2021). It has also been shown to be resilient in coping with 'external trends and events rather than relying on individual behavioural change or organisational change alone to overcome the challenge of poor health literacy. Furthermore, an enhanced health literacy system capacity prevents system failure by ensuring a better match between the organisations, the context in which they work, and the needs they meet by addressing and enhancing the capacity' of the eight identified systemic capacities (Sørensen et al. 2021).

Applying a systemic response requires bold leadership, built on rights-based approaches that secure individual dignity and rights, as well as facilitating societal sustainable development. Thus, 'capacity-building related to public health entails

the development of sustainable skills, organisational structures, resources, and a commitment to prolong and multiply health gains many times over' (Hawe et al. 1997, as cited in Sørensen et al. 2021).

6.5   Conclusion

In earliest societies, literacy was perceived in a simple, pragmatic way; it was a way to record land, livestock, crops, and business transactions. Since then, there have been three major human contributions that have greatly influenced and developed the concept: the invention of writing, the invention of print, and the current dominance of ICT technologies (Abdallah 2008). Notably, literacy is one of the most perplexing concepts in the modern world, especially with the emergence of associated concepts of new literacies, digital literacies, and multiple literacies. Continuous and rapid development is needed within research, policy, education, and practice (Bales 2019) to accommodate the needs of present and future generations to ensure that they can benefit and contribute to healthy societies around the world. Thus, this calls on all involved stakeholders to help in bridging competency gaps across relevant sectors.

Apart from classroom integration, there are many resources that students can access to develop multiple literacies. Students will naturally use many of these resources, such as gaming, the Internet, and social media outlets. Many libraries now recognise multiple literacies and offer resources for students, such as free computer and internet access, e-books and audiobooks, tablet access, and digital media workshops. Multiple literacies can also be taught as part of post-graduate training. Moreover, media and science communities can be called upon to provide greater support by increasing the availability of valid and timely information for people to find, understand, appraise, and use to form judgements and make decisions in everyday life. Relevant disciplines working in the digital space are essential for the creation of user-friendly environments that are responsive to the needs related to multiple literacies when it comes to the facilitation of the development of healthier populations and societies.

The need for new literacies is apparent in the fast-evolving societies of today. According to futurist Alvin Toffler, the illiterate of the twenty-first century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn (1970). The demand is not any more the information overload but how *to deal* with the information overload and its impact on modern lives, especially in the attempts to maintain and promote health and well-being. As such, the acquisition of new literacies is becoming a pre-requisite for empowerment and active living in the digital age.

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Chapter 7
To Debunk or Not to Debunk? Correcting (Mis)Information

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7.1 Introduction

Although misinformation is not a new problem, questions about its prevalence, its public impact, and how to combat it have recently taken on new urgency. Declining trust in social institutions is undermining experts and sowing confusion, while the expansion of social media and internet use has enabled an abundance of information, including false or misleading information to spread more rapidly, especially during a disease outbreak. WHO calls this an 'infodemic' (WHO 2022).

An obvious solution to the problem of misinformation is to offer corrections (or debunkings) to clarify what is true and what is false. Broadly speaking, we know that corrections can mitigate misperceptions on a specific issue, but related attitudes and behaviours are more resistant to change (Porter and Wood 2019; Swire et al. 2017a). In some cases, correcting a single inaccurate gateway belief (e.g. the misconception that scientists disagree about climate change) can lead to sustained attitude change (an understanding that scientists agree that climate change is real and dangerous), which can then lead to policy support (van der Linden et al. 2019). In other cases, even when people seemingly accept the correction and acknowledge the inaccuracy of the misinformation, beliefs still continue to be influenced (Walter and

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Tukachinsky 2020). This *continued influence effect* is more likely when the misinformation implicates a central identity. For example, one study found that partisans were more likely to accept corrections when they targeted misinformation of misconduct of a single member of their preferred party rather than misconduct by their party in general (Ecker and Ang 2019).

Despite these limitations, corrections remain an important tool to address misinformation. Corrections can come from a variety of sources, including social peers, experts in a particular domain, and fact-checking or news organisations. These sources are complementary; peer correction is especially important given the scale of misinformation (Bode and Vraga 2021), but relies on experts and news organisations to provide the groundwork for the public and platforms to respond to misinformation.

To address misinformation, three related themes must be considered: (1) *which* misinformation to prioritise for correction, (2) *how* to best correct misinformation, and (3) *what else* can be done pre-emptively to protect the public from future misdirection. Additionally, corrections and other pre-emptive solutions for misinformation must be tailored to recognise cultural contexts. To date, much of the research regarding correction and best practices focuses on Western-style democracies. Identifying who serves as a trusted expert remains difficult, as it differs within each community. While many countries rated WHO highly for their COVID-19 response, this perception was not universal, or even consistent within individual countries (Bell et al. 2020).

Increasingly, research suggests that social media platforms focus largely on identifying and correcting English-language misinformation and, to a large extent, ignore non-English-speaking communities and many misinformation hotspots around the world (Avaaz 2021; Wong 2021). Likewise, modern fact-checking originated in the United States and remains more common in countries with a high degree of democratic governance (Amazeen 2020). Research and scholarship must pay more attention to language and cultural factors to tailor solutions to specific contexts (Malhotra 2020; Winters et al. 2021).

7.2   Prioritising Corrections

The scale of misinformation on social media means it may be impossible to respond adequately to all misinformation. Therefore, consideration of the source of the misinformation, the audience it is likely to reach, and the content itself can help provide a focus for which misinformation to prioritise for correction.

7.2.1   Misinformation Source

Not all sources of misinformation are equally important or easy to correct, so the 3 Ps of proximate, prominent, and persuasive sources should be prioritised. Proximity refers to the perceived social distance of a source. People are more likely to believe (mis)information when it is shared by their peers or those close to them, making peer corrections particularly valuable (Malhotra 2020; Margolin et al. 2017; Walter et al. 2020).

The second consideration is the prominence or reach of the source. A study conducted by the Reuters Institute found that although public figures contributed to only 20% of the total misinformation analysed in the study, these posts accounted for 69% of total engagement (Brennen et al. 2020). Opinion leaders or social media personalities wield considerable influence, and misinformation stemming from them can be particularly problematic (Pang and Ng 2017). Recent research suggests just 12 people, called the 'Disinformation Dozen', are responsible for the majority of anti-vaccine content on Facebook and Twitter (Ahmed 2021).

The third consideration is source persuasiveness or credibility. Misinformation coming from a trusted or seemingly expert source is likely to be especially persuasive and the use of fake experts is a frequently used tactic in disinformation campaigns (Cook 2020).

7.2.2   Misinformation Audience

Source proximity, prominence, and persuasiveness depend upon the audience. Considering the alignment between the source of misinformation and its likely audience is critical. When the misinformation source and content align with audience values, the misinformation is more likely to generate misperceptions.

A separate audience feature that should also be considered is the insularity of the audience. Misinformation shared within a receptive echo chamber makes correction more difficult; individuals turn to others for social support, which leads to continued misperception (Chou et al. 2018). On the other hand, finding trusted allies who can speak to their peers within otherwise insular groups facilitates correction.

7.2.3   Misinformation Content

Finally, the features of the misinformation itself, especially its salience, accuracy, and potential impact on its audiences, all determine whether information is perceived to be correct or not.

One important consideration is the salience or prominence of the misinformation itself beyond the actual source. Repeating messages makes people believe them

more, even if the message is false and conflicts with existing knowledge (Fazio et al. 2015). When misinformation becomes salient, there is an increased need to address it before it can circulate even further.

The line between truth and falsehood is often blurred, but misinformation that directly counters clear expert consensus and concrete data should be prioritised (Vraga and Bode 2020a). Accessible and easy-to-understand materials from credible governing bodies or organisations, in particular, facilitate peer correction (Vraga and Bode 2021).

Finally, of paramount importance, is consideration of the potential negative repercussions of misinformation. While direct, immediate harm from misinformation can be critical (e.g. vaccine misinformation creating vaccine hesitancy), so, too, are potential longer-term effects such as decreased trust in scientists, health literature, or health professionals (e.g. vaccine misinformation lessening trust in doctors or nurses). Misinformation with the potential to cause individual or community harm should be prioritised in correction efforts.

7.3   How to Correct: REACT

Once a decision has been made to correct a specific piece of misinformation, it is important to do so effectively. While corrections can help reduce misconceptions, it is not expected that they could be fully effective at reducing all misinformation beliefs at group level. To maximise corrective impact, we have summarised best practices using the acronym REACT (for additional summaries, see Lewandowsky et al. 2020; Paynter et al. 2019) (Fig. 7.1).

7.3.1   Repetition

While repetition has historically been exploited by propagandists and advertisers, it can also be used as a force for good when debunking misinformation through repetition of relevant core facts. Claim repetition can strengthen the perception of a social consensus, even if it originates from just a single source (Weaver et al. 2007). It can also be useful to refer to multiple sources of factual information or provide

Fig. 7.1 Best practices: REACT to correct misinformation

R epetition
E mpathy
A lternative explanations
C redible sources
T imeliness

information on social norms, be that an expert consensus (Cook 2016), peer consensus (Ecker et al. 2022b; Vraga and Bode 2020b), or social endorsement of the correction (Vlasceanu and Coman 2022). Finally, even the best corrections may only produce temporary effects in reducing misperceptions, thus necessitating repeated intervention (Paynter et al. 2019; Swire et al. 2017b).

7.3.2 Empathy

When correcting misconceptions, it is important to consider how others may have arrived at a false belief and what their underlying concerns might be. Debunking messages should generally be fact-oriented and civil. The false information and underlying logical flaws should be addressed rather than attacking or ridiculing the misinformation source. Respectful engagement is important, even when the protagonists are not susceptible to rational argument, due to the potentially detrimental impact on observers. Observers often update their beliefs when they see someone else being corrected (often on social media) in a calm and evidence-based manner (Steffens et al. 2019; Vraga and Bode 2020b). Aggressive argumentation has been found to limit the credibility of the debunker (König and Jucks 2019), although uncivil corrections may still reduce misperceptions among some bystanders (Bode et al. 2020). Empathetic corrections should try to appreciate an audience's worldview; for example, when debunking climate change misinformation, a conservative audience may be more susceptible to framing in terms of economic opportunities rather than government intervention (Kahan 2010). Of course, there are limits to this approach, and in the case of intentionally designed disinformation campaigns, undermining the credibility of the dis-informant may be warranted (MacFarlane et al. 2021; Walter and Tukachinsky 2020).

7.3.3 Alternative Explanation

Arguably the most important component of any correction is that it goes beyond merely challenging a false claim or labelling it as false. If available, corrections should provide factual alternative information, point to evidence, and explain why the misinformation is false (Seifert 2002; van der Meer and Jin 2020). Not only does this make a correction more persuasive, it also provides details that are stored in an individual's memory and, thus, facilitates future retrieval of the corrective information (Swire et al. 2017b). These explanations need not be elaborate, and effective refutations can even be provided in the concise format of social-media posts (Ecker et al. 2020b).

7.3.4   Credible Source

The most important characteristic of a credible source is its perceived trustworthiness (Guillory and Geraci 2013). While expertise can also matter, especially for the debunking of science-related misinformation (Vraga and Bode 2017; Zhang et al. 2021), a non-expert source can still be effective, whereas a non-trusted source cannot (Ecker and Antonio 2021). The sources that will be perceived as credible will naturally vary across communities, cultural groups and countries. In-group sources, and especially known peers, should be used wherever available (Gallois and Liu 2021; Margolin et al. 2017; Pink et al. 2021). This also highlights the importance of building and maintaining high levels of community trust for organisations and individuals who seek to actively debunk misinformation in the public realm.

7.3.5   Timeliness

Even though the immediacy of a correction may not have a strong impact on the belief updating process itself (Johnson and Seifert 1994), the speed with which misinformation can travel through the contemporary information landscape (Vosoughi et al. 2018) incentivises quick debunking responses. Even if time does not allow for full-blown, detailed refutations, swift rebuttal of particularly concerning pieces of misinformation is still advised.

