From insight to action: A toolkit for mpox preparedness and response research

A practical guide for research-practitioner teams

A Report for the WHO/European Region created by the
RCCE-IM Collaboration Centre at Kristiania University of Applied Technology – Oslo, Norway

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Abstract

This evidence-based toolkit was developed to strengthen public health responses to mpox outbreaks across the WHO European Region. It t is designed to generate actionable evidence before initiating RCCE-IM activities, The toolkit equips research–practitioner teams with a tool for conducting rapid social science research before and during outbreaks.

Validated through pilot testing and community consultation, the toolkit offers an adaptable survey to support stigma-sensitive, research projects to tailor risk communication, community engagement and infodemic management (RCCE-IM) messaging and interventions. The toolkit enables RCCE-IM practitioners and researchers to rapidly assess behavioural drivers and barriers, build trust, counter mis- and disinformation, and improve compliance with official guidance.

The outcome targeted by this toolkit is message acceptance. The focus on message acceptance, highlights the importance of emphasizing why public health guidance is offered to support informed decision-making by communities.

Pilot testing across three countries revealed that demographic factors alone were insufficient predictors of behaviour. Instead, identifications – including political ideology, religiosity and personal values – were significantly more predictive of whether individuals accepted and acted on public health recommendations.

This document is based on WHO's RCCE-IM work during the mpox outbreak since 2022 and the IDEA (internalization, distribution, explanation, action) model, providing a structured approach to understanding and improving message acceptance.

Keywords

MPOX; INFODEMICS; DISEASE OUTBREAKS; SOCIAL SCIENCES

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Glossary

Battery (of questions): a set of related closed-ended questions presented in a matrix format designed to: (1) obtain a broad understanding of a respondent's views on a specific topic; (2) collect a large amount of information efficiently; and (3) assess attitudes, beliefs, and opinions on the topic.

Categorical variable: (sometimes called a nominal variable) has two or more categories, but there is no necessary ordering to the categories. For example, if you were comparing three countries (UK, Belgium, and Netherlands), it does not matter which of those countries is listed first, second, or third. An order is assigned.

Composite score: a single number created by taking the average of the responses to a specific battery of questions. This allows the battery to be condensed into a more useful score for analyzing the data.

Correlation: a measure of a mutual relationship or connection between two or more variables. Correlations can be positive meaning that when one of the variables change, the other does in the same way. An example of a positive correlation in the context of this toolkit – if we observe that the greater the level of education in our sample, we also observe greater trust in governments, there would be a positive correlation between education and trust. Correlations can also be negative meaning that an increase in one variable corresponds to a decrease in another. An example of a negative correlation in the context of this toolkit – low levels of education is related to greater susceptibility to infodemics. Correlation; however, does not mean causation. To test a causal relationship, a regression test is required.

Cross-tabulation: a table that shows how two different variables (like education and trust) are related.

Demographics: characteristics of populations used to segment and understand different groups. In research, demographics are important to collect. In this toolkit, they include:

- age
- gender
- education level
- marital status
- household composition
- country of residence
- country of birth.

Determinants: influence whether individuals accept and act on public health recommendations. In the context of this toolkit, determinants include demographic characteristics (e.g. age, gender, education), identifications (e.g. political ideology, religiosity, personal values), and communication-related variables from the Internalization, Distribution, Explanation, Action (IDEA) model. These factors are related to message acceptance and guide the design of targeted, evidence-based interventions.

Dependent Variable: a variable whose value is affected by another variable. It is what is measured – in the context of this toolkit, message acceptance is the primary dependent variable.

Dummy coding: a procedure that compares one categorical variable to all others in the same category for statistical analysis – especially correlation and regression. For example, if we want to compare how people in the Netherlands compare to any other country measured, the Netherlands would be assigned one number and all others would be grouped together and assigned a different number.

Enabler: a factor that increases the likelihood of individuals accepting and acting on public health recommendations. In the toolkit, enablers include:

- trust in expert and official sources
- belief in the effectiveness of recommended actions (response efficacy)
- simpler, relatable actions (small steps approach)
- institutional trust and support systems.

Factor: a group of related survey questions that together measure a complex idea (like trust or values).

False information: a general term that includes both:

- **misinformation**: incorrect, misleading, or misattributed information shared without intent to cause harm; and
- **disinformation:** incorrect, misleading or misattributed information shared with the intent to deceive or manipulate – this can include true information that is artificially amplified or strategically framed.

Identification: refers – for this publication – to the social and ideological affiliations that shape how individuals perceive health risks and respond to public health recommendations. These include:

- political identification (e.g. liberal or conservative leanings)
- religiosity (the role of religion in daily life)
- values (such as social justice or environmental protection)
- cultural attitudes (e.g. intercultural contact and openness)

Inhibitor: a factor that reduces the likelihood of individuals accepting public health guidance. In the context of mpox, inhibitors include:

- high perceived knowledge (which may be inaccurate)
- belief in misinformation or conspiracy theories
- low perceived personal risk
- concerns about privacy or stigma

Independent variable: a variable whose variation does not depend on that of another. Its value does not change by the other variables being measured. Independent variables have at least one of three characteristics: (1) they are unaffected by others (e.g., gender); (2) it causes the changes in other variables (e.g., enablers); and/or (3) these are the ones that are controlled (e.g., in an experiment to test messages, presenting different messages to different groups of similar people to determine which one is the most effective).

Infodemic: an overabundance of information – both accurate and false – that makes it difficult for people to find trustworthy sources and reliable guidance during a health emergency.

Interview guide: a structured or semi-structured list of questions used during interviews to help researchers explore specific topics. It ensures consistency across interviews while allowing flexibility to follow up on important points raised by participants.

Likert scale: a common survey format where people rate their agreement with a statement on a scale (e.g. 1 = strongly disagree to 5 = strongly agree).

Message acceptance: the degree to which individuals are willing to accept and act on public health recommendations. In the context of this toolkit, message acceptance is a measurable outcome used to evaluate the effectiveness of communication strategies. It reflects how well public health messages resonate with different communities and is influenced by factors such as political identity, religiosity, trust in institutions and perceived relevance of the health threat.

Mpox (previously known as monkeypox): a viral disease caused by the monkeypox virus, a member of the Orthopoxvirus genus in the Poxviridae family. It spreads mainly through close contact with someone who has mpox, causing a painful rash, enlarged lymph nodes and fever. The disease can be severe, especially in young children, pregnant women and immunocompromised individuals. Mpox can be transmitted through close contact with infected individuals, contaminated materials or infected animals.

Predictive variable: a factor that helps explain or forecast a behaviour or outcome. Also referred to as an independent variable or enabler.

Preparedness research: a strategic, long-term research that happens before or between emergencies. It helps prepare by establishing baselines and learning what might work best, so systems, messages and strategies are ready in advance. For this publication, the focus is on the social, behavioural and ideological factors that influence public health message acceptance.

Public Health Emergencies: refer to situations that pose a significant risk to health, requiring immediate action to prevent widespread illness or death. These emergencies can result from disease outbreaks, natural disasters or other health threats. WHO's Health Emergencies Programme works globally to prepare for, prevent, detect and respond to these emergencies, ensuring that health systems are resilient and capable of managing such crises.

Regression analysis: a statistical method used to identify causal relationships between two variables. Whereas correlation only determines that there is a positive or negative relationship between variables, regression identifies which independent variables/ factors are the most influential, their impact, and how they help in decision-making and optimization. Correlation and regression are used in combination – correlation to determine if there is a relationship and regression to determine if that relationship is predictive of outcomes.

Response efficacy: the belief that a recommended action will effectively reduce risk or improve outcomes.

Response research: short-term, time-sensitive research that happens during an outbreak or emergency. It helps responders quickly understand what people think, feel or need in real time, so they can adjust messages or actions immediately. For the purposes of this publication rapid research aims to adapt public health messaging.

Risk communication, community engagement and infodemic management (RCCE-IM): encompasses – as defined by WHO – a broad spectrum of activities aimed at enhancing public health emergency preparedness and response. These activities include building the capacity of health authorities to communicate effectively with journalists and collaborating with local civil society organizations on community empowerment projects.

- **Risk communication**: the exchange of real-time information, advice and opinions among experts and individuals facing threats to their health, or economic or social well-being. This communication enables informed decision-making for health and is used alongside infodemic management and community engagement during public health emergencies.
- **Community engagement:** a process of developing relationships with at-risk or affected communities that enable stakeholders to co-design and co-deliver interventions to achieve positive health impacts and outcomes, including in emergencies. It goes together with risk communication and infodemic management within public health emergency preparedness and response.
- **Infodemic management**: the systematic application of risk- and evidence-based analysis and approaches to manage the infodemic and mitigate its impact on health behaviours during health

emergencies. Infodemic management aims to promote good health practices by listening to community concerns and questions, fostering an understanding of risk and expert health advice, building resilience to false information, and engaging and empowering communities to take positive action. It involves actionable steps from surveillance through to social listening, verification, risk assessment and response strategies, including debunking and pre-bunking.

Risk perception: refers to how individuals interpret and evaluate the likelihood and severity of a threat to their health or well-being.

