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Subject: CDC's State of Vaccination Confidence Insights Report #28

Hello partners and colleagues,

CDC has published the [State of Vaccine Confidence Insights Report #28](#) which emphasizes major themes influencing vaccine hesitancy and uptake, categorized by their level and type of threat to vaccine confidence, degree of spread, and directionality. By examining how Americans think and feel, social processes, and the practical issues around vaccination, the Insights Report seeks to identify emerging issues of misinformation, disinformation, and places where intervention efforts can positively impact vaccine confidence across the United States. You can find back-issues of the [CDC's State of Vaccine Confidence Insights Reports](#) online. For the ways you can take action on these themes, go to the "Ways to Act" section in the report.

SPECIAL UPDATE: CDC partners can now report vaccine-related rumors directly to CDC. To report a rumor, go to: www.cdc.gov/report-rumors and start the subject line with: "Rumors:" In the question box, give as much information about the rumor as you can, such as a description of the rumor, where you heard it, and how many times you have heard it.

State of Vaccine Confidence #28 Summary:

Major Themes

Consumers continue to express their concerns about actual and potential COVID-19 vaccine side effects.

- **Hepatitis.** Some consumers are concerned that rising hepatitis cases in children are caused by COVID-19 vaccines.
- **Myocarditis.** Although COVID-19 vaccine-related myocarditis is much lower for children than teens, personal anecdotes and reports of hospitalization following myocarditis continue to negatively impact vaccine confidence.
- **Vaccine-acquired Immune Deficiency Syndrome and HIV.** Online rumors continue to spread stating that COVID-19 vaccines cause vaccine-acquired immune deficiency syndrome (VAIDS) and HIV.
- **Impaired Immunity.** Some social media users are sharing a pre-print manuscript of a study that has not been peer-reviewed claiming that mRNA vaccines harm long-term immunity. Due to this and other safety concerns, some social media users are claiming vaccines do more harm than infection-induced immunity.
- **Fertility, reproductive health, and lactation.** Some consumers are hesitant to get the COVID-19 vaccine due to fear of long-term effects on fertility, lactation, and pregnancy. Additionally, social media users are concerned about the effects vaccine can have on fetuses.

Identified misinformation theme that may impact vaccine confidence

- Some consumers believe that the COVID-19 side effects listed in released Pfizer documents prove Pfizer lied about the number of Pfizer-BioNTech COVID-19 vaccine-related adverse events, engaged in fraudulent and dishonest vaccine research, and this vaccine has negative impacts on fertility, pregnancy, and lactation.

Continuing and Evolving Themes Impacting Vaccine Confidence

Consumers continue to express their lack of concern about COVID-19 despite rising cases and 1 million dead Americans.

- Competing national events, continued rollback of mitigation measures, and consistently decreasing coverage from social media, news media, and political sources may lessen the frequency and impact of COVID-19-specific information for consumers.
- Consumers question the effectiveness of COVID-19 vaccines as stories of breakthrough infections persist. Moreover, reports of vaccines' decreased efficacy against new dominant variants and waning vaccine immunity appear to negatively impact consumer confidence in COVID-19 vaccines and pharmaceutical brands.
- Online consumers continue to question whether testing and wastewater surveillance methods are effective or accurate.

Identified misinformation themes that may impact vaccine confidence

- Some consumers believe that natural immunity is superior to vaccine-induced immunity despite the health risks associated with getting SARS-CoV-2.
- Some social media users state that the efficacy of the Pfizer vaccine is only between 1 and 12 percent at preventing illness while leaving out the additional context that the

vaccine-acquired immunity decreases with time, the vaccines are less effective against some variants of SARS-CoV-2, and, most importantly, the vaccine provides protection against severe illness.

- Some social media users believe SARS-CoV-2 is the same as influenza.
- Some social media users believe COVID-19 vaccines are causing a surge in the number of COVID-19 cases.

Parents continue to express concern and hesitation regarding COVID-19 vaccination in children.

- Some consumers believe vaccines are unnecessary because COVID-19 rarely affects this group.
- Some believe infection-induced immunity protects children better than vaccines.
- Some social media users do not think there is enough data to support vaccination against COVID-19 in children.
- Some are concerned that immunity from vaccines decreases rapidly in adolescents.

Identified misinformation themes that may impact vaccine confidence

- Some social media users believe authorizing vaccines in children is only a ploy for pharmaceutical companies to make money.
- Some social media users claim that COVID-19 cases in children are always mild.

Emerging Misinformation Theme Affecting Vaccine Confidences

Consumers have questions about the relationship between COVID-19 vaccines and monkeypox.

- Some consumers believe there is a link between COVID-19 vaccines and monkeypox.

Identified misinformation themes that may impact vaccine confidence

- Some social media users believe COVID-19 vaccines weaken the body's immune system, making vaccinated individuals more susceptible to monkeypox.
- Some social media users believe monkeypox is caused by COVID-19 vaccines.
- Some social media users believe monkeypox is being used to scare people now that COVID-19 is not seen as a threat.
- Some social media users believe pharmaceutical companies are attempting to create a monkeypox pandemic to increase company profits.

Chris

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Subject: CDC's State of Vaccine Confidence RISE Special Report

Hello partners and colleagues,

CDC has published the [Routine Immunizations on Schedule for Everyone \(RISE\) SoVC Report](#) which examines the impacts of the COVID-19 pandemic on routine vaccination. You can find back-issues of the [CDC's State of Vaccine Confidence Insights Reports](#) here. For the ways you can take action on these themes, go to the "Ways to Act" section in the report.

SPECIAL UPDATE: CDC partners can now report vaccine-related rumors directly to CDC. To report a rumor, go to: www.cdc.gov/report-rumors and start the subject line with: "Rumors:" In the question box, give as much information about the rumor as you can, such as a description of the rumor, where you heard it, and how many times you have heard it.

Impact of the COVID-19 pandemic on routine vaccinations

Global Impact

- According to a November 2021 UNICEF report, declines in routine vaccination occurred worldwide in 2021, with 25 million children missing out on life-changing vaccines.
- Several studies of vaccination rates in non-US countries also found a decline in adult and childhood routine immunizations during the COVID-19 pandemic.
- However, most WHO regions, except the South-East Asia region and the Western Pacific region, returned to or exceeded the pre-pandemic pediatric vaccination baseline by December 2020.

Domestic Impact

- Several studies found a decline in rates of routine vaccinations during the COVID-19 pandemic in the US. All studies found that routine vaccination rates rebounded to some extent, but most US-centric studies found that they did not return to pre-pandemic levels.
- In the US, in 2020, coverage was approximately 94% for MMR, DTaP, and varicella vaccines for kindergarten students, approximately one percentage point lower than the previous school year. The exemption rate remained low at 2.2%, based on data from kindergarten vaccination assessments.
- Stratification of [CDC FluVaxView](#) data found that after COVID-19 vaccines became widely available in the 2021-2022 season, adult influenza vaccine uptake decreased from 43.7% to 39.2% in states with the lowest COVID-19 vaccine uptake and only decreased after the COVID-19 vaccine was made available.

Evidence negating an association of hesitancy between COVID-19 vaccines and other vaccines

- Some social media users opposed to the COVID-19 vaccine still support routinely recommended vaccines because of a perception of fewer or less severe side effects, longer-lasting protection, and more data on the safety of routine vaccines.
- A study among parents in California between September 2020 and February 2021 (n = 175) found no statistically significant change from before to during the pandemic in how parents perceived the importance of influenza vaccines.
- A survey (N = 2232) by the American Academy of Family Physicians (AAFP), fielded from March 4th and 5th, 2021, found that 33% of respondents had delayed their medical care due to concerns about COVID-19, and 16% of parents had delayed their child's/dependent's medical care. The same survey found that the majority of respondents expressed either no change (39.3%) for an increase (29.3%) in vaccine confidence since the pandemic's start.

Evidence supporting an association of hesitancy between COVID-19 vaccines and other vaccines

- The AAFP survey (N = 2232), however, also found that 20.8% of respondents reported decreased vaccine confidence since the start of the COVID-19 pandemic.
- A cross-sectional study in May 2020 of parents and guardians with children ages 6 months through 5 years old found that of the respondents (N = 2,164) whose children did not receive the 2019-2020 seasonal influenza vaccine, 34% reported they were less likely to get their child the 2020-2021 seasonal influenza vaccine due to the COVID-19 pandemic.
- Some social media users, websites and news outlets are explicitly stating that their concern or some patients' and parents' concerns about the COVID-19 vaccine now applies to other vaccines.

Suggested reasons for how impacts of the COVID-19 pandemic carried over to other routine immunizations

- Some believe that economic stability, including access to routine healthcare services, has not recovered for some individuals and families since the start of the pandemic which may impact access to care and routine vaccination services
- Some authors, social media users and news stories report that pandemic-related increases in lack of trust in government, scientific processes, and the healthcare industry continue to impact vaccination rates.
- Some authors and news outlets suggest possible contributors to routine vaccine hesitancy include medical mistrust, an increase in the availability of vaccine misinformation and concerning factual vaccine information due to newly developed and expanded vaccine skeptic networks, especially with political extremist groups, which led to more people believing vaccines are neither safe nor effective.

Proposed vaccine legislation drafted in response to COVID-19

Legislative efforts continue across the country to codify vaccine exemptions in the law, outlaw all vaccine requirements altogether, and/or hold employers liable for vaccine injury when they require or promote vaccination for workers. Some consider this as evidence that concern about the COVID-19 vaccines has been applied to routine vaccinations. Although these laws were

generally written in response to COVID-19 vaccination requirements, the following examples of legislation were written broadly enough to apply to all vaccines.

- Bills that guarantee exemptions from all or multiple vaccine requirements and from workplace vaccine requirements
- Bills that outlaw all or multiple vaccine requirements, and workplace vaccine requirements
- Bills that hold employers liable for injuries associated with workplace requirements or by incentivizing vaccinations

Specific bills can be found in the Getting Back on Track Report.

Select suggestions for increasing routine vaccinations from the data sources

Suggestions for increasing routine immunization rates were identified in a selection of peer-reviewed literature specifically related to increasing routine vaccinations caused by the decline in routine immunizations during the COVID-19 pandemic. Categories of suggestions, in order of frequency, are

- Peer-reviewed suggestions for providers and at point-of-care, partnerships and collaborations, public health communication strategies, and systemwide strategies
- Suggestions from the American Academy of Family Physicians Report
 - *Surveying the Effect of the COVID-19 Pandemic on Public Confidence in Vaccines and Vaccine Messengers: Lessons Learned and Challenges Ahead*

Specific suggestions can be found in the Getting Back on Track Report.

Chris

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Subject: CDC's State of Vaccine Confidence Updated 6mo - 5 years Report

Hello partners and colleagues,

CDC has published the [2nd COVID-19 Vaccine Summary Report: 6 months through 5 years Report](#) which identifies the public's questions, concerns, frustrations, and circulating misinformation about COVID-19 vaccines for children 6 months to 5 years old. A summary of this report is below. You can find back-issues of the [CDC's State of Vaccine Confidence Insights Reports](#) here. For the ways you can take action on these themes, go to the "Ways to Act" section in the report.

Reminder: CDC partners can now report vaccine-related rumors directly to CDC. To report a rumor, go to: www.cdc.gov/report-rumors and start the subject line with: "Rumors:" In the question box, give as much information about the rumor as you can, such as a description of the rumor, where you heard it, and how many times you have heard it.

2nd COVID-19 Vaccine Summary Report: 6 months through 5 years

Consumers continued to have concerns about the effectiveness and safety of COVID-19 pediatric vaccines

Perceptions, Concerns, and Threats to Vaccine Confidence

- Some consumers believe that the COVID-19 vaccine is not warranted in children because they are considered a low-risk population with minimal health effects from the virus and have a low death rate.
- Parents are hesitant to vaccinate their children because they fear serious side effects, adverse events, and unknown long-term side effects.
- Some believe infection-induced immunity provides more protection to children than vaccines do.
- A Kaiser Family Foundation poll found that 17% of parents with children younger than 5 years old will get their child vaccinated right away, while 38% say they plan to wait and see how the vaccine is working for others, 27% say they will definitely not get their child vaccinated, and 11% say they will only do so if they are required.

- Some government officials made public statements against COVID-19 vaccines for healthy children.
- Some social media users do not think there is enough data to support vaccination against COVID-19 in children.
- Some social media users believe that COVID-19 vaccines are ineffective at stopping COVID-19 or the spread of the virus in children.

Information voids and commonly asked questions from the public

- Why should a child through the age of six be vaccinated if they are less likely to experience negative health outcomes from COVID-19?
- Do COVID-19 vaccines cause myocarditis?
- What are common COVID-19 vaccine side effects in children?
- Can the COVID-19 vaccines cause the cases of hepatitis of unknown cause recently seen in children?

Identified misinformation themes that may impact vaccine confidence

- COVID-19 vaccines are ineffective for children.
- The COVID-19 vaccine is an experiment on children and is not needed because children can build "natural immunity" through virus exposure.
- Children have a high risk of death from receiving the COVID-19 vaccines.
- COVID-19 poses no risk to children.
- Children are getting hepatitis from the COVID-19 vaccines.
- The virus that causes COVID-19 does not infect children.

Ways public health and partners can take action to improve vaccine confidence

Work with community partners and trusted messengers, including pediatricians, teachers, coaches, parents, and trusted local community messengers, to create and disseminate messages related to the following topics:

- Messages that clearly explain the differences in rates of symptomatic infection for unvaccinated and vaccinated children through 5 years of age that contracted SARS-CoV-2.
- Messages that note the higher risk of myocarditis from SARS-CoV-2 infection when compared to the risk of myocarditis from COVID-19 vaccination such as "COVID-19 is more likely than vaccines to cause myocarditis, and symptoms and outcomes are often worse."
- Materials detailing the benefits of vaccination over infection-induced immunity, especially emphasizing the risk of negative health outcomes of COVID-19 in children through 5 years of age.
- Messages that accurately describe the side effects and risk of side effects of COVID-19 vaccination in children.
- Messages and talking points for pediatric healthcare providers to assist them in their conversations with parents and caregivers that include motivational interviewing and empathic communication techniques, and evidence-based ways to counter misinformation.

Chris

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Subject: CDC's Updated (Bivalent) Booster State of Vaccine Confidence Report

Hello partners and colleagues,

CDC has published the [Updated \(Bivalent\) COVID-19 Booster State of Vaccine Confidence Report](#) which identifies the public's questions, concerns, frustrations, and circulating misinformation about the new updated (bivalent) COVID-19 booster dose. A summary of this report is below. You can find back-issues of the [CDC's State of Vaccine Confidence Insights Reports](#) here. For the ways you can take action on these themes, go to the "Ways to Act" section in the report.

Reminder: CDC partners can now report vaccine-related rumors directly to CDC. To report a rumor, go to: www.cdc.gov/report-rumors and start the subject line with: "Rumors:" In the question box, give as much information about the rumor as you can, such as a description of the rumor, where you heard it, and how many times you have heard it.

Updated (Bivalent) COVID-19 Booster Dose Report

Major themes identified from social media, news, and other sources that may impact vaccine confidence

Some consumers, news outlets, and medical professionals are concerned about the availability and eligibility requirements of the updated (also known as bivalent) COVID-19 booster dose.

- Slow updated booster dose uptake may indicate some consumers perceived updated booster vaccination as not an immediate necessity. Some consumers' comments express a range of opinions, such as the belief that any waning protection from the primary series suggests an overall lack of vaccine effectiveness and that emerging circulating variants are not targeted by the updated booster dose.
- Some consumers expressed concern regarding the authorization of the updated booster dose, such as the lack of human studies during the reporting period, and vaccination administration errors.
- Some consumers are not fazed by the notion of receiving a COVID-19 booster dose annually, as many have already formed a habit of receiving a seasonal influenza vaccine.

Identified misinformation themes that may impact vaccine confidence

- Some social media users believe infection-induced immunity from SARS-CoV-2 provides more protection than a COVID-19 vaccine and, therefore, entirely obviates the need for a vaccine.
- Some social media users believe COVID-19 vaccines and booster doses are not necessary and exist to bolster pharmaceutical company profits or governmental control.
- Some social media users believe additional and successive COVID-19 vaccines will inhibit immune response.

Consumers have questions and concerns about the safety of the updated COVID-19 booster dose especially given reports of lack of human trial data

- Some healthcare professionals have spoken out about the FDA's new approval strategy believing that it might result in waning support for COVID-19 booster vaccines.
- Some consumers are questioning whether the updated COVID-19 booster doses will create stronger variants of SARS-CoV-2 resulting in a decline in the effectiveness of the COVID-19 vaccines and booster doses.
- Some social media users are concerned that the updated booster doses will not be effective against new and emerging variants of the SARS-CoV-2 virus.
- Consumers have questions about the updated COVID-19 booster doses' interaction with the previous COVID-19 primary series.

Identified misinformation themes that may impact vaccine confidence

- Some social media users believe COVID-19 is no longer a threat, and no further vaccines or protection measures are needed to curtail the disease.

- Some social media users believe the lack of safety trials in humans is evidence of a corrupt vaccination authorization system.
- Some social media users believe harm from COVID-19 vaccines and booster doses is greater than or equal to harm incurred from SARS-CoV-2 infection.
- Some social media users believe the updated booster dose is a scam and a new vaccine will come out every season so the government and pharmaceutical industry can keep making money from COVID-19.

Consumers have questions and concerns about the effectiveness of a bivalent booster dose, including if a booster dose is even needed

- Some social media users are concerned that the updated booster dose will not protect against new variants.
- Consumers expressed their confusion about why a Vaccines and Related Biological Products Advisory Committee (VRBPAC) member voted against approving the updated COVID-19 booster dose.
- Social media users are concerned that the variants targeted by the updated booster dose are no longer circulating in the population.
- Consumers are concerned about whether the updated COVID-19 booster dose is effective, how it compares to the original COVID-19 monovalent vaccines, and whether it is needed.

Identified misinformation themes that may impact vaccine confidence

- Some social media users believe one of the previous COVID-19 vaccines or booster doses were ineffective, so the updated vaccine will not be effective.
- Some social media users believe COVID-19 is not a problem anymore so the FDA should not grant Emergency Use Authorization for the bivalent booster dose.
- Some social media users believe the updated COVID-19 booster dose will cause more variants.
- Some social media users believe the updated COVID-19 booster doses are unneeded because they do not prevent transmission, are not effective, or are not necessary.

Some health experts question whether combined messaging to promote uptake of both updated COVID-19 boosters and seasonal influenza vaccine is a helpful strategy.

- Social media users are concerned about experiencing more intense side effects from receiving the updated COVID-19 booster dose and annual influenza vaccine at the same time.
- Some social media users are sharing their experiences with receiving the updated COVID-19 booster dose and annual influenza vaccine simultaneously, stating the side effects are normal and without adverse reactions.

Identified misinformation themes that may impact vaccine confidence

- Some social media users believe getting the seasonal influenza and COVID-19 vaccines simultaneously is harmful.

Chris

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Centers for Disease Control and Prevention

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Subject: confidential draft infodemic insights report on monkeypox
Attachments: MM_MONKEYBOX_TOPLINE_BRIEFING_edited.docx

Dear Chris and Lis,

I think you'll get a kick out of what Atsu and Brian produced in 2 days worth of analysis – rapid report of monkeypox conversations: <https://1drv.ms/w/s!AtPoc3YQwOufgFAhZdK2-HwZK8dl4g?e=Rdkz9A>
It's still unclear and unedited... but I am very proud of them what they put together.

And a collaborator shared an analysis of Monkeypox memes:

https://docs.google.com/presentation/d/1j3r0z0YhaMqY7uyOtlMXeWtKnv4qpM8bBrJHl8-KypE/edit#slide=id.g12ed7b37072_0_82

Best regards,

Tina

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Sign up for the WHO infodemic management News Flash: <https://bit.ly/flashsubscribe>



Monkeypox infodemic monitoring and insights – 26 May 2022

Infodemic management team, Unit for High Impact Event Preparedness, Department of Epidemic and Pandemic Preparedness and Prevention, HQ/WHE (in collaboration with Marble Global and Jamie Cohen, Queens College New York)

Data collection period for online conversations: 16 - 25 May 2022

Languages covered in analysis: English, Spanish, French

Data sources: Twitter, Facebook, Forums, Blogs, TikTok, Instagram, Pinterest, YouTube, Reddit

Key findings

1. Discussions online are evolving. Users online do not express worries about risk of disease to themselves, but are rather discussing the disease and about others with the disease.
2. The drivers of attention and conversations online about monkeypox are basic information seeking about what is monkeypox, followed by discussions about stigmatizing vulnerable populations, and conspiracy theories.
3. Online users are not finding answers to their questions from WHO and are redirecting to other health authority web sites.
4. There are multiple groups of people (Africans, MSM, immigrants/foreigners/travelers) who are subject of stigmatizing conversations, in reaction to the health information and reporting circulating about monkeypox.
5. The analyses of memes online show early signals of conspiracy and misinformation formation that is not yet detected in on text analysis on online messages. Aside from several viral tweets, most memes are coming from very few meme creators. The lack of meme format diversity shows that a message isn't really sticking as the message lacks clarity.

Key recommendations

1. Because online discussions are evolving and shifting in focus and subject, more monitoring is needed to rapidly adapt communication materials to the questions, concerns and information voids as they appear.
2. WHO web site needs to be search engine optimized, to allow users to more easily access WHO materials that are answering specifically framed questions.
3. Health communication and health information should be published with careful consideration of the identified stigmatized groups, and use messages and visual representation that does not reinforce the stigmatizing narratives online.
4. A week into the start of the online conversation dynamics, health authorities have an early window of opportunity to push out the health messages and encourage organic spread of user-generated content before the narrative about monkeypox has been usurped by mis and disinformation narratives.



Conversations in monkeypox have spread very quickly and the interest at its peak has almost reached the same levels as COVID-19.

But we don't know how long this attention will last. Infodemic monitoring must be continued to understand how people are reacting and what questions they have.

- Social media posts about monkeypox were recorded globally in high volume, but a substantial volume comes from the 12 non-endemic outbreak countries equating to **34%** of the global volume ([Figure 1](#))
- Globally, the volume of social media posts about monkeypox was lower than posts about COVID-19; however, at the height of the monkeypox conversation it was only **21%** less than that of the global COVID-19 conversation during the same period ([Figure 2](#))
- In certain countries, Google Trends data show that searches for monkeypox were greater or equal to COVID-19 searches in Germany, Netherlands, Sweden, and United Kingdom ([Figure 3](#))

Information seeking about monkeypox is shifting away from searching for basic information about the disease and symptoms towards understanding personal level of risk and treatment options

- As outlined in [Table 1](#), four main areas of questions were identified and categorized using the social listening taxonomy (i.e., illness, treatment, cause, intervention)
- At the start of the reporting period, questions largely focused on basic characteristics of the disease, such as what monkeypox is and how it spreads
- From **21 May**, a greater number of high engagement posts asked about the expected level of threat from monkeypox and whether people should be concerned about outbreaks. These types of questions peaked on **24 May**.
- Questions about cause and intervention were less prominent during this reporting period
- WHO has released information materials that answer most of the major questions raised by online users, but their searchability and reach appear to be suboptimal, with WHO information appearing low in organic searches, often displaying source material that is not directly answering the question ([Table 1](#)).

Four standout narratives, worries, concerns about monkeypox

Concerns stemming from social media conversations around monkeypox did not show any particular trends over time, but can be categorized into the following topics:

Rumours about link between COVID-19 vaccines and monkeypox

- Most conversations did not appear to be driven by actual concerns around the spread of this virus, but rather by misinformation, including conspiracy theories about population control and alleged links between COVID-19 and monkeypox (e.g., claims that monkeypox is caused by chimpanzee adenovirus allegedly present in the AstraZeneca COVID-19 vaccine)

Concerns about the origin of the virus

- Netizens claimed that monkeypox was developed in biochemical weapons laboratories, with support provided by a prominent philanthropist, by public health institutions to achieve population control, or to vaccinate people for financial reasons



Concern about lack of PHSM

- Concern over public health's ability to respond to the spread of monkeypox and about the implementation of effective PHSM measures against airborne transmission

Lack of concern about transmission

- Monkeypox is primarily a sexually transmitted disease and with the low number of cases, some users have criticized the disproportionate attention it has received from the media.

Stigmatizing conversations and concerns expressed through narratives and propagated through visual representation in online conversations

Another widespread trend was that of stigma. These conversations can be categorized based on the different groups that are subject to stigma ([Table 2](#)):

Black people, particularly people from Africa

- Criticisms of misleadingly depicting monkeypox as a virus circulating amongst black people
- Calls to counter "public health racism" ([Figure 4](#))

Men who have sex with men (MSM), sexual minority groups

- Discussing the accusations that MSM have seemingly driven the spread of monkeypox
- Opposing views about whether it is inherently homophobic to claim that the virus is spreading within MSM or other sexual minorities

Immigrants, ethnic minorities and foreign travelers

- Calls for travel bans to reduce cases with current transmission blamed on illegal immigrants from Africa

Meme use online shows a fractured conversation, driven mostly by influencers and bad actors

- Monkeypox memes are distinctly far more astroturfed than COVID-19 memes have been in the past two years – this means that they appear to be organic and average-user-initiated, but are created and shared nearly exclusively by influencers and bad actors. ([Images 2](#))
- The monkeypox memes fall into a few distinct categories, relying mostly on reactionary stances, conspiracy theories, and anti-vaccination.
- In the English conversations, some are made by unassuming "normies" seeking to poke fun at conservatives they dislike, but the large majority of memes lack variation and rely solely on in-group behavior (they are used to interact with thin an online community), mostly used and deployed in bad faith to reinforce poor behavior.

The lack of variation around Monkeypox memes displays two things ([Images 1](#)):

- Monkeypox is not widespread enough to create memes that act as a coping device and rely on few influencers to sustain the momentum.
- The far-right, conspiracy theorists, Qanoners, anti-vaxxers, and bad actors are attempting to get ahead of the narrative to frame this their way before it becomes widespread. (If it becomes widespread.)

There is a lack of a coherent narrative among the meme creators and there is no "we're in this together" identity as the far-right is fairly fractured in world view.



The categories of Monkeypox memes as of 26 May 2022 are:

- Bill Gates Conspiracy Theorists
- Anti-Vaccination blaming the vaccine for Monkeypox
- Anti-democracy calling Monkeypox a false flag for midterm turnout
- Qanon - The usual fare of big tent conspiracy posting
- Liberals posting frivolously to make fun of conservative politicians (calling them Monkeys or a Pox)

Report reference material

Time points of significant communication or events:

- *First Disease Outbreak News (DON): [Monkeypox - United Kingdom of Great Britain and Northern Ireland - 16 May 2022](#) Situation, description, public health response, risk assessment and WHO advice*
- *Second DON: [Monkeypox - United Kingdom of Great Britain and Northern Ireland - 18 May 2022](#) Situation, description, public health response, risk assessment and WHO advice*
- *Third DON: [Multi-country monkeypox outbreak in non-endemic countries - 21 May 2022](#) Situation, description, public health response, risk assessment and WHO advice – surveillance, investigations, contact tracing, prevention and control*
- *Guidance documents posted by WHO*
 - [Monkeypox Factsheet – 19 May 2022](#)
 - [Monkeypox Q&A - 20 May 2022](#)
 - [Monkeypox Outbreak Toolbox – May 2022](#)
 - [News - WHO working closely with countries responding to monkeypox – 20 May 2022](#)
 - [Monkeypox: public health advice for gay, bisexual and other men who have sex with men – 25 May 2022](#)

Guidance documents posted by Regional WHO Offices:

EURO

- [Statement – Investigations ongoing into atypical cases of monkeypox now reported in eight countries in Europe – 20 May 2022](#)

PAHO

- [Monkeypox Q&A – 19 May 2022](#)
- [Epidemiological Alert Monkeypox in non-endemic countries - 20 May 2022](#)
- [Monkeypox – Your questions answered – 25 May 2022](#)

EMRO

- [First case of monkeypox reported in WHO's Eastern Mediterranean Region](#)



Table 1: Questions and information voids regarding monkeypox categorized by the social listening taxonomy (16-25 May, 2022)

Questions and concerns	Is this being answered by WHO or does information material exist?	Is information material by WHO easily searchable and accessible online?
Illness - What is Monkeypox - What are the symptoms - What does it look like - How is it transmitted - Severity, level of risk	What is monkeypox? What are the symptoms of monkeypox? Monkeypox health topic How does monkeypox spread from person to person? Can people die from Monkeypox?	- WHO Q&A webpage is usually not at the top of Google search results (sometimes not on the first page) - WHO Q&A webpage received 2.3K interactions on social media
Treatment Is there a cure/vaccine	Is there a treatment against monkeypox?	- WHO Q&A webpage is usually not at the top of Google search results (sometimes not on the first page) - WHO Q&A webpage received 2.3K interactions on social media
Cause Origin - Where did it come from	Multi-country monkeypox outbreak in non-endemic countries	- WHO webpage on the current outbreak and disease epidemiology is one of the top 3 Google search results - WHO webpage received 34.5K interactions on social media
Intervention What public health and social measures are planned or necessary (e.g., isolation)	Reducing the risk of human-to-human transmission	- WHO key facts page is one of the top results, but the answer to the question is not easily found - WHO key facts page received 68.6K interactions on social media

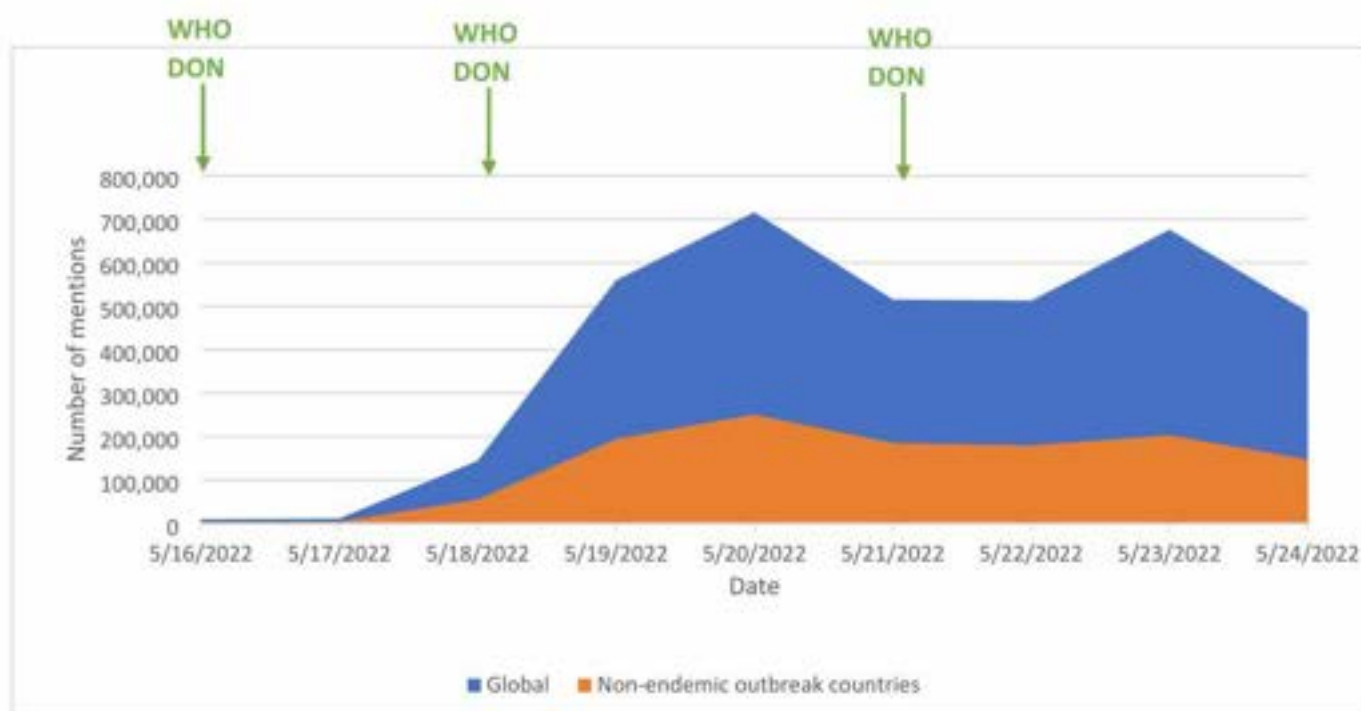
Table 2: Online monkeypox narratives associated with stigma against certain groups (16-25 May, 2022)

Group	Narrative	Example
Black people, particularly people from Africa	Criticisms of misleadingly depicting monkeypox as a virus circulating amongst black people, calls to counter "public health racism" (see Figure 4)	A top-engaged with post shared a video which jokingly suggested that people did not supposedly care when it was in Africa, but only started caring when it was in the West (9.24M engagements, 21 May). A user said that they were supposedly hesitant to retweet stories which feature pictures of black people as this suggest the



		disease is "foreign" (1.93k engagements, 21 May).
Men who have sex with men (MSM), sexual minority groups	Discussing the accusations that MSM have seemingly driven the spread of monkeypox, opposing views about whether it is homophobic to claim so	One user argued that it is not homophobic to claim that monkeypox is seemingly being spread by networks of men who have sex with men (21 May). A user criticized the view that recommendations about abstinence is stigmatizing, juxtaposing it with how lockdowns were used to prevent COVID-19 transmission (12.5k engagements, 22 May).
Immigrants, ethnic minorities and foreign travelers	Calls for travel bans to reduce cases with current transmission blamed on illegal immigrants from Africa	A user from Spain questions the outbreak: MONKEYPOX Eradicated in Europe for decades, a disease that only existed in central Africa. How many sub-Saharanans have illegally entered Spain... (1.99k engagements, 18 May)

Figure 1: Volume of social media posts about monkeypox in non-endemic countries* and globally (16 - 24 May 2022)



*The non-endemic outbreak countries are Australia, Belgium, Canada, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden, UK, USA. Eight languages were monitored for both data sets: English, French, Spanish, Portuguese, Italian, Dutch, German and Swedish.



World Health
Organization

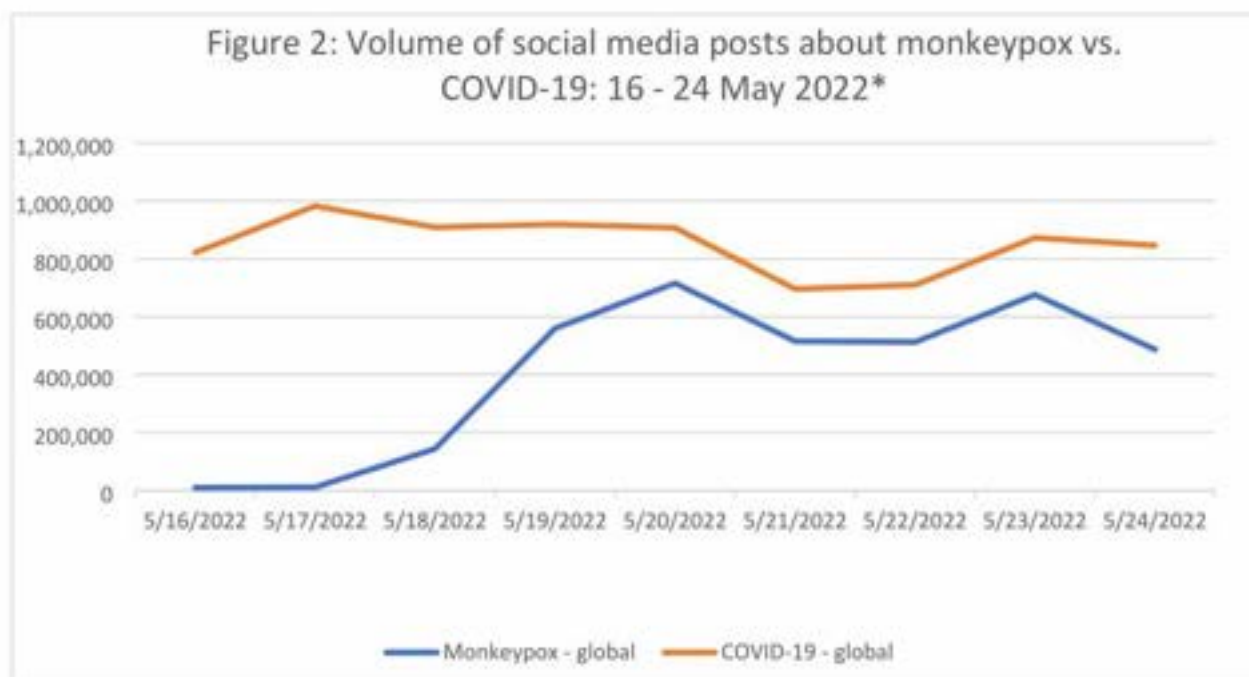


EPIDEMIC
& PANDEMIC
PREPAREDNESS
& PREVENTION

infodemic
MANAGEMENT



Figure 2: Volume of social media posts about monkeypox vs. COVID-19 globally (16 - 24 May 2022*)



*Eight languages were monitored for both data sets: English, French, Spanish, Portuguese, Italian, Dutch, German and Swedish.

Figure 3: Google Trends Search data for Monkeypox vs COVID-19 (16 - 23 May 2022*)



* Google Trends searches for monkeypox were greater or equal to COVID-19 searches in Germany, Netherlands, Sweden, and United Kingdom from the 12 non-endemic countries



Figure 4: One user in the USA questioned why news sources are showing pictures of black people with monkeypox from 1996 when the disease is spreading in Western countries in 2022 (1k engagements, UK).



Images 1: Anti-Vaxxers and Conspiracy Theorists

These memes are focused on two distinct talking points leveraged by the anti-vaccination community and conspiracy theorists. Both these groups overlap almost completely. In a Venn Diagram between anti-vaccination people and conspiracy theorists, it would be nearly a circle.

Anti-Vaxxers and Conspiracy Theorists



Images 2: Low format diversity of memes

A good meme uses many unique formats, some created independent of existing meme formats.



Low Format Diversity



From: PURNAT, Tina
Sent: Mon, 12 Dec 2022 17:07:34 +0000
To: Wardle, Claire; abdelhalim.h.abdallah; Voegeli, Chris (CDC/DDID/NCIRD/ISD); Petronille Bogaert; Boender, Sonia; Schneider, Anton (GH/HIDN:CAMRIS International)
Subject: consultation on the manual on generating rapid infodemic insights report + survey on social media analysis tools
Attachments: infodemic insights manual steps 3-5, infodemic insights manual consultation Steps 1-2

Dear colleagues,

I hope that you are weathering well through the winter holidays frenzy! We survived the SBCC Summit!



I am writing to reach out to your teams, as well as colleagues in country offices and in your country and regional networks to participate in the review and feedback on the draft manual for generating an infodemic insights report in 5 steps.

- Once of the most common requests for materials we receive is how to rapidly analyze data, assess infodemic risk and appraise evidence in the field where lack of time and resources are a reality for many responders. This manual is intended to fill that need.
- This manual's zero draft version was coproduced between WHO's infodemic management team and the UNICEF demand for immunization team, and reviewed by the WHO infodemic manager community.
- We have field tested it with social and behavior change practitioners at the SBCC summit last week in Morocco, by running it through a teaching simulation exercise.

The manual can be downloaded at the following link and comments can be sent to us in the google form listed in the document: <https://bit.ly/infodemicinsightsmanualdownload>

We will run meetings for anyone who would like to drop by to discuss the manual with us on 19 and 26 January, for steps 1-2 and 305, respectively. I attach the Outlook events to add to your calendars if interested.

Thank you very much for your interest and for help ensuring wide consultation on this tool. The final version of the manual will be accompanied by training simulations that can be run offline and incorporate in training workshops.

We'd be happy to receive your feedback and collaborate on the application of the tools for infodemic managers in the coming year.

Thank you so much, and have a great finish of 2023!

Best regards,

Tina

Tina D Purnat
Team Lead for Infodemic Management
High Impact Events Preparedness Unit
Department for Epidemic and Pandemic Preparedness and Prevention (EPP)
Preparedness Division, WHO Health Emergencies Programme (WPE/WHE)
World Health Organization, Geneva, Switzerland

puernatt@who.int | WhatsApp/Signal: (b) (6) | www.linkedin.com/in/tinadpuernat | @tdpuernat |

Sign up for the WHO infodemic management News Flash: <https://bit.ly/flashsubscribe>

From: PURNAT, Tina
Sent: Mon, 12 Dec 2022 16:36:27 +0000
To: PURNAT, Tina
Subject: infodemic insights manual steps 3-5

The manual can be downloaded at the following link and comments can be sent to us in the google form listed in the document: <https://bit.ly/infodemicinsightsmanualdownload>



Hi there,

PURNAT, Tina is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting

One tap mobile: Switzerland: (b) (6)
(b) (6)
Meeting URL: (b) (6)
Meeting ID: (b) (6)
Passcode: (b) (6)

Join by Telephone

For higher quality, dial a number based on your current location.

Dial:
Switzerland: (b) (6)
(b) (6)
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(b) (6)
Meeting ID: (b) (6)
Passcode: (b) (6)

International numbers

Join from an H.323/SIP room system

H.323:

(b) (6)

Meeting ID:

(b) (6)

Passcode:

(b) (6)

SIP:

(b) (5)

Passcode:

(b) (6)

From: PURNAT, Tina
Sent: Mon, 12 Dec 2022 16:35:20 +0000
To: PURNAT, Tina
Subject: infodemic insights manual consultation Steps 1-2

The manual can be downloaded at the following link and comments can be sent to us in the google form listed in the document: <https://bit.ly/infodemicinsightsmanualdownload>



Hi there,

PURNAT, Tina is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting

One tap mobile: Switzerland: (b) (6) [redacted]
[redacted]
Meeting URL: (b) (6) [redacted]
Meeting ID: (b) (6) [redacted]
Passcode: (b) (6) [redacted]

Join by Telephone

For higher quality, dial a number based on your current location.

Dial: Switzerland: (b) (6) [redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
Meeting ID: (b) (6) [redacted]
Passcode: (b) (6) [redacted]

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Join from an H.323/SIP room system

H.323:

(b) (6)

Meeting ID:

(b) (6)

Passcode:

(b) (6)

SIP:

(b) (5)

Passcode:

(b) (6)

From: Voegeli, Chris (CDC/DDID/NCIRD/ISD)
Sent: Mon, 27 Mar 2023 16:19:14 +0000
To: PURNAT, Tina (b) (6) @sent.com; TUF@mailbox.sc.edu
Subject: Differentiating IM from comms
Attachments: eval v reseach v qi v4.pdf

Good afternoon all!

After a great meeting and a great follow up discussion with Liz and Tina, we drafted the following sheet: <https://docs.google.com/spreadsheets/d/1TkgEZf7t0-IKOxi6jc44Q891AijyFMKwCXqmMrlmCn8/edit?usp=sharing>

As a reminder, we are aiming to explain how the fields differ based on the questions identified. We added some additional questions as well. Finally, the tools/approaches question and the overlapping answers have always been helpful in providing an explanation of why there is confusion in the fields (ie we use the same and similar methods).

If you all have time to review it, that would be very helpful. I really want to ensure that we are doing the other fields justice with out explanations so any and all feedback is welcome.

This is meant to mimic the graphic in the attached eval v research v qi pdf which itself is based on the distinction found on this site: <https://www.betterevaluation.org/blog/week-19-ways-framing-difference-between-research-evaluation#:~:text=Research%20is%20seen%20as%20more,funding%20or%20commissioning%20the%20evaluation>

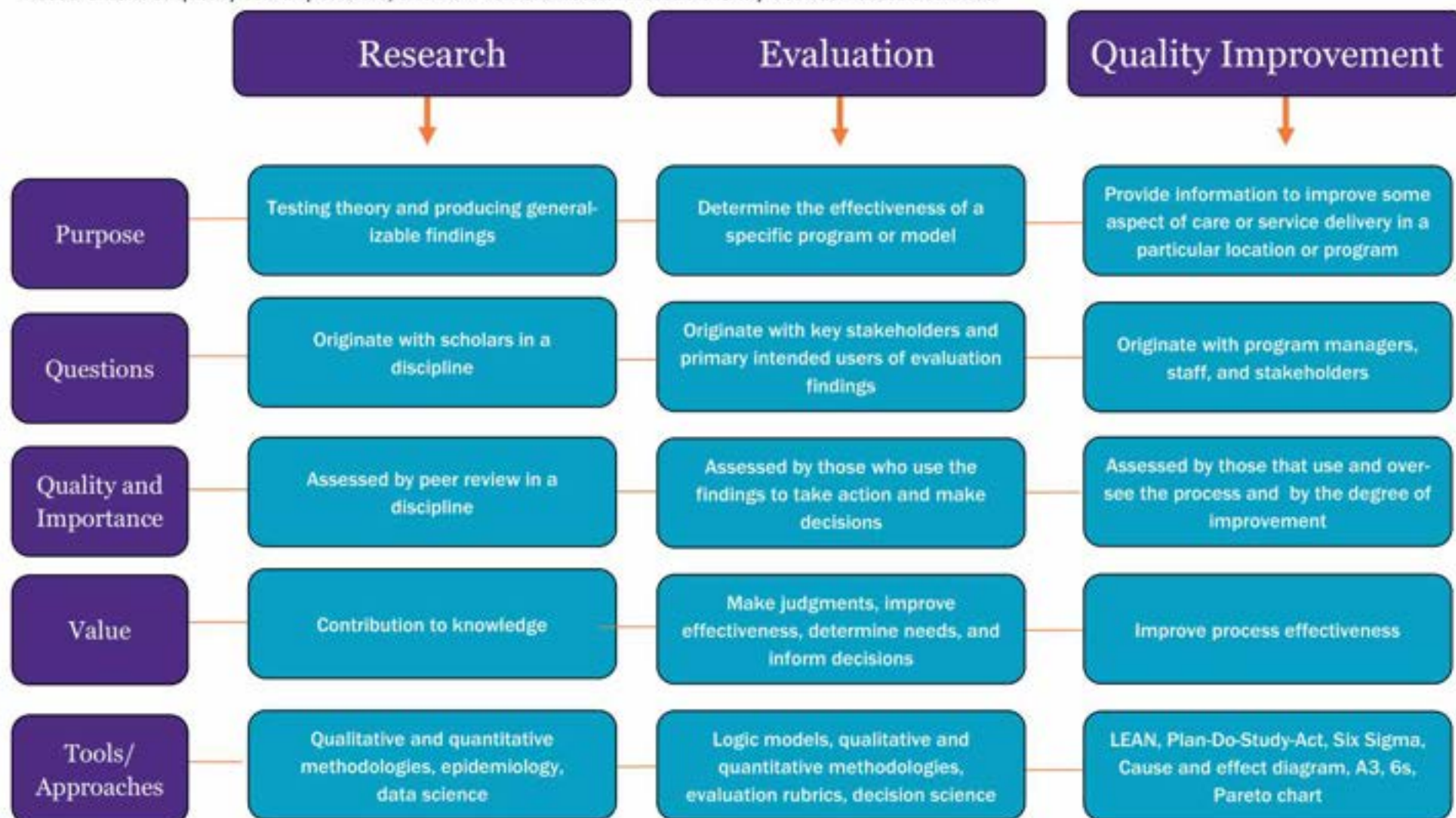
Chris

-

Christopher Voegeli, Ph.D., MPH (he/him)
Behavioral Scientist | Acting Vaccine Confidence and Demand Lead
Email: 0002@cdc.gov
Work Phone: (404) 498-0176
Cell Phone: (b) (6)
National Center for Immunization and Respiratory Diseases | Immunization Services Division
Centers for Disease Control and Prevention

Research, Evaluation, and Quality Improvement: How are they different and how are they the same?

The following graphic is meant to illustrate the differences between research, evaluation and quality improvement. Although there can be overlap between these approaches, each is used for different reasons and with different intended outcomes. This is a tool to better understand the purpose, guiding questions, measurement of quality and importance, and how value is determined differently between these activities.



From: Voegeli, Chris (CDC/DDID/NCIRD/ISD)
Sent: Wed, 22 Mar 2023 10:41:24 +0000
To: PURNAT, Tina
Cc: (b) (6) @sent.com
Subject: Differentiating IM from Comms
Attachments: eval v reseach v q1 v4.pdf

Tina,

I have talked about this with Feili and Liz, and I think you might be interested. When Feili was on the panel yesterday, her concern about the need to differentiate IM from comms reminded me that the field of evaluation went through something similar differentiating itself from research. One of the leaders in the eval field came up with four questions that fields could use to identify overlap or differences. They are:

1. What is the purpose of the field?
2. Where do questions originate that the field is trying to answer?
3. Who determines the quality and importance of the work?
4. What is perceived as the ultimate test of value?
5. I added my own: What tools and approaches does the field use?

I used these questions in my previous life to craft the attached image to communicate the difference between research, evaluation, and quality improvement. I wonder if this exercise for IM vs comms would be helpful. What do you think?

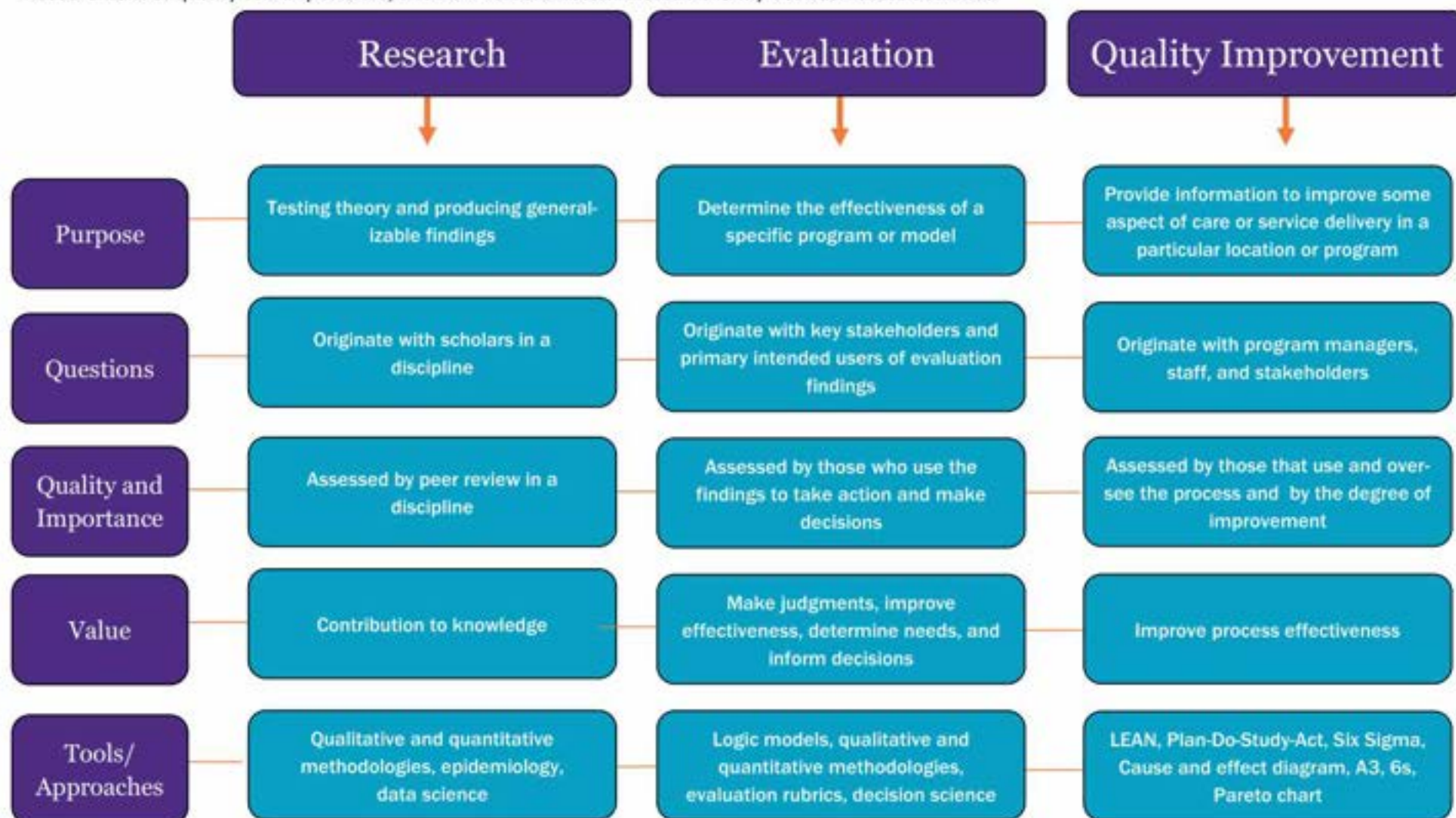
Chris

-

Christopher Voegeli, Ph.D., MPH
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Work Phone: (404) 498-0176
Cell Phone: (b) (6)
National Center for Immunization and Respiratory Diseases | Immunization Services Division
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Research, Evaluation, and Quality Improvement: How are they different and how are they the same?

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From: BERTRAND-FERRANDIS, Catherine
Sent: Tue, 19 Oct 2021 15:29:07 +0000
To: Voegeli, Christopher (CDC/DDID/NCHHSTP/DHP); Kolis, Jessica (CDC/DDPHSIS/CGH/GID)
Cc: PURNAT, Tina; imtraining; Infodemic Management Training; Nell Conway; Wilhelm, Elisabeth (CDC/DDPHSIS/CGH/GID)
Subject: DOI and media releases for the 3rd WHO Infodemic management training
Attachments: DOI_EN_Form_blank.docx, declaration_of_consent_named_subjects_english.docx

Dear Jessica and Chris,

Thanks again for your positive feedback to our invitation to speak at the coming Infodemic management training!

You have received this afternoon exactly 16 calendar invitations to block your calendars. Please make sure that they are not in your junk mailbox.

As explained in the emails, you do not need to be present all 3 hours long for both sessions. Your dedicated timeslot is indicated in the invitation.

Please note that my future emails will come from c.bertrand-ferrandis@olylo.fr or from infodemicmanagement@olylo.fr => I recommend you ensure that these both addresses are in your contacts list of email box to avoid missing information about the training.

I would finally need your kind collaboration in filling in the two documents attached. Could you please send them back to infodemicmanagement@olylo.fr by the 30th of October?

Thank you so much for your attention and participation!

All the best,
Catherine

Catherine BERTRAND-FERRANDIS, DVM
Infodemic Management
Health Emergencies Programme
Email: bertrandferrandisc@who.int

Learn about the WHO COVID-19 infodemic response <https://bit.ly/WHOinfodemic>
Subscribe to the infodemic management news flash <https://bit.ly/InfodemicNews>



DECLARATION OF INTERESTS FOR WHO EXPERTS

WHO's work on global health issues requires the assistance of external experts who **may have interests related to their expertise**. To ensure the highest integrity and public confidence in its activities, WHO requires that experts serving in an advisory role disclose any circumstances that could give rise to a potential conflict of interest related to the subject of the activity in which they will be involved.

All experts serving in an advisory role must disclose any circumstances that could represent a **potential conflict of interest** (i.e., any interest that may affect, or may reasonably be perceived to affect, the expert's objectivity and independence). You must disclose on this Declaration of Interests (DOI) form any financial, professional or other interest relevant to the subject of the work or meeting in which you have been asked to participate in or contribute towards and any interest that could be affected by the outcome of the meeting or work. You must also declare relevant interests of your immediate family members (see definition below) and, if you are aware of it, relevant interests of other parties with whom you have substantial common interests and which may be perceived as unduly influencing your judgement (e.g. employer, close professional associates, administrative unit or department). Please note that not fully completing and disclosing all relevant information on this form may, depending on the circumstances, lead WHO to decide not to appoint you to WHO advisory bodies/functions in the future.

Please complete this form and submit it to WHO Secretariat if possible at least 4 weeks but no later than 2 weeks before the meeting or work. You must also promptly inform the Secretariat if there is any change in this information prior to, or during the course of, the meeting or work. All experts must complete this form before participation in a WHO activity can be confirmed. Please note that not fully completing and disclosing all relevant information on this form may, depending on the circumstances, lead WHO to decide not to appoint you to WHO advisory bodies/functions in the future.

Answering "Yes" to a question on this form does not automatically disqualify you or limit your participation in a WHO activity. Your answers will be reviewed by the Secretariat to determine whether you have a conflict of interest relevant to the subject at hand. One of the outcomes listed in the next paragraph can occur depending on the circumstances (e.g. nature and magnitude of the interest, timeframe and duration of the interest).

The Secretariat may conclude that no potential conflict exists or that the interest is irrelevant or insignificant. If, however, a declared interest is determined to be potentially or clearly significant, one or more of the following three measures for managing the conflict of interest may be applied. The Secretariat (i) allows full participation, with public disclosure of your interest; (ii) mandates partial exclusion (i.e., you will be excluded from that portion of the meeting or work related to the declared interest and from the corresponding decision making process); or (iii) mandates total exclusion (i.e., you will not be able to participate in any part of the meeting or work).

All potentially significant interests will be **disclosed** to the other participants at the start of the activity and you will be asked if there have been any changes. A summary of all declarations and actions taken to manage any declared interests will be **published** in resulting reports and work products. Furthermore, if the objectivity of the work or meeting in which you are involved is subsequently questioned, the contents of your DOI form may be made available by the Secretariat to persons outside WHO if the Director-General considers such disclosure to be in the best interest of the Organization, after consulting with you. Completing this DOI form means that you agree to these conditions.

If you are unable or unwilling to disclose the details of an interest that may pose a real or perceived conflict, you must disclose that a conflict of interest may exist and the Secretariat may decide that you be totally recused from the meeting or work concerned, after consulting with you.

Name:
Institution:
Email:

Date and title of meeting or work, including description of subject matter to be considered (if a number of substances or processes are to be evaluated, a list should be attached by the organizer of the activity):

3rd WHO Infodemic Manager Training, from Tuesday 16 November to Thursday 10 December, aiming at providing an update on the most recent infodemic management guidance and approaches, based on the experience since the beginning of the COVID-19 pandemic.

Please answer each of the questions below. If the answer to any of the questions is "yes", briefly describe the circumstances on the last page of the form.

The term "you" refers to yourself and your immediate family members (i.e., spouse (or partner with whom you have a similar close personal relationship) and your children). "Commercial entity" includes any commercial business, an industry association, research institution or other enterprise whose funding is significantly derived from commercial sources with an interest related to the subject of the meeting or work. "Organization" includes a governmental, international or non-profit organization. "Meeting" includes a series or cycle of meetings.

EMPLOYMENT AND CONSULTING

Within the past 4 years, have you received remuneration from a commercial entity or other organization with an interest related to the subject of the meeting or work?

- 1a Employment Yes ☐ No ☐
- 1b Consulting, including service as a technical or other advisor Yes ☐ No ☐

RESEARCH SUPPORT

Within the past 4 years, have you or has your research unit received support from a commercial entity or other organization with an interest related to the subject of the meeting or work?

- 2a Research support, including grants, collaborations, sponsorships, and other funding Yes ☐ No ☐
- 2b Non-monetary support valued at more than US \$1000 overall (include equipment, facilities, research assistants, paid travel to meetings, etc.) Yes ☐ No ☐

Support (including honoraria) for being on a speakers bureau, giving speeches or training for a commercial entity or other organization with an interest related to the subject of the meeting or work?

INVESTMENT INTERESTS

Do you have current investments (valued at more than US \$5 000 overall) in a commercial entity with an interest related to the subject of the meeting or work? Please also include indirect investments such as a trust or holding company. You may exclude mutual funds, pension funds or similar investments that are broadly diversified and on which you exercise no control.

- 3a Stocks, bonds, stock options, other securities (e.g., short sales) Yes ☐ No ☐
- 3b Commercial business interests (e.g., proprietorships, partnerships, joint ventures, board memberships, controlling interest in a company) Yes ☐ No ☐

INTELLECTUAL PROPERTY

Do you have any intellectual property rights that might be enhanced or diminished by the outcome of the meeting or work?

- 4a Patents, trademarks, or copyrights (including pending applications) Yes ☐ No ☐
- 4b Proprietary know-how in a substance, technology or process Yes ☐ No ☐

PUBLIC STATEMENTS AND POSITIONS (during the past 3 years)

- 5a As part of a regulatory, legislative or judicial process, have you provided an expert opinion or testimony, related to the subject of the meeting or work, for a commercial entity or other organization? Yes ☐ No ☐
- 5b Have you held an office or other position, paid or unpaid, where you represented interests or defended a position related to the subject of the meeting or work? Yes ☐ No ☐

ADDITIONAL INFORMATION

- 6a If not already disclosed above, have you worked for the competitor of a product that is the subject of the meeting or work, or will your participation in the meeting or work enable you to obtain access to a competitor's confidential proprietary information, or create for you a personal, professional, financial or business competitive advantage? Yes ☐ No ☐
- 6b To your knowledge, would the outcome of the meeting or work benefit or adversely affect interests of others with whom you have substantial common personal, professional, financial or business interests (such as your adult children or siblings, close professional colleagues, administrative unit or department)? Yes ☐ No ☐
- 6c Excluding WHO, has any person or entity paid or contributed towards your travel costs in connection with this WHO meeting or work? Yes ☐ No ☐

6d Have you received any payments (other than for travel costs) or honoraria for speaking publicly on the subject of this WHO meeting or work? Yes ☐ No ☐

6e Is there any other aspect of your background or present circumstances not addressed above that might be perceived as affecting your objectivity or independence? Yes ☐ No ☐

7. **TOBACCO OR TOBACCO PRODUCTS** (*answer without regard to relevance to the subject of the meeting or work*)

Within the past 4 years, have you had employment or received research support or other funding from, or had any other professional relationship with, an entity directly involved in the production, manufacture, distribution or sale of tobacco or tobacco products or representing the interests of any such entity?