Critically, any debunking intervention is generally better than no intervention at all. While there are cases where misinformation carries lower risk of harm and can be 'left alone' – specifically, where the misinformation is gaining little traction or is deemed inherently harmless – correction is generally beneficial and carries little risk of harm itself. Indeed, concerns regarding potential backfire effects of corrections have been overblown (Ecker et al. 2022a; Swire-Thompson et al. 2020). Moreover, some design factors have been shown to matter less than initially assumed. For example, the order in which a correction presents the to-be-debunked misinformation and the associated facts (i.e. a 'myth-fact' or 'fact-myth' approach) seems largely inconsequential (Martel et al. 2021; Swire-Thompson et al. 2021).

Another example is the use of stories. While narrative elements can enhance engagement with corrections (Lazić and Žeželj 2021) with a receptive audience, non-narrative debunking that is fact-focused can be just as effective (Ecker et al. 2020a). Ultimately, corrections should be made accessible and relevant to their audience through the use of different techniques: (i) clear, accurate, and engaging graphics or visual simulations (Danielson et al. 2016; Thacker and Sinatra 2019); (ii) analogies (Danielson et al. 2016); or (iii) humour (Vraga et al. 2019).

7.4   Beyond Corrections: Proactive Approaches to Misinformation

Correction is inherently a reactive solution, because it occurs after misinformation has begun to spread. Misinformation is also not bound by reality; it can be created quickly and have considerable novelty and emotional appeal that further encourages its dissemination (Acerbi 2019; Vosoughi et al. 2018). As debunking requires considerable resources, it should be paired with other ways of reducing misinformation, such as promoting high-quality information, 'prebunking' misinformation, building health and information literacy, and redesigning media platforms.

7.4.1   Promoting High-Quality Information

Particularly in situations of great uncertainty, when timely access to high-quality information is not available (an 'information void'), people may form more misconceptions or engage in increased speculation. Moreover, when made available, official recommendations compete with misinformation for attention. If high-quality information is to be heard and understood, it needs to be made 'stickier' than misinformation, more adept at grabbing attention, and remaining memorable.

Many of these recommendations for making information 'sticky' echo best practices for creating and sharing effective corrections. Highly trusted community leaders should be involved in the design and dissemination of official information, such as trusted military personnel chosen as the public face of the COVID-19 vaccine rollout in Portugal (Hatton 2021). This aims to ensure that information appeals to the target communities' concerns, cultural values, and priorities. Materials should be as compelling and accessible as possible, supplementing facts with personal narratives and appeals to positive emotions when appropriate (Lazić and Žeželj 2021), using straightforward content and accessible language to account for low audience literacy, and delivering messages through a variety of media channels such as TV or posters for those without internet access.

Contradictory scientific or health information can potentially confuse audiences and undermine trust in guiding institutions (Nagler et al. 2019), so creators of high-quality information should be as transparent in disclosing the sources of information, the available evidence, and who was consulted. An acknowledgement of changes in evidence or recommendations, as well as the admission of errors, is also necessary (Ghio et al. 2021; Hyland-Wood et al. 2021).

7.4.2 Prebunking

'Prebunking' or 'inoculation' comprises two components: offering a warning about misinformation and pre-emptively refuting misinformation or explaining misleading techniques to build resilience against future attempts at deception (Compton 2020; McGuire 1961). Prebunking has been shown to be effective across different topics, including climate change and the COVID-19 pandemic (Basol et al. 2021; Schmid and Betsch 2019) and can be approached in two complementary ways: issue-based prebunking and logic-based prebunking.

Issue-based or fact-based prebunking requires the anticipation of potential misinformation in a particular domain. For example, many COVID-19 vaccine myths could have been foreseen, since they rely on often repeated tropes of the anti-vaccination movement, such as 'vaccines are toxic' or 'vaccines are unnatural' (Kata 2012). Another way to increase communication preparedness is to identify emerging or common concerns and rumours by systematically monitoring relevant data sources such as field reports, social media, and news articles (Ecker et al. 2022a). In Malawi, for example, preparations for the human papillomavirus (HPV) vaccine rollout in 2018 included tracking public opinion and pre-emptively inform-ing and reassuring parents and caregivers (Global HPV Communication 2019). There are also guides that can provide resources on how to set up rumour-tracking systems (Fluck 2019; United Nations Children's Fund 2020).

Logic-based or rhetorical prebunking teaches people about typical misinformation techniques to help them discern the difference between real and fake informa-tion. The FLICC framework provides an overview of five commonly used techniques of science denial (Cook 2020). These techniques and examples of each are: *Fake Experts* – when Jovana Stojkovic appeals to her authority as a psychiatrist to spread baseless vaccine claims in Serbia; *Logical Fallacies* – the claim 'she is cancer-free, because she eats healthy food' is based on the single cause fallacy; *Impossible Expectations* – 'PCR tests for coronavirus are not 100% accurate, so we shouldn't bother administering them'; *Cherry Picking* – basing the claim that Ivermectin is an effective COVID-19 treatment on a small number of poorly designed studies; and *Conspiracy Theories* – attributing random, uncontrollable events to malicious intents of powerful actors. Logic-based inoculations can be effectively scaled up through engaging games (Basol et al. 2021; Roozenbeek and van der Linden 2019), such as Bad News (www.getbadnews.com), Go Viral! (www.goviralgame.com), or Cranky Uncle (www.crankyuncle.com).

7.4.3 Literacy Interventions

A long-term approach to managing infodemics necessitates the improvement of health and media literacy, including information, news, and digital competencies. Educating citizens about specific media strategies can help minimise the impact of

misinformation (Kozyreva et al. 2020). Encouraging people to ask questions – *Do I recognise the news organisation that posted the story? Is the post politically motivated?* – can reduce the spread of fake news (Lutzke et al. 2019), while simply reminding someone to consider accuracy can help them discern real from fake news (Pennycook et al. 2020).

It is also crucial to increase access to information and to empower local journalists to identify misinformation, such as First Draft's collection of tools for journalists (First Draft 2020). During crises, governments can specifically look to collaborate with fact-check organisations that can help provide media literacy education for the community, as in the case of Indonesia (Kruglinski 2021). Simple interventions that empower people to handle misinformation such as tips for spotting false news or accuracy prompts are also scalable to social media platforms (Guess et al. 2020; Pennycook et al. 2021).

There are, however, several caveats to be kept in mind here. Social media literacy interventions may increase confusion through perceptions of hypocrisy between the actions and policies of individual platforms (Literat et al. 2021). Such a situation may even prompt cynicism towards all information (Vraga et al. 2021). Furthermore, interventions may not capture the attention of enough social media users (Tully et al. 2019).

7.4.4   Platform-Led Interventions and Technocognition

In the context of the COVID-19 pandemic, online platforms were quick to take action (Bell et al. 2020), with some introducing or prioritising fact-checking. This follows evidence suggesting such action reduces the impact of misinformation on beliefs (Courchesne et al. 2021). Algorithmic downranking, content moderation, redirection, and account de-platforming are among the most commonly employed interventions aimed at limiting exposure to misinformation. However, they have been criticised for encouraging censorship. Data on their effectiveness is also scarce, especially for non-Western populations (Courchesne et al. 2021).

The production and spread of misinformation can also be addressed by (re) designing online platforms using insights from psychology, communication, computer science, and behavioural economics. This approach has been labelled 'technocognition' (Lewandowsky et al. 2017). For example, online platforms such as WhatsApp have limited the number of times a message can be forwarded, thus slowing down the spread of information (de Freitas Melo et al. 2019). Alternatively, they could require readers to pass a comprehension quiz before commenting, as implemented by Norwegian public broadcaster NRK (Lichterman 2017). However, social media companies may not have the motivation or ability to enact these changes without public or governmental pressure.

7.5 Conclusion

Misinformation cannot ever be completely eradicated. However, uncovering the best methods for addressing misinformation in the most effective ways possible is still vital. Debunking misinformation can significantly reduce misperceptions when employed effectively. Misinformation that is more likely to have a negative impact, either because of the nature of the source, the audience, or the misinformation itself, should be prioritised for correction. Debunking is unlikely to backfire, so should be encouraged in most scenarios. Corrections can be made more effective by using best practices to REACT, using repetition, empathy, alternative explanations, credible sources, and timely responses in any debunking efforts.

Corrections are appropriate when misinformation is already circulating. However, the scope of the misinformation problem requires additional proactive solutions to build audience awareness and resistance. Promoting 'sticky' high-quality information, warning people against common myths and misleading techniques, encouraging health and information literacy, and designing platforms more resilient to misinformation efforts are all essential components in the management of infodemics now and going forward into the future.

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Chapter 8
Prebunking Against Misinformation in the Modern Digital Age

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8.1 Beyond Fact-Checking: Tackling the Infodemic

The global pandemic saw a rapid rise in information regarding COVID-19 (Frenkel et al. 2020; Tardáguila 2020; Zarocostas 2020), prompting the World Health Organization (WHO) to declare an *infodemic* (WHO Director General 2020): a situation where there exists too much information, both offline and online, that can make it difficult to identify trustworthy information and which causes confusion (Pertwee et al. 2022). Misinformation is a dangerous part of the infodemic and can contain outright false messaging, which is easier to spot or fact-check but also uses techniques of manipulation to contort information, make it appear true, and much more difficult to identify (Roozenbeek and van der Linden 2019a). Determining a definition of misinformation has proved to be a scholarly challenge, with some defining misinformation as information presented by fictitious or fake sources (Pennycook et al. 2021), while others categorise misinformation according to whether or not it contains misleading information that distorts the truth, regardless of the source (Traberg 2022). Here we define misinformation in line with the latter characterisation of the term.

Misinformation in and of itself is not inherently dangerous if nobody believes it. If everyone simply scrolled past it and gave it no attention, the problem would be much easier to contain. However, misinformation during the pandemic has been associated with a decrease in compliance with public health guidelines (Freeman et al. 2022; Imhoff and Lamberty 2020; Roozenbeek et al. 2020a), and an increase in violent behaviour (Featherstone and Zhang 2020; Jolley and Paterson 2020). Although the COVID-19 vaccine has the potential to end the pandemic, the simultaneous infodemic has led to people questioning the safety of vaccines, thereby

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lowering vaccination intentions (Loomba et al. 2021) and uptake (Pierri et al. 2022). Misinformation has also given rise to dangerous health-related beliefs such as the promotion of bleach as a cure for the virus (Litman et al. 2020) and conspiracy theories suggesting the purposeful manufacturing of the virus as a bioweapon (Roozenbeek et al. 2020a).

To tackle the infodemic, a focus has, therefore, been to understand how we can prevent people from being persuaded to believe misinformation, leading to the design and testing of interventions to counter the influence of misinformation. Amongst other initiatives, fact-checks have become increasingly popular – these have included either removing information that is flagged as false (Taylor 2021) or providing disclaimers on articles (RAND 2022). Although studies have found positive effects of fact-checks (Porter and Wood 2021; Walter et al. 2020), debunking is not always fully effective, as misinformation can continue to influence how we see the world even if we have been told that it is false: a psychological effect known as the 'continued influence effect' (Lewandowsky et al. 2012; Cook et al. 2017). For example, picture a social media user scrolling past a clip posted by a Facebook friend, which is initially perceived as true. Later, the same person notices that the clip now contains a correction noting that it contained false information. This correction may not be internalised into memory and the individual may not update their beliefs, leaving the correction ineffective (Ecker et al. 2022). Indeed, as more time passes between the initial exposure to a message, the more likely it is that the source is forgotten and the message increases in persuasiveness over time, known as 'the sleeper effect' (Kumkale and Albarracín 2004). A final problem with fact-checking is that it does not pierce echo-chambers, which exist when groups of polarised social media users aggregate around different types of content, as users in these online communities can respond to fact-checks negatively (Zollo et al. 2017).