Scale variable: a measurement variable – a variable where the numeric number matters. The number either matters because it is relative (e.g., level of education is a scale variable because the lowest level of education corresponds with the lowest number and the highest level corresponds with the highest number) or because the value itself matters (e.g., age is a reflection of the actual age of respondents).

Self-protective behaviours (for mpox): specific actions individuals are encouraged to take to reduce their risk of contracting or spreading mpox. These include:

- having open conversations about symptoms with close contacts;
- avoiding close physical or sexual contact with symptomatic individuals;
- washing or sanitizing hands regularly;
- seeking medical advice if symptoms appear;
- self-isolating when symptomatic;
- using condoms for 3 months after recovery;
- avoiding contact with wild animals or improperly cooked meat;
- seeking information about mpox and its symptoms;
- discussing vaccination with a health-care provider when traveling to or exposed in high-risk areas; and
- following public health advice if exposed or symptomatic.

Self-selection bias: when the people who choose to participate in a study are different from those who don't. This often results in the participant pool being meaningfully different than the larger population from which they are drawn. For example, if people who participate in interviews do not fear their identify being known when the rest of the population is concerned about that, then those people interviewed are not representative of the lager population.

Small steps approach: a method that breaks down complex behaviours into manageable, achievable actions. In the context of this toolkit, it refers to guiding communities through gradual, step-by-step changes to improve understanding, trust and adoption of public health recommendations.

Social desirability bias: when people give answers they think are more acceptable or favourable, rather than what they truly believe.

Social listening: surveillance for infodemic management, often referred to as social listening, involves tracking information and data, and monitoring emerging false information. Regular and tailored social listening provides a useful snapshot of people's questions, concerns and circulating narratives and false information about health from both online and offline data sources.

Third-person effect: a psychological phenomenon where individuals perceive others as more (or less) at risk than themselves, which can influence their willingness to act.

Executive Summary

This toolkit is designed to improve evidence-based interventions for mpox in the WHO European Region. It builds on WHO's 2025 interim guidance on social and behavioural research and is aligned with its risk communication, community engagement and infodemic management (RCCE-IM) framework. The toolkit is designed to serve research needs both before (preparedness) and during (response research) outbreaks. The two approaches serve different needs.

- ***Preparedness research*** is designed for public health practitioners to take their time, develop intelligence about mpox, community attitudes, and identify long-term preparedness strategy. This approach then allows practitioners to respond quickly with evidence-based interventions.
- ***Response research*** is designed for public health practitioners to quickly gain insights after a public health emergency is identified to rapidly gain insights and tailor messages to more specific communities affected.

As such, the toolkit provides RCCE-IM practitioners and researchers with a customizable, context-sensitive set of measures that can be deployed either as a part of a preparedness agenda or response research to strengthen risk communication interventions during mpox outbreaks. By focusing on community behaviours, perceptions and information dynamics, the use of the toolkit should improve public understanding and acceptance of self-protective health recommendations. Its flexible design allows for purposeful deployment in diverse settings, making it a valuable resource for both preparedness and response interventions.

The primary outcome targeted by this toolkit is **message acceptance**. The focus on message acceptance, highlights the importance of emphasizing *why* public health guidance is offered to support informed decision-making by communities. Collecting data using this toolkit helps health authorities and partners prepare better and focus their efforts more effectively during the community engagement phase of the RCCE-IM framework.

The advantages of this approach are as follows:

1. Message acceptance can be rapidly and accurately assessed using the sample survey provided in this toolkit. During the early stages of an outbreak, this means that a research team can provide good quality data to guide the response in a matter of days.
2. This quantitative survey can be conducted anonymously, which avoids respondents feeling stigmatized or judged and empowers them to give more honest answers. Particularly in relation to vulnerable communities, this enables the research team to hear more from "the unheard".

To develop the toolkit, a pilot study was conducted in three WHO/European countries with diverse populations – Belgium, the Netherlands, and the United Kingdom. The findings were used to develop the toolkit and provide a benchmark of insights to support practitioners. The full summary of those insights is reported at the end of the toolkit. However, a key insight from the pilot study is that identity factors – such as political identity, religiosity and trust in institutions – are often more predictive of message acceptance than demographics alone. The toolkit advises on how to choose questions based on whether the goal is to:

- build trust (e.g. institutional trust questions)
- counter false information (e.g. knowledge and belief questions)
- improve message acceptance (e.g. willingness and efficacy questions).

The toolkit draws on consultations with vulnerable communities, including LGBTQI+[1] populations – particularly men who have sex with men – and African diasporas who have been most affected by mpox. The community consultation identified six key challenges in the European context: low risk perception of mpox, widespread false information, privacy concerns, lack of symptom awareness, unclear public messaging and the need for

[1] Lesbian, gay, bisexual, transgender, queer, intersex and more.

specific, actionable guidance. It uses validated questions about people's background, beliefs and behaviours to identify enablers and inhibitors to public health message acceptance.

Based on the consultations and six challenges, the toolkit is grounded by the IDEA model approach – a public health risk communication framework that focuses on: internalization (making risks feel personally relevant to those who bear the risks), distribution (sharing messages through trusted and used sources and platforms), explanation (clearly describing the risk and what to do), and action (recommendations for self-protective behaviours).

This model helps RCCE-IM practitioners and researchers see how people respond to mpox-related messages. It includes tools to measure willingness to take protective actions, trust in information sources and how false information and privacy concerns affect reporting. It shows how community perceptions shape behaviour and offers ways to improve message acceptance, reduce stigma and build trust. The toolkit offers RCCE-IM practitioners and researchers a flexible, yet rigorous evidence-based approach to prepare for a mpox outbreak and engage communities effectively, especially across diverse European settings.

The toolkit is presented as follows:

1. a brief conceptual introduction and practical guidance for developing research
2. the toolkit itself is separated into two sections – preparedness research and response research
3. within each section, the toolkit is presented based on intervention objectives that correspond with key insights from the IDEA model and the pilot test
4. guidance on how to conduct the research for the intervention objectives and questions to ask are also provided as the intervention objectives are presented.
5. a detailed summary of the pilot study's results informing the toolkit

Introduction

Mpox was first declared a Public Health Emergency of International Concern by WHO in July 2022, and again in August 2024, in response to continued transmission and emerging risks globally.

The mpox response quickly became a model of a community-led response, especially in the WHO European Region as behaviour change by affected communities has been attributed as a driver of the control of mpox *(1)*. As the Region entered a new phase of the outbreak in 2025, mpox has presented fresh challenges, including managing mpox as a prolonged outbreak and addressing the risk of imported cases from countries in the African Region where a new clade has begun circulating.

This is a key moment to engage the most affected communities – particularly gay and bisexual men who have sex with men, African diaspora communities and frontline health workers – through tailored risk communication, community engagement and infodemic management (RCCE-IM) interventions that resonate with their specific values and concerns, and are delivered through trusted messengers, with the overall aim of eliminating mpox through message acceptance.

The WHO Regional Office for Europe has developed a growing body of guidance and tools to support Member States to move towards mpox elimination, including the policy brief *Considerations for the control and elimination of mpox in the WHO European Region (2)*, *A risk communication, community engagement and infodemic management toolkit for mpox elimination, 17 May 2023 update (3)*, the Resource toolkit for mass and large gathering events *(4)*, and the Mpox *toolkit for health-care workers (5)*. In March 2025, WHO released its first-ever guidance on social and behavioural research for the mpox response, providing concrete recommendations to systematize data collection and improve RCCE-IM guidance for mpox elimination *(6)*. These resources have supported national authorities, civil society organizations and health professionals in tailoring RCCE-IM strategies to the needs of affected communities.

In March 2025, WHO released its first-ever guidance on social and behavioural research for the mpox response *(6)*. The guidance outlines the principles for conducting high-quality and ethical research during an outbreak. It provides foundational principles for research, regarding: i) study design, delivery and documentation; ii) multisectoral stakeholder engagement for research; iii) ethical conduct and oversight for research; iv) data protection and data-sharing; and v) the environment for social and behavioural research. It also provides two important annexes on scoping reviews and rapid surveys.

The overall objectives in developing the toolkit were to i) evaluate why potential messages may be more or less effective in different populations; ii) to identify the factors that affect message credibility; iii) to predict message acceptance through identifying barriers and enablers of self- and community-protective health messages; iv) to develop an adaptable research toolkit that can be tailored to populations and contexts. Thus, this document's central aim is to use the RCCE-IM intervention recommendations developed in combination with the research principles established and produce a practical, usable research toolkit. Such a toolkit is designed to allow Member States and other actors customise and tailor their approaches to RCCE-IM to meet the objective of mitigating the spread of mpox in Europe. A critical lesson learned across public health emergencies is that tailored responses save lives [3].

The toolkit is divided into five main sections: Section 1 focuses briefly on the theoretical framework. Section 2 provides overall research design and methodological guidance to ground either preparedness or response research agendas. Section 3 presents the toolkit. It is organised based on the preparedness and response aims and the specific intervention objectives so that practitioners can focus only on the aim(s) and objective(s) relevant for their needs. Section 4 presents the key findings from the pilot test as a benchmark for anticipating

and comparing to data collected by practitioners. In each section, the field guide summarizes the key concepts for implementation and then it provides the detailed content.