Yes ☐ No ☐

EXPLANATION OF "YES" RESPONSES: If the answer to any of the above questions is "yes", check above and briefly describe the circumstances on this page. If you do not describe the nature of an interest or if you do not provide the amount or value involved where relevant, the conflict will be assumed to be significant.

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From: PURNAT, Tina
Sent: Sat, 8 Oct 2022 12:52:37 +0000
To: Kulkarni, Shibani (CDC/DDPHSIS/CGH/GID); Voegeli, Chris (CDC/DDID/NCIRD/ISD)
Subject: draft of paper from 5th WHO infodemic conference in WHO executive clearance
Attachments: Main document for executive clearance.docx, Multimedia appendix 1.docx, Multimedia appendix 2.docx, Multimedia appendix 3.docx, Multimedia Appendix 4.docx

Dear Shibani and Chris,

I wanted to send to you the draft article that we've revised based on the comments of those conference participants who wanted to join the article. You may remember we went through the review and commenting exercise in May/June. The attached copy is now circulating in WHO for clearance so we can submit to JMIR infodemiology.

You were the only coauthors from US CDC that indicated you wish to join and who contributed to the paper. I wanted to share the draft so you can let me know if you're still interested to join the paper and by when you could obtain the clearance. I hope that it can be reasonably quick – normally it takes about the same time as WHO review.

Please let me know,

Kindest regards,

Tina

Original paper

Towards measuring the burden of infodemics: Methods and results of the 5th WHO Infodemic Management Conference

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Abstract

Background: An infodemic is an excess of information of varying quality, including false or misleading information and/or ambiguous information, that spreads in digital and physical environments during a public health emergency. The COVID-19 pandemic has been accompanied by an unprecedented global infodemic that has led to confusion about the benefits of medical and public health interventions with substantial impact on risk-taking and health-seeking behaviors, erode trust in health authorities and compromise the effectiveness of public health responses and policies. Standardized measures are needed to quantify the harmful impacts of the infodemic in a systematic and methodologically robust manner, and harmonizing highly divergent approaches currently explored for this purpose. This can serve as the foundation for a systematic, evidence-based approach to monitor, identify and mitigate future infodemic harms in emergency preparedness and prevention.

Objective: In November 2021, WHO held the Fifth Infodemic Management Conference, which sought to identify the interdisciplinary approaches and frameworks needed to enable measurement of the burden of infodemics. The event combined expert presentations and focused discussions built around key themes. This resulted in the creation of a proposed action plan to serve as the blueprint for the future steps on systematically measuring the burden of infodemics.

Methods: An iterative human-centered design approach was used to facilitate focused discussions and allow for the generation actionable outcomes and recommendations. The discussions included 86 participants representing diverse scientific disciplines and health authorities from 28 countries across all WHO regions, along with observers from civil society and global public health implementing partners. A thematic map capturing the concepts matching the key contributing factors to the public health burden of infodemics was used throughout the conference to frame and contextualize discussions. Five key areas for immediate action were identified.

Results: The five key areas for development of metrics to assess the burden of infodemics and associated interventions included: (1) developing standardized definitions and ensuring the adoption thereof; (2) improving the map of concepts influencing the burden of infodemics; (3) conducting a review of evidence, tools and data sources; (4) setting up a technical working group; and (5) addressing immediate priorities for post-pandemic recovery and resilience building. The summary report consolidated group input toward a common vocabulary with standardized terms, concepts, study designs, measures, and tools to estimate the burden of infodemics and the effectiveness of infodemic management interventions.

Conclusions: Standardizing measurement is the basis for documenting the burden of infodemics on health systems and population health during emergencies. Investment is needed into development of practical, affordable, evidence-based and systematic methods which are legally and ethically balanced, for the monitoring of infodemics, generation of diagnostics, infodemic insights and recommendations, and development of interventions, action-oriented guidance, policies, support options, mechanisms and tools for infodemic managers and emergency program managers.

Keywords: COVID-19; infodemic; burden of infodemic; infodemic management; infodemic metrics; World Health Organization; technical consultation; infodemiology

Introduction

The challenge that infodemics pose to health system response in emergencies

An infodemic is excess information, including false or misleading information, in digital and physical environments that spread during a health emergency [1, 2]. Infodemics are more complex than just amplification and spread of mis- and disinformation; they spread across a wider information landscape where population questions, concerns and information voids can lead to misinformation growth and spread, particularly in societies undergoing digital transformation. The COVID-19 pandemic has been accompanied by an unprecedented global infodemic that has led to confusion about the benefits of medical and public health interventions with substantial impact on risk-taking and health-seeking behaviors, erode trust in health authorities and compromise the effectiveness of public health responses and policies [3].

There are several key concepts that are integral to discussing infodemics and how they link to health authority responses, including the online information environment, the channels, formats and quality of health information people are exposed to, individual-level literacy, the psychology of emergencies, and multifaceted aspects of trust and how they influence perception and behavior in health. Many of these areas have bodies of research and literature and measures associated with them in specific fields of study such as psychology or governance and policy or digital user experience, but usually not connected in a systematic, causal way that are applicable to how health systems act in emergencies.

The information environment and accessing health information

As the world becomes more digitized, the digital information environment increasingly influences social dynamics between people and across communities, and influencing health decisions and behaviors. Accessibility and availability of health information, algorithms of social media platforms, the architecture of online communities and news channels, and format all impact how individuals receive and act on it [4, 5]. Creating and updating credible, accurate health information for dissemination to different audiences is within the purview of health authorities and tends to be formalized in policies for healthcare delivery and in public health matters, especially in emergencies [6]. However, health information is often shared through unofficial and unregulated channels and made available in a wider variety of formats and for channels not typically utilized by the health system or for communication of public health guidance, creating a gap between what communities have access to official and credible information, versus those that do not [7]. For example, TikTok and closed messaging networks such as WhatsApp and Telegram have increasingly been used to share health information and misinformation [8].

Literacies related to health, infodemics and emergencies

However, simply having access to health information is insufficient for promoting positive behavior change [9]. Health, digital, media, science, information and influence literacies all play a role at the individual level, mediating between availability of health information and individual ability to process, understand and act on it [10]. However, in emergencies, people seek, process and act on information differently, looking for information to protect themselves and their families, even though information may be scarce and are looking for alternate sources of information whilst tending to believe the first thing they hear. There are examples from noncommunicable diseases, such as tobacco cessation campaigns, that aim to address health literacy gaps and counter harm from misinformation [11]. Teaching critical thinking skills to individuals to be able to identify and rebut health misinformation can broadly inoculate against specific misinformation narratives and is one promising intervention for building resilient individuals and communities against misinformation. Therefore, building skills and resilience against misinformation and other infodemic harms and for improving use of health information during times of calm are not alone sufficient to help people during emergencies, where traditional health communications pathways, such as communicating with a primary healthcare provider, may have been interrupted.

Building trust to prevent erosion during emergencies

Building trust in health authorities is critical to do before emergencies strike, because infodemics can quickly erode trust, especially when there is low trust at baseline. Trust contributes towards the willingness to accept and adopt necessary measures and can be the deciding factor in terms of how successful the implementation of a sound public health strategy will be, as for example in the context of implementing public health and social measures to control the disease as part of containment strategies. Trust can be eroded by what the public may perceive as conflicting guidance and mixed messages, information released late, multiple experts with divergent opinions, paternalism and political infighting [12]. Infodemics can further add friction by promoting misinformation and more destructive forms such as disinformation or conspiracy theories, and not addressing people's questions and concerns in a timely manner or leaving people struggling to access accurate, credible and up-to-date health information [13].

Why measure the burden and cost of infodemics?

Due to the multifaceted nature of infodemics affecting individuals, communities, societies, economies and health systems during emergencies, it can be difficult to know how to prepare for infodemics, determine when and where to intervene and how to much effectively reduce harm to population health. Globally applicable infodemic measurement and metrics are needed. The true cost of infodemics have not been robustly measured, but have been anecdotally reported with impacts such as stigma, violence against health workers, overdoses of non-recommended treatments or stockouts, refusal by individuals or communities to wear masks or get vaccinated, frivolous lawsuits against health systems and healthcare workers [14]. One academic brief suggested that COVID-19 misinformation costed 50-300 million USD a day at the height of the

pandemic in the US [15]. Without measures or costing, it is difficult to develop effective interventions and advocate for supportive policies. More innovation in how measurements and metrics are developed are needed due to the multi-level nature of the phenomenon and the sheer diversity of disciplines and in-depth expertise required to measure or estimate different aspects of infodemics.

Spurring development of metrics to measure the burden of infodemics and interventions as part of the WHO public health research agenda on infodemiology

Since the beginning of the COVID-19 pandemic, WHO has expanded the concept of infodemiology beyond use of data produced and consumed on the web to inform public health officials, agencies, and policy into a multidisciplinary scientific field. Interventions must account for an information environment where information flows online and offline, highly tailored people's information diets and their responses can lead to non-protective behaviors and to poor health outcomes offline [1, 2, 16]. Building harmonized measures and cohesive interventions requires amalgamation of cross-disciplinary and mixed methods approaches to inform the health emergency response and routine health systems strengthening efforts online and offline [16].

Early in the COVID-19 response, the First WHO Infodemiology Conference in June–July 2020 brought together experts from a range of disciplines to begin the global conversation about the science of infodemiology and establish a public health research agenda for managing infodemics, recognizing that each discipline has a different perspective on the problems of infodemics, different ways of measurement and a different vocabulary [16, 17]. While previous conferences have expanded our understanding of infodemic drivers [18] and social listening approaches [19], the Fifth Infodemic Management Conference aimed to collaboratively develop a proposed action plan to foster implementation for work stream 1 of the WHO public health research agenda for managing infodemics: the development of metrics and indicators for measuring the burden of an infodemic and related interventions. The full conference report is available on the WHO website [20]. In this article, we summarize the conference structure, proceedings, outcomes and proposed actions.

Methods

Overview

The conference used an iterative human-centered design approach in line with the Purpose-Outcome-Process (POP) model, a tool for focusing actions on creating results [21, 22]. Held in the context of the COVID-19 pandemic and with travel restrictions in place, the meeting necessarily took place online via videoconference. The virtual discussions took place over four three-hour meetings during two weeks in November 2021, resulting in a summary report, and recommended actions to advance five key areas for development of metrics to assess the burden of infodemics. The summary report consolidated participants input for a common vocabulary, concepts, standardized study designs, measures, and tools to estimate the burden of infodemics or the effectiveness of infodemic management interventions. Institutional Review Board review was not sought because the work described in this paper was based on observation of discussions at the conference, and it focused

on the synthesis of expert opinion following the Chatham House Rule [23]. No personal information was collected from participating experts.

Conference participants

The 86 invited participants included academics and public health practitioners from 48 organizations, including voices from 28 countries across 18 time zones, with a 56% to 44% gender split in favor of women (48 females and 38 males). In addition, 48 additional invited academics and policymakers were not available to participate. The conference participants were academics selected by the organizers for the relevance of their publication record in the past two years for the purpose of this meeting, or practitioners who were working in health metrics, measurement and health programme implementation. The participants also included five observers from civil society and global public health implementing partners. Conflicts of interest were reviewed in accordance with WHO procedures for the management of declaration of interest for expert consultations [24]. An extended conference organizing team comprising 32 members was drawn from across the WHO, US Centers for Disease Control and Prevention (US CDC), and the George Institute for Global Health (TGI), India.

Design of the conference discussions

The organizers used a human-centered design approach to intentionally facilitate engaging and effective conference deliberations [22]. First, the conference format was designed to offer a level playing field for all participants who were encouraged to contribute their knowledge in an environment where most participants came from extremely diverse disciplines, backgrounds, country settings and professional experiences. Second, the conference structure was designed with the help of the POP model [21] to provide a structured output to conference deliberations. Third, sessions were scheduled on different days, allowing the organizing team to synthesize inputs and prepare for the next session and adapt the deliberations and format. Consideration was given to what and how essential information that was shared with participants before and during the conference sessions, to the emotional pacing of the interactions that would support intense cross-disciplinary expert deliberations, and to the environment that would support the participant behaviors and discussions towards actionable recommendations.

The Purpose + Outcome + Process (POP) model of the conference

The purpose of the meeting was to determine how to measure the burden of infodemics associated with the information mix people access and associated drivers for people's behaviors over time, and to discuss new ways to characterize information exposure and health outcomes that support this measurement. The expected outcomes of the meeting were to synthesize collective feedback and arrive to concrete next steps on: (i) a concept map on the main pathways on the wider effects of the infodemic (individual, society, health system and policy); (ii) a list of principles for ranking and prioritization of concepts and indicators to be used; (iii) a prioritized list of actions, study designs and metrics that need development; (iv) the establishment of collaborations to advance the work. Because the expected outcomes were ambitious for the planned total 12 hours of deliberations, careful consideration was given to how the conference outcomes could best benefit from the expertise of participating senior academics and policymakers.

How the conference was run

The virtual conference took place during four three-hour working sessions on 2, 4, 9 and 11 November 2021. Each three-hour session was chaired and directed by two co-chairs and followed a similar structure, first setting the scene of the day's discussions in the plenary, then discussing in smaller groups, and then returning to plenary to reflect on collective outcomes. The core organizing team worked with 13 experts, who each prepared a lightning talk for one session to frame the discussion of the session day. The talks aimed to share experience and the insights from conducting research into various aspects of the infodemic, or from responding to the same from a public health standpoint. This was followed by breakout discussions, where participants brainstormed in smaller groups to respond to a set of technical tasks outlined on a shared Miro board (interactive virtual whiteboard) [25]. Breakout group discussions were supported by facilitators who were provided with facilitation reference materials and example prompts to elicit expert discussion before the discussion. Notetakers assisted in capturing major points of discussion and shared links and resources. Chat features on Zoom and a WhatsApp group were additionally available to participants to share insights, responses and views on the meeting proceedings during and between sessions, and larger emerging developments around infodemic management. The highlights and outcomes of each discussion were briefly reported back in the plenary by the group facilitators, so that all participants were abreast of significant observations. More information on the structure and methodology of the conference is detailed in the [Multimedia Appendix 1](#).

Framing discussions with a concept map of the wider impacts of infodemics

A map of concepts of the wider effects of infodemics was developed and used as a structured aid to facilitate streamlined discussions during the conference (Figure 1). The map itself was organized into four sections, representing elements relating to the hypothetical influence of information environment, and their potential effects on individual, health and societal impacts. Further details about the burden of the infodemic concept map can be found in [Multimedia Appendix 2](#).



Figure 1: Concept map of the burden of infodemics as discussed at the conference. *It is organized across four domains: (1) in green, level of information ecosystem: online and offline content, social context and the structures that affect dynamics of information consumption and transmission; (2) in blue, individual level: behaviors and psychological mediators that determine exposure and susceptibility to information characteristics of infodemics, as well as the proximal physical and psychological outcomes after this exposure (3) in red, the level of health system impacts focused on metrics and outcomes specific to healthcare delivery and public health systems; (4) in red, the societal level: infodemic impacts and ultimate outcomes that affect groups of individuals.*

Concept mapping is a technique from the social and natural sciences to represent hypotheses about how elements affect one another [26, 27]. These maps are meant to be preliminary frameworks—for example, concept maps typically start in a highly qualitative form, similar to mindmapping or causal mapping techniques. While concept maps may eventually inform the basis of quantitative research, such as structural equation modeling, highly qualitative concept maps can be helpful for nascent problems to provide a system-level visualization of potential causal links, which, in turn, informs strategies for their investigation.

A brief review of the literature did not yield any comprehensive existing frameworks to discuss the whole complexity of the infodemic. Therefore the concept map was developed to help participants from different backgrounds have a common frame and vocabulary for discussion.

The draft concept map was based on theoretical expectations, drawing from existing models from multiple disciplines including anthropology, psychology, sociology, and informatics. The concept map sought to apply exposure or dose-relationship models from medicine and public health towards infodemic impacts, and draws from socioecological models to consider interactions between individuals and broader societal factors. It sought to provide a system-level visualization representing hypotheses about how key factors may affect outcomes in an infodemic. A synthetic map was needed as the majority of research to date has focused only on limited facets of the system; for example, one study sought to estimate the total monetized cost of decisions not to receive a COVID-19 vaccination based on misinformation or disinformation [15]. Another study focused on the incremental health costs due to additional COVID-19 cases caused by misinformation, as well as the impact on gross domestic product due to government restrictions needed to address the infection growth rate attributable to the impact of misinformation [28]. Directionality and potential causal links between different concepts on the map would be a point of discussion during the meeting.

The concept map was designed to help overcome challenges associated with bringing together such a diverse group of participants from diverse fields and areas of public health practice and policymaking. As research on infodemiology remains emergent, significant variations in how infodemics and their impacts are conceptualized exist. Any research seeking to measure the predictors, mediators, and impacts of either health behaviors or human cognition is intrinsically complex. The interdisciplinary nature of infodemiological research draws interest from a wide variety of diverse disciplines ranging from the social sciences to health informatics. Moreover,

experts working in infodemiology vary in professional settings ranging from public health action to academic research.

The concept map was prepared by expert members of the organizing team, was shared with participants ahead of the conference, and was referred to through all deliberations. Several map limitations were communicated to the participants ahead of time. First, the map was used as a discussion tool, and its primary purpose was not considered a formal model. Second, elements that were likely to be challenging to measure were included in the map to foster discussion. Third, the model was based on theoretical expectations and not a systematic review of the literature. Fourth, the model was not comprehensive, and should not be used to inform intervention design or quantitative modelling.

Designing for consensus on outcomes and recommendations

The four conference sessions were structured over the following thematic areas, for a cumulative duration of 12 hours. Facilitators directed participant discussions to arrive at actionable recommendations on the last day. Ahead of each session, the design of the proceedings and group discussion tasks and visuals were also tested with the co-chairs of the conference and a group of experts, and the feedback was used to set clear discussion tasks and discussion aids. This approach aimed to prepare each session discussions by building on the collective knowledge from previous sessions, and to effectively facilitate technical discussions despite complex multidisciplinary topics.

The meeting schedule was designed as follows: ahead of each of the three-hour virtual meetings, the organizing team prepared introductory talks to set the task of the day, defined discussion questions, developed visual aids and designed the discussion process. During the session, the outcomes of discussions were recorded by facilitators and note takers on Miro boards that were used during the session. After each session, debriefs with breakout group facilitators reflected on the group dynamics and technical discussion. The organizing team used all of this information to adapt and refine the preparation of next session, including the discussion questions and discussion inputs on Miro. Moreover, after each session and debrief, the organizing team updated the concept map on a summary Miro board to capture the progressive discussions, and made it available for asynchronous review and comments by conference participants.

Synthesis of discussions using thematic analysis by the organizing team led to identification of five key areas for immediate action for the development of metrics to assess the burden of infodemics and associated interventions. They were summarized alongside a participant-generated list of proposed actions and concrete next steps for each area for implementation.

Designing for emotional pacing, engagement and behaviors supportive of desired conference outcomes

Experience from previous WHO infodemic management meetings has shown that infodemiology discussions often require design that helps overcome barriers in differences in language and terminology and focus of actions or aims of research between researchers from different disciplines and practitioners from different health programmes or evidence-informed policy functions in health authorities [16, 17, 29]. Several meeting design features aimed to address this:

- The concept map and lightning talks by experts at the beginning of the day were used to highlight perspectives from different scientific disciplines or public health practice on the discussion task of the day.
- Facilitators of small group discussions were coached and provided facilitator guides with prompts to help them moving the discussion towards the task, and were given a space on the discussion boards where they could record suggestions tangential to the task at hand.
- The schedule deliberately emphasized more discussion time in smaller groups in comparison to in-plenary, to allow for maximum participation and exchange of experience.
- Synthesis of collective discussion was used to prepare for next session. This was a resource-intensive activity that aimed to learn as much as possible from participants while keeping them interested, engaged and motivated to provide further input in the next session.
- The organizing team reflected back to the group not only technical summary of discussions, but also the observations on the discussions – for example, the development of common understanding of vocabulary and small group identities.
- Because the discussions were highly technical and required intense engagement, breaks were designed to be playful. Music videos on the topics of public health and science were played at the beginning of the meeting and during breaks to set the tone of interactions at the conference.

Results

We identified five key areas for immediate action towards the development of metrics to assess the burden of infodemics and associated interventions over the four sessions. The outcomes of discussion are summarized below and more details on each of the action areas are provided in [Multimedia Appendix 3](#).

First, participants note that currently, although often referred to, no established and widely accepted definition exists of what exactly characterizes infodemics and related aspects (e.g., misinformation) and thus urged to establish the development of standardized definitions related to infodemic measurement and management. This could be achieved through the establishment of a working group aimed at developing working definitions which could later be validated using a Delphi method. Participants assessed this task as a priority since the term “infodemic” was conceptually conflated, often overworked, and was currently used to refer to very different concepts in different fields or country settings. A glossary of terms associated with measurement of infodemics—examples include “information exposure,” “overload,” “risk mediators of individual effects,” and “delayed care due to infodemic”—with standardized definitions was urgently needed to aid infodemiology research as well as public discourse.

Second, participants proposed the establishment of a multi-disciplinary working group to review and build on the concept map to reflect and reconcile different perspectives and disciplines that look at the information ecosystem, individual, health system and societal factors contributing to the infodemic. A Delphi method was recommended to be used to validate the concept map. Efforts to improve the concept map should be closely coordinated with the technical working groups responsible for developing standardized outcomes (Area #1), and with the group conducting a desk

review of the evidence, tools and data sources (Area #3). This is essential as definition of the appropriate elements in the map will be in conversation with the terminology being developed. Similarly, evidence from the literature reviews will be vital to arriving at relevant connections/associations between the elements in the map. Participants assessed this task to be a priority and voted to retain the infodemic burden concept map. However, participants warned against following any concept map too closely, as it might lead to disregarding critical elements which were not already elaborated on the map. They agreed on its value in identifying the various inputs and outcomes, as well as the confounding factors that determine the contours of a complex object of scientific inquiry, such as an infodemic.

Third, participants proposed the establishment of a working group to draft a protocol for conducting a review of evidence, tools and data sources related to infodemic measurement. The working group would also explore options and partnerships that could implement the review. Participants assessed this task to be a priority. Given the emerging contours of infodemiology, its scope would extend beyond that of a traditional review. While drawing on tools for systematic reviews of ongoing and upcoming research, it would, for instance, also involve searches within the grey literature.

Fourth, participants suggested the establishment of a working group to review and improve different policy, practice and research priorities on a rolling basis, and work towards alignment of infodemic management efforts at the global level by different stakeholders. Additionally, this group would support mainstreaming of infodemic management into public health practice, policy and capacity-building. This core group would be complemented by a wider array of related groups, leveraging expertise in specific areas in a Delphi method to reach consensus on various items discussed in the group. Participants assessed this task to be a priority.

Fifth, participants identified four urgent aspects of COVID-19 infodemic management needing attention in the short term. Additionally, participants ranked them in order of priority, and offered inputs on their potential modification and expansion: (1) Development of harmonized tools for the measurement of information diet/exposure and establishment of a global research collaboration to use them; (2) Development of behavioural/process models that can be used for the development and evaluation of interventions; (3) Measuring the economic cost of the COVID-19 infodemic and related spill-over effects; (4) Identification of data sources and measures following the concept map, which can be used for defining global open datasets to facilitate modelling and research.

Participants agreed that pandemic response, health system recovery and resilience building remain key priorities for most health authorities, and continue as research focus for academicians. In addition to the five key areas of action, several additional themes of conversations were identified during the discussions (see details in [Multimedia Appendix 4](#)), in general reflecting on the barriers and enablers to assessing and measuring the burden of infodemics.

Discussion

Based on the far-ranging small and large group and asynchronous discussions of participants, inputs to multiple interactive boards and summaries from deliberations the five key areas, we should consider the following:

1. To successfully respond to the infodemics and integrate infodemic management into health systems and health policies, it is crucial to be able to measure the burden of infodemics on society. The conference discussions reaffirmed that there is an urgent need for infodemiology research to be fast-tracked and oriented in directions that are most effective for infodemic management in public health. Efforts to identify metrics for assessing the burden and evaluating interventions related to infodemics will benefit if they proceed in a parallel manner. Metrics that are feasible to measure and implement across a wide range of public health programmatic settings should continue to be prioritized. Standard indicators already used for measuring health, population and economy should be given priority over the invention of new ones.
2. The identification of sources and metrics from established and routine health and data systems should be rigorously prioritized over the formulation of new ones. Integrating insights from online and offline sources of information would be essential to an objective infodemic burden assessment.
3. Despite the efforts focused on characterizing misinformation, little research in the area has been designed to measure population-level associations between (mis-)information exposure and attitudes like vaccine hesitancy or behaviors such as non-adherence to public health practices [30]. Research in data-driven infodemiology has mainly focused on identifying types of misinformation which appear online and their prevalence, often limiting itself to a single social media platform. With few exceptions [31], research designs do not associate information exposure with individual outcomes (e.g., attitudes, practices or behaviors) and thus cannot be used to assess the burden of infodemics [32, 33]. This results in absence of solid evidence which could support effective design of public health interventions.
4. On the other hand, the difficulties in harmonized measurement of the burden of infodemics should not pause the efforts in public health practice to introduce evidence-based interventions through rigorous implementation research and adaptable health programming. For example, lessons should be drawn from how policies to address the burden of non-communicable diseases on populations evolved over time. Measurements such as monitoring of blood sugar levels became standard practice and indicators before science was able to unequivocally link them to health outcomes and burden of disease.
5. Although the WHO Member States have recognized the perils of health misinformation [34], WHO, Member States, civil society and other stakeholders have different roles to play in infodemic management and response. To be effective, management and response activities need to understand where the greatest risks are and rapidly capture positive impact of responses without having to develop new robust evaluation programs for every activity. Observational studies that simply report on the prevalence of misinformation make recommendations based on biased data and without measuring associations with behavior. For example, it was assumed that bots were important for disseminating misinformation, but research could not prove real impact on attitudes of social media users [35]. Studies

that do not directly link information exposure to behavior can lead to wasted effort and unintended consequences. Understanding the mediating role that the social determinants of health play on individuals and their susceptibility to misinformation should be investigated.

6. Infodemic causes harm on many levels and it is by its nature a complex problem. Assessing its burden on health and society will require rethinking not only frameworks, pathways and protocols for measurement, but also how the data are collected in a sustainable manner. WHO is developing activities to support pandemic preparedness and to mitigate the current pandemic, and several WHO preparedness activities rely on the development of new technologies and tools. The deployment of standardized tools for measuring how population-level differences in exposure to information risk factors explain differences in behaviors after accounting for demographic differences is a challenge. New forms of global collaborations are needed, to collect harmonized data through distributed collective measurement of the burden of infodemics. Moreover, research and data collection should consider using participatory research methods with communities and infodemic managers where generation of metrics is paired up with interventions.
7. Infodemics can be best addressed using a multidisciplinary approach, and grounding in public health practice [16]. The currently emergent stage of the science of infodemiology, combined with the heterogeneity of academic expertise and professional backgrounds of the participants at the conference, offered rich opportunities for multifaceted technical discussions on metrics related to infodemics. At the same time, the meeting reconfirmed that conversations across diverse background must be prepared carefully, to facilitate discussion across different scientific terminologies and approaches, as well as the differences between research methods and public health practice considerations.
8. The lack of trust or mistrust towards health authorities can compromise adherence, compliance, and, ultimately, overall success of the public health response, with all that these implies in terms of adverse outcomes on individual and population-wide levels. Identifying public health and social indicators for measuring and monitoring the impact of infodemics on health behaviors are now a priority for many health authorities who require evidence for planning, implementing and evaluating interventions and policies. Trust metrics should be incorporated into infodemic metrics and modeling because these concepts are so interlinked.
9. Currently, there are few published studies that reflect on how policies foster or hinder infodemic-related outcomes; without measures that are identified that can be acted on by health systems, it will be difficult to institute more supportive and effective policies to mitigate the effects of infodemics on health.
10. The way information access, exposure, and engagement are estimated for individuals is inconsistent across studies and often restricted to single social media platforms, limiting the value of the research. Furthermore, it remains unclear whether data from social media and web platforms can be used as proxy measures for a person's broader information diet and if these data capture differences in how people make sense of that information in terms of attention, trust, and prior beliefs. Ultimately, understanding how a person's interaction with an increasing individually attenuated and complex information ecosystem affects their health behaviors should be better studied to understand linkages to their online interactions.

However, there are ways forward to advance the measurement of infodemic harms and impacts and use of infodemic management interventions. The five conclusions and five key actions from the conference represent the convergence of many of the limitations and opportunities mentioned above for the field and propose a roadmap for advancing the field for WHO.

Conclusion

Infodemics now constitute a condition of our times and are here to stay, even it is extremely difficult to measure them precisely. In order to advocate evidence-based interventions for use in preparedness, prevention and emergency response, thorough assessment of infodemics' impact and burden the society is required. This, however, requires to first reach consensus about what we exactly mean when we talk about infodemics and also about its moderating determinants. When definitions are set, formulating an adequate methodology – relevant in various healthcare settings and contexts – can be pursued that helps measuring and eventually expressing the damaging effects of infodemics by using standard indicators.

Previously, many efforts in research and coordination in the misinformation space have focused on individual, societal or media-related domains—but now is the time to firmly center the health system in the infodemic management conversation when it comes to health emergencies. Strengthening preparedness, prevention and resilience aspects to health systems in infodemic management will mean moving from defining terms and metrics to routinizing infodemic measures in routine data collection and decision-making in “peacetime” preparedness work and ramp up engagement, grounded in policy and enabled by sufficient workforce capacity and resources, during emergency activations of incident management structures. Therefore, efforts to build research in infodemic management, including metrics, will require a two-pronged approach, which can contribute to generalizable knowledge but also generate evidence-informed rapid insights that emergency response officials need to make better decisions in midst of a chaotic information environment. Common infodemic-related definitions, measures, and analytic approaches would allow for better comparison and evaluation of response efforts between countries, similar to how standardized epidemiological measures have allowed for tracking pandemic response performance.

Multidisciplinary research and partnerships between public health, academic, media and civil society institutions will continue to be needed and fostered to identify interconnections which could provide basis for such assessments. Convenings similarly patterned on human-centered design principles may be well-suited to further discussing and establishing frameworks for interdisciplinary areas of health that are identified as priorities following emergencies and outbreaks, even if science and policy surrounding the topic is only emergent. This could include focus on burgeoning areas of governance, privacy and ethics in infodemic management and even in other health areas affected by infodemic harms. To that end, WHO is convening a WHO ethics panel to deliberate on ethical considerations of social listening and infodemic management.

The infodemic has not only affected the world's response to its most recent pandemic, but misinformation has plagued other areas of health, from decades-long efforts by the tobacco industry to minimize the harms of smoking and use of tobacco products causes, including most recently vaping in teens, to the marketing of potentially useless or harmful holistic medicines for cancer and diabetes, to the still-pernicious myth that vaccines cause autism and that there are alternative cures for autism. Yet, we can learn from these other misinformation examples. Conducting evidence gap analyses on what has been published in other areas of health and what metrics and interventions have been tested would contribute to the larger effort to more accurately understand the burden of health-related infodemics beyond emergencies.

Commented [EW1]: REF WHO toolkit against noncommunicable diseases and health misinformation will be launched oct 21 so add reference after this

Ultimately, a successful infodemic response will lead to informed policies and promote healthy behaviors by individuals and communities. To do this, it identifies and addresses individuals' and communities' questions, concerns and information voids on health topics; reduces the spread and impact of misinformation; and refines public health engagement strategies (i.e. promoting health equity, addressing scientific uncertainty and promoting culturally relevant risk communication and education) and health system response to more effectively promote healthy behaviors. To support countries, WHO has fostered development of tools to provide an evidence-based response to the infodemic and strengthen epidemic and pandemic preparedness activities. [36, 37]. As the COVID-19 response has shown, all emergencies and pandemics in the future will be accompanied by infodemics that will be better addressed with the tools and insights developed today.

As the COVID-19 pandemic has evolved over time, so have country and public health priorities. Infodemic issues have also changed with increased pandemic fatigue, and despite greater access to vaccines and treatments, not enough people are receiving them, amid increased politicized discussion of pandemic-related measures [38]. Although new outbreaks, such as polio and monkeypox, have grabbed headlines in 2022 and generated their own infodemic concerns, the same challenges of lack of common language, measurement, tools and resources and expertise remain. It is important to quickly identify what can be learned from the COVID-19 experience, taking stock of what interventions and metrics have been used, and how they can be applied to mitigating future infodemics. A policy brief for COVID-19 infodemic management has also been published, outlining key recommendations for policymakers to integrate infodemic management in COVID-19 response and strengthen preparedness for other emergencies [39].

Health authorities seeking instructive policies or global technical guidance on infodemic management as the global epidemiological picture changes. WHO is working to establish a technical working group to support development of technical guidance that will be relevant to different country contexts, emergencies and outbreaks.

Countries are seeking solutions—interventions to stem current and future infodemics. Following the conference, WHO has commissioned an evidence gap map (EGM) exercise to analyze and visually map areas where there is evidence, the strength and applicability of that evidence of infodemic management interventions in the time of COVID-19 to the wider field, and where there are evidence gaps. In conjunction with the conference outcomes and priorities identified by participating experts, this EGM can aid in prioritizing where investments in research and

interventions should be directed. WHO is also collecting the stories of infodemic managers to understand their experiences of responding to COVID-19 and identifying promising practices, serving as a companion to the Evidence Gap Map to focus on what resilience-building measures can be taken to prepare health systems for the next emergency.

We are standing on the shoulders of giants as diverse knowledge can be transferred from other disciplines and contexts into infodemic management for emergencies. Yet, we need more innovation to address some of the longstanding questions and bring about a truly multidisciplinary effort that serves both, academic research and public health emergency preparedness, prevention and response.

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Conflicts of Interest

SB, SBr, NG, SH, AI, MK, RL, TN, TDP, and BY are staff of the World Health Organization; CBF and BW are consultants with the World Health Organization; SK and CV are staff of the US Centers for Disease Control and Prevention. These authors alone are responsible for the views expressed in this paper, and they do not represent the views of their organizations.

Conflict of Interest was reviewed and managed as per WHO procedures. AD declared that his university received research support on information diet measurement by WHO for product owned by WHO. He was not part of the consensus driving during the closing session of the meeting. TM declared ownership interest in a company for work not related to the deliberation in this publication. LMB works for Immunize Canada/Canadian Public Health Association, which has received educational grants/funding from Merck Canada, Pfizer Canada, Pfizer Global, Moderna Canada, Seqirus, Sanofi Canada, GSK Canada and the Public Health Agency of Canada (PHAC). These funds are not related to the paper. BO declared past employment with a humanitarian organization, which was not related to the objectives of the conference. CW was Executive Director of non-profit organization First Draft, which received funds for research and advocacy work from Google, and research project support on effectiveness of SMS-based social inoculation from World Health Organization. She chaired the first three days of the conference, but was not part of the consensus driving during the closing session of the meeting. EP declared receiving conference stipends, training fees and publication fees from the Medical Research Council. NB receives paid advisory service fees from US CDC and World Health Organization, Merck and Novartis. He was not part of the consensus driving during the closing session of the meeting. IB is Director of WHO Collaborating Center on information systems for health, which supports WHO with broader digital health analytics and policy

analysis. The center has supported Pan American Health Organization (PAHO)/WHO with infodemic analytics during COVID-19. SMR declared receiving consultancy fees from "EURO Health Group" research consortium and is currently a consultant in IM for the WHO. JR and SVDL declared that his university received research funding from NATO StratCOM CoE, Google Jigsaw, Whats App, British academy, ESRC, UK Cabinet Office and EU Horizon 2020. They were not part of the consensus driving during the closing session of the meeting. AG declared that his university received research funds from the Canadian Institutes of Health Research (CIHR). AS declared receiving consultancy fees from Euro Health Group A/S – Denmark for services unrelated to the topic of the conference. BG declared past employment with President, Global Immunization at the Sabin Vaccine Institute. PB is founder and CEO of HealthEnabled, which received past funding from Gavi, The Vaccine Alliance to do digital social listening. JN declared employment with Harvard University, working in the field of medical misinformation. MG and MEB declared no conflicts of interest for this paper.

Abbreviations

US CDC: Centers for Disease Control and Prevention

COVID-19: coronavirus disease

DOI: Declaration of Interest

LMICs: low- and middle-income countries

WHO: World Health Organization

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APPENDIX 1

CONFERENCE MEETING: METHODOLOGY AND STRUCTURE

Day 1

The concept map was introduced by members of the organizing team during the plenary session. It was subdivided into six focus areas to facilitate discussion among participants:

- Information landscape (social context, content generation, exposure mediators)
- Risk mediators
- Direct physical and psychological and indirect psychological effects, and health and well-being
- Health system outcomes
- Societal impact
- Economic impact.

Participants were also accordingly assigned to one of the six breakout groups, denoted by Groups A through F. Each breakout group discussed two parts of the concept map for 20 minutes each, where participants suggested concepts that fell into part of the assigned concept map.

After the initial 20 minutes of breakout discussions, groups were switched to different breakout rooms to discuss another focus area for 20 minutes. Given the rotation, the second focus area discussed by each group had already been the focus of another group's discussion for the first round of 20 minutes.

Observations by group members were noted on the Miro board's virtual sticky notes by an assigned note-taker in each group. Participants were free to directly add their own sticky notes to the board.

Day 2

The breakout group discussions during the second session of the Conference were also focused on the concept taxonomy map. Participants were assigned to the same group as on Day 1 to promote collegial discussion.

The following prompts were used to guide the group discussions in keeping with the session's theme of "How do we measure information diet and information exposure?"

- What are the barriers and limitations that make it difficult to measure?
- What are the measurement tools that can be used or need to be developed?
- What study designs can be used to measure this?
- What indicators could be used or developed, keeping in mind that priority should be given to existing/routine data sources to ensure sustainability and feasibility even in low-resource settings?

Day 3

Breakout group discussions during the third session were organized around the theme of "Identifying measures for each of the concept taxonomy elements".

Based on feedback from previous days' sessions, the organizing team edited the notion of a concept map, which had initially been presented as a causal map, to a concept taxonomy. Through this modification, the various elements that needed capturing through existing and future metrics were prioritized instead of characterization of the nature of the logical relations between two or more elements.

There were four breakout rooms, each assigned to a specific theme of discussion towards the identification of available and potential measures around each of the four areas of the concept map. These were:

- information ecosystems;
- individual-level concepts;
- individual-level health outcomes;
- societal (including health system) outcomes.

Participants were free to join rooms of their choosing based upon their interests. They were also free to change rooms at any point during the discussions.

Day 4

During the final day of the Conference, participants were invited to join any breakout room of their choice. There were five breakout rooms, each dedicated to a specific task in view of the next steps to develop metrics and associated interventions for infodemic management.

- Develop standardized definitions.
- Improve the concept map.
- Conduct a desk review of the evidence, tools and data sources.
- Set up a technical working group.
- Address immediate priorities for COVID-19 recovery and resilience building.

APPENDIX 2

CONCEPT MAP

The highly interdisciplinary nature and the currently nascent stage of the science of infodemiology, combined with the heterogeneity of academic expertise and professional backgrounds of the participants, offered rich opportunities for multifaceted technical discussions on metrics related to infodemics. These same features also presented significant challenges in terms of establishing a common language and framework needed for streamlined and actionable discussions around the measurement of the health effects of infodemics.

A concept map was introduced during the first working session of the Conference to facilitate discussions among participants on the technicalities of developing metrics for infodemics.

Why start with a concept map?

As research on infodemiology remains nascent, there are significant variations in how infodemics and their impacts are conceptualized. The reasons for this are fourfold:

1. The interdisciplinary nature of infodemiological research draws interest from a wide variety of diverse disciplines ranging from the social sciences to health informatics.
2. Experts working in infodemiology vary in practice settings, ranging from public health action to academic research.
3. Brief reviews of the literature suggest that comprehensive frameworks for the impacts of infodemics do not exist.
4. Any research seeking to measure the predictors, mediators and impacts of either health behaviours or human cognition is intrinsically complex.

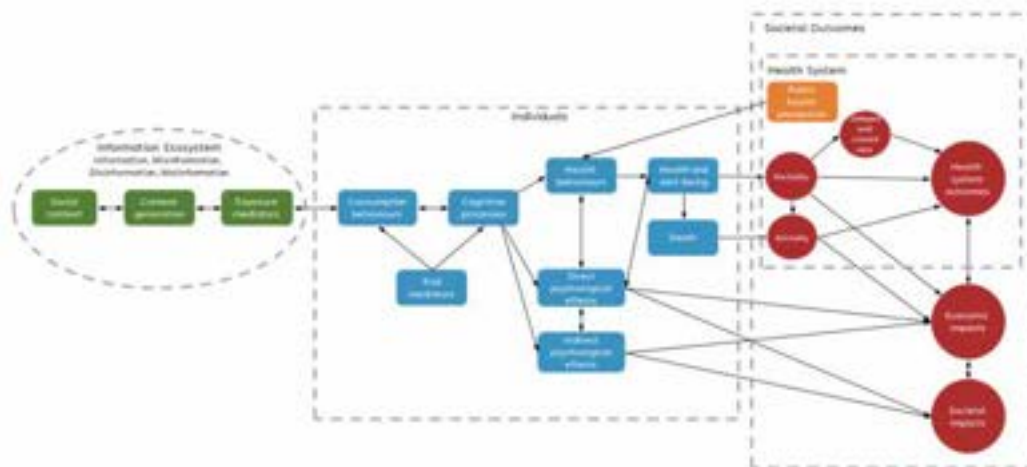
As potential impacts will likely vary from the effects on individuals to broader societal-level outcomes, a lack of consensus will hinder discussions on how to think about infodemics and measure their impacts. A draft concept map would consequently facilitate conversation during this Conference.

What was the concept map used for?

Fig. 1 is a fictitious example based on world experiences from the COVID-19 infodemic, and its interactions between health authorities, media channels and sources, how infodemics affect individuals, families and communities, and possible outcomes.

In this concept map, boxes represented thematic constructs or elements hypothesized to be significant predictors of infodemic outcomes. Arrows suggested causality or influence in the direction indicated. Circles were thematic outcomes of interest to public health. Sticky notes designated ideas developed during the Conference and in small breakout groups.

While the same map was used over the three sessions, participants were given distinct prompts for discussion and actions related to the concept map, and towards the identification of metrics for infodemiology.



The map itself was organized into four sections, representing elements relating to the influence of information dynamics, and their attendant effects on individual health and societal impacts.

1. Information ecosystems: online and offline content, social context and the structures that affect dynamics of information consumption and transmission
2. Individual effects: behaviours and psychological mediators that determine exposure and susceptibility to information characteristics of infodemics, as well as the proximal physical and psychological outcomes after this exposure
3. Health system impacts focused on metrics and outcomes specific to health-care delivery and public health systems
4. Societal impacts: infodemic impacts and ultimate outcomes that affect groups of individuals.

In this concept map, boxes represented thematic constructs or elements hypothesized to be significant predictors of infodemic outcomes. Arrows suggested causality or influence in the direction indicated. Circles were thematic outcomes of interest to public health. Sticky notes designated ideas developed during the Conference and in small breakout groups.

How was the concept map used?

Different parts of the concept map were discussed over the course of the Conference in two formats: by discussants who were experts at providing perspectives on specific topics in

plenary, and in small group discussions in breakout groups where all participants were asked to provide inputs on the topic.

The interactive Miro platform was used to present the concept map and capture inputs from discussions. Participants in breakout groups were encouraged to populate and edit the concept map, as per the specific facilitation instructions for the discussions. Alternatively, participants could either voice their position or make a note on the chat feature of the breakout room, and an assigned group discussion facilitator would capture the conversation through virtual sticky notes on the Miro board.

Some leading questions for the breakout groups in discussing the concept map are given below:

- What subconcepts should be added within the box on the map?
- What measures can be used to measure the concept?
- How can we prioritize adding concepts that are measurable and for which data sources may already exist?
- What are the barriers or considerations that make this harder or easier to measure in high-income countries? In LMICs? Globally?

APPENDIX 3

DISCUSSIONS ABOUT ACTION AREAS

Five key areas for immediate action towards the development of metrics to assess the burden of infodemics and associated interventions were identified over the four sessions. Participants discussed in detail the technicalities involved in implementing each, which are captured below.

1. DEVELOP STANDARDIZED DEFINITIONS

Participants agreed that this task was a priority because at present the term “infodemic” is used to refer to many scenarios and situations. As such, it is conceptually conflated, overworked. A glossary of terms associated with infodemics – such as misinformation, disinformation or an overabundance of information – with standardized definitions was sorely needed to aid infodemiology research as well as public discourse.

Several nuances around this task were anticipated, which would need to be addressed by the working group. These included the following:

- Apart from mis- and disinformation, how should notions that such information is/was true at one point in time but has become outdated/expired in face of newer evidence, be captured in the terminology?
- Should there be a term to indicate information that is not mis- and disinformation, i.e. so-called “good” or “true” or “accurate” information?
- Should infodemics, with regard to its connotations of “excess information”, be defined as a universally negative phenomenon? Where does this leave contexts in which “more information” might be adding value and fostering education rather than contributing to the reverse?
- Strong operational definitions of terms such as “overabundance of information” would be essential to develop operational metrics to measure infodemics, given the inherently relational and contextual nature of such concepts. What should be the markers of “overabundance” and what is the overabundance relative to? Is it fair to assume that individuals and societies are always overwhelmed with information?
- Is the idea of “overabundance” better applied to the magnitude of information to which people are exposed, or to the harms that are then caused? Harmful outcomes have the advantage of being easier to measure (in terms of mortality, vaccine refusals, and so on) but run the risk of abandoning the link with information exposure. Should the current definition be modified to “an overabundance of harm created through exposure to mis-, dis-, and an excess of information”?
- The question of language and the power of the translator to dictate the narrative. Along with a glossary, WHO should develop guidelines on how to translate the same

into different languages. There may be many terms in a language that may have approximately the same meaning, but with different political connotations.

- Multiple terms that have approximately the same meaning are currently in use to describe infodemic-related phenomena. The duplication that happens when multiple terms are commonly used to denote essentially the same concept/phenomenon adds to the confusion. A timely example would be “vaccine hesitancy” versus “vaccine confidence”. Another would be differences in meaning between “vulnerability” or “susceptibility” in risk assessments of mis- and disinformation.
- WHO should take the lead in producing a standardized glossary that can be used to inform scientific research, technical discussions and public discourse.

2. IMPROVE THE CONCEPT MAP

Participants agreed that this task was a priority and voted to retain the infodemic burden concept map. They agreed on its value in identifying the various inputs and outcomes, as well as the confounding factors that determine the contours of a complex object of scientific inquiry, such as an infodemic. However, participants warned against following any concept map too closely, as it might lead to missing critical elements that were not already elaborated on the map.

A multidisciplinary steering committee should be formed to develop the concept map, and to identify stakeholders to define its elements and links. Efforts to improve the concept map should be closely coordinated with the technical working groups working on developing standardized outcomes (Conference outcome #1), and with the group conducting a desk review of the evidence, tools and data sources (Conference outcome #3). This is essential as definition of the appropriate elements in the map will be in conversation with the terminology being developed. Similarly, evidence from the literature reviews will be vital to arriving at appropriate causal connections between the elements in the map.

In terms of specific modifications, participants suggested the following:

- The map should be sensitive to the differences between mis- and disinformation and information overload, as these can lead to entirely different health behaviours and outcomes.
- Models on information-seeking behaviours should also be included in the map.
- Elements on the map should be refined so that they have the same level of granularity, instead of some elements being extremely broad and the others too narrow.
- Elements should also be reworked to make the model more broadly applicable to infodemics and health outcomes, rather than focus on a specific-use case alone, such as vaccination.
- A balance should be sought between making the concept map precise for a specific infodemic-related use case, which might help tailor better research questions, and its applicability for articulating general infodemic-related dynamics.

In terms of enhancing the utility of the infodemic burden concept map, participants made the following suggestions:

- There should be a clear understanding of and communication on who the target audience and what the target use for the map is.
- The map should be presented to select groups who did not participate in the Conference.
- A series of infodemic-related case studies, based on literature reviews, should be developed as use-cases to illustrate the analytical utility of the concept map.
- Training should be offered for different stakeholders (e.g. researchers and public health policy-makers) on how to use the map based on their specific research tools and needs. For example, the concept map might be integrated as part of the [WHO COVID-19 infodemic management course](#).
- Future meetings should devote more time to the revision and review of the concept map, with concrete-use cases to bring the discussions together.

In sum, the infodemic burden concept map could be envisioned as a living document that is refined and evolved as infodemiology research progresses and more is known about the links between information exposure and health outcomes. This would necessitate regular reviews with key stakeholders. The review committees should be diversely constituted to avoid fatigue and keep the advantage of fresh eyes to help identify different areas of focus where further research and measurement is needed.

3. CONDUCT A DESK REVIEW OF EVIDENCE, TOOLS AND DATA SOURCES

Participants agreed that this task was a priority. Given the emerging contours of infodemiology, its scope would extend beyond that of a traditional desk review. While drawing on tools for systematic reviews of ongoing and upcoming research, it would, for instance, also involve searches within the grey literature.

The process of compiling the desk review should be initiated by stakeholder mapping to identify networks in infodemiology research to link and reach out to. This could be followed by search query data for an idea of the data that is being collected but not shared widely, and a review of the public health interventions aimed at addressing infodemic burdens alongside a comparison with the infodemic burden concept map. Finally, experts and practitioners could be approached with additional interviews and/or surveys for a comprehensive idea of the evidence, tools and data sources currently in use.

A broad range of stakeholders should be invited to join and consulted in the desk review. Academics from across relevant disciplines, researchers at public health and communications and mass media institutes, representatives from consumer societies, social media platforms, community-based organizations, and social research institutions, including public opinion companies, should be invited. Consultants on the task might include area experts, policy-makers, health authorities, social media oversight boards, fact-checker organizations, marketing companies with a track record of studying messaging impact in terms of media and content.

In compiling a review of the existing evidence, tools and data sources being deployed in studies around infodemic burdens, particular attention should be paid to the following in knowledge synthesis:

- the choice and use of particular tools to investigate particular questions;
- the intersectional nature of the available evidence (from communication, marketing, public relations studies, and so on);
- the ways in which the digital divide (and the populations unreached by digital information) is being addressed;
- new and emerging data sources or methods;
- prioritizing evidence and measures that can be used to inform action, which are readily available, timely and associated with low costs of collection and a high confidence in the measure;
- the facilitation of a rapid critical appraisal of the evidence, tools and data sources;
- its translational aspects, focused on ways in which the nature of the information captured might be categorized and classified, so that it might be used by multiple audiences, including but not limited to policy-makers, health authorities, researchers and the lay public alike;
- its relevance at multiple levels – global, national and local;
- ways to maintain transparency and accountability with the technical working team.

A suite of complementary instruments would likely need to be developed to support the primary work of the desk review, including:

- standards to gauge and define the levels of confidence associated with specific evidence, tools and data sources;
- protocols for data-sharing, including standards for maintaining privacy/ anonymity, guidance on releasing metadata, or descriptive statistics, and coordinated negotiations with data providers;
- protocols and guidance on making databases interoperable;
- a validation exercise to facilitate the collation of a registry of validated data sources.

The desk review is an immensely collaborative task, which requires working with diverse data, languages and formats. Access to these data would likely be governed by a number of different legal frameworks that determine the ownership of data and its privacy protections. The willingness of various parties (governments, universities, technology corporations) to share relevant data might constitute another barrier. The participation of various stakeholders might be motivated by different incentive structures (non-profit organizations may want to raise funds around data findings, for instance), which must be negotiated.

A number of repositories and models – embodying specific principles, operating protocols and the objectives mentioned above – can be used as resources to inform this synthesis and review:

- Cochrane databases, for guidance on using standardized reporting and critical appraisals tools: <https://www.cochranelibrary.com>
- EQUATOR (Enhancing the QUALity and Transparency Of health Research) network: <https://www.equator-network.org/>
- Global Research Map, which constitutes a worldwide landscape of digital health and artificial intelligence (AI) in health activity, methodologies and research via regional landscapes, done by iDAIR: <https://www.i-dair.org/launch-of-i-dairs-digital-health-and-ai-global-research-map-grm/>
- A repository focused on new and ongoing COVID-19 vaccine research in behavioural science, which was crowdsourced and curated by a non-profit research organization, without funding for the task: <https://docs.google.com/spreadsheets/d/1HrG2-AL17Hku-T55jXGeCGm7DPsv3oGOcymRnZYtZwg/edit#gid=45559234>
- CoVaxxy dashboard for misinformation on vaccines in the US, developed by the Indiana University Observatory: <https://osome.iu.edu/tools/covaxxy>
- Convening with newsrooms, journalists and health experts on the challenges of reporting on COVID-19 and vaccines in underrepresented communities: [Takeaways from the COVID-19 Community Convening](#)
- Reaching offline communities, working with Google News Initiative to fund global fact-checking initiatives: [COVID-19 Vaccine Counter-Misinformation Open Fund](#).

4. SET UP A TECHNICAL WORKING GROUP

Participants agreed that this task was a priority.

A host of considerations should guide deliberations and decisions on the constitution, activities and expected impact of the working group:

- Include a wide network of individuals and institutions, representative of a wide range of actors and affected stakeholders, to minimize homogeneity and facilitate better advocacy and dissemination of work.
- Carefully select representatives from across the world and involve country-level practitioners, avoid overrepresentation by experts from areas with the maximum research funding and published literature on infodemic management.
- Include practitioners from the field to maintain focus on public health action and provide grounding on what is actionable, feasible and sustainable.
- Reach out to other working groups that are already working in this area and might be able to assist.
- Identify institutions at the regional and local levels (e.g. using the Vaccine Safety Network), whose work aligns with one or more of the proposed action areas to be part of the extended network.
- Ensure the technical and apolitical orientation of the group's work to serve all organizations and the public.

- Commit to transparency in all decisions and processes of decision-making, facilitated by actions such as a public call for members, and a collaborative approach to setting up the terms of reference of the group.
- Look to international agencies to keep the focus on developing health-related metrics in infodemic burdens, while also deciding on appropriate limits to the notion of “health”.
- Specify concrete deliverables for the working group to facilitate timely assessments of its impact in advancing the field, relative to the time and resource investments incurred.

5. ADDRESS IMMEDIATE PRIORITIES FOR COVID-19 RECOVERY AND RESILIENCE BUILDING

Participants agreed that all aspects constituted essential work for developing metrics to measure the infodemic burden. A number of ways of ordering the priorities were put forth, subject to different lines of reasoning on why measuring the burden of infodemics constituted essential public health action.

The common priorities that emerged from the discussions, in rough order, are listed below:

1. Development of harmonized tools for measurement of the information diet/exposure and establishment of a global research collaboration to use them
2. Identification of data sources and measures following the concept map, which can be used for defining global open datasets to facilitate modelling estimation and research
3. Development of behavioural/process models that can be used for the development and evaluation of interventions
4. Measuring the economic cost of the COVID-19 infodemic and related spill-over effects.

Alternative priority actions on metrics development could involve the following:

- Developing measures to assess and capture public trust in institutions (in government agencies, health authorities, traditional media, social media, etc.), as well as in individuals (community-level leaders, influencers, etc.) and their relationship to infodemic and consumer behaviour
- Developing methods to track and measure how levels of trust change over time, subject to infodemic/risk communication interventions
- Identifying and developing measures to assess information voids, and to determine the costs associated with the voids as opposed to mis- and disinformation alone
- Developing metrics to describe and assess the consumption of infodemic diets and ecosystems, so that the notion of information exposure is well-defined
- Developing methods to capture cost savings made from investing in infodemic management as potential incentives for policy-makers, in addition to the economic cost burdens of infodemics.

Multimedia Appendix 4

Guiding principles for measuring the burden of infodemics

- The nature of the broader information ecosystem, particularly in its mix of sources and drivers of information creation, spread and consumption, necessitates the use of mixed-methods research in infodemiology, wherein qualitative aspects and methods of investigating infodemics are developed alongside quantitative metrics
- A human-centred approach should be adopted in developing metrics for infodemic research and interventions. This would call for participatory research methods and foreground the human subjects who are the intended beneficiaries of infodemiology research and health interventions.
- The effort of developing metrics to produce evidence of the health burden of infodemics should be calibrated from the health systems perspective of LMICs

Developing ecosystems for data-sharing and knowledge synthesis

- It is essential to incorporate systems and platforms, and foster cultures of knowledge-sharing into infodemiology research, even as the scientific discipline is growing.
- While more research is undoubtedly required, there is an urgent need to focus on knowledge synthesis and promoting awareness of currently available tools as options for systematic implementation towards infodemic management
- To this end, there is a need to collate and build repositories of available information across datasets, sources, tools and policies being used for infodemic research and management (in line with Area #3).

Putting infodemics on the health advocacy and public health action agendas

- Coordinated networks should be formed to engage a broad range of stakeholders to promote the visibility, awareness and action around the health costs of infodemics.
- These networks could also support countries and ministries of health in formulating policies and a governmental structure towards supporting infodemic management.

Definitions and metaphors for metrics

Given that infodemics constitute complex objects of scientific inquiry, it is imperative to outline common conceptual frameworks and operational definitions to aid the development of metrics to ascertain their burdens. It becomes essential to reflect on the heuristic frameworks and terminologies in use to speak to and of infodemics, which will inevitably determine how they are measured.

- Standardized definitions to establish a common understanding of the various terms used to discuss infodemics would be a key step to measuring the health burden of infodemics (in line with Area #1).
- Understanding an infodemic as a one-off phenomenon, or one that is discrete and contains events that can be stopped, should be replaced with a recognition that infodemics are here to stay but can be managed and mitigated with the right strategies during an emergency or acute health event. An alternative analogy, for

instance, might liken the health effects of infodemics to those of spurious treatment or mistreatment, instead of a disease.

Measures for mitigation

Alongside developing metrics to capture the health burden of infodemics, we need to move towards building systems and societies that are resilient to infodemics, so that its burdens are minimized. Here, it is important to be mindful of the scope of infodemics; namely, that infodemics are not confined to mis/dis/information but are also about coping with an overabundance of information, which includes true and accurate information as well as questions, concerns and information voids. As infodemics now constitute a condition of our times and are here to stay, health education and early education on the various vectors of infodemics are crucial.

- There is an urgent need to integrate health literacy, including education, on how to search for and assess information from an early stage, just as the importance of healthy foods and healthy lives are now a routine part of primary education.
- There is a need to build an understanding among the public about the evolving nature of science and how public health recommendations are made and why they change.
- We need to be vigilant of the avenues and processes by which the output and evidence generated by research studies reaches the lay public and informs their health decisions.

From: PURNAT, Tina
Sent: Mon, 11 Apr 2022 17:55:16 +0000
To: Wilhelm, Elisabeth (CDC/DDPHSIS/CGH/GID); Voegeli, Christopher (CDC/DDID/NCIRD/OD)
Subject: ECDC added infodemiology into core competencies for epidemiologists

ECDCs recent updated of the "Core competencies in applied infectious disease epidemiology in Europe", where a big chunk of infodemiology and infodemic management competencies are added:

<https://www.ecdc.europa.eu/en/publications-data/core-competencies-applied-infectious-disease-epidemiology-europe>

Best regards,

Tina

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Sign up for the WHO infodemic management News Flash: <https://bit.ly/flashsubscribe>

From: CECCHINI, Sergio
Sent: Thu, 25 Nov 2021 08:44:59 +0000
To: Undisclosed recipients:
Subject: ESAR Joint Monthly Infodemic Trend Report - October 2021
Attachments: Joint Monthly Trends Report_October 2021.pdf

Good morning/ afternoon/ evening,

Attached is the October ESAR Joint Monthly Report, produced in collaboration with AIRA, WHO, UN Global Pulse, UNICEF, IFRC, RCCE Collective Service

Key trends in October have been:

- **Concerns over COVID-19 vaccines related to religious beliefs**
- **Concerns about mandatory vaccines and certificates**
- **Access to vaccines, including the second dose**

As always, please don't hesitate to reach out with feedback, questions or concerns.

Wishing you a great week ahead!

Warmly,
Sergio

Bonjour/ après-midi/ soir,

Vous trouverez ci-joint le rapport conjoint ESAR pour le mois de Octobre produit par AIRA en avec WHO, UN Global Pulse, UNICEF, IFRC, RCCE Collective Service.

Les tendances principales du mois d'Octobre ont été:

- **Préoccupations concernant les vaccins COVID-19 liées aux croyances religieuses**
- **Préoccupations concernant les vaccins et les certificats obligatoires**
- **Accès aux vaccins, y compris la deuxième dose**

Comme toujours, n'hésitez pas à nous faire parvenir vos commentaires, préoccupations ou questions.

En vous souhaitant une bonne semaine!

Chaleureusement,

Sergio

Sergio Cecchini

Infodemic Management Officer

Coordinator Africa Infodemic Response Alliance (AIRA)

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**World Health
Organization**

REGIONAL OFFICE FOR **Africa**

COVID-19 Infodemic Trends in ESAR – October 2021

Scope

This report presents operational recommendations based on COVID-19 online and offline community feedback trends analysis in the East and Southern African Region (ESAR) for the month of October 2021. It aims to enable evidence-based decision-making at regional and national levels.