Likening the infodemic to its biological pandemic counterpart, the cost of treatment dwarfs the cost of prevention. Although the infodemic analogy has not gone without critique (Simon and Camargo 2021), researchers have successfully used models from epidemiology to understand the spread of misinformation in social networks (Vosoughi et al. 2018; Cinelli et al. 2021; Jin et al. 2013). According to social scientists, the answer to the infodemic might mirror the answer to the pandemic – that is, through psychologically inoculating (i.e. vaccinating) individuals *before* exposure to the misinformation 'disease'. In this chapter, we detail how a psychological theory from the 1960s has been applied to tackling online misinformation, and highlight projects that have demonstrated that gamified 'vaccines' against misinformation can have inoculating effects on people (Traberg et al., 2022), making them more resistant to manipulation.

8.2   Inoculation Theory: A Vaccine Against Persuasion

While the idea of a vaccine against persuasion techniques dates back to the 1960s, it is only in the last decade that this approach has been applied to tackling misinformation. Based on inoculation theory, psychological inoculations or 'prebunks' were originally proposed and tested by McGuire (1964) to train individuals to resist having their attitudes changed by persuasive messages (e.g. propaganda). His suggestion was that the psychological process involved in creating resistance against persuasion is comparable to our bodies creating biological resistance against viruses (McGuire 1961). As with biological vaccines where individuals are injected with a weakened version of a virus to generate immunity against future exposure to viral pathogens, psychological vaccines involve exposing individuals to 'weak' persuasive 'attacks' such as watered-down bite-sized versions of misleading arguments followed by a strong and persuasive rebuttal to these weak arguments.

When the body encounters a biological vaccine, the immune system responds by generating antibodies. With psychological vaccines, when the individual is preemptively exposed to a 'weak' persuasive attack followed by a strong rebuttal, mental 'antibodies' are generated as the individual is given the tools to spot deception. According to inoculation theory, this takes place through the use of two key mechanisms that must be present in the inoculation process, known as 'threat' or 'forewarning' and refutational preemption (prebunking). *Threat* entails warning people that they will be exposed to a manipulative message, motivating the 'mental' immune system into action. The second element, *refutational preemption* or prebunking provides individuals with the means to shoot down these misleading arguments. The idea is that once inoculated, individuals are better prepared to resist 'stronger' misleading arguments in the future.

While initial experiments showed that after 'inoculation', individuals were better at resisting persuasive attacks, the theory was never tested in the context of misinformation and remained largely untouched until recently. The threat posed by misinformation online (and more recently, the infodemic) gave rise to new potential applications of psychological vaccines (for recent reviews of the theory, see Traberg 2022; Lewandowsky and van der Linden 2021; Compton et al. 2021). Scientists thus found a potential new virus to inoculate people against dangerous and misleading information on the internet.

Inoculation was initially designed to be *prophylactic*; meaning it was intended to protect against future persuasive attacks before they occurred (McGuire 1964). However, in the context of infodemics, it may be more appropriate to discuss therapeutic inoculation as misinformation reaches more people and spreads at faster rates than fact-checked content (Vosoughi et al. 2018), implying that a large proportion of any inoculation will occur after exposure. Today, following the advancement of therapeutic vaccines that can still boost immune responses when someone has already been infected (e.g. HPV), 'therapeutic' inoculation also occurs in a psychological sense when individuals are inoculated after being exposed to, but not yet fully convinced by, misinformation (Compton et al. 2021). The distinction between

prebunking and debunking (post-hoc corrections) likely depends on the incubation period of the misinformation virus in question; that is, sometimes, it may only take a single exposure to dupe someone on social media, but at other times, it may require repeated exposure from trusted members in one's social network over extended periods of time (van der Linden 2023).

8.2.1 Initial Vaccines Against Specific Misinformation

One of the early pioneering studies looked at the prevalence of misinformation about climate change (van der Linden et al. 2017), as previous research had not focused on contentious issues or misinformation (Banas and Rains 2010). To test whether being inoculated against climate misinformation would reduce the likelihood of persuasion, the researchers recruited over 2000 participants online who were assigned to groups containing either inoculation messages or simple facts. The scientists attempted to 'vaccinate' individuals psychologically against the Oregon Petition – a real-life petition denying anthropogenic climate change claimed to have been signed by 31,000 'scientists'. This petition has been debunked (Greenberg 2017) – with fewer than 1% of the 'scientists' on the list having any degree or expertise in climate science, with names like Dr. Gari Halliwell (from the Spice Girls) cited. Participants in the inoculation condition were forewarned that someone would try to persuade them that climate change is a hoax (*threat* element) (van der Linden et al. 2017). The study also provided factual information about the fact that 97% of climate scientists agree that humans have contributed to the global rise in temperatures and proof that the petition consists of the names of fake experts (*refutational pre-emption*).

Results showed that while the misinformation message negatively impacted people's beliefs about climate change, it mostly only persuaded participants who had not been inoculated beforehand. In other words, the inoculation messages successfully protected individuals against the misinformation. Consequently, one of the first modern applications of inoculation theory showed that it was possible to protect individuals against future exposure to misinformation, and these results were soon replicated across several additional studies (Cook et al. 2017; Williams and Bond 2020).

8.2.2 A Broad-Spectrum Vaccine Through Gamification

In the initial studies, the goal was to protect individuals from being persuaded by specific myths (e.g. claims of climate change being a hoax). However, due to the volume of misinformation covering a wide range of topics, inoculating against specific myths limits its scalability. As such, inoculation interventions were developed to educate individuals on the techniques used by peddlers of misinformation.

Specifically, researchers developed entertaining and interactive games built on principles of inoculation theory in a new and accessible way. Firstly, the game environments allow players to be exposed to the threat posed by fake news as they witness the 'ease' with which truths can be spun into falsehoods using misleading tactics, representing the '*threat*' element of inoculation. Secondly, in the games, players are taught how and why fake news producers use misleading techniques. Exposing players to these misleading tactics in a humorous way is intended to inspire players to come up with counter-arguments, representing the '*refutational pre-emption*'. These games are known as *technique*-based inoculation interventions, as they train participants to spot the misleading tactics used across a wide range of misinformation messages, rather than focusing on a specific example of misinformation. In addition, game-based inoculation is also superior to text-based interventions in that they provide higher entertainment value and are publicly available.

One of the most well-known and thoroughly tested inoculation games is the award-winning *Bad News* game developed by Roozenbeek and van der Linden (2019a, b) in collaboration with the Dutch media platform DROG (DROG 2019). In *Bad News*, players are placed in the shoes of a misinformation producer and tasked with spreading weakened doses of their own misinformation within a simulated social media platform. Players are taught how to use six commonly used fake news tactics: (1) *impersonating* individuals or groups to make audiences believe the source of the information is credible; (2) *polarising* audiences by feeding on the divide between political groups; (3) using overly *emotive* language that distorts the original news to spark strong emotional reactions; (4) creating or inspiring *conspiracy theories* to explain recent events; (5) *trolling* users, famous people, or organisations, for example, to create the impression that a larger group agree or disagree with a claim; and (6) *discrediting* otherwise credible individuals, institutions, or well-established facts to create doubt amongst audiences.

This type of inoculation is also otherwise known as *active* inoculation as players are not directly told why the misinformation is misleading (instead known as *passive* inoculation), but they learn it through actively having to create it themselves in a controlled setting. The original authors of inoculation theory (McGuire and Papageorgis 1962) believed that this type of inoculation may be more effective, because participants are more involved, which may lead to them remembering it better – that is learning by doing (Tyler et al. 1979). A screenshot of these gamified interventions is provided in Fig. 8.1.

8.2.3   Testing the Efficacy of Inoculation Games

To assess whether such interventions are successful, that is, if they effectively reduce the likelihood of news consumers being persuaded to believe fake news, scientists have tested the game using several different scenarios. First, the game was tested in a live card version (Roozenbeek and van der Linden 2019a). After promising results, the online version of the game was released and has been widely studied
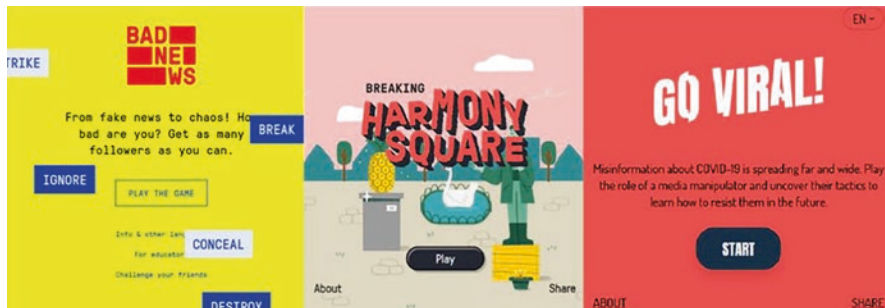
Fig. 8.1 *Bad News*, *Harmony Square*, and *Go Viral!* games. (Source: *Bad News* [www.getbad-news.com], *Harmony Square* [www.harmonysquare.game], and *Go Viral!* [www.goviralgame.com]. Reprinted with permission)

since its inception. The impact of the online *Bad News* game was originally tested in a before-after design, meaning the researchers test the players' improvement in spotting fake news after the game compared to before (Roozenbeek and van der Linden 2019a; Roozenbeek et al. 2021; Maertens et al. 2021; Basol et al. 2020). In one of the largest studies, Roozenbeek and van der Linden (2019a) recruited 15,000 online participants whose abilities to spot misleading news headlines were evaluated. Results showed that players evaluated misinformation headlines as significantly less reliable following gameplay, highlighting the 'inoculating' effects of the *Bad News* game. For example, after having been 'vaccinated' against conspiracy theories, game players would judge conspiratorial headlines such as '*Scientists discovered greenhouse effect years ago but aren't allowed to publish it, report claims*' as less reliable after playing, compared to before.

Although conspiracy narratives represent just one of six misinformation techniques in the game, they remain a highly effective tool to spread misinformation. Conspiracy theories can be used to vilify certain groups by accusing them of secretly plotting to achieve their own evil goals (Nera et al. 2022) while simultaneously placing the conspiracy believer in a morally superior victim role (Douglas et al. 2017, 2019). The believability of conspiracy theories can be explained by their perceived ability to satisfy unmet psychological needs (Douglas et al. 2017, 2019; Biddlestone et al. 2022), and the entertainment value they can provide (van Prooijen et al. 2022). Given their complexity, conspiracy theories have been given increased attention from social scientists and prior to the creation of inoculation games, it remained unclear whether inoculation interventions could successfully reduce the likelihood of believing conspiracy theories. Promisingly, Roozenbeek and van der Linden (2019a) showed that the *Bad News* game could be used to protect individuals against conspiratorial narratives.

8.3   Criticisms of the Initial Game Studies

8.3.1   *The Use of Randomised Research Designs*

One concern about testing the effectiveness of games by measuring improvements using before and after measures is that it remains uncertain whether the improvement is the result of the specific intervention. This concern can be alleviated by testing the intervention using randomised research trials by (1) allocating a control condition and (2) changing the test items (the false headlines) in the game. Basol et al. (2020) therefore allocated participants to a control group that played *Tetris*, showing that participants who played the *Bad News* game outperformed their *Tetris*-playing counterparts when it came to spotting unreliable headlines – with even stronger effects than prior studies. The team found that the intervention also improved participants' confidence in their own abilities to spot misinformation: a promising finding as higher confidence can boost one's ability to resist persuasion (Tormala and Petty 2004). Other studies have shown that even when headlines are changed in the post-test, participants' abilities to spot previously unseen misinformation are improved through the *Bad News* inoculation game (Roozenbeek et al. 2021, 2022a).