The toolkit is tailored to the European Region. Consultations with community organizations representing vulnerable groups identified six key mpox-related communication challenges in Europe, including:

1. **low visibility**: mpox receives little attention in Europe, so many see it as irrelevant or not a serious threat;
2. **high false information risk**: widespread assumptions about mpox create fertile ground for an infodemic;
3. **privacy concerns**: people are worried about how their personal information is handled in public health responses;
4. **information voids on symptoms exist**: communities want clearer information on what mpox looks and feels like;
5. **lack of clarity**: there is a general need for better information about the disease, people's status and contact risks; and
6. **actionable advice**: recommendations must be specific, realistic and easy to follow.

On request from WHO Regional Office for Europe, Kristiania University of Applied Science's WHO Collaborating Centre on RCCE-IM is available to provide training resources on using the toolkit, support the customization, and/or the implementation of this toolkit. The WHO Regional Office for Europe can also help RCCE-IM practitioners develop partnerships with local academics and research institutes. Request from national officials to the Regional Office should be made via their local WHO Country Office or International Health Regulation National Focal Point.

Section 1: Toolkit Theoretical Framework

Field Guide: Applying Theory to Risk Communication & Infodemic Management (RCCE-IM)

This guide translates the theory behind the mpox RCCE-IM toolkit into practical steps. It shows how to use community insights and the **IDEA model** to design stronger messages that people will accept and act on.

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1. Why Theory Matters for Practice

Public health messages only work if people believe them, understand them, and feel motivated to act. Traditional models (like COM-B) explain why behaviours change, but they don't always show how to make messages stick in diverse, multicultural environments.

This toolkit uses the **IDEA model**—Internalization, Distribution, Explanation, and Action—because it focuses on message acceptance. Combined with insights about community demographics and social identities, it helps practitioners tailor interventions that overcome barriers like stigma, mistrust, and misinformation.

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2. Know Your Audience: Beyond Demographics

Many communication efforts stop at **demographics** (age, gender, income, ethnicity). While useful, they don't fully explain how people respond to health messages. Instead, you need to consider **identifications**—the deeper attitudes and worldviews that guide decisions.

🔑 **Four key identifications to consider:**

- **Values & Cultural Attitudes** – shape risk perception and decision-making; essential when working with minorities or stigmatized groups.
- **Political Identification** – broad categories like "conservative" or "liberal" help predict whether people will trust and act on messages.
- **Religiosity** – not just religion, but how important it is in daily life; helps assess whether faith leaders can be partners in outreach.
- **Trust in Science & Institutions** – affects willingness to follow guidance.

👉 **Field tip:** Collect limited demographics (family status, gender, household composition, country of birth/residence) but always add questions about values, politics, religion, and trust. These give a more accurate picture of what will influence message acceptance.

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3. The IDEA Model: A Practical Framework

Use the **IDEA model** as your roadmap for crafting messages.

1. **Internalization** – Make people feel the risk is relevant to them, their loved ones, or their community.
    - Use real-life examples.
    - Show who is most at risk.
    - Highlight local impacts.
2. **Distribution** – Share information across multiple formats and channels.
    - Mix written, spoken, and visual content.
    - Use both traditional and social media.
    - Work with trusted messengers (community leaders, civil society, healthcare providers).
3. **Explanation** – Go beyond "what" and explain "why."
    - Clarify risks and knock-on effects (e.g., service disruption, stigma, economic impacts).
    - Connect actions to outcomes ("Wearing a mask helps protect your family").
4. **Action** – Give clear, simple, doable instructions.
    - Be specific ("Call this hotline if you have symptoms").
    - Avoid vague advice.

    - Link action to personal and community benefit.

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4. Turning Theory into Action

- **Segment your audience**: Different groups respond to different drivers. Don't use one-size-fits-all messaging.
- **Reduce stigma**: Stigma is one of the biggest barriers. Use respectful language and involve affected communities in message design.
- **Work through trusted channels**: Messages are more effective when delivered by voices people already trust.
- **Pre-test and adapt**: Pilot messages with small groups to ensure they resonate. Adjust based on feedback.

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5. Quick Golden Rules for Practitioners

- Look beyond demographics—values and identities often matter more.
- Always apply the **IDEA model**: Internalize → Distribute → Explain → Act.
- Involve community leaders early to build trust.
- Keep messages clear, relevant, and stigma-free.
- Tailor messages before crises, not just during them.

👉 In short: **Know your audience. Apply IDEA. Build trust. Reduce stigma. Keep it actionable.**

Section 1: In Detail

Several behavioural change models, such as the COM-B[2] model, are widely used in European public health communications practice to understand the drivers of behaviour (8). However, these models focus more on factors influencing behavioural change and less the convergence of those factors with on risk communication and community engagement. To support an RCCE-IM focus, this toolkit uses the internalization, distribution, explanation, and action (IDEA) model, which focuses specifically on improving message acceptance (explained in further detail below). In part, this is important because the European Region has culturally diverse and complex risk communication environments. Tailoring messages to different audiences is essential to encourage protective behaviours. This is especially important when addressing modern challenges such as infodemics. This toolkit aims to guide RCCE-IM interventions before and as emergencies like mpox escalate, rather than reacting after they begin *(8–10)*.

Community demographics and identifications

Without actionable research it is unlikely to be clear how to adapt messages to increase their acceptance. Theoretical models provide critical insights into how to develop messages (i.e., what public health should talk about), but practitioners still need to understand for whom those messages are relevant. Audience segmentation and message targeting is a well-supported best practice in public health interventions. For example, during the COVID-19 pandemic, the countries with the best outcomes demonstrated the clearest evidence of audience segmentation and message tailoring [1].

To effectively tailor messages, both community demographics and identifications are needed to understand public health message acceptance, however, too often in traditional social and behavioural science research and intervention development there is an over-emphasis on demographic information to guide message acceptance and message resistance. For example, RCCE-IM research for vaccination often emphasizes family status, gender, ethnicity and socioeconomic status *(12)*. However, identifications and social attitudes (e.g. religiousness, broad political attitudes, values and trust in science) have been shown to better predict people's attitudes and willingness to get vaccinated *(13–15).*

Demographic variables cannot be ignored to create a valid and reliable toolkit; therefore, a limited range of demographic variables were collected that reliably predict acceptance of mpox-related self-protective behaviours. These included family status, gender and ethnicity, household composition, country of residence and country of birth – all factors shown to influence how people respond to public health guidance and policies *(16–18).*

Though demographics are important, risk perception is complex because personal risk is shaped by their worldviews, ideologies and values *(19).* This is why translating research into practice – characteristics like gender, ethnicity or education often do not reliably predict community behaviour across different regions or countries *(7,13,20)*. Research suggests that four particular identifications (values, cultural attitudes, political identification and religiosity) influence people's willingness to accept public health recommendations for self-protective behaviours, as expanded on below.

Values and **cultural attitudes** influence risk perception and decision-making *(21–24)*. This is particularly true in diverse communities and when reaching out to minorities and vulnerable populations *(25)*. One major challenge in RCCE-IM before and during public health emergencies is navigating intercultural attitudes. A key lesson from past crises – such as HIV/AIDS, Ebola, and coronavirus disease (COVID-19) – is that stigma and intergroup or

[2] The COM-B model proposes that there are three components to any behaviour (B): Capability (C), Opportunity (O) and Motivation (M).

intercultural experiences strongly influence whether communities accept public health recommendations *(26,27)*. This is a key reason why reducing stigma toward those affected by mpox was made an operational objective in the WHO Regional Office for Europe's RCCE-IM toolkit for Mpox elimination *(3)*.

Political identification is also becoming an important factor in how people engage with information and the likelihood they will follow health recommendations. Previous research finds that using broad categories like "conservative" and "liberal" is more effective than focusing on specific political parties when analysing these patterns *(28–30)*.

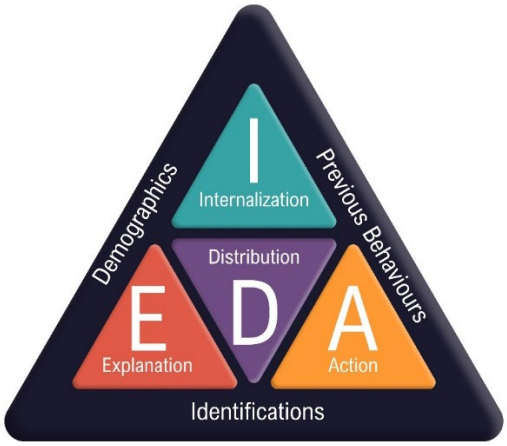
Finally, understanding how important religion is in people's daily lives – known as **religiosity** – is key. This helps to predict not only how likely people are to follow public health advice, but also how effectively faith leaders can be involved in community-based health efforts in a planned intervention *(3,31–33)*. Because religiosity measures how much religion influences daily life, it gives a clearer picture of someone's religious identity than just asking what religion they belong to. The assumption is that people who are highly religious – or not religious at all – may relate more to each other based on how religion shapes their lives, even if they follow different faiths. In contrast, people who share the same religion but differ in how important it is to them may have less in common.
Together, previous research and good practice suggests that by understanding a community in terms of these values, cultural attitudes, political identification and religiosity, interventions can be better planned and tailored to different populations *(11).*

The IDEA Model

While social and demographic data can help predict how people respond to public health messages, previous research suggests that they don't tell the whole story. To improve message acceptance, risk communication needs clear goals. The IDEA model helps research teams set these goals by using insights from data, social listening and community feedback to design more targeted and effective interventions.