Three key themes related to COVID-19 emerged from social listening and community feedback:

1. Concerns over COVID-19 vaccines related to religious beliefs
2. Concerns about mandatory vaccines and certificates
3. Access to vaccines, including the second dose

We also identified **three persisting trends** (Treatments as vaccine alternatives, Vaccine safety, and Vaccine efficacy) and **two upcoming trends** (COVID-19 vaccine production in Africa, Pfizer vaccine trial safety).

#1 - Concerns over COVID-19 vaccines related to religious beliefs

Zimbabwe, Kenya, Malawi, South Africa

- Examples include an increased number of rumors that COVID-19 vaccines contain “fresh fetal cells” due to the false video widely spread on social media with references to religious exemptions
- Religious conspiracies such that vaccine certificates are the “the mark of the beast” were also tracked



Recommendations

- o Create clear, consistent and fact-based messaging about vaccine developments and communicate often about what is known and unknown (fact check [here](#))
- o Share information on ethics of COVID-19 vaccines developed by trusted religious organisations (example [here](#))
- o Continue engagement with religious leaders in line with African Council of Religious Leaders’ recommendations ([here](#)) including utilising science as a gift from God and supporting government efforts to vaccinate by receiving vaccinations first and using places of worship for vaccination campaigns.
- o Encourage dialogue between communities and healthcare practitioners to ensure people can express their concerns and obtain responses to their questions
- o Enhance factual information sharing by encouraging people to pause before sharing social media content (UN Pledge to Pause campaign [here](#), Viral Facts example [here](#))

#2 - Concerns about mandatory vaccines and certificates

Kenya, South Africa, Angola, Mauritius, Namibia, South Sudan, Zimbabwe

- Ongoing and persisting frustration with implementation of mandatory vaccination has been reported
- News of events or institutions requiring proof of vaccination generated negative reactions
- Concerns about the capacity of the government to provide enough vaccines for people before they implement the policy of mandatory COVID-19 vaccines

Recommendations

- o Disseminate and/or amplify personal stories showcasing vaccine hesitant people who have chosen to get vaccinated (Viral Facts example [here](#))
- o High level advocacy to governments to promote vaccination as a public good and should not be forced to avoid hesitancy due to protest



#3 - Reduced vaccine uptake due to brand preference

Kenya, Malawi, Ethiopia, Uganda, South Africa, South Sudan

- Slower vaccine uptake has been linked to preferences for specific vaccine brands due to stated perceptions around reduced side effects or ease of single dose
- Increased concerns over the AstraZeneca vaccines due to people's skepticism on its safety, leading to the decreased number of people who are willing to receive the second dose of vaccine made by AstraZeneca

Recommendations

- o Provide clear communications when introducing multiple vaccines (factsheet [here](#))
- o Emphasize that the risks associated with contracting COVID-19 far outweigh the risks of vaccination → Communicate that severe side effects are rare and often also occur when one contracts COVID-19 → Emphasize the risks associated with waiting to obtain a vaccine
- o Debunk mis/disinformation around unfounded negative side effects (e.g. blood clots, losing mental faculties, or death); work with platforms to remove misinformed content (video debunking misinformation the vaccines lead to death [here](#); another video debunking claims the vaccines affect a menstrual cycle [here](#))
- o Support accelerated vaccination campaigns and drives targeting specific populations focusing on mobile outreaches to schools, places of worship, workplaces, marketplaces in order to supplement the static vaccination sites



PERSISTING TRENDS

Unproven treatments for COVID-19 as vaccine alternatives

While content remains similar to what has been reported in the previous monthly reports, there was an increased interest in Ivermectin, Hydroxychloroquine, and herbal remedies as treatments for COVID-19 and as vaccine alternatives

Recommendations:

- o Discourage people from making decisions around alleged COVID-19 medications based on content circulating on social media, and encourage them to seek professional medical advice if they have symptoms.

- Disseminate fact-based content on which treatments for COVID-19 have and have not been approved by WHO and national regulatory bodies, [here](#)
- Continue to closely monitor content around Ivermectin, Hydroxychloroquine and herbal remedies and share accurate information to respond to people's questions (Viral Facts example [here](#))
- Develop social media content to clarify the difference between treatments and vaccines, promoting COVID-19 vaccines as a key tool to prevent severe illness, hospitalization, and death
- Highlight that little is known about post-COVID conditions or long COVID

Vaccine safety

There has been a persisting trend that people are concerned about the safety of COVID-19 vaccines

Recommendations:

- Emphasize hopeful messages highlighting vaccines are crucial ending the pandemic
- Consider providing country-specific vaccine safety information based on the vaccine being disseminated nationally, particularly in relation to the AstraZeneca vaccine
- Deliver a clear message as to why vaccines are considered safe and effective (Viral Facts example [here](#), factsheet prepared by Vaccine Demand Hub [here](#))

Vaccine efficacy

People continue to have skepticism about the efficacy of vaccines especially being surged by the death of former US Secretary of State Colin Powell due to COVID-19 complications. It generated engagement on social media, with users arguing that the vaccine is not effective since Powell had received the jab

Recommendations:

- Provide accurate scientific information that vaccinated vulnerable populations can still suffer greater COVID-19 complications due to comorbidities resulting in reduced vaccine efficacy
 - Focus on encouraging unvaccinated users to get their first available dose and recommended number of jabs to protect themselves and reduce transmission to vulnerable populations
 - Amplify the voices of trusted sources, particularly scientists, through two-way communication channels such as radio talk shows with Q&A
-

UPCOMING TREND

COVID-19 vaccine production in Africa

People have an increased interest in the potential launch of the COVID-19 vaccine production in Africa influenced by the recent [news](#) that Moderna and a US pharmaceutical firm plan to build a factory in Africa to produce safe and effective vaccines. Conversations around this topic are expected to rise in upcoming weeks

Pfizer vaccine trial safety

Recent [news](#) published in early November on claims of misconduct during COVID-19 vaccine trials made by the Pfizer whistleblower is expected to boost conversations around vaccine safety in upcoming weeks (original scientific article [here](#))

Methodology

Partners contributing to the report meet on a monthly basis to review trends and identify shared recommendations. They also discuss themes and recommendations on a bi-weekly basis during Africa Infodemic Response Alliance (AIRA) as well as the RCCE ESAR Sub-Working Group meetings.

The report is based on online social listening feedback from UNICEF ESARO and AIRA, as well as online and offline community feedback provided by a partner network who contributes to the ESAR RCCE

Community Feedback Sub-Working Group. Monitored online channels include Facebook, Twitter, Instagram, digital news, and WhatsApp messages forwarded to the researchers. Online and offline information is also obtained through the feedback form that RCCE partners fill out on a monthly basis. The report is temporarily coordinated and produced by UN Global Pulse due to the departure of AIRA's Social media analyst.

For each trend, the report specifies the countries in which relevant content was tracked. This information may nonetheless be circulating in other African countries not mentioned in this report.

Report Focal Points

Africa Infodemic Response Alliance (AIRA) • Sergio Cecchini • cecchinis@who.int

UN Global Pulse • Ayako Kawano • ayako@unglobalpulse.org

African Field Epidemiology Network (AFENET) • Sandra Varaidzo Machiri • smachiri@afenet.net

RCCE ESAR Community Feedback Group • Elisabeth Ganter Restrepo • elisabeth.ganter@ifrc.org

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UNICEF Eastern and Southern Africa Regional Office • Silvia Sommariva • ssommariva@unicef.org

From: PURNAT, Tina
Sent: Mon, 15 Nov 2021 19:46:19 +0000
To: Voegeli, Christopher (CDC/DDID/NCHHSTP/DHP)
Subject: Essential notes to start the 3rd WHO infodemic manager training tomorrow

Dear Christopher,

We are excited to welcome you to the 3rd WHO infodemic manager training tomorrow!

The countdown begins!

Essential things to note/do:

#1

You have been assigned to **Cohort B**. The start of trainings for Cohort A and B is copy-pasted below our signature for your reference.

#2

You have been assigned to simulation exercise group **"Wishdom group 17"**.

To join your team mates and the coaches, please install WhatsApp application on your mobile device, and then click on this link to join the group chat:

(b) (6)

#3

Please remember to log into the Learning Management System tomorrow, and look for Session 1 – you will be able to enter the Zoom meeting from there.

Go to this page and log in as per instructions on the page:

<https://imtraining.learnupon.com/>

STEP 1: CLICK THE BUTTON BELOW TO ENTER THE LMS

STEP 2: LOGIN USING THE EMAIL THAT YOU APPLIED WITH AND PASSWORD (b) (6)

STEP 3: CREATE A UNIQUE PASSWORD AND START SESSION 1

#4

Please ensure you have added imtraining@romelaproductctions.com to your address book to avoid emails being sent to spam.

At this time you should have received two welcome emails, please contact imtraining@romelaproductctions.com if you don't see these in your spam/promotions/inbox.

If you need any help, please email Nell at imtraining@romelaproductctions.com and she will help to onboard you.

We look forward to meeting you all!

See you tomorrow!

Greetings from New York City, Atlanta, Paris and Geneva

Nell, Lis, Catherine and Tina

Schedule of trainings, for Cohort A and B

Date

CohortCohort

A. B.

****ALL TIMES ARE LISTED AT CET (Geneva Switzerland time)***

Please pay attention to the daylight savings time change and how it could potentially change your meeting time in your own timezone.

Tuesday, November 16th	9:00	16:00
	CET	CET
Thursday, November 18th	9:00	16:00
	CET	CET
Tuesday, November 23rd	9:00	16:00
	CET	CET

Friday, November 26th

9:00 16:00

CET CET

Tuesday, November 30th

9:00 16:00

CET CET

Thursday, December 2nd

9:00 16:00

CET CET

Monday, December 6th

9:00 16:00

CET CET

Thursday, December 9th

9:00 16:00

CET CET

From: ISHIZUMI, Atsuyoshi
Sent: Tue, 12 Apr 2022 10:22:00 +0000
To: Konne, Nuadum Muriel (CDC/DDPHSIS/CGH/GID)
Cc: Catherine BERTRAND-FERRANDIS; YAU, Brian; PURNAT, Tina; Wilhelm, Elisabeth (CDC/DDPHSIS/CGH/GID); Voegeli, Christopher (CDC/DDID/NCIRD/OD)
Subject: EUPHA abstract for field infodemiology manual workshop
Attachments: EUPHA_FIM workshop_draft_12April22.docx

Hi Muriel,

As promised, here's a draft abstract for the field infodemiology manual skills building workshop for EUPHA conference – wanted to share early to make sure you have time for clearance on your end.

The basic structure we are proposing is a short panel discussion (hopefully with some colleagues from European institutes, but yet to be confirmed) and intro presentation, followed by group learning exercises. For the group exercises, we thought it would be best to focus on analysis planning and intervention development because other aspects of the manual like integrated analysis will be covered by other workshops we plan to submit. But of course would appreciate any comments or suggestions. Thank you in advance!

Kind regards,
Atsu

From: PURNAT, Tina <purnatt@who.int>
Sent: Tuesday, April 5, 2022 8:56 PM
To: Wilhelm, Elisabeth (CDC/DDPHSIS/CGH/GID) <nla5@cdc.gov>; Konne, Nuadum Muriel (CDC/DDPHSIS/CGH/GID) <xfv8@cdc.gov>; Voegeli, Christopher (CDC/DDID/NCIRD/OD) <oqo2@cdc.gov>
Cc: Catherine BERTRAND-FERRANDIS <c.bertrand-ferrandis@olylo.fr>; ISHIZUMI, Atsuyoshi <ishizumia@who.int>; YAU, Brian <byau@who.int>; NGUYEN, Tim <NguyenT@who.int>
Subject: EUPHA abstract format for workshops

Dear all,

Thanks for working with us on submissions to EUPHA conference, Berlin, Nov 2022.
Deadline for submission is May 1.

The instructions for workshops are here:
<https://ephconference.eu/submit-workshop-abstracts-283>

I tried making it easy so I copy pasted the format into a word document for you to use. See attached.

Topics:

- **Field infodemiology guide geared for epis as a skill-building workshop** – I suggest as Skills building seminar (see at link the definition) – Atsu drafts first version, then passes to Muriel

- **Elements of conducting RCA and integrated analysis in a skill-building workshop**– I suggest as Skills building seminar (see at link the definition) - Muriel
- **Panel discussion on vaccine confidence, infodemics, and its spillover effects across borders (with US CDC as a panelist)**.. – I suggest format of Round table - Tina
- **Pop-up SOVC workshop** – I suggest as Skills building seminar (see at link the definition) - Chris

Here's an example of a panel workshop from last year.

<https://1drv.ms/w/s!AtPoc3YQw0uf7kMmfBA-Fq4w2ku?e=RIcus8>

I will approach the PHIRI project (<https://www.phiri.eu/>) and the EUPHA Public Health Monitoring and Reporting section (<https://eupha.org/public-health-monitoring-and-reporting#:~:text=The%20EUPHA%20Public%20health%20monitoring,public%20health%20monitoring%20and%20reporting.>) to coorganize the first three.

Best regards,

Tina

Tina D Purnat
Team Lead for Infodemic Management
High Impact Events Preparedness Unit
Department for Epidemic and Pandemic Preparedness and Prevention (EPP)
Preparedness Division, WHO Emergency Programme (WPE/WHE)
World Health Organization, Geneva, Switzerland

purnatt@who.int | WhatsApp/Signal: (b) (6) | www.linkedin.com/in/tinadpurnat | @tdpurnat |

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Instructions for workshops: <https://ephconference.eu/submit-workshop-abstracts-283>

Abstract : Workshop

Conference topic(s) : suggested two categories from below

Workshop type : Skills building seminar

Preferred duration : 60 minutes

Presentation type : Regular (presentation plus discussion)

Workshop/seminar title : The public health practitioner's guide to investigating and responding to an infodemic: an introduction to the Field Infodemiology Manual

Organiser :

- Infodemic Management Team, High Impact Events Preparedness Unit, Department for Epidemic and Pandemic Preparedness and Prevention, World Health Organization
- Demand for Immunization Team, Immunization Systems Branch, Global Immunization Division, US Centers for Disease Control and Prevention
- Population Health Information Research Infrastructure (PHIRI) – to be confirmed
- EUPHA PHMR – to be confirmed
- Robert Koch Institute (RKI) – to be confirmed

Contact details :

Atsuyoshi Ishizumi
Technical Officer, Department for Epidemic and Pandemic Preparedness and Prevention, WHO
ishizumi@who.int

Workshop/seminar abstract : explain the reasons for the workshop and the objectives of the workshop. What is the added value of organising the workshop? What is the coherence between the presentations in relation to the topic of the workshop? Describe the format of the workshop. Maximum amount of characters (including spaces): 3,000.

Public health response to the COVID-19 pandemic has been challenged by an infodemic, defined as an overflow of information across physical and digital spaces that makes it difficult for people to better protect themselves from public health harms. An infodemic is not only driven by misinformation, but also involves other challenges such as information overload, unsettled science, and lack of reliable and accessible health information. These challenges can fuel concerns and confusion that undermine outbreak responses, but public health capacity for infodemic management has been limited thus far due

Commented [PT1]: Please choose the main topic:



Commented [IA2R2]: Looks like we need to choose two topics. I suggest the below, but open to other suggestions

Health promotion, Health literacy, Behavioural insights

Digital health and communication

to the discipline's nascency. Specifically, there is a need for practical and scalable tools that can support the work of responders in the field, including those who may not have prior experience with infodemic management.

The Field Infodemiology Manual (FIM), a tool co-developed by WHO and US CDC, addresses this urgent need by providing a framework and guide for public health practitioners to monitor, detect, and respond to infodemics. In this skills building workshop, participants will be provided with an overview of FIM, followed by interactive learning sessions intended to teach participants how to immediately apply the manual to their work. Workshop participants will achieve the following learning objectives: 1.) understand the overall structure of FIM and the topics covered in each chapter; 2.) learn how to practically apply FIM to their work, with a particular focus on strategic planning and translation of insights into recommendations (i.e., Chapters 3 and 5).

In terms of format, the workshop will first start with a panel discussion presenting European and international perspectives on the need to develop field infodemiology and associated tools. It will be followed by a short introductory presentation that will give an overview of FIM and its different chapters. After the presentations, participants will be split into small working groups (4-6 people per group) and will be asked to work on a set of interactive learning exercises that will last for approximately 30 minutes, with the support of a moderator assigned to each group. The group exercises will be based on Chapters 3 and 5, which focus on the development of a data collection and analysis plan and translation of analysis insights into intervention development, respectively. These two chapters were selected because both are crucial steps in performing field infodemiology and are topics well suited for group discussion and collaborative learning. The group exercises will first start off with a review of main takeaways from each chapter, followed by facilitated discussions in which the moderator will ask a series of questions to prompt participants to reflect on the key takeaways, including how they can apply what they have learned to their own work and any limitations they foresee. Handouts or worksheets will also be used to facilitate the group discussions. Following these exercises, in the remaining few minutes of the workshop, participants will have an opportunity to share final remarks or questions in the plenary.

Key message 1 : short (200 characters maximum) messages which summarise the main impact of the proposed workshop.

Public health capacity for infodemic management has been limited thus far especially in terms of practical and scalable tools for responders in the field. The Field Infodemiology Manual addresses this critical gap.

Key message 2 : short (200 characters maximum) messages which summarise the main impact of the proposed workshop.

Workshop participants will learn practical ways of applying the Field Infodemiology Manual to their work, leading to capacity building for infodemic management in the European region.

Chairperson 1 email : nguyent@who.int

Chairperson 1 :

Title: Unit Head First name: Tim Last name: Nguyen

Chairperson 2 email : vjx3@cdc.gov

Chairperson 2 :

Title: Team Lead First name: Neetu Last name: Abad

Number of presentations : repeat for each presentation or panelist; if presentations are also accompanied by panelist discussion, just their name is required, no abstract,

#1 presentation - panel

Title : Discussion of field infodemiology in European context

Presenting authors

1. PHIRI representative or EUPHA PHMR – to be confirmed
2. US CDC representative – to be confirmed
3. Atsuyoshi Ishizumi, WHO

#2 presentation

Title : Introduction to the Field Infodemiology Manual

Presenting author email: xfv8@cdc.gov

Presenting author

Title: Health Communications Specialist First name: Muriel Last name: Konne

Author and co-authors :

Initial(s)	Last name	Affiliation number(s)
A	Ishizumi	1

E	Wilhelm	2
T	Purnat	1
J	Kolis	2
H	Chiou	2
D	Prybylski	2
C	Voegeli	3
R	Ludolph	1
SV	Machiri	4
S	Cecchini	5
T	Nguyen	1

Affiliations:

Unit / department	Institute / company	Town	Country
-------------------	---------------------	------	---------

1. High Impact Events Preparedness Unit, Department for Epidemic and Pandemic Preparedness and Prevention, World Health Organization, Geneva, Switzerland
2. Global Immunization Division, US Centers for Disease Control and Prevention, Atlanta, USA
3. Vaccine Taskforce, COVID-19 Emergency Response, US Centers for Disease Control and Prevention, Atlanta, USA
4. African Field Epidemiology Network (AFENET), Zimbabwe
5. Africa Infodemic Response Alliance, WHO Regional Office for Africa

Abstract:

This 10-15 minute presentation will provide an overview of the Field Infodemiology Manual (FIM), developed by infodemic management and vaccine demand experts convened by US CDC and WHO. It is designed to meet the urgent needs of infodemic managers, health communicators, epidemiologists, and other public health practitioners at national and subnational levels – providing critical guidance for the design and implementation of field investigations about infodemics.

In this presentation, FIM's overall structure and main points from each chapter will be introduced. First, social listening is examined as a public health surveillance system and function of field investigation to help determine when to respond to public health threats. Second, methodologies for conducting social listening are described, starting with guiding principles for data collection and analysis to inform public health intervention, policies, and programs. Key challenges and evolving intervention approaches, as well as limitations and ethical considerations are then discussed. Finally, FIM provides guidance on developing more effective communication strategies for broader public health impact.

Commented [IA3]: Muriel: I am not sure what his latest affiliation is as I believe he's no longer deployed – could you confirm and kindly update #3 below?

Commented [IA4]: In general, we may have to circulate this to all co-authors and ask them to confirm their affiliation because I am unsure about some of them...

Commented [IA5]: Based on an abstract previously shared by Muriel

From: PURNAT, Tina
Sent: Tue, 5 Apr 2022 18:56:22 +0000
To: Wilhelm, Elisabeth (CDC/DDPHSIS/CGH/GID); Konne, Nuadum Muriel (CDC/DDPHSIS/CGH/GID); Voegeli, Christopher (CDC/DDID/NCIRD/OD)
Cc: Catherine BERTRAND-FERRANDIS; ISHIZUMI, Atsuyoshi; YAU, Brian; NGUYEN, Tim
Subject: EUPHA abstract format for workshops
Attachments: workshop template skills building.docx

Dear all,

Thanks for working with us on submissions to EUPHA conference, Berlin, Nov 2022.
Deadline for submission is May 1.

The instructions for workshops are here:
<https://ephconference.eu/submit-workshop-abstracts-283>

I tried making it easy so I copy pasted the format into a word document for you to use. See attached.

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- **Panel discussion on vaccine confidence, infodemics, and its spillover effects across borders (with US CDC as a panelist)..** – I suggest format of Round table - Tina
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I will approach the PHIRI project (<https://www.phiri.eu/>) and the EUPHA Public Health Monitoring and Reporting section (<https://eupha.org/public-health-monitoring-and-reporting#:~:text=The%20EUPHA%20Public%20health%20monitoring,public%20health%20monitoring%20and%20reporting.>) to coorganize the first three.

Best regards,

Tina

Tina D Purnat
Team Lead for Infodemic Management
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Department for Epidemic and Pandemic Preparedness and Prevention (EPP)
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Instructions for workshops: <https://ephconference.eu/submit-workshop-abstracts-283>

Abstract : Workshop

Conference topic(s) : suggested two categories from below

Commented [PT1]: Please choose the main topic:

Workshop type : Skills building seminar

Preferred duration : 60 minutes

Presentation type : Regular (if presentation plus discussion) OR Panel (if only discussion)

Workshop/seminar title : xxx

Organiser : xxx

Contact details : xxx

Workshop/seminar abstract :

Key message 1 :

Key message 2 :

Chairperson 1 email :

Chairperson 1 : Title First name Last name

Chairperson 2 email :

Chairperson 2 : Title First name Last name

Number of presentations : repeat for each presentation or panelist; if presentations are also accompanied by panelist discussion, just their name is required, no abstract.

#1 presentation

Title :

Presenting author email

Presenting author

Title	First name	Last name
-------	------------	-----------

Author and co-authors :

Initial(s)	Last name	Affiliation number(s)
------------	-----------	-----------------------

Affiliations :

Unit / department	Institute / company	Town	Country
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1

Abstract :

From: PURNAT, Tina
Sent: Wed, 23 Feb 2022 07:34:26 +0000
To: Wilhelm, Elisabeth (CDC/DDPHSIS/CGH/GID); Voegeli, Christopher (CDC/DDID/NCHHSTP/DHP)
Subject: EURO guidance on infodemic management
Attachments: 20211125_Advancing IDM within RCCE in WHO Europe_Clean.docx

Dear Chris and Lis,

Wanted to share this with you, coming from WHO European region.

I'm not sure if it's worth reviewing in detail. I will discuss with Lis later on today.

Best regards,

Tina

Tina D Purnat
Team Lead for Infodemic Management
High Impact Events Preparedness Unit
Department for Epidemic and Pandemic Preparedness and Prevention (EPP)
Preparedness Division, WHO Emergency Programme (WPE/WHE)
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Advancing Infodemic Management within Risk Communication and Community Engagement in the WHO European Region

Implementation guidance

ABSTRACT

This document provides guidance to National Health Authority RCCE Focal Points at working level in the WHO European Region on Infodemic Management (IDM) preparedness and response efforts, under the larger umbrella of Risk Communication and Community Engagement (RCCE), particularly in the context of the COVID-19 pandemic.

Evidence and practical experience in the fields of RCCE and IDM continue to be rapidly evolving during the COVID-19 pandemic, so this document is complemented by various unpublished and regularly updated resources, developed by the WHO Regional Office for Europe. For more information and a copy of these resources please reach out to Simon van Woerden at vans@who.int.

Keywords

Infodemic

COVID-19

Communication

Misinformation

Disinformation? Malinformation?

Health communication

Persuasive communication

Information seeking behavior

Document number: [TBC by eupub colleagues]

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Suggested citation: Risk communication and community engagement for COVID-19 contact tracing: interim guidance. Copenhagen: WHO Regional Office for Europe; 2020. Licence: CC BY-NC-SA 3.0 IGO. **Cataloguing-in-Publication (CIP) data.** CIP data are available at <http://apps.who.int/iris>.

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Acknowledgements

This implementation guidance was developed by WHO Regional Office for Europe colleagues of the COVID-19 IMST Communication Pillar: Sara-Jayne Terp (Project Manager and Technical Lead for the Infodemic Management project), Kimberly Rambaud (Infodemic Management Consultant), Simon van Woerden (Risk Communication Officer) and Cristiana Salvi (Regional Adviser for Risk Communication and Community Engagement).

For their support and inputs, thanks are also due to the other WHO Regional Office for Europe staff on the Infodemic Management project, namely Clayton Hamilton (Regional Adviser Digital Health) and Nils Fietje (Technical Officer, Behavioural and Cultural Insights Unit), other WHO Regional Office for Europe colleagues, including Vasily Esenamanov (Hub Coordinator for the Southern Caucasus /Country Health Emergency Preparedness & IHR Officer), Ababayehu Mengistu (Hub Coordinator for the Balkans/Country Health Emergency Preparedness & IHR Officer), Nicholas Fry (Consultant, Communication on COVID-19) and Leonardo Palumbo (Project Manager for the Civil Society Organizations Initiative), and WHO colleagues Melinda Frost (Translate Science Team Lead), Tim Nguyen (Unit Head High Impact Events Preparedness) and Christine Czerniak (Technical Officer, Global Infectious Hazards Preparedness Department).

The authors are particularly grateful for the comments received from partner organization staff, including John Kinsman (Expert Social and Behaviour Change Communication at the European Centre for Disease Prevention and Control).

Glossary and abbreviations

Artifact – item created as part of an infodemic incident. Examples include messages, images, video and audio, online accounts, and online groups.

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

Campaign – longer-term, organized sets of infodemic incidents.

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

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

Disinformation – incorrect, misleading, or misattributed information circulated with a specific, often political, agenda. It includes incorrect, misleading, or misattributed information, but it can also include information that is true, but artificially amplified, and the manipulation of individuals' information seeking, sharing, and consumption behaviours.

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

IFRC – International Federation of Red Cross and Red Crescent Societies.

Incident – shorter term bursts of infodemic activity (typically 1-3 days), consisting of a visible set of artifacts (hashtags, images etc.), that support one or more narratives, which may have multiple infodemic behaviours associated with them (e.g. artificial amplification of narratives).

Incident Management System – The standardized structure and approach that WHO has adopted to manage its response to public health events and emergencies, and to ensure that the Organization follows best practice in emergency management.⁴

Incident Management Team – The in-country team responsible for managing and implementing the WHO response to the emergency. It is structured around the Incident Management System functions and their associated sub-functions. The size and composition of the team is flexible and can vary according to context.

Incident Management Support Team – The team providing day-to-day technical and operational support to the in-country Incident Management Team across all of the critical functions, at both Regional and Headquarters Offices for graded emergencies.

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

¹ <https://www.who.int/publications/i/item/9789240010529>

² https://firstdraftnews.org/wp-content/uploads/2020/11/FirstDraft_Underthesurface_Fullreport_Final.pdf

³ Neil Levy, Radically socialised knowledge and conspiracy theories, Episteme v4 issue 2, 2007

⁴ ERF

⁵ <https://infodemiology.jmir.org/2021/1/e30971>

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

Infodemic Management (IDM) – the systematic use of risk- and evidence-based analysis and approaches to prepare for and manage an infodemic, to reduce its impact on public health. This includes ongoing surveillance and preparedness, including following infodemic-focussed parts of health emergency preparedness and response plans.

Infodemiology – the study of infodemics and responses to them.⁶

Information landscape – the existing communication and information systems in the area: the flows of communication, emotions, and group interactions that infodemics exist within.

Information void(s) – the gap(s) between a community's information need and the publicly available, evidence-based communication, which emerge due to evolving public information needs, questions, and concerns.

Narrative – the core of a story told to explain events, identity (identity narrative), or a sense of belonging or not-belonging to different communities and groups (in-group and out-group narratives).

Malinformation – genuine information that is shared with an intent to cause harm.

Manipulated media site – website that includes misinformation. Often created as part of a "pink slime" network of misinformation or conspiracy websites. Archaically (2017ish) called "fake news sites".

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

Disinformation incorrect or misleading information circulated with intent to harm.

Red Teaming – a particular form of readiness simulation exercise which involves pursuing the objective opposed to that of emergency response authorities and partners.

Response landscape – the systems around the activities used to prevent, mitigate or remove the effects of an infodemic. These include groups that could respond to infodemic risks, and the current and potential actions that can be taken to reduce those risks.

Risk communication – the exchange of real-time information, advice and opinions between experts and people facing threats to their health, economic or social well-being, to enable them to take informed decisions for their health. Goes hand in hand with community engagement within public health emergency preparedness and response.

Risk landscape – an information landscape made up of phenomena (artifacts, campaigns, accounts, networks) capable of causing infodemic harms.

Rumour – unverified information. Rumours can exist outside infodemics, and may or may not be true (e.g. rumours could be part of misinformation, or could be previously-unknown issues within a public health response).

UNESCO – United Nations Educational, Scientific and Cultural Organization.

UNICEF – United Nations Children's Fund.

⁶ Note: an alternative definition of infodemiology exists in the work of Gunther Eysenbach: 'the study of the determinants and distribution of health information and misinformation' (Eysenbach, G. Infodemiology: the epidemiology of (mis)information. The American Journal of Medicine 2002; volume 113, issue 9:763:765. [https://doi.org/10.1016/S0002-9343\(02\)01473-0](https://doi.org/10.1016/S0002-9343(02)01473-0)). Although this definition is useful and predates WHO's work on the COVID-19 infodemic, in this document the WHO definition is chosen for consistency purposes.

UNDP – United Nations Development Programme.

WHO – World Health Organization.

Executive summary

The COVID-19 pandemic has seen both reliable evidence-based information and rumours, conspiracy theories, and mis- and disinformation circulating with unprecedented volume, variety, and speed. Although this 'infodemic' is not exclusively a digital phenomenon, and its main component challenges have long historical roots, the COVID-19 pandemic has seen an unprecedented size and scope of this challenge to health as well as its mediation via online and social media.

The World Health Organization at the global level has responded to this challenge with an unprecedented effort to manage the infodemic and establish a new scientific discipline and working area named Infodemic Management (IDM). These pioneering efforts have included a number of Infodemic Management conferences, a research agenda and competency framework, developing new software tools, building capacity through trainings, and publishing new research.

Subsequently, the WHO Regional Office for Europe, in support of Member States in the European Region, has integrated Infodemic Management in its long-standing expertise with Risk Communication and Community Engagement (RCCE), adding new and strengthened capacities and capabilities to the existing RCCE work – including rumour management, social listening, community engagement, capacity building, and Monitoring, Evaluation and Learning.

IDM in the WHO European Region aims to detect, assess, analyse and respond to infodemic risks, while also maintaining and strengthening (sub)systems at national and Regional levels with training and broader capacity building efforts. IDM, like RCCE and the overall COVID-19 response, aims to hasten the end of the pandemic and build back better for future health emergencies.

This implementation guidance document is based on the latest evidence and practical experience with IDM and aims to provide operational guidance on IDM preparedness, readiness and response related to COVID-19. It offers practical advice, tools, and references for response authorities, stakeholders, and partners in Member States at the coordinating and working levels.

The document's theoretical framework contextualizes core concepts e.g. rumours, mis- and disinformation, information voids, big data's "3 Vs" problem; lays out the infodemic ecosystem and its three component landscapes (information, risk and response); and provides guidance on measuring infodemic response.

The core of the document details how IDM embeds into the wider umbrella of RCCE in the WHO European Region, and dovetails with two key models: the emergency cycle (with its phases of prevention and mitigation, preparedness, readiness, response and recovery); and the four core capacities of Risk Communication and Community Engagement (transparency and early announcement of a real or potential risk; coordinating public communication; listening through two-way communication; and selecting effective channels and influencers).

The conclusion of the document summarizes briefly the importance of IDM work, and adds a landscaping of areas for further contribution and development of this work.

A list of references is included as well as a number of annexes for further support – including IDM quick-start guides (on maintenance and response) and a list of further reading.

Introduction

Why this guidance exists

The COVID-19 pandemic has seen reliable evidence-based information as well as rumours, conspiracy theories, mis- and disinformation circulating with unprecedented volume, variety, and speed. At the same time, vulnerable population's information need and concerns evolved with such speed that scientists and communicators sometimes struggled to keep up, creating information voids that further provided fertile grounds for more misinformation.

Salient topic areas that have gained or regained⁷ prominence during the pandemic have included supposed risks of 5G technology,⁸ COVID-19 vaccine misinformation,⁹ and fake cures^{10,11} (two notable examples include the rumour that ingesting medicinal alcohol could kill the virus, and the similarly fake cure of injecting or ingesting bleach).^{12,13} Although not exclusively a digital phenomenon, online and social media play a large role in the dissemination and mediation of this infodemic.¹⁴ In addition, while the concept of an infodemic existing alongside health emergencies has long historical roots, the COVID-19 pandemic has produced conditions akin to "a perfect storm of conspiracy theory and misinformation."¹⁵

The World Health Organization at the global level has responded to this challenge with an unprecedented effort to manage the infodemic and establish a new scientific discipline and working area named Infodemic Management (IDM).¹⁶ These

⁷ For an analysis of different approaches to the size, novelty and significance of the infodemic phenomenon see: infodemic.eu. "A perfect storm?" 29 January 2021 (<http://infodemic.eu/2021/01/19/a-perfect-storm.html>).

⁸ Ahmed W, Vidal-Alaball J, Downing J, López Seguí F. COVID-19 and the 5G Conspiracy Theory: Social Network Analysis of Twitter Data. *J Med Internet Res*. 2020 May 6;22(5) (<https://pubmed.ncbi.nlm.nih.gov/32352383/>).

⁹ Burki T. The online anti-vaccine movement in the age of COVID-19. *The Lancet Digital Health*. 2020;2(10) ([https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30227-2/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30227-2/fulltext)).

¹⁰ Rovetta A, Bhagavathula AS. Global Infodemiology of COVID-19: Analysis of Google Web Searches and Instagram Hashtags. *J Med Internet Res*. 2020 Aug 25;22(8) (<https://pubmed.ncbi.nlm.nih.gov/32748790/>).

¹¹ Rovetta A, Bhagavathula AS. Global Infodemiology of COVID-19: Analysis of Google Web Searches and Instagram Hashtags. *J Med Internet Res*. 2020 Aug 25;22(8) (<https://pubmed.ncbi.nlm.nih.gov/32748790/>).

¹² Shokoohi M, Nasiri N, Sharifi H, Baral S, Stranges S. A syndemic of COVID-19 and methanol poisoning in Iran: Time for Iran to consider alcohol use as a public health challenge? *Alcohol*. 2020 Sep;87:25-27 (<https://pubmed.ncbi.nlm.nih.gov/32505493/>).

¹³ Islam, M. S., Sarkar, T., Khan, S. H., Mostofa Kamal, A., Hasan, S. M. M., Kabir, A., Yeasmin, D., Islam, M. A., Amin Chowdhury, K. I., Anwar, K. S., Chughtai, A. A., & Seale, H. (2020). COVID-19-Related Infodemic and Its Impact on Public Health: A Global Social Media Analysis. *The American Journal of Tropical Medicine and Hygiene*, 103(4), 1621-1629. Retrieved Jun 26, 2021, from <https://www.ajtmh.org/view/journals/tpmd/103/4/article-p1621.xml>.

¹⁴ Gabarron E, Oyeyemi SO, Wynn R. COVID-19-related misinformation on social media: a systematic review. *Bulletin of the World Health Organization*. 2021;99(6) (<https://www.who.int/bulletin/volumes/99/6/20-276782/en/>).

¹⁵ Infodemic.eu. "A perfect storm?" 19 January 2021 (<http://infodemic.eu/2021/01/19/a-perfect-storm.html>).

¹⁶ While Infodemic Management is also sometimes abbreviated as IM, here IDM is used to disambiguate from other acronyms commonly used in WHO e.g. Information Management and Incident Manager.

pioneering efforts have included a number of Infodemic Management conferences,¹⁷ a research agenda¹⁸ and competency framework,¹⁹ new software tools,²⁰ trainings,²¹ and new research.²²

Subsequently, the WHO Regional Office for Europe, in support of Member States in the European Region, has followed the global lead and embedded key IDM response efforts in the framework of Risk Communication and Community Engagement (RCCE) by enhancing, reinforcing and modernizing its long-standing expertise in the area. As experts have observed, "an integral part of risk communication involves identifying and countering misinformation and disinformation, the impacts of which can be extreme and immediate."²³ Additionally, a core tenet of RCCE is ensuring at-risk populations have the required information to take informed decisions to mitigate the effects of a health hazard and take protective and preventive measures,²⁴ as well as "proclaiming the uncertainty"²⁵ and/or "communicating in uncertainty"²⁶, and addressing and filling gaps in evidence and available information tailored to at-risk communities.²⁷

In response to the COVID-19 infodemic, particular interest and focused efforts have centered on social listening and monitoring of online signals (including rumours, misinformation, and disinformation), their effects on people's knowledge, beliefs and behaviours, and managing resultant health risks throughout the emergency cycle with efforts for prevention and mitigation, preparedness and readiness, and response and recovery.

IDM in the WHO European Region aims to detect, assess, analyse and respond to infodemic risks, while also maintaining and strengthening (sub)systems at national and Regional levels with training and broader capacity building efforts. Every part of a health system can be affected by, and interact with an infodemic (including responses to rumours based on genuine community concerns) so this design is collaborative by nature, including connectors across to other parts of the health system and pandemic response.

¹⁷ World Health Organization: WHO. 5th virtual WHO Infodemic Management conference: Developing metrics and indicators to quantify the burden of infodemic and effectiveness of mitigation interventions. Who.int. Published September 13, 2021. Accessed November 22, 2021. <https://www.who.int/news/item/13-09-2021-5th-virtual-who-infodemic-management-conference>

¹⁸ Global Infectious Hazard Preparedness. WHO Public Health Research Agenda for Managing Infodemics. World Health Organization; 2021. Accessed November 22, 2021. <https://www.who.int/publications/i/item/9789240019508>

¹⁹ Global Infectious Hazard Preparedness. WHO Competency Framework: Building a Response Workforce to Manage Infodemics. World Health Organization; 2021. Accessed November 22, 2021. <https://www.who.int/publications/i/item/9789240035287>

²⁰ World Health Organization - EARS - Early AI-supported Response with Social Listening. Who-ears.com. Published 2020. Accessed November 22, 2021. <https://www.who-ears.com/>

²¹ World Health Organization: WHO. Global community of practice grows to over 500 WHO trained infodemic managers. Who.int. Published September 16, 2021. Accessed November 22, 2021. <https://www.who.int/news/item/16-09-2021-global-community-of-practice-grows-to-over-500-who-trained-infodemic-managers>

²² Without citing the entirety of published research, two noteworthy special issues focused on infodemics are: Studying the COVID-19 Infodemic at Scale: Big Data & Society: SAGE Journals. SAGE Journals. Published 2020. Accessed November 22, 2021. <https://journals.sagepub.com/page/bds/collections/studyinginfodemicatscale> and Health Security: Vol 19, No 1. Health Security. Published 2021. Accessed November 22, 2021. <https://www.liebertpub.com/toc/hs/19/1>

²³ Bedson J, Skrip LA, Pedi D, et al. A review and agenda for integrated disease models including social and behavioural factors. *Nature Human Behaviour*. 2021;5(7):834-846 (<https://www.nature.com/articles/s41562-021-01136-2#ref-CR157>).

²⁴ Geneva: World Health Organization. Module B3. <https://www.who.int/risk-communication/training/Module-B3.pdf>

²⁵ Sandman, P. and Lanard, J. COVID-19: The CIDRAP Viewpoint. <https://www.cidrap.umn.edu/sites/default/files/public/downloads/cidrap-covid19-viewpoint-part2.pdf>

²⁶ World Health Organization. (2017). Communicating risk in public health emergencies: a WHO guideline for emergency risk communication (ERC) policy and practice. World Health Organization. <https://apps.who.int/iris/handle/10665/259807>.

²⁷ Global Infectious Hazard Preparedness. COVID-19 Global Risk Communication and Community Engagement Strategy – interim guidance. Who.int. Published December 23, 2020. Accessed November 22, 2021. <https://www.who.int/publications/i/item/covid-19-global-risk-communication-and-community-engagement-strategy>

Within the COVID-19 response, IDM shares the goal of the overarching RCCE Pillar and the Incident Management System as a whole: ending the pandemic and building back better to ensure improved health risk management for future health emergencies (including pandemics).²⁸

This implementation guidance document is based on the latest evidence and practical experience with IDM and RCCE. It aims to provide key operational guidance on IDM preparedness, readiness and response related to COVID-19, and is mainly aimed at response authorities, stakeholders, and partners in Member States at the coordinating and working levels,²⁹ with call-outs to work suitable for stakeholders working at local and community levels.³⁰ The document offers practical advice, tools, and references to inform and strengthen country-level IDM activities embedded in the RCCE and overall pandemic response.

The document offers specific guidance on operationalizing IDM efforts in teams and offices of different sizes and capacities, including those in which these activities may be carried out by focal points simultaneously covering other areas of RCCE and external communication.

Although the guidance focuses on the COVID-19 infodemic, most of the principles, tools and practices laid out below will apply equally to infodemics caused by other disease outbreaks or health emergencies.

Structure of this document

This introduction is followed by a section on the theoretical framework which underpins the guidance. It section defines and contextualizes core concepts, lays out the infodemic ecosystem and its three constitutive landscapes (information, risk and response), followed by a section on measuring IDM response.

The core of the document details how IDM efforts embed into the wider umbrella of RCCE and dovetails with the pieces of two key models: the emergency cycle, and the four core capacities operationalized in standard work streams of RCCE:

1. Planning and internal coordination;
2. Partners, networks and external coordination;
3. Community engagement;
4. Formative research and analysis;
5. Media, materials and message production;
6. Capacity building.

The first piece of the core paints in broad terms how IDM actions map onto the different phases of an emergency, while the second demonstrates how these actions support the four core RCCE capacities and operationalizes this support within standard RCCE work streams.

The conclusion of the document summarizes briefly the importance of IDM work, and adds a landscaping of areas for further contribution and development of this work.

A list of references is included as well as a number of annexes for further support – including IDM quick-start guides (on maintenance and response) and a list of further reading.

²⁸ For an overview of how IDM fits into RCCE and the Incident Management Support Team (IMST) structure, see [Infodemic Management in the Emergency Cycle](#)

²⁹ For an in-depth look at the tiers of response actors involved in infodemic management, see [Organising large numbers of responders](#) below.

³⁰ For an in-depth look at the tiers of response actors involved in infodemic management, see [Organising large numbers of responders](#) below.

Who this guidance is for

This guidance note is mainly aimed at response authorities, stakeholders, and partners in Member States at the coordinating and working levels, with call-outs to work suitable for stakeholders working at local and community levels.

Where to begin

Depending on the reader's needs and capacities, certain sections of this guidance may be more or less relevant. The document aims to inform efforts by a range of RCCE professionals: from those who manage IDM at the Regional or national level on a full-time basis, to individuals at the national and subnational levels for whom IDM is a small part of their daily job.

Here are some suggested trails through the guide's chapters for different profiles:

- "I cannot devote much time to IDM, but I have a problem and just need to get started": start with the quick-start guides in the annex;
- "I'm setting up a response to an infodemic aimed at a community, country, or region, and I have resources available for that, including people, time, and the ability to set up and maintain tools": start with the quick-start guides, then move to the advice on partners, tool choice and localization, and more depending on specific need;
- "I'm part of an RCCE team responsible for IDM across a region, connecting and supporting efforts across countries": recommended to read the whole document;
- "I'm curious about IDM, what the WHO Regional Office for Europe's IDM team is doing, and how my work in RCCE, communication, or public health broadly connects with IDM": review relevant sections of the chapters "IDM within the emergency cycle" and "IDM within RCCE", and potentially the quick-start guides.

More details on how these different profiles can be organized can be found in the section [Organising large numbers of responders](#).

Key considerations

While reading the guidance, it pays to keep a number of overall considerations in mind:

1. **Risk-based approach:** the guidance approaches the infodemic as a health risk problem. This means that for a proper prioritization of response efforts, an assessment is required of those risks and how they differentially apply to different vulnerable groups. Focusing on the highest risks will ensure the most vulnerable are supported first and foremost.
2. **Planning, preparedness and readiness:** it is advisable to create IDM connections and broad (chapters of) planning documents before a crisis emerges. At minimum, this includes listing stakeholders and contacts, mapping the infodemic ecosystem, and ensuring an understanding of basic response and mitigation steps.
3. **Adaptation:** the advice below is intended for adaptation to country, community, situation, and available resources - infodemic management does not have to be complicated or involve expensive tools.
4. **Coordination:** coordinating and planning with available local experts will amplify impact.
5. **Community empowerment:** working with communities will help build resilience to infodemics, including by way of increased literacy, skills, and connections to information infrastructure.
6. **Bounds and assumptions:** mis- and dis-information mitigations and responses exist within larger systems³¹ that contain many different organisation types and activities. This guidance is practical, intended for RCCE

³¹ See e.g. the Atlantic Council report embedding misinformation response in larger geopolitical systems <https://www.atlanticcouncil.org/content-series/geotech-commission/exec-summary/>

professionals, and assumes that work on e.g. government and platform misinformation response policies will be done elsewhere.

Theoretical framework

Before operationalizing IDM within the context of public health emergency response and for advancing RCCE specifically, it is necessary to understand some key concepts and best practices. These include overall IDM goals within the emergency cycle and a general outline of how these goals translate and embed into RCCE core capacities and work streams at different phases of the cycle.

Defining an infodemic

WHO defines an infodemic as “excess information, including false or misleading information, in digital and physical environments or landscapes during an acute public health event.”³² An infodemic could just be this over-abundance of information, but in most cases, this dynamic is exacerbated by the availability of rumours (unverified information), misinformation (false information) and disinformation (deliberate attempts to change beliefs, emotions, trust, community cohesion, by falsifying information, sources, popularity, and other parts of the information landscape).³³

Technically outside the short definition, another important factor are information voids: gaps in publicly available, evidence-based communication, due to evolving public information needs, questions, and concerns. During an emergency such voids occur frequently as science struggles to keep up with public and media demand for information – for this reason, emergency RCCE traditionally places a premium on the ability to “speak in uncertainty”³⁴ and “communicate, or proclaim, the uncertainty.”³⁵

It is important to note infodemics occur in digital as well as offline environments or landscapes; for the latter dimensions, community engagement efforts are of particular relevance, so offline community feedback is combined and triangulated with digital sources of data, and fed into response decision making processes.

Another crucial element outside the definition of an infodemic is trust. In the World Health Organization Regional Office for Europe’s work on RCCE, trust between emergency response actors and affected or at-risk communities traditionally plays a central role, and the infodemic is no exception. Communities need to be able to trust that response authorities’ efforts will take seriously and address their concerns and risks, and reflect them in the response. Response authorities, in turn, must trust the communities they serve to take informed decisions for their health, and not assume too quickly or easily that there are no valid reasons why communities may not immediately be following health guidance.

While RCCE historically has placed strong emphasis on the building, earning, or restoring of this trust, IDM complements this model by focusing on factors and actors that intentionally or unintentionally harm this trust. By doing so, IDM enhances the RCCE function from one-sided trust-building to two-sided trust management, across the whole emergency cycle, including the times between infodemics.

A final important note: as the saying goes, trust comes on foot but leaves on horseback. It takes time, resources, good faith engagement, and actual delivery of responsive services, to build trust between response authorities and affected communities. RCCE and IDM experts have the important responsibility to keep these efforts alive during, but especially before and after emergencies, when attention and therefore resources may be at lower levels.

³² <https://infodemiology.jmir.org/2021/1/e30971> Health topic: infodemic. Geneva: World Health Organization (https://www.who.int/health-topics/infodemic#tab=tab_1).

³³ Additional commonly used terms and categories include malinformation, propaganda, and more – see e.g. Understanding Information Disorder; 2019. https://firstdraftnews.org/wp-content/uploads/2019/10/Information_Disorder_Digital_AW.pdf?x61605

³⁴ World Health Organization. (2017). Communicating risk in public health emergencies: a WHO guideline for emergency risk communication (ERC) policy and practice. World Health Organization, <https://apps.who.int/iris/handle/10665/259807>.

³⁵ Sandman, P. and Lanard, J. COVID-19: The CIDRAP Viewpoint. <https://www.cidrap.umn.edu/sites/default/files/public/downloads/cidrap-covid19-viewpoint-part2.pdf>

Understanding an infodemic: the infodemic ecosystem

There are many models that help to understand how information moves among communities. For the purpose of this implementation guidance, two operational models are most useful to describe the “what” and the “how” of an infodemic:

- Object-based models: these describe who and what are in an infodemic. This includes people, groups, behaviours, incidents, narratives, content (messages, images, hashtags etc), and the relationships between them.³⁶ These models are useful for analysing incidents and rapidly sharing information between incident responders (infodemic response).
- Ecosystem models: these describe environments or landscapes in which infodemic objects or artifacts occur. For the analysis of the ecosystem itself, this guidance concentrates on three interrelated landscapes: the information landscape, the risk landscape, and the response landscape.³⁷ These are all interconnected, and understanding/improving each of these helps us to make our health information systems stronger.

The information landscape

To understand and manage the infodemic, it is helpful to think of three interrelated landscapes: the information, risk, and response landscapes.

The information landscape is defined as the existing communication and information systems in a certain area. It includes the flows of communication, emotions, and group interactions that infodemics exist within. This landscape includes trustworthy sites and sources of information which are relevant to the subject (e.g. health) and locations of interest. The specific channels used vary between countries, regions and demographics.

Mapping the information landscape informs infodemic managers with knowledge of channels people use to look for and share information, and how information flows between them, including which organisations and user accounts can disseminate information to large numbers of people (“superspreaders”),³⁸ and which are more trusted or repeated by large numbers of people (“influencers”).

Many infodemic mitigation and response actions rely on understanding and managing the information landscape. For example, to respond to a piece of misinformation with a counternarrative, it is often necessary to understand where and how people seek information, and how they share information with each other.

Overabundances of information

Data scientists talk about the “three Vs” problem of big data: Volume, Velocity, and Variety.³⁹ To achieve a real-time understanding of information and disinformation flows across the Internet that can inform IDM response, responders must be equipped to handle data that is:

³⁶ Object-based models include Francois’ Actor Behaviour Content model, Pamment’s Actor Behaviour Content Degree Effect model, Terp et al’s AMITT STIX-based and behaviour-based models, and Carley et al’s BEND behaviour models <https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/Mar-Apr-2019/117-Cybersecurity/b/>

³⁷ For an example of a country landscape summary, see Figure 10 - Sample country landscape map.

³⁸ Not to be confused with the epidemiological use of the term ‘superspreading events’.

³⁹ Ward JS, Barker A. Undefined by data: a survey of big data definitions. Ithaca: Cornell University Library; 2013 (<http://arxiv.org/pdf/1309.5821v1.pdf>). A fourth V (veracity, referring to “questions of trust and uncertainty with regards to data and the outcome of analysis of that data”) is sometimes added – see for example: WHO | Big data in global health: improving health in low- and middle-income countries. WhoInt. Published online February 26, 2015 (<https://www.who.int/bulletin/volumes/93/3/14-139022/en/>). Finally, a fifth V has been added by some actors (value – or “the ability to transform a tsunami of data into business”) – see e.g. The five V’s of big data. NEWS BBVA. Published May 8, 2017. Accessed November 25, 2021. <https://www.bbva.com/en/five-vs-big-data/>

- Large in volume ("Volume");
- Being updated and moved within information landscapes (accounts, groups, platforms) very quickly ("Velocity"); and
- Is diverse ("Variety") with regards to formats, platforms, languages, sources, and other dimensions.

During crises, including natural disasters and large-scale health emergencies, these three Vs increase information flows past the sense-making capacity of human analysts, responders, and the general public. This is the "excess of information" from the definition of an infodemic.

In parallel with the excess of information is a corresponding increase in health information-seeking behaviour, where people facing a risk to their health seek information to help them make decisions, share with others, or to reinforce already-held positions on health matters. This second abundance is what generates information voids (see below), and is often twinned with increases in emotions (e.g. fear, anxiety) around health topics, and increasingly, as health-related disinformation increases, around identity and group membership.

Multiple information channels

Information channels often combine and reinforce one another, and mapping the information landscape requires an inventory of these and their interactions. For example, information on social media is often picked up by traditional media for use in stories, then repeated back to social media. This means that even in areas where social media coverage is limited (e.g. geographically or in the languages it is posted in) narratives from social media will be available in other channels.

Traditional mass media includes newspapers, radio (including community radio) and television. Many countries have spectrum licensing agencies who hold lists of television and radio stations, and there are often journalists' associations with lists of newspapers and their operating areas.

Online information channels include social media (e.g. Facebook, Twitter), online newspapers, websites, messaging services (e.g. WhatsApp)⁴⁰ and other spaces where people interact, including multiplayer games, forums and messaging boards.

Other information channels useful to include in an information landscape summary include word of mouth and more formal communication interactions including e.g. town halls, theatre, and protests.

Influencers and information sources

Information spaces usually contain influencers: sites, channels, and accounts that are more trusted than others, or whose content is more widely shared than others. There are many ways to measure influence.⁴¹ By looking at user accounts as a network whose connections include behaviours like following, retweeting, quoting, commenting, "like"ing, it is possible to establish a measure of influence - how far can new information from a user spread across a network, influenced by whether the user links together different communities. These are all useful things to consider when looking at graphs of connected accounts.

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

In a healthy information landscape reliable influencers and channels, disseminating evidence-based, trustworthy information, are more trusted than mis- and disinformation influencers and channels. To strengthen an information

⁴⁰ These services are sometimes called "dark social media" as tracking conversations in them is complicated, including keeping your investigation within laws including GDPR.

⁴¹ See e.g. Ribeiro et al, "[How to measure influence in social networks?](#)"

landscape, these actors typically amplify or set up and maintain trustworthy and trusted sources of information before a health emergency, serving at-risk communities as well as fact checking teams and other infodemic responders.

Practically, influence is both online and offline, and an information landscape summary should include not only the influencers but also characteristics of their audiences and communities (e.g. an influencer across a small vulnerable community may be more useful to response than an influencer with large follower numbers who do not face similar levels of risk).

Communities

Infodemics, like epidemics, start and end in communities – groups of people that may or may not be spatially connected and could be local, national or international, but who share common (specific or broad) interests, concerns or identities, without precluding the presence of significant heterogeneity.⁴² To manage trust between communities and response authorities effectively, the latter require an understanding of community dynamics, power structures, and flows of information, as well as a commitment to supporting and partnering with communities rather than taking an exclusively top-down approach. Especially the offline components of infodemics cannot be managed appropriately without a genuine and thorough effort for community engagement.

Information voids

Any health emergency brings a large degree of uncertainty for affected populations, driving an exponential increase in concerns, questions, and a need for information. As scientific data and evidence-based guidance and messaging takes time to develop, this will almost without exception generate a gap or gaps between information demand and supply. These gaps are referred to as information voids.

Emergency RCCE traditionally places a premium on the ability to “speak in uncertainty” and “communicate, or proclaim, the uncertainty.” One formula for speaking in uncertainty is as follows:⁴³

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

Information voids that are not addressed or filled in a timely manner are likely to generate rumours and misinformation, and are a favored target among disinformation actors. Using social listening, media monitoring, community feedback and formative research including behavioural insights to keep a real-time finger on the pulse of evolving community concerns to rapidly respond is an effective strategy to mitigate this dynamic.

⁴² World Health Organization, Health Promotion – Track 1: Community Empowerment. Geneva: World Health Organization; 2021 (<https://www.who.int/teams/health-promotion/enhanced-wellbeing/seventh-global-conference/community-empowerment>). See also: SocialNet 2019, Community engagement training – integrating social science-based interventions in health emergencies response. Copenhagen: World Health Organization Regional Office for Europe; 2020 (page 21 - https://www.euro.who.int/_data/assets/pdf_file/0004/461794/SocialNet2019.pdf).

⁴³ Taylor D. Effective Risk Communication & Coordination.; 2009. Accessed November 25, 2021. <https://www.paho.org/disasters/dmdocuments/RiskCommSub-regionalMeetingCarterTaylor.pdf>

The risk landscape

In traditional risk management,⁴⁴ risk is defined as a function of the probability of an adverse health effect and the severity of that effect.⁴⁵ For IDM, risk-based prioritization helps to focus limited resources on the artifacts that have the highest likelihood of producing the highest negative health effect.

Other important considerations in risk are the targets of harms and their vulnerability (who they're likely to happen to), timeframes (e.g. when events are likely to happen – some events will naturally 'time out' after hours/week/months), and the drivers of risk effects and probabilities.⁴⁶

An infodemic risk landscape maps the artifacts and narratives that together generate infodemic harms, the accounts that broadcast them, the people or actors behind them (both nefarious and neutral), and potential harms from information overload, inaccurate information, and difficult to navigate information landscapes.

Infodemic features

Signals of issues within the context of an infodemic include:

- **Content:** an increase in false narratives - rumours and false stories about a current health situation;
- **Context:** a mismatch between information-seeking behaviours (including trust levels, and the channels where information is sought) and information posting behaviours/availability.
- **Behaviours:** infodemic techniques include fake experts and manipulated media websites seeding or boosting false narratives; coordinated inauthentic behaviours creating the appearance of greater than usual popularity for false narratives, and false narratives spreading into community discussions,
- **Risk:** the degree to which an incident is affecting a community, or could potentially affect that community is important; and combining that with the demographics potentially affected by the incident gives an estimate of relative risk. At the country, regional, or global levels, infodemics generally work at scale: a rarely-repeated conspiracy rumour is not a signal of a problem within the context of an infodemic, but that rumour spreading into the wider popular narrative and negatively affecting health behaviour is. Scale is also relative: issues that don't affect many of a country's wider population might cause significant harm to a smaller community and its members.

The risk landscape includes objects contributing to an infodemic includes artifacts, narratives, incidents, and campaigns. Each of these may be event-based (tied to specific moments or events) or operating in the background.

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

Inaccurate information

While infodemics include information excess and voids, much of the potential harm in an infodemic is generated by various kinds of inaccurate information. For example, rumours are unverified pieces of information. Misinformation is defined as incorrect, misleading, or misattributed information circulated without underlying agenda. Conspiracy theories are

⁴⁴ For the RCCE definition of "Risk = Hazard + Outrage", coined in the research of Peter Sandman and how it dovetails with infodemic risks, see below.

⁴⁵ Risk Analysis Draft May 2008 Principles And Methods For The Risk Assessment Of Chemicals In Food

https://www.who.int/foodsafety/chem/risk_analysis.pdf

⁴⁶ Chapter 2 of Feund and Jones' "Measuring and managing information risk" is a good introduction to information risks.

alternative explanations for events that are not always founded in reality. WHO's RCCE work has long-standing expertise with rumour management in health emergencies, when their volume, velocity and variety tend to multiply. Although much attention focuses on the prevention or reduction of rumours and their dissemination, anthropological perspectives also frame them as a "valuable window on public sentiments (...), a means of seeking answers where official sources are not delivering, for collective sense-making in the face of uncertain risks, and as a beacon signaling new information of an unforeseen risk not yet recognized through more formal channels."

Drivers of rumour and misinformation creation and sharing include rapid changes in response, uncertainty around where outbreaks are, who is susceptible, and different levels of trust in the governments, health authorities and other providers of health information and response. Rumours thrive when communications are not early, regular and transparent. A separate WHO Europe study is being conducted into uncertainty created by scientific communications methods, and how they feed into rumours and misinformation.⁴⁷

Disinformation

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

Disinformation uses false sourcing, amplification, or other "hacks" to the information landscape to manipulate peoples' beliefs, emotions, or sense of belonging to different in-groups and out-groups. The messages and images used in disinformation are often real, truthful (or mostly truthful with misinformation mixed in) but used out of context, mislabelled, or amplified to create emotive responses and affect behaviours.

Although RCCE covers 'good faith' actors in the information space (those with the public's best interest at heart, of which there are many) and infodemic harms are generated by the simple excess of information, not every messenger in an infodemic is benign. Disinformation actors may have powerful political, financial or other motivations that conflict with public health goals. Disinformation attribution (who is responsible for creating it) and intent (why it was created) are typically difficult to determine and can consume valuable effort in responding to an ongoing disinformation incident, making it advisable to instead prioritize the potential targets of disinformation and improving the information landscape around them.

Infodemic harms

The infodemic risks generated by the aforementioned include the effects of information overload, rumours, misinformation, and disinformation, and may result in infodemic harms of different kinds. Rumours, misinformation, disinformation, and related processes create behaviour change to produce adverse effects: this is what is meant by the term infodemic harms in this document.⁴⁸ Examples of harms created by the infodemic include the effects of ignoring safety guidelines (e.g. increased transmission), psychological effects (e.g. vaccine hesitancy and damage to trust in public health and pandemic response authorities; as well as general anxiety and related mental health effects),⁴⁹ and harm from adopting fake COVID-19 cures (e.g. methanol poisoning).