8.3.2   *Long-Term Effectiveness of Inoculation*

Recently, researchers have begun to study the long-term effectiveness of psychological inoculation with results showing that inoculation interventions are at least as good as, and sometimes better than, other traditional interventions in providing long-term protection against misinformation (Banas and Rains 2010; Maertens et al. 2021; Nisa et al. 2019). Effects typically last for at least a couple of weeks (Maertens et al. 2020; Maertens 2022), and sometimes for months (Pfau et al. 1992; Pfau et al. 2006; Maertens et al. 2021). However, research also shows that the inoculation effect starts decaying within days after the intervention, meaning that a diminishing effect needs to be accounted for (Maertens 2022). Recent research using the *Bad New*s game indicates that the inoculation effect can last up to 2 months but needs to be 'boosted' in a similar way that biomedical vaccine booster shots may help to prolong immunity against viruses. Practically, this means regularly engaging people with a fun quiz or shortened version of the initial treatment to boost both people's ability *and* motivation to resist fake news (Maertens et al. 2021; Maertens 2022).

8.4 Applications and Herd Iimmunity

8.4.1 Policy Applications of Inoculation Theory

One of the major advantages of inoculation interventions is that they can be applied in other settings. For instance, *Cranky Uncle* is a humour-based inoculation game about climate misinformation (Cook 2021). In a recent study, Cook et al. (2022) showed that playing the game improved students' ability to identify logical fallacies often used in climate misinformation. Other games have been developed in collaboration with government partners, such as *Go Viral!* (https://www.goviralgame.com/), a 5-minute game about COVID-19 misinformation produced in collaboration with the UK Cabinet Office (Basol et al. 2021), and *Harmony Square* (https://www.harmonysquare.game/), a game developed with the US Department of Homeland Security, which tackles political disinformation and polarisation (Roozenbeek and van der Linden 2020). These games have been tested (Basol et al. 2021) and translated into numerous languages (*Bad News, Go Viral!* and *Harmony Square* include the option to select a different language). Both Basol et al. (2021) and Roozenbeek et al. (2020b) found that the games were similarly effective across different (European) languages, and that people are better able to spot misinformation online and are less likely to report wanting to share it with their social networks.

The games are freely accessible online and can be used as part of public health campaigns. For example, *GoViral!* was part of WHO's '*Stop the Spread*' campaign and the United Nation's '*Verified*' campaign, reaching over 200 million impressions on social media (Government Communication Service 2021; WHO 2021). Another practical application of inoculation interventions is to run ad campaigns on social media platforms. Roozenbeek et al. (2022b) showed that running a video ad campaign on YouTube using inoculation videos they had created significantly improved YouTube users' ability to identify manipulative content correctly 'in the wild' on YouTube, at a cost of a maximum of US$ 0.05 per video view. Policymakers may, thus, run similar campaigns on YouTube or other social media platforms using these or other inoculation videos.

8.4.2 Can Inoculation Spread?

One limitation of vaccines against misinformation is that, much like vaccines against biological infections, it is difficult, if not impossible, to inoculate everyone. However, what if this was not necessary? In the past, research had suggested that once individuals had been psychologically inoculated, talking with others about the inoculation might, in turn, actually increase their own resistance to misinformation (Compton and Pfau 2009; Ivanov et al. 2012). Exciting novel research by Basol (2022) suggests that inoculated individuals voluntarily engage in post-inoculation talk without instruction, and that not only does talking about inoculation increase

the protective effects of inoculation for the inoculated individual, inoculated individuals can vicariously inoculate the recipients of talk. In another study, participants were more willing to share the *GoViral!* game with their friends and family than other interventions. If enough people share the inoculation in their network, it could outpace the spread of misinformation, or at least protect enough people within a social network so that the influence of misinformation is substantially reduced as recent computer simulations have indicated (Pilditch et al. 2022). In this way, inoculation has the potential to promote psychological herd-immunity against misinformation, as inoculating one individual could end up having exponential effects.

8.5   Conclusion

In this chapter, we have outlined the history of inoculation theory and its applications to tackling misinformation. Given the increasing number of studies that highlight the efficacy of psychological vaccines in reducing persuasion by misinformation, it is clear that inoculation interventions represent a promising and potentially scalable tool to limit the influence of online misinformation.

Like all interventions, however, they are not without limitations and unresolved questions remain. For example, news and information online is not consumed in a social vacuum. Instead, news consumption increasingly takes place in a social environment where social cues are present. Furthermore, individuals hold pre-existing beliefs about the world and may be prone to additional cognitive biases that impact their perceptions and judgements of information veracity (Traberg and van der Linden 2022). As such, there may be other factors at play other than the simple news headline when it comes to being persuaded by misinformation, which have yet to be tested in relation to inoculation interventions. Unlike biological vaccines, psychological vaccines against misinformation cannot claim to guarantee 90% efficacy against future misinformation attacks. However, given the rapid spread of misinformation and the lack of alternative scalable solutions, inoculation intervention remains one of the most powerful tools currently available.

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Chapter 9
Addressing Mis- and Disinformation on Social Media

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9.1   Introduction

The value of accessible and reliable information was made abundantly clear during the COVID-19 pandemic. Amid high levels of uncertainty, auditing the most important developments and emerging evidence from the deluge of content was no easy task. A significant proportion of all information in circulation was false or misleading, making navigating public health and policy choices even more problematic. This chapter focuses on the challenge of responding to mis- and disinformation while respecting freedom of expression, particularly in times of crisis.

If an overabundance of information can be considered an "infodemic," then we can also identify an associated subcategory: a "disinfodemic" or a pandemic of nonverified or misleading information. Two UNESCO policy papers (see Bontcheva and Posetti 2020; Posetti and Bontcheva 2020) describe a disinfodemic as a mix of both misinformation and disinformation that circulated in society during the pandemic – that is, both content that is created with the knowledge that it is false and with the intention to harm, as well as content that is misleading but not created or shared with the intention of causing harm. In the context of the COVID-19 pandemic, both proved to be of concern, and particularly when in combination. Such content can cause real damage, no matter the intention behind the Tweet or Facebook post that denied science, blamed the origin and spread of the virus on specific, often marginalized groups, or provoked unjustified skepticism about the safety and efficacy of vaccines.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of UNESCO and do not commit the Organization.

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Over the past 2 years, the world's experience with the pandemic has taught us important lessons about the potential social harms caused by misinformation and disinformation, as well as about the damaging effects of misguided policy responses on freedom of expression and other fundamental human rights. In this chapter, we seek to outline some of the key dynamics driving mis- and disinformation, explain why we need to protect freedom of expression while addressing the danger, explore how actors responded during the COVID-19 crisis, and offer some nonregulatory approaches aimed at long-term social resilience.

It is important to underline that due to its purpose and scope, this chapter focuses on the intersection between mis- and disinformation and the public health crisis. However, mis- and disinformation impact several other areas that are crucial to our lives, including climate change, elections, press freedom, migration, and natural disasters. We hope that the issues highlighted here can provoke discussions that help inform initiatives addressing mis- and disinformation in fields beyond public health.

9.2 What Is a "Disinfodemic"?

Understanding the dynamics of mis- and disinformation is vital for the enablement of effective policy responses. Due to the complexity of the subject matter, the field is fraught with diverging definitions and conceptualizations. There are no internationally agreed-upon definitions of misinformation or disinformation. In wading through this potential confusion, it is important to consider the key dynamics of the spread of false and potentially harmful content online.

WHO defines an infodemic as "an overabundance of information – some accurate and some not – that occurs during an epidemic… [and] makes it hard for people to find trustworthy sources and reliable guidance when they need it" (WHO 2020). Within the larger category of the infodemic, what, though, is a disinfodemic?

"Disinfodemic" is a term used by UNESCO to specify the potential harms caused not only by too much information in general, but by false and misleading information specifically (Posetti and Bontcheva 2020). It focuses on the potential harmful consequences of mis- and disinformation, as well as the specific challenges associated with an information landscape polluted with false and misleading content.

Mis- and disinformation related to the COVID-19 pandemic was spread virally. According to data presented in UNESCO's 2021/2022 edition of the *World Trends in Freedom of Expression and Media Development Report*, over 1 million posts circulated on Twitter in September 2021 with inaccurate, unreliable, or misleading information related to the pandemic (UNESCO 2022). From the start of the pandemic up until August 2021, Facebook reported that it had removed over 20 million posts on Facebook and Instagram on the grounds of promoting COVID-19-related misinformation (Rosen 2021). Encrypted messaging apps also provided a platform for the rapid spread of false information that proved difficult to monitor and trace. The scale of the problem and its social consequences should not be underestimated.

The issue of false and misleading information is not only in its scale as measured by total amount of content, but also in the number of users it reaches online. In addition, the way that biased and selective sharing (fuelled by algorithms designed to maximize user engagement) of both true and false news skews overall constructions of reality for users (Roozenbeek and van der Linden 2019). Combined with a lack of trust in quality information, and a lack of overall media and information literacy, this creates an information environment in which citizens are vulnerable to false and misleading content with potentially negative social consequences (Kim et al. 2020; Pennycook et al. 2021).

Within the sea of content encountered online, and particularly during moments of great uncertainty, people are most likely to share false content that is novel, emotionally evocative, and confirms existing ideologies, biases, and attitudes (Guess et al. 2019; Rathje 2021) – the type of content that social media algorithms have been designed to deliver to targeted individuals. As an often-cited study by researchers at the Massachusetts Institute of Technology, false news travels faster than true stories (Soroush et al. 2018). When citizens do not trust, cannot access, or do not have the necessary media and information literacy skills to analyze verified information provided by media outlets, they are especially susceptible to mis- and disinformation.

COVID-19 showed us the potential varied social harms these dynamics can cause. While there is limited evidence to suggest widespread public belief in COVID-related misinformation, those susceptible to mis- and disinformation (e.g., due to low levels of trust in traditional media outlets or science institutions) report lower levels of compliance with public health guidance, including accepting vaccination (Roozenbeek et al. 2020).

The way we understand the drivers behind the disinfodemic matters. If we assume that the main problem behind mis- and disinformation is simply that there is too much of it circulating online, then the solution may seem to lie in simply reducing the amount of false and misleading content in circulation. However, this solution is far from straightforward as content often reappears through shares, screenshots, and other forms of dissemination that can be difficult to track. Attempts to reduce the amount of false information online have, as noted previously, often been implemented through content moderation by social media companies, penal sanctions by governments, and even large-scale legal bans. These have had complicated implications (outlined in Sect. 9.4).

Shifting our attention to the supply side, trustworthy information, however, reveals multiple benefits of this approach. The role of the media is particularly important in crisis situations, when accurate information can help alleviate human suffering and save lives. The media can also reduce risks by contributing to preventing, mitigating, and preparing people for disasters. Among the many key roles in this context, the media can help rectify and prevent the spread of mis- and disinformation at a sensitive time, provide access to public information adapted to the needs of different groups across societies, monitor the respect for human rights during crises, and act as a watchdog of public entities in charge of crisis response and disaster risk reduction. In short, the media empowers individuals, humanitarian workers,

and decision-makers to take informed decisions, and during the COVID-19 pandemic, there was an increased demand for reliable information as readership and viewership of trusted news sources surged around the world (Pollack 2020; UNESCO 2022).

At the same time, reporting on sensitive topics requires skills and knowledge. During the pandemic, journalists needed greater skills in areas such as crisis communications and fact-checking. Medical knowledge and skills in science journalism also proved essential. With this in mind, it is important to consider how efforts to stifle the flow of false and misleading content may create a backlash, preventing the very antidotes needed to counter them: true and reliable information (Bontcheva and Posetti 2020). It is vital that any measures aimed at tackling mis- and disinformation do not hinder the production and accessibility of quality information that citizens can trust in order to navigate a crisis. This means protecting and respecting freedom of expression. The following section underlines the international human rights standards that outline when freedom of expression can and cannot be legitimately restricted.

9.3   International Standards on Freedom of Expression

Freedom of expression encompasses the right to seek, receive, and impart information. These rights are central to combatting mis- and disinformation. During the pandemic, proactive disclosure by governments of statistics on health and public spending on the pandemic was vital. In addition, open data, open access to scientific information, and accessibility to information for minority and marginalized groups were also essential. The work of a free, independent, and pluralist media, which is also protected under the umbrella of freedom of expression, was also critical for holding governments accountable and investigating wrongdoings perpetrated by a variety of actors during the public health crisis.