Of course, several frameworks could have been used, the specific challenges raised by vulnerable communities in Europe made it important to choose a model that fit the situation and had been applied in different public health settings. The IDEA model (Fig. 1) has been used in wide-ranging risk communication contexts, from designing more effective earthquake alerts *(34)*, biosecurity *(35)* and community action *(36)* and reflects how the IDEA models is contextualized by demographics, previous behaviours, and identifications.

Figure 1. The IDEA Model Combined with Community Demographics & Identifications



The components of the model are as follows:

- **Internalization**: risk bearers – that is the affected communities, especially those most vulnerable – must be motivated to pay attention to the message and thereby internalize the relevance and impact of the disaster or risk to them, those they care about and/or their property *(36,37)*.
- **Distribution**: the information must be distributed using multiple formats (e.g. verbal, written, visual) across multiple channels (e.g. interpersonal, legacy and social media) by a variety of trusted messengers (e.g. people or organizations) *(35)*.
- **Explanation**: RCCE-IM practitioners must explain the risks linked with the primary or secondary crises, that is, both the emergency itself and its cascading consequences (such as disruption of health care, transport, power and water services, as well as impacts on the economy, society, and mental health). This helps risk bearers not only understand what is happening, but also why following the recommended actions will help reduce those risks *(38)*.
- **Action**: In RCCE-IM interventions, a key goal of risk communication is to highlight recommended actions from risk bearers *(39,40)*. This means that the messages must provide clear, actionable instructions *(41)* – it is not enough to merely tell people what to do.

Section 2: Research Design and Methodology Recommendations for Toolkit Implementation

Field Guide for Research Design and Methodology

Step 1. Start with Ethics

- ✅ Explain the survey's purpose, how data will be used, and make participation voluntary.
- ✅ Use plain language and let people opt out at any time.
- ✅ Avoid collecting personal details unless absolutely necessary.
- ✅ Store data securely; restrict access to authorized staff only.
- ✅ Avoid harmful or stigmatizing questions—consult civil society or community groups on wording.
- ✅ Involve trusted local actors in design and delivery.
- ✅ Seek ethics approval (formal or rapid).
- ✅ Share findings with communities and show how their input shaped actions.

Step 2. Build a Research Agenda (Before Outbreaks)

- ✅ Plan research early, not just during emergencies.
- ✅ Focus on factors that influence **trust and message acceptance**.
- ✅ Strengthen health/media literacy before misinformation spreads.
- ✅ Create ongoing community involvement (e.g., citizen panels, volunteer groups).
- ✅ Use community actors for continuous feedback and lower costs compared to paid survey panels.

Step 3. Choose What to Study

- ✅ Match research objectives to your outbreak needs.
  - If institutional trust is important → focus on trust measures.
  - If you need broad insight → use the full toolkit.
    - ✅ Keep surveys short for volunteers (≤10 minutes).
    - ✅ Use survey companies when longer surveys or broad national samples are needed.

Step 4. Design Your Questions

- ✅ Use **single questions** for simple facts (age, education).
- ✅ Use **multiple related questions (factors)** for complex ideas (trust, risk perception).
- ✅ Group related questions into **batteries** with one introduction to save time.
- ✅ Aim for **30–50 questions in 10 minutes** by using smart design.
- ✅ Average the responses in a factor to create a single score (e.g., "institutional trust").

Step 5. Analyse the Data

- ✅ **Descriptive stats**: Who answered? How do groups differ (e.g., by age, gender)?
- ✅ **Predictive stats**: What influences what? (e.g., Does trust predict willingness to report symptoms?)
- ✅ Tools you can use:
  - Paid: SPSS (easy to use).
  - Free: PSPP, Jamovi, JASP.
  - Common: Excel (good for smaller datasets).
    - ✅ Clean your data:
  - Order response options logically (e.g., lowest to highest education).
  - Combine question batteries into single factor scores.

Step 6. Adapt Methods as Needed

✅ **Quantitative (surveys):** Fast, anonymous, scalable.
✅ **Qualitative (interviews/focus groups):** Deeper insights, good for refining tools and building trust.
⚠️ Be careful with mpox stigma—participants may not speak openly. Anonymous surveys can reduce this risk.
✅ Use both together: surveys for breadth, interviews for depth.

Step 7. Close the Loop

✅ Share results with communities and partners.
✅ Translate insights into practical actions.
✅ Keep community actors engaged for future response.

Quick Golden Rules

- Ethics before speed.
- Keep it simple and short.
- Involve communities early and continuously.
- Use the right tool for the right job (volunteers vs. survey companies).
- Always turn data into action.

Section 2: In Detail

Before introducing the research tools, it is critical to note that designing and executing research must be done in an ethical and strategic manner, as the 2025 WHO guidance on social and behavioural research outlines (6). The following section aims to guide a RCCE-IM practitioner and research team on how to develop a research project and the components involved. Specifically, this section contains guides to;

- using an ethical approach when conducting research
- developing a research agenda
- designing specific research projects
- adapting the toolkit for quantitative and qualitative research
- using single versus multiple questions when selecting survey design
- analysing data and providing recommendations.

At its core, this toolkit supports **community-based data collection and analysis** in emergency settings. While some users may view certain tools within the kit as a form of active social listening, this toolkit is not intended to function as a full-scale social listening system. Comprehensive social listening requires specialized resources and infrastructure beyond the scope of this toolkit.

Using an ethical approach

Before introducing the research tool, it is important to emphasize that designing and carrying out research must be done in an ethical manner as outlined in the *Interim guidance on social and behavioural research for the mpox public health response (6)*. The pilot study that informed this toolkit was reviewed informally by representatives from vulnerable communities. Additionally, it was formally reviewed through a national research ethics process, in line with General Data Protection Regulation (GDPR) standards which governs data privacy and protection in the European Union. An ethical approach is key in rapid response research to allow time for proper oversight of how data is collected and managed. Box 1 presents ethical considerations for any research.

Box 1. Ethical considerations for using the mpox survey

Conducting research during a public health emergency requires careful attention to ethics. The are key principles include:

- informed consent:
  - always explain the purpose of the survey, how data will be used, and that participation is voluntary – specifics on obtaining consent is available within the tool;
  - use plain language and ensure participants can opt out at any time;
- anonymity and confidentiality:
  - do not collect names, contact details or identifiable information unless absolutely necessary;
  - store data securely and restrict access to authorized personnel only;
- do no harm:
  - avoid questions that may stigmatize or distress participants – local civil society can advise on terminology to use and appropriateness of questions;
  - be especially sensitive when working with marginalized groups to avoid research or interventions leading to increased stigma;
  - use trusted researchers (those who have worked with the affected community in the past are preferred);

Box 1 - Continued

- cultural and contextual sensitivity:
  - adapt language and examples to local norms and values;
  - engage local partners or community leaders to review the survey before deployment in the design of the project and adapt the survey where necessary;
  - whenever possible , surveys should be administered by trusted community-based actors and sent from a recognized and trusted source – such as a Ministry of Health or a local civil society organization – to ensure credibility and increase participation;
- ethical approval:
  - seek approval from a national or institutional ethics board if required;
  - if gathering data is urgent, apply rapid assessment protocols;
- feedback and transparency:
  - share findings with the communities involved; and
  - work with the community to translate the analysis of data into interventions.

Developing a research agenda for message acceptance

Building on WHO's guidance for social and behavioural research *(6)*, the first recommendation for using the insights in this toolkit is for institutions and Member States to create a focused RCCE-IM research agenda emphasizing preparedness research and capacity building. This will help generate the evidence needed to inform response. Starting research before an outbreak has four advantages:

1. While traditional rapid research is helpful for identifying affected groups and testing how well messages resonate, it is not suited for understanding the deeper reasons behind message acceptance. That is because there is no baseline to compare community insights during "peace" times versus crisis situations.

2. The most effective time for risk communication interventions is before misinformation and disinformation can take hold in vulnerable communities. Once an outbreak begins, that window of opportunity is often lost. Infodemic management involves four types of interventions: listening to community concerns and questions, promoting understanding of risk and health expert advice, building resilience to false information, and engaging and empowering communities to take positive action *(41)*. Recent research in risk communication and infodemic management highlights two key points:
   - Improving health, media and information literacy is most effective before a public health emergency begins.
   - Although people generally prefer expert sources, they may turn to less reliable ones if they can't find enough clear information or struggle to navigate online spaces during a crisis *(28,43–47)*. Preventing the infodemic from emerging within a Public Health Emergency is essential. Once false information becomes a part of people's understanding of a disease like mpox, it is much more difficult to counter than preventing it from being accepted in the first place *(48–51)*.