Because National Health Authorities and healthcare workers play an important role as trusted sources of health information, the infodemic can hamper the health system's and workforce's pandemic response efforts in a number of key ways, including direct infodemic attacks, harming trust in healthcare workers' expertise and work, and instilling doubt in guidance

⁴⁷ WHO Regional Office for Europe, Health Evidence Network - Synthesis study on infodemic risk from information voids – forthcoming.

⁴⁸ For an overview of categories of infodemic harms, see: Agraifotis, I. *et al.* A taxonomy of cyber-harms: Defining the impacts of cyber-attacks and understanding how they propagate. *Journal of Cybersecurity* 2018; volume 4, issue 1 (<https://doi.org/10.1093/cybsec/tyy006>).

⁴⁹ For additional examples of this, see for example Aronis, A. *et al.* The effect of infodemic and other information-related factors on health-information seeking behavior in COVID-19 outbreak (forthcoming – for a draft copy please contact vars@who.int).

and scientific evidence among healthcare workers directly. Healthcare workers themselves, like any human being, may also be susceptible to the dynamics in an infodemic, including disinformation tactics – furthering the need for building infodemic resilience through e.g. literacy training.

Infodemic harms

The infodemic and related processes create behaviour change that produce adverse effects, or infodemic harms.⁵⁰ Infodemic harms are generated by information overload, information voids, as well as by rumours, misinformation, and disinformation.

For example, individual harm categories include psychological (e.g. health-information seeking anxiety⁵¹) and physical (e.g. adopting fake COVID-19 cures leading to methanol or bleach poisoning). Other individual harms include lowered uptake of vaccination and protective measures.

Institutional harms include impacts on communities, national health, economy, global health and development. Because National Health Authorities and healthcare workers play an important role as trusted sources of health information, the infodemic can hamper the health system's and workforce's pandemic response efforts in a number of key ways. These include direct infodemic attacks, harming trust in healthcare workers' expertise and work, and instilling doubt in guidance and scientific evidence among healthcare workers directly. Healthcare workers themselves, like any human being, may also be susceptible to the dynamics in an infodemic, including disinformation tactics – furthering the need for building infodemic resilience through e.g. literacy training.

Infodemic risk assessment

While there are few comprehensive and specific risk assessment methods available for IDM,⁵² some useful existing resources include the following:

- **UNICEF:** Vaccine Misinformation Field Guide⁵³
- **FullFact:** A framework for information incidents⁵⁴
- **Global Disinformation Index:** Rating Disinformation Risk: The GDI Methodology⁵⁵
- **The Adversarial Misinformation and Influence Tactics and Techniques (AMITT) Framework**⁵⁶

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

Risk = Hazard + Outrage

It is worth noting that seminal RCCE literature evolves on the traditional definition of risk (a function of probability and adverse effect) to include the differential ways that experts quantify risk (risk assessment – how likely is it that X will cause harm) and publics understand risk (risk perception – how dangerous is X). Peter Sandman coined the alternative formula

⁵⁰ For an overview of categories of infodemic harms, see: Agraftiotis, I. *et al.* A taxonomy of cyber-harms: Defining the impacts of cyber-attacks and understanding how they propagate. *Journal of Cybersecurity* 2018; volume 4, issue 1 (<https://doi.org/10.1093/cybsec/tyy006>).

⁵¹ For additional examples of this, see for example Aronis, A. *et al.* The effect of infodemic and other information-related factors on health-information seeking behavior in COVID-19 outbreak (forthcoming – for a draft copy please contact yans@who.int).

⁵² One such resource is under development, titled "WHO field guide for assessing infodemic risk and preparedness."

⁵³ Vaccine Misinfo Guide. Published 2020. Accessed November 25, 2021. <https://vaccinemisinformationguide/>

⁵⁴ A framework for information incidents - Full Fact. Full Fact. Published 2020. Accessed November 25, 2021.

<https://fullfact.org/about/policy/reports/incidentframework/>

⁵⁵ Rating disinformation risk: the GDI methodology - https://disinformationindex.org/wp-content/uploads/2019/12/GDI_Index-Methodology_Report_Dec2019.pdf

⁵⁶ Welcome to AMITT - Amittsite. Herokuapp.com. Published 2021. Accessed November 25, 2021. <https://ancient-castle-77376.herokuapp.com/>

of “Risk = Hazard + Outrage”,⁵⁷ with outrage accounting for most of the deviation of public risk perception from expert risk assessment, and being driven by factors such as familiarity, natural versus industrial, and other markers.⁵⁸

This formula and the subsequent four strategies for risk communication apply to the response to infodemic risks. Applying key RCCE strategies to identified infodemic risks will increase the alignment of risk perception with risk assessment, and improve the appropriateness of at-risk communities’ responses to infodemic risk.

The response landscape

As is true for public health emergency response and RCCE overall, managing an infodemic requires a whole-of-society approach, taking cooperation across disciplines, groups, sectors and communities. It involves individuals learning to stop and assess “news” before they share it, to policymakers improving the range of available responses. At the community level, understanding community information landscapes, information gaps and how to best fill them, and community capacity to respond to infodemics, supporting or co-creating this with each community, is crucial.⁵⁹

In most countries, several groups will be finding, analysing and responding to information. Combining efforts, especially where groups have complementary skills and interests, can help response coverage (e.g., the number of narratives analysed and addressed), with sharing giving more efficient use of limited resources.

Most countries already have teams working on infodemic management. These include fact-checking organisations, government groups, and media teams. There are also regional and international organisations searching for infodemic artifacts and narratives, and responding to them at different levels (global, regional, national and subnational). Many of these organisations have specific skills, foci, or geographical areas of operation, so mapping these groups and working with them will often broaden the available range of alerts and responses.

Each region, country, or topic will have a number of people who are already active in IDM. These will likely include:

- **Government counter-misinformation teams:** these could be in an IT department, but could also be within any department dealing with information and the public;
- **United Nations agencies and other international partners:** WHO, UNICEF, UNESCO, UNDP, IFRC at headquarters, Regional and country level;
- **Media and journalist groups:** e.g. BBC Media Action, Internews, European Federation of Journalists. Linked to existing news organisations and journalism schools;
- **Dedicated fact-checking, disinformation analysis and response organisations;**
- **Community response groups;**
- **Influencers.**

Different organisations and groups work on different parts of IDM. Some are focused on improving the landscapes that infodemics occur in; many work on building community resilience by training communities and influencers, and building up networks of trust. Other teams track infodemic artifacts or create tools, processes, and datafeeds needed by IDM mitigation and response teams.

⁵⁷ Sandman, P. Responding to Community Outrage: Strategies for Effective Risk Communication. American Industrial Hygiene Association, 2012. <https://www.psandman.com/media/RespondingtoCommunityOutrage.pdf>

⁵⁸ Slovic P. The perception of risk. ResearchGate. Published August 11, 2016. Accessed November 25, 2021. https://www.researchgate.net/publication/325954197_The_perception_of_risk

⁵⁹ WHO field guide for assessing infodemic risk and preparedness – forthcoming.

Response activities

Based on an understanding of their information, risk, and response landscapes, response actors should be able to identify and prioritize activities based on risk, available capacity and resources, and likely impact. Time should be considered as a resource as well, as the depth and intensity of activities will be different for prevention and preparedness than for response.⁶⁰

Infodemic management is a combination of responding to infodemic artifacts and narratives, and making the local information landscape more resilient to an infodemic. Most of this work will be narrative-based, consisting of creating trusted places online that put out messages and counternarratives that negate rumours and misinformation narratives.

Organizing and understanding the response landscape

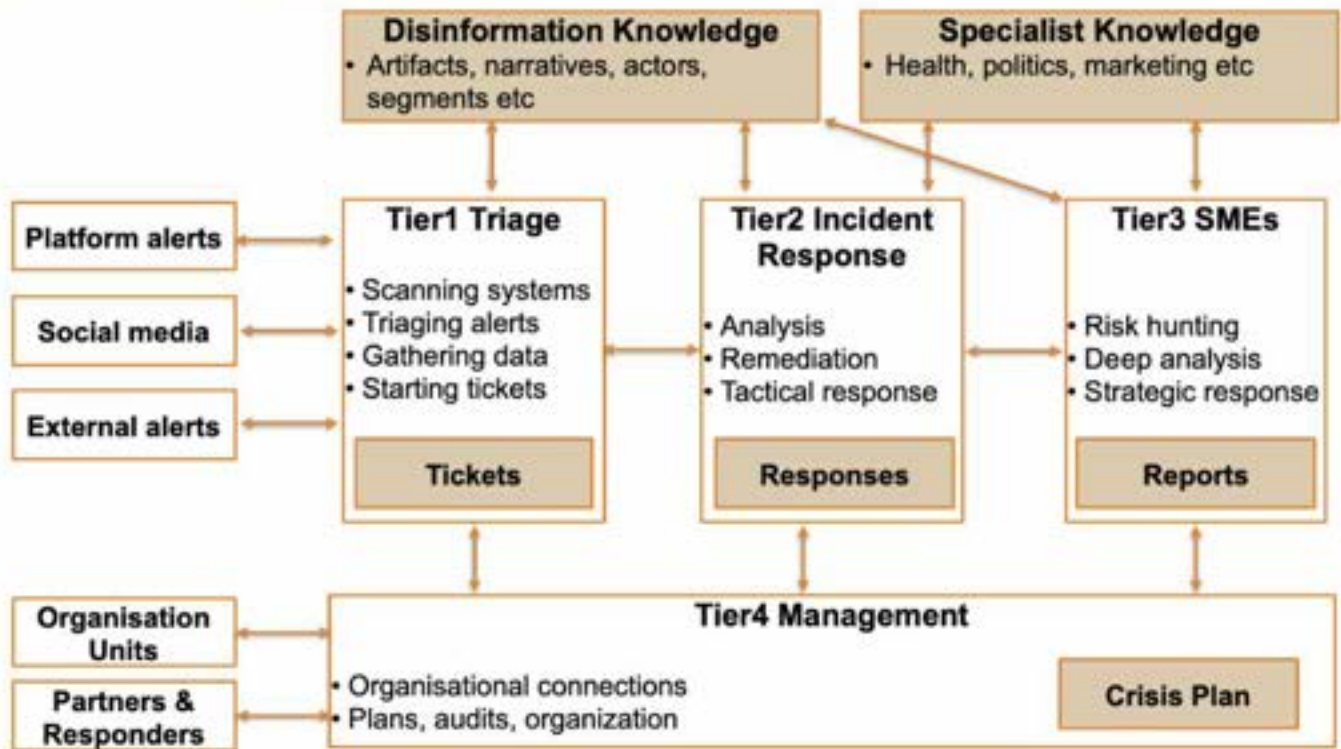
While infodemic response need not involve large numbers of actors or large budgets,⁶¹ to map a response landscape it can be helpful to consider different functions of infodemic responders. These can be organised into four tiers:

- **Tier 1: triage.** These teams gather data through social listening, tiplines, online search, and highlight the data points that are of interest to people sifting through information, or responding to rumours and misinformation. Triage teams generally produce lists of interesting datapoints, e.g. the datapoint plus summary and tags for other teams to work on, or visualisations highlighting data, sources, hashtags, and other features of interest to infodemic researchers and responders. Large organised teams will produce some form of “ticket” containing this information. Other teams post information online, e.g. on websites and by e-mail. The timespan for action is usually minutes to hours. See also: [Formative research and analysis](#) below for details on these kinds of activities.
- **Tier 2: incident response.** These teams investigate the datapoints highlighted by triage teams or tiplines, adding more details to them, including connections to narratives, information sources, counternarratives, and potential remediations and responses. These teams usually post their results on online pages, organise their own responses (e.g. amplifying related information or creating counternarratives), and send information to other teams (including social media platforms) who can also create evidence-based responses. The action timespan on average ranges from hours to days. See also [Media, materials and message production](#) below.
- **Tier 3: subject matter experts.** Subject matter experts tend to have deeper expertise in infodemic response. This tier concentrates on deeper analysis to help understand the underlying mechanisms and infodemic ecosystem, hunting for indicators of new activity, and planning longer-term mitigations and responses. Tier 3 usually produces longer reports on infodemic incidents and conditions. Actions will normally span days up to months. Relevant sections for these kinds of activities include [Community engagement](#), [Guidance and research production](#), and [Capacity building](#).
- **Tier 4: coordination.** Teams or individuals in this tier work to coordinate activities across the other three tiers, both with each other and with other teams and organisations. The primary document for tier 4 responders is an infodemic response plan, listing connections, data sources, and the activities that could be used to monitor, respond, and share information. This work tends to occur on an ongoing basis and in the background. See [Planning and internal coordination](#) and this section for more.

⁶⁰ For a more detailed analysis of how IDM activities play out during different emergency cycle phases see [Infodemic management within the emergency cycle](#).

⁶¹ See for example below under Partners, networks and external coordination.

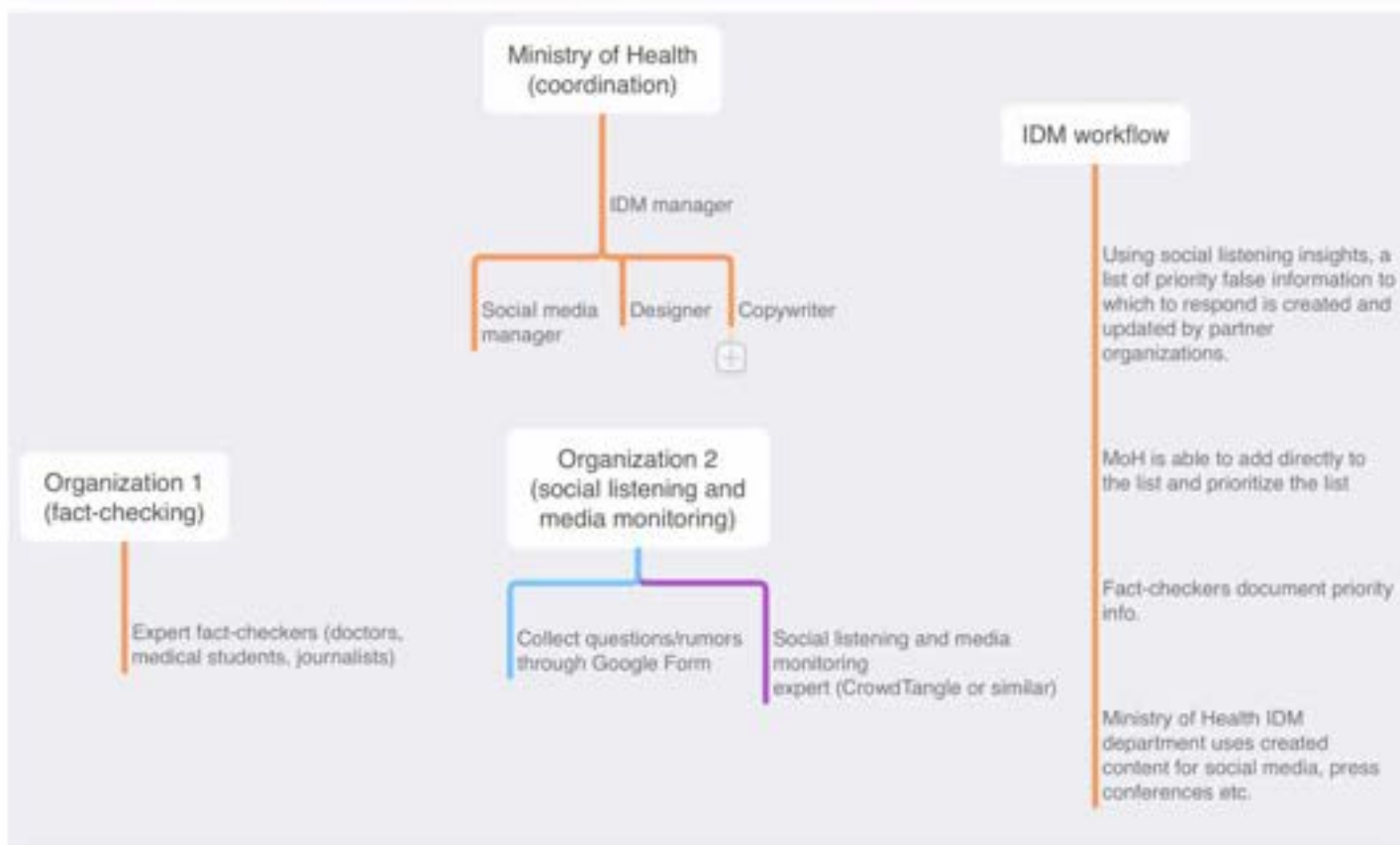
Figure 1 - Figure 11: Four-tier IDM response model⁶²



Many organisations contain two or more of these tiers, some focus on one, and different organisations may have very different team and information-handling structures. Each of these tiers interact and use knowledge about the infodemic (artifacts, narratives, incidents, campaigns, influencers, community segments and more) and knowledge about health responses, the geographical area covered, demographics and other relevant factors. Even when an IDM team or organisation doesn't overtly organise itself into tiers, it is worth assessing which of these tiers are present in that team, what their inputs and outputs are, and which activities they do at that level. Knowing stakeholder capabilities and shortfalls can help ensure focused, prioritized and adequate IDM.

⁶² Theory in Terp et al, "[Enterprise-appropriate responses to disinformation risks](#)", FiveBy Solutions, 2021. Tiers seen in practice in "[The long fuse: disinformation and the 2020 election](#)", EIP, 2021

Figure 2 - Example of an existing IDM team in a WHO European Region Member State



Measuring IDM response

IDM response is measured on two levels: the overall effectiveness of an IDM response system (people/groups, their processes, tools etc.) in terms of how well it meets its mission of reducing infodemic risk in its area, and the effectiveness of response to individual infodemic incidents.

Monitoring and evaluation of an IDM response helps with deciding on which interventions are most effective in the response, assessing which additional resources and training might be needed, and in learning lessons for future IDM activations. Not assessing and evaluating an IDM response is a false economy, which to-date has often led to putting resources into efforts without knowing whether work has been done on them elsewhere, who could be partnered with, and whether efforts are likely to produce effects, or potentially further harm.

Two resources that can support with monitoring and evaluation are:

- The WHO MEL Manual - Measurement, Evaluation, And Learning for communication campaigns and activities: this manual provides an overview of key processes for evaluating communication campaigns and activities, how to construct effective indicators, collect and analyse data, and formulate lessons learned.
- The International Health Regulations (IHR) (2005) Monitoring and Evaluation Framework: States Parties (IHR signatories) to the IHR have access to its [Monitoring and Evaluation Framework](#), which provides an overview of approaches to review implementation of country core public health capacities under the IHR (2005). As part of reviewing COVID-19 response efforts, two key processes are worth mentioning:

- COVID-19 Intra-Action Reviews: a country-led facilitated process conducted during the COVID-19 outbreak in-country, bringing together a small group of COVID-19 responders with knowledge of the public health response pillars under review.⁶³
- IHR After Action Reviews: a qualitative review of actions taken to respond to an event as a means of identifying best practices, lessons and gaps in a country's public health emergency preparedness and response capacity as part of a process of continual improvement and collective learning.

⁶³ Guidance for conducting a country COVID-19 intra-action review (IAR). 23 July 2020. Geneva: World Health Organization, 2020 (https://www.who.int/publications/i/item/WHO-2019-nCoV-Country_IAR-2020.1).

Advancing infodemic management within RCCE

Based on the understanding of key concepts of IDM as laid out in the theoretical framework, it is now possible to elaborate how these embed into the area of Risk Communication and Community Engagement in the WHO European Region.

Infodemic management has the same overall goal as RCCE: enabling at-risk communities to take informed decisions for their health, by the effective exchange of information between experts and affected populations (risk communication), and ensuring the strengthening of trusted relationships and collaboration between response authorities and affected communities (community engagement).

Within the context of the COVID-19 pandemic, IDM activities contribute to broader RCCE and response efforts to end the pandemic and build back better. Concretely, IDM efforts help achieve this goal by:

- **Maintaining and strengthening IDM (sub)systems** within RCCE, by conducting capacity building, mobilizing human and financial resources, and instituting infrastructure and best practices;
- **Detecting infodemic risks** before they arise actualize into harms (for prevention and mitigation) and in real time (for response);
- **Assessing and analysing infodemic risks** and potential responses (including standard RCCE response efforts);
- **Taking appropriate action** for mitigation and response in a timely manner, within the legal, jurisdictional and policy frameworks and constraints of each responding team.

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

Infodemic management within the emergency cycle

Before looking in detail at what IDM activities look like within RCCE capacities and work streams, it is helpful to review the emergency cycle model and how, broadly speaking, IDM maps onto it.

The emergency cycle

Although every public health emergency has its own specificities, generally each emergency situation passes through various phases, which may overlap and sometimes repeat. These emergency cycle⁶⁴ phases are as follows:

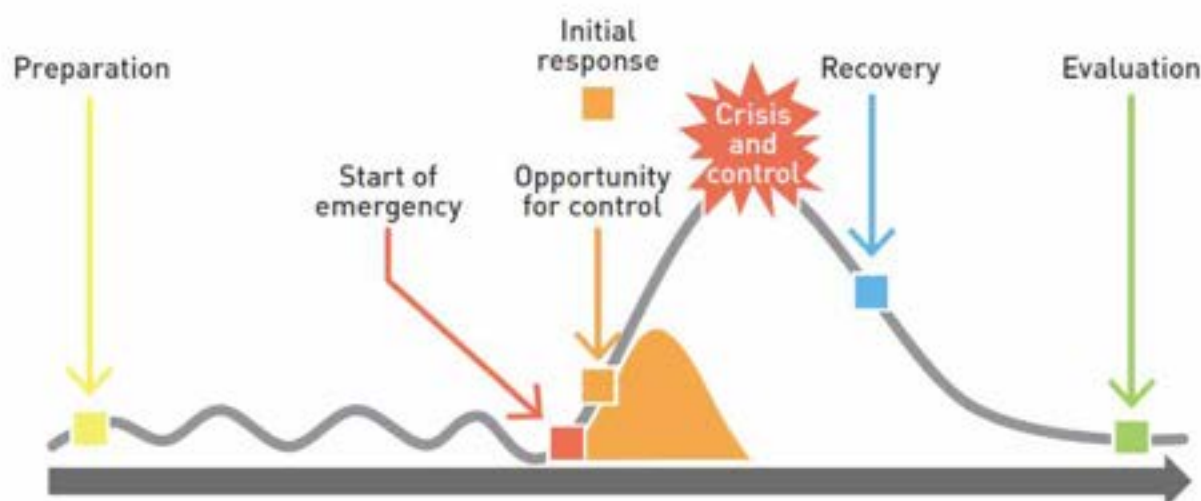
1. **Prevention and mitigation: reduce likelihood and potential impact of a future hazard.** Many health emergencies can be prevented or quelled before they cause extreme damage – think of vaccination as a preventive measure against emergencies caused by outbreaks of infectious diseases.
2. **Preparedness: reduce potential impact of an imminent or expected hazard by improving response systems.** Health emergency preparedness in Europe means ensuring that all countries in the Region have the capabilities to manage any type of health emergency. For example, by ensuring enough trained spokespeople are available, a country will be better prepared to handle RCCE response efforts when emergency strikes.
3. **Readiness: reduce potential impact of an imminent or expected hazard by practicing and testing the response systems and skills.** Capabilities built up during preparedness have been tested and practiced in a way

⁶⁴ Emergency cycle. 2021. Copenhagen: World Health Organization Regional Office for Europe; 2021 (<https://www.euro.who.int/en/health-topics/health-emergencies/pages/about-health-emergencies-in-the-european-region/emergency-cycle>) and WHO Guidance on Research Methods for Health Emergency and Disaster Risk Management – 3.2. Disaster risk factors – hazards, exposure and vulnerability. Kobe: World Health Organization Centre for Health Development; 2020 (https://extranet.who.int/kobe-centre/en/project-details/GUIDANCE_ResearchMethods_HealthEDRM).

that will allow a timely, effective and efficient response. This involves drills, simulations and other exercises, as well as ensuring resources are sufficient and can be rapidly scaled up as needed.

4. **Response: reduce actual impact of a materialized recognised hazard.** Effective emergency response means life-saving health interventions are implemented to ensure that affected populations have timely access to quality health services. A classical example of RCCE response is timely public announcement of a health risk to at-risk populations.
5. **Recovery: reduce likelihood and impact of future hazards (leads back into prevention and mitigation):** Once the peak of a crisis has passed, recovery entails remaining on the ground, sustaining efforts and building back better, including by evaluating the response and implementing lessons learned. Think of case studies and lessons (to be) learned documents, and processes like the Intra-action and After Action Reviews of the IHR Monitoring and Evaluation Framework.⁶⁵ It is important to note that evaluation (including by documenting lessons (to be) learned) should not occur only during recovery, but as part of all phases, particularly the response phase and especially during protracted emergencies.

Figure 3 - The emergency cycle



For each of the emergency cycle phases, an infodemic objective can be identified and summarized:

Stage	Infodemic
Prevention and mitigation	Work with partners to strengthen information and response systems before an infodemic occurs. Follows after the recovery phase.
Preparedness	Understand the current information, infodemic risk, and response landscapes, and set up resources as an infodemic is anticipated or imminent.
Readiness	Practice infodemic skills and test plans, processes and systems in drills, simulations and tabletop exercises, including viewing an infodemic incident from the point of view of people, entities, and objects involved in its creation ("Red Teaming").

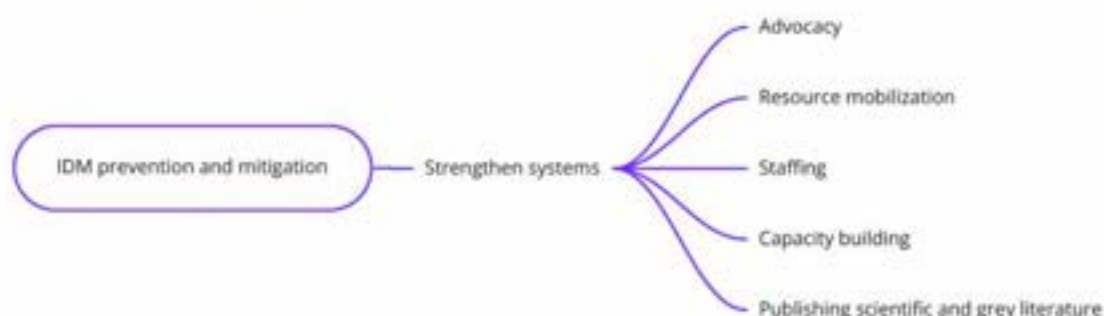
⁶⁵ IHR Monitoring and Evaluation Framework. Geneva: World Health Organization; 2021 (<https://extranet.who.int/sph/ihr-monitoring-evaluation>) and Guidance for conducting a country COVID-19 intra-action review (IAR). Geneva: World Health Organization; 2020 (https://www.who.int/publications/i/item/WHO-2019-nCoV-Country_IAR-2020.1).

Response	Respond to an infodemic with information and risk interventions, including ensuring affected populations have timely access to quality health information.
Recovery	Write up response lessons learned; support ministries of health to build lower-intensity monitoring before next infodemic. Leads into the prevention phase.

The following diagrams visualize key components of IDM work within each phase of the emergency cycle. Note: the activities listed in them might happen at any point during an emergency, but it's useful to group them to times in the lifecycle when they typically apply.

Prevention and mitigation

Figure 4 - Infodemic management during prevention and mitigation



Prevention and mitigation activities typically occur when there is no current or anticipated emergency. Their focus is on building out infrastructure, so the organization can respond rapidly if an infodemic occurs. They include capacity building – ensuring that the organization has trained people, processes, tools, culture, connections, and other resources available for a response if needed. They also include academic research, knowledge sharing and advocacy for IDM as an integral part of emergency response and communication.

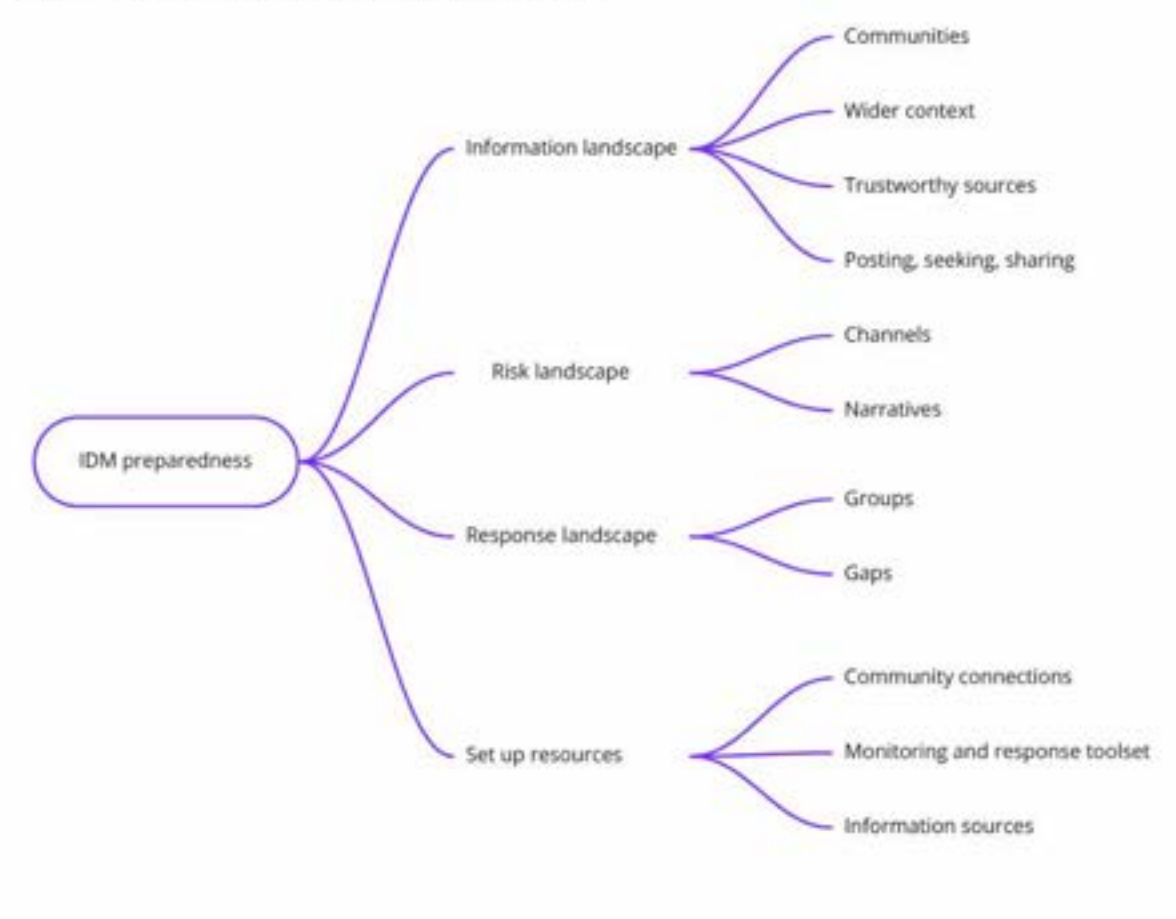
Actions for the prevention and mitigation phase should take place in any period of non-emergency.

Level	Prevention and mitigation activities
Basic	List what you could do and who you could connect to in an emergency: • Nominate an infodemic point of contact. • Identify and connect to existing infodemic responders and/or coordinators in the area (use the stakeholders list to find responders in your area). • Identify and connect to internal teams who could be part of an infodemic response. • Encourage staff, national health staff, health influencers, and communities to attend infodemic training.
Intermediate	Build awareness and connections before an emergency happens. As basic, but add: • Map your infodemic ecosystem landscapes: information, risk, response. (check responder websites to get a sense of the types of rumours and misinformation in your area. List types of health narratives seen, and any communities being targetted). • Identify or arrange for translation and localisation of resilience-building tools including games and training materials as needed / possible. • Identify or arrange IDM training sessions for staff and health authority responders.

	• Identify or arrange IDM awareness sessions for internal teams who could be part of an infodemic response. • Connect infodemic monitoring groups, response groups, and health authorities to each other. An IDM seminar or tabletop exercise is a light-touch way to start building these connections.
Advanced	Improve your infodemic mitigation and response systems. As intermediate, but add: • Improve the infodemic ecosystem landscape assessment with a desk survey, country data analysis, and semi-structured interviews or workshops with potential responders. • Identify gaps between potential infodemic risks and existing mitigations and responses, where gaps could include focus (e.g. politics rather than health), response activities, communities served, languages served. • Assess the resilience of at-risk communities to infodemics. Reinforce that resilience through influence literacy training, games, and co-created plans. Arrange for translation and localisation of training materials as needed / possible. • Coordinate (or be part of, if these already exist) response capacity building efforts, including training, and response community building. Localise existing guides to your own infodemic ecosystem (consider country, languages, and community specificities). • Coordinate (or be part of, if these already exist) information ecosystems improvements, including helping to build trust and reach of national health influencers (use influencers list to find positive health influencers in your area). • Maintain a library of common infodemic techniques, narratives, and known responses to them. Test and improve these with tabletop exercises and simulations. • Ensure drills and simulation exercises are included in IDM plans. Include IDM components in wider emergency readiness skills and simulation exercises. • Integrate and connect IDM infrastructure and listening systems into relevant segments of the national health emergency response infrastructure. Assess the suitability of available tools for the communities, channels, and languages that you'll work with and monitor, and arrange for translation and localisation as needed/ possible. • Include IDM planning in relevant national and international planning processes, budget cycles, etc. including pandemic preparedness and response plans. • Work with researchers to improve IDM knowledge and responses. Publish peer-reviewed, scientific, grey and other literature and guidance • Advocate for appropriate financial and human resources for infodemic management.

Preparedness

Figure 5 - Infodemic management during preparedness



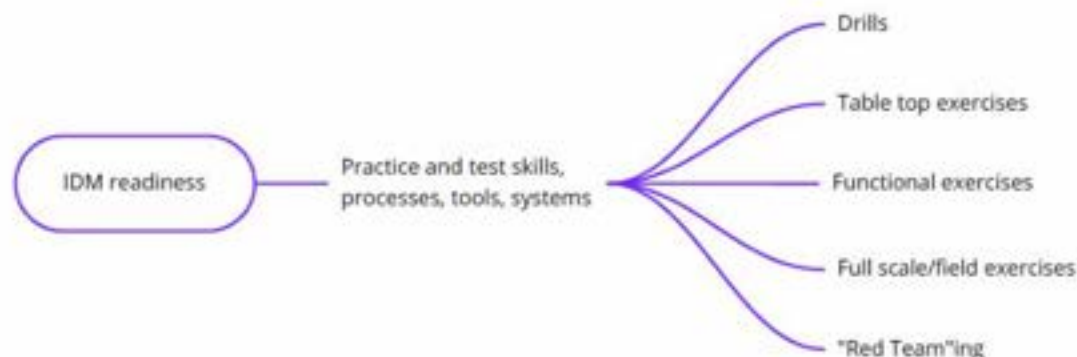
Preparedness activities aim to increase capacities to manage an anticipated or imminent emergency. They include planning the response to match the team capacity and the incident; creating or updating summaries of information, risk and response landscapes, and setting up resources: connections to communities and other stakeholders, toolsets, and information sources.

Level	Preparedness activities
Basic	Update your lists of connections: • Update lists of local infodemic responders, coordinators, and internal points of contact. • Identify local sources of credible health information for this emergency.
Intermediate	Map your current landscape, and build response plans for the new emergency. As basic, but add: • Update your infodemic ecosystem landscapes (information, risk, response) for this specific emergency. Identify all the potential stakeholders in your area who can detect, analyse, respond to, or mitigate this infodemic, including existing coordination bodies. • Work with positive health influencers, if needed, to increase trust and visibility, and/or fill information voids. Check that influencers and responders are connected to each other. • Help health authorities identify infodemic mitigations, build response plans, and build connections to communities and responders.

	• Work with community support leads to identify communities with potential rumour/misinformation issues in this infodemic, and/or who need support with community-led infodemic responses. Identify at-risk communities, including targeted health communities (health worker groups, parents, carers etc). Work with them to describe communications channels and styles, identify influencers, design mitigations, and tailor responses to themselves. • Identify alert, monitoring, and analysis tools that are appropriate to your infodemic ecosystem (languages, communities, risk profile etc) and resources (e.g. amount of time available per week). Set up the tools.
Advanced	Derisk the ecosystem. As intermediate, but add: • Use your response landscape to identify potential mitigation and response partners. Connect to them, and assess their activities and resource levels. Identify positive and less-positive health influencers in communities and regions. Identify any gaps between potential risks and their existing mitigations and responses. • Create an IDM mitigation, monitoring, and response plan with partners: include processes, contacts, resources. Plan divisions of work between office and other partners, including regional and international HQ responders. • Set up processes and a toolkit for your area, paying attention to issues like coordination, localisation, channels, community needs. • Find and fill information voids. • Produce counternarratives and prebunking materials.

Readiness

Figure 6 - Infodemic management during readiness



Readiness activities test IDM activities, skills, resources and knowledge about an infodemic, to improve team responses to an ongoing or potential infodemic. They include exercises ranging from table-top runthrought to full simulations, and "red teaming": running an exercise in the roles of both infodemic creators and responders, to gain insights into events, and anticipate future infodemic narratives and incidents.

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

Level	Readiness activities
Basic	Practice how you'd respond to an infodemic incident: Take an existing incident. Think through how you'd respond to it. Who/where would you get alerts, analysis, response materials from? Who do you need to alert? Will you need translations, or other modifications to existing response materials?
Intermediate	Test your response plan: as basic, but add: Test listening systems/tools and validate information, risk, and response landscapes against existing incidents, modified for the new emergency. Address any gaps identified (these might include channels, languages, or where you get alerts from).
Advanced	Test your response systems: as intermediate, but add: - Run drills and simulation exercises. Involve key response partners, communities and leaders/influencers in the design and execution of drills and exercises – as co-organizers, participants, and red-team roleplayers. - Test standard messages and materials, and message production, clearance, dissemination procedures with communities and health responders. Use outcomes to improve the materials and processes.

Response

Figure 7 - Infodemic management during response



Response activities focus on managing an active infodemic. These include managing the information landscape to reduce the numbers of spoof sites and information voids, and a cycle of detecting, assessing and responding to incidents. As mentioned above, it is also important to document and implement lessons (to be) learned during the response phase, especially for emergencies that are more protracted in nature.

Level	Response activities
Basic	Support responders • Monitor outputs from external and internal infodemic responders. Connect them, and route urgent alerts between them if needed. • Ensure countermessaging resources are available in local languages.
Intermediate	Implement your monitoring and response plans: as basic, but add: • Activate infodemic partnerships and response actions. • Health authorities monitor and respond as appropriate to misinformation that affects operation and trust in them, and to infodemic narratives in health-related fora.

	- Communities with the resources to do this monitor and respond as appropriate to misinformation that affects operation and trust in them, and to infodemic narratives in health-related fora. Low-resource communities report infodemic artifacts and narratives to responders. - Produce or request counternarratives and prebunking materials - Manage remaining, unmitigated impact part of risk, by monitoring responder sites, social listening feeds and media landscapes, alerting internal and external partners as needed.
Advanced	Coordinate response, adapting as needed. As intermediate, but add: - Collect and analyse data in time to inform infodemic response actions. - Route information requests and responses between internal and external partners. - Help health authorities and responders to adjust plans as landscapes, conditions, and needs change - Conduct rapid research to help answer questions and improve guidance relevant to the response. - Find and respond to information landscape issues including new information voids. - Run further training on tools, processes etc as needed - Monitor for internal issues including staff stress and security issues.

Recovery

Figure 8 - Infodemic management during recovery



Recovery activities happen after an infodemic, or as an infodemic winds down. These include archiving materials that can help in both research and in warm-starting the next infodemic response, running intra- and after-action reviews to collect and begin implementing lessons (to be) learned, and reducing or adapting activities to maintain capacity at a lower intensity over time.

As mentioned above, it is crucial to remember that evaluation and learning should also occur throughout the cycle and especially during response, to ensure lessons learned are not lost.

Recovery also includes efforts to build back better, by increasing community resilience to infodemics, and managing information landscapes to make misinformation and disinformation less effective. Activities around this include community, influencer, and media training to spot and manage their own responses to infodemic incidents, building trusted sources and channels for health information, and regularly checking for new information voids and spoof sites. This includes various kinds of literacy training (digital, science, information and health literacy to name a few) at different levels, including as part of school curricula in the longer term.

The recovery phase will normally lead into a new non-emergency prevention and mitigation phase.

Level	Recovery activities
Basic	Store lists of useful connections Make a list of any information sources, connections, and tools that you used in your infodemic response.
Intermediate	Archive materials, and write up lessons learned: - Review materials produced - create library of infodemic narratives and responses, marking any that are applicable to infodemics in general. - Archive data and knowledge produced during the response. - Run or attend a listening session with partners and communities. Summarise activities, list lessons learned, resource gaps, what measures were most effective, what did and didn't work etc. - Write an after-action report / IAR based on the listening session, and other lessons learned.
Advanced	Build back better: - Start adapting tools, processes, etc to handle gaps found during response. - Publish/produce case studies. - Keep training materials updated; run semi-regular training sessions on new research. - Plan ongoing staff / community/ responder contact, to ensure that capacity remains in-country when the current infodemic recedes. - Maintain a background level of readiness through training, papers, regular connections etc.

Infodemic management within RCCE core capacities and work streams

With a broad understanding of how IDM priorities change throughout the different phases of the emergency cycle, it is now possible to connect these priorities to overarching RCCE core capacities, and operationalizing them within concrete standard RCCE work streams.

Four core capacities of RCCE

Under the International Health Regulations (2005),⁶⁶ Risk Communication is listed as one of eight core capacities that the 194 States Parties have committed to strengthening.⁶⁷ While not (yet) included in the title, evaluation indicators for this capacity include a focus on community engagement and practitioners increasingly agree that the two parts of RCCE in

⁶⁶ International Health Regulations (2005), Third Edition. Geneva: World Health Organization, 2016

(<https://apps.who.int/iris/bitstream/handle/10665/246107/9789241580496-eng.pdf?sequence=1>)

⁶⁷ The other seven are Legislation and Policy, Coordination, Surveillance, Response, Preparedness, Human Resources and Laboratory (see also: Risk Communication for Public Health Emergencies - Workshop Facilitator's Guide (2009 edition). Lyon: WHO Lyon Office for National Epidemic Preparedness and Response, 2009 (https://www.who.int/ihr/training/risk_comm_fac_guide_en.pdf) and Satyajit Sarkar. Introduction: Risk Communication and Capacity Building under the IHR. Lyon: WHO Department of IHR Coordination (https://www.paho.org/hq/dmdocuments/2011/Guatemala_Introduction_to_RC_and_IHR_SatyaSarkar.pdf).

most cases are two sides of the same coin.⁶⁸ To enable this process of national capacity building, four specific core RCCE capacities have been identified and refined over time,⁶⁹ each with relevant applications for IDM.

Figure 9 - The four core capacities of RCCE



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

- **Key overall RCCE components:** standard operating procedures and other decision making principles for message production, clearance and distribution; RCCE representation in key decision making forums; capacity to draft effective messaging that is tailored to cultural, religious, ethnic, linguistic and literacy level dimensions.

2. Coordinating public communication

Proactive external public and internal communication and coordination with partners before, during and after an emergency are crucial to ensure effective, consistent, trustworthy risk communication that both provides information and addresses public concerns.

- **Key overall RCCE components:** availability of RCCE focal points and capacities among response actors; established coordination structures and procedures; availability of key community networks.

⁶⁸ See for example Joint external evaluation tool: International Health Regulations (2005), second edition. Geneva: World Health Organization; 2018 (page 88-95, <https://extranet.who.int/sph/sites/default/files/document-library/document/9789241550222-eng.pdf>). Revisions to IHR MEF indicators currently under review reflect this.

⁶⁹ Salvi, C., Frost, M., Couillard, C., Enderlein, U., and Nitzan, D. Emergency risk communication – early lessons learned during the pilot phase of a five-step capacity-building package. Public Health Panorama: Volume 4 | Issue 1 | March 2018 | 1-146 (https://www.euro.who.int/_data/assets/pdf_file/0009/364869/php-4-1-1207-emergency-risk-eng.pdf). See also Emergency risk communication (ERC) 5-step capacity-building package. Copenhagen: World Health Organization Regional Office for Europe; 2018 (<https://www.euro.who.int/en/health-topics/health-emergencies/pages/whos-work-in-emergencies/risk-communication-in-emergencies/emergency-risk-communications/emergency-risk-communications-tools/national-health-emergency-risk-communication-training-package>).

3. Listening through two-way communication

Community engagement is key for effective RCCE response. Communities must be at the heart of any health emergency response and it is essential to know which people to target, how they understand and perceive a given risk and their beliefs and practices. The community should be seen as a true partner in the response and the presence or absence of this partnership mindset will often determine the success of response actions.

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

4. Selecting effective channels and influencers

The right channels and influencers to reach target audiences depend on the local context and are usually the ones already used by the audience.

- **Key overall RCCE components:** mapping of channels and influencers for each key target audience (web, social media, traditional media (radio, TV, print), SMS, public address systems); partnerships and relationships with the same; availability of spokespersons.

While the four core capacities model focuses on earning, restoring, and building trust between emergency response actors and at-risk communities, IDM complements this model by focusing on factors and actors that intentionally or unintentionally *harm* this trust. By doing so, IDM enhances the RCCE function from one-sided trust-building to two-sided trust *management*.

From capacities to work streams

To operationalize the four core capacities outlined above, a number of key work streams can be identified:⁷⁰

1. **Planning and internal coordination:** achieve effective and efficient IDM impact by ensuring efforts are strategic, in line with relevant WHO and other guiding plans and documents, communicated and advocated clearly among internal stakeholders, and effectively monitored and evaluated to ensure delivery, necessary course adjustments, and documentation of lessons learned;
2. **Partners, networks and external coordination:** multiply impact by identifying synergy, areas for joint work, and avoiding overlap, and advocate externally for IDM activities and COVID-19 response efforts more broadly;
3. **Community engagement:** empower communities, influencers and CSOs with resilience to infodemics. Co-design IDM solutions with communities, tailoring them to the health information needs of the community, and combining scientific soundness and cultural relevance;
4. **Formative research and analysis:** establish necessary and sufficient data collection and analysis processes to inform infodemic response actions, ensure efforts are responsive to evolving community and country needs, as well as to ensure evaluation of process and impact;
5. **Media, materials and message production:** provide information in response to infodemic artifacts (including via the media, social media and web and other channels used by target audiences) so at-risk populations are able to take informed decisions to protect themselves and their loved ones, and response authorities' public reputation is protected and strengthened;
6. **Capacity building:** strengthen country IDM capacity to improve sustainability of efforts and impacts.

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

⁷⁰ Work streams based on the 2021 Communication Pillar Strategy of the WHO Regional Office for Europe's Incident Management Support Team (internal draft).

Applying IDM within these RCCE capacities, work streams and activities, and mapping these across the emergency cycle phases yields the table on the following page, which is further elaborated and operationalized in the subsequent sections.

RCCE work stream	Emergency cycle phase				
	Prevention (reduce likelihood of a future hazard) and mitigation (reduce potential impact of a future hazard)	Preparedness (reduce potential impact of an imminent or expected hazard by improving response systems)	Readiness (reduce potential impact of an imminent or expected hazard by practicing and testing the response systems and skills)	Response (reduce actual impact of a materialized hazard)	Recovery (reduce likelihood and impact of future hazards leads back into prevention and mitigation)
Planning and internal coordination	Connect IDM planning to national and international planning processes and budget cycles, including e.g. the COVID-19 Country Preparedness and Response Planning.	Create a plan that's realistic for office resources and landscape. Planning includes identifying potential partners and prioritizing activities for each level and actor (subnational, national, regional, global, partners).	Ensure drills and simulation exercises are included in plans. Include IDM components in wider emergency readiness skills and simulation exercises.	Implement monitoring and response plan. Adjust plan as needed. Monitor for internal issues – e.g. staff stress and security issues.	Plan to maintain a background level of readiness through training, papers, regular connections. Produce, publish and/or share IAR, AAR, case studies, lessons learned.
Partners, networks and external coordination	Coordinate capacity building efforts for synergy and to avoid duplication and competition.	Identify potential preparedness and response partners, their activities and resource levels. Identify and address potential gaps in preparedness and response efforts (e.g. activity, communities, languages). Connect to potential partners, plan together, implement preparedness actions (reducing likelihood part of risk).	Involve response partners in drills and simulation exercises.	Activate partnerships and response actions (manage remaining, unmitigated impact part of risk).	Involve partners and stakeholders in lessons learned and building back better activities.
Community engagement	Assess and reinforce at-risk community resilience to infodemics, including by IDM literacy training. Connect community feedback channels to listening data collection processes.	Identify at-risk communities. Work with them to describe communications channels and styles, identify influencers, tailor mitigations and responses to themselves.	Involve key communities and leaders/influencers in the design and execution of drills and exercises – as co-organizers, participants and/or roleplayers.	Communities with the resources to do this monitor and respond as appropriate to misinformation that affects operation and trust in them, and to infodemic narratives in health-related fora. Low-resource communities report infodemic artifacts and narratives to responders.	Intra/after-action review on communities: where were the resource gaps, what measures were most effective.
Formative research and analysis	Integrate and connect IDM infrastructure and listening systems into relevant segments of the national health emergency response infrastructure. Map information, risk and response landscapes.	Survey landscapes: information, risk, response. Write a response plan: processes, contacts, resources. Identify tools that are appropriate to your infodemic ecosystem and resources (e.g. amount of time available per week).	Test listening systems/tools and validate information, risk, and response landscapes during drills and simulation exercises. Address any gaps identified.	establish necessary and sufficient data collection and analysis processes to inform infodemic response actions, and to ensure efforts are responsive to evolving community and country needs;	Write up lessons learned. Start adapting tools and processes to handle gaps found during response.
Media, materials and message production	Maintain a library of common infodemic narratives and known responses to them.	Find and fill information voids. Produce counternarratives and prebunking materials.	Test standard messages and materials, and message production, clearance, dissemination procedures. Use outcomes to improve the materials and processes.	Find and fill information voids. Produce counternarratives and prebunking materials.	Review materials produced, update the library of infodemic narratives and responses, marking up any new ones that are applicable to infodemics in general.
Capacity building	Long-term training and capacity building, including IDM in RCCE and other relevant training activities. Advocacy for financial and human resources.	Assess and remedy any remaining gaps in IDM response capacity with supplemental training.	Test IDM capacity through skills and simulation exercises.	Training on response tools and processes as needed.	Keep training materials updated; semi-regular sessions on new research. Ensure baseline capacity remains.

Planning and internal coordination

Work stream objective: achieve effective and efficient IDM impact by ensuring efforts are strategic, in line with relevant WHO and other guiding plans and documents, communicated and advocated clearly among internal stakeholders, and effectively monitored and evaluated to ensure delivery and necessary course adjustments.

Planning and Internal Coordination	
Prevention	Connect IDM planning to relevant national and international planning processes, budget cycles, etc. including e.g. the COVID-19 Country Preparedness and Response Planning.
Preparedness	Create a plan that's realistic for your office resources and ecosystem. Planning includes identifying potential partners and prioritizing activities for each level and actor (subnational, national, regional, global, partners).
Readiness	Ensure drills and simulation exercises are included in plans. Include IDM components in wider emergency readiness skills and simulation exercises.
Response	Implement monitoring and response plan. Adjust plan if needed. Monitor for internal issues – e.g. staff stress and security issues.
Recovery	Plan to maintain a background level of readiness through training, papers, regular connections.

IDM relies on human analysts and responders who use infodemic processes, standards, and responses. By taking a risk-based approach, responders can prioritize limited resources. This means working from the point of reducing the likelihood of harm, rather than to find and address every possible piece of data.

Toolset

It's possible to run an infodemic response with Google search and a spreadsheet, but it's a lot easier if you use a set of tools. One tool is unlikely to do all the things you need. Tools might also need to be localized: adapted to your target location and languages. For more details on tool selection, see the section on [Tools](#) below.

Measurement, evaluation and learning

To ensure IDM is working as planned, activities will need to be measured, evaluated, and any lessons learned incorporated into plan updates and course corrections. See also [Measuring IDM response](#) above.

Partners, networks and external coordination

Work stream objective: multiply impact by identifying synergy, areas for joint work, and avoiding overlap, and advocate externally for IDM activities and COVID-19 response efforts more broadly.

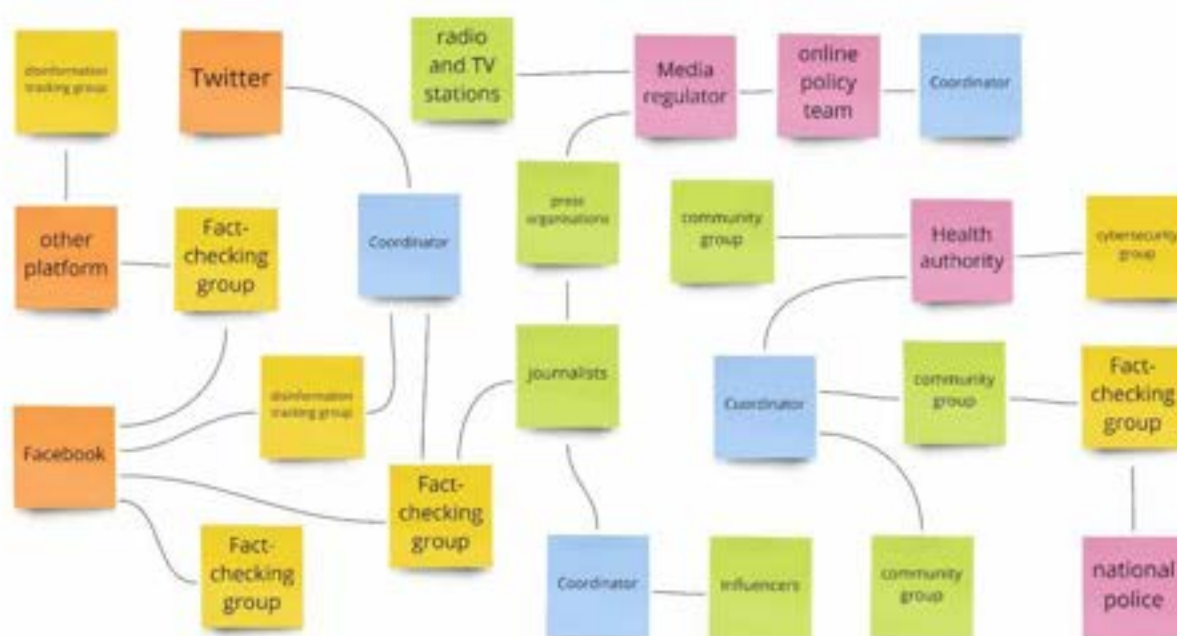
Partners, networks and external coordination	
Prevention	Coordinate capacity building efforts for synergy and to avoid duplication and competition.
Preparedness	Identify potential preparedness and response partners, their activities and resource levels. Identify and address potential gaps in preparedness and response efforts (e.g. activity, communities, languages). Connect to potential partners, plan together, implement preparedness actions (reducing likelihood part of risk).

Readiness	Involve response partners in drills and simulation exercises.
Response	Activate partnerships and response actions (manage remaining, unmitigated impact part of risk).
Recovery	Involve partners and stakeholders in lessons learned and building back better activities.

Collaboration is key. Infodemic monitoring and response is most effective when multiple organisations and communities work together – some groups will be better at surfacing rumours and misinformation, others at analysis, and yet other groups can respond in ways (e.g., platforms can remove content, influencers can reach larger numbers of people) that others can't.

Working with other teams

Figure 10 - Sample IDM partner/stakeholder map for a country. Yellow = mis/disinformation response groups; orange = platforms; light green = other responders; pink = government bodies; light blue = coordinating groups; link = organisations working together)



Part of mapping the response landscape for a country, subject area, etc. is understanding which groups are already working on an infodemic, which have capabilities that can be useful to an infodemic response, and how they're already connected.

Figure 10 shows a typical situation for a country that already has a misinformation response infrastructure in place. Misinformation response groups, platforms, communities, government, media, etc. are all coordinating with each other, or through coordinating groups that might be INGO or government-backed programs. If that coordination is already in place, your role is to work out how your work fits into this existing landscape, and how best to work with existing groups to reduce the infodemic risk in your area.

It's rare, but you might find no misinformation response infrastructure in your area or country. In that case, decide whether you want to coordinate response groups yourself, or find a group in-country who could do

this, and work out how to support them (Training? Identify other potential in-country groups? Arrange support from peer groups in other countries? Convene responders, government etc, to get a response started?).

Organising large numbers of responders

For some infodemics, you might find yourself organising a large team of infodemic responders, or coordinating connections with a set of infodemic response groups.⁷¹ The aim of doing this is usually to build an effective infodemic response that reduces the overall risk from the infodemic.

Large teams are often used during times of high infodemic activity – the volume, velocity, variety, veracity of information become too great for one team to handle, or to ensure coverage of an infodemic across teams that might have different specialisations. This is a format familiar to crisismapping organisations, information security Security Operations Centres, and disaster response bodies.

Working alone

Some misinformation response teams are strong enough to work alone, without collaboration with other teams. This is rare – even large platform teams work collaboratively. If you do work alone, perhaps because of time pressure, or the material you're handling is very sensitive, it's still useful to be aware of other groups' work, and potential partnerships if needed.

Community engagement

Work stream objective: empower communities, influencers and CSOs with resilience to infodemics and involve communities in designing IDM solutions for health, combining scientific soundness and cultural relevance.

Community Engagement	
Prevention	Assess and reinforce at-risk community resilience to infodemics, including by IDM literacy training. Connect community feedback channels to listening data collection processes.
Preparedness	Identify at-risk communities. Work with them to describe communications channels and styles, identify influencers, co-develop messages, and tailor mitigations and responses to themselves.
Readiness	Involve key communities and leaders/influencers in the design and execution of drills and exercises – as co-organizers, participants and/or roleplayers.
Response	Communities with the resources to do this monitor and respond as appropriate to misinformation that affects operation and trust in them, and to infodemic narratives in health-related fora. Low-resource communities report infodemic artifacts and narratives to responders.
Recovery	After-action review on communities: where were the resource gaps, what measures were most effective etc.

As mentioned in the Theoretical Framework, infodemics start and end in communities – groups of people

⁷¹ See also above under Organizing and understanding the response landscape

that may or may not be spatially connected and could be local, national or international, but who share common (specific or broad) interests, concerns or identities.

To manage trust between communities and response authorities effectively, the latter require an understanding of community dynamics, power structures, and flows of information, as well as a commitment to supporting and working with communities rather than taking an exclusively top-down approach. Especially the offline components of infodemics cannot be managed appropriately without a genuine and thorough effort for community engagement.

Key focus areas for IDM with and for communities include:

- **Listen to your communities:** their concerns, who and what they trust, how they access and share information. Understand why a message might be particularly damaging for a community, and why a community might be inclined to believe it. Connect digital and offline information systems.
- **Clearly communicate risks and science, in places that are accessible to your communities:** go to where they seek information, or build information sites that they trust – again remaining mindful of both digital/online and in-person/offline sources and systems. Empower community leaders and influencers with the information and skills that their communities need. Communicate in a culturally appropriate way, or in a way that allows for the community to meaningfully understand.
- **Help communities become resilient to infodemic risks:** conduct media and IDM literacy training to help communities deal with the infodemic.⁷²
- **Involve communities in decision-making and planning processes:** applies across all phases of the emergency cycle.
- **Empower communities:** share tools and resources so communities are empowered to conduct IDM for themselves.

These are often not grand actions. Simple training and information in the languages and information channels that communities use, links to trusted sources of information, listening tools like HealthBuddy+,⁷³ can all help communities find and share trusted information in an infodemic, and become more resilient to infodemic risks.

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

A Muslim religious leader promptly tackled misinformation about vaccines being dangerous shared on social media with other Muslim leaders, based on WHO/Europe's evidence-based guidance.

Full context: A religious leader shared an article containing misinformation about vaccine in a WhatsApp group including 400 senior Muslim leaders, representing a community of 2 billion people around the world. Sheik Ra'ed Bader could demonstrate that this was misinformation, with a translation of a reliable source in Arabic. WHO/Europe advised on the approach to take. If action was not fast enough, misinformation would have been mentioned in religious rulings and spread widely to billions of Muslims around the world. This collaboration helped prevent leaders publishing a ruling on the basis of misinformation.

⁷² For more on this see "[Capacity building](#)".

⁷³ Enhancement to COVID-19 mobile app rolled out across WHO European Region, 28 October 2020. World Health Organization Regional Office for Europe, 2020 (<https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/10/enhancement-to-covid-19-mobile-app-rolled-out-across-who-european-region>). See also: <https://healthbuddy.plus>.

Formative research and analysis

Work stream objective: establish necessary and sufficient data collection and analysis processes to inform infodemic response actions, and to ensure efforts are responsive to evolving community and country needs.