Yet these aims often not only fail to be met but, in some cases, are actively counteracted. Government restrictions on freedom of expression that do not meet international human rights standards, threats to journalist safety and media viability, as well as opaque practices among both states and internet companies have, in many cases, repressed freedom of expression (and its corollaries, press freedom and access to information) and worsened the effects of the disinfodemic. The following sections outline how these standards are defined and applied under international human rights law.

9.3.1 Alignment with International Human Rights Standards and Sustainable Development

Freedom of expression and access to information are universal human rights guaranteed by Article 19 of the *Universal Declaration of Human Rights* (United Nations 1948) and of the *International Covenant on Civil and Political Rights* (United Nations 1966). Freedom of expression is both a right in itself, as well as enabler of all other human rights, including the right to health.

With these objectives in mind, legal approaches to combatting mis- and disinformation have appeared and given greater priority on the agendas of many governments. It is important to note that false content and/or the production and distribution of such content is not criminalized per se under international human rights law. However, international human rights law does offer us guidance on when and how freedom of expression can be restricted in order to address potentially harmful speech. The *International Covenant on Civil and Political Rights* (ICCPR) stipulates that any limitations to freedom of expression can "only be such as are provided by law and are necessary: (a) for respect of the rights or reputations of others; (b) for the protection of national security or of public order, or of public health or morals" (UN General Assembly 1966).

Box 1: The ICCPR 3-Part Test

According to international law standards (and particularly Article 19.3 of the ICCPR), the right to freedom of expression entails duties and responsibilities for those who exercise it, although these should never legitimize unjustified restriction of this freedom.

This means that in order to be legitimate, all restrictions on freedom of expression must comply with a three-part test that must follow these principles:

- "Principle of legality – any restriction to the freedom of expression must be expressly, straightforwardly, and clearly prescribed by law in its formal and material aspects.
- Principle of legitimacy – any restriction must serve to attain the imperative objectives expressly enumerated in the ICCPR to ensure the protection of the rights of others, national security, public order, public health and morals.
- Principle of necessity and proportionality – any restriction must be strictly necessary in a democratic society for the attainment of its imperative aims. It must also be strictly proportionate to the aim pursued and reasonably suited to the attainment of its imperative aim. The test of necessity is applied in a stringent way and requires a demonstrable imperative or absolute need to introduce restrictions" (Barata 2020, p. 6).

Box 2: The Rabat Plan of Action Six-Point Threshold Test

The way to apply these narrow conditions through which human rights may be restricted was further defined in the Rabat Plan of Action on the prohibition of advocacy of national, racial, or religious hatred that constitutes incitement to discrimination, hostility, or violence (OHCHR 2012). This plan came out of a series of expert workshops organized by the Office of the UN High Commissioner on Human Rights.

While the Rabat Plan of Action is focused on addressing hate speech, its principles can also guide the standards for evaluation of restrictions aimed at countering mis- and disinformation, particularly as these phenomena often go hand in hand with hate speech. According to the Rabat Plan of Action, when such restrictions are imposed, they must pass a six-part threshold test that determines the context of the speech in question to determine whether it should be limited to stop its potentially harmful effects. The following criteria must be taken into account:

1. The social and political context of the speech.
2. The status of the speaker.
3. Intent to incite an audience toward a targeted group.
4. The content and form of the speech.
5. The extent of dissemination.
6. The likelihood of harm, including its imminence.

In addition, the protection and promotion of freedom of expression has been recognized as relevant to many other areas related to human welfare and sustainable development.

The United Nations *2030 Agenda for Sustainable Development* (United Nations 2015) recognizes that freedom of expression, access to information, and the safety of journalists are pivotal to building peaceful, just, and inclusive societies. Sustainable Development Goal (SDG) 16, Target 10 calls for "fundamental freedoms and public access to information." This target is measured through SDG indicator 16.10.1 on the safety of journalists and SDG indicator 16.10.2 on public access to information. Indicator 16.10.2 measures: (i) constitutional and/or statutory guarantees of public access to public-sector information; and (ii) effective implementation of statutory guarantees of public access to public sector information.

Therefore, although very specific restrictions to freedom of expression may be authorized by international law, in accordance with concrete rules, the overall recommendation of the universal system of human rights is that we need *more* freedom of expression (including access to information and press freedom) to counter phenomena such as mis- and disinformation, not less.

9.4 Responses to Counter Mis- and Disinformation

Many governments, internet companies, and other actors have introduced measures in response to mis- and disinformation. Some of these measures have been in line with international standards on freedom of expression, while others have not. Governments, private companies, and other actors have, in some instances, addressed the COVID-19 pandemic by reinforcing their efforts to build social resilience to mis- and disinformation, including boosting their strategies for improving media and information literacy. Other efforts were more problematic. In some cases, governments have used anti-"fake news" or disinformation laws to restrict legitimate speech, leading to criminal penalties against journalists and media organizations. While the ICCPR does allow for temporary restrictions of freedom of expression in cases of emergency, as described above, many of these laws do not pass the "3-part test" (Barata 2020).

In addition, technological solutions, particularly those that rely on automated detection of potentially harmful content, with limited human intervention, have also had limited effectiveness, particularly when tested against the highly diverse linguistic and cultural contexts in which disinformation and misinformation are spread. Below, we outline some of the responses that governments, companies, and other actors have taken to address the mis- and disinformation online.

9.4.1 Actions Taken by Governments

During the pandemic, many governments were confronted with the additional challenges posed by mis- and disinformation. As a result, policymakers often displayed heightened awareness of the importance of addressing the disinfodemic in all its complexity. The responses by governments included legal measures, as well as initiatives to improve access to quality information and support media and information literacy.

Yet, there has been a trend in recent years toward the introduction of legislation aimed at curbing mis- and disinformation, hate speech, and other forms of potentially harmful content, both online and off-line. While many of these laws and policies have been introduced with the stated objective of combatting the negative effects of such phenomena, some have had concerning implications. According to the 2021/2022 UNESCO *World Trends Report*, since 2016, at least 44 countries have enacted legal measures that threaten online freedom of expression and media freedom (UNESCO 2022). These laws and policies often contain overly vague definitions and disproportionate punishments for crimes such as "spreading rumors."

Legal researchers have expressed concern that these restrictions may have long-term "chilling effects" on freedom of expression. A "chilling effect" occurs when legal measures that restrict, or are perceived as restricting, freedom of expression

deter further speech. For example, journalists may refrain from reporting on a corrupt politician for fear of legal repercussions for criminal defamation.

As a blunt instrument, legal measures alone can be problematic as an approach to addressing mis- and disinformation. Even when they respect international standards for freedom of expression, the impact of these laws and policies on the supply of information needs to be considered. For this reason, government initiatives to support the sustainability of news media have also been crucial. Such measures include funding for media (including regional media) in COVID-related bailout packages, as seen in countries such as Indonesia and Australia. Efforts to step up national commitments to media and information literacy have also been vital (outlined in Sect. 9.5.2).

The pandemic also highlighted the need to build public trust. Government initiatives to improve transparency and accountability constituted important steps toward this end. Governments publishing open data related to both the spread of the virus and their public health measures, including vaccination campaigns, on accessible public platforms is one example of how to improve transparency for the purposes of building public trust (Calgua 2022).

9.4.2 Actions Taken by Social Media Companies

The rapid spread of false and misleading content is facilitated largely on digital platforms, which have become a primary news source for many people around the world. A 2019 study of respondents in 36 countries found that in 14, Facebook was in the top three channels for people's sources of news (Kennedy and Pratt 2019). The policies and practices of social media companies matter greatly in terms of determining what kind of content reaches whom, and at what speed.

During the COVID-19 pandemic, social media companies took steps to counter mis- and disinformation through revising their content moderation policies, directing users to official public health information (such as WHO), donating or partnering with credible media outlets and/or fact-checking institutions, and banning advertisements that contained COVID-19-related misinformation (Pollack 2020).

Given the massive volume of content circulating on social media platforms, companies like Meta, Twitter, and Google have increasingly turned to automated systems for detecting false and other potentially harmful content. While these allow for greater speed and scale in detection, automated approaches have limited ability to consider nuance. They also carry the potential for false negatives or false positives in identifying problematic content, with the latter risking the penalization of legitimate content. The automated detection systems of many platforms have been shown to lack nuance, particularly in multilingual environments, further increasing the risk for errors in this regard (UNESCO 2021b).

Additionally, reactive policies that focus on identifying, removing, or de-amplifying content as it appears are not fully able to work at the speed at which information is spread online. By the time even an automated system has picked up

a piece of concerning content, it may already have been reposted elsewhere or been seen by millions of users.

Platform community standards are constantly evolving, particularly in terms of how much they rely on human versus automated approaches to content moderation. As detailed elsewhere in this chapter, greater transparency on the parts of tech companies is needed in order to allow users and other actors to understand and critically analyze the policies and processes that determine the functioning of these platforms.

9.4.3   Actions Taken by Civil Society

Given the urgency and severity of social consequences of mis- and disinformation, there has been a rise in civil society initiatives to address this issue using a wide variety of approaches. These include fact-checking initiatives, advocacy campaigns targeting governments or tech companies, and efforts to promote access to trustworthy information. It is worth noting that some civil society groups mobilized against public health advice, disseminating mis- and disinformation around topics such as vaccines in their campaigning efforts. This highlights the need to engage a wide variety of actors in addressing mis- and disinformation.

One example from the COVID-19 pandemic is the *#CoronaVirusFacts* Alliance, a network of more than 100 fact-checking organizations and news outlets. As reported in the 2021/2022 UNESCO *World Trends Report*, this network fact-checked as many as 1700 false claims per month related to COVID-19 in the spring of 2020 (UNESCO 2022). Fact-checking initiatives, whether in-house for media outlets or independently done, have also partnered with social media companies and other actors.

Several international initiatives have been mobilized to improve public trust in the media and improve transparency policies within the media industry. These include the Journalism Trust Initiative, the Trust Project, the Credibility Coalition, and United for News. Such coalitions and partnerships can be effective in building political will, mobilizing other actors around the importance of supporting trustworthy, independent media, and increasing the geographical and thematic spread of these initiatives.

9.5   Long-Term Solutions to Mis- and Disinformation Online

Responses that focus on a reactive approach based on limiting the amount of false information in circulation run into a number of pitfalls – not least when it comes to ensuring that freedom of expression is not unduly restricted. In order to counter the effects of such content in the long term, a range of other solutions must also be considered.

This focus on long-term solutions was supported by all 193 UNESCO Member States during the Organization's 41st General Conference, when they formally endorsed the *Windhoek+30 Declaration* (UNESCO 2021a). This document was developed through a multistakeholder process in the lead up to, and during, the 2021 World Press Freedom Conference and states that to counter phenomena such as disinformation, we need to address three key areas: supporting the sustainability of media, improving transparency of internet companies, and enhancing media and information literacy.

Such solutions focus on providing access to verified, reliable information. This means both supporting quality journalism and ensuring that citizens have the necessary skills to receive and critically analyze such information. The former addresses the supply or production side of the equation, increasing the volume of information in circulation to which the public has access. The latter addresses the receiver side and reduces the impact and onward circulation of mis- and disinformation. Solutions are also needed in the distribution of information, pointing to the role of corporate policies, business models, and curational algorithms.

9.5.1 Research Needs

There are still many gaps in our understanding of how false and misleading online content is spread and how it can be addressed. Effective research requires greater access to data, both by governments and by internet companies regarding the presence and spread of information, misinformation, and disinformation in their public disclosures and on their platforms. Data about how these actors are responding to these challenges is also essential.