3. When developing a valid and reliable set of predictors[3] for community acceptance of public health recommendations related to self-protective behaviour, it's important to recognize that these predictors tend to remain stable over time and are consistent across contexts. Therefore, rapid response research should focus on understanding how a specific emergency influences people's perceptions, behaviours and the effectiveness of existing communication strategies.
4. Involving and developing community actors to help share and interpret findings over time is less expensive than carrying out extensive rapid research during outbreaks. Community engagement is a long-

[3] A predictor is a variable used in research to estimate or anticipate an outcome, such as a person's behaviour or response to a public health recommendation.

term process. Active research, where community actors provide feedback, help interpret insights and assist in sharing tools can keep community actors engaged. The alternative – purchasing survey samples – is costly (e.g. over €10 000 for a sample of around 1500 people) and often difficult to tailor to vulnerable populations. With careful planning, it may be possible to create a citizen panel, a group of volunteers who regularly participate in surveys or research. One example is Sweden's Citizen Panel, which includes over 75 000 volunteers who participate in research a few times a year *(52)*.

Connecting the research agenda with specific research projects

It is possible to use the entire research tool in a single round of data collection (see Section 4) and pilot testing shows that it takes approximately 20 minutes to complete; however, that is not always the best approach. Depending on strategic goals, resources and the communities that institutions are working with, it may be more effective to select only the most relevant sections. For example, if the evidence already suggests that institutional trust significantly influences message acceptance during an outbreak, but how much a community really trusts different institutions is not known, focusing on that single objective may provide the intelligence needed in a more time and resource efficient manner.

For this reason, the toolkit is designed around intervention objectives tied to the factors pilot tested. The best approach to using the toolkit is to align the intervention objectives and the research agenda to select the specific measures needed. This helps to maintain data quality and avoid participant fatigue – especially when working with volunteer panels. This is less important if purchased panels from General Data Protection Regulation-compliant survey companies are used.

The strategic decision on whether to use community-based volunteer panels versus paid participants from survey companies depends on balancing the following issues:

1. Survey companies provide reliable and timely completion of longer questionnaires of a broad population. They typically struggle with very specific populations for highly targeted message adaptation and require significant cost resources
2. Volunteer respondents completing questionnaires provide important highly targeted message insights. They are also inexpensive to tap into and the questionnaires can be an opportunity for maintaining touchpoints in diverse communities to show ongoing concern. However, volunteer respondents are unlikely to respond to long and complicated questionnaires, so it is important to minimize the length and difficulty of the questionnaires for them.

Using single questions versus multiple questions

In quantitative social science research, there are two types of measures that are used in survey-based design. First are single-question measures for simple concepts and questions. For example, demographic data is typically collected with single-question measures or demographics (e.g. what is your age, highest level of education completed, country/city/region of residence?). It is also possible to measure some behaviours using single questions.

However, when researchers want to understand more complex concepts – like values, religiosity or risk perception – they need to ask multiple questions to measure these ideas or identifications accurately and consistently. This is part of what makes these concepts useful for predicting people's behaviour, but it also means they are a bit more complex to use properly. In this toolkit, a **factor** is a group of related questions that measure one idea – like trust in institutions or perceived risk. These questions have been validated through previous research (tested to work well together), capturing different sides of the same concept. Making small wording changes to fit local language or context are best practice; however, all the questions must be asked to ensure the results are valid and reliable.

In research it is often assumed that surveys with more than 10 questions are too long. But evidence shows this is not always true. For volunteer panels, surveys should ideally take under 10 minutes, with most questions taking 20–30 seconds to complete.

Using question batteries – related questions with the same introduction – helps make surveys quicker and more efficient. An example of a battery of questions is the sector of the survey "Trust in health information and public health institutions". Figure 2 provides an example of what one of these batteries looks like in a survey laid out for participants to complete. The stem gives context once, and each follow-up question takes just 5–10 seconds to answer. With smart design, researchers can include 30–50 questions in a 10-minute survey instead of just 20–30. This makes surveys more reliable and broader in focus without creating participant fatigue.

Figure 2: Example of how a battery of questions for the institutional trust factor can look in a survey

2. Institutional Trust - Thinking about public health organizations including national-level public health organizations or international public health organizations, collectively indicate how much you agree or disagree with each of the following statements. Public health institutions:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Give me a trustworthy impression	☐	☐	☐	☐	☐
Are typically truthful	☐	☐	☐	☐	☐
Demonstrate they are dedicated to being 'good'	☐	☐	☐	☐	☐
Give me a feeling of trust	☐	☐	☐	☐	☐
Share information freely with the public	☐	☐	☐	☐	☐

To analyse the data from such a factor, a simple average (mean) is taken for each participant's response. This does not require advanced mathematical skills and tools like Excel or SPSS can quickly convert the data for questions for a factor into a single measure to be used in the data analysis.

The basic formula is simple: add up the scores for all the questions in the battery, then divide by the number of questions.

For example, for the institutional trust factor, if a participant answered:

- Strongly agree (5) for 'gives me a trustworthy impression'
- Neither agree nor disagree (3) for 'are typically truthful'
- Neither agree nor disagree (3) for 'demonstrate they are dedicated to being good'
- Agree (4) for 'gives me a feeling of trust'
- Agree (4) for 'share information freely with the public'

The average score would be: $(5 + 3 + 3 + 4 + 4) \div 5 = 3.80$.

This number becomes their "institutional trust" score and can be used in analysis just like a single-question measure. This is an extra step but provides much better insight into what institutional trust really is than just asking the single measure making it more conceptually valid and thus more reliable in its implementation.

Analysing data and providing recommendations

Once the data has been collected, analysing the data helps strategists to understand the findings much more than trying to understand summaries of the raw data. There are two main types of statistical analysis:

1. **Descriptive statistics** summarises the data – for example, showing how many men and women responded, or how trust levels vary by age group. These are often shown in **tables or charts** (like cross-tabulations).

2. **Predictive statistics** go a step further. They help to understand causal connections between independent variables (e.g., the demographics or identifications described earlier) and important outcomes (e.g., message acceptance) and even predict whether focusing on a strategy designed to build trust in the institution would predict a community's willingness to report mpox symptoms. This is intelligence that improves the impact of interventions – it can save lives for less cost. This is when **correlation** (identification if variables are related) and **regression** (how one variable influences another) are applied. This toolkit is primarily designed for correlation- and regression-based analyses because they provide the most directly actionable results for predictive statistics.

To analyse data, the data must be prepared 'correctly' which requires three steps:

- **creating categorical variables** (like country or marital status) by either identifying whether each category is present or not present or **dummy coding** variables to compare one of the category to all of the others;
- **ordered variables** (like age or education level) are treated as **scale variables**, which means they can be analysed like numbers, so long as the progression from the lowest to the highest number has meaning; and
- **cleaning the data** by combining the batteries of questions into single-factor scores (e.g., the institutional trust example above).

It is important to note that the first two steps can be set up easily in the way that the questionnaire itself is designed. For example, if asking a question about education, the order that the options are presented should reflect the progression. Similarly,

Being a statistician is not required for using this data. There are several tools that can help:

- **SPSS** is widely used and user-friendly, but it requires a paid license.
- **Excel** can also be used for correlation and regression, especially for smaller datasets. It's more manual but can still be used.
- **Free alternatives** include:
    - **PSPP**, which works similarly to SPSS.
    - **Jeffreys's Amazing Statistics Program** and **Jamovi**, which are open-source programmes with easy-to-use interfaces and built-in support for correlation and regression.

The WHO Collaborating Centre on RCCE-IM is available to support this type of data-analysis and will develop a training package on this topic. The WHO Regional Office for Europe can also support establishing partnerships with local academics and research institutes through its Technical Advisory Group on RCCE-IM *(53)*.

Adapting for quantitative and qualitative research design

This toolkit can be adapted for qualitative research. The questions and broad topic areas can serve as a foundation for developing semi-structured or structured interview[4] guides. These may involve asking the original questions and inviting additional feedback. These are often more effective when used as **guiding themes** for open-ended conversations rather than rigid scripts.

However, this adaptation carries some risk – especially for sensitive issues like mpox. Both the tool validation and WHO experience with mpox suggests that mpox is a disease that carries high potential for stigma, discrimination and prejudice *(6)*. While interviews and direct community engagement can offer confidentiality and privacy protections, this may not be enough to encourage participation or honest responses – especially from vulnerable community members affected by mpox. Stigma, discrimination, and prejudice can make people hesitant to speak openly, even in private settings. In these cases, the **anonymity** of online research is likely to increase participation and improve data quality. It also helps reduce social desirability bias – a tendency for people to give answers they think are more acceptable or favourable, rather than what they truly believe or experience.

That said, traditional methods like focus group discussions and one-on-one interviews with community opinion leaders are still strongly recommended to complement quantitative surveys, in that they allow the research team to:

1. **reflect critically**: explore broader findings about mpox, assess message acceptance and refine rapid research tools based on feedback from community stakeholders;
2. **improve quantitative tools:** gather insights to revise and adapt quantitative tools before wider distribution, ensuring the language and format are appropriate for the target community;
3. **build trust and show goodwill**: demonstrate active listening and respect for vulnerable communities by addressing their specific concerns and sensitivities; and
4. **assess practicality:** determine how feasible it is to distribute quantitative tools within communities and identify the most suitable formats for doing so.

When working with stigmatized populations or sensitive topics, it's important to recognize that those who volunteer to participate may have different communication needs than those who are hesitant. To reduce self-selection bias (when only certain individuals choose to participate, potentially skewing the results):

- ensure that researchers conducting interviews are **trusted by the participants**
- build relationships and credibility within the community before engaging in data collection.