Formative research and analysis	
Prevention	Integrate and connect IDM infrastructure and listening systems into relevant segments of the national health emergency response infrastructure. Map information, risk and response landscapes.
Preparedness	Survey landscapes: information, risk, response. Write a response plan: processes, contacts, resources. Identify tools that are appropriate to your infodemic ecosystem (consider languages, communities, risk profile etc) and resources (e.g. amount of time available per week).
Readiness	Test listening systems/tools and validate information, risk, and response landscapes during drills and simulation exercises. Address any gaps identified.
Response	Establish necessary and sufficient data collection and analysis processes to inform infodemic response actions, and to ensure efforts are responsive to evolving community and country needs.
Recovery	Write up lessons learned. Start adapting tools, processes, etc to handle gaps found during response.

IDM is a constant activity. New narratives and artifacts appear over time, and need to be addressed in a timely manner. Setting up a process, even a simple one like “every morning, we check the monitoring tool outputs for new narratives” helps with this ongoing work of collecting and analysing data to inform response action.

Map your landscapes

Another key part of formative research is mapping the information, risk and response landscapes. The first part of this is a desk survey of the information, risk, and response landscapes, followed by semi-structured interviews with existing infodemic responders, targeted organisations, and communities. The interviews provide a more detailed overview of information, risk and response landscapes from which to plan and act, and often contain surprises (e.g. misinformation channels that aren't visible to a desk survey).

- **Information landscape:** the existing communication and information systems in the area: the flows of communication, emotions, and group interactions that infodemics exist within.
- **Risk landscape:** infodemic harms, their propagation channels, and the mechanisms that cause them.
- **Response landscape:** the systems around the activities used to mitigate or remove the effects of an infodemic. Understanding who could be part of an IDM response is as important as understanding the information and risk landscapes you're working in. These include groups that could prepare for and respond to infodemic risks, and the current and potential actions that can be taken to reduce those risks.

Resources to help with the desk survey include:

- **Information landscape**
 - Desk survey: e.g. the [Hootsuite/WeAreSocial internet report](#) with sections per country. These figures show social media trends which may not always line up with how people post,

seek, and share information online. Nevertheless, they provide a good list of where to start looking for more information. The [Reuters Digital News Report](#) is similar but covers fewer countries.

- Connections: ask existing social listening and infodemic management groups in-country about which information channels people use to access and share information, and how they do this.
- Formative research: add social media habit and information diet questions to existing survey methods.
- **Risk landscape**
 - Oxford Internet Institute's (OII) country by country yearbooks (e.g. [2019](#), [2020](#)).
 - Newsguard's misinformation tracking center, listing known disinformation and junk news sites.
 - Infodemic response organisations, fact-checkers and related groups already working in the country.
- **Response landscape**
 - For more details on partners and stakeholders, see [Partners, networks and external coordination](#) below.

Social listening

To inform IDM, RCCE and broader emergency responses, an understanding of the information landscape in target audiences and communities is essential. Social listening captures conversations that are ongoing in communities – online, offline, and on the ground. This means social listening systems should also connect to community feedback mechanisms to capture information shared by community members with actors involved in serving them.

Understanding the information landscape includes listening to communities, to understand how they seek, access and share information, and the different filters they use to do this. It also includes listening to the emotional stances that people take relative to information, and understanding community structure, including the people, accounts, and organisations that have influence within them.

Social listening online will be helped by the landscapes above. All of life is represented online, and there is a lot of noise, some intentional, most not, around health information. Within this, IDM social listening looks for signals of community concerns, rumours, trends, and coordinated inauthentic activity.

Internet and media monitoring

Monitoring actively searches for potential infodemic artifacts and narratives within traditional media, social media, and the wider internet. Traditional media organisations (TV, radio, newspapers etc) often have websites and social media accounts that can be included in more general internet searches; this can be supplemented with monitoring TV/radio channels, newspapers etc., or arranging alerts from groups (e.g., Media monitoring agencies) that already do this work.

Online searches with search engines like Google are a good first check on internet-based information sources. A prebuilt set of Google search strings, or "google dorks", can help with narrowing down a search to specific topics, communities, or countries.²²

Some basic dork examples include:

- [vaccination OR vaccine OR vaccinate](#) – returns results mentioning one or more of the search terms;

- [vaccination OR vaccine OR vaccinate AND COVID-19](#) – returns results that mention one or more of the vaccine keywords as well as COVID-19;
- ["COVID-19 vaccination"](#) – returns exact sentence or combination of search terms;
- [vaccination site:co.uk](#) – returns results from websites from a specific domain or website;
- [intitle:vaccine](#) – looks for pages with vaccine in their titles;
- [inurl:vaccine](#) – looks for pages with vaccine in their web address.

To get started with building dorks, [Google's advanced search page](#) offers an easy-to-use interface. It also offers a dropdown list of languages and locations to geographically restrict your searches.

By combining search operators, it is possible to build large, complex queries with very specific results. For example, [vaccination OR vaccine OR vaccinate site:facebook.com](#) will look for pages with one or more of these three keywords within the specific domain (in this case, Facebook).

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

Monitoring risk

Risk landscape monitoring will mostly use the same tools as information landscape monitoring, but with some changes and additions:

- **Channels and routes:** misinformation is usually posted and shared in the same spaces as information, but there are also dedicated sites, accounts, groups etc for misinformation/disinformation. These can be on channels that aren't included in common monitoring tools, so specialist tools and techniques may be required to monitor these for new rumours and narratives.
- **Sources:** many countries have known sources of misinformation, including manipulated media websites selling "cures" or other products, or amplifying false health or medical narratives.
- **Artifacts:** types of mis- and disinformation artifacts to check for include messages, images, videos, and audio (e.g. phone messages).
- **Narratives and rumours:** misinformation often forms around narratives, e.g. "garlic cures COVID-19". Narratives are often reused between countries, communities, and events, so keeping an eye on existing known narratives and for new ones in neighboring communities, regions, countries and even globally can help IDM risk monitoring efforts. Rumours are a form of narrative, but are usually based on an uncertainty, or a lack of available information.
- **Target segments:** disinformation creators often target specific segments of society. Healthcare workers have been targeted during infodemics, and other segments of society have been targeted around specific concerns (e.g. children) or behaviours (e.g. vaccine hesitancy).

Improving the information landscape

Mis- and disinformation rely on propagation of narratives across channels. Focusing on the source and distribution mechanisms is useful. This includes actions like searching for information voids (places where people search for information that doesn't exist in them) and placing information in them, and searching for artifacts like accounts and websites that spoof genuine information providers.

It is often not possible to manage the entirety of each landscape simultaneously. A good set of IDM tools can help to better understand where risks are high, and where response efforts are likely to succeed.

The set of tools that you use need to fit your needs. Things to be aware of here include:

- What are your needs? A simple toolset that's used regularly is much more valuable than an expensive toolset that's unused.
- Do you have the resources to install, use and maintain this toolset – resources include people, money, available technical knowledge.

An initial set of tools may be selected during planning and updated over time. Many tools that serve IDM purposes are available nowadays, including ones for:

- **Internet monitoring:** looking for trends, known narratives, new narratives, and risk activity in social media, websites, and other places that people seek and share information online.
- **Media monitoring:** looking for trends, known narratives, new narratives, and risk activity in traditional mass media, including newspapers, radio, and TV. Some of this monitoring can be covered by searching media's internet sites.
- **Monitoring other channels:** messaging apps and word of mouth misinformation sharing cannot usually be tracked using internet monitoring tools. However, surveys, chatbots and other social listening tools can help to surface infodemic narratives and artifacts in these "dark" channels.
- **Analysis:** making sense of the often-large volumes of data produced by monitoring. Analysis tools includes tools to support teams of human analysts to share information; text analysis tools to help identify and track narratives, and graph analysis tools to help map information flows, find influencers, and identify and track coordinated online activity.
- **Message-based responses:** getting prebunking, debunking and other messages to community segments in the channels that they use or trust, in forms they're familiar with (e.g. languages, message styles, literacy levels, cultural appropriateness).
- **Other responses:** sharing infodemic artifacts with platforms and other responders.

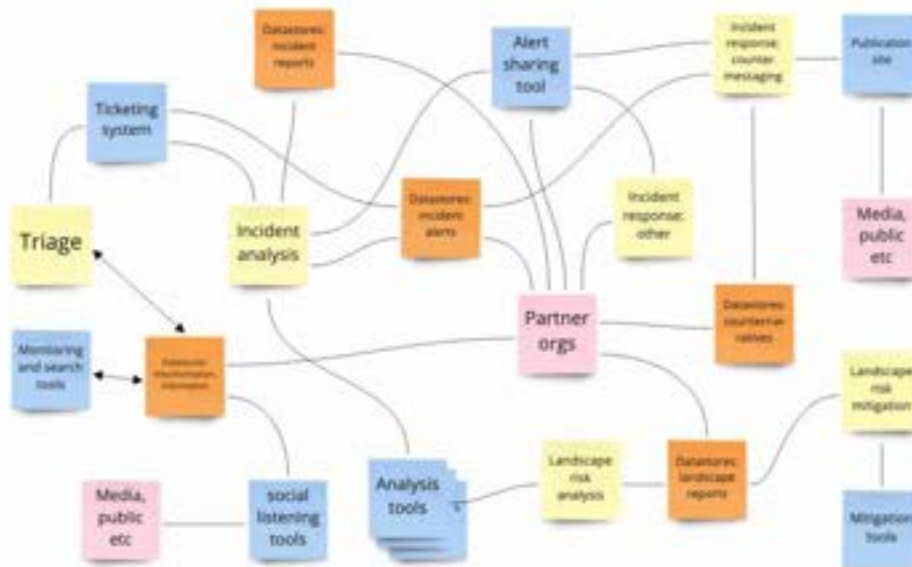
To make the most of each tool, they must often be localised – adapted to the relevant community, culture, language and other specificities. This also includes adjusting for locally relevant vocabulary, slang, idioms and even use of non-text elements like emojis. Localisation issues to be aware of include:

- **Language localisation⁷⁴:** most localisation work is language-based and a major part of this is localising the tools you're using. Many tools allow for language and alphabet selection, both in the places that users interact with them, and in the languages and alphabets that are used to set up, monitor, and create graphs and other outputs. In some cases, further language localization is required, often in translating words and phrases used by a tool, and an in-country team may be able to help with this.
- **Algorithm localisation:** many algorithms (the rules used by computers to e.g. make estimations, solve problems, summarise data) are designed for a limited set of locations, languages, and demographics (e.g. American English) which limits their usefulness on datasets outside that scope. For example, a text analysis algorithm may include a list of English "stop words" ('and', 'a', 'it', etc.) to filter out – but a similar list in a local language may need to be located or created and imported into the algorithm. [Stopwords ISO](https://www.iso.org/stopwords) is a useful, extendable resource for stopword lists in multiple languages.

⁷⁴ See <https://www.w3.org/International/questions/qa-i18n> for more on localisation and internationalisation.

- **Algorithm fairness** is another area where tool capabilities may differ between languages, regions, and uses. This is a large area – be aware of it, and ask yourself whether there are human biases in any algorithm training sets you create⁷⁵.
- **Visual localization:** is the user interface of the tool appropriate for its audience, e.g. contain images that exclude population segments, or colour schemes with negative associations in your area⁷⁶.

Figure 11 - tool categories and uses. Yellow = activity; Blue = tool category; Orange = datastores; Pink = external actors.



Media, materials and message production

Work stream objective: provide information in response to infodemic artifacts (including via the media, social media and web and other channels used by target audiences) so at-risk populations are able to take informed decisions to protect themselves and their loved ones, and response authorities' public reputation is protected and strengthened.

Media, materials and message production	
Prevention	Maintain a library of common infodemic narratives and known responses to them.
Preparedness	Find and fill information voids. Produce counternarratives and prebunking materials.
Readiness	Test standard messages and materials, and procedures for message production, clearance, and dissemination. Use outcomes to improve the materials and processes.
Response	Find and fill information voids. Produce counternarratives and prebunking materials.

⁷⁵ Algorithm bias and fairness is a growing field. Cathy O'Neill's book "weapons of math destruction" contains many examples of built-in biases in algorithms; <https://www.nature.com/articles/d41586-018-05469-3> gives an overview of the field. Examples here could include text-based alerting systems missing misinformation signals for a country because they haven't been trained with data targetting minority populations, or in the languages/ dialects that they use.

⁷⁶ There are many anecdotes about unfortunate colour choices https://www.buffpost.com/entry/what-colors-mean-in-other_b_9078674 including those around colours favoured by local political parties. Your best action here is to test mockups or screenshots with potential users and local communities.

Recovery	Review materials produced - update the library of infodemic narratives and responses, marking up any new ones that are applicable to infodemics in general.
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Useful practical resources exist that deal with practical aspects of debunking, prebunking and counternarratives. See [Annex 2](#) for a selection of these.

Debunking, prebunking and counternarratives

Managing infodemic risks is a combination of responding to infodemic events, and building resilience to infodemics more broadly. Responding to infodemic events can involve different kinds of countermessaging, the production of which follows a similar flow to RCCE messages and materials generally. Taking listening and other data to understand the communication purpose or outcome, messages are crafted, reviewed, shaped into one or several communication products, disseminated via the right channels, and evaluated for impact.

Where RCCE messaging overall must take into account behavioural science (which kinds of approaches and messages are most likely to encourage the behaviours associated with better health outcomes), for IDM messages a number of specific effects must be considered. These have to do with the unique features of infodemics, how people consume and process mis- and disinformation, and what evidence suggests are more and less effective ways of (counter)messaging around these.

Narratives are summaries of the stories that we tell ourselves about the world. Example narratives include rumours like “garlic cures COVID-19”. Narrative management produces some of the most useful counters to inaccurate or false information in an infodemic.

Information and risk landscapes include the narratives that are circulating in a community, including inaccurate or false narratives. It is also possible to predict the narratives that might be used in a community, by looking at narratives that have been used in similar circumstances (e.g. other health events), or are circulating in other communities or countries, or anticipating likely narratives ahead of upcoming events (e.g. vaccination drives or elections).

Prebunking or inoculation is the practice of preparing before an anticipated narrative becomes widespread. Useful prebunking practices include creating and publicising information materials relevant to the narrative. **Avoid highlighting the incorrect narrative in this – instead concentrate on making relevant information available.**

Capacity building

Work stream objective: strengthen country IDM capacity to improve sustainability of efforts and impacts.

Capacity Building	
Prevention	Long-term training and capacity building, including IDM in RCCE and other relevant training activities. Advocacy for financial and human resources.
Preparedness	Assess and remedy any remaining gaps in IDM response capacity with supplemental training.
Readiness	Test IDM capacity through skills and simulation exercises.
Response	Training on tools and processes as needed.
Recovery	Keep training materials updated; semi-regular sessions on new research. Ensure baseline capacity remains.

Capacity building includes training responders, influencers, and communities, in the languages and styles that they work in, to sustainably strengthen IDM and foster infodemic resilience. Depending on an understanding of the information, risk and response landscapes, a tailored capacity building plan will aim to fill any gaps in response capacity. In the broader sense, ensuring the right amount and kinds of IDM capacities exist also requires thinking about advocacy and resource mobilization.

Understand the need for IDM training and capacity building, building on the information in the three landscapes drawn up under [Planning and internal coordination](#).

Conclusion

The COVID-19 pandemic added new urgency to the challenge of managing exploding increases in volume, velocity, and variety of health information - of a range of veracity. While health risks associated with infodemics of this kind are by no means a new phenomenon, the unprecedented scope and scale of the COVID-19 infodemic saw a concomitant increase in infodemic risk, hazard and (potential) harms. By building on and combining existing work in the fields of Risk Communication and Community Engagement, infodemiology, and by incorporating best practices from new areas like data science, information security, and others, the World Health Organization since the start of the COVID-19 pandemic has endeavored to advance and accelerate how the international health emergencies infrastructure responds to the COVID-19 infodemic at all levels from the global to the subnational – and how it prepares for the next one.

This document has aimed to lay out operational guidance on implementing and further strengthening these efforts in the WHO European Region, by demonstrating how IDM may be integrated into existing RCCE infrastructure to manage new and existing health risks.

Far from being the final or only effort in this area, it is the authors' hope that the ideas presented in the document further the discussions in this rapidly developing area of work, connect it to relevant existing and antecedent efforts in rumour management and social listening, and thus ensure effective support to operational efforts at the Regional, national and subnational level, while at the same time improving the sustainability of these renewed efforts.

Particular room for further research and guidance development in the WHO European Region exists in applying IDM best practices to evidence-based RCCE risk assessments, ecosystem mapping and analysis, and strengthening data collection and analysis for monitoring evaluation and learning – the latter being especially salient as specific evaluation methods for IDM are as of yet insufficient.

IDM is already strengthening RCCE efforts in many important ways, including the adjustment of the model focused on unidirectional trust building to a two-sided model of trust management, as well as by adding a range of tools, principles, and best practices from listening and big data to modernize significant parts of RCCE.

It is the authors' hope and ambition that this document provides the first foundational building block for a sustained effort for IDM in the WHO European Region, and a set of ready-to-use tools for national and subnational actors at various levels of involvement, complexity and resource heaviness.

Infodemics will, more likely than not, continue to be a recurring phenomenon alongside large scale health emergencies. It is then not a matter of 'combating' or 'eradicating' the infodemic and its artifacts (indeed, it is probably wise to exercise caution when applying martial or epidemiological analogies to this phenomenon);⁷⁷ but rather one of managing the resultant risks to public health. When IDM capacities are strengthened throughout the emergency cycle, supporting core RCCE capacities and strengthening its work streams in concrete ways, the infodemic can be managed – and with it, health emergencies overall.

⁷⁷ For more on this see e.g. Simon FM, Camargo CQ. Autopsy of a metaphor: The origins, use and blind spots of the "infodemic." *New Media & Society*. Published online July 20, 2021:146144482110319. doi:10.1177/14614448211031908 and Infodemic.eu. Published 2021. Accessed November 25, 2021. <http://infodemic.eu/2021/04/08/infodemic-metaphor.html>

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Annexes

Annex 1 – IDM quick-start

Quick start guide: IDM maintenance and mitigation

The maintenance stages of IDM – prevention, preparedness, readiness, recovery – help a team prepare for future infodemics, and decrease their potential effects on health outcomes. This quick-start guide is a set of simple activities to help with this.

This section references several existing quick-start guides to IDM, including:

- UNICEF "Vaccine misinformation field guide"
- WHO "How to respond to vaccine misinformation online"
- Internews "Rumour tracking methodology"

The notes below are a combination of advice from these guides and from practical experience with IDM.

Landscapes

RCCE checklists for assessing infodemic risk

Use a desk survey to sketch out what you think the information, risk, and response landscapes are for your geographical area and communities. Then talk to communities, infodemic responders, and healthcare workers in your geographical area to see what might be wrong in the landscapes, and what else you need to know about them.

Sketch out the local information landscape, with a desk survey

(Use this to know where to look for issues, and plan information fixes to lower infodemic risk)

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

You're looking for platforms (twitter, facebook etc) and groups (forums, facebook groups, etc); you're also looking for trusted sources (websites, accounts etc) and influencers (trusted accounts who can push messages out to large numbers of people).

Map local responses to infodemics and misinformation, with a desk survey

(Use this to understand what's already being done to combat an infodemic in your area)

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

Summarise local infodemic risk, with a desk survey

- Which health misinformation narratives have already been seen in this country (check fact-checker sites/reports and similar sources for these)?
- Which channels has mis/disinformation been posted to, or propagated in (e.g. social media, traditional media, word of mouth, health care-focused online for a, communities, websites)?
- Are specific communities (parents, healthcare workers etc) targetted with health misinformation? Is it different across communities?
- What seems to be driving health misinformation? Are there groups actively coordinating to push health misinformation? Is it for financial gain? Is it concerned people who need better access to credible information?
- Which infodemic behaviours already exist? Examples include fake experts, botnets.
- Which harms exist or are likely to occur from this mis/disinformation?
- Which national health sector areas may be at risk? Are any public health communities, actors, institutions likely to be/being targeted specifically?

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

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

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

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

- Does this group have a particular focus (e.g. women, faith etc), political orientation, geographic focus or scale (global, regional, national, subnational)?
- What is the extent of this group's capacity and influence?
- What types of activities does this group carry out? Are they collecting examples, doing analysis, or responding to the infodemic? How do they respond?
- Which other groups is this one already working with, and how?
- How does my organization's focus and mandate complement or overlap with this group? What areas of partnership and collaboration exist?

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

- What are the major IDM risks identified in your country's landscape?
- How do IDM response capacities currently address these risks?
- Are there important gaps that need to be filled? List any shortfalls, and ideas for resources to cover them.

*Resources***RCCE checklists for resourcing your infodemic team**

Work out realistically which resources you have to work on IDM.

Build partnerships

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

Listen to communities

- Connect community feedback channels to other sources of data and listening.
- Consider setting up ways for communities, other affected groups (e.g. healthcare workers), and the public to report infodemic narratives and artifacts. This could be an email address, a tipline, online form, or social media account to receive information. This might also already exist in your organisation, e.g. in the form of community information posted to a chatbot like HealthBuddy+.

Assess audience and training content needs

- Based on the response gap analysis, who are the groups/actors best positioned to respond?
- What kinds of additional support and training do these require to sustainably fill the identified gaps?

Assess resource mobilization needs

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

Decide on a toolset

- List your tool needs. Use this to choose a set of tools appropriate to your needs.

Ask if you need to localise your tools

- Is the tool available in the set of languages and alphabets that you need?
- If not, does the tool have options internationalization and localization ('i18n and L10n' in computing terms) built in – can you add a file for a new language (usually containing translations of words and phrases used in the tool)?
- If not, are there other ways to make them usable in your target languages?
- Are images, colours, and other visual elements in the tools appropriate to your location, and if your language is right-to-left, is that reflected in the visualisations that you use?
- When working with machine learning tools, ask if they've been tuned to local languages and uses.

Plan your monitoring and evaluation

- Draft a response plan
- Draft a Monitoring and Evaluation plan

*Mitigation***RCCE checklists for infodemic mitigation**

Mitigation reduces the potential impact of current and future infodemics, by improving your information and response landscapes.

Improve the information landscape

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

Empower communities

- Conduct media and IDM literacy training to help communities deal with infodemics.
- Prebunking. Inoculate against misinformation. (prebunking): there are different definitions of prebunking. This paper is using the definition around influence training, e.g. training the public in how antivaxxers etc influence them. Others worth mentioning include games, identifying and training influencers, and others.

Improve the response landscape

- Train yourselves. Attend IDM training sessions.
- Train others. Run training sessions for local staff and communities.

*Closing down and learning from an infodemic response***RCCE checklists for closing down an infodemic response****Capture what you've learned**

- Write a lessons-learned note. Right after an infodemic is a good time to write down what you've learned, so it's ready for you when the next infodemic hits.

Plan how you'll maintain capacity between infodemics

- Write down the things you could do in the coming months, to improve the next response. These could include training, building out datasets, building more connections, simulations etc.

*Maintaining IDM awareness between infodemics***RCCE checklists for maintaining between-infodemic awareness**

Between infodemics, IDM work is likely to be monitoring your landscapes for new changes, checking for new infodemic events, training staff, and maintaining tools.

Build IDM into your diary

- Create a regular practice of checking for infodemic artifacts, narratives, and responses, and regularly updating the desk survey landscapes.

Improve your infodemic capacity

- It's helpful to keep doing *something* on IDM even between infodemics: it makes it easier to ramp up to a full IDM response when needed. That something could be training, practicing on other health misinformation, or running exercises to test what you might need to adjust.

- Collaboration is key. Find groups, communities, and coordinators already working on IDM in your area, and work out how to share information between and during infodemics.

Quick start guide: IDM Response

This section references several existing quick-start guides to IDM activities during the emergency response phase, including:

- UNICEF "Vaccine misinformation field guide"
- WHO Regional Office for Europe "How to respond to vaccine misinformation online"
- Internews "Rumour tracking methodology"

The notes below are a combination of advice from these guides and from practical experience with IDM.

Stage 0: Know what you're getting into

RCCE checklists on understanding your infodemic

Your task is to reduce the effects of an infodemic on a health event. Understanding the infodemic ecosystem will help avoid common issues like only managing the effects that are easily visible, trying to solve issues beyond your focus area, or heading down interesting data rabbit holes that don't markedly reduce your infodemic risks.

Describe your focus

- You're probably focussing on a specific epidemic, a specific geographical area (e.g. a country), and/or specific communities. List these.

Assess your infodemic risk

- If you've already followed the checklist on understanding infodemic risk, update it. If you haven't, do it.

Suggested readings include Vaccine misinformation field guide section "vaccination in information age", How to respond to vaccine misinformation online section "social media communications landscape", Rumour tracking methodology section "understanding context and community".

Stage 1: Plan

RCCE checklists for planning an infodemic response

Plans change over time, but they're still useful to help you size your response.

List the resources you have available for IDM

- People: how many people, how many hours per week, and how many people can help when you're overwhelmed?
- Allies: IDM-related groups working in your country/area; communities who could help with tiplines or amplifying messages.
- Budget: Similarly, you may or not have a tools budget, existing tools that can be used for e.g. monitoring, and/or people who can install or maintain tools.

Decide which topics you're interested in

- Which geographical area are you covering, which aspects of health?

- Which communities are you planning to help?
- Are you watching for misinformation about your organisation too?

List the places where most people are sharing information, rumours and misinformation

- Which social media sites? Which messaging systems? Which traditional media (newspapers, tv, radio etc)?
- Which languages?

Decide on a toolset

- What are you going to use to search for infodemic narratives and objects
- What are you going to use to ask for infodemic narratives and objects (if you do this)
- What are you going to use to analyse what you've found
- Where and how are you going to store what you've found
- How are you going to share what you've found

Suggested readings on planning a response include Vaccine misinformation field guide section "preparation", and Rumour tracking methodology sections "project planning and setup", "A1: rumour tracking form", "A2: rumour database", "A3: letter of understanding for datasharing", "A4: job descriptions for team".

Stage 2: Monitor

RCCE checklists for monitoring an infodemic

Misinformation is in messages and other artifacts, narratives and stories.

Know what you're looking for

- Narratives - rumours and false stories about a current health situation; these often use emotional words to increase engagement with them. Existing response groups in and near your country usually have websites listing these.
- Narratives that attack the credibility and reputation of responding groups. Your communication team usually knows about these.
- Fake experts and manipulated media websites creating or boosting narratives. Responding groups often mention these, and sites like HealthGuard keep labelled searchable lists – although country coverage can be variable. These are good places to look for new narratives emerging.
- Search terms. Use your topics list and existing narratives to create a set of search "dorks".
- Text, images, video, audio, groups etc supporting and boosting those narratives. Searching online
- Coordinated inauthentic behaviours

Know what you can ignore

- Examples: a rarely-repeated conspiracy rumour isn't an infodemic signal, but a rumour spreading into the wider popular narrative and negatively affecting health behaviour is.

Set up monitoring

- Set up a social media monitoring system. This could be regular use of Google dorks, or a system designed to find and present relevant narratives and data to you.
- Monitor for known rumour and misinformation sources, narratives, artifacts, hashtags, channels etc.
- Monitor response. Multiple groups are likely to respond to an infodemic: monitoring their outputs can help improve your visibility of misinformation and disinformation. For more, see [Partners, networks and external coordination](#).
- Monitor social media regularly and collaboratively. Small teams don't have the resources to do continually. Solicit tips from your wider team, from the public and other monitoring groups.
- Monitor and respond where the conversations are. If misinformation is being posted, searched, or shared on a channel, monitor that channel either directly or by asking people to send tips to you. Also, if you monitor where the conversations are, you have a better chance of finding and filling information voids.

Suggested readings include Vaccine misinformation field guide sections "listen", "A2: set up basic social listening", How to respond to vaccine misinformation online section "Core principles of SM monitoring and prevention", Rumour tracking methodology section "3: collecting rumours".

Stage 3: Understand

RCCE checklists for understanding infodemic data

Make sense of what you've found before you act on it. There are two big questions here: content - what am I looking at -, and risk - what are the relative risks of leaving a rumour / misinformation alone, and of responding to it.

Assess data

- Vaccine misinformation field guide suggests the "5 pillars of verification": provenance, source, date, location, and motivation.
- How far has this rumour spread, and across which communities?

Assess risk

- What could you do about this rumour/ misinformation?
- Will your planned response make the rumour/ misinformation more visible to communities?

Suggested readings include Vaccine misinformation field guide section "understand", Rumour tracking methodology section "4: analysing and fact checking"

Stage 4: Respond

RCCE checklists for responding to infodemic incidents

If it's appropriate, respond to misinformation. Mitigation is almost always appropriate to do.

Pre-position materials

- Get ahead of misinformation narratives by learning from earlier and nearby incidents.
- Have messaging in place ahead of an event, and use this to gain the information space before misinformation creators do.
- List local infodemic narratives and known responses to them.
- Produce counternarratives and prebunking materials.

Respond appropriately

- Debunk only if you have to.
- Amplify truthful messengers whenever you can.

Mitigate regularly and collaboratively

- Look for and plan to fill information voids.
- Look for and report accounts, groups etc used in misinformation.

Suggested readings include Vaccine misinformation field guide sections "engage", "A3: 5 tips to make your content more sticky", "A4: examples of inoculating messages", "A5: example performance / outcome metrics", How to respond to vaccine misinformation online sections "Decision trees for when to respond", "evidence-based guidance for when response needed", "examples of how to respond with evidence-based messages" ("inoculation/prebunking", "debunking misinformation", "responding with empathy, facts, and support"), Rumour tracking methodology sections "5: sharing outputs", "A5: editorial guidelines".

Annex 2 – Further reading

WHO pages and publications

- [Health Topic: Infodemic](#) - notes, tools, trainings and other resources
- [Managing the COVID-19 infodemic: call for action](#)
- [First WHO infodemic manager training](#) (including [training booklet](#))
- [Public health research agenda for managing infodemics](#)
- [How to report misinformation online](#)
- [Infodemic Management News Flash](#)
- [How to respond to vocal vaccine deniers in public](#)
- [How to respond to vaccination misinformation online](#) - A quick guide for vaccine communicators (forthcoming).
- [An introduction to risk communication](#)
- [Risk communication and community engagement \(RCCE\) action plan guidance COVID-19 preparedness and response](#)
- [WHO Emergency Response Framework](#)
- [Risk communication and community engagement in emergencies](#)
- [Emergency risk communication \(ERC\) 5-step capacity-building package](#)
- [Risk communication simulation exercises](#)
- [IHR Monitoring and Evaluation Framework](#)
- [Joint External Evaluation Tool – Second Edition](#)
- <https://www.who.int/publications/m/item/a-social-media-toolkit-for-healthcare-practitioners---desktop>

Partner and other publications

- [Vaccine misinformation field guide](#) – UNICEF
- [Countering misinformation resource pack](#) – UNICEF Regional Office for Europe and Central Asia
- [Managing misinformation in a humanitarian context](#) – Internews
- ["What works: addressing misinformation in 100 countries"](#) – Internews
- [Debunking Handbook 2020](#) – Center for Climate Change Communication
- [Disinfodemic](#) – UNESCO
- [Countering online vaccine misinformation in the EU/EEA](#) - ECDC, 2021

Academic publications

- Health Security, Special feature: ["Infodemics and Health Security"](#)
- Big Data & Society, Special issue: ["Studying the COVID-19 Infodemic at Scale"](#)
- Buchanan, M. Managing the infodemic. Nature Physics. 16, 894 (2020) (<https://doi.org/10.1038/s41567-020-01039-5>).
- Eysenbach, G. How to Fight an Infodemic: The Four Pillars of Infodemic Management. Journal of Medical Internet Research 2020; 22(6) (<https://www.jmir.org/2020/6/e21820/>).

From: ISHIZUMI, Atsuyoshi
Sent: Wed, 9 Nov 2022 15:57:40 +0000
To: Calleja Neville at Health Policy; Boender, Sonia; Voegeli, Chris (CDC/DDID/NCIRD/ISD); Elisabeth Wilhelm; BEZBARUAH, Supriya; SEALE, Andrew Nicholas J.; HO, Elodie Ngoc-thy; Silvia Sommariva; NWONYE, Chinyere Blessing; ORBINA, Jun Ryan
Cc: PEREIRA IBRAHIM, Alhassan; PURNAT, Tina
Subject: Feedback on risk matrix for monkeypox infodemic insights
Attachments: Monkeypox_IM risk matrix update.pptx, confidential_Monkeypox_keythemes&recommendations_31oct.pptx

Hi everyone,

I hope you're well. As you may have seen, we recently delivered the first biweekly infodemic insights report for monkeypox. The methodology we used is largely based on [COVID-19 weekly infodemic monitoring](#), with updated search keywords informed by the [monkeypox taxonomy](#). The other aspect we adapted is the risk matrix for classifying key themes. We are seeking input on this updated risk matrix so that we can continue to tailor it to the specific needs of monkeypox infodemic insights. I am reaching out to you because Tina shared your names as experts working in IM and/or monkeypox.

If you have the time, any feedback on the attached updated risk matrix would be appreciated. You'll also see in there an explanation of why we made the changes. I am also attaching the 1-slide summary of the first biweekly report, which has the key narratives and recommendations we generated using the matrix (for your reference only, not for wider circulation, please).

Thank you in advance for your feedback and please let me or Alhassan know if you have any questions!

Kind regards,
Atsu

Atsuyoshi (Atsu) Ishizumi

Technical Officer | Infodemic Management Team

High Impact Events Preparedness Unit, Department of Epidemic and Pandemic Preparedness and Prevention
Division of Emergency Preparedness, World Health Organization, Geneva HQ, Switzerland

Summary of Monkeypox Risk Matrix Update

The risk matrix is an important tool that helps analysts systematically translate infodemic insights into actionable recommendations.¹ As shown on the following slides, the overall structure of the risk matrix used in this monkeypox infodemic reporting is based on the risk matrix that has been developed for COVID-19, but it has been updated to reflect the following considerations that are specific to the current monkeypox outbreak. Stigma – key differentiator, especially between COVID-19 and monkeypox, is the stigmatization of vulnerable population groups. At-risk population, population of focus – in addition to reach and dissemination, narratives that emerge may subsequently affect or target vulnerable population groups in potentially negative ways, leading to reduced uptake of PHSM, vaccines, treatments and diagnostics for monkeypox (this has already been noted in report 1). Context/region – particular focus is also on the ways in which narratives may lead to different, and potentially more dangerous/negative outcomes in regions that criminalise or socially discriminate against LGBTQI+ and MSM populations.

1. Purnat TD, Nguyen T, Ishizumi A, Yau B, White B, Cecchini S, Samuel R, Hess S, Bezbaruaha S, Briand S. Delivering actionable infodemic insights and recommendations for the COVID-19 pandemic response. Geneva: WHO 2022.

RISK MATRIX TO DERIVE INFODEMIC-RELATED RECOMMENDATIONS FOR MONKEYPOX

Each key finding is classified by level of risk to public health. A risk matrix assesses potential for impact on uptake of PHSM, vaccines treatments and diagnostics, stigmatisation* of, and the experience of stigma in vulnerable populations, as well as narrative reach and dissemination. The risk level is illustrated by colour. High risk may lead to increased stigmatisation, refusal of recommended treatments and diagnostics, underreporting of cases, or lower adherence to recommended health behaviour, which has a wide reach and is pervasive particularly among at-risk and vulnerable populations (red colour) Moderate risk may trigger stigmatisation, hesitancy to adhere to public health and social measures, underreporting of cases, vaccination or pharmaceutical interventions but has moderate reach and dissemination (orange colour) Low risk narrative themes are a concern but pose a low risk to uptake of recommended health behaviour and guidance and have limited reach and dissemination (yellow colour) Positive sentiment reflects thematic narratives that could increase uptake of health guidance and healthy behaviour and may have variable reach and dissemination (green colour)

		Reach, dissemination, at-risk population, population of focus		
		Wide reach, high dissemination, particularly among at-risk and vulnerable populations (e.g., MSM)	Moderate reach and dissemination	Limited reach, limited dissemination
Impact on uptake of PHSM, vaccines, treatments and diagnostics	May lead to increased stigmatisation, refusal of recommended treatments and diagnostics, underreporting of cases, or lower adherence to recommended behaviours	High risk	High risk	Moderate risk
	Potential to trigger stigmatisation, underreporting of cases, hesitancy to public health and social measures, vaccination, or pharmaceutical interventions	Moderate risk	Moderate risk	Low risk
	Concerning, but low risk to uptake of recommended health behaviours and health guidance	Low risk	Low risk	Low risk
	Could increase uptake of health guidance, intent, and enactment of health behaviours.	Positive Sentiment	Positive Sentiment	Positive Sentiment

*Cultural contexts and legal barriers in some Low & Middle-Income Countries (LMIC) may contribute to under-reporting, and even the experience of stigmatisation in health service access and delivery.

FOR REFERENCE ONLY: RISK MATRIX USED TO DERIVE COVID-19 INFODEMIC-RELATED RECOMMENDATIONS

Each key finding is classified by level of risk to public health. A risk matrix assesses potential for impact on uptake of PHSM, vaccines treatments and diagnostics as well as narrative reach and dissemination. The risk level is illustrated by colour. High risk may lead to refusal of recommended treatments and diagnostics or lower adherence to recommended health behaviour, which has a wide reach and is pervasive particularly among at-risk and vulnerable populations (red colour) Moderate risk may trigger hesitancy to adhere to public health and social measures, vaccination or pharmaceutical interventions but has moderate reach and dissemination (orange colour) Low risk narrative themes are a concern but pose a low risk to uptake of recommended health behaviour and guidance and have limited reach and dissemination (yellow colour) Positive sentiment reflects thematic narratives that could increase uptake of health guidance and healthy behaviour and may have variable reach and dissemination (green colour)

		Reach and dissemination		
		Wide reach, high dissemination, particularly among at-risk and vulnerable populations	Moderate reach and dissemination	Limited reach, limited dissemination
Impact on uptake of PHSM, vaccines, treatments, and diagnostics	May lead to refusal of recommended treatments and diagnostics, or lower adherence to recommended health behaviours	High risk	High risk	Moderate risk
	Potential to trigger hesitancy to public health and social measures, vaccination, or pharmaceutical interventions	Moderate risk	Moderate risk	Low risk
	Concerning, but low risk to uptake of recommended health behaviours and health guidance	Low risk	Low risk	Low risk
	Could increase uptake of health guidance, intent, and enactment of health behaviours	Positive Sentiment	Positive Sentiment	Positive Sentiment

For more information see: Purnat TD, Nguyen T, Ishizumi A, Yau B, White B, Cecchini S, Samuel R, Hess S, Bezbaruaha S, Briand S. [Delivering actionable infodemic insights and recommendations for the COVID-19 pandemic response](#). Geneva: WHO 2022.

Monkeypox Infodemic Insight: Key themes and recommendations based on integrated analysis (18 Oct - 31 Oct 2022)

Key themes (by social listening taxonomy)

Persistent

THE INTERVENTIONS - CONCERNS SURROUNDING ACCESS TO MONKEYPOX VACCINES

Expressions of frustration over the perceived lack of access to monkeypox vaccines represented a continuing trend over the monitoring period, particularly among netizens geolocated in Latin America. Netizens in Colombia were particularly vocal, taking to social media to criticise the health ministry's alleged delay in acquiring monkeypox vaccines, with numerous calls for increased accessibility. In a parallel conversation, users geolocated in Mexico engaged with posts suggesting that citizens were travelling to the USA to receive a monkeypox vaccine dose. This prompted further discussion regarding unequal vaccine access.



THE INTERVENTIONS - CONCERNS OVER THE STIGMA ATTACHED TO RECEIVING MONKEYPOX VACCINATION & TREATMENTS

The notion that monkeypox treatment has been subject to stigmatisation emerged as a prominent theme over the reporting period. Concerns were noted from members of the LGBTQI+ community in the USA that MSM were displaying a reluctance to get vaccinated due to the associated stigma. In a similar vein, apprehension that monkeypox treatments and vaccines were given less attention due to their stigmatised association with the LGBTQI+ community emerged in both the UK and Mexico. Advocacy from LGBTQI+ politicians and influencers, was suggested by netizens as a means to destigmatise forms of treatment.



THE ILLNESS - POLARISED CONVERSATIONS REGARDING THE EXISTENCE OF MONKEYPOX AND NATURE OF SYMPTOMS

An overwhelming dominance of Spanish-language users questioned the "disappearance" of monkeypox, and whether it had ever existed. (Narratives observed in Mexico, Colombia, USA Spanish lang). Simultaneously, there was a rise in online users discussing the severity of the disease. (Narratives observed in Chile, Mexico and Uganda). Additionally, narratives questioning the existence of the virus were interspersed with other, satirical and "humorous" posts aimed at undermining the severity of monkeypox were witnessed on TikTok, with articulations that the virus' risk has been taken out of proportion.

Recommendations for action

- Use these insights on perceived lack of access to monkeypox vaccines to further analyse local specific barriers to monkeypox vaccine uptake and design vaccine delivery to address issues in accessibility and acceptability. Review and update as needed existing guidance on vaccine distribution to ensure that they include information on how to address issues of unequal vaccine access. Share these insights with IMST colleagues working on vaccine distribution and equity to inform future actions and guidance.
- Continue to track and monitor the spread and velocity of these narratives, particularly in regions and contexts that present hurdles or further risks to vulnerable populations who may be affected by increased stigmatisation. Develop tools, fact-sheets or guidance for countries to perform rapid participatory community-based assessments, and integrated analysis to incorporate community feedback in order to inform local immunization programs. Work with WHO-trained community of infodemic managers to quickly collect and synthesise experiences and best practices from the field in addressing this challenge.
- Address questions, concerns and information voids that have been identified, especially in Spanish-language communities and in mediums that they use. Conduct rapid community sentiment analysis to understand narratives among vulnerable groups (e.g. MSM) and what types of online users are specifically driving the polarized conversations. Characterize the visual language used in video-based platforms such as TikTok, e.g., a deep dive report. Use these insights to develop and optimize the delivery of health information content in a way that is tailored to user behaviours and information environment in these platforms.

Level of risk to public health (impact on uptake of PHSM, vaccines, treatments, diagnostics) as determined by type of narrative, reach, dissemination, affected communities: **high; **moderate**; **low**; **positive sentiment***

From: Wilhelm, Elisabeth
Sent: Sun, 18 Jun 2023 17:19:27 -0400
To: Elisabeth Wilhelm
Cc: Huy Tran; Jones, Tzion
Subject: Follow up to infodemic stories focus group
Attachments: A Bad Sign.docx, Haystack.docx, Science Questions.docx

Hi everyone,

Thank you for taking valuable time out of your weekend to spend with us immersed in the stories of infodemic managers who worked during the COVID-19 pandemic and to identify the stories that best represent the challenges this community has experienced. We had a lot of stories to get through so big thanks for everyone's efforts!

Here's the final expansive Miro: <https://drive.google.com/file/d/1KaFOWdOAp3nCpi835izp7-A4JzZiqSTk/view?usp=sharing>

And here's all of you in intensive analysis mode: <https://drive.google.com/file/d/1BmrXDSeCpYtLgHiiwon4XOO5J2QWLF64/view?usp=sharing>

Strong work!

Attached are the final three stories that were chosen, in case you have additional comments on them or why you voted for them. The screenshot with the winning stories and reasons we captured during the focus group is below.

A Bad Sign

I am a small city girl from a rural community in my country with a population of about 1000 to 2000. Became a physician at 22, worked in small community hospitals as a family practitioner for about two years, and the muddiness was really getting to me. I knew I needed to learn more, come back and support on a bigger scale. So in search of a career adventure, I take a leap of faith and moved to another country in the summer of 2018, I believe. Moved to one of the most chaotic cities in the country, the capital city. Big city girl, Small city girl. So you live in a big city life. It was very interesting. On the personal front, change, occasionally you see people that looked like you, but you thought differently because of the culture here. But I was a girl with a mission and nothing was going to stop me. So I knew there were a couple of hurdles I needed to jump and some bridges to cross. Being a physician from a different country. So I came with all my savings, took examinations, was working to obtain my license in two years, which is the minimum time you can actually achieve it. I had big dreams. I was ready for the setbacks. Maybe a minor flood of setbacks. I wasn't expecting a hurricane of them, so I took my exams, passed my exams. By 2019, I was ready for what the world had to offer. But in that state, I had to wait for the licensing process to be complete.

So I took the first exciting job with an organization that deals with blood primary blood pressure prevention amongst people in the country I had moved to, specifically the elderly population. So I thought it was really close to what I was looking to do. It was health promotion in cardiology, and I thought it will boost my portfolio to for when I was ready to become a cardiologist here. So I took that job. It was funded by the government. We will do a lot of travel into community to educate and to provide blood pressure machines. It was super exciting. I was finding a sense of normalcy and balance like. Then COVID hits. The world stops, my world stops. A project, a very promising project that was almost gaining funding to become a nationwide program, loses all of its funding because everyone is focusing on COVID right now. But at that point, that was the least of my problems. The borders were shut down with lockdowns. My parents were miles away in a different continent. They're elderly with comorbid conditions. My paranoia sets in. And what does a physician do when they're paranoid or don't have enough information? They go searching for information right. My research was getting pretty overwhelming and I get to a point where the information I was gathering was causing me more stress and oblivion wasn't even an option. Or did I even

have a choice? So I quickly realize what's within my sphere of control and influence, and I decide to learn about as little information as I can digest it, and then share with my parents to the best of my ability, be there for them.

Despite the distance, I felt the least I could do right now was be a sounding board, someone that could just listen to them when they had questions and provide them with information if I had any. And keep my head up because this was not a good time to be panicking. And I talked myself out of it on an almost daily basis. But I knew this was not sustainable. I needed a healthy distraction. So what do I decide to do? I decide to throw in an application and volunteer for a role. Do something I care about, something that will distract me from my distractions. I decide, You know what? There are outbreaks in marginalized communities. One of the things I really wanted to do as a physician in this country was to work. Was I dreaming? Is it even possible? Could he be a scam? But I follow through and four interviews later I was employed as a public health specialist with the same organization and went through the trainings and on boarding was deemed fit to deploy and I was ready to go now. While they had multiple volunteers and very competent public health specialists and advisers paired up with infection prevention and control officers, so many people would deploy in teams of 11 to 20. But my team was a team of about five, including myself, who deployed to another province in the winter.

I didn't understand why and I wasn't even ready to put on my Sherlock Holmes hat and delve into a thorough investigation. Then I fly out of the capital city about four degrees Celsius on a pretty cool day and fly and arrive. And it's about -25 degrees with wind chills like okay. That explains everything. That explains why we have the smallest team. But that wasn't enough to deter me. We transit in the province's capital for a few days and we are almost too ready to deploy into our first. I arrive in my first indigenous indigenous community in the country. And it's different yet familiar. It's different because it feels detached from other parts of the country that have been to for the most part. I lived in the country's capital city, then travel a bit to other provinces, but never been on a reserve where indigenous communities dominate. And so I was on the reserve this time. It felt disconnected from the rest of the country. It felt almost impoverished. So for a small city here that was very familiar, but then again familiar in a Third World Country. So, it was a bit confusing for me to see a small community in this country, didn't even have potable water. So there were a lot of questions. It was new to me, but then I was savouring all the positive things because I was super excited to come help this

community ramp up their vaccination rates from 30 to maybe 70, where the rest of people from this country were right. That wasn't the case, although a mass immunization clinic set up in a hockey arena. Vaccines were available, but they'll get expired. The clinics were well-resourced, considering there were resource restraints in other parts of the country. Indigenous communities were prioritized when it came to the COVID 19 vaccines. And so, there were vaccines available, but they'll actually get expired and people would barely walk past the clinic. And if people even entered, they were just going to ask someone they knew a question and just go away day in, day out. We'll see a similar trend. But the questions that were being asked were if you did a thematic analysis, you'd see that there were a lot of interconnectedness in what people were thinking. And so it means people were actually looking for the information, but there was a lot of bad information mixed with good information and a lot of misinterpretation of both the bad and the good. So we devised a new strategy during one of our debriefing sessions. We decided to turn things around, flip the script, not focus too much on getting vaccines into arms, focus on why are people not interested in getting the vaccines in the first place. So this hockey arena, which became an immunization clinic, quickly became your one stop shop for information. You actually come there and a lot of health education was happening. There were times where we'd have to say, We don't know. Multiple times people will ask me very legitimate questions about the vaccines or what will happen and the adverse reactions, and I will tell them all I know.

But then there were other times I didn't have the answers and I would be very upfront and say it's new. We are learning as we go the science is evolving and this is what we know so far. And so people were actually very happy to start coming to the clinic to get their questions answered, but not necessarily get the vaccine. We were in our maybe fifth week where when we noticed one very lovely woman comes in and says she's never gotten a vaccine in her life, but she's interested in knowing more. Is it true that when you get the COVID 19 vaccine is going to alter with your DNA? And she had it can wipe out her DNA and actually affect her reproductive prowess. And and we had a very interesting dialogue. We tried to understand where she was coming from. I had a one on one with her and she finally decided to take the shot. About 10 seconds into her shot, she goes into anaphylaxis. Everyone is petrified. We are like, what? The first person that willingly comes together shot in a very long time on a very long shift goes into anaphylaxis. This must be a bad sign. But who knows? She. We have a whole lot of

professionals from community deployed with my team as well. We're able to give her the care she needed.

Crisis averted. We do a debrief at the end of the day and we tell ourselves, This is it. We're going to be demobilized ASAP. Nobody wants us in this community. And now we almost killed someone. No one is going to want the shot. Days passed by this woman actually comes in with three people she had identified as her family members, who also came with five people who were family of her family. And they wanted the shot and the we were wondering why. And they told us that the transparency with which we handled the whole situation made them feel we had their best interests at heart. They were confident in their decision and they really wanted the shot. And eight people, like I said. So this is a community where everyone feels like family. And even if they were a family, they were actually family by extension. So eight people quickly became 100 people and 100 became 1000. We stayed in the community for about six weeks. People will now troop into the immunization clinic, come for the shot and actually remember us by our first names. This was more than enough progress to make us feel like superheroes. And the longer we stayed, the more connected I felt with the community. I had never felt this amount of warmth since I came to this country and the sense of belonging I was so looking forward to experiencing. Who would have thought, I will get that in one of the coolest communities in this northern province?

Haystack

Hi, I'm a man and I have a magazine for women. Or as some would say, I am the embodiment of patriarchy. It's funny because when I'm invited to an event or a meeting they say women's magazine and they expect a woman and a man almost six feet tall shows up. The worst thing is that I write Alejandro and people read Alejandra and tell me Ale and then pum! I am a 6'2" male. Later they get to know me, get used to me and understand me. I have always lived surrounded by women. From sisters, friends. Yes, I have a gift. Even the most obnoxious lady out there ends up loving me. That one that people say old, if I'm their favorite . And it is that I always cared, let's say, I took care or I was, I care. Or maybe it's because my mother wanted a daughter. I do not know. But because of these things in life, I ended up working surrounded by women. It was like this. I have always played that role of son, older brother, where you have to accompany your sisters, mothers, grandmothers, aunts or friends with their things. So, well, I was there with my magazine, with my girls writing and one day Pandemic hears the end of the world. And that was the first time I felt that I couldn't, that I had no answers, that I didn't know what to do or what to say. And it's devastating, because you find that you don't know and everyone comes to you to ask you, and what's worse than not knowing anything? Well, yes, cancer.

But I mean something else worse than not knowing is having too much information that is contradictory and false. How do you make a decision if two people tell you otherwise? Well, you opt for your criteria and the person who knows the most about the subject, but if the person who knows the most about the subject is the one who says the nonsense. I remember that when the pandemic started, working with so many people from abroad, I already had information and I saw what was happening in the world, but here in my country it was something that did not exist and was not even mentioned. And to make matters worse, we started off on the wrong foot. They asked the highest health source what would happen and he answered that he was not going to get here, as if we were living on another planet, and then he affirmed that a cup of tea would cure him. Sorry. The ultimate source of health just recommended a home remedy, but not even my grandmother dared so much. And it was to see a tsunami, a wave that grew more and more and more and more. And you see what was going on in the world, you see the peak sources of health and you see the numbers of contagion growing. And the tsunami wave grew and grew, and you see a giant wave coming in. I tell them I prepared myself

as if it were the end of the world. And then the wave came and we went to desolation, just like when a tsunami hits, everything is swept away by the wave and nothing. And we moved on to the longest quarantine in the world here in my country. But that was not the problem. The problem was dealing with not knowing. And it is that first dealing with the tsunami of uncertainty and lack of information. And then came the tsunami of disinformation and the wave grew and grew and grew. Intellectually I felt far away, desolate and I didn't even get to talk about conspiracists or people who talk without knowing why. Everyone here gives their opinion and speaks without knowing. People from our country are experts in that. "What are they talking about? Ah, I don't know anything about that. But let me tell you something. Not knowing brings with it great fear. And this is big business. First, because we all know that fear sells and they use it, and then in the speed of the news that is published and so many things are published without checking that they replicate the information very badly and it is the consequence of the speed of the news. You have to publish a lot. People want to know better to come out with the wrong information than not to publish. Publish one thing one day and the opposite the next. That's the game, the news day by day, the crisis minute by minute, all in real time, all on the cha. For an environment like ours, where we work in a more artisanal and responsible way, we don't have that rush. This situation is heartbreaking because you see all that and it seems understandable.

You can't plan and you find yourself with the what do I do I publish, I don't publish anything, we do that doesn't exist. And if today's information is no longer valid tomorrow, the minute to minute is the king of disinformation. And then one has to deal with people's fear. The hundreds of questions about what to do from many mothers and women, about whether to vaccinate over the dose or something as basic as whether children have to wear a mask. I remember going on Instagram one Monday and coming across a post from a concerned mom asking "what to do because she didn't have to give her baby the vaccine. But the health centers were closed or collapsed. Where was I going? What was he doing? Didn't give the baby the vaccine? How long did he have to wait? What if he went with the baby? Wouldn't it be dangerous? He had to respect the vaccination schedule. Or at this point it didn't matter." And that's when I saw that huge wave in front of me. My world came to a standstill. I did not know. I had no answers. I could not help. I made a tsunami of misinformation. It devastated everything in its path and even what we knew we no longer knew. There was nothing left. Just that emptiness, that anguish, that absence. Not only did we no longer know about the future.

The damage caused by the wave was worse than I thought. The information we had that we relied on was gone. He had been dragged, swallowed.

The basic information, the usual was outdated, all the information, all the years of work were gone. And that generates anxiety and stress, because you have to deal with the anxiety of the uncertainty of the other and not having answers, not being able to help and not knowing even the basics of your work or your own life. And this got me thinking what do you do when you don't know? Looking for new information but which one do you trust? And well, you have to look outside and you have to keep looking. It is not enough among sources, you need more and thank God there are more responsible sources and one turns to NGOs to see how this goes on. And so journalism becomes a needle, a haystack of information, where science is lost in 300 outdated news stories published in a hurry with sensationalist headlines where, to top it all, one does not want to be part of this tsunami of misinformation. But the pressure and the business force you, and that makes you question your profession. People want to know, they need to know. And journalism is a profession where you have to know what to publish and why you publish. Fortunately, after the wave, the waters calm down. In times of crisis you realize how important the journalist's work is and even a small magazine for women. These are the times when you are looking for more answers to questions. People get desperate. People want to know and as a journalist it makes you feel vulnerable, because you always know that you know someone who knows and now you don't know.

Your whole world was razed to the ground. It makes you feel vulnerable, frustrated, unable to have answers. And this leads you to take a position in which each journalist or editor will be responsible. At the end of the day, you don't know the consequences of what is published. Sometimes it is better to refrain from publishing anything or we really should publish anything at all. It's serious. It's in our work. And while there are people who write anything who are just doing their job, people's lives, their health is at stake. At the end of the day, their health depends on your word.

This makes you question the profession and makes you fearful. Not only are you exposed to the legal and human consequences of your work. And if someone dies because of you, just because of a note, it scares you, it demands you to be more responsible. Today I learned that we are all vulnerable. We got used to the speed and pressure of social networks. If I leave a comment someone will respond to me. If I

upload a post, someone is going to comment on me. If I upload a photo, someone will instantly like me. We expect and want the answer at the moment, it is the minimum. Everyone in the now, in the immediate, we live in a hurry without reason by default, where a Prime life awaits us, where I make a click and I already bought something and it doesn't arrive in a day, I get minutes to my house, where we get used to instant messaging. We all have someone who wrote to you privately and was offended that you didn't respond at the time.

We expect nothing less than a chat where anything that is not instant is too late and if it bores me or takes too long, I swipe. People want to know and they want the answer now, not today and not in a little while. Now. And that also transforms professions. There is no more time to research, think or reflect. And the problem is that you don't always know everything, you can't always give an answer and sometimes the answers take time, especially in times of crisis. In life, everything has its time, its development, its evolution, its research. You can't recommend a vaccine that didn't come out or explain what science doesn't yet know. Science has to do research, but society, paradoxically, seems to say "we don't have time for that. Give me the answer." And it is at these times that you must be most responsible. Your job is not to publish for the sake of publishing or to talk to fill the space you get. The journalist's job is to inform as a person and as a professional. You realize that there are situations in life that it is better to remain silent than to give an answer you don't know or don't have. Sometimes we have to wait.

Science Questions

When I go to parties with my family, I'm almost always the first to say goodbye or the first to fall asleep. You may wonder why? Well, my brother Roberto has an incredible ability to tell jokes. Ana never stops talking about her hiking trails. Saul talks to us about how business is going and well, my father, my father always fills us with wisdom. And well, sometimes, only sometimes, In fact, rarely, I would say, Rarely do I talk about science. Bullshit, I always talk about science. I come with news about neuroscience, the taste system, how it is altered, the perception of flavors, the long term effects of poor nutrition, and I come with the latest news about neuroscience, the taste system, how it is altered, the perception of flavors, the long term effects of poor nutrition. .. What if one of my nephews or nieces did poorly in school? I already start with the master class on neurosciences and their relation to education, on attention, memory, retrieval, learning strategies, methodologies, sleep in nutrition That if someone started to exercise, well, I meddle and talk only about the effects of the organism at the cellular level, at the level of the nervous system. Well, if you're talking about pets, why don't I talk about my lab rats? And well, you know those conversations in which I always have the answer, in which everyone pays attention for the first few minutes and as soon as someone finishes their drink, someone comes to offer another drink and they take the opportunity to not resume the conversation and end up eating snacks, eventually they exercise unsupervised. Continue to educate in the traditional way. I have no credibility in my family.

That's the reason I always go outside the party first. But I remember October 20 21, Saturday 18:00 pm. Yellow pandemic traffic light status. If you can, stay home. Mmmmm. No, my family and I could not. We did not stay at home, but well, we met at my father's house, we already felt the need to be together, to talk, to interact, to live together, to see each other, to feel good, to be happy, to celebrate life in the garage was the ideal space, outdoors, yes, separate benches, gel everywhere, everyone with masks, no handshakes or kisses, just waving hands. That car belonged to my father and a space free of all possible order, to say the least. But at that moment the smell of chlorine gave the sensation of being in a doctor's office. Well, what do I say? The operating room itself would smell the same. This gave a strong sense that there was a close to 100% probability of a zone free of microorganisms from the environment. Loving Father had prepared everything. When I say everything, I mean everything. to

avoid contamination, table in the center, salsa on one side, tortillas on the other, beans on one side, nopales on the other, different containers, onions, dinner plates, hundreds of napkins, table sets, the same snack.

But some jicama [a turnip] to keep Diana quiet and avoid the talk of health foods, sweetened beverages, soda, oh, and mineral water to avoid the talk of being upset by sweetened and carbonated beverages. I tell them all prepared, well prepared. The grill to the embers so as not to burn the meat with an unbeatable onion grill that whets the appetite anyone and he clamps it at the end of the table, the container with the meat marinated for a day before. that peppery orange peppery smell is indescribable. We already wanted it to be on the coals. And well, as the sun went down, I was excited to see my brothers, my nephews and nieces, who were speeding up. We look at each other's faces, move them back and forth, and then move on to line up to wash our hands. After that ritual and after that very specific ritual that we had and to see the grandmother in the farthest corner to prevent her from being contaminated, to prevent her from being infected. My moment was coming, I knew it, they were waiting for it, I sensed it after 20 years that nobody had listened to me, after 20 years that my recommendations and opinions were not worth a damn and were omitted. After a drink, I went through my mind each of those moments in which I started to talk about science and everyone was having micro-conversations with the person next to me. Bad luck for the one sitting next to me, who ended up listening to my whole story. It was my time to shine. The question and answer session begins. Was I the protagonist? Well, at least I thought so at the time. Little by little I will be solving basic questions such as what is sodium chloride, what is that type of mouth cover, what if closed places, what if I use gel, the percentage. Everything was going smoothly until we started talking about vaccines, vaccines, not vaccines, side reactions, long-term effects. Well, I could even tell you the catalog of the type of mouth cover, the recommended brand of alcohol, the percentage of alcohol, how to prepare it. But vaccines. Boom! He went down. One moment. Which vaccine would you recommend? Was there a cross-reaction? Were there studies showing cross-reactivity between vaccines? We knew the side effects of vaccines. Would there be long-term effects? Was it safe for children? I became very nervous. I felt my heart start to beat. I began to sweat. Time stood still. Of course, my momentum was already crumbling.