It is also important to consider the highly diverse contexts in which mis- and disinformation is spread. Existing studies suggest that exposure to false and misleading information does not affect individuals in the same ways across cultures and languages (Kim et al. 2020). Current research on mis- and disinformation and other forms of potentially harmful content are often focused on Western, English-speaking contexts and cannot be generalized globally. Refocusing efforts to cover more of the world's population in all its cultural and linguistic diversity is crucial in order to fully understand the drivers and impacts of mis- and disinformation.

9.5.2 Supporting Journalism

Journalists are on the frontline of securing the public's access to reliable information. Ensuring public access to quality information means supporting and encouraging innovation in the media sector. However, both in terms of economic viability, as well as journalist safety and press freedom, journalism is under threat. Fortunately, there has been an increase in international commitments to address these issues,

with growing momentum to develop innovative funding models and to build greater political commitment for supporting media. The *Windhoek+30 Declaration*, mentioned above, notably calls for promoting "information as a public good" (UNESCO 2021a).

The financial sustainability of media institutions is another crucial dimension of ensuring access to information. The media industry has been experimenting with innovative alternative business models, including subscription, membership, and partnership-based funding streams. The latter two, in particular, can encourage positive effects in enabling trust in media institutions, as can editorial transparency policies.

International organizations and civil society could play an important role in supporting the media industry in this respect. During the pandemic, UNESCO led several projects to enhance reporting on COVID-19 and strengthen people's resilience to mis- and disinformation.

With funding from the European Union as part of the project *#CoronaVirusFacts, Addressing the "Disinfodemic" on COVID-19 in conflict-prone environments,* UNESCO and partners strengthened the capacity of over 30,000 journalists, fact-checkers, and communicators from 157 countries to report on the pandemic and debunk misinformation. Targeted support included training, development of specialized guidelines, resource hubs for journalists and fact-checkers, and the creation of new networks to enable information sharing across professions and geographic areas.

Through this and related projects, UNESCO – in partnership with WHO, the United Nations Development Programme and the Knight Center for Journalism in the Americas at the University of Texas at Austin – offered Massive Open Online Courses (MOOCs) and webinars available in up to 13 languages. Such resources provide journalists with rapid support on a global scale, complemented by activities for specific geographic contexts to address local needs.

9.5.3   *Media and Information Literacy*

Strengthening the ability of individuals to understand and critically analyze the information they encounter is a vital tool in building social resilience against mis- and disinformation. Such skills fall under the umbrella of media and information literacy. While schools and other formal educational institutions are vital for building such skills, media and information literacy skills can also be developed for both children and adults as part of lifelong learning.

International commitments to strengthening media and information literacy have increased through various instruments, including *Windhoek+30 Declaration* (UNESCO 2021b) and the *Seoul Declaration on Media and Information Literacy for Everyone and by Everyone: A Defence against Disinfodemics* (UNESCO 2020). Each year, more and more countries participate in the Global Media and Information Literacy Week, rallying to raise awareness of the importance of media and

information literacy around the world. The UNESCO Media and Information Literacy Alliance, a multistakeholder network consisting of associations of media, libraries, NGOs, universities, and government institutions from over 100 countries, has also worked to provide a collaborative response to the COVID-19 pandemic.

9.5.4 *Transparency*

Greater transparency from social media and other internet communications companies is fundamental for understanding the origins, types, circulation, and treatment of mis- and disinformation (UN Dialogues on Disinformation and Data Transparency 2020). Transparency can also shed light on how corporate policy, business models, and associated algorithms impact the spread of such content.

Yet the practices and policies of internet companies problematize responses to the disinfodemic. Without clear and accessible insight into the processes that determine the spread of false and misleading content online, it is difficult for the public, as well as policymakers, to make informed decisions on how they use and regulate such platforms. While many companies have begun to release regular transparency reports, these often take widely disparate approaches to how they reveal information about company policies and practices to the public.

UNESCO's 2021 policy brief, *Letting the Sun Shine In: Transparency and Accountability in the Digital Age* (UNESCO and Puddephatt 2021), presents a selection of 26 high-level principles ranging from content and process, through to data protection, commercial dimensions, and user empowerment. By providing guidance to policymakers, regulators, and companies, such principles take a step toward achieving the transparency needed to understand and counter mis- and disinformation.

UNESCO has also developed a set of indicators to map the extent to which the digital environment is aligned to the principles of human rights, openness, accessibility, and multistakeholder governance, in line with UNESCO's framework of Internet Universality. More than 35 countries have used, or are using, this framework at the time of writing.

9.6 Conclusion

An evidence-based and holistic approach to countering mis- and disinformation requires consultation involving a wide range of actors. Just as the challenges related to the rapid spread of false and misleading information are many, there are also many opportunities for response. Maintaining a human-rights-based approach is crucial at every step of this process, including upholding respect of freedom of expression.

While COVID-19 brought the problem of mis- and disinformation into greater relief, there are many other fields in which false and misleading content can cause harm, in areas as varied as climate change and elections. Reactive measures may provide temporary solutions, but, in the long term, individuals must be empowered to access and analyze quality information. At the same time, institutions must be strengthened to counter mis- and disinformation without undermining human rights or the right to freedom of expression.

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Chapter 10
Partnering with Communities for Effective Management of Health Emergencies: Four Case Studies

Julienne N. Anoko, Anton Schneider, Parfait D. Akana, and R. Umamaheshwari

10.1 Introduction

During recent public health emergencies, health authorities have run communication campaigns, as well as tailoring messages and risk communication strategies aimed at responding to infodemics in order to engender social and behavioural change from individuals and communities. This is despite the fact that those messages do not always correspond to the expectations of specific communities. Evidence from research and lessons learnt from health emergencies such as the COVID-19 pandemic (2018–2021) and the Ebola outbreak in West Africa and Central Africa (2013–2016) have proved that effective social and behavioural change solutions are co-constructed through a partnership between communities and health authorities (Anoko et al. 2020). This chapter presents a review of 4 case studies for the co-construction of effective solutions for social and behavioural change.

Several key lessons derive from considerable marketing, marketing communication, and social marketing experiences, and show that people agree to change their behaviour when they perceive an advantage in making that change. Thus, health

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All ideas and opinions expressed in this chapter are those held personally by the authors.

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authorities must consider communities as 'customers' to whom a product – in this case public health messages – is sold in order to convince them to 'buy it' for their own benefit and thereby change their behaviour (#case study 1, Sect. 10.2). Through personal engagement within a community in India during the COVID-19 pandemic lockdown, popular alternative narratives challenged the policies of pandemic programmes, as well as raised questions surrounding drastic uncoordinated biosecurity protocols and humanised the solutions on offer (#case study 2, Sect. 10.3). Built on socio-anthropological research, community dialogues, coupled with COVID-19 vaccinations, have led to the acceptance of the vaccine and increased appreciation of its value in Cameroon (#case study 3, Sect. 10.4). The final case study (#case study 4, Sect. 10.5) shows us how health authorities and communities re-established trust by working together to rebuild a Treatment Centre that had been destroyed by arson in an active armed conflict zone in the Democratic Republic of the Congo during the Ebola outbreak.

10.2   A. Schneider: Lessons from Social Marketing (Case Study 1)

Social marketing has been practised for over 50 years and has taught us many valuable lessons about how to influence health behaviours. The question now is whether it is still able to teach us anything that can help deal with contemporary public health emergencies such as COVID-19. Social marketing has become embedded in a larger discipline we now call social and behavioural change. In addition to social marketing, this area includes a broad array of tools and approaches, including behaviour change communication, social change, risk communication, human centred design, behavioural economics, and community engagement. In this section, I focus on some of the key lessons that can inform our approach to public health emergencies.

10.2.1   Voluntary Exchange

Central to the social marketing construct is the notion of voluntary exchange. It is understood that in the commercial marketplace, we trade something of value in order to obtain something else of similar or perhaps even greater value. The fact that the commercial marketplace has been modified throughout history, yet has endured as a central feature of human existence, suggests that it is a core element of who we are as humans. We have to ensure this concept remains front and centre in our public health interventions. Marketers have become experts in encouraging customers to engage and purchase goods and services without the use of coercion. An exploration of how they have been able to do this could provide some useful lessons that could be applied to health emergencies.

The four P's of social marketing highlight four of the core strategies:

- *Price*

Reduce all costs. We have learned that costs are measured not only in monetary terms. Making behaviours easier, or less of an effort, is an age-old technique that has been applied to public health interventions. It requires innovative thinking and knowledge of community behaviours and preferences. For example one of the best ways to make behaviours easier and less costly during the COVID-19 pandemic was through the provision of free vaccinations and handing out free masks at the entrance to shops and places of business. Considering price provides an opportunity to be creative and innovative by answering the question, "How might we reduce the barriers to adoption of the desired behaviour?"

- *Place*

Address the 'where' of obtaining the product or service or enacting the behaviour. As with price, convenience is a key factor. Bringing services to customers is preferable to requiring them to go out of their way to engage in them. For example bringing vaccination services into the workplace (ideally, also free of cost) proved effective. The expansion of access should be among the first targets to maximise utilisation of services and/or adoption of behaviours.

- *Product*

Be clear about what is being asked of people. In commercial marketing, the products and services are skilfully packaged/repackaged and positioned based on consumer preferences. In public health, the look and feel of products and services is often packaged in the equivalent of an unappealing brown paper and what is on offer may be quite unclear. Appealing to individuals and groups to adopt something new continues to be a struggle that must be approached with respect for community preferences and values. When Apple launched its newest MacBook, for example, they appealed to user values and aspirations, and did not focus solely on product features. We need to do our best to go beyond an explanation of features, safety, effectiveness, and cost, and consider (and appeal to) user values and aspirations such as security, group identity, and freedom of choice.

- *Promotion*

Utilise all appropriate means to promote the product or service. This is the area that is the most visible aspect of marketing. It includes advertising and the full range of marketing communication, such as PR, social media, public service announcements, TV appearances, panel talk shows, shopping channels, hotlines, promotional tours, and street dramas. Utilising the full range of promotional tools and approaches is arguably one of the most important roles undertaken by those involved in public health. Research has shown that the more public exposure to carefully crafted messages, the better. The caveat is that those messages have to be harmonised and free of internal contradictions. In all of our promotional efforts, we must be smart marketers; look beyond the immediate, and seek to build and maintain long-term relationships with our clients. That means being respectful, even (or especially) when customers say 'no' to what is being offered.

10.2.2 Factors Influencing Behaviour

We all know there are many ways to influence behaviour. For clarity, behavioural scientists often group these into three categories: structural factors, social factors, and individual factors. Individual factors might be considered the classical factors of behavioural change: for example, knowledge, skills, and attitudes. Over time, however, we have found that knowledge is often overrated as a critical factor influencing consumer choice. We have found that factors such as attitudes and skills – often considered necessary predecessors to behaviour – can follow the behavioural choice rather than precede it.

Human-centred design and consumer journey mapping are specific tools that have been used to identify points at which consumers make critical decisions. These tools can provide us with valuable insights into where along the consumer pathways we can most effectively intervene to affect change. Marketers have reduced consumer pathways that in the past may have seemed insurmountable; for example ATMs replacing bank branches and online shopping displacing retail shopping behaviour. In both cases, marketers focused on assessing the core behaviour and cutting down the 'friction' between the consumer and the desired behaviour, allowing 'information' and 'attitudes' to follow the service experience.

Social factors include some of the most powerful influences on human behaviour. Fear of social rejection is one of our most primal fears, and many of our actions are guided by the actions of others and driven by social influence. We are all shaped by the need for recognition, acceptance and by the fear of rejection. Notably, social factors are often specific to social groupings, so our appeal to social influence must be community specific. We have seen social factors utilised successfully in community programmes that engage community leaders. These may be celebrities, religious leaders, or other influential members of the community. Engaging fully in the needs of constituencies and communities involves talking to them, listening and understanding concerns, and then helping them to best meet the needs of their communities.