[4] interviews with a fixed set of questions (structured) or flexible prompts (semi-structured).

Section 3: Toolkit for Preparedness & Response Research for Mpox

Field Guide for Applying the RCCE-IM Mpox Toolkit

This toolkit helps practitioners design and test public health messages that people are more likely to accept and act on. It can be used both for **preparedness research** (before outbreaks) and **response research** (during outbreaks).

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1. Preparedness vs. Response

- **Preparedness research** builds long-term understanding of what drives people's willingness to follow health advice. It strengthens trust, prevents misinformation from taking root, and prepares interventions that can be quickly adapted.
- **Response research** is short-term, used during outbreaks to fine-tune strategies, test messages in context, and check which groups may need extra support.

👉 **Field tip:** Use preparedness research whenever possible. Save response research for urgent adjustments.

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2. Message Acceptance (Action in the IDEA model)

The main outcome this toolkit measures is **message acceptance**—how willing people are to adopt protective behaviours.

Examples include: washing hands, avoiding close contact, using condoms after recovery, seeking medical care, or self-isolating.

🔑 Pilot research showed: people who adopt one protective behaviour are more likely to adopt others. This means encouraging even one small step can trigger wider positive habits.

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3. What Drives Acceptance

The toolkit identifies **drivers** of acceptance, which can be:

- **Enablers** → factors that improve acceptance.
- **Inhibitors** → factors that reduce acceptance.

These vary by country and community, but three factors stood out in testing:

1. **Political ideology** – strongest single predictor of message acceptance.
2. **Values** – priorities such as equality, social justice, and protecting nature.
3. **Religiosity** – how much religion shapes daily life and decisions.

👉 **Field tip:** Always include demographics (age, country) plus political, values, and religiosity questions in your surveys.

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4. Applying the IDEA Model

The toolkit provides **seven intervention objectives**, linked to the IDEA framework:

- **Internalization** – Help people see mpox as relevant, without causing stigma.
  - Counter misinformation (e.g., false knowledge, conspiracy beliefs).
  - Use the "third-person effect": people may act more when they see others as vulnerable.
  - Highlight small disruptions (missed plans, short isolation) rather than stigma-heavy risks.
- **Distribution** – Get credible messages through trusted sources.
  - Share widely across all platforms, but focus on **trusted messengers** (experts, doctors, official public health bodies).
  - Identify which sources communities already rely on.
- **Explanation** – Build understanding and trust.
  - Strengthen institutional trust (government, health authorities).

    - Use community leaders and experts as messengers.
    - Emphasize support (financial help, privacy protection) to overcome stigma and reporting fears.
- **Action** – Make behaviours easy and credible.
    - Promote **small steps first** (washing hands, seeking information).
    - Show that actions work—emphasize effectiveness to boost confidence.

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5. Response Use

During outbreaks, use rapid surveys to check:

- What misinformation is circulating.
- Which sources people trust.
- Whether communities feel supported and protected.
- Which small actions can be promoted quickly.

These real-time insights help tailor interventions while the outbreak is ongoing.

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6. Golden Rules for Practitioners

- Plan early with preparedness research.
- Focus on **message acceptance** as the key outcome.
- Always check for **enablers and inhibitors** in each context.
- Apply IDEA: Internalize → Distribute → Explain → Act.
- Promote small, simple steps that build towards bigger change.
- Strengthen trust and reduce stigma at every stage.

👉 In practice: Use this toolkit to **predict and improve message acceptance**, adapt messages to different groups, and make outbreak communication more effective, ethical, and actionable.

Section 3: In Detail

This toolkit has been designed for application in two different contexts – producing actionable knowledge needed for preparedness research and producing actionable knowledge for outbreak response. These are important points to distinguish. *Preparedness* research should be deployed over a longer period and strategically to build up a detailed understanding of the core attitudes and identifications that drive message acceptance about self-protective behaviours. Preparedness tools allow strategy to be developed ahead of time and interventions to then be deployed or adapted quickly depending on the situation. More specifically, these tools can help practitioners to:

- improve information literacy about diseases like mpox,
- reduce the risk of infodemics taking root during outbreaks,
- strengthen relationships between governments, public health, and non-state actors, and
- build or maintain the trust necessary at multiple levels for communities to feel confident in the public health recommendations they research during outbreaks.

This stands in contrast to *Response* research, which should be used sparingly but are useful in refining strategy based on specific demographics, the details of a public health emergency (PHE), and pre-testing messages in the specific outbreak contexts to ensure message success.

The toolkit applies the IDEA model and the boxes represent the integration of the IDEA principles in combination with demographics and identifications (see Figure 2). Collectively, in the pilot test (see Section 4) indicates well-designed messages can have a 68% chance of persuading targeted populations to adopt self-protective behaviours for mpox, which provides a meaningful outcome for public health communication.

Preparedness Research Toolkit

The primary aim of this toolkit is to identify how to improve people's willingness to adopt self-protective behaviours related to mpox. In short, we call this 'message acceptance'. Therefore, the **'action'** component of IDEA is our outcome or **dependent variable**(s). The preparedness research tool then focuses on the drivers of self-protective behaviour message acceptance or the **independent variables** including **social demographics, internalization, explanation**, and **distribution** of the communication strategy for mpox.

Action: Message Acceptance

The self-protective behaviours included here are based on WHO guidance for mpox from 2024 *(1)*. They can be measured using single questions or grouped together. Pilot testing showed that self-protective behaviours often occur together. When someone adopts one action, they are more likely to adopt others. Therefore, the survey can be adapted by the practitioner-research team in collaboration with community partners to ensure cultural relevance, clarity, and alignment with local public health priorities. The aim of these adaptations is to improve message acceptance and ensure the toolkit is actionable across diverse settings. This pattern suggests that promoting even one simple behaviour can lead to broader protective habit. Therefore, survey adaptation can include one or a combination of the self-protective behaviours given in Box 2[5]. The allows practitioners the opportunity to customise and focus the questionnaire as narrowly or broadly as appropriate.

Box 2 – Measuring Action: Willingness to Take Self-Protective Behaviours to Reduce Mpox Risk

For each behaviour listed, please indicate your willingness on a scale of 1 (not willing) to 5 (willing) to perform the behaviour:

- open conversation face-to-face
- avoiding close contact, including sex
- wash/sanitize hands
- seek medical advice on mpox
- fully self-isolate w/mpox
- use condoms for 3 mo. after recovery
- avoid wild animal contact
- avoid improperly cooked meat
- seek info about mpox
- discuss vaccination for travel to affected areas w/ doctor
- discuss vaccination for mpox if exposed w/doctor
- if traveling where prevalent, seek info
- if exposed, follow health advice from authorities
- if symptomatic, no traveling
- if symptomatic, seek immediate medical care
- if symptomatic after travel, inform of travel history
- if symptomatic, inform health provider about lifestyle factors

Drivers for Self-Protective Behaviour Message Acceptance

While the toolkit will continue to evolve and be adapted for different countries and communities in the European Region, the current version already shows strong potential to predict message acceptance. Based on regression analyses, the overall toolkit can help explain up to 68% of the reasons why people choose to follow – or not follow – self-protective behaviours during a mpox outbreak.

[5] For formatting the survey, Figure 2 in Section 2 provides an example of how an online survey tool would format it for participants.

Each independent variable may be either an:

- **enabler**: a factor that helps improve message acceptance – these are useful for designing better messages and targeting risk communication more effectively; or
- **inhibitor***:* a factor that makes people less likely to accept public health messages – these highlight barriers to communication and show where community engagement is most needed.

However, the characterization of whether these independent variables function as enablers or inhibitors is country and context dependent; this is a conclusion to be drawn from the research, but can be put in context by comparisons to the pilot study (see Section 4).

Social demographics to maximize the intervention impact

In this toolkit, evidence based on the regression analyses show that the following social demographic variables account for up to 44% of people's willingness to adopt self-protective behaviour recommendations about mpox (see Section 4 for full results details). Therefore, when conducting preparedness research, the following social demographics should always be included in the survey design:

- Demographics (i.e., age & country of residence)
- Identifications (i.e., political identity, religiosity, and values)

In prioritising which of these variables matter the most, the pilot test findings suggest that political ideology (Box 3) was the most important single factor to know followed by values (Box 4), and then religiosity (Box 5). Each of these are factors; therefore, all of the questions in each of the boxes should be asked when creating a survey, unless it is otherwise noted within the box.