What to do? What to say? I felt so vulnerable, so naive. There was no scientific evidence to support the arguments. Scientific reality stood in my way. There were simply no answers at the time to their questions. I was afraid of responding without evidence and that they would make the wrong decisions and I would lose them. I felt embarrassed. The family scientist could not help. It was a deep conflict that I felt some embarrassment. I felt scared, fearful, frustrated, a little afraid. I couldn't fool myself, there were no answers. I had to recognize that the way science works at that time there was no evidence. Yes, I felt very vulnerable as a scientist, I was looking in my short term way. It is the long-term one. News, articles, reports and no, nothing. It was in process in experimental phase. Science. This is how it works. It is part of the process. All this was in the experimental phase. Science does not have all the answers, it does not have absolute truths. Science changes, what is it about science?....Questions. I remembered my first day in science 15 years ago, in the lab. "You wanted to do science? What does a scientist do. Questions." What is the importance of science education? Show how science works. And one of the most important skills is questioning. So I was in front of my family, all of them behaving like scientists with this thought, asking questions, researchable and well, me. I watched. How they discovered that science doesn't have all the answers. That science has questions, that science evolves, that science has moments and that yes, during the pandemic there were many first moments, with the vaccine despite the fact that there were antecedents and there were vaccines already made. With these methodologies. there is not much. Much of the work is and continues to be in process to answer those questions for those I do. I am winner of the National Teacher Prize 2020, recognized as the best teacher in STEM areas, considered one of the ten best teachers by the Global Teacher Prize and also considered one of the 100 most powerful women by Forbes magazine in my country in 20 21. I didn't have the answers, but at that moment I felt deeply happy. My family was behaving like scientists, asking researchable questions. But also, identifying how science works. being critical. Asking for evidence, trying to find out which were the best sources of information. I was observing part of my personality in them. Part of being scientific, of questioning, of knowing the process. And well, who would have thought that at a party they would be asking probing questions of my family and I was the last one to leave that day.

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Subject: for review: two toolkits for interventions using HCD and sentiment analysis methodologies (toolkits)
Attachments: toolkit - RCOIA for teens version 4 12 dec 2021.docx, Designing for Implementation_HCD manual draft 3_6Dec.docx

***** resent with correct attachments *****

Dear colleagues,

I hope you are all doing well in the final stretches of time before the holidays and deserved break. We are circulating to you two draft toolkits that have been prepared based on innovation, lessons learned and collaborations we've supported recently. The methods we've been piloting and designing bring together participatory practices with interventions to rapidly identify the needs of communities and design response.

#1 WHO toolkit for rapid community online sentiment analysis

- Describes a participatory online investigation of sentiment towards health practices within a specific online community
- It complements AI-supported narrative analysis by providing a rapid context into sentiments of a community and co-development of recommendations on how to support health behaviors on a particular topic
- If focuses on adolescents because as they favor platforms that are not part of most current automated analyses and that are not text based (NOT Twitter and Facebook)

#2 WHO toolkit: Designing for Community-Led Infodemic management and emergency response strategies

- Describes a participatory method using human centered design approach of how infodemic management and social listening can be cascaded through communities
- It necessarily complements AI-supported analysis by providing an offline version of human centered activity in infodemic management (design of response and PHSM)

We would be happy to discuss with of the partners in more detail to either cobrand and with academic collaborators to pilot in the field and develop cases for either of the two methods. Other toolkits are in development and will be circulated by the end of the year.

Knowing it's the end of the calendar year, we have set the **deadline for receiving comments to Thursday, Jan 6.**

Please send your response to Brian Yau at yaub@who.int, with a copy to me.

Happy holidays and we hope you get some R&R in the next weeks!

Very best regards,

Tina

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Sign up for the WHO infodemic management News Flash: <https://bit.ly/flashsubscribe>

WHO toolkit for rapid community online sentiment analysis

**Assessing online attitudes towards health practices:
A toolkit for enabling community-focused investigations and developing community-led recommendations**

[WHO toolkit for rapid online sentiment analysis]

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List of acronyms and abbreviations

COVID-19	coronavirus disease 2019
EPI-WIN	WHO Information Network for Epidemics
IM	Infodemic management
US CDC	US Centers for Disease Control and Prevention
WHO	World Health Organization

Note to the reader

This toolkit has been designed to assist infodemic management (IM) efforts by providing training in rapid community online interaction assessment. RCOIA is a participatory method for gauging public health-related sentiment.

The genesis for RCOIA was a unique partnership between the U.S. Centers for Disease Control and a group of teenagers from the Mid-Peninsula Boys and Girls Club of San Mateo California, who worked as co-investigators on a Rapid Community Assessment, designed to better understand how adolescents were feeling about proposed rollouts of the COVID-19 vaccine to their age group.

The following groups may find value in parts or the entirety of this toolkit:

1. Young people (in and out of formal learning environments) especially those desiring ways to research youth sentiment voiced online, who frequently search for tools to help them translate these sentiments to adult audiences.
2. Teachers (in and out of classrooms) especially those interested in digital media literacy, tasked with helping students decode meaning in online communication formats dominated by images, video, memes, dare-oriented challenges, and other online social trends.
3. Parents and caregivers, especially those seeking dialogue with young people about how and why some online messaging has a strong effect on youth, and some impacts minorly, or not at all.
4. Health workers and health promoters, especially those seeking to better understand the emotional, social, and algorithmic dimensions of online health information literacy.
5. Policymakers, health-related NGOs, and community organizers, especially those tasked with garnering youth community feedback on health and education policy issues.
6. Anyone working in infodemic management, especially those desiring better understanding of the social dynamics of youth-favored social media platforms such as Tik Tok, Instagram, YouTube, and Twitch.

This toolkit has four sections. The first, directed at health professionals and communication teams, locates the aims of this toolkit within a wider discussion of infodemic management, provides a methodological rationale for deploying rapid community online interaction analysis, and discusses the ethical considerations of engaging in community-led projects focused on young people.

The second section, directed at instructors and facilitators, focuses on ways to organize a group to engage in online interaction analysis, explaining how the exercises in the toolkit may be used modularly. This section includes a case study, sample conversation scripts, and a list of free digital tools of assistance.

The third section, directed at students and community members engaging with the toolkit, explains what sentiment is, details some things expected of a community investigator, and discusses the importance of communication and feedback.

The fourth section of this toolkit contains a student workbook with seven exercises that move students through the process of identifying, analyzing, and sentiment coding online interactions; synthesizing these observations into a set of possible challenges to uptake of desired health behaviors; and proposing recommendations to address these challenges.

Executive Summary

This toolkit has been designed to assist infodemic management (IM) efforts by providing training in *rapid community online interaction assessment (RCOIA)*. The focus of this version of the toolkit is adolescent communities, and those interested in serving them.

RCOIA is a quick and low-cost way to enlist community members in sentiment tracking and analysis efforts, with an eye toward beliefs, attitudes, and feelings with potential to adversely affect a desired community health behavior (e.g., vaccine uptake, masking, etc.)

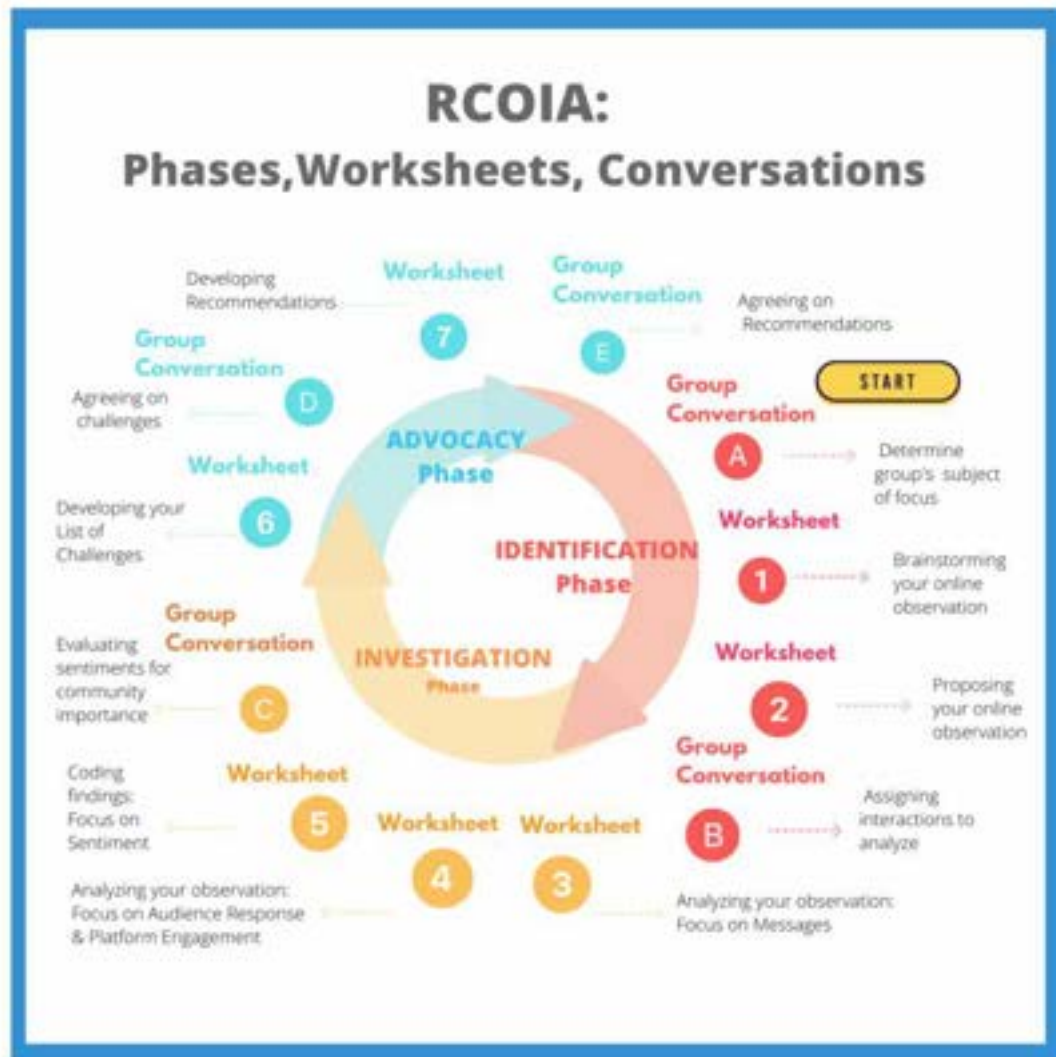
Contemporary examples include community *confusion* about COVID-19 vaccine side effects (which can lead to individual hesitancy and vulnerability to misinformation); group *frustration* about changing guidelines about wearing masks at work (which can invite lower vigilance among employees); and/or widespread *belief* in a school district that students contracting COVID are permanently barred from sports (which might inhibit reporting symptoms.)

To conduct a complete RCOIA, the following steps are involved:

1. Identify a population currently underserved by health or education authorities (in this instance, young people).
2. Recruit from that population a group of community ‘investigators,’ who decide on a shared area of sentiment interest (e.g., how people are feeling about vaccines.) connected to a set of desired set of health practices (e.g., getting vaccinated, going for a second dose, etc.)
3. Designate an instructor (and where possible, one or two facilitators) to train community investigators in the basics of RCOIA, using the toolkit section called “For Students” and workbook exercises provided.
4. Decide on a community-designated topic of sentiment interest (e.g., vaccines) and brainstorming ideal community health behavior uptakes (e.g., getting vaccinated)
5. Ask community investigators to search for online conversations, videos, memes, and challenges related to their topic of sentiment interest, transpiring on digital platforms they favor (for young people, platforms like Tik Tok or Instagram, etc.)
6. Gather as a group to assign each investigator one online interaction to analyze.
7. Guide investigators as they use worksheets to analyze selected online interactions, with the objective of translating for outsiders (in this case, adults) any hard-to-decipher beliefs, or feelings they see being expressed online.
8. Come together as group to compare what they’ve witnessed online and discussing which online thoughts and feelings mirror ones they’ve seen voiced by peers offline, in their home communities.
9. Assess time remaining. Here, the investigation may stop, investigators may decide to gather more data, and/or they may move to steps 10 and 11.
10. Develop a list of sentiments that might pose a potential challenge to uptake of desired health behaviors in local communities.
11. Develop a list of recommendations to address these challenges.

As an infodemic management intervention, the RCOIA process can be used in full, or in part. Here it may be helpful to think of the RCOIA as three phases: identification, investigation, and advocacy. The first two phases, *identification*, and *Investigation*, are easily adopted to any existing program focused on health information literacy efforts. The second phase, *Advocacy*, can help communities seeking to act on findings developed in the investigation

phase. Groups may decide to conduct a full RCOIA or focus on selected phases (or even individual worksheets) to generate outputs applicable to their specific settings.



Although this version of the RCOIA toolkit focuses on teens, the process can be also highly useful interventions with other underserved communities, provided:

- The population is one that regularly spends time communicating online.
- Investigators live in geographic proximity (e.g., classmates, club members, neighbors.)
- Provisions are made for personnel and resources (e.g., an instructor, online access) to assist with RCOIA training, fieldwork, and development of findings.
- Health or education authorities have experience with or knowledge of best practices for facilitating community-led processes for the population they have chosen to work with.

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TOOLKIT FOR
RAPID COMMUNITY
ONLINE
SENTIMENT
ANALYSIS

Guidance for Health Authorities & Communication Teams

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Introduction

This toolkit has been designed to assist infodemic management (IM) efforts by providing training in *rapid community online interaction analysis (RCOIA)*, a quick and low-cost way to use online observation to prompt offline discussions about community sentiments with potential to adversely affect a desired health behavior, now or in the future. Contemporary examples include community *confusion* about COVID-19 vaccine side effects (which can lead to individual hesitancy and vulnerability to misinformation); group *frustration* about changing guidelines about wearing masks at work (which can invite lower vigilance among employees); and/or widespread *belief* in a school district that students contracting COVID are permanently barred from sports (which might inhibit reporting symptoms.)

RCOIA: Step by Step

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10. Develop a list of sentiments that might pose a potential challenge to uptake of desired health behaviors in local communities.
11. Develop a list of recommendations to address these challenges.

The original impetus for this toolkit was the desire by the US CDC and local health authorities to gauge the thoughts and feelings of adolescents in California regarding proposed rollouts of the COVID-19 vaccine to teens in the U.S. However, the exercises in this toolkit have can be easily modified to accommodate other concerns related to health promotion more generally, e.g., hesitancy among young people to more routine vaccinations like HPV.

RAPID COMMUNITY ONLINE INTERACTION ASSESSMENT: STEPS

STEP 1



HEALTH
AUTHORITIES
LOCATE A
COMMUNITY
OF INTEREST

STEP 2



COMMUNITY
INVESTIGATORS AND
FACILITATORS
ARE RECRUITED FROM
NEIGHBOURHOODS, CLUBS,
CLASSROOMS, ETC.

STEP 3



INSTRUCTOR EXPLAINS
RCOIA AND INTRODUCES
WORKBOOK
TO INVESTIGATORS

STEP 4



INVESTIGATORS
DECIDE ON A HEALTH-
RELATED TOPIC OF
GROUP FOCUS

STEP 5



EACH INVESTIGATOR LOCATES
AN ONLINE INTERACTION
TO OBSERVE AND PROPOSES IT
TO THE GROUP

STEP 6



GROUP DIALOGUES ON
PROPOSALS & ASSIGNS
ONE ANALYSIS PER
INVESTIGATOR

CONTINUED ON NEXT PAGE

RAPID COMMUNITY ONLINE INTERACTION ASSESSMENT: STEPS (CONTINUED)

STEP 7



STEP 8



STEP 9



STEP 10



STEP 11



Background

This toolkit represents one of many responses to the COVID-19 *infodemic*, defined by the WHO as an overabundance of information – some accurate and some not – that occurs during an epidemic. For the WHO, addressing the infodemic figures as a central challenge in responding to disease outbreaks around the world. Negative consequences of infodemics include confused decision-making that, in the context of a pandemic, might lead to disease and death. These consequences have been disproportionate in populations that are vulnerable and at risk. Young people are particularly at risk while:

- working in ‘essential’ or ‘frontline’ jobs in service and manufacturing
- struggling with underlying health concerns, including psychological and emotional health issues
- living in homes or regions marked by abuse, violence, or conflict.

People frequently evaluate general health information through the contexts of their personal circumstance. The rise of the DELTA variant worldwide means that the message that young people should consider themselves largely safe from the worst of COVID-19 (delivered early in the pandemic by schools, employers, and others) is one that needs revising, and when believed, will raise new fears. Especially for young people who are vaccine resistant, vaccine hesitant, or have yet to qualify to receive the COVID-19 vaccine, these new fears will no doubt be in competition with existing ones, including:

- Balancing desires for personal safety with need for family income
- Navigating competing norms regarding right behavior in a pandemic
- Trusting health-related or other messaging from ‘faceless’ institutions.

To help stem fear, the WHO has advised that managing an infodemic means that health institutions must be able to “talk” to, exchange with and respond to their communities. This toolkit is intended to assist this process by facilitating cultural translation between young people and adults, sharpening critical thinking, and deepening digital media literacy, and empowering young people to successfully interface with those who serve them. In step-by-step fashion, the learning instruments in the toolkit are designed to teach:

- how to identify health-related sentiments young people have already expressed online over platforms they frequently use.
- how to ‘read’ the visual, sonic, and video formats of these messages for content and for emotional impact and resonance.
- how to research and contextualize the ‘backstories’ of messengers and audiences online.
- how to categorize observations into thematic categories of youth realities, needs, and desires.
- how to map these to a matrix of youth practices and beliefs that help, hinder, or complicate their compliance with public health directives.
- how to brainstorm youth-focused solutions to trust and compliance challenges.

The WHO describes an infodemic as an overabundance of information that occurs during an epidemic.

Sentiment: Monitoring the Digital Landscape

During epidemics, more so than in normal times, people need accurate information so that they can adapt their behavior and protect themselves, their families, and their communities

against infection. Although health-related misinformation, disinformation, and overload information confusion can and does circulate in communities with little to no digital connectivity, it increasingly has its origins online.

In 2020, EPI-WIN held its first global infodemic manager training. The objective of this training was to equip healthcare, policymakers, educators, and community organizers with knowledge of best practices for identifying, measuring, and responding to infodemic challenges in their local jurisdictions. The secondary aim was catalyzing a new global community of practice on infodemic management.

A chief component of the training involved exposures to tools and techniques for listening to communities of interest as they interacted with one another online. A strategy mentioned frequently was “social media listening,” which involves using artificial intelligence tools (Crowd Tangle is a popular one) to search through up to hundreds of thousands of exchanges among users on social media platforms. Users of these tools can input word clusters of interest (such as “DELTA variant”, or colloquial phrases like “scamdemic.”) Within minutes, they receive date-specific reports on the frequency, popularity (generally measured as likes, retweets and so forth) and sometimes relationships between word clusters.

As useful as social listening tools can be, they have important limitations worth noting. With their origins in market rather than scientific research, social listening tools tend to be tied to proprietary platforms (Facebook owns Crowd Tangle, Google owns its Analytics suite) and can be costly to access. Although free and publicly accessible tools (e.g., EARS, developed by the WHO) help with these issues by providing more equitable access, all social listening tools are structurally limited in what they can and cannot do.

A second limitation of social media listening tools is that they can only access exchanges that are publicly available online. These tools are of no use for assessing the estimated 70% of communications that occur over so-called “dark social” spaces, such as private messaging platforms like WhatsApp and Viber, or in “friends only” forums online.

A third limitation of social media tools is that they only work on platforms that have agreed to “open their API” (i.e., permitted their data to be mined for by researchers vowing to use it for non-commercial purposes.) This issue is especially pressing when it comes to studying young people, since the most popular platforms for young people engaged in video sharing, gaming, and livestreaming (e.g., Tik Tok, Among Us, Twitch) have closed APIs, which means social listening tools don’t work on them.

A final and crucial limitation for those studying young people is that social media listening tools are designed to search textual data, and produce numerical results: number and frequency of posts, replies, likes, links, etc. This limitation matters for those studying young people, as their online exchanges circulate less frequently as pure searchable text, and more in image, photo, music, and video formats.

In fairness, some technological tools do exist to identify, index, and classify the circulation of image, music, and video online, such as an AI technology known as ‘machine vision,’ which requires human cross-checking for accuracy. Even so, existing technologies do not exist to answer questions like:

- Why do some messages emotionally resonate with audiences, while others fall flat?

- What leads someone to craft a message in a particular format, genre, or style?
- When audiences react or respond to a message online, do they always take that message at face value? How do we better understand messages that work by tapping into unstated audience concerns, in-group controversies, social unrest, etc.?
- How should we think about messages, reactions and responses intended to be read as code, as mimicry, parody, satire, or as raw material for repurposing (often the case with memes)?

Figure 2. Comparing 3 Digital Methods.

Comparing 3 Digital Methods			
Type	AUTOMATED NARRATIVE DETECTION	RAPID ONLINE INTERACTION ANALYSIS (RCOA)	DIGITAL ETHNOGRAPHY
Also known as	Social Media Listening with Artificial Intelligence tools	Digital media/performance analysis	Online participant observation
Used to learn about	generalizable PATTERNS among users	Communication EXCHANGES between users	environmental PROCESSES governing users
Methods employed	Quantitative analyses on large online data sets	Qualitative analyses of selected online interactions	Embedded analyses of selected online environments
Tools needed	Analytics tools needed, such as CrowdTangle, HootSuite, EARS	No tools needed beyond internet access.	No tools needed beyond recording tools for interviews.
Time & training needed	Minimal training required to operate dashboards. Advanced training required to program.	High school level training needed in digital media analysis. Trained investigators can perform 1 online analysis per hour.	High school level training in ethnographic observation. Substantial time to become trusted member of a community.
Best features	Fast results. Can point to issues worth deeper investigation. Sometimes predicts future concerns.	Inexpensive and easy to teach. Works well on or visual, sound and film-based exchanges. Can be combined with participatory action research.	Nuanced analyses, full of "thick descriptions." Ethnography can be combined with community empowerment efforts.
Biggest drawbacks	Can be costly. Tools don't work well with image and video, and require platform permissions to work	Hard to scale. Analyses of targeted interactions are not always representative or generalizable to public at large.	Can be slow. Ethnographic accounts require large amounts of researcher time and labor, and community trust.

This exercises in the Analysis phase of this toolkit represent one effort to address these sorts of issues. It has been designed to complement (rather than replace) quantitative ‘big data’ analysis of young people online, by providing young people themselves training on how to conduct community-specific, fine-grained observations of the online interactions they encounter each day. Especially when triangulated with learnings from other qualitative practices (e.g., interviews, focus groups, ethnographic reporting) the strategies offered in this toolkit provide an intervention designed to meet the benchmarks of effective community listening, as laid out in the WHO’s *Infodemic Management Framework*:

- Identifying people’s topics of interest
- Recognizing emotional language
- Detecting information deficits and open questions in the offline and online populations
- Identifying, analyzing, and evaluating the evidence-basis of the main narratives and claims over health issues circulating in the population.

Objectives of this Toolkit

The main objective of this toolkit is to strengthen efforts to manage the COVID-19 infodemic, by providing training in how to identify and analyze health-related sentiment voiced by underserved populations over digital platforms they favor. This version of the toolkit is meant to benefit young people, and all personnel working in institutions and organizations addressing the infodemic, particularly those with active roles in youth education and policymaking. The conceptualization of this toolkit has been structured in accordance with an argument presented in *WHO public health research agenda for managing infodemics*, that IM involves four dimensions:

- The *computational dimension*: IM involves the ability to tap into huge amounts of data.
- The *cognitive, emotional, and overall behavioral dimension*: the focus on behavior and behavior change is key for the success of the interventions.
- The *sociocultural dimension*: analyses and interventions require knowledge of social networks with anthropological perspectives.
- The *communication dimension*: communication is key and crucial and requires expertise and evidence of impact.

Other WHO principles guiding the formation and structuring of this toolkit include:

- the respect of ethical conduct,
- the overall task of empowering communities through the framing of access to reliable health information as a right,
- a community centered and context-appropriate approach,
- a focus on interventions that can be implemented rapidly in response to acute health events,
- the ongoing effort to strengthen health systems and build trust.

Above all, this toolkit is meant to guide the empowerment, education and training of young people navigating the infodemic. As young people master strategies to analyze and translate youth concerns beyond the contexts in which they ordinarily circulate, they transform from valued research informants to spokespeople capable of articulating data-driven arguments regarding community needs, and informed recommendations for addressing them.

Structure of this Toolkit

Depending on circumstances, communities may have differing amounts of time and resources to allocate to an RCOIA. To accommodate this, the exercises in the workbook have been designed to be used modularly. Here, it can be useful to think of the RCOIA process in terms of two phases. The two phases, *identification*, and *Investigation* are easily adopted to any existing program focused on health information literacy efforts. The second phase, *Advocacy*, can help communities seeking to act on findings developed in the investigation phase.

In the *identification phase*, youth investigators work individually and as a team to:

- **Brainstorm an online interaction to analyze.** Worksheet 1 is designed to get investigators accustomed to brainstorming possible sites of analysis, by talking among friends and using sites like Google, Google News, and technology blogs to search for stories, memes, and/or online trends or challenges that mention young people, relative to the ‘sentiment topic’ of interest (e.g., COVID-19, misinformation, vaccines, etc.) Using this information, they can begin searching teen-favored platforms, communities, and threads for publicly viewable interactions to investigate further.
- **Propose possible interactions for investigation.** Worksheet 2 is designed to help investigators Identify a specific online interaction to analyze in depth and characterize the nature of this interaction. Is it a post that spawned a conversational thread? Is it a series of reactions to an image or video posted online? Does it seem to be part of a recognizable trend (e.g., a duet, a dance challenge, etc.?) To prepare them for group conversations, investigators are also prompted to explain how further investigation of this interaction might provide a better understanding of the sentiment topic of interest.

In the *identification phase*, youth investigators work individually and as a team to:

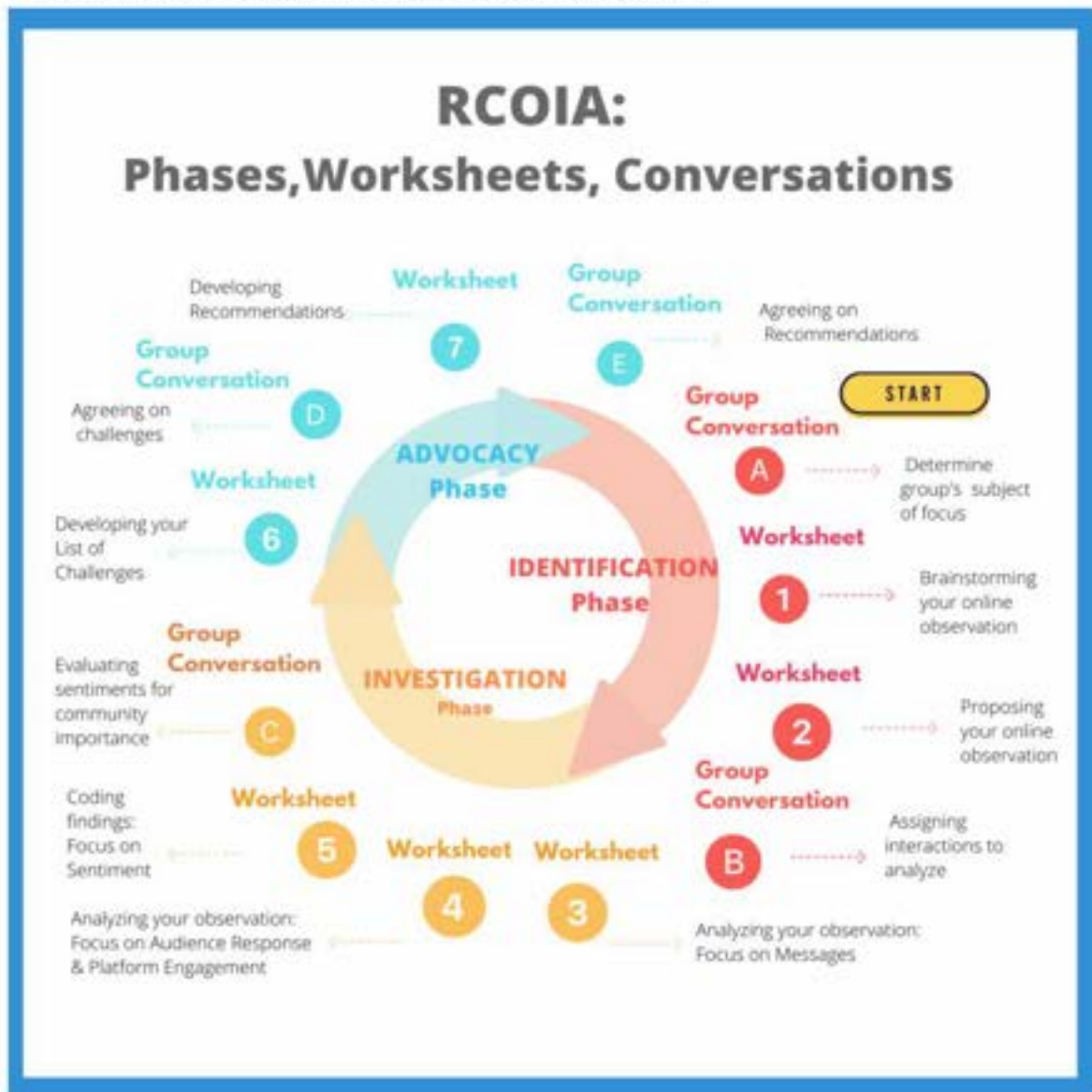
- **Analyze messages observed in online interactions:** with a focus on content (what is written, said, shown for reading and viewing) and format (the arrangement of image, sound, and motion, and the emotional impact it has on audiences.) Guidance for this step can be found in Worksheet 3.
- **Analyze audience receptions and platform engagement:** including engagement intended by creators, generated by audiences (as comments, responses, reactions, etc.), those circulated through algorithms. Focus paid to visible metrics of user engagement as well as the impact of social contexts (as trends, ‘drama’, back-stories, scandals etc.) Guidance for this step can be found in Worksheet 4.
- **Thematically code findings:** To prepare them for group conversations, investigators are prompted to note how what they’ve observed online (beliefs, feelings, norms, and responses to messaging) might adversely affect desired health behavior uptakes (e.g., vaccination, media literacy, etc.) This prepares them for later conversations about which sentiments seen online seem applicable offline, in their own communities. Guidance for this step can be found in Worksheet 5.

Depending on time and resources available to continue, RCOIA participants may move to the *advocacy phase*. Here, all youth investigators come together to consider how online sentiment observed individually reflects (or does not) local community concerns. This process involves:

- **Develop a list of challenges.** Here, community members work together to list specific community sentiments they feel pose existing or potential challenges to uptake of desired community health practices, ranking these in order of importance. Guidance for this step can be found in Worksheet 6.

- **Develop recommendations** for actions to address those challenges. Guidance for this step can be found in Worksheet 7.

Figure 3: RCOIA Phases, Worksheets, Conversations



Scenarios for using this toolkit (whole or parts)

The modularity of the RCOIA means that it can be used in several ways in multiple settings to accommodate for varying amounts of time and resources. Individual RCOIA phases (e.g., Investigation, Advocacy) and even individual worksheets can be used to generate outputs applicable to several settings. What follows are a range of scenarios in which the Toolkit and its various components could be used by facilitators and young people.

Scenario 1: Full RCOIA

Health Authorities, seeking to understand sentiment of young people regarding the COVID-19 Omicron variant, could facilitate a RCOIA using the whole toolkit which comprises of both the Investigation and Advocacy phases. In the Investigation phase, using worksheets 1 and 2, youth investigators will brainstorm, identify, and investigate some online interactions (e.g., a Tik Tok Challenge, meme and/or online trend) relevant to sentiment around the Omicron variant. Following this, each investigator is assigned an interaction to analyze, with an eye toward its message and audience reception. In the final stage of the investigation phase, using worksheet 5, investigators code potentially concerning audience sentiment (e.g., fatigue, fear, concern) and its impact on the uptake of desired health-related behaviors (mask-wearing, booster shots and rule compliance). Investigators then reconvene as a group to discuss to deliberate: (a) what sorts of sentiment have they spotted online? (b) is the nature of this engagement around these sentiments? (b) to what degree does this sentiment or engagement online seem to mirror concerns or activities occurring in the investigators' local community, now or in the future?

In completing the 'investigation phase' investigators would be able to move to the 'advocacy stage.' Here, they use worksheet 6 to rank what they see as main challenges and worksheet 7 to develop recommendations. This process can create valuable outputs, ranging from a better local understanding how young people are feeling about the Omicron variant, to what type of messaging may (or may not) resonate with the local community in focus and lead to the uptake of health-related behavior and compliance with regulations.

Scenario 2: Identification and Investigation Phases Only

A group focused on educating or empower youth can deploy the 'investigation phase' of the Toolkit to develop points of discussion or an agenda for an upcoming community forum or meeting devoted to rolling out a vaccine for young people. Using the toolkit modularly would assist in; for example, uncovering questions young people may have about how vaccines are developed or approved. Through conducting the 'investigation phase', youth-investigators and facilitators use worksheets 1, 2, and 3 to identify online messaging and sentiment on youth-oriented platforms and spaces around the chosen topic. Using worksheets 4 and 5, youth group members deliberate how (or whether) online sentiment reflects that of the local community. Sharing what they've found in the community forum or meeting, youth investigators can use this data to paint a picture of the specific needs of their local population that is much richer than had they arrived empty handed to the discussion.

Scenario 3: Worksheet 3 only

Individual worksheets from the toolkit can valuable educational tools in secondary and tertiary settings for both instruction and research across a wide variety of disciplines from

public health to media and communications. For example, educators can use Worksheet 3 'Analyzing Interactions: Focus on Messages' to analyze a specific online interaction around forthcoming booster-shots. For educators and young people, using the worksheet has several benefits. For young people unfamiliar to media analysis, the worksheet scaffolds and segments the process of conducting a rigorous analysis. For educators, the format enables a standardized structure which will facilitate coherent and ordered outputs and by extension - a focused discussion. For students engaged in creative projects, using Worksheet 3, becomes a tool for understanding sentiment and messaging which garners engagement. Utilizing this specific aspect of the Toolkit then becomes a springboard for educators and students to develop online messaging which can better engage with and respond to the needs of young people in a community.

Methods

From its conceptual framing to its training instruments, this toolkit has been developed with an emphasis on four methodological strategies. The first involves engagement with principles of the WHO infodemic framework, discussed above. The second involves adherence to ethical guidance for studying human subjects online offered by the Association of Internet Researchers Ethics Committee, discussed at length below. The third methodological strategy involved developing training materials in alignment with accepted best practices for studying online youth culture. Here, a scoping review was conducted, targeting peer-reviewed literature with specific methodological emphasis on:

1. *Platforms favored by young people*, focusing on the technologies they use to circulate information to users, and the behavioral norms they encourage between messengers and audiences.
2. *The circulation of images, photos, music, and video online*, with particular focus on the relationship between composition (color, order, motion, lighting, editing, etc.), and emotional impact.
3. *The rise of memes as communicative practice*, with a focus on the ways memes function among young people as information, misinformation, disinformation, imitation, critique, parody, and/or evidence social standing within a particular group.
4. *The dynamics of online social trends*, including viral dance crazes, personal accountability callouts, dare-related actions, and other challenges.

The fourth and final strategy involved adhering to WHO principles of participatory research design. Critical feedback on the instruments in this toolkit has come from members of the Association of Internet Researchers, as well as members of the International Selfie Researcher Network (selfieresearchers.org.) The toolkit itself was recently field-tested by a team of teen researchers at the San Mateo Mid-Peninsula Boys & Girls Club in California, trained by Dr. Theresa (Terri) Senft. In July 2021, these teens worked with the CDC as co-researcher on the first-ever Vaccine Confidence Rapid Community Assessment (RCA) to focus on adolescents in the United States.

Limitations

This toolkit comes with some general caveats about conducting research in online environments. When conducting qualitative fieldwork offline with individuals we meet in the flesh, identities and geographic locations of subjects are relatively easy to verify. This is not the case when conducting qualitative research online. Certainly, online spaces exist that are earmarked for users who identify offline as part of a particular age, race, gender, ability, or national group. There are also community pages and entire platforms designed to gather

members of streets, neighborhood, and cities. While verification methods exist in these spaces, they are not foolproof, and the veracity of users being who they say they are (or in the case of bots, what they say they are) can be hard to establish.

Therefore, especially in situations where it is imperative that researchers assess sentiment among members of specific geographic regions (as is the case in the CDC's Rapid Community Assessment model), it is necessary to triangulate data gleaned from online observations with material gained from interviews and listening sessions with known residents of a neighborhood, city, state, and/or country of interest. Indeed, some of the most fruitful interviews had by teens in their community have been ones where the interviewer uses images, memes, and challenges found online as 'jumping off' point, to elicit views and stimulate conversations on COVID-19 vaccines, and the pandemic more generally, that might otherwise feel contrived and forced.

In addition to the general caveats above, this toolkit may present yet-unknown limitations adapted to global contexts, given its sole focus on platforms in the "North American" (i.e., non-Chinese) online ecosphere, where exchanges in many languages certainly do exist, but where English language dominates features like hashtags and trending charts.

Ethical considerations

In any research project involving humans, but especially when working with young people, the first ethical hurdle involves gaining *informed consent*. To provide informed consent, subjects need to be able to comprehend a description of a project in which they are being asked to participate; agree to the actions and time commitments being asked of them; and understand that their participation is voluntary, with freedom to leave at any time.

Ethically speaking, young people under the age of eighteen are automatically classified as *vulnerable subjects*, considered to be at higher risk than adults for potential physical or emotional trauma resulting from participation in studies. When working with investigators who are minors, it is important to understand that they too are considered vulnerable subjects. To participate in any research project, an investigator under the age of eighteen requires written consent from a parent or guardian. For this, it may be necessary to generate a permission slip, which should be signed by a parent/guardian before investigators begin their work. Educational and after-school programs frequently procure 'umbrella consent' agreements from parents/guardians that could be used to cover participation in research projects.

What about the young people being observed online: is parental consent required to study them, as well? The answer to this depends on whether their interactions are occurring private spaces online, or in public ones. To study private online interactions (e.g., those in closed communities, or over private messaging apps) investigators must secure informed consent of those they observe. When those observed in private are minors, parental consent must be secured as well. For this reason, we advise focusing only on publicly viewable interactions online, which do not require consent to study.

Is good practice to always ensure *subject confidentiality* in reporting the activities of young people online, even when these occur in publicly viewable spaces. As the Association of Internet Researchers notes, online researchers have historically treated public material online as if it was behavior witnessed in a public square, freely available to quote and reproduce for

non-commercial purposes. Increasingly, however, young people carry an “expectation of privacy” regarding the things they say and do online, even in public. This expectation can be understood as belief that their words and images online should not be circulated online (or off) beyond contexts and audiences for which they were originally intended. To accommodate young peoples’ expectations of privacy, we recommend using de-identification practices when reporting findings. Common de-identification practices include using pseudonyms when quoting people, removing geographic references that could link subjects to home or school addresses or places of work, and/or omitting or blurring faces appearing in shared images.

From time to time, the question of observing subjects with some degree of internet fame comes up. Should we directly quote or show the faces of teens who occupy high-profile roles online, such as those who position themselves as celebrities, influencers, and/or political advocates for change, or should their identities remain confidential? Here, expert guidance is mixed. On one hand, all public figures want their identities associated with their words and images. Yet as the age for achieving fame online gets lower, there is a strong case to be made that identity protections should get stronger, lest official reports and news stories tie young people for all time to sentiments they expressed as vulnerable minors.

Implementation and next steps

It is important to highlight that this toolkit and its exercises are intended to be applied locally according to the local context and needs, and depending on factors such as capacity, resources, and needed additional competencies, such as proficiency with platforms or certain languages. In the future, WHO will use this toolkit to develop training curricula and programs through the WHO Academy, which will deliver internationally certified micro-skill certificates to health workers, worldwide. The toolkit will be evaluated on a rolling basis to review the implementation and reflect on lessons learned from it and the practice of IM, as well as ongoing lessons learned from the pandemic response.

This toolkit could be adapted for use in other sectors of society, including the education sector, where it could work well to encourage both participatory research training and digital media literacy to building a “culture of resilience” to infodemics.

Section 2: Guide for Instructors and Facilitators Working with the Toolkit

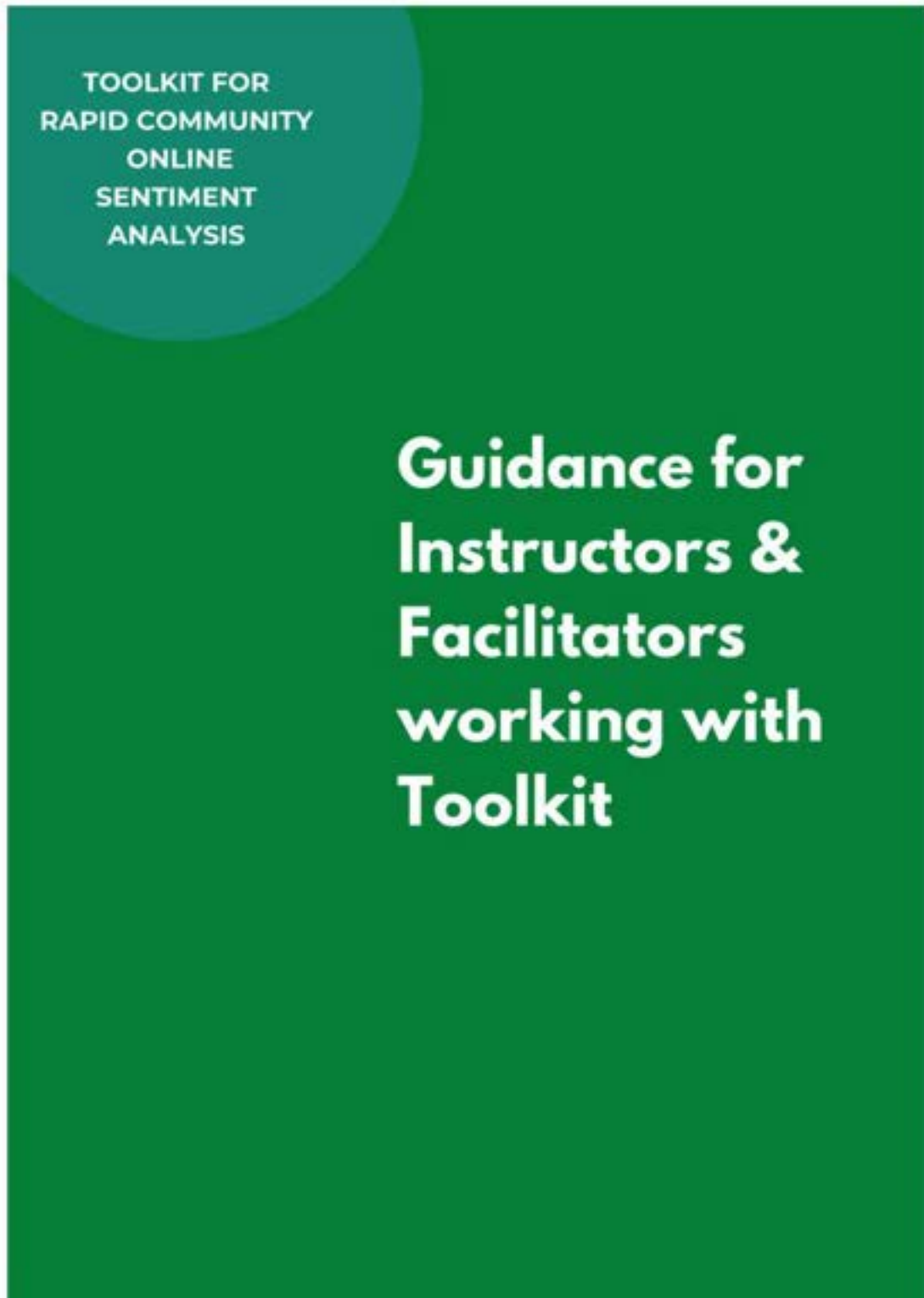


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Free digital tools for Instructors and Investigators

Welcome to Instructors

Welcome! This toolkit has been designed to provide training in *rapid community online interaction assessment (RCOIA)*. RCOIA is a quick and low-cost way to enlist community members in sentiment tracking and analysis efforts, with an eye toward beliefs, attitudes, and feelings with potential to adversely affect a desired community health behavior. Recent examples include community *confusion* about COVID-19 vaccine side effects (which can lead to individual hesitancy and vulnerability to misinformation); group *frustration* about changing guidelines about wearing masks at work (which can invite lower vigilance among employees); and/or widespread *belief* in a school district that students contracting COVID are permanently barred from sports (which might inhibit reporting symptoms.)

Why and for whom this toolkit was created

The focus of this version of the toolkit is adolescent communities, and those interested in serving them. The original impetus for this toolkit was the desire to gauge the thoughts and feelings of adolescents in California regarding proposed rollouts of the COVID-19 vaccine to teens in the U.S. However, the exercises in this toolkit have can be easily modified to accommodate other concerns related to health promotion more generally, e.g., hesitancy among young people to more routine vaccinations like HPV.

The workbook at the end of this toolkit features a series of exercises designed to lead investigators through each step of the RCOIA process. This version of the toolkit features exercises co-designed with teens, designed to help locate and analyze health-related interactions online, focusing especially on youth-favored social media platforms like Tik Tok, Instagram, Twitch and You Tube, with the aim of translating for a wider public the sentiments being voiced there. Although the focus of this toolkit is adolescents, the workbook exercises can be modified to accommodate a range of underserved populations, and a host of health-related concerns beyond the pandemic, such as routine vaccine hesitancy.

When designing for communities beyond adolescents, it is useful to know that RCOIAs are most useful interventions when:

1. The community of interest regularly spends time communicating online.
2. The investigators live in proximity (e.g., classmates, club members, neighbors.)
3. Personnel and resources (e.g., an instructor, online access) are on hand to assist with RCOIA training, fieldwork, and development of findings.
4. Instructors and facilitators are familiar with best practices for engaging with and speaking to the community of interest.

Introducing the RCOIA

Step by Step

As illustrated in Figure 1 below, the RCOIA process can be thought of as a series of steps, as follows:

1. Identify a population currently underserved by health or education authorities (in this instance, young people.)
2. Recruit from that population a group of community ‘investigators,’ who decide on a shared area of sentiment interest (e.g., how people are feeling about vaccines.) connected to a set of desired set of health practices (e.g., getting vaccinated, going for a second dose, etc.)
3. Designate an instructor (and where possible, one or two facilitators) to train community investigators in the basics of RCOIA, using the toolkit section called “For Students” and workbook exercises provided.
4. Decide on a community-designated topic of sentiment interest (e.g., vaccines) and brainstorming ideal community health behavior uptakes (e.g., getting vaccinated)
5. Ask community investigators to search for online conversations, videos, memes, and challenges related to their topic of sentiment interest, transpiring on digital platforms they favor (for young people, platforms like Tik Tok or Instagram, etc.)
6. Gather as a group to assign each investigator one online interaction to analyze.
7. Guide investigators as they use worksheets to analyze selected online interactions, with the objective of translating for outsiders (in this case, adults) any hard-to-decipher beliefs, or feelings they see being expressed online.
8. Come together as group to compare what they’ve witnessed online and discussing which online thoughts and feelings mirror ones they’ve seen voiced by peers offline, in their home communities.
9. Assess time remaining. Here, the investigation may stop, investigators may decide to gather more data, and/or they may move to steps 10 and 11.
10. Develop a list of sentiments that might pose a potential challenge to uptake of desired health behaviors in local communities.
11. Develop a list of recommendations to address these challenges.

Figure 1



RAPID COMMUNITY ONLINE INTERACTION ASSESSMENT: STEPS
(CONTINUED)

STEP 7



STEP 8



STEP 9



STEP 10



STEP 11



RCOIA Phases: Identification, Investigation, Advocacy

Depending on circumstances, communities may have differing amounts of time and resources to allocate to an RCOIA, which is why the exercises in the workbook have been designed to be used modularly. Here, it can be useful to think of the RCOIA process in terms of three phases. The first two phases, *identification*, and *investigation* are easily adopted to any existing program focused on health information literacy efforts. The second phase, *Advocacy*, can help communities seeking to act on findings developed in the investigation phase.

In the *identification* phase, youth investigators work individually and as a team to:

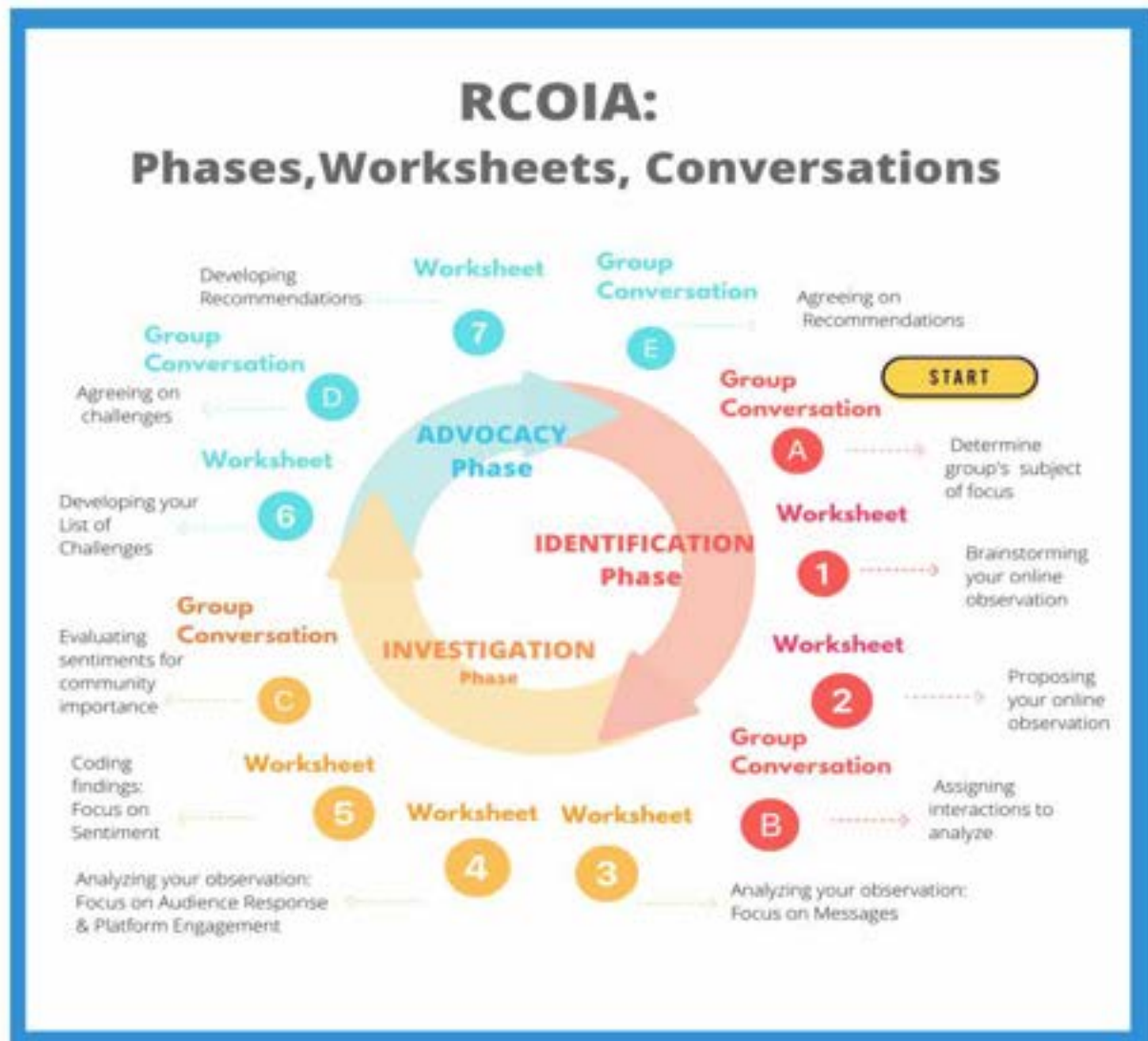
- **Brainstorm an online interaction to analyze.** Worksheet 1 is designed to get investigators accustomed to brainstorming possible sites of analysis, by talking among friends and using sites like Google, Google News, and technology blogs to search for stories, memes, and/or online trends or challenges that mention young people, relative to the 'sentiment topic' of interest (e.g., COVID-19, misinformation, vaccines, etc.) Using this information, they can begin searching teen-favored platforms, communities, and threads for publicly viewable interactions to investigate further.
- **Propose an investigation.** Worksheet 2 is designed to help investigators Identify a specific online interaction to analyze in depth and characterize the nature of this interaction. Is it a post that spawned a conversational thread? Is it a series of reactions to an image or video posted online? Does it seem to be part of a recognizable trend (e.g., a duet, a dance challenge, etc.?) Investigators are also prompted to explain how further investigation of this interaction might provide a better understanding of the sentiment topic of interest.

In the *investigation* phase, youth investigators work individually and as a team to:

- **Analyze messages observed in online interactions:** with a focus on content (what is written, said, shown for reading and viewing) and format (the arrangement of image, sound, and motion, and the emotional impact it has on audiences.) Guidance for this step can be found in Worksheet 3.
- **Analyze audience receptions and platform engagement:** including engagement intended by creators, generated by audiences (as comments, responses, reactions, etc.), those circulated through algorithms. Focus paid to visible metrics of user engagement as well as the impact of social contexts (as trends, 'drama', back-stories, scandals etc.) Guidance for this step can be found in Worksheet 4.
- **Thematically code findings,** with a concentration on audience sentiment (beliefs, feelings, norms, and responses to messaging) and desired behavioral uptakes (e.g., vaccination, media literacy, etc.) Guidance for this step can be found in Worksheet 5.
- Depending on time and resources available to continue, RCOIA participants may move to the *advocacy phase*. Here, all investigators come together to consider how online sentiment observed individually reflects (or does not) local community concerns. This process involves:
Develop a list of challenges of sentiments that may lead to challenges regarding community uptake of desired health practices. Guidance for this step can be found in Worksheet 6.
- **Develop recommendations** for actions to address those challenges. Guidance for this step can be found in Worksheet 7.

Throughout the RCOIA process, investigators are reminded that because data from online exchanges can potentially come from all over the world (even in forums dedicated to local

issues) all findings should be discussed and evaluated for community relevance among investigators, and where possible, triangulated by more traditional sentiment analysis processes. Indeed, the point of RCOIA is not to replace traditional sentiment analysis processes like polls, surveys, interviews, social media trend analysis, or keyword-driven 'social media listening' strategies, but to fruitfully supplement them.



Planning an RCOIA

Before launching any project that requires community involvement, it is important to assess the following:

- **Time considerations:** How quickly does this process need to move (e.g., can it run for six weeks or 3 hours?) How much time are community members prepared to devote (working individually and as a group)? Are there existing timetables that need to be accommodated for this community (e.g., a bi-weekly class slot, an internship period at a community organization, etc.)?
- **Investigator considerations:** How many investigators do you imagine gathering (e.g., eight in an afterschool program, eighty in a health education curriculum rollout, etc.)? Are the investigators all the same age and in the same grade, or is there variation? Do all the investigators have access to similar technology, or is there variation? Do all the investigators have equal time to spend conducting research outside of class time, or does this vary? What incentives exist for keeping investigators engaged in the RCOIA process? Are they receiving pay for their labor? Are they enrolled in an internship program? Are they receiving an academic grade? Will they receive certification of any sort at the end of the process?
- **Instructor and facilitator considerations:** Does the instructor have experience with this community? Does the instructor have experience thinking about digital culture? Does the instructor have experience thinking about public health? If not, how might they get assistance themselves? Are facilitators available to help guide conversations among group members? Is it possible to recruit facilitators with experience in the community, with digital culture, and/or public health to fill in any gaps the instructor may have?
- **Resource considerations:** Does the health, education, or community group sponsoring this RCOIA effort have access to online resources like Zoom (for conducting online instruction when necessary); a secure drive (for storing collected data); a web site or learning portal (where instructors can post instructional materials)? For group conversations, is there a room available where investigators can come together to talk, or will this be done online? For investigators experiencing online access or bandwidth challenges, can spare computers or phones be made available?

Sample Timeline for full RCOIA Training & Deployment

This toolkit was originally piloted with a group of sixteen young people aged 16-17 at the Mid-Peninsula Boys & Girls Club in San Mateo California, in partnership with the the U.S. Center for Disease Control and Prevention (CDC) Vaccine Confidence Unit. The process of learning and fully deploying all phases of the RCOIA (identification, investigation, and advocacy) included 15 total hours of group meeting time, spread over 3 weeks. The teen investigators were told they should anticipate spending an additional 4-5 hours outside classes on tasks relating to fieldwork brainstorming, planning, execution, and analysis. The timeline for group engagement on the RCOIA roughly followed this order:

Week 1: Getting Ready to Work (3 hours group time)

- Group introductions, establishment of shared areas of interest (e.g., teen sentiment re. vaccines) and ideal health behaviors (e.g., getting vaccinated.)
- Introduction to the RCOIA steps and phases, and discussion of which ones will apply to the students (i.e., clarifying whether they will go through the entire process, or parts of it.)

- Introduction to RCOIA workbook, and discussion of Exercises 1 & 2 (students work independently to complete Workbook Exercises 1 & 2)

Week 2: (3 hours group time)

- Group discussion to assign each investigator a specific interaction to analyze
- Students work independently on Workbook Exercises 3, 4, 5
- Group discussion of negative and positive sentiments discovered; identifying and ranking which of these apply to local community

Week 3: (3 hours group time)

- Group discussion to develop List of Challenges (everyone works with Workbook Exercise 6)
- Group discussion to develop list of Recommendations (everyone works with Workbook Exercise 7)

Group Conversations: Times, Objectives & Prompts

Time & Objective	Class conversation prompt
Before Worksheet 1: Determine shared topic of health-related interest	Today, we are going to introduce ourselves and get clear on why we've come together. Specifically, we will discuss: • What should be our shared topic of interest (e.g., <i>COVID-19, Delta variant, teen vaccine rollout, etc.</i>)? • What are some desired health behaviors around this topic (e.g., <i>getting vaccinated, adhering to community curfew, wearing masks indoors, getting tested, etc.</i>)? • Once we've determined our topic of interest and desired behaviors, what key words or images might be worth keeping in mind as we search for possible interactions to observe (e.g., <i>if topic is COVID, also searching for words like Corona; if topic is vaccines, perhaps searching recent images for needles, etc.</i>)
After Worksheet 2: Assign observations for analysis	You've been spending some time brainstorming and investigating possible interactions to analyze. Today, let's talk about those. Specifically: • Please share with the group an interaction you'd like to analyze • How do you see this interaction relating to our topic? • Have we checked that two investigators aren't looking at the same interaction? • It can be helpful to have someone 'shadow' you during analysis, to talk with you about what you've observed. Who might you be able to ask to shadow you?
After Worksheet 5: Evaluate findings for community Sentiment	You've been busy doing your online interaction work individually. Today, we are going to talk as a group about what we each observed online, and how (or whether) what we've seen applies to things people are thinking and feeling in your community. With this in mind: • When you think about the feelings, beliefs, norms, and message reactions you observed online, which ones have you seen or heard mirrored in your local community?

	• When you think about the order of importance to these, which would you rank as A or B (are _____ [<i>A is most important</i>]) • Is there anything you didn't encounter online but you know is a big issue in your community?
After Worksheet 6: Develop Challenges	Today, we will work as a group lists 5 observations that might qualify as challenges to uptake. By "challenges to uptake," we mean online interactions observed during this online interaction that: (1) (1) investigators have noticed are also happening (or might happen soon) in their offline community, and (2) involve beliefs, feelings, norms, or responses to messaging that might discourage, hinder, or confuse people about adopting a desired health behavior, (e.g., get vaccinated, read more critically, etc.) Let's use our worksheets to dig deeper.
After Worksheet 7: Develop List of Recommended Actions	Today, will work as a group to generate a Recommendations to address the challenges we spoke about last time. Examples of possible recommendations, include things like • <u>Education campaigns</u> led by schools, designed to provide information regarding the vaccine clearance process. • <u>Promotional efforts</u> led by an influencer, designed to raise awareness regarding the impact of Delta variant on teens. • <u>Listening sessions</u> led by peers, designed to provide a safe space for those with questions about mask use. • <u>Empowerment efforts</u>, such as an internship program led by the WHO, designed to empower young people to serve as vaccine advocates. • <u>Legal efforts</u> led by parent advocacy groups, designed to pressure social media platforms used by teens to put clearer labelling on health misinformation. As you can see from the examples above, an ideal recommendation opts for specificity over generality. While making recommendations, keep the following elements in mind: • Specify an actor (e.g., schools, an influencer, a group of peers, etc.) • Specify an action (e.g., an education campaign, a listening session, etc.) • Specify a purpose (providing information, providing a safe space, etc.) Let's use our worksheets to dig deeper.

Ethical considerations for studying and working with young people

In any research project involving humans, but especially when working with young people, the first ethical hurdle involves gaining *informed consent*. To provide informed consent,

subjects need to be able to comprehend a description of a project in which they are being asked to participate; agree to the actions and time commitments being asked of them; and understand that their participation is voluntary, with freedom to leave at any time.

Ethically speaking, young people under the age of eighteen are automatically classified as *vulnerable subjects*, considered to be at higher risk than adults for potential physical or emotional trauma resulting from participation in studies. When working with investigators who are minors, it is important to understand that they too are considered vulnerable subjects. To participate in any research project, an investigator under the age of eighteen requires written consent from a parent or guardian. For this, it may be necessary to generate a permission slip, which should be signed by a parent/guardian before investigators begin their work. Educational and after-school programs frequently procure ‘umbrella consent’ agreements from parents/guardians that could be used to cover participation in research projects.