The last group of factors are structural. In essence, this group of factors encourages us to find ways to make behaviours easier for our consumers. For example bringing services to local communities, providing mobile clinics, extending clinic hours, leveraging private sector outlets for services or referrals, and increasing the availability and visibility of services. We can better achieve our goals by understanding some of the constraints or obstacles that stand between people and desired behaviours. Travel is almost always an issue – how can we reduce travel costs or compensate for lost time and associated expenses? Can we bring services to the workplace or other local community venues to better serve working adults? Can we persuade employers to provide paid leave to become vaccinated? How can we provide services that take into consideration the full-time caregiving responsibilities of working mothers? We have seen that offering products and services in a variety of settings (in the home, pharmacy, workplace, and marketplace) increases uptake.

10.2.3 Appealing to Who People Are

Lastly, we would also suggest that as important as our work may be, we need to remind ourselves that health concerns are not the only issues that people are dealing with. When we speak to them, we must speak to who they are, not to how we imagine them to be, or would like them to be. Our communities are made up of different groups who have a diversity of needs, wants, responsibilities, identities, and aspirations. We cannot assume that everyone perceives health risks in the same way, or that arguments that work for one person or group will be equally effective with another group. People routinely risk their own health and welfare to make a living, to pursue their own dreams, or for the sake of loved ones. We cannot assume that clearly outlined arguments will inevitably resonate. However, if we listen to our communities, if we work with them to understand them more deeply, and, most of all, if we respect who they are, we will have a much better chance of engaging with them to develop interventions in which public health goals will align with community goals.

10.3 R. Umamaheshwari: 'Pandemic' Times and a Hill Village of Himachal Pradesh State, India (Case Study 2)

A providential outcome of the Covid-19 lockdown in India from mid-March 2020 resulted in my seeking shelter in a rented house in a small village named Hiwan, near Shimla, in Himachal Pradesh state, India. This became home for the following year and a half. 'Home' and 'family', two terms used considerably in 2020, have meanings that extend beyond one's place of birth or domicile and blood ties; if we can *belong* where we are *accepted* or vice versa, regardless of race, religion, or gender. Being in a village in Corona times was unintentionally in synch with the metaphor of the times: the other-worldness of rural India, its real distance from the *centre,* including the mainstream media/information discourse. The epiphany of this was seen in one of the longest held protests in the world (November 2020–November 2021) during a 'pandemic', led by peasants and agriculturists of Punjab and Haryana against three market-driven Farm laws introduced by the Indian government, which have since been withdrawn.

Fear of contagion takes second place when people's identities, lands, and livelihoods are at stake. The Covid-19 'infodemic' – too much or misleading information – was subverted successfully by the movement, forcing mainstream elite media to step outside of their 'reporting from home' syndrome to give prime-time to the protests. Few regard lockdowns as human rights violations. Extreme medicalisation of the discourse, in 'pandering' to the 'pandemic', made less visible or less relevant issues such as climate change, ecological crises, and the future of Earth itself.

The pandemic turned the purely for-profit entities – IT giants, online retailers, telemedicine and cellular service providers, global traders in medical products,

including those selling the PPE kits and sanitisers, and OTT platforms, as well as private educational app manufacturers – into 'essential services'. The worst-hit were street-based vendors, whose daily earnings came from the informal sector. An internet-based global 'pandemic-economy', involving virtual currencies, accompanied by the conscious expansion in the amount of information provided, created the space for infodemics via the media. This phenomenon insidiously altered individual psyches through the power of suggestion and by impacting natural responses, so people simply accepted a stated suggestion as truth until a newer suggestion entered the arena replacing it.

No one questions the fact of the pandemic itself as a term or event, and the flow of information on the terminology can be seen as top-down from the centres of power. However, alter-narratives among the general population in India increasingly question the politics of vaccination programmes, inequality, the business of medical treatment, and the benefits (or futility) of shutting down schools. My experience of an alter-narrative stems from personal experience in the village but is located within this larger context.

10.3.1   Nature and Habitat

Comprising of around 100 farming-based people, with small farm lands growing self-consumption-oriented food crops such as corn and wheat, potatoes, pumpkins, and gourds, Hiwan (with two sections, the original, in the valley, and the relatively newer, modernised one further uphill by the road-head) is a virtual ecological niche amidst dense cedar, pine, silver oak, and other local species of trees. A few underground natural springs provide drinking water and amazing wildlife, including leopards, barking deer, occasional wild boars, langurs, reptiles, and amphibians, and a plethora of bird, butterfly, and moth species. There are also various medicinal ferns and fungi. Traditional homesteads in the valley are built at a distance from each other. Cows, a few livestock, and domesticated dogs are part of every home. This way of living is in stark contrast to the dense cluster settlements found in large cities that are without 'lung space' and are exposed to shrinking water bodies and decreasing tree cover. The question arises if we should explore such settlements as future alternatives to the urban living environments that so often engender diseases?

10.3.2   Community Cohesion and Human Bonds

I was welcomed into the village in the midst of the COVID-19 scare, and at a time when numerous news reports of prejudice and hatred for outsiders were circulating. Despite this, I was gradually invited to take part in family meals or offered cups of tea more and more often. When schools were closed, the degree of trust I was held in was reflected in the fact that neighbours sent their children over to be taught by

me and through them supporting my idea of opening a library for the children in the community centre. Children attended regularly for a while, albeit reluctantly adhering to protocols of wearing masks and using sanitisers. In the months of May and June 2021, a few members of a family in the valley, two of which had been vaccinated, as well as two migrant workers staying in a rented room near the road-head, contracted the virus. The family self-quarantined, while the workers were looked after by men of the village who took turns in providing them with food and essentials. They also coordinated with the visiting medical team to monitor those infected. Everyone recovered completely. No further cases were detected thereafter. People became more careful, while not breaking community bonds, and did not exhibit the same level of prejudice or paranoia that was evident at that time in Indian cities.

10.3.3   The e-Learning 'Infodemic' and Consumerism

Initially, with the closure of schools and colleges, children and young adults (irrespective of gender) returned to the agricultural and household work cycle, helping parents in their farms and homes. Childhoods more reminiscent of the past were restored. WhatsApp-based schooling impacted not only the nature of learning and reading habits but also pushed youngsters towards greater consumerism and an increased presence on Facebook, Twitter, and Instagram, alongside news-gathering, and viral videos of pandemic-related information. Unfortunately, they did not have an adequate level of skill or knowledge to sift genuine facts from false news. Many became addicted to gaming apps, often downloaded on the single phone of the family. Gradually, each family was forced to buy more than one device in order to deal with pressures of erratic online classrooms. With constant power outages, online sessions were constantly disrupted.

Most families do not own computers, and computer literacy has not made inroads here. The brief re-opening of schools and colleges in mid-2021 reduced the usage of phones for learning. Yet, with the ongoing winter break (until February 2022), schools have forced children to stay connected to a centralised e-learning platform. This will indirectly increase the profits of private vendors and cellular service providers. There is as yet no critique of this state-sponsored 'infodemic', a centralised curriculum or the impact of telecommunications.

10.3.4   Autonomy and Dignity of the Body

I observed that funerals in villages in Himachal retained a level of human dignity, ritualistic orthodoxy notwithstanding, which those in cities did not experience. For example social boycotting of families of COVID-19 patients who had died was reported in cities but was not heard of in the villages. There is a significant difference between the autonomy of a family over the treatment of a dead body as opposed

to letting it slip into the hands of a distant, unfeeling system where, once gone, it is stripped of the dignity of a name and family history. Bombardment in mainstream media of visual (and visceral) images of human bodies piled up and cremated en-masse may have led to underground funeral ceremonies in some villages, with the cause of death undisclosed.

10.3.5   The Last Mile Walker/Worker

Accredited Social Health Activists (ASHAs) are the 'last mile' walkers/workers in the area. The worker in Himachal asked to maintain her anonymity and be referred to simply as 'Asha'. Largely invisible to the media, she has intimate connections with families, recording births, deaths, sickness, and promoting health awareness. During the lockdowns, she had the additional duty of reporting new entrants into a village, their health status, and contact details. She was also expected to encourage people to become vaccinated through phone calls and, later, personal visits. Asha is paid a minimal Rs. 2700/- per month, without any additional perks or job protection. PPE kits rarely reached any of the ASHAs and sometimes Asha had to walk up to 7 kilometres from her village to the health centre for vaccinations. Though her working hours were 10 am to 4 pm, often she started from home at 7 am to reach the centre. She had to cover villages spread over a large Panchayat (local governance unit), yet received no free passes or concessions on state buses. Her duty phone calls were not reimbursed either. Initially, she also faced prejudice in villages due to her contact with COVID-19 patients in the course of her work. Neither snow nor rains halt her efforts. Should Asha fall sick in the line of duty, she would receive no monetary compensation from the government: 'It is a thankless job', she said. With fears of a new strain of the virus, Asha may have extra work brought about by another vaccination programme, without any prospect of increased wages or job security.

  The pandemic has now become more about the digital/cyber economy and control than about a disease per se. Had it been simply an 'epidemic', it may not have resulted in the constant and often frightening visual images that have been disseminated for purposes other than the control and prevention of disease. The apparent lack of a moderating structure is of concern, as the rationale behind the publication of certain information is at best questionable. There are, however, communities and environments where the impact of the virus has been neutralised through local solutions and resources rather than through a universally applied, blanket ban on all activity other than cyber activity. Perhaps it is time to remember that cautionary tale about not burning the house down to kill a mouse.

10.4 P.D. Akana: Strengthening Community Engagement Towards COVID-19 Vaccine Acceptance in Cameroon (Case Study 3)

Socio-anthropological studies analysed rumours and fake news disseminated during the COVID-19 pandemic in Cameroon by traditional media and social networks (World Health Organization 2020a, b). Strong reluctance and hesitation regarding vaccine acceptance and compliance with preventive measures was highlighted. Additionally, evidence further revealed that communities were strongly influenced by the infodemic through a real lack of accurate information on vaccination. This not only allowed multiple conspiracy and false theories to flourish, it also led to the feeling that beyond mass awareness campaigns, the essential message of the pandemic response teams remained inaccessible to people where communities were not engaged in the interventions. Therefore, COVID-19 vaccination in Cameroon was launched within a context of doubt, suspicion, and inequity in access to quality information. This situation prevented communities from committing themselves or being able to make genuinely informed decisions.

National health authorities and WHO carried out a survey during the mass gathering event of the African Nations Championship in January 2020 that revealed negative trends in community attitudes. For example 73% of the people interviewed in the city of Yaoundé were opposed to the COVID-19 vaccine, while 27% were in favour (Fig. 10.1).

This data correlated with that of a KAP survey in September 2020 (Ministry of Health/World Health Organization 2020), which confirmed a significant point already observed; low levels of community engagement are strongly correlated with negative attitudes and perceptions towards the disease and vaccination (Fig. 10.2).

Indeed, a geographical analysis of attitudes shows an overall saturation of negative attitudes in the five main regions where the KAP survey was conducted. Only three health districts among the 20 enrolled had neutral or positive attitudes (Fig. 10.3).

Fig. 10.1 Survey results for the city of Yaoundé. (Source: Ministry of Health/World Health Organization 2021)
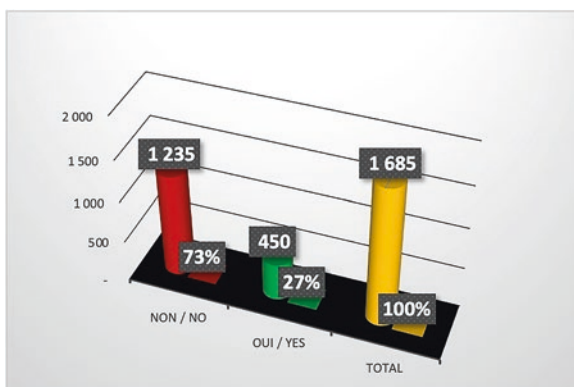
In order to reverse the trends and enhance community engagement for vaccine acceptance, health authorities and WHO designed and implemented the strategy of community dialogues, coupled with public and publicised[1] vaccinations of community leaders and political and administrative authority figures. The strategy was built in an inclusive and concerted manner by state actors (Ministries of Health, Ministry of Youth and Civic Education and the National Program of Immunization), WHO, and civil society. It quickly became an example of collaborative teamwork, with a strong commitment to discussion and deliberation manifested in a workshop to validate the tools (community dialogue training module, community dialogue methodological guide).