Box 3 – Identification: Political Ideology

For each statement, please indicate how much you agree or disagree with it on a scale of 1 (strongly disagree) to 5 (strongly agree):

- It is the government's responsibility to protect environment
- It is right for the government to provide healthcare to undocumented migrants
- It is right for the government subsidize art & entertainment
- The freedom of religion is important, even when some religions are different
- Women should be allowed contraception & abortion
- All consensual human sex acts should be legal
- Government should not limit free speech
- Government should provide public education at all levels
- Government should provide healthcare to all citizens
- Government should provide healthcare to all legal residents

Box 4 – Identification: Values

For each statement, please indicate how much you agree or disagree with it on a scale of 1 (strongly disagree) to 5 (strongly agree):

- Social justice
- Unity with nature
- Protecting the environment
- Preventing pollution
- Equality
- Peace
- Helpfulness
- Respecting the earth

Box 5 – Identification: Religiosity

For each statement, please indicate how much you agree or disagree with it on a scale of 1 (strongly disagree) to 5 (strongly agree):

- I regularly attend religious services
- I pray everyday
- I pray more than once a day
- I read the sacred text of my religion
- I participate in religious social gatherings
- I provide financial support to my religion
- I use religious teaching to make important decisions
- I participate in groups affiliated w/my religion
- Religion is important when choosing a job
- Religion is important when dating
- Religion is important when looking at the news
- Religion is important in food choice
- Religion is important in drinking choices
- Religion is important in reading choices
- Religion is important in film choices
- Religion is important in music choices
- Religion is important in tv choices
- Religion is important in education choices for me, my children
- Religion is important in my voting choices
- Religion is important in my clothing choices
- Religion is important in my charity donation

*This factor can be split – either using the first 8 questions or the last 13 questions depending on application

Applying the IDEA model: Designing for specific communication interventions

Beyond the social demographic independent variables, the toolkit was designed to be flexible enough to allow practitioners to focus on seven specific intervention-based objectives:

1. Improving message internalization by countering infodemics;
2. Improving message internalization by focusing on message acceptance;
3. Improving message distribution by improving source credibility & reliance on official sources for mpox information;
4. Improving explanation by evaluating and improving the quality of relationships between institutions and communities;
5. Using explanation to build acceptance of self-protective recommendations;
6. Improving action by advocating small steps for mpox self-protective behaviours; and
7. Demonstrating the intervention efficacy for mpox self-protective recommendations.

These objectives may be used on their own or used in any combination depending on the research agenda, resources, and participants as described in Section 2.

Internalization-Related Interventions

Internalization focuses on the degree that people believe that mpox is relevant to them *(2)*. If people do not believe mpox is relevant to them, they are likely to ignore the public health recommendations. By addressing mpox's relevance to members of communities, internalization is grounded in a tradition of community risk assessment *(3).* Although internalization is one of the more complex factors to assess, it plays a meaningful

role in improving message acceptance. It helps guide the design of more effective community engagement strategies and tailored public health messages.

Intervention objective 1: Improving message internalization by countering infodemics

The 2023 WHO risk communication, community engagement and infodemic management (RCCE-IM) toolkit on eliminating mpox *(4)* noted a critical objective is managing the infodemic. While false information on social media is often seen as the main cause, it's not the whole story. When people feel at risk – either personally or for those close to them – they tend to focus more on reducing uncertainty than on taking deliberate, reasoned action *(5)*. In these moments of uncertainty, people often seek out more information to cope. This suggests they may consume any information they can find that makes them feel reassured *(6,7)*. This behaviour shows that the roots of the infodemic lie in how people internalize risk. Internalization is about helping people recognize a risk without overwhelming them. Rather than *reacting* to the infodemic after an outbreak begins, preparedness research can *proactively* build community resilience by identifying trusted sources and accurate beliefs to guide tailored interventions. If there is a silver lining, recent research suggests that widespread belief in misinformation is not as common during public health emergencies as often assumed *(8,9)*.

In the context of mpox, countering the infodemic means strategically addressing *inhibitors* to internalization. In the pilot test, four inhibitors were identified, namely:[6]

- perceived knowledge
- community threat
- conspiracy beliefs
- incorrect medical beliefs.

Perceived knowledge is about how confident people feel about what they know about mpox. While this confidence can be based on accurate information, it often is not *(5)*. In the pilot test, higher perceived knowledge was linked to lower message acceptance. This means that people who believed they already knew enough about mpox were less likely to follow public health recommendations. Perceived knowledge is measured using just three simple questions (Box 6).

Box 6. Countering the infodemic: perceived knowledge

For each statement, please indicate, on a scale of 1 (strongly disagree) to 5 (strongly agree), the confidence you have in your current knowledge of:

- Extensive knowledge about mpox
- Accurately describe how mpox is spread
- Accurately describe mpox symptoms

Community threat reflects how likely people think they are to get it and how serious they believe it would be. In most social science theories, including the IDEA model used in this toolkit, feeling some level of personal threat is important to motivate action. However, in the case of mpox, other surrounding issues – like social stigma and political identification *(4)* – can turn this sense of threat into an inhibitor. Instead of encouraging action, it can increase infodemic risks and lead to inaction. Box 7 shows the wording from the toolkit to help measure perceived threat.

[6] The complete wording for each of the questions is in the research toolkit.

Box 7. Countering the infodemic: mpox threat in my community

For each statement, please indicate, on a scale of 1 (strongly disagree) to 5 (strongly agree), the level of threat you feel from mpox to:

- you personally
- your family
- your friends
- your local community

Conspiracy beliefs are increasingly identified as inhibitors to the acceptance of public health recommendations *(10–12)*. In today's political landscape, attitudes – like where someone falls on the liberal-to-conservative scale – can shape both health decisions and what information people consider "true". Because of this, understanding conspiracy beliefs surrounding mpox is important in countering its related infodemic. Box 8 shows the wording from the toolkit to help measure susceptibility to conspiracy beliefs.

Box 8. Countering the Infodemic: mpox false information susceptibility from conspiracy beliefs

For each statement, please indicate whether you think it is false or true.

- Mpox was created in a lab
- Mpox is related to coronavirus disease (COVID-19)
- Mpox is caused by COVID-19 vaccinations

Incorrect medical beliefs about mpox were the single most important factor in understanding the mpox infodemic. From an information literacy perspective, it is much harder to correct inaccurate beliefs after they've formed than to provide accurate information early on *(13,14)*. That's why health literacy – people's ability to understand and use health information – and community empowerment approaches recommend tracking basic medical knowledge *(15–17)* . Doing so may help predict message acceptance and identify how vulnerable a community may be to infodemics. Box 9 shows the wording from the toolkit to help measure susceptibility to incorrect medical beliefs. In this scale, lower scores indicate lower knowledge about mpox and how it spreads.

Box 9. Countering the infodemic: mpox misinformation susceptibility from incorrect medical beliefs

Below is a list of statements about mpox. Some of these may be true, some of these may be false. You will receive a link for more information about mpox at the end of this questionnaire.

- Avoiding direct skin-to-skin contact with people who have a rash that looks like mpox reduces your risk of mpox
- Avoiding wild animals in areas with mpox reduces your risk
- Washing hands can lower mpox risk
- Aside from rash, other symptoms of mpox include fever, headache, muscle aches, back pain, low energy and/or swollen glands
- The number of mpox sores range from one to thousands

Intervention objective 2: Improving message internalization by focusing on message acceptance

Mpox risk internalization is a careful balance. On one side, is the need to understand what helps people take the disease seriously. On the other, RCCE-IM interventions should not increase stigma. Preparedness research can help manage this balance by identifying which communities are ready to follow public health guidance and which may need more engagement. What is interesting about mpox – as shown by the pilot study (see Section 4) – are the two sides of threat susceptibility: when people or communities feel personally at risk, they may be less willing to follow public health advice, but when they believe that others around them outside their close circle (i.e. those who are not family, friends or direct members of their community) are at risk, they are more likely to follow recommendations.

This is known as the **third-person effect** – people are more likely to act when they see others as vulnerable. Understanding this helps provides insight into who is willing to take on self-protective behaviours. Box 10 Shows the wording from the toolkit to help measure perceived threat to others.

Box 10. Improving internalization: mpox's third person effect

For each statement, please indicate, on a scale of 1 (strongly disagree) to 5 (strongly agree), the level of threat you think mpox is to:

- immigrants or migrants
- people in other countries in Europe
- people in other non-European countries

One of the most valuable insights is knowing how strongly people believe mpox could disrupt their daily social life. This suggests that people are more likely to internalize mpox's threat if they understand that it will mean a minor disruption to their and their family's day-to-day life – known as low-grade social impact. Rather than developing RCCE-IM interventions that highlight lifestyle factors that could put people at risk and possibly increasing stigma and prejudice for mpox *(4)*, focusing on mere inconvenience and disruption will improve internalization and acceptance of public health recommendations. Therefore, the toolkit recommends the following two measures be included (Box 11).

Box 11. Improving internalization: mpox's low-grade social impact

If you or one of your family contracted mpox, what kind of disruptions to your everyday activities would you expect: (no, maybe, yes)

- Cancellation of social plans
- Self-isolation

Distribution-Related Intervention

A hallmark to effective RCCE-IM is distribution. This means getting the right message, delivered by the right sources and placed on the right platforms. A common concern during an infodemic is that people will follow the "wrong" sources – especially on social media. However, research shows that infodemics are less about exposure to false information and more about two key issues *(8,12,18–22)* namely:

- a lack of reliable information (known as information voids)
- people's trust in the sources they use.

The pilot study showed that for mpox, the most important distribution factors are:

- sharing messages from experts and official sources; and
- understanding which sources people already trust for health and mpox-related information.