What about the young people being observed online: is parental consent required to study them, as well? The answer to this depends on whether their interactions are occurring in private spaces online, or in public ones. To study private online interactions (e.g., those in closed communities, or over private messaging apps) investigators must secure informed consent of those they observe. When those observed in private are minors, parental consent must be secured as well. For this reason, we advise focusing only on publicly viewable interactions online, which do not require consent to study.

It is good practice to always ensure *subject confidentiality* in reporting the activities of young people online, even when these occur in publicly viewable spaces. As the Association of Internet Researchers notes, online researchers have historically treated public material online as if it was behavior witnessed in a public square, freely available to quote and reproduce for non-commercial purposes. Increasingly, however, young people carry an “expectation of privacy” regarding the things they say and do online, even in public. This expectation can be understood as belief that their words and images online should not be circulated online (or off) beyond contexts and audiences for which they were originally intended. To accommodate young people’s expectations of privacy, we recommend using de-identification practices when reporting findings. Common de-identification practices include using pseudonyms when quoting people, removing geographic references that could link subjects to home or school addresses or places of work, and/or omitting or blurring faces appearing in shared images.

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Free Tools for Instructors and Investigators

Tool	You might use this tool for
Weebly download at Weebly.com	Creating instructional web sites. To learn how to use Weebly to quickly set up a web site: https://www.youtube.com/watch?v=v81nRa_W9Fk You can see the training web site developed for the San Mateo Teen Vaccine Confidence here: http://teenrcatraining.weebly.com/
Zoom download at Zoom.com	Conducting online classes. To learn more about what Zoom can do, see: https://support.zoom.us/hc/en-us/articles/206618765-Zoom-video-tutorials
Slack download at Slack.com	Encouraging announcements and conversations beyond classroom. For a quick guide to what Slack can do, see: https://slack.com/intl/en-au/help/articles/360059928654-How-to-use-Slack--your-quick-start-guide
AirTable download at AirTable.com	Creating forms for workbook exercises that can be used to collect, consolidate, and code group work. To learn more about what AirTable can do, see: https://www.airtable.com/get_started_faster
Miro download at Miro.com	Group brainstorming and collaborating on projects. To learn more about what Miro can do, see: https://www.youtube.com/watch?v=pULLAEmhSho
Canva download at Canva.com	Easy to use graphic design for infographics, charts, and slides. Can also be used to create templates. To learn more about what Canva can do, see: https://www.youtube.com/watch?v=zJSgUx5K6V0
Loom download at Loom.com	Site for creating easy screen casting videos. To see the Teen Vaccine Confidence RCA Final video, see: https://www.loom.com/share/c02942ac175743d9a0165d1a358cb285 To quickly learn how use Loom, see https://support.loom.com/hc/en-us/articles/360002187698

Section 3: Guide for Students and Community Working with the Toolkit

TOOLKIT FOR
RAPID COMMUNITY
ONLINE
SENTIMENT
ANALYSIS

**Guidance for
Students &
Community
Working
with Toolkit**

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Introducing the RCOIA: Phases & Worksheets
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Welcome to Community Investigators

Welcome! This toolkit has been designed to provide training in *rapid community online interaction assessment (RCOIA)*. RCOIA is a quick and low-cost way to enlist community members in sentiment tracking and analysis efforts, with an eye toward beliefs, attitudes, and feelings with potential to adversely affect a desired community health behavior. Recent examples include community *confusion* about COVID-19 vaccine side effects (which can lead to individual hesitancy and vulnerability to misinformation); group *frustration* about changing guidelines about wearing masks at work (which can invite lower vigilance among employees); and/or widespread *belief* in a school district that students contracting COVID are permanently barred from sports (which might inhibit reporting symptoms.)

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The focus of this version of the toolkit is **adolescent communities**, and those interested in serving them. The original impetus for this toolkit was the desire to gauge the thoughts and feelings of adolescents in California regarding proposed rollouts of the COVID-19 vaccine to teens in the U.S. However, the exercises in this toolkit have can be easily modified to accommodate other concerns related to health promotion more generally, e.g., hesitancy among young people to more routine vaccinations like HPV.

The workbook at the end of this toolkit features a series of exercises designed to lead investigators through each step of the RCOIA process. This version of the toolkit features exercises co-designed with teens, designed to help locate and analyze health-related interactions online, focusing especially on youth-favored social media platforms like Tik Tok, Instagram, Twitch and You Tube, with the aim of translating for a wider public the sentiments being voiced there.

Introducing the RCOIA Phases & Worksheets

You might find it useful to think of the RCOIA process in terms of three phases and seven workbook exercises. Depending on how your instructor guides you, your experience may involve the full RCOIA process, a few phases of the process, or even just worksheets.

RCOIA: Phases, Worksheets, Conversations



As you can see in the illustration above, the three phases of the RCOIA are identification, investigation, and advocacy. In the *identification* phase, you will work individually and as a team to:

- **Brainstorm an online interaction to analyze.** Worksheet 1 is designed to get you accustomed to brainstorming possible sites of analysis, by talking among friends and using sites like Google, Google News, and technology blogs to search for stories, memes, and/or online trends or challenges that mention young people, relative to the 'sentiment topic' of interest (e.g., COVID-19, misinformation, vaccines, etc.) Using this information, you can begin searching teen-favored platforms, communities, and threads for publicly viewable interactions to investigate further.
- **Propose an investigation.** Worksheet 2 is designed to help you identify a specific online interaction to analyze in depth and characterize the nature of this interaction. Is it a post that spawned a conversational thread? Is it a series of reactions to an image or video posted online? Does it seem to be part of a recognizable trend (e.g., a duet, a dance challenge, etc.?) Investigators are also prompted to explain how further investigation of this interaction might provide a better understanding of the sentiment topic of interest.

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- **Thematically code findings,** with a concentration on audience sentiment (beliefs, feelings, norms, and responses to messaging) and desired behavioral uptakes (e.g., vaccination, media literacy, etc.) Guidance for this step can be found in Worksheet 5.

Depending on time and resources available to continue, you may move to the *advocacy phase*. Here, all investigators come together to consider how online sentiment observed individually reflects (or does not) local community concerns. This process involves:

- **Develop a list of challenges** of sentiments that may lead to challenges regarding community uptake of desired health practices. Guidance for this step can be found in Worksheet 6.
- **Develop recommendations** for actions to address those challenges. Guidance for this step can be found in Worksheet 7.

How much time and effort will be expected from you?

The answer to this question will vary, according to how much of the RCOIA your group plans to get through. Your instructor will brief you on the specifics of what’s expected of you on the first day you meet. Don’t worry--you won’t be asked to do anything you haven’t agreed to, and you will be supported each step of this process, by your instructor and the workbook exercises.

**Workbook for Conducting Rapid Community Online Interaction
Analysis**

TOOLKIT FOR
RAPID COMMUNITY
ONLINE
SENTIMENT
ANALYSIS

WORKBOOK

**For Conducting
Rapid Community
Online Interaction
Analysis**

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Worksheets for PART 4:
Developing Recommendations

Worksheet 7
Developing Recommendations
to Meet Identified Challenges

Worksheet 1: Brainstorming interactions to investigate

TASK AT HAND

Today, you are going to brainstorm two recommendations:

(A) A locale featuring online interactions among young people that might be worth investigating, given the group's topic of interest.

(B) An online trend featuring online interactions among young people that might be worth investigating, given the group's topic of interest.

Your recommendation can be EITHER

1. Somewhere or something you have seen yourself online and can point to right now.
2. Somewhere or something you have heard about and think we might be able to find material to study.

SOME DEFINITIONS FOR YOU

Online interactions: refers to things people do online, such as:

1. Posting, chatting, streaming,
2. Reacting, commenting, promoting, boycotting
3. Circulating text, images, and videos and money online
4. Creating, participating in, and circulating memes, challenges, trends, etc.

Online locales: refers to specific places online an interaction occurs. We identify online locales:

1. By platform (*e.g., YouTube, Instagram, etc.*)
2. By area (*channel, page, etc.*)
3. By post (*title of the video, topic of the post*)
4. By link (*a URL where others can find it, whenever possible*)

Online trend: refers to the circulation of an image, meme, gesture, action, song, or dance through one or multiple platforms, either:

1. by the general population online
(*Examples: ALS Ice Bucket challenge, the 'no makeup selfie'*) or else
2. by members of particular groups online
(*Examples: the left-wing trend of spamming right wing political posts with K-pop fan cam images; the alt-right trend of replying to left-wing political posts with Pepe the Frog images, etc.*)

Topic of interest refers to whatever topic the investigation team has decided to pursue, e.g., vaccine

confidence, attitudes about misinformation, etc. The purpose of this exercise is to identify online interactions among young people that somehow relate to your topic of interest. *Somehow* is a key word here—we know that online interactions rarely stay on one topic for long, and sometimes the most interesting comments on show up in conversations that started on entirely different topics.

Interactions among young people: All sorts of people gather in online locales, including those primarily intended for or populated by young people, and not every user is the age they say they are. For this project, that is fine. We do not use online interaction analysis for making definitive statements about demographic groups. We used to gain more nuanced understandings individuals and groups as they express themselves online, regarding a particular topic of interest.

EXAMPLES: TALKING ABOUT YOUR LOCALE-BASED SUGGESTIONS

1. "There is a YouTuber who is pretty popular with teenagers who I remember made a video about vaccines lately. It might be interesting to check back on the comments on that--we can't guarantee the comments would all be by teens, but I bet many of them are, because it seems like that's the primary viewer base for this YouTuber."
2. "On my school's public Facebook page, I remember a bunch of really frustrated comments by students when the principal said that seniors should get excited about having a Virtual Prom this year."
3. "There is this Discord server I've heard kids talk about where people go to talk conspiracy theories. I bet there are a bunch of people talking about vaccines over there. I can't say all those people will be teenagers, but many probably are."
4. "I know there is a Subreddit called, "If Delta ruins Driver Education, I am seriously going to lose it."
5. "There is a game streamer on Twitch who likes to get into conversations about stuff like vaccines with viewers. A lot of high school students are into her, because she is a great gamer but also funny. My sister watches her a lot and was even made a chat moderator a few times. I think my sister could contact her and see if she would be willing to bring up the topic of teen vaccination on her next stream--we could get some interesting comments from that!"
6. There is this Samoan-Australian influencer I've heard of named Taylor Winterstein. She is vocally anti-vax, and a big deal with some people in my community who have families in the South Pacific. It might be worth looking at her channel, although I'm not sure how old her primary viewer base is.

EXAMPLES: TREND-BASED SUGGESTIONS

1. I am seeing a lot of kids at school posting vaccination card selfies these days. Maybe I can do a Google or Google News search for "selfie" and "vaccine" and see if there are blog posts or news stories of other sorts of trends going on.

2. I remember when our governor put out a confusing video talking about lockdown, there were a lot of parody reaction videos on Tik Tok about it. Maybe I can Google “parody” and “Tik Tok” and “vaccine” or “Delta” and see if there are any interesting trends going on...
3. I remember a selfie trend a while ago featuring Asian-identified students were holding signs saying, “I am Not the Virus.” Maybe I can do a Google image search for “selfie” and “racism” and “COVID” or “Vaccine” and see if something interesting turns up
4. I don’t know why, but it seems like the 5G rumor is this big thing in gaming chat rooms, much more than other places. Maybe I can do a Google search for “rumor” and “gaming”, or “streaming” and “vaccine” see if there are any blog posts or news articles worth looking into?
5. I remember there was a big push to cancel Lana Del Rey when she wore a mesh fashion mask to a meet and greet. Maybe there is a similar cancel push going on connected to a celebrity who is popular with teens, and is taking a position (either for or against) on vaccines? Maybe I can Google words like “cancel” or “controversy” or “scandal” and “celebrity” or “influencer” and “vaccine” and see if we get anything interesting?
6. I think there might be a few memes circulating about recent news events involving teens and vaccines. Maybe I can Google words like “lawmaker” or “legislation” and “minor” or “teen” and “vaccine” or “vaccination” to see what is going on? And then maybe do a Google image search using the word “meme” and a key word from a news story (like a state name) and see if something turns up?
7. It might be interesting to see what sorts of videos are being tagged #NursingStudent on Instagram or Tik Tok or Twitter right now—there could be an interesting vaccine-related trend going on there worth looking at.

FOR YOU TO COMPLETE ON YOUR OWN

Task 1: Suggest a SPECIFIC interaction among young people that might be interesting to examine further.

Fill in the blanks below:

1. Platform: _____ (e.g., YouTube, Insta, etc.)
2. Area: _____ (e.g., a channel, page, etc.)
3. Title: _____ (e.g., of the video, of the post)
4. Link: _____ (whenever possible)
5. How locale fits with our research interests?

6. Is this a locale you have seen yourself, or you’ve heard about from others?

7. If this interaction involves circulation of images, photos, or videos please provide a screen shot

of so we can see precisely what is appearing.

PLEASE INSERT SCREENSHOT HERE

TASK 2: Suggest a TREND popular among young people that might be interesting to examine further:

8. Please describe the nature of the trend or challenge you are thinking of examining.

9. Please tell us any word search combinations (using Google, Google Images, or Google News) you think might yield more context, information, and/or leads to follow up about this trend, challenge, or movement:

10. How do you see this trend fitting with our research interests?

11. Is this a trend you have seen yourself, or you've heard about from others?

12. If the trend involves circulation of images, photos, or videos as part of a meme or challenge, please provide a screen shot of so we can see precisely what people are copying.

PLEASE INSERT SCREENSHOT HERE

13. If you are talking about trend involves the circulation of a rumor, a protest, boycott, or something similar, please provide a screen shot of a post related to the trend (with hashtag or not) so we can see what people are talking about.

PLEASE INSERT SCREENSHOT HERE

NEXT STEPS

Submit this worksheet to your group to get further feedback on your ideas. Continue searching online for a possible interaction or trend you feel might be worth observing, given the group's general topic of interest (e.g., vaccination, misinformation, etc.) When you have found something to investigate further, please propose it to the group using Worksheet 2.

Worksheet 2: Proposing your online analysis

TASK AT HAND

Today, you are going to propose an online interaction to analyze. This involves:

1. **Classifying** the interaction as either a single event, or as part of a trend
2. **Describing** the interaction for someone unfamiliar with it
3. **Characterizing** the creator and audiences of this interaction
4. **Explaining** how you see the interaction relating to the group's topic of interest
5. **Contextualizing** this interaction for someone unfamiliar with it

You can use this this worksheet to propose either of these two types of online interactions:

1. **Interactions occurring in a specific locale:** usually as a single post, with multiple responses/replies to that post. Examples:
 - Comments on a particular statement posted to Reddit
 - Reactions to a specific selfie posted by a specific influencer on Instagram
 - Viewer responses to specific You Tuber's video
2. **Interactions occurring as part of a trend:** usually through circulation of specific memes, hashtags, photo types, etc., occurring in multiple locales over one or more platforms. Examples:
 - A dance challenge trend across one or more platforms
 - A meme trend across one or more platforms
 - A photo trend across one or more platforms
 - A hashtag trend across one or more platforms

Advice on narrowing down the focus of a trend.

If you are interested in analyzing online interactions occurring in a specific locale (option 1, above), you can skip what is written below, and head immediately to the next section of this worksheet.

If you are interested in analyzing online trends, before going to the next section of this worksheet, you need to narrow your broad interest down to **one sample case**. If you said you wanted to analyze "the ALS Ice Bucket Challenge" in its entirety, you would be faced with addressing tens of thousands of posts, images and videos produced by young people over a multi-year period. Narrowing your focus to by platform and time (for instance, to young people participating in the challenge over Twitter from Oct-Nov 2019) shrinks that to hundreds of cases, which is still too many for an investigator conducting an observational analysis.

To narrow the field further, we choose a sample case to examine. A sample case can be considered as any post (with responses) that strikes us as a typical representation of the trend in question. An example of a sample case taken from the large grouping above would be, "Reactions to a video created by Mary X, a 16-year-old Twitter user who posted her Ice Bucket challenge on October 15,

2019, at this link.”

Here are some common ways people locate sample cases:

(1) **Do some background reading.** Check [Google News](#) to see if anyone has written about this trend yet. For memes, check [Know Your Meme](#) to see if anyone has written about this meme yet. It’s standard practice for articles to include links to user pages online. Clicking those links can take you to a post that might serve as a starting place for your interaction analysis.

(2) **Search Google Images.** Images from popular trends frequently come up with the right word searches. Clicking on those images can take you to the place they originally appeared online, and you can use that as a starting place for your interaction analysis.

(3) **Ask friends for links.** Many people bookmark or forward examples of trends that are popular, have made them laugh, made them angry, etc. There is a good chance someone has material that would make a great starting point for your investigation.

GENERAL INFORMATION	
Your name	
Group name (if applicable)	
Today’s date	
Date you plan to conduct analysis	
Which of these are you focusing on?	
(1) An interaction at a specific locale online.	
(2) An interaction that typifies a trend across platforms.	
LOCATION of interaction	
Post title. Online interactions normally are in response to a post, most of which have titles. Please provide the title of the post you plan on examining.	
Post creator. Posts are created by users. Tell us the name of the user who created the post you are examining.	
Date created. Most posts are dated. Please note the date the post was first post was created.	
Platform. Let us know the platform on which you see the post residing (e.g., YouTube, Instagram, WeChat, etc.)	
Platform description. Describe the nature of that platform, for those who might not know (e.g., <i>social networking, gaming, livestreaming, video sharing, etc.</i>)	
Section on platform. On large platforms, posts normally appear in sections-- on channel X, at personal page for Z, on community page called A, etc.	
Online link to see the post and reactions (if possible)	

DESCRIPTION of interaction	
Overview. Most online interactions can be described in terms of a post, which then receives reactions. If you had to describe the interaction you want to investigate in 1-2 sentences, how would you do it?	
First post. Please provide a screenshot the first post that began this interaction, and in 1-2 sentences, mention any images or words used by the post creator that seem to have impacted the audience.	
Typical reactions: Please summarize the typical responses to this post, in 1-2 sentences.	
Surprising reactions: If they occurred, please summarize any counter-typical or surprising responses to this post, in 1-2 sentences.	
Applicability: Keeping in mind your group's demographic and topic of interest, please explain how you believe an investigation of this interaction will be of value?	
The CREATOR of this interaction	
Creator Name. Please give the name of the person who created the first post of the interaction.	
Creator's Name Status. <i>Please consider which applies:</i> --creator is using their 'real' name -- creator is using an online name --creator is posting anonymously	
Creator's Identity Status. As the term "trust the messenger" implies, we frequently interact with people based on our perception of their identity. Please consider which apply in this case: --- the creator is someone identified by others as a public figure [e.g., an influencer, an entertainer, a politician] --the creator is someone identified by others as having a certain standing on the platform [e.g., a top poster, a moderator, etc.] -- creator is someone who self-identifies as part of a particular group [of employees, of fans, of a political movement] that matters, for the message of the post --creator is someone who self-identifies as having a particular identity role [gender, race, age, ability, nationality, etc.] that matters, for the message of the post --creator is someone who self-identifies as having had	

certain experiences [with hospitals, the government, education, industries, religions, etc.] that matters, for the message of the post.	
The AUDIENCES for this interaction	
Metrics of engagement. On social media platforms, audiences frequently note their interest in a post through reaction buttons. On the post that began this interaction: --how many views did it receive? --which reaction was used most frequently? --what is the ratio of reactions to comments? <i>(Note: favorable posts generally have many more reactions; posts spurring outrage tend have higher numbers of comments)</i>	
Audience Identity status. If you had to provide a quick character sketch of the audience for this interaction, how would you do it, using the options below? --- these audience members seem to self-identify as part of a particular group [of employees, of fans, of a political movement] that matters, for the message of the post --these audience members seem to self-identify as having a particular identity role [gender, race, age, ability, nationality, etc.] that matters, for the message of the post --these audience members self-identify as having had certain experiences [with hospitals, the government, education, industries, religions, etc.] that matters, for the message of the post.	
Most frequent commenters Out of the identity positions above, how would you characterize the identity of the most frequent commenter (s) on this post?	
TIME and this interaction	
Duration of this interaction. Please provide a rough estimate of how long this interaction lasted, by noting time between the original post and the last comment.	
Speed of this interaction. Looking over the time stamp on	

comments, provide a rough estimate of how quickly this interaction transpired—do you see many comments in one day, or are they spread out over time?	
Backstory of this interaction. To your knowledge, was there anything transpiring at the same time as this interaction that might have influenced people's behavior? This could be something internal, like an internet drama or external, like a lockdown announcement.	
Future-story of this interaction. To your knowledge, is there anything about this interaction that influenced people after it occurred? This could be something negative, like a call to 'cancel' someone online, or positive, like rise of awareness around a topic.	
CIRCULATION and VARIATION of this interaction	
Conduct a quick Google search to detect if the post you are looking at has been re-posted (or if you are currently looking at a re-post right now.) If so:	
What portion of the original post was reposted? Possibilities: <i>--the entire post with responses</i> <i>--the entire post without responses</i> <i>--an image from the post with text</i> <i>--an image from the post without text</i> <i>--a clip of a longer video</i>	
Where was the original post reposted? Possibilities: <i>--to another platform, perhaps as part of a cross-promotion effort by the creator,</i> <i>--to someone else's channel or page, often linked or featured as part of a reaction, or as part of a larger discussion,</i> <i>--to a press outlet, often the case when post is connected to a scandal or controversy, or used as an example of a larger trend</i>	
If you are focused on post that exemplifies a trend, what variations exist of this type of post? This question is especially pertinent to posts that draw on meme culture.	
NEXT STEPS	
Use this worksheet as the basis of a discussion with your group about your forthcoming plans for deeper investigation. While you will be doing the bulk of your observing on your own, it is important that each investigator in the group communicate their research plans to one another, if only to avoid duplicating focus (e.g., three people deciding to look at the same online thread.)	

Be ready to discuss with your group:

- Which interaction would you like to analyze on your own?
- How do you see this interaction relating to our topic?
- It will be helpful to have someone 'shadow' you during analysis, to talk with you about what you've observed. Who might you be able to ask to shadow you?

After you have discussed your plans with your group, move to Worksheet 3.

Worksheet 3: Analyzing interactions: focus on messages

TASK AT HAND

Today, you are going to analyze messages in an online interaction. This includes:

1. Messages delivered via **Image-based formats** (photos, illustrations, animations, etc.)
2. Messages delivered via **sound formats** (music, sound effects, voiceovers, etc.)
3. Messages delivered through **video formats** (face to camera, split screen, streaming, etc.)

Advice on using this worksheet.

The purpose of this worksheet is to get you to assess and describe the messages of an online interaction for someone who has neither seen it nor heard the interaction before. You can complete this worksheet on your own, but it can be useful to ask for help from to ask from a friend, or to request that an adult listen as you talk through your answers. This is because messages delivered in online interactions can have multiple meanings and *connotations* (meanings based on personal or group histories.) In conversation, you may learn that you associate an image or trend with one set of meanings, only to talk to a friend and learn all sorts of other meanings. We can never grasp all meanings, and that is fine, but a perspective beyond your own helps you remember to keep an open mind.

The worksheet has been arranged to help you evaluate your interaction of choice in terms of messages delivered over specific media formats. Because they are so popular among young people, the worksheet concentrates on posts that feature photo, and/or video material. If you are asked about something that does not apply to your interaction, just write, "NA" (not applicable) on the worksheet and move on.

Confidentiality Reminders.

1. When you are talking about people who appear in online interactions who are ADULT celebrities, politicians and/or influencers, you can mention them by name, as they are considered "public figures."
2. When you are talking about online influencers who are MINORS, you should use a pseudonym (fake name), as any minor is considered a "vulnerable subject."
3. When you are talking about anyone who is not a public figure (i.e., most of us) use pseudonyms (fake names.)

Note: We use pseudonyms for both given names (e.g., John Smith) and for online names (e.g., Titan the Destroyer.)

We do this because even though these interactions occurred in public spaces online (i.e., not

friends-locked, or otherwise restricted), most people using social media have an *expectation of privacy*—that is, a belief that what they are saying will stay where they said it, online—and using pseudonyms helps keeps their actual identities unknown.

4. When you are showing a screen shot featuring images of non-public figures (or influencers who are minors), you want to cover or blur individual faces shown in those images. This is to honor the expectations of privacy, mentioned above.
5. When you are showing a screen shot featuring a poster's name or profile icon, you want to black out or blur that name or icon. This is to honor the expectations of privacy, mentioned above.

GENERAL INFORMATION	
Your name	
Group name (if applicable)	
Date of your analysis	
Title of post analyzed	
Creator of post analyzed	
Date post originally created	
Link to view post	
Summary of interaction analyzed: Please provide a 1-2 sentence overview description of what you are observing. Examples: "I'm looking at a video made by <i>[tell us who made it]</i> on <i>[platform]</i> about <i>[tell us the topic]</i>." "I'm looking at interactions between influencer <i>[tell us the name]</i> and viewers on a <i>[tell us the platform]</i> thread about <i>[tell us the topic]</i>." I'm looking at a post that exemplifies a trend across <i>[platform or platforms]</i> where people are <i>[tell us what they are doing]</i>.	
Does your interaction contain photos?	
Photo genres and types: Does the post that begins this interaction (or any responses thereafter) contain a photo or photos? If so, how would you characterize these, in terms of genre and/or type? Some possibilities: --a selfie (or something more specific, like a mirror selfie) --a group photo (or more specific, like a team photo) --a documentary or news photo --a "on location" photo --an archival photo from the past --a screenshot from a someone's computer --a still shot taken from a movie	
Rationale for presentation Why do you think the person who posted this photo chose to present it in this genre & style? <i>Some Possibilities:</i>	

-- it makes their post look official -- it's the style they always use on their feed -- it's a format that fits a current challenge or trend	
Photo content Please describe for someone who cannot see them: --What is happening in this photo? --Where and when does this photo appear to be taken? --Who or what is featured in the foreground (front) of the photo? --If it matters, who or what is featured in the background of the photo?	
Characters in photo Who seem to be the main characters (human and non-human) in this photo? Who seem like background characters in this photo? Are there any characters that seem like stereotypes or clichés? If so, who are these, and how do they signal their cliché status to you?	
Lighting, filtering, editing: Our emotional responses to photos are frequently tied to things like camera angles, lighting, and photo editing. This isn't a photography class, so no panicking, here. But if you can, please tell us something that may have affected your reaction. <i>Examples of camera and photo editing techniques:</i> <i>Filters, cropping, labelling something on the photo, camera close ups, camera angles making things like bigger or smaller than they are, use of black and white photography, etc.</i>	
Photo title, caption, hashtags Does this photo contain a title, caption, or other sort of description? If so, what is it? Have the interactions surrounding this photo used any hashtags? If so, what are they?	
Rationale for photo description Why do you think the person who uploaded this photo chose to title, caption, or describe the photo as they did? <i>Possibilities: to simply describe the photo, to comment on it, to</i>	

make a joke about it, or do something else?	
Poster intent Why do you think this photo was first posted in the first place? <i>Possibilities: it was to document a recent event; it was in response to someone else's photo; it was participation in a challenge or trend; some other reason...</i>	
Questions about photo messaging 1. If you had to summarize the main point or message of this photo in one sentence, what would it be? <i>Note: This point doesn't have to be 'deep,' but rather something you think the creator wants you to come away thinking about.</i> 2. Can you think of alternative messages this photo might have for different sorts of audiences? If so, what sorts of messages are those?	
Viewer response to messaging If you had described the feeling, you get looking at this photo using two or three words, what would those words be? Did you have the same feeling while reading these titles, captions, or other description? Do you think alternative feelings this photo or its description might have for different sorts of audiences? If so, what sorts of feelings would those be?	
Questions about communication strategies If you had to explain the communication strategies used in this photo, how might you fill in the blanks below (<i>only choose ones that seem appropriate to your case</i>): 1. The photo shares a story about _____ by _____ 2. The photo shares information about _____ by _____ 3. The photo raises questions about _____ by _____ 4. The photo supports debates about _____ by _____	

5. The photo tries to persuade people that _____ by _____	
6. The photo tries to encourage people to _____ by _____	
7. The photo celebrates people who _____ by _____	
8. The photo defends people who _____ by _____	
9. The photo warns people that _____ by _____	
10. The photo advises people about _____ by _____	
11. The photo teaches people about _____ by _____	
12. The photo teaches people to _____ by _____	
13. The photo criticizes individuals who _____ by _____	
14. The photo critiques organizations that _____ by _____	
15. The photo mocks people who _____ by _____	
16. The photo attacks people who _____ by _____	
17. The photo mimics people like _____ by _____	
18. The photo mimics videos like _____ by _____	
19. The photo references a meme about _____ by _____	
20. The photo references an online trend involving _____	
Questions about assessment:	

Speaking as a viewer, assess the effectiveness of this photo by filling in the following statements as they apply to you: 21. For me, the most appealing, clarifying, educational touching, funny or persuasive elements of this photo were: _____. 22. For me, the most unappealing, unclear, off-putting, unfunny, or non-persuasive elements of this photo were: _____. 23. If I had to share this, I would probably share it with people who appreciate photos that _____. 24. I wouldn't share this video with anyone who _____, because _____.	
Does your interaction include IMAGES (non-photographs)?	
Image types and styles: Does the post that begins this interaction (or any responses thereafter) contain an image, or images? If so, how would you characterize these, in terms of genre and/or type? Some possibilities: --an illustration of _____ --a graph showing _____ --a map of _____ --a timeline from _____ --a cartoon featuring _____	
Rationale for presentation Why do you think the person who posted this image chose to present it in this style? <i>Some Possibilities:</i> -- it makes their post look official -- it's the style they always use on their feed -- it's a format that fits a current challenge or trend	
Image content Please describe for someone who cannot see them: --What is happening in this image? --Who or what is emphasized in the image?	

--If it matters, who or what de-emphasized in the image?	
Image title, caption, hashtags Does this image contain a title, caption, or other sort of description? If so, what is it? Have the interactions surrounding this image used any hashtags? If so, what are they?	
Rationale for image description Why do you think the person who uploaded this image chose to title, caption, or describe the photo as they did? <i>Possibilities: to simply describe the image, to comment on it, to make a joke about it, or do something else?</i>	
Poster intent Why do you think this image was posted in the first place? <i>Possibilities: it was to illustrate something about a recent event; it was in response to someone else's graph or map; it was participation in a challenge or trend; some other reason...</i>	
Questions about image messaging 3. If you had to summarize the main point or message of this image in one sentence, what would it be? <i>Note: This point doesn't have to be 'deep,' but rather something you think the creator wants you to come away thinking about.</i> 4. Can you think of alternative messages this image might have for different sorts of audiences? If so, what sorts of messages are those?	
Viewer response to messaging If you had to describe the feeling you get looking at this image using two or three words, what would those words be? Did you have the same feeling while reading these titles, captions, or other description? Can you think of alternative feelings this image, or its description might have for different sorts of audiences? If so, what sorts of feelings would those be?	
Questions about communication strategies	

If you had to explain the **communication strategies** used in this image, how might you fill in the blanks below (*only choose ones that seem appropriate to your case*):

1. The image **shares a story** about _____ by _____
2. The image **shares information** about _____ by _____
3. The image **raises questions** about _____ by _____
4. The image **debates about** _____ by _____
5. The image to **persuade people** that _____ by _____
6. The image tries to **encourage people** to _____ by _____
7. The image **celebrates people** who _____ by _____
8. The image **defends people** who _____ by _____
9. The image **warns people** that _____ by _____
10. The image **advises people** about _____ by _____
11. The image **teaches people** about _____ by _____
12. The image **teaches people** to _____ by _____
13. The image **criticizes individuals** who _____ by _____
14. The image **critiques organizations** that _____ by _____
15. The image **mocks people** who _____ by _____

16. The image attacks people who _____ by _____ 17. The image mimics people like _____ by _____ 18. The image references a meme about _____ by _____ 19. The image references an online trend involving _____	
Questions about assessment: Speaking as a viewer, assess the effectiveness of this image by filling in the following statements as they apply to you: 20. For me, the most appealing, clarifying, educational touching, funny or persuasive elements of this image were: _____. 21. For me, the most unappealing, unclear, off-putting, unfunny, or non-persuasive elements of this image were: _____. 22. If I had to share this, I would probably share it with people who appreciate photos that _____. 23. I wouldn't share this with anyone who _____, because _____.	
Does your interaction include VIDEO?	
Video genre and style. Does the post that begins this interaction (or any responses thereafter) contain video? If so, how would you characterize that video, in terms of genre and/or style? Some possibilities: --Vlogging format YouTube video --Split-screen video on Tik Tok	

--Stories video posted to Instagram --Live streaming video on Twitch	
Creator intent. Why do you think the creator chose this genre & format? <i>Possibilities: it's the style they always use on their channel; it's a format that fits a current challenge or trend, etc.</i>	
Characters in video. 5. Who would you list as the main characters (human and non-human) in this video? 6. Who seem like background characters? 7. Are there any off-screen characters like voice narrators? 8. Are there any characters that seem intended to act as stereotypes or clichés? 9. If so, who are these, and how do they signal their cliché status to you?	
Questions about video plot 10. In chronological order, what appears to happen in the video, and to whom? 11. Are there any moments when time seems to speed up or slow down for emphasis? If so, which moments are these? 12. Are there any classic plot 'set ups' in this video that jump out at you? <i>Examples of classic set-ups: something that clearly copies the format of a popular sitcom, televised sports or game show format, a scene from a well-known sci-fi, romance or action movie, one or more viral trend online, etc.</i>	
Questions about music 13. In the video, do you hear music? 14. How would describe the music's genre (e.g., rock, hip hop, classical)? Are there any songs in the video you recognize? 15. How would you describe the mood created by the music at the start of the video? 16. Does the mood of the music change at all during the video? 17. If the music does change: 18. In what way does it change (e.g., louder, faster, slower, etc.)? 19. When in the on-screen action does the change occur? 20. How does the music change affect you as a viewer? <i>Possibilities: It increases tension; it gets less impactful</i>	

<i>as it goes on; it changes my mood (e.g., fear to humor), etc.</i>	
Questions about sound effects 21. Beyond music and speaking, does the video include any significant sound effects? 22. If so, how would you describe loudest or most obvious sound effect? 23. When does the loudest or most obvious sound effect happen in the video? 24. Why do you think the creator chose that effect for that moment? 25. Does the effect happen once, or is it repeated? 26. If repeated, how does the repetition affect you as viewer? <i>Possibilities: It increases tension; it gets less impactful as it goes on; it changes my mood (e.g., fear to humor, etc.)?</i>	
Questions about video effects and edits: Our emotional responses to videos are frequently tied to things like camera angles, lighting, and video editing. This isn't a film class, so no panicking, here. But if you can, please watch this video again and tell us something about how editing may have affected your reaction. <i>Examples of camera and editing techniques:</i> <i>zoom, close ups, extreme close-ups, shaky camera, quick cuts between scenes, camera angles making things like bigger or smaller than they are, switching from color black and white, etc.</i>	
Questions about video messaging 27. If you had to summarize the point of this video in one sentence, what would it be? <i>Note: This point doesn't have to be 'deep,' but rather something you think the creator wants you to come away thinking about.</i> 28. If you describe the feeling or 'vibe' of this video using two or three words, what would those words be? <i>Note: If you think the feeling of this video changes throughout, pick words that help us get a sense of that change.</i>	

Questions about communication strategies

If you had to explain the **communication strategies** used in this video, how might you fill in the blanks below (*only choose ones that seem appropriate for the video you looked at*):

1. The video **shares a story** about _____ by _____
2. The video **shares information** about _____ by _____
3. The video **raises questions** about _____ by _____
4. The video **debates whether** _____ by _____
5. The video tries to **persuade people** that _____ by _____
6. The video tries to **encourage people** to _____ by _____
7. The video **celebrates people** who _____ by _____
8. The video **defends people** who _____ by _____
9. The video **warns people** that _____ by _____
10. The video **advises people** about _____ by _____
11. The video **teaches people** about _____ by _____
12. The video **teaches people** to _____ by _____
13. The video **criticizes individuals who** _____ by _____
14. The video **critiques organizations** that _____ by _____
15. The video **mocks people** who _____ by _____

_____ 16. The video attacks people who _____ by _____ 17. The video mimics people like _____ by _____ 18. The video mimics videos like _____ by _____ 19. The video references a meme about _____ by _____ 20. The video references an online trend involving _____	
Questions about assessment: Speaking as a viewer, assess the effectiveness of this video by filling in the following statements: 21. For me, the most appealing, clear, touching, funny or persuasive elements of this video were: _____. 22. For me, the most unappealing, unclear, off-putting, unfunny, or non-persuasive elements of this video were: _____. 23. If I had to share this, I would probably share it with people who appreciate videos that _____. 24. I wouldn't share this video with anyone who _____, because _____.	
NEXT STEPS	
Once you have completed this worksheet, please move to Worksheet 4, which focuses on audience responses and platform engagements.	

Worksheet 4: Analyzing interactions: audience interaction and platform engagement

TASK AT HAND

Today, you will focus on analyze an online interaction, with a focus on audience reception, and markers of engagement created by platform algorithms. This includes:

1. Comments made by users (number, types, and tone)
2. Reactions from users (number, types, and tone)
3. Amplification of interactions by platforms (e.g., spotlighting, linking, trending)
4. Dampening of interactions by platforms (e.g., censoring, blocking, shadow banning)
5. Evidence of normative policing (e.g., flaming, bullying, 'cancel culture')
6. Evidence of platform weaponization (e.g., organized factions, offensive measures, etc.)

Advice on using this worksheet.

The purpose of this worksheet is to get you to assess and describe the social and platform-based reception of the online interaction you have chosen to investigate.

The worksheet has been arranged to help you evaluate the online interaction you have chosen to investigate in terms of actions performed by human audiences, actions performed by algorithms triggered to behave in particular ways on platforms, and actions that result when people and platforms mix. messages delivered over specific media formats. To help you think systematically, the worksheet concentrates on user activities like commenting and reacting; platform activities like amplification and dampening of posts; and techno-social activities such as online policing of social norms, stigmatizing activities like bullying, and concerted acts of social media weaponization. If you are asked about something that does not apply to your interaction, just write, "NA" (not applicable) on the worksheet and move on.

Confidentiality reminders.

1. When you are talking about celebrities, politicians and/or influencers who are ADULTS, you can mention them by name, as they are considered "public figures."
2. When you are talking about online influencers who are MINORS, you should use a pseudonym (fake name), as any minor is considered a "vulnerable subject."
3. When you are talking about anyone who is not a public figure (i.e., most of us) use pseudonyms (fake names.)

Note: We use pseudonyms for both given names (e.g., John Smith) and for online names (e.g., Titan the Destroyer.)

We do this because even though these interactions occurred in public spaces online (i.e., not

friends-locked, or otherwise restricted), most people using social media have an *expectation of privacy*—that is, a belief that what they are saying will stay where they said it, online—and using pseudonyms helps keeps their actual identities unknown.

4. When you are showing a screen shot featuring images of non-public figures (or influencers who are minors), you want to cover or blur individual faces shown in those images. This is to honor the expectations of privacy, mentioned above.
5. When you are showing a screen shot featuring a poster's name or profile icon, you want to black out or blur that name or icon. This is to honor the expectations of privacy, mentioned above.

GENERAL INFORMATION	
Your name	
Group name (if applicable)	
Date of your analysis	
Title of post analyzed	
Creator of post analyzed	
Date post originally created	
Link to view post	
Summary of interaction analyzed: Please provide a 1-2 sentence overview description of what you are observing. Examples: "I'm looking at a video made by <i>[tell us who made it]</i> on <i>[platform]</i> about <i>[tell us the topic]</i>." "I'm looking at interactions between influencer <i>[tell us the name]</i> and viewers on a <i>[tell us the platform]</i> thread about <i>[tell us the topic]</i>." I'm looking at a post that exemplifies a trend across <i>[platform or platforms]</i> where people are <i>[tell us what they are doing]</i>.	
Share the post that began your interaction	
It's difficult to understand an audience reaction to something, without knowing what it that something is. For the sake of reference, please recap the post that began the interaction are investigating. If the post features images or video, you should upload a screenshot, so that someone we can see what you are describing.	

Tell us about CREATOR of this interaction	
Creator Name. Please give the name of the person who created the first post of the interaction.	
Creator's Name Status. <i>Please consider which applies:</i> --creator is using their 'real' name -- creator is using an online name --creator is posting anonymously	
Creator's Identity Status. As the term "trust the messenger" implies, we frequently interact with people based on our perception of their identity. Please consider which apply in this case: --- the creator is someone identified by others as a public figure [e.g., an influencer, an entertainer, a politician] --the creator is someone identified by others as having a certain standing on the platform [e.g., a top poster, a moderator, etc.] -- creator is someone who self-identifies as part of a particular group [of employees, of fans, of a political movement] that matters, for the message of the post --creator is someone who self-identifies as having a particular identity role [gender, race, age, ability, nationality, etc.] that matters, for the message of the post --creator is someone who self-identifies as having had certain experiences [with hospitals, the government, education, industries, religions, etc.] that matters, for the message of the post.	
Tell us about the AUDIENCE IDENTITIES for this interaction	
Audience Identity status. If you had to provide a quick character sketch of the audience for this interaction, how would you do it, using the options below? --- these audience members seem to self-identify as part of a particular group [of employees, of fans, of a political movement] that matters, for the message of the post --these audience members seem to self-identify as having a particular identity role [gender, race, age, ability, nationality, etc.] that matters, for the message of the post	

--these audience members self-identify as having had certain experiences [with hospitals, the government, education, industries, religions, etc.] that matters, for the message of the post.	
Dominant audience Identities Out of the identity positions above, how would you characterize the identity of the most vocal, frequent, or longest commenter (s) on this post?	
Tell us about the COMMENTS AND REACTIONS on this interaction	
Reaction/comment ratio. On social media platforms, audiences frequently note their interest in a post through via reactions and comments. On the post that began this interaction: --how many comments were posed? --how many reactions (e.g., likes) were given? --what is the ratio of reactions to comments? <i>(Note: favorable posts generally have many more reactions; posts spurring outrage tend have higher numbers of comments)</i>	
Typical reactions to this post: Take a look at the reaction section of the main post that began this interaction. What is the most frequently used reaction button used by audience members to respond? What is the second most frequently used button?	
Knock-on reactions to this post: In longer threads, people sometimes make comments or post images that get as much, or more reaction than the original post did. If this happened in the interaction you observed, please describe the knock-on post that received attention, and let us know how many likes and/ or follow-up comments it received.	
Typical user comments on this post: Please summarize the original comments to this post, by paraphrasing 2-3 typical commenters.	
Knock-on comments on this post: In longer threads, people sometimes turn away from talking with the original poster and start discussions with one another. If this happened in the interaction you observed, paraphrase 2-3 typical examples of this "knock on" commentary.	
Surprising comments on this post: If they occurred, please summarize any counter-typical or surprising comments to this post, in 1-2 sentences.	

TIME and this interaction	
Duration of this interaction. Please provide a rough estimate of how long this interaction lasted, by noting time between the original post and the last comment.	
Speed of this interaction. Looking over the time stamp on comments, provide a rough estimate of how quickly this interaction transpired—do you see many comments in one day, or are they spread out over time?	
Backstory of this interaction. To your knowledge, was there anything transpiring at the same time as this interaction that might have influenced people's behavior? This could be something internal, like an internet drama or external, like a lockdown announcement.	
Future-story of this interaction. To your knowledge, is there anything about this interaction that influenced people after it occurred? This could be something negative, like a call to 'cancel' someone online, or positive, like rise of awareness around a topic.	
CIRCULATION and VARIATION of this interaction	
Conduct a quick Google search to detect if the post you are looking at has been re-posted (or if you are currently looking at a re-post right now.) If so: What portion of the original post was reposted? Possibilities: --the entire post with responses --the entire post without responses --an image from the post with text --an image from the post without text --a clip of a longer video	
Where was the original post reposted? Possibilities: --to another platform, perhaps as part of a cross-promotion effort by the creator, --to someone else's channel or page, often linked or featured as part of a reaction, or as part of a larger discussion, --to a press outlet, often the case when post is connected to a scandal or controversy, or used as an example of a larger trend	
If you are focused on post that exemplifies a trend, what variations exist of this type of post? This question is especially pertinent to posts that draw on meme culture.	
Evaluating audience communication strategies	
If you had to explain the communication strategies used by audience members communicating about this post via	

reaction, comments, cross-conversations, re-posting, and circulating in meme formats, how might you fill in the blanks below (*only choose ones that seem appropriate to your case*):

1. Respondents **share stories** about _____ by _____
2. Respondents **share information** about _____ by _____
3. Respondents **raise questions** about _____ by _____
4. Respondents **debate about** _____ by _____
5. Respondents try to **persuade people** that _____ by _____
6. Respondents try to **encourage people** to _____ by _____
7. Respondents **celebrate people** who _____ by _____
8. Respondents **defend people** who _____ by _____
9. Respondents **warn people** that _____ by _____
10. Respondents **advise people** about _____ by _____
11. Respondents **teach people about** _____ by _____
12. Respondents **teach people how to** _____ by _____
13. Respondents **criticize individuals who** _____ by _____
14. Respondents **critique organizations that** _____ by _____

15. Respondents mock people who _____ by _____ 16. Respondents attack people who _____ by _____ 17. Respondents mimic people like _____ by _____ 18. Respondents reference a meme about _____ by _____ 19. Respondents reference an online trend involving _____	
---	--

Next steps

Once you have completed this worksheet, please use Worksheet 5 to code your findings.

Worksheet 5: Thematically coding your findings

TASK AT HAND

Today, you will learn to code the discoveries you have made about the online interaction you have been investigating. By “code,” we don’t mean computer coding, but rather the practice of grouping your observations shared thematic categories.

By “shared thematic categories,” we mean pre-established areas of focus that were earlier agreed upon by your group. For example, let’s say you were received a basket of fruit containing two apples, one banana, and one lemon. If your group requested that you code them as below which fruits, would you assign in what categories?

1. Fruits that are yellow
2. Fruits that arrived to you in pairs
3. Fruits that you might eat for breakfast

While coding a research project, an investigating group can come up with as many common themes as they wish. For today, you’ll be arranging your observations into these categories:

1. Expressions of **belief and attitudes** regarding a topic of interest
2. Expressions of peer, family, and other **norms** regarding a topic of interest
3. Responses to health-related **messaging** regarding topic of interest

From here, you will be asked to categorize your observations into further categories regarding uptake of a desired practice (e.g., vaccination, literacy, etc.)

1. Factors that may **aid the uptake** of a desired practice
2. Factors that may be **barriers to uptake** of a desired practice
3. Considerations **worth flagging** for further study re. a desired practice

Advice on using this worksheet.

The purpose of this worksheet is to get you to review the observations you have made thus far (you will refer to worksheets 2, 3, and 4 for this), consider which of your observations might be worth sharing, and organize that sharing so that it corresponds to group-shared categories.

To help you think systematically, the worksheet has been arranged to correspond to the themes detailed above. If you are asked about something that does not apply to your interaction, just write, “NA” (not applicable) on the worksheet and move on.

Throughout this worksheet, you will see suggestions for how you might word and phrase things, but the objective is not to mimic the language here. The objective is to communicate in a way that would make sense to someone who has not themselves witnessed the online interaction you have analyzed.

You can complete this grid on your own, but it can be very helpful to ask a fellow group member to listen as you talk through your answers. Sometimes the way we would code an observation differs from the way someone else in the group would someone else would do it. Conversations like this can help the group determine issues that might be worth flagging for consideration later.

For example, let's say you have been looking at responses to a meme about mask use, and you note respondents bringing up words like "shame." You feel confident that you should code shame thematically as a feeling. But when you get to the issue of desired practice uptake, things get more confused. Should you put a feeling like shame into the category of 'aids to uptake' (because people may comply out of shame) or 'barriers to uptake' (because people may resist or out shame)?" In conversation with a group member, you both decide that shame-based memes are a great example of an online practice that may need further consideration down the line and mention it in the "worth flagging" column.

GENERAL INFORMATION	
Your name	
Group name (if applicable)	
Date of your analysis	
Title of post analyzed	
Creator of post analyzed	
Date post originally created	
Link to view post	
Summary of interaction analyzed:	
Please provide a 1-2 sentence overview description of what you are observing. Examples: "I'm looking at a video made by <i>[tell us who made it]</i> on <i>[platform]</i> about <i>[tell us the topic]</i>." "I'm looking at interactions between influencer <i>[tell us the name]</i> and viewers on a <i>[tell us the platform]</i> thread about <i>[tell us the topic]</i>." I'm looking at a post that exemplifies a trend across <i>[platform or platforms]</i> where people are <i>[tell us what they are doing]</i>.	
Share the post that began your interaction	
It's difficult to understand an audience reaction to something, without knowing what it that something is. For the sake of reference, please recap the post that began the interaction are investigating. If the post features images or video, you should upload a screenshot, so that someone we can see what you are describing.	

CODING GENERAL EMOTIONAL STATES

In this section of the chart, you will summarize the two general emotional states you saw expressed during your observation. To describe each, you can mimic the language below or else use language of your own.

LANGUAGE FOR DISCUSSING GENERAL SENTIMENT

In the interaction I observed online, I noticed people seem to feel _____
[choose an emotion from the charts below, or use your own] **about _____**
[explain what they were emotional about]

EXAMPLES:

Judging by the number of times this Tik Tok video emphasized word “awkward,” it seems young people feel embarrassed talking about COVID-19 while socializing with friends, because the topic is seen to stop fun.

Judging by all the responses agreeing to the message of a meme featuring supermarket checkout workers titled, “The Real MVPs,” I noticed many teens are proud of their essential jobs, which aren’t normally celebrated the way doctors and nurses are.

SAMPLE NEGATIVE EMOTIONS

aggravated	fearful	sad	destructive
argumentative	frustrated	scared	divided
confused	hesitant	Stuck	doubtful
deflated	ignoring	wanting	embarrassed
demoralized	isolating	worrying	resisting
denying	overwhelmed	rejected	retaliating

SAMPLE POSITIVE EMOTIONS

Relaxed	calm	satisfied	joyful
agreeing	confident	generous	happy
Clear	attentive	sharing	assured
Excited	communal	clarifying	progressing
inspired	controlling	encouraging	Proud
believing	accepting	mastering	united
advancing	assured	enthusiastic	creative

Emotional Description #1

Emotional Description #2

Coding for BELIEFS

In this section of the chart, you will summarize the top two **beliefs** you saw expressed during your observation. To describe each, you can mimic the language below or else use language of your own.

LANGUAGE FOR DISCUSSING BELIEFS

Judging by comments like _____ [*share a standard comment, here*],
_____ [name and individual or group, here] seem to believe
_____ [*insert belief statement, here*]

EXAMPLE:

Judging by comments like "It's true though, people can be so dramatic!" commenters on this Tik Tok Vaccine Arm Challenge" video seem to believe that people saying they have experienced pain after getting a vaccine are exaggerating.

Beliefs Description #1

Beliefs Description #2

Coding for NORMS

In this section of the chart, you will summarize the top 2 expressions of **norms** you witnessed during your observation. By norms, we mean feeling about, discussion of, or enforcements regarding

- things people *should do*, regarding your topic of interest
- things people *should not do* regarding your topic of interest
- things people regard as *noteworthy* or commendable
- things they find *upsetting* or disgusting
- things people find '*normal*' regarding your topic of interest
- things people find *weird* or abnormal

Keep in mind, our understandings of appropriate and inappropriate behavior tend to turn on who we are with at the time: what is normal among friends might be seen as strange in a school setting. When you discuss norms, be sure to specify context as well. To do this, you can mimic the language below or else use language of your own.

LANGUAGE FOR DISCUSSING NORMS

_____ [*note an individual or group, here*] **shared that when they are with**
_____ [*name a group, here; peers, family, teachers, etc.*] **they find it**
_____ [*insert an adjective here: easy, challenging, etc.*] **to**
_____ [*insert a verb, here: talk about a particular topic,*
get permission to do something, access information about, etc.] **because**

_____ [share a reason, here]

EXAMPLES:

Some teens shared that when they are with older family members, they find it challenging to have conversations about vaccines, because their brother listens to Talk Radio all day, and refuses to move from his established conspiracy views.

Norm Description #1

Norm Description #2

In this section of the chart, will summarize up to 2 important findings you made during the online interaction you observed, regarding audience response to health-related messaging. By 'health-related messaging,' we mean information, announcements, tutorials, debates, or advertisements that reference healthcare issues. In online interactions, messaging of this sort might be delivered by ordinary people online; from authorities like nurses or teachers; from people like celebrities or influencers; or by institutional agencies like the WHO, the CDC, state health authority, a local school district, etc.

By ‘responses to messaging’, we mean audience-driven activities like commenting, discussing, debating, or failing to do any of these things (which might indicate disinterest in the message or its format.) To refresh yourself on the audience responses you observed earlier, see Worksheet 4. To think more deeply about the tactics of messages that seemed to work well (or did not), see Worksheet 3. To think more deeply about any backstory behind a response to a message, see Worksheet 2.

LANGUAGE FOR DISCUSSING RESPONSES TO MESSAGING

Judging by _____ *[insert something you observed, here]*
 _____ *[note an individual or group, here]* **objects/appreciates/is confused**
by {pick one of these} to the public health media practice of
 _____ *[name media tactic]* **because they find it**
 _____ *[insert an feeling here]*

EXAMPLES:

Judging by her use of the hashtag #vaccinecardselfie, the creator of this photo seems to appreciate the health department's tactic of encouraging people to share pictures to announce vaccine status and have fun doing it.

Judging by the large number of unanswered questions posted by readers of the health department's official Twitter feed, teens might be confused by health messaging that advises that people check official sites for information.

Response #1 Description	
Response #2 Description	
Once you have completed this worksheet, submit it to your instructor, and be ready to have a group discussion around the following questions: • When I think about the feelings, beliefs, norms, and message reactions I've discussed above, which ones seem to apply to things I've seen or heard in my local community? • Of these, how would I rank each in terms of importance? For instance, if I had to rank each on a scale of A-D [<i>A being of highest importance to our local community and D being the lowest</i>], how would I do it?	

Worksheet 6: Developing a list of potential challenges to desired health behavior

TASK AT HAND

Up until this point, you have completed each of these worksheets on your own. Today, you will use this worksheet **as a group** to generate a **Challenges** portion of this document. To do this, take these steps:

1. Gather as a group. Each investigator completes these statements, drawing on their observations in Worksheet 5:
 When I think about the feelings, beliefs, norms, and message reactions I've observed online, I've seen (or heard) the following mirrored in my local community:
 _____ *[share what you've seen or heard.]*
 When I think about the order of importance to these, the ones I marked as A or B (are
 _____ *[A is most important]*
 Something I didn't encounter online but I know is a big issue in our community is
 _____ *[if relevant, share this with the group.]*
2. After sharing, the group designates someone to fill in the worksheet below, listing the top challenges to uptake (of desired health behavior.) Top challenges are usually ones brought up by more than one group member.
3. To prepare for brainstorming recommendations (worksheet 7) the group completes a list of top aids for uptake.

LISTING CHALLENGES TO UPTAKE

In this section of the chart, you the group lists 5 observations that might qualify as **challenges to uptake**. By "challenges to uptake," we mean online interactions observed during this online interaction that:

- (1) investigators have noticed are also happening (or might happen soon) in their offline community, and
- (2) involve beliefs, feelings, norms, or responses to messaging that might discourage, hinder, or confuse people about adopting a desired health behavior, (e.g., get vaccinated, read more critically, etc.)

Challenge #1 Description

[describe in a word or phrase]

Fill in these blanks:

One possible challenge _____ *[list a challenge]* might pose in our community is that if left unchecked, it may damage efforts to _____ *[give us a desired health behavior]* because _____ *[explain how you imagine that happening.]*

Challenge #2 Description

[describe in a word or phrase]

Fill in these blanks:

One possible challenge _____ *[list a challenge]* might pose in our community is that if left unchecked, it may damage efforts to _____ *[give us a desired health behavior]* because _____ *[explain how you imagine that happening.]*

Challenge #3 Description [describe in a word or phrase]	Fill in these blanks: One possible challenge _____ [list a challenge] might pose in our community is that if left unchecked, it may damage efforts to _____ [give us a desired health behavior] because _____ [explain how you imagine that happening.]
Challenge #4 Description [describe in a word or phrase]	Fill in these blanks: One possible challenge _____ [list a challenge] might pose in our community is that if left unchecked, it may damage efforts to _____ [give us a desired health behavior] because _____ [explain how you imagine that happening.]
Challenge #4 Description [describe in a word or phrase]	Fill in these blanks: One possible challenge _____ [list a challenge] might pose in our community is that if left unchecked, it may damage efforts to _____ [give us a desired health behavior] because _____ [explain how you imagine that happening.]
Challenge #1 Description [describe in a word or phrase]	Fill in these blanks: One possible challenge _____ [list a challenge] might pose in our community is that if left unchecked, it may damage efforts to _____ [give us a desired health behavior] because _____ [explain how you imagine that happening.]
LISTING POSSIBLE AIDS UPTAKE	
In this section of the chart, you will list up to 5 things you observed that might qualify as aids to uptake . By “aids to uptake,” we mean any beliefs, feelings, media messages, or social cues you’ve observed during this online interaction that you believe could be used to assist, support, or encourage people to adopt a desired behavior (e.g., get vaccinated, read more critically, etc.) regarding your sentiment topic of focus.	
Aid #1 Description [describe in a word or phrase]	Fill in these blanks: One possible way _____ [list a something] might help with efforts to _____ [give us a desired health behavior] is by _____ [explain how you imagine that happening.]
Aid # 2Description [describe in a word or phrase]	Fill in these blanks: One possible way _____ [list a something] might help with efforts to _____ [give us a desired health behavior] is by _____ [explain how you imagine that happening.]
Aid #3 Description [describe in a word or phrase]	Fill in these blanks: One possible way _____ [list a something] might help with efforts to _____ [give us a desired health behavior] is by _____ [explain how you imagine that happening.]

Worksheet 7: Developing a list of recommendations

TASK AT HAND

Today, you will use this worksheet **as a group** to generate a **Recommendations** to address the challenges you detailed in Worksheet 6. To do this:

1. Gather as a group to review the challenges you articulated on Worksheet 6.
2. After sharing, the group designates someone to fill in the worksheet below.
3. After each challenge listed, the group brainstorms **possible recommendations**. Examples might be:
 - **Education campaigns** led by schools, designed to provide information regarding the vaccine clearance process.
 - **Promotional efforts** led by an influencer, designed to raise awareness regarding the impact of Delta variant on teens.
 - **Listening sessions** led by peers, designed to provide a safe space for those with questions about mask use.
 - **Empowerment efforts**, such as an internship program led by the WHO, designed to empower young people to serve as vaccine advocates.
 - **Legal efforts** led by parent advocacy groups, designed to pressure social media platforms used by teens to put clearer labelling on health misinformation.

As you can see from the examples above, an ideal recommendation opts for specificity over generality. While making recommendations, keep the following elements in mind:

Specify an **actor** (e.g., schools, an influencer, a group of peers, etc.)

Specify an **action** (e.g., an education campaign, a listening session, etc.)

Specify a **purpose** (providing information, providing a safe space, etc.)

4. (4) For examples of interventions that are already working, the group may wish to consult their list of “aids to uptake” at the end of worksheet 6.

BRAINSTORMING RECOMMENDATIONS

Challenge 1	Recommendation
Challenge 1: Description: _____ <i>[fill in a word or phrase]</i>	Recommendation 1: <i>Fill in these blanks:</i> One possible way to address _____ <i>[name a challenge]</i> might be through a _____ effort <i>[name a type of effort from chart below]</i> lead by _____ <i>[explain who would be leading this effort]</i> and targeting _____ <i>[explain who might most benefit from this effort.]</i> When I envision how this would work, I see _____ <i>[give</i>

	as much detail as you can, here.] For inspiration, I think it might be worth looking online at _____ [if possible, give us an example of a news story, or a web site, or a social media feed online that offers something related to what you are suggesting.] I think a good time to launch an effort like this might be _____ [tell us when.]
Challenge 2	Recommendation
Challenge 2 Description: _____ [word or phrase]	Recommendation 2 Fill in these blanks: One possible way to address _____ [name a challenge] might be through a _____ effort [name a type of effort from chart below] lead by _____ [explain who would be leading this effort] and targeting _____ [explain who might most benefit from this effort.] When I envision how this would work, I see _____ [give as much detail as you can, here.] For inspiration, I think it might be worth looking online at _____ [if possible, give us an example of a news story, or a web site, or a social media feed online that offers something related to what you are suggesting.] I think a good time to launch an effort like this might be _____ [tell us when.]
Challenge 3	Recommendation
Challenge 3 Description: _____ [word or phrase]	Recommendation 3 Fill in these blanks: One possible way to address _____ [name a challenge] might be through a _____ effort [name a type of effort from chart below] lead by _____ [explain who would be leading this effort] and targeting _____ [explain who might most benefit from this effort.] When I envision how this would work, I see _____ [give as much detail as you can, here.] For inspiration, I think it might be worth looking online at _____ [if possible, give us an example of a news story, or a web site, or a social media feed online that offers something related to what you are suggesting.]