The strategy was extended to other actors such as the Red Cross, UNICEF, and Breakthrough Action. Using evidence from KAP surveys and socio-anthropological rapid studies, behaviours resulting directly from community resistance to the COVID-19 vaccine were identified and challenges and solutions were prioritised (WHO n.d.).

The consultations led to a social organisation to co-construct the community dialogue, in particular by identifying and discussing strategies to

- Build consensus with community leaders for the acceptance of vaccination.
- Lead the development of a community-led action plan that could promote a positive approach to immunisation and behavioural change.
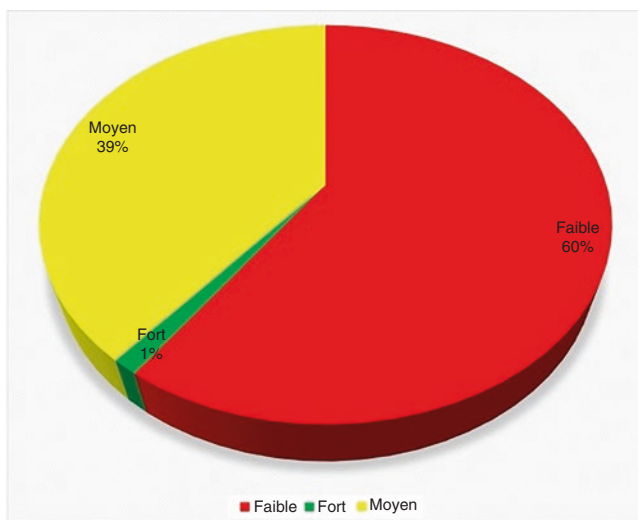
Fig. 10.2 Attitudes towards vaccine acceptance in 4 main districts. (Source: Ministry of Health/ World Health Organization 2020)

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[1] Media coverage of vaccination is a powerful advocacy tool that sends clear messages of the commitment of community leaders and political and administrative authority figures to communities. Publicising vaccination also makes it transparent and can help dispel doubts and hesitation, making other beneficial public health practices more visible.
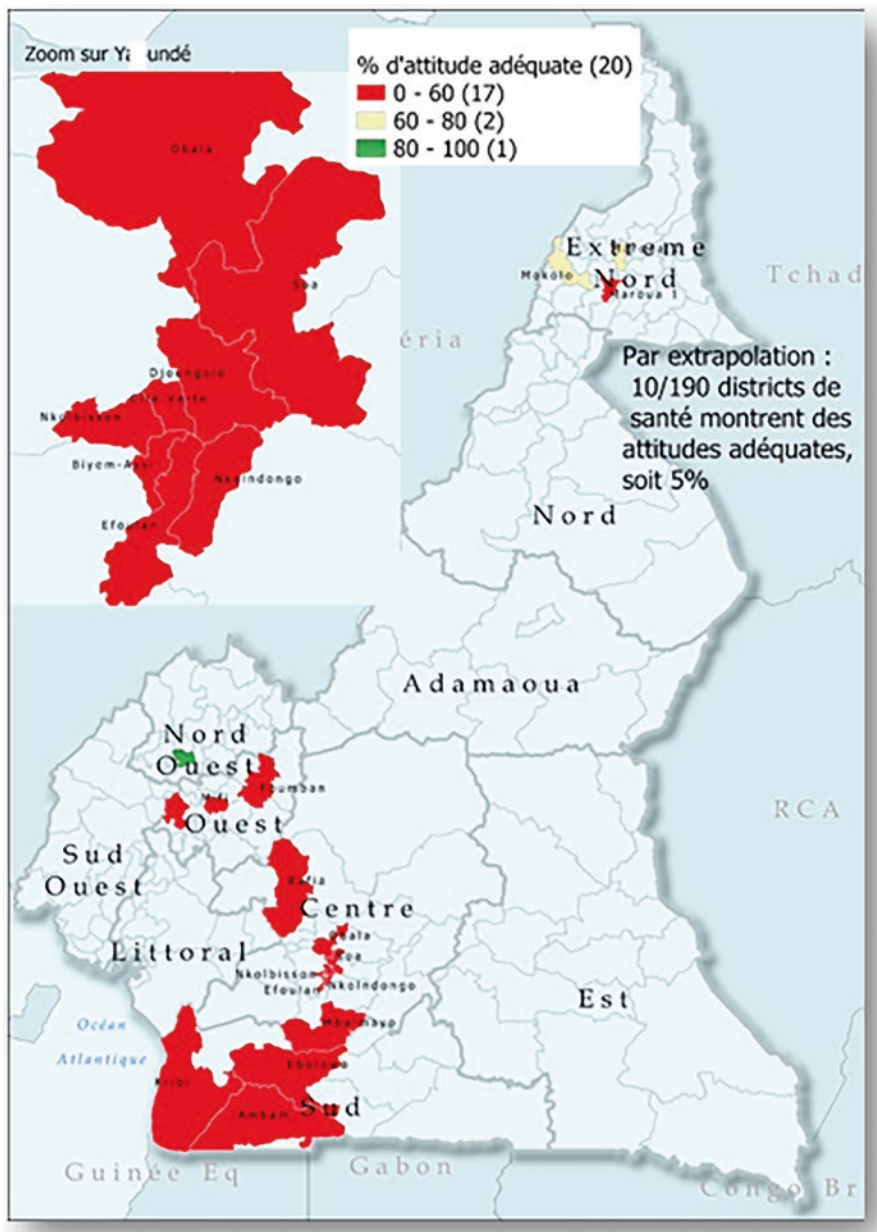
Fig. 10.3 Attitudes towards COVID-19 in the health districts. (Source: Ministry of Health/World Health Organization 2020)

The main results of this approach include

- The development of one community dialogue module.
- The enrolment of 26 health districts of four mains districts.
- 210 community mediators and facilitators put in place to enable community dialogue
- The conduct of 1107 community dialogues, coupled with vaccination.
- Vaccination points decentralised from health facilities to community spaces such as markets, mosques, churches, bars and other drinking places, streets, esplanades of places of worship, courts, and other public buildings.
- 1565 people mobilised by community mediators and facilitators publicly vaccinated and their vaccinations made public through the media
- At least 10 articles published by private and public media and a large number of testimonies of vaccinated people recorded and disseminated in real time.

One of the key successes of this approach was the priority mobilisation of community prescribers and the trust in leaders such as traditional chiefs, political and administrative authority leaders, leaders of associations, and religious leaders. They supported response teams to carry out advocacy in their communities. Journalists from public and private media, as well as technical partners, relayed the operations in real time. The main challenge was in convincing influencers and trusted leaders to take part in public vaccination as their participation could then snowball and reassure communities. Despite the constraints, this innovative pilot project achieved its objective: co-construction of solutions with communities. During community dialogues, response teams were able to observe people flocking to be vaccinated.

10.5   J. N. Anoko: Effective Partnership with Communities to Rebuild an Ebola Treatment Centre (Case Study 4)

On 27 February 2019, arsonists destroyed the Ebola Treatment Centre (ETC) in the health district of Katwa, North Kivu Province, Democratic Republic of Congo (DRC). Ebola broke out in the province where people were already suffering due to more than two decades of active armed conflict. This has resulted in widespread lack of trust in government authorities and in health response teams. Insufficient listening and engagement of communities in terms of the response to the health situation has also led to strong resistance, rumours, misinformation, conspiracy theories, and even the murder of health responders. The burning of the ETC can be viewed as the culmination of this deep crisis of trust with communities throughout an epidemic that lasted 22 months (August 2018–June 2020). A total of 3470 people were infected, 2287 died, and 1171 survived. The partnership to rebuild the ETC is an example of the commitment of communities to establish co-construction of solutions in equal partnership with response teams.

10.5.1 Method

The response partners put in place a team composed of socio-anthropologists, members of the risk communication and community engagement commission, logistics personnel, and medical teams from the Katwa district. Three preliminary meetings were held with the chiefs of Katwa, Rughenda, and Vighole[2] to discuss the reconstruction of the ETC. In turn, each district organised a community dialogue to gather the views of their populations in the absence of the response teams. Three other community dialogues were organised with the response teams to feedback the results of the internal dialogues. The main points of discussion during the meetings were (i) the urgent need to rebuild the ETC; (ii) the socio-cultural representations of the ETC; and (iii) the construction period and operational modalities. The parties defined the action plan with the main requirement that the ETC be rebuilt exclusively and entirely by the local population. Response teams were to provide technical and financial support and oversight of the construction works. In terms of modalities, the community leaders designated 180 people on an equitable representative basis (men, women, and youths) to carry out the work under the supervision of the logistics teams.

10.5.2 Results

This section provides a summary of the main outcomes of the project:

- Exorcising the misfortune before rebuilding the ETC

  For the people, the new ETC fulfils the conditions of a '*Vuhima*', that is *a* '*Nande*[3] *house of care*' or '*house of deliverance*' in spiritual terms. To this end, it had to be built entirely and exclusively by the Nande people in the style of the local houses. If the Nande build the ETC, they can appropriate it as a 'Nande property', a space where the Nande come to entrust their sick so that experts can give them appropriate care in times of illness, misfortune, and death.

  Therefore, the first essential step was to exorcise the misfortune. A ritual to appease anger and fear was performed to obtain the blessing and protection of the ancestors. This purification aimed to appease the spirits and ask forgiveness for the destruction of the previous ETC. The participants in this ceremony collectively and unanimously agree to protect the ETC for the good of their community. The costs of the ritual were shared between the community leaders and partners. The ritual was performed on the first day of the event by the dean of the Bwami (singular Mwami) and local leaders in the presence of the response teams (health authorities and partners) and selected workers. Local 'Kasixsi' wine was poured on the ground over

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[2] The ETC was built at the crossroads of these three districts with the agreement of the local chiefs.

[3] The Nande are the majority ethnic group in North Kivu.

the ashes of the devastated premises. Each community leader then drank from the communal cup in turn, repeating the words of the Mwami, 'Woe and death'. The Nande are strongly attached to their land and to the house as a symbol of stability and rootedness. Someone noted, 'If we build our ETC, if we build our care home, we will never destroy it' (personal communication – 22 March, 2019), carrying out the work.

Following the ritual, the work was launched under the slogan '*STOP EBOLA, STOP EBOLA*'. Logistics experts provided supervision to ensure that the protocols and biosafety standards for the construction of the ETCs were respected. Those involved worked as day labourers for about 10 days, using tools brought from home as recommended by community leaders to demonstrate ownership of the ETC.

- Securing the ETC

Young women and men were mobilised to ensure the security of the site. Some of them acted as guides to orient patients and visitors by speaking to them in local languages. Most of them came from pressure groups as, according to a community leader, 'some of the members of these pressure groups are also in the local self-defence groups and they will know how to prevent delinquency around the new ETC because they have a very good knowledge of the terrain and local realities' (personal communication – 22 March, 2019).

During humanitarian and public health emergencies, community engagement cuts across all areas, not just risk communication. Following this intervention, a woman leader working on the site said, 'It is now that we feel involved in the activities of this response. It really gives hope that together we can defeat this epidemic' (personal communication – 22 March, 2019).

The new ETC has not been attacked. Even after the end of the epidemic in June 2020, it remained secure and was ready to be used again during the 2021 Ebola outbreak.

10.5.3   Conclusion

Communities are partners and need to be empowered and supported to play their role. Such engagement through cooperation with communities calls for an urgent change in the approach to health emergency responses. This can be achieved by a moving away from the dominant biomedical design of public health emergency response towards a public health design that balances biomedical paradigms with those of social and behavioural sciences.

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