	I think a good time to launch an effort like this might be _____ <i>[tell us when.]</i>
Challenge 4	Recommendation
Challenge 4 Description: _____ <i>[word or phrase]</i>	Recommendation 4 <i>Fill in these blanks:</i> One possible way to address _____ <i>[name a challenge]</i> might be through a _____ effort <i>[name a type of effort from chart below]</i> lead by _____ <i>[explain who would be leading this effort]</i> and targeting _____ <i>[explain who might most benefit from this effort.]</i> When I envision how this would work, I see _____ <i>[give as much detail as you can, here.]</i> For inspiration, I think it might be worth looking online at _____ <i>[if possible, give us an example of a news story, or a web site, or a social media feed online that offers something related to what you are suggesting.]</i> I think a good time to launch an effort like this might be _____ <i>[tell us when.]</i>
Challenge 5	Recommendation
Challenge 5 Description: _____ <i>[word or phrase]</i>	Recommendation 5 <i>Fill in these blanks:</i> One possible way to address _____ <i>[name a challenge]</i> might be through a _____ effort <i>[name a type of effort from chart below]</i> lead by _____ <i>[explain who would be leading this effort]</i> and targeting _____ <i>[explain who might most benefit from this effort.]</i> When I envision how this would work, I see _____ <i>[give as much detail as you can, here.]</i> For inspiration, I think it might be worth looking online at _____ <i>[if possible, give us an example of a news story, or a web site, or a social media feed online that offers something related to what you are suggesting.]</i> I think a good time to launch an effort like this might be _____ <i>[tell us when.]</i>

Designing for implementation

A toolkit for human-centered approaches to support public health, social measures and pharmaceutical interventions

DRAFT

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Acknowledgements (to be updated)

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List of acronyms and abbreviations

CDC	Centers for Disease Control
CHW	Community health worker
CVRC	COVID-19 Response Committee
HCD	Human centered design
NPHCDA	National Primary Health Care Development Agency
SBC	Social and behavior change
WHO	World Health Organization

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Introduction

In program design and implementation, understanding disease and behavior, cultural practices, and community dynamics are critical to improving health outcomes. Involving individuals from the community in the design, development and implementation of public health and social measure programs ensures that strategies are contextually relevant and culturally sensitive. Moreover, it empowers stakeholders, influencers, and individuals by leveraging their expertise to develop feasible and actionable approaches thus promoting accountability, instilling hope and building trust.¹

Human-centered design (HCD) leverages tools and techniques to identify user needs which are critical in developing strategic approaches for problem solving including for systems change and behavior change. HCD is a creative problem-solving approach that starts with gaining deep empathy for the individual and their needs. It involves the end user in the process who can be engaged in a variety of ways, including through research, co-design, co-creation and/or prototyping.

HCD can be used in public health and social measure programs and is particularly helpful in times of a public health emergency when a rapid response is necessary to mobilize individual behavior change.

¹ Simone E. Carter, Marion O'Reilly, Vivien Walden, Jack Frith-Powell, Alpha Umar Kargbo & Eva Niederberger (2017) Barriers and Enablers to Treatment-Seeking Behavior and Causes of High-Risk Practices in Ebola: A Case Study From Sierra Leone, *Journal of Health Communication*, 22:sup1, 31-38, DOI: 10.1080/10810730.2016.1222034

As with most tools, developing effective human-centered approaches involves using the most appropriate theory, practices and tools for the given situation.³ This toolkit provides examples for application in public health emergencies, and non-emergencies.

[Call out box]

Tip: Evaluate your program, situation, context and participants along with your program objectives and modify the tools and approach based on what you need.

[Call out box]

How this approach is different from other HCD processes

Different from other HCD approaches that seek to design a product or service, this process is designed for implementation approaches. It uses HCD tools to leverage insights of users and stakeholders and to lead stakeholders through participatory problem identification, prioritization, problem solving, decision making and action planning. The stakeholders identify solutions that are relevant to their context and make decisions about how to carry them forward with clear tangible steps. The process compliments infodemic management's theory of data and evidence driven, human centered practice that strengthens public health systems to support behavior change during a public health emergency.

This approach focuses on two levels of designing for implementation.

- 1) Designing for health systems strengthening leverages both user insights and stakeholder (workshop participant) insights to develop strategic approaches for program sustainability. We have provided a specific example at the district level with district stakeholders who go through a process of learning the contextual environment, collecting user insights, participating in a co-creation, co- design and action planning for sustainable service delivery. For example, this process could be used for district health teams who have had support from a donor and are transitioning it to the district health team supported by the Ministry of Health.
- 2) Designing for individual behavior change leverages user insights from influencers in the community to identify social measures or public health priorities, develop solutions they feel that they can take forward to mobilize individual behavior change (both their own and that of others) towards collective action. For example, this process could be used by a program that is leveraging influencers (women's groups, farmers, religious leaders, and others) to mobilize in villages to promote behavior change related to COVID-19 vaccine adoption or other prevention behaviors (e.g. mask wearing, physical distancing, hand washing, etc.).

³ Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual review of public health*, 31, 399-418.

1.2.1 Who this toolkit is for

This toolkit is for field practitioners who are working with stakeholders at all levels of program design who want to leverage user insights and participatory problem-solving mechanisms to design for sustainability and behavior change in public health, social measures, or pharmaceutical interventions.

1.2.2 Overview of toolkit approach

This toolkit provides a brief explanation of why the HCD approach is useful for program design, an overview on preparing for using HCD tools and collaborative processes, detailed instructions on how to use the HCD tools in the collaborative sessions with stakeholders and how to organize and synthesize the information in tangible steps forward.

The table below provides an overview of the two different approaches described throughout.

Style of design	Designing for health systems strengthening	Designing for individual behavior change
Designers / workshop participants	District nursing officer, district medical officer, community health nurse, health promotion officer, medical clinicians, administrators (including finance/information, etc.) who strategize and make decisions at a variety of levels	Influencers (e.g. religious, women, youth and community leaders) who directly promote change at the individual level with those they interact with
Who are they designing for	Designers / workshop participants are designing for themselves and others	Designers / workshop participants are the actual users of the human-centered design implementation approach
Distance away from individuals according to the socioecological framework		
Example	District health team designing an plan to transition program sustainability from donor supported to government district team.	Influencers develop hyper-focused communication and community engagement approaches to mobilize themselves to advocate for behavior change related to COVID-19 prevention behaviors and vaccine acceptance.

Part 2: Prepare for collaborative workshop sessions

2.0 General program preparation

By the time you are here you likely already have an idea of what you want to accomplish. For example, do you want stakeholders within the health system to identify key priorities for sustainable service delivery for a particular intervention? Or do you want influencers in a village to feel empowered with the appropriate skills, tools, resources, self-confidence, direction and knowledge about a technical public health issue (e.g. COVID-19 prevention behaviors and vaccines) to respond to individual needs within their geographic area? Below are a few steps that are typically part of a program design that you will need to consider before planning the collaborative (human-centered design) workshop sessions.

Pre workshop program preparation steps:

1. Build team
2. Stakeholder mapping
3. Geographic area identification
4. Government collaboration and alignment
5. Stakeholder consultations and desk review
6. Assessment
7. Data analysis and key recommendations

Once you have the above process completed, you will begin to prepare for the collaborative workshop sessions.

[Call out box]

Encouraging the inclusion of people with disabilities

Because people with disabilities can be at high risk to many health concerns, they are a cohort of the population that can benefit greatly from their involvement in the HCD process. However, reaching them and engaging their involvement may need additional effort.

At the planning stage there needs to be intentional discussion on how to reach people with disabilities and determine their involvement throughout the different stages. First, how will you reach representatives of the community who have disabilities with mobility, hearing, vision, communication, and cognition to ensure they are included in the process (suggestion could be to include representatives from the local organization of disabled people or association for the blind/deaf, etc.). Second, if accessibility is an issue for their participation, consider what adaptive support is needed to enable and maximize their meaningful participation (such as is the workshop space wheelchair accessible, are their sign language interpreters for participants who are deaf, is the support person of an individual who is blind

accommodate for, etc).⁴

2.1 Prepare workshop materials

- What it is

- You will need a variety of tools and materials to ensure the participants have the skills, information, and confidence to fully engage in developing their approach.

2.1.1 Facilitation tools

- What it is

- Agenda, facilitation guide, slides to support facilitation process (including facilitation skills).
 - Some of the topics to cover in the preparation could include participant and facilitator expectations, ground rules, agenda, time allocation, materials (flipcharts, markers, post it notes, voting dots, etc.), icebreakers, and HCD activities.
 - As you think about the group that will come together and the users who are in the community, consider dividers among different groups of people and what is helping to bridge a divide, consider power dynamics in the group and try to avert them ahead of time. This topic will be even more sensitive in areas of crisis.

2.1.2 Summary of key findings from the data analysis

Your analysis might be a compilation of a desk review of other research in combination with your own survey results and stakeholder interviews. It provides participants an understanding of the situation beyond their own experience, beliefs and assumptions.

2.1.3 Technical content

See examples of different types of technical content in Appendix 2.

- What it is

- The technical content will be specific to the goal of your HCD sessions.
- Why it's important
 - It gives participants background knowledge on the topic related to the objective. This is especially important if you have people with you that do not have technical expertise in the area. However, even if participants have a range of knowledge on the topic, this process will help get participants to the same baseline of understanding.
- How to do it
 - Identify the health topic or social measure you are working towards.
 - Identify existing training materials or create ones that will suit your needs.

⁴ See process example of inclusive content dissemination modes for people with hearing impairment in Indonesia: <https://investdmleanon.medium.com/>

Ensure you have the technical content – a common pitfall is assuming that people already know about the topic or that people have been trained before, however experience shows us that this is a critical step for success.



[call out box]

Tip: If there are participants involved in your session who are experts or well versed in the technical topic, speak with them ahead of time about how to leverage their support in creating discussion and answering questions throughout the training.

2.2 Conduct training for workshop facilitation team

- What it is
 - Technical content that will likely be shared depends on the type of program you are designing for. At times, the facilitator might also be a technical expert in the content, if not you can identify a technical expert to provide these pieces of the training/workshop.
 - HCD process: Learn about the HCD design techniques and practices.
- Why it is important
 - It is important that the facilitators are well versed in the flow of activities, the techniques and have the ability to pivot as needed to respond to the participants, e.g. modify activities or provide additional prompts to coach them through the activities. This confidence and technical knowledge will transfer to the participants and ensure technical accuracy.
 - Technical content: When you are conducting the training, be transparent if you do not know the answer to questions that come up. Be sure to find the answers and come back to the participants. This will also instill confidence in them that it is ok to not know all of the answers and that they can also take the same approach when they are answering questions to community members.
 - HCD tools: Practicing the HCD techniques ahead of time will help you as a facilitator to learn the techniques and how to guide others through it, understand how much time is needed, verbiage and prompts needed and materials set up.
- How to do it
 - Try to have a diverse facilitation team. Having a facilitation team that represents people of different age, sex, language, ethnicities, etc. provides an optic that all voices are welcome. It can also mitigate each of the facilitators personal bias enabling fuller participation from all participants.

[Call out box]

Tip: Practice facilitation of the process with a group of colleagues even if it is a brief walkthrough. This will help you practice the process of room set up (how long it takes to get

the materials prepared) and how to transition from one activity to another, as well as how to describe activities.

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Part 3: Implement collaborative workshop

3.1 Organize workshop participants

Decide how you plan to organize the results and exploratory activities of your session – there is no right or wrong way to do this, but some organization structures will make transitioning your work into a tangible strategy more feasible. See framework examples in Appendix 5.

- If you are developing a strategy where the user focus is on the individuals then you might organize the groups by audience segment (male/female user, mother, father, teacher, provider, key stakeholder, etc.)
 - For example, stakeholders would sit at different tables where their focus throughout the process would be on a particular audience segment, e.g. a table with a group focused on 'male or female user', a table with a group for audience segment 'parent', another for audience segment 'teacher' etc.
 - If your session is focused on influencers / leaders as the 'user' of the HCD strategy then you might organize the framework and groups by leader type (e.g. religious, youth, women, farmers, etc.);
 - Groups can be organized by leader 'type' e.g. all of the religious leaders at one table to form a group, farmers at another, teachers at a different table, youth, etc.
- At this time, remind them of the goal of the workshop, ask their expectations and set ground rules for a successful workshop.

[Call out box]

Consider an equity lens to ensure to maximize all voices and ideas regardless of power-dynamics in the room. When breaking into small discussion groups, create affinity spaces where people will feel comfortable to engage with each other in the same group. Consider how age, sex, language, status, etc. may affect peoples' participation. During plenary, small groups can share their ideas with the broader group. This ensures that people who might be more reserved can have their views shared in the bigger group and that people who feel confident sharing have a chance to listen to the views of others.

[call out box]

Tip: Experience shows that it is valuable to organize groups from the beginning of the workshop, that way the groups begin to know one another. It is more difficult to move people around once they get comfortable or find their comfortable spot in the room. If they are assigned a group, it creates a sense of purpose from the start. However, it may be helpful to assign stakeholders based on their area of expertise, strength, or interest to benefit from that expertise and passion.

3.2 Share back assessment findings

Sharing the assessment results provides context to the health system ecosystem for sustainability, or for the perceptions of risk / need and outstanding perceptions related to the topic being discussed in the workshop. This helps contextualize the need for the program and why the teams' work is helpful to the issue at hand.

- How to do it

Depending on your topic, you might provide the assessment results for a variety of the topics below

- Health services ecosystem for sustainability
- Risk perception / need of defined topic
- Attitudes, beliefs, knowledge
- Power dynamics, government, social cohesion or institutional trust, etc.

[Call out box]

Tip: Make the slides visually appealing. For example, here is an interesting format for sharing key questions and concerns.



3.3 Introduction of technical content

At this stage you have:

1. Organized the participants according to how you want to organize the strategy
2. Provided an explanation of why people have come together in the session - what you are trying to accomplish in community
3. You have set the ground rules for success
4. You have shared back the assessment findings (created demand and need for their collaboration)

You have helped the participants understand why their collaboration is vital. Now begin overlaying the need with solutions. At this stage you will begin to intertwine technical content

with activities. In an adult learning style, it is important to mix learning with application for better retention and to keep people engaged and focused.

Begin with introductory topics to ensure participants have a baseline understanding of the topic.

[Call out box]

Tip: Do not skip the foundational technical content, this is instrumental for helping people understand the background of the subject/topic so that they are able to have deeper and better conversations in community. It helps them be able to pivot in conversation and to address questions with a broader understanding.

Give people the novel so that they can use the information from pages they need at different times.

[Call out box]

Tip: Collect questions as they come up on a parking lot flipchart. At the end of the technical review sessions revisit any questions that were not addressed during the training sessions.

3.4 Goals

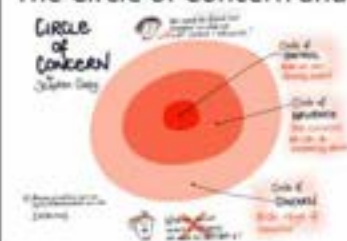
At this point you will need to be sure your groups are divided by the 'user type' which can also be described as the 'target audience or audience segment' that you are designing for. This could be by influencers in the community, e.g. leader type, or audience type / individual segments e.g. adolescent male / female, parent (mother / father), influencer groups.

3.4.1 Goal setting preparation

The Circle of Concern and Influence is a common principle used in business, leadership, and planning.⁵ The inner circle – circle of control is what we are able to control as individuals. The middle circle is what we have influence over and where we have our greatest power. The outermost circle is the circle of concern – which describes things beyond our individual control.

[Call out box]

The Circle of Concern and Influence



[text]

For these activities, we are focusing on the circle of control and the circle of influence.

⁵Covey, S. R. (2004). *The 7 habits of highly effective people: Powerful lessons in personal change*. Simon and Schuster.

3.4.2 Set goals

- What it is
 - Participants will identify the goal / behaviors you are trying to change of the individual (user).
 - If the user is an audience not in the workshop (e.g. adolescent male or female, parent, etc.) you consider what would be the aspiring goals to achieve. These could be informed by a variety of factors including programmatic goals, research, and immersion insights.
 - If your user is the community leader or CHW, they will identify their goals, e.g. to be a trusted source of information, to mobilize X # of households, etc.
- Why it is important
 - This will help create structure for the following activities and will bring cohesion to the group of participants working together. It also helps participants identify the actual goal / behavior changes they are trying to accomplish.
- How to do it
 - Give the team time to discuss the most appropriate group goals for the user (the user could be themselves or another person).

Effective behavior change / HCD recognizes what people care about and how program designers' desired behavior change fits into that, but it is unlikely that the program "behavior change" (e.g. get a vaccine) is going to be the same "behavior" that the user is thinking about (perhaps protect myself against COVID).

[call out box]

Tip: The facilitators or technical experts who are familiar with the data and program goals should move around the room and provide support and guidance to ensure the goals are in alignment with program goals. Be careful not to hamper creativity. Feel free to provide examples if you feel that would provide better guidance for constructive and tangible goals. Offering prepared examples can also save time at this step.



<https://blog.practicalservicedesign.com/the-difference-between-a-journey-map-and-a-service-blueprint-31a6e24c4a6c>

3.5 Empathy & exploratory phase

3.5.1 Empathy activities: how to know which ones to use

The tools and activities that are used will depend on who is involved in the process.

Style of design	Designing for health systems strengthening	Designing for individual behavior change
Who are they designing for	Designers / workshop participants are designing strategies and approaches for themselves (that are also designed for others)	Designers / workshop participants are the actual users of the HCD process
Designers / workshop participants	District nursing officer, district medical officer, community health nurse, health promotion officer, medical clinicians, administrators (including finance/information, etc.) who strategize and make decisions at a variety of levels	Influencers (e.g. religious, women, youth and community leaders) who directly promote change at the individual level with those they interact with
Tool preference	Empathy driven tools that draw out insights of the 'user'	Some empathy tools, more co-design and co-creation tools.
Example of recommended empathy tools	Persona profile, empathy map, journey map	Empathy map (not required but helpful), journey map

[call out box]

Tip: Have each group assign one or two people to collect materials for each activity – they will be responsible for collecting the materials and preparing the activity.

Tip: Preferred - create an example of the activity materials at the front of the room for people to follow for setting up their materials. Optional – show an example on a slide. An alternative is to prepopulate the flipcharts/tools prior to the workshop. You can also distribute the flip chart templates to the group tables or put the flip chart template up on the wall during a break to save time.

At this point, you have learned about individuals / end users from the assessment findings and / or from insight gathering. Now we will learn how to synthesize that information.

If you have not done an assessment, ensure you do insight gathering in the community and/or include users in the following steps before proceeding. Example insight gathering techniques are in Appendix 6.



3.5.2 Persona profile**

******Designing for others:** This activity is required if the workshop participants are designing for a user other than themselves. If the actual users are the workshop participants, they can do this as an optional activity. See Appendix 4 for example.

- What it is
 - This is where you begin to set up the user and develop a fictitious 'archetype' also known as a 'persona profile'. You will want to include at minimum the users' goal, influencers, interests, behaviors, needs, aspirations, beliefs, and concerns / worries.
- Why it is important
 - This is increasingly important the further away the designers are from the user. This helps you begin to contextualize the users' needs, goals, hopes, challenges and aspirations and begins to shape the empathetic approach.
- How to do it
 - This is a group activity / group discussion
 - Each group uses one piece of flipchart paper. Label it with the audience segment (community leader type or woman, male, parent (mother / father), provider type, etc.)
 - Make a section at the top to add background information on the persona and add a name, age, sex, rural / urban, and anything else that is relevant about their life such as their language or if they have a type of disability like a person who is deaf.
 - Below the background section, make a grid of six boxes for each of the topics: interests, behaviors, needs, influencers, values and aspirations. Add other categories if they suit your needs.

3.5.3 Empathy map**

******Designing for others:** This activity is required if the workshop participants are designing for a user different from themselves. If the actual users are the workshop participants, this is an optional activity. Though if it is a mixed group (users and non-users) this activity can be helpful to bring empathy and clarity for the non-users. See Appendix 4 for example.

- What it is
 - We do empathy maps because people's feelings, thoughts, actions, and words are not always aligned. Sometimes people may feel one thing but do something else. Empathy maps help us understand the full complexity of the experience

and look beyond words and behaviors, to also consider how people think and feel.

- Why it is important
 - Taking an empathetic approach helps workshop participants remove their own assumptions and contextualize the users' motivations and barriers and how their ecosystem influences their behavior change. We can better understand how their behavior is connected to their environment, social and cultural norms, power dynamics of relationships, and influences around them.
- How to do it
 - This activity is done individually (while sitting with group members); members will write their responses individually and the group members will populate one flipchart collectively.
 - Preparation: On a flipchart, draw two lines to make four quadrants. Label each quadrant Do, Say, Think, Feel
 - Quadrant 1 'Do': Begin with the most tangible (least abstract) piece of the activity. Experience demonstrates that it is easiest for people to think about what someone would 'do' on their journey to the desired outcome first (e.g. go to a clinic, talk with their mother, buy condoms, go to school, etc.)
 - Tip 'Do': Encourage participants to think in terms of verbs / actions (walk, talk, go somewhere, etc.)
 - Ask people to write one verb action per post-it note and post it to the flipchart in the 'Do' section.
 - Quadrant 2 'Say': Ask participants to repeat the activity but this time to consider what people would say on this journey to the outcome (one saying per post-it note).
 - Tip 'Say': Encourage people to consider what they might say to someone that they interact with.
 - Quadrant 3 'Think': Ask participants to write one thought per post-it note. They can consider thoughts that are going around in their minds – things that people might be thinking and not saying aloud.
 - Present some examples – "I wonder if someone will see me if I'm buying these pills or condoms"; "What will my husband think if I ask him to use a condom?"; "I can't go to the clinic, the staff will judge me."; "Is the vaccine safe?"; "How can we possibly finance all of these activities?"; "How will I get there?"
 - Quadrant 4 'Feel': Last, move to 'feel' – ask them to describe how the user might feel during these times. What would their emotions be at different times?
 - Some examples include shame that they cannot afford transport to the pharmacy; fear that the procedure will be painful or get an infection; apprehension to talk about sex / body with parents or teachers; relief after beginning contraception, anxiety to talk about topics that they do not have adequate training.

3.5.4 Journey map

See Appendix 4 for example.

- What it is
 - The journey map compiles the experiences of the users and brings to life key motivators, barriers, beliefs, and experiences of the users.
- Why it is important
 - This helps us understand what moves people forward or holds them back on their way to adopting a behavior change. The journey map helps us identify and prioritize opportunities for interventions or to know how / where to reach people and how they interact with their environment beyond the objectives of the program / intervention that you are designing for.
- How to do it
 - This is a group activity done collectively and through group discussion while using post-it notes or writing on the flipchart to document the journey.
 - Preparation: On a horizontal flipchart, draw a line horizontally to divide the flipchart into two sections (write the audience type or the persona name at the top of the journey).
 - Preparation: Indicate that above the line are the positive experiences, below the line are negative experiences.
 - Step 1: Add the goal that was created for them at the end of the journey (see if any modifications are needed).
 - If the participants did an empathy map, they can transfer those post-it notes to the journey map, otherwise, they can create a new journey map as a group discussion. Place post-it notes where they belong from beginning to the end of the journey.
 - The goal is to understand what happens along the journey. You can explain that you want to understand what pushes them forward and what holds them back. You can prompt teams by asking them, 'what happens next?' 'And then what?' keep asking questions to bring out more experiences in the journey.
 - They can consider it in stages – what happens at the beginning, middle, end of the journey. Sometimes the journey starts today (e.g. influencers prepping to do mobilization), in other examples, the journey will start before, e.g. if the designers are understanding the journey of an adolescent female for a sexual and reproductive program, their experiences leading up to adolescence will be helpful to include, thus the journey would start much earlier than adolescence.

[call out box]

Safety, respect and dignity

Some health issues can be sensitive with different groups of people. While talking about the health issue is important, in order to address it, the facilitators should take care and prepare.

To understand the sensitivities of the issue, it is important to discuss with representatives of different cohorts to understand how they feel comfortable talking about the issue and how they can talk about the issue when other groups may be in the same session. Be transparent and make sure all participants are aware prior to the workshop that this topic will be discussed. Talking about these issues can be lifesaving but people only discuss when they feel safe, dignified and respected. If you suspect tension, it might need to pivot the approach and do additional preparation before continuing. Stop and rethink how you can approach the subject next time safely, with dignity, and respectfully.

Tip: Use post-it notes to make it easier to move things around on the journey map as the group discusses the experiences along the way.

3.5.5 Passion voting

- What it is
 - Passion voting is when you give multiple stickers and people can vote based on how "passionate" they are about a certain topic. For example, if someone is very passionate about one idea, they can put all of their stickers on that one idea. If they are moderately passionate about many ideas, they can spread their votes out across many ideas.
 - In this exercise, participants will vote on the most important issues or barriers to address along the journey map. It does not exclude other topics, but this can help prioritize the most relevant issues to be addressed or relevant motivations / success or events where other initiatives can be layered.
- Why it is important
 - This can help focus solutions on the greatest needs identified by participants in the workshop.
- How to do it
 - Preparation: Provide each participant small dot stickers (usually about 5-6) to apply on the journey map they have created.
 - Instructions: Apply the stickers to the post-it notes that they feel are the most important to address or where they feel they can have the greatest impact.
 - People often want to vote on additional journey maps beyond the initial audience segment they are designing for if they have additional insights to contribute. You can also provide another round of voting stickers for this if relevant.

Optional activity: Root cause analysis

- What it is
 - The 5 Whys root cause analysis is an exercise that is used to cut quickly to the outer symptoms of a problem to identify the root cause. The exercise is based on

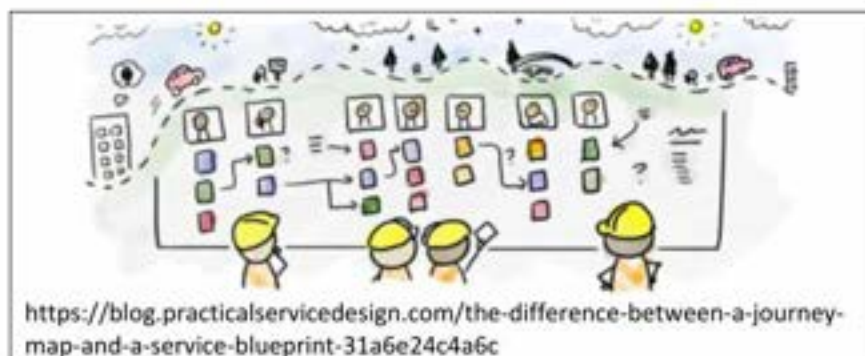
repeating and answering the question, Why? or Why is this problem occurring? Each answer forms the basis of the next question, until a root cause is reached. The idea of the activity is to ask the question Why? five times, however it may need to be asked more or less than five times to identify the root cause.

- Why it is important
 - Challenges are often symptoms of larger and more complex problems than what surfaces initially. This exercise is a way to get to the root of an issue so that the solutions will address the root rather than the symptoms of the problem.
- How to do it
 - Write your problem or barrier on the top of a fresh flipchart or paper. As a group, ask “Why is this problem occurring?” Together, answer the question and write it on the paper. Identify answers that are grounded in fact - they must be things that have happened. Next, ask ‘Why’ to your new statement and answer as a group. Repeat five times or until you agree you are at the root cause of the problem. Once the root cause has been identified, groups craft a problem statement based on the exercise.

3.6 Co-design

Style of design	Designing for health systems strengthening	Designing for individual behavior change
Designers / workshop participants	District nursing officer, district medical officer, community health nurse, health promotion officer, medical clinicians, administrators (including finance/information, etc.) who strategize and make decisions at a variety of levels	Influencers (e.g. religious, women, youth and community leaders) who directly promote change at the individual level with those they interact with
Who are they designing for	Designers / workshop participants are designing for themselves and for someone else (other than themselves) in their community	Designers / workshop participants are the actual users
Example of co-design tools	Voting, root cause analysis, framework, action plan	Voting, framework, action plan

3.6.1 Co-Design Framework



- What it is
 - The framework is a grid that you will develop to suit the needs of your collaborative sessions. It is a synthesis tool that will help you bring all the insights together.
- Why it is important
 - This is the beginning of the solution phase and it will help you organize the insights and key challenges or opportunities from the HCD activities.
- How to do it
 - Identify a wall in the room that is flat, and that you do not plan to use as a wall for a screen / projecting presentation.
 - Prepare the framework: Decide how you will organize your framework ahead of time, because this will set up how you organize groups during the activities.
 - You will include the users along one axis (usually horizontally across the top) and the intervention or planning topics along the other (usually vertically from top to bottom).
 - See Appendix 5 for examples that will help you identify a way to organize your framework.

Designing for health systems strengthening	Designing for individual behavior change
● Populate the framework: ○ One team/table/group at a time collects the most voted upon barriers and motivators from their journey map and adds them to the appropriate section of the framework. ○ Tip: The actual barrier, etc. might not fall within the audience segment that the group is focused on, it could be rooted in a different audience segment - map it to the appropriate audience	● Populate the framework: ○ Each team/table/group populates their column within the framework from top to bottom. ○ One representative from each table brings their table name to the blank wall. ○ Place the goal of the group just under the group identifier name ○ Answer the questions within the framework design: ▪ Question #1: Who will you reach? / Who do you want to

segment what would require the intervention.	motivate to do things differently? • Who are the vulnerable people that you feel need to be protected or motivated to do ____ (e.g. wear masks, get vaccinated, etc.)? • What do you want people to do, specifically, to protect themselves and each other ____ (e.g. COVID-19)? • What activities will you do? • What will you say to people to motivate them to practice the behaviors you hope they will? • What challenges will you have? • What resources you will need? 
	

3.6.2 Setting up Developing Solutions <i>How Might We</i> questions: • What it is ○ <i>How Might We</i> questions help frame the identified barriers and motivators and moves teams into a brainstorming process. • Why it is important ○ This is part of the creative problem-solving process that brings about many options rather than one perfect solution - teams can prioritize solutions after the activity. • How to do it ○ Begin rephrasing the prioritized barriers and motivators beginning with <i>How Might We</i> (e.g. <i>How Might we improve data quality?</i>; <i>How might we create demand for ____ population?</i>; <i>How might we more effectively engage influential people to gain their support for ____?</i>) ○ Reframe the <i>How Might We</i> questions into the framework. ○ Tip: You might want to take a photo of the framework prior to covering the barriers and motivators before applying the <i>How Might We</i> questions if you are planning to document the stakeholder priorities.	If solutions did not come out clearly in the RCCE framework, you can complement the previous activity with the Developing Solutions - <i>How Might We</i> questions and <i>Brainstorming</i> activities.
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3.6.2 Brainstorming

****Note:** This is a step in the process where groups change. ******* Until now groups were working by target audience segment. Before the brainstorming begins you can modify the groups to align with the workstreams (e.g. demand creation, service delivery, quality, strategic information, leadership / management / coordination and financing. That way teams align themselves with how the work will be accomplished.

- What it is
 - The brainstorming session is a collaborative ideation method to generate ideas and develop creative solutions.
 - This step should be time bound and focused on solutions to the specific question.
- Why it is important
 - This process allows participants to leverage each other's ideas
- How to do it
 - Each group should have a fresh flip chart and each person should be equipped with post-it notes and a marker.
 - Post the *How Might We* question that the team is brainstorming towards.
 - For a predetermined amount of time and focused on the question or problem, individuals write or draw their ideas on a post-it note, read and share it upon the flip chart. All participants listen and write ideas as they come up with them on post-its,

sharing ideas with the group when able. The group aims to come up with as many ideas as possible in the allotted amount of time. This process should encourage creativity. ○ Teams organize / consolidate ideas if there are overlapping ideas and begin to prioritize the ones that the team identifies as the most impactful.	
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3.7 Co-creation

Designing for health systems strengthening	Designing for individual behavior change
<i>3.7.1 Prototype</i> ● What it is ○ A prototype is an early, draft or model version of an idea to test the concept with the user before investing time and money in development. Prototypes can be made at any level from a very low (paper and pen mock-up) to a very high (almost real) fidelity. ● Why it is important ○ Prototyping helps us to break an idea up into easily digestible and testable components, to learn about what does or does not work about our idea by seeing how users react to it, to answer specific questions we have	<i>3.7.2 Content Co-creation</i> ● What it is ○ Community-led messaging mixes both the technical accuracy with appropriate language and context, the idea is to make the most relevant and fair balanced content. ● Why it is important ○ This is important because different cultures use different approaches and messages; it increases the likelihood that it will be understood and accepted by the individuals receiving the information. It helps us communicate in meaningful, relevant, and personal terms to gain traction in behavior change.⁶

⁶ Schoch-Spana M, Brunson E, Long R, Ravi S, Ruth A, Trotochaud M on behalf of the Working Group on Readyng Populations for COVID-19 Vaccine. The Public's Role in COVID-19 Vaccination: Planning Recommendations Informed by Design Thinking and the Social, Behavioral, and Communication Sciences. Baltimore, MD: Johns Hopkins Center for Health Security; 2020. https://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2020/200709-The-Publics-Role-in-COVID-19-Vaccination.pdf

about our idea, and to enable us to course correct and refine ideas.

- How to do it
 - Making a prototype involves making something visual or physical that helps you better imagine the possibilities and the pitfalls of the solution. Your prototype should break up your idea into easily understandable parts and should help you answer the specific question about your idea.
 - Teams can begin with construction paper, markers, stickers, tape, and other craft supplies that are available.
 - For each prototype ask the team to answer these questions:
 - What is the idea?
 - What problem is it trying to solve?
 - How does it solve this problem?

[call out box]

A prototype can be anything, but some examples of prototypes may be:

- Create a 3-D model of your idea
- Create a mock-up of a meeting or coordination / planning session
- Role play an experience using any props that might bring your idea to life
- Draw a diagram that maps out the structure or process of your idea
- Make an advertisement for content that is important to share to

● How to do it

- Everyone in the session has been trained on the technical content for what you are working towards.
- Set up flipcharts landscape side by side near each group. Each group will need three flipcharts. Label them with 1, 2, 3, 4, 5, 6
- One question at a time – give the teams the below questions.
- Question 1: Who is the intended user of the product or service?
- Question 2: What are the motivators for use?
- Question 3: What are the benefits?
- Question 4: Who should not use it? (Are there contraindications or precautions?)
- Question 5: Are there any potential side effects and how would those be addressed?
- Question 6: Other information such as dosing (e.g. for immunization, how many injections are required or for other products or services, when/how to use the product or service)?

[call out box]

Tip: Providing one question at a time allows teams to stay focused and ensure a group discussion, this will help with retention and technical accuracy of key fair balanced content.



different users, show how, where and what you will communicate	[call out box] Tip: Providing a 2-page summary of the most relevant content for technical accuracy will both make this process more doable for the participants, increase the likelihood of technical accuracy and move the activity along more quickly.
	

3.8 Action planning

Guiding questions

- What it is
 - Now that solutions have been identified and prototyped, details of how to implement the solution will be fleshed out through a series of guiding questions. Together, groups will answer each of the questions for the solutions created.
- Why it is important
 - These questions help the teams turn a prototype into an implementable solution.
- How to do it

Organized and prioritize the solutions that were created. To do that, place them from top to bottom along the left side of the flipchart and answer the guiding questions to the right of each solution.



As a group, teams answer the five guiding questions for each solution. Responses can be filled in with post-it notes next to the activity that will be used in the next activity to develop the workplan.



[Call out box]

Guiding questions

1. Who (be specific) will implement the idea?
2. What activities do they need to do?
3. What do we already have that we can leverage to make this happen?
4. What needs to be created or developed to make this happen?
5. What technical support is needed?

Workplan development

- What it is
 - A workplan will be your template for how to move forward. Teams will use the answers to the guiding questions to begin to detail out the workplan for each solution.
- Why it is important
 - Building a workplan together in a visual manner allows all participants to share their input and expertise to make sure the workplan is realistic, achievable and solves the identified problems.
- How to do it
 - Teams the barrier identified / issue to address, solutions, persons responsible and resources needed.
 - You can then transfer the workplan to an electronic template to document and share with others.

[Call out box]

Implementation tips for community mobilization

- Begin engagement and activities with the state level officials, then district level, followed by ward level and then to the community.

- Include influencers from a variety of e.g (womens' groups, youth groups, religious groups and people living with disabilities) and speak with them ahead of time to increase engagement and acceptance within the community.
- Sensitization activities that will be conducted in multiple locations should be conducted consecutively; this will help draw learning from the activity in one location to improve activities that follow.
- Have a pre-sensitization activity meeting with the team to discuss key issues like translating materials to the local languages, target areas to cover, practice role play etc., these practical steps help the teams conduct mobilization with efficiency.
- Have a post sensitization meeting or feedback workshop to collect feedback from the influencers and community members, this enables opportunities for improvement as you move through your activities.

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Appendix 1: Case Studies

Case Study 1: Using human centered design for health systems strengthening in Zimbabwe

Background: Zimbabwe adopted voluntary medical male circumcision (VMMC) in 2009 as a high impact HIV intervention and scaled up national program implementation through 2018. In 2019 many districts throughout the country had reached the target coverage of 80% of men ages 15-29 years. To maintain coverage of 15–29-year-old males, the VMMC program needed to ensure that more than 80% of adolescents aging in from the 10–14-year age group are circumcised.

Population Solutions for Health (PSH) was assigned by Ministry of Health and Child Care (MoHCC) to design and implement collaborative and district-led workshops that leverage the HCD approach to develop a plan for sustainable and integrated VMMC service delivery and to ensure new / adapted programs were designed with the (new target group - adolescent males ages 10-14) users in mind. The workshops used HCD tools and approaches to develop strategies across the 6 health systems strengthening pillars: 1) demand creation; 2) service delivery; 3) quality assurance; 4) strategic information; 5) leadership, management and coordination; and 6) financing. The HCD process informed workshops were implemented in 22 districts with 20-35 stakeholders in each workshop per district.

Workshop and district preparation: MoHCC conducted district-level baseline assessments, using a nationally agreed standard tool, to assess district readiness and progress towards sustainable implementation across the six pillars. The objective of the tool was to identify gaps in programming and highlight areas where technical assistance is required. Once the baseline assessments were conducted and results available, a team of workshop facilitators (1 HCD expert, 2-3 interns, 1-2 HQ program staff) were deployed to guide the 5-day process with district stakeholders.

Workshop implementation: PSH, in partnership with the MoHCC, built on learnings from the assessments with district-level user-centered workshops. Stakeholders continued to build on their learnings, gather insights from communities, and develop district-led solutions to their challenges, developing a detailed sustainability plan. This process ensured that the sustainability plans were rigorous, measurable, district-specific, district-led and user-centered. The goals of the workshop were to 1) collect stakeholder and user insights regarding VMMC sustainability / health systems strengthening pillars; 2) to find creative solutions to challenges to sustainability across the six pillars; 3) to use a creative and collaborative approach to develop

a sustainability plan for the district; 4) to identify gaps and technical support required for the district to be successful in the sustainability plan; and 5) to familiarize and upskill participants on the key aspects of HCD.

Collectively, across the 22 districts, 554 stakeholders (from MoHCC, Ministry of Primary and Secondary Education, National AIDS Council, local government, and PSH) participated in the HCD process. Stakeholders collectively conducted participatory insight gathering with 675 key program users and influencers in the community including circumcised and non-circumcised adolescent (10-14 years) males, parents of adolescent males, educators such as- headmasters and teachers, community leaders, and health providers such as- nurses, medical counselors, and doctors). The insights from these participatory interviews were used during the collaborative synthesis (empathy and journey map) activities during the workshop to help inform stakeholders of their barriers, motivators, needs and contextual environments.

“[I] learnt empathy helps elicit information.”

– Mutoko Participant

Results: The development of clear, actionable district-specific plans informed by data, by program users themselves, and by collaborative input from a range of district stakeholders. The plans addressed key issues including: limited age appropriate materials for specific cohorts (boys and parents); parents not knowing enough to give consent, limited training for educators, lack of community ownership, lack of age appropriate information for community leaders to share, non VMMC providers not sensitized to VMMC; shortage of certified providers to conduct circumcision and lack of VMMC in rural areas, shortage of medical supplies and commodities and shortage of vehicles; the need for more robust data verification procedures and quality audits at clinic level, expanded learning need for QA team, efficient and effective reporting of adverse events; different reporting timelines among different partners, inconsistency / incomplete data; lack of integrated programming with VMMC; limited coordination among all stakeholders; limited resource allocation and limited commodities; limited sustainable funding mechanisms for clinics.

Participants expressed that the collaborative approach led to a more efficient and actionable plan than the typical process. Participants reported the most impactful element of the process to be the engagement of users in program design, something that they had never previously done but that they perceived to strengthen the program, etc.

"If I'm asked to mention the one thing, I really enjoyed in the past four days, it's the four days. It was all involving, and it was reflecting on what we are seeing and hearing people doing... And including our own reactions to what people do, say, and feel. Everyone was doing. We were producing our own. This is my workplan, not something that was prescribed."

- Participant, Zvimba District

"Collaboration is essential for the success of the program."

– Participant, Rushinga District



PILLARS OF SUSTAINABILITY

Both the baseline assessments and district user-centered design workshops were centered around the six pillars of sustainability that are defined in the national strategic plan for VMMC, the Sustainability Transition Implementation Plan 2019-2021 (STIP). This ensured that both the assessment and the district plans were rigorous and comprehensive.



WORKSHOP OVERVIEW



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Case Study 2: Preparing for COVID-19 vaccines in Haiti: A community influencer led approach to increasing vaccine confidence

Challenges of porous borders and ongoing conflict leave Haiti ill-equipped to face the COVID-19 pandemic. This is exacerbated by the ongoing political division, densely populated slums controlled by gangs, lack of sanitation and clean water, food insecurity, limited resources for health and overall poverty at large.

Low risk perception of COVID-19, low trust in and use of healthcare institutions, and spiraling mis / disinformation about COVID-19 vaccines make communities even more susceptible to low vaccine confidence.

Even though vaccines were not expected for many months, Mercy Corps Haiti knew that the longer misinformation was able to spread and questions about COVID-19 and vaccines were left unanswered, the more difficult it would be to course correct when vaccines did arrive. They decided it was time to start mobilizing leaders to answer questions within their communities. Moreover, these influencers needed to design strategies to advocate for prevention behaviors including physical distancing in crowded spaces, mask wearing and other hygiene measures.

In January 2021, Mercy Corps coordinated with the Ministry of Health and risk communication and community engagement (RCCE) community of practice to discuss the opportunity for vaccine confidence work and began designing a community assessment.

The team conducted human centered design planning sessions with nearly 100 community leaders throughout Canaan (an informal settlement outside of Port au Prince), and Bas Ravine and Petite-Anse at Cap Haitien. The community leaders consisted of religious leaders, youth leaders, women's groups, farmers, entrepreneurs, and teachers. Leveraging data from the community assessment and insights from the community leaders, a human-centered design approach was used to create hyper-focused community engagement strategies and communication content to respond to the contextual needs of their communities. Tools used include empathy map and journey maps highlighting the user-experience of the community leader to implement activities. To follow, the team used a framework to facilitate a collaborative and co-creation process to document the target and vulnerable audiences, key behaviors they would like to see change in their communities, activities they plan to do, key information they plan to share, resources that would support the process and challenges they might have. The last step of this workshop included a content (messaging) co-creation process for technical COVID-19 vaccine questions.

Following the workshops Mercy Corps funded some of the programs such as

- Technical and financial support for the replication of training.
- Field materials to assist with interpersonal dialogues in communities.
- Distribution of hygiene kits in communities.

These activities were complemented with a COVID-19 and vaccine national hotline and digital community mobilizers.

Community-led process			
Share back assessment findings	Setting influencer goals as a team	Empathy map	Training
			
Journey map	Framework co-design	Messaging co-creation	Developing a way to delivery important key content
			

Tip: Identify a dedicated person to document the findings as you go.



"Now we know what Corona is and look at all of these post-its and the work is amazing – this is us."

– Canaan Participant

Framework template

Risk communication and community engagement Topic	Question to answer	Community Leader group 1	Community Leader group 2	Community Leader group 3	Community Leader group 4
Target audience	<i>Who do you feel is the highest risk to protect in your community?</i>				
Vulnerable population	<i>Who do you feel are the MOST vulnerable people to protect?</i>				
Key behaviors	<i>What do you want to change in your community? Which behaviors?</i>				
What to say	<i>What are the key messages you think you will need to communicate?</i>				
Activities	<i>How will you reach people? What will you do?</i>				
Challenges/ Resources	<i>What challenges will you face? What resources might be needed?</i>				



Additional implementation activities			
Community trainings	Distribution of hygiene kits	Digital influencers	National Viamo hotline
			

Case Study 3 Iraq: Designing a community-led and user-centered approach to address COVID-19 prevention behaviors, vaccine equity and vaccine confidence in Iraq

Ninewa, Iraq has the highest percentage of vulnerable individuals where the federal government has moved to close all IDP camps causing secondary displacement, increased vulnerability and needs that are more difficult to track. Ninewa and Salah al-Din areas were struggling with the high rates of dissatisfaction in health services and people were worried about the expense as well as the possibility of contracting COVID-19 when visiting a clinic.⁷ Intermittent lockdowns and travel restrictions imposed by federal and provincial governments created substantial uncertainty. Moreover, the psychological stress of containment measures was causing trauma, stress and anxiety.

With the worry that the spread of misinformation and entry of vaccines could exacerbate drivers of conflict, Mercy Corps Iraq began preparing to engage communities in Ninewa (East and West Mosul and Tel Kaif) with a COVID-19 vaccine confidence program in coordination with the Director of Public Health of Division of Vaccination and Immunization in Nineveh and existing community committee structures to create COVID-19 Vaccine Response Committees (CVRCs). Over the course of four days, the participants learned about the assessment findings⁸ and were trained on 1) advocacy, 2) social cohesion, 3) COVID-19 and 4) vaccines. The community leaders designed hyper-focused community engagement strategies and used WHO technical guidance and content from the Directorate of Health to design context-specific and responsive messaging as teams.

The main focuses of the community-led strategies included:

- Vaccine Equity: Raising community voice to the government. To begin, the community leaders facilitated discussions in the community to identify the key issues (including access issues, lack of vaccines and lack of services), then Mercy Corps facilitated a dialogue between community leaders and government officials.
 - As a result, additional vaccination centers opened closer to communities in need and there was a more equitable distribution of the vaccines available in the market.
- Community Committee dialogue sessions: Engaging community members in dialogue about vaccines. Each week CVRC leads met with 15 community members providing accurate information, dispelling misinformation, and sharing vaccination center locations.
 - This also provided an opportunity to collect community feedback to iterate our materials and discussion points.

⁷ https://groundtruthsolutions.org/wp-content/uploads/2021/02/GTS-COVID_19-report_-iraq_-R3.pdf

⁸ Of 376 respondents nearly half of men and more than half of women were not vaccinated and were not planning to get vaccinated. Of those who didn't know how to access or register for the vaccine, about 80% also didn't want help with knowing where/how to register for it. Qualitative data analysis indicated nearly 40% of respondents were access dependent, waiting to see what others did or had outstanding questions (including about safety and side effects, and efficacy).

- Note: social media monitoring was also being conducted; this was compiled alongside community feedback to inform responsive messaging and materials
- Community Health Workers (CHWs): Six CHWs 2 in each area (East Mosul, West Mosul, Tel Keif) went door-to-door in communities to answer questions, provide accurate information, fill information voids / correct misinformation.
- Content collected during the Community Committee dialogue sessions and through online social media monitoring was assessed weekly and informed the regular updates provided through the CHWs.

[Results will be updated throughout November as we are still waiting on the MEL report]

- Tools used and photos of activities (is a placeholder/idea for designer to replicate for toolkit example)



Case Study 4 Nigeria: COVID-19 behaviors and vaccine confidence in Nigeria: A community-led approach to greater vaccine confidence

In Nigeria, by March 2021, in addition to multiple conflicts and insecurity challenges mis and disinformation was already circulating about COVID-19 vaccines. COVID-19 and responses to it were adding to exacerbating drivers of conflict by diminishing trust in government, increasing economic hardship and resource scarcity, and disrupting social cohesion.⁹

Mercy Corps Nigeria approached the National Primary Health Care Development Agency (NPHCDA) to discuss collaboration on a short-term vaccine confidence pilot project. Yobe state was selected based on need (high vaccine hesitancy) and Mercy Corps' deep knowledge of the context and relationships with communities. The team began with a desk review and learnings to provide implementing team members with supported social and behavior change and infodemic management skills.^{10,11,12,13,14,15,16,17,18,19,20,21} After coordination with NPHCDA, Nigeria CDC and WHO, Mercy Corps initiated an assessment to understand the context of COVID-19 prevention behaviors, risk perception, government trust, vaccine perceptions / attitudes, and information ecosystem.²² After conducting a quantitative analysis of the results, a qualitative analysis was conducted on the psycho-behavioral segments to define specific strategies. These results and recommendations were shared in a validation meeting with partners including government officials, UNICEF representatives and NGO stakeholders, co-facilitated by Yobe State Hon. Commissioner for Health, Dr Muhammad Lawan Gana.

Mercy Corps and the other stakeholders agreed that a community-led approach would be the most effective to address challenges related COVID-19 prevention behaviors and low COVID-19 vaccine confidence. Mercy Corps brought together 25 community leaders (identified by the

⁹ Mercy Corps. 2021. A Clash of Contagions: The Impact of COVID-19 on Conflict in Afghanistan, Colombia, and Nigeria. Washington, D.C.: Mercy Corps. <https://www.mercycorps.org/sites/default/files/2021-06/Clash-of-Contagions-Full-Report-June-2021.pdf>

¹⁰ <https://covid19.ncdc.gov.ng/> (accessed April 8, 2021)

¹¹ <https://nphcda.gov.ng/covid-19-vaccination-update-in-36-states-and-the-fct/> (accessed March 22, 2021)

¹² <https://covid19.ncdc.gov.ng/media/files/COVIDResponseMarch1.pdf> (accessed March 2021)

¹³ https://covid19.ncdc.gov.ng/media/files/UPDATED_RCCE_Strategy_web_version.pdf

¹⁴ <https://nphcda.gov.ng/nigeria-flags-off-covid-19-vaccination-campaign/> (accessed March 7th, 2021)

¹⁵ <https://covid19.ncdc.gov.ng/media/files/COVID19PatientsBookforHomebasedCare.pdf>

¹⁶ <https://ccp.jhu.edu/kap-covid/kap-covid-country-profiles-with-demographic-disaggregation/> (Accessed March 2021)

¹⁷ <https://apps.who.int/iris/bitstream/handle/10665/337335/9789240016927-eng.pdf?sequence=1&isAllowed=y>

¹⁸ <https://dataforgood.facebook.com/covid-survey/vaccines>

¹⁹ https://www.unicef.org/mena/media/8401/file/19218_MinimumQuality-Report_v07_RC_002.pdf.pdf

²⁰ <https://whoinfodemic.citibeats.com/?cat=fYJ1oBNEUQtfbExrkGvsyr> (accessed April 7, 2021)

²¹ https://covid19.ncdc.gov.ng/media/files/UPDATED_RCCE_Strategy_web_version.pdf

²² https://docs.google.com/spreadsheets/d/1y_b5J5yS7tN9kvVRcBaEM0PVSJD8xuz0bgWT100yb_o/edit#gid=392175790

Ministry of Health) to leverage a community led (human centered design) approach. The community leaders represented a variety of religious networks and other leaders.

The community-led approach began with sharing the results of the community assessment including the most common questions from the community (vaccine safety and efficacy, access points and side effects). Trainings were facilitated on misinformation, COVID-19 overall, how community leaders can instill hope, COVID-19 vaccines and interpersonal communication in times of crisis. A co-creation process was used to develop community-facing content ensuring it would be contextually applicable and culturally sensitive. The facilitators led community leaders through a process to design hyper-focused community engagement strategies to support behavior change for both COVID-19 prevention behaviors and vaccine confidence in their immediate networks. A community flipchart, Moderna and AstraZeneca FAQs and a brochure were developed after inputs from the leader training and with contributions from NPHCDA.

These influencers / leaders supported their communities through sensitization in their immediate networks. A targeted approach was used for the sensitization where information was passed down through a cascading network, from the emirate councils, to the district and ward heads, who then spread the information to their community members.

As of November 12, community leaders in groups of five have conducted sensitizations to five Emirate Councils in Yobe. In total, they have been able to reach 97 community and religious leaders, estimated to reach about 1000 to 2500 people with COVID-19 messages during their own sensitization. **[this will be updated throughout November as we are still implementing activities]**

"COVID-19 can be defeated if we join hands to fight it."
~ Community Leader, Yobe

"My goal is to make people understand the danger of COVID-19 and make them understand the importance of being vaccinated". ~ Community Leader, Yobe

"I will create a facebook page and organize some programs to advise my people about the vaccine". ~ Community Leader, Yobe

"My goal is to be a trusted source of information. I will preach and organize seminars on the importance of vaccines". ~ Community Leader, Yobe

Call out Box

Community-led process and training slides + field materials

Master [Facilitation training deck](#)

Training ppts: [About misinformation](#); [About COVID-19](#); [How community leaders can communicate to end misinformation, discrimination and instill hope](#); [COVID-19 vaccines](#); [Interpersonal communication in times of crisis](#)

Community facing materials: COVID-19 behaviors and vaccine [Flipchart](#) and [flipchart](#); [Moderna vaccine FAQ](#)

Message co-creation process



Overview of process



Implementation Activities



Appendix 2: Examples of workshop participants and technical content

Type of workshop participants	Community leaders	Community health workers	Local decision makers
Example of participants	Religious leaders, women's groups, male and female - youth leaders, farmers, entrepreneurs, teachers, etc.	Male and female community health workers, community nurses, etc.	District Medical Officer, District Nursing Officer, Health Promotion Officer, Service Providers (doctors / nurses), Community Health Nurse, Representatives from Ministry of Education, Finance, etc. NGOs
Why these participants?	Community leaders are influential in communities, they are trusted sources and because they are part of the community, they understand the context and social dynamics – this is all critical to driving change. As we rely on them to help us facilitate behavior change, understanding them as a target audience, influencer and 'user' is integral to program success. Through this process we learn how to support them better on their journey as agents of change. Many of them do not have technical training (though some might) in health or technical health areas/ products. Through this process we ensure that the community leaders have accurate information and the ability to develop technically accurate and contextually appropriate content for sharing with community members.	Community health workers are an integral part of the community health system and depending on their level of training, they deliver different levels of health care in communities. They are very influential in communities and are often a first point of contact when someone is seeking health information. They are trusted in communities because they come from the community and are trained in health by the government or NGO partners. Through this process we learn how to support them better on their journey as agents of change. They are trained in technical health areas, and as new topics arise (e.g. COVID-19) and new products come to market (e.g. COVID-19 vaccines, a new family planning method, or application for PrEP) it is important that they have the information to provide technically accurate information in communities. It is important to not make assumptions that because they are health workers, that they	These decision makers are planning programs for health systems strengthening but are often a few steps away from the end user. This approach brings decision makers together in an empathy driven way to develop more sustainable program design. Through the process they gain insights from community members and better identify how to help them along their journey. This level of participants will likely not only design a strategy but will also need to do further HCD activities including prototyping and testing. For more information on - see the UNICEF Demand for Health Services HCD Field Guide.

		will understand a new virus, new products and the features, benefits or safety profile without dedicated training and time for discussion/Q&A.	
Example of strategy	To design hyper-focused community engagement strategies around COVID-19 prevention behaviors and to increase vaccine confidence.	To encourage the use of health products and services.	To develop a sustainable approach for quality service delivery at the community level.

Examples of technical training modules	• About misinformation • About COVID-19 • How community leaders address misinformation, discrimination and instill hope • About COVID-19 Vaccines • Interpersonal communication	• About sexual and reproductive health • Landscape of different family planning products • Product specific information • Interpersonal communication	• Background on sustainability goals • Baseline assessment findings for sustainability (district level) • Assessment findings for behavioral insights related to VMMC • Introduction to HCD and design sprint process and practice
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Appendix 3: Participatory interview techniques for collecting user insights

Circle of Influence	Objectives: Understand who they listen to, who influences them, and why . Purpose: Build rapport with the interviewee and gather background context for future conversations. Materials: Poster with concentric circles and a deck of cards with influencers. Description: The interviewee places the cards on the circles (influencers with the most influence would be placed closest to the center, and those with the least influence would be placed furthest away). Once he/she has placed the cards, ask questions to understand why he/she put each influencer there. Probe into them if any are particularly surprising. Let him/her add additional influencers if anyone is missing.
Dreams and Wishes	Objectives: To understand the interviewee's dreams and wishes and how circumcision might affect those. Purpose: To help us understand what interviewees aspire to, and what will motivate them to support circumcision. Materials: Poster board with the spectrum and a deck of cards with topics. Description: Ask the interviewee to rank the cards in order of what is least important to most important. Once the interviewee has made the placements, ask him/her to add at least two dreams/wishes that are missing. Ask questions to understand why he/she placed the cards in that order. If anything is surprising, probe into his/her thought process when placing it there.
Journey Map	Objectives: To understand the interviewee's journey with circumcision. Purpose: To understand the different phases of the interviewee's journey and what was pushing him/her forward or pulling him/her back in each phase. Materials: Journey map template, pen. Description: Starting with when he/she very first heard of circumcision, ask the interviewee to tell the story of his/her journey. Map out every time he/she had an interaction related to circumcision (talked about, heard about, thought about, experienced, etc.). Map positive experiences above the line and negative experiences below, for a visual snapshot of the journey. Probe into anything unclear or surprising.

Appendix 4: HCD tools for collaborative workshop sessions



Tool name	Workshop setup	End result example
Persona Profile ²³		
Empathy map		
Journey map		
Content co-creation matrix		

²³ Persona profiles (archetypes) and journey map examples can be found in the [Comprehensive National HIV Communications Strategy for Zimbabwe: 2019-2025](#).

Appendix 5: Framework Examples

Health Systems Strengthening

If your workshop participants are stakeholders rather than the users themselves (though you likely have a mix), you will set up your framework in a different way – below is an example.

If your users are adolescent males, parents, teachers, providers, community leaders, and other stakeholders planning a community-led service delivery strategy your framework might look like:

	Adolescent (male or female*)	Mothers	Fathers	Teachers	Providers	Communit y leaders	Other stakeholde rs
Demand creation							
Service delivery							
Quality assurance							
Strategic information							
Leadership, coordination & management							
Financing							

*This will be dependent on the type of program you are designing for e.g. if you are designing for adolescent males for male circumcision this column will be 'adolescent male'; or will be 'adolescent female' if you are designing for a female-based product / service, however if males are also a target audience (influencer) of a female then you would also include a column for them.

Influencer / Leader Risk Communication and Community Engagement

If your users are community leaders designing hyper-focused risk communication and community engagement (RCCE) strategies, you can put the community leaders types (how you have the groups organized) across the top and questions to be answered as they correlate to the different components of an RCCE strategy along the side.

[callout box]

Tip: Add one question at a time. This will help the group stay focused. Give them 2 minutes per question.

Pro tip: Create the questions and make pieces of tape to apply them to the wall ahead of time.

Note: Sometimes post it notes do not stick to the walls well, or they fall off, you can tape up blank pieces of printer paper to apply the post it notes to – this should help them from falling off the wall.

Applying the responses to post-it notes is a fun and interactive way to keep the group involved and for all voices to be included, however you can adapt this process to flipcharts if necessary.

	Religious leaders	Women leaders	Male youth leaders	Female youth leaders	Male farmers	Female farmers	Male entrepreneurs	Female entrepreneurs
Who do you feel is the highest risk to protect in your community?								
Who do you feel are the MOST vulnerable people to protect?								
What do you want to change in your community? Which behaviors?								
What are the key messages you think you will need to communicate?								
How will you reach people? What will you do?								
What challenges will you face?								
What resources might be needed?								

Appendix 6: Field materials

If you plan to have participants do mobilization activities following the workshop, please have at least a draft of the field materials for testing / review and feedback.

- What it is
 - Field materials help present technical information in a way that is easily understood by community members. These might include a simplified training deck (for the community leaders to conduct field training), field flipchart, brochures, social media content easily shared in social media, etc.
- Why it is important
 - These materials can help mobilizers keep their dialogues technically accurate (it is hard to remember everything you learn in a training without reminders, especially when you learn a lot all at once).
 - It makes conversations easier for the mobilizers to ensure they have the facts to reference to answer questions (avoids accidental misinformation).
 - It captures the attention of the person who the mobilizer is engaged in dialogue with
 - These are important because people, in general, can be either or both auditory and visual learners.
 - The materials can help instill confidence in the mobilizer because they know they can always refer to the materials.
- How to do it
 - For any field materials you want to include a description of 'who' are you talking about/ whose behavior do you want to change?
 - For pharmaceutical products or service delivery interventions you need to ensure fair balance of information meaning you need to include both safety (side effects, precautions, contraindications/who should not use the product), efficacy (that it works), dosing information (how often to use the product/when/time between injections for a vaccine, etc.) benefits of the product or service and generally a very brief understanding of how the product/service works. To ensure informed choice it is important to have mobilizers well versed in the different choice options (e.g. family planning). You can see some examples of materials in the case study section.

Other resources:

Johns Hopkins Bloomberg School of Public Health: Modules on Interpersonal Communication & Building trust with empathy <https://www.covid19vaccinetraining.org/training-modules/module-3-trust>

Collective Service Risk Communication and Community Engagement Guidance on COVID-19 Vaccines for Marginalised Populations https://communityengagementhub.org/wp-content/uploads/sites/2/2021/09/2021_09_20_Guidance-on-COVID19-Vaccines-for-Marginalized-Populations_FINAL-MASTER.pdf

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