No other sources had a meaningful impact – positive or negative – on whether people were willing to follow public health advice. This effect was "platform neutral" across all communication platforms, meaning public health messages should be shared widely across all platforms people use. What matters most is that the information comes from trusted, credible sources *(7,8,23).*

Intervention objective 3: Improving message distribution by improving source credibility & reliance on official sources for mpox information

People's trust in sources of information and the types of sources people rely on can vary widely across countries. For this reason, assessing both allows practitioners to focus on aspects of digital and health literacy related to the distribution of messages – which sources communities trust and rely on for health-related information. Knowing this information not only provides a diagnostic about the quality of the relationship between communities and different information providers like government, civil society, and non-governmental organizations but can identify whether building trust in experts and increasing knowledge of reliable sources should be a priority in preparedness planning.

Like an increasing among of research is finding, the pilot study found that community members' first choice for credible sources and the information they rely on to guide self-protective behaviours comes from experts and official sources of information. It also indicates that messages from non-health experts or unofficial sources did not produce consistent or reliable results.

However, this should not be taken for granted, so when message improving distribution is a strategic goal, it is useful for assessing source credibility (how much people trust the source of information) (Box 12) and information reliance (which sources people turn to for health or emergency information) (Box 13).

Box 12. Improving distribution: health experts as trusted sources for health information

For each statement, please indicate, on a scale of 1 (strongly disagree) to 5 (strongly agree), the degree to which you trust information about health and emergencies from:

- My national public health service
- my local or regular doctor
- a different national public health service
- health-related nonprofits or charities
- health-related advocacy groups
- the government of the country/region that I'm living in

Box 13. Improving distribution: sources people rely on for health information

For each statement, please indicate, on a scale of 1 (strongly disagree) to 5 (strongly agree), the degree to which you rely on information from each of the following sources:

- Website/social media from public health organizations
- Website/social media from governments
- Website/social media from health-related organizations
- Website/social media from news organizations
- Television news broadcasts from my country of residence
- Newspapers/publications from my country of residence
- Press conferences by public health experts
- Press conferences by government officials
- Press conferences by health advocacy groups

Explanation-Related Interventions

Whereas distribution focuses on using the right sources and platforms to share information, explanation focuses on crafting the right messages for effective RCCE-IM around mpox. Explanation involves three key elements *(2)*, namely:

1. **who** is communicating the risk to communities
2. **what** communities need to understand about mpox
3. **how** they expect to be treated.

The pilot study confirmed that **explanation** is important for improving message acceptance.
Intervention objective 4: Improving explanation by evaluating and improving the quality of relationships between institutions and communities

The distribution section highlighted that experts are more likely to be trusted to share accurate information than other sources. However, people's willingness to follow public health recommendations about mpox also depends on whether community members view institutions as trustworthy *(5)*. Institutional trust – meaning trust in government and public health organizations – is now widely recognized as essential for effective RCCE-IM.

This is distinctive from source credibility because building institutional trust is a feature of the message and it plays a key role in encouraging people to adopt self-protective behaviours *(24–26)*. In other words, when explaining what self-protective behaviours people should adopt, explaining *why* they should adopt them is linked to the trustworthiness of the institutional actors making the recommendations on diseases and disease prevention *(5,7)*. For this reason, assessing institutional trust is recommended to help public health organizations understand their potential for successful community engagement around mpox. Box 14 provides a measure institutional trust to diagnose whether the quality of the relationships needs to be targeted in the communication strategy.

Box 14. Improving explanation: institutional trust to evaluate mpox community engagement success

For each statement, please indicate, on a scale of 1 (strongly disagree) to 5 (strongly agree), the degree to which you believe that public health organizations (national or international):

- give me a trustworthy impression
- are typically truthful
- demonstrate they are dedicated to being "good"
- give me a feeling of trust
- share information freely with the public
- provide all the latest information about their activities
- are transparent

Whereas distribution requires the source of the message to be credible, explanation also requires the messenger to be credible. Public health organizations increasingly rely on partnerships with community leaders to share important health recommendations. The pilot study found that explanation is improved when the messengers are leaders – both institutional and community leaders because they are trusted to communicate accurate information. Box 15 provides the tool for assessing whether the messengers are trusted to deliver accurate information about mpox.

Box 15. Improving explanation: evaluating information accuracy from institutions and community leaders

On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate how much you agree with the statement "I trust ____ to provide accurate information on mpox."

- scientists, doctors and health experts
- national health organizations
- global health organizations (e.g. WHO)
- national (e.g. Belgian, Dutch, United Kingdom) government
- leaders within my local community

Intervention objective 5: Using explanation to build acceptance of self-protective recommendations

Though the messenger is important, the content of the message is ultimately critical. While the specific action or self-protective behaviour must be clear, that may not be the only content required to persuade communities to act. Explanation can also provide the context necessary for community members to act. In the European Region mpox has mostly affected groups with certain behaviours – such as people with multiple sex partners (including sex workers), men who have sex with men, and immigrant or migrant populations who travel to countries where mpox is endemic *(4)*. WHO recommendations on mpox acknowledge the challenges posed by the social stigma of the disease *(4)*. This is consistent with previous research about mpox as well as other diseases *(10,27–29)*. When stigma or fear of discrimination is linked to a health emergency, people may be less willing to accept public health recommendations due to fear of being judged or punished *(4,10,26,27,30)*. These concerns are also tied to how well people believe they will be supported if they are affected by the disease *(30,31)*. Clear risk communication about mpox can help communities accept public health advice. But this only works when the message also explains and addresses the community's biggest concerns about the disease *(2, 31)*.

The pilot test identified three explanation-related enablers that help tailor messages to specific communities, namely:

1. general willingness to self-report symptoms (Box 16)
2. whether receiving support would influence their decision to report (Box 17)
3. confidence that their privacy will be protected when reporting (Box 18).

By focusing on these peripheral issues, messages about mpox can highlight the support and privacy that community members can expect, which is crucial with a disease where social stigma is a major inhibitor for adopting self-protective behaviors. These also represent indirect strategies for improving recommendations for self-protective behaviours.

Box 16. Improving explanation: general willingness to self-report mpox symptoms

On a scale of 1 (strongly disagree) to 5 (strongly agree), indicate how much you agree with the statement "I am willing to report symptoms of mpox to my local doctor or health authority."

Box 17. Improving explanation: support when self-reporting mpox

On a scale of 1 (strongly unlikely) to 5 (strongly likely), indicate how likely you would be to report mpox symptoms to your local doctor or health authority if:

- I would receive financial support for lost work because of self-isolation requirements
- receiving treatment would not cost me any money
- if I were feeling unwell/seeing the first or minor symptoms
- if I had skin-to-skin contact with a symptomatic person
- if I were experiencing severe symptoms of mpox

Box 18. Improving explanation: privacy protected when self-reporting mpox

On a scale of 1 (strongly unlikely) to 5 (strongly likely), indicate how likely you would be to report mpox symptoms to your local doctor or health authority if you knew that:

- the police would not be informed about health, lifestyle and/or migration status
- the government would not be informed about health, lifestyle and/or migration status
- friends and family would not be informed about health, lifestyle and/or migration status

Action-Related Interventions

Action has already been discussed as the critical outcome – people's willingness to accept self-protective behavior recommendations *(34)*. However, the effectiveness of these instructions can be improved by linking them to **cues for action**: signals or prompts that encourage people to take the recommended steps. These elements help strengthen message acceptance by making the recommended actions feel more relevant and effective. The research toolkit defines these cues in two ways:

1. **related actions** – other behaviours that support the main recommendation; and
2. **contextualization** – providing information that helps communities feel confident the actions will successfully reduce their risk.

Intervention objective 6: Improving action by advocating small steps for mpox self-protective behaviours

The pilot study suggests that public health practitioners and community leaders can use a **small steps approach** – starting with simpler actions to build confidence in the behaviours and trust in those delivering the messages *(35)*. This approach may improve overall message acceptance. More importantly, it avoids overwhelming people with a long list of actions, keeping risk communication simple and manageable.
As a single-item measure, community members can be asked about any one mpox-related behaviour together with their acceptance of public health recommendations (Box 19). In research terms, this is known as a **single-item measure** – a question designed to capture a key behaviour or belief using just one item. If they agree to one, they are more likely to agree to others.

These measures allow interventions to be customised to different populations with different interests and concerns.

Box 19. Enabling action: a small steps approach to improving action recommendations

On a scale of 1 (strongly unlikely) to 5 (strongly likely), indicate how likely you would be to report mpox symptoms to your local doctor or health authority if you also:

- Have an open conversation with friends and family face-to-face about mpox
- Avoid close contact, including having sex
- Wash/sanitize hands
- Seek medical advance on mpox
- Use condoms for 3 months after recovery
- Seek information about mpox
- Discuss vaccination for travel to affected areas with a doctor
- If exposed, follow health advice from authorities
- If symptomatic, no traveling
- If symptomatic, inform health provider about lifestyle factors
- If symptomatic, inform health provider about travel history

Intervention objective 7: Demonstrating the intervention efficacy for mpox self-protective recommendations

The final preparedness research objective focuses on response efficacy – whether people believe that recommended actions will effectively reduce their risk of mpox. While recognizing a health threat is important for motivating self-protective behaviour, research shows that *response* efficacy is a critical enabler of action *(36–38)*.

Higher response efficacy is associated with:

- greater willingness to follow public health recommendations
- more positive perceptions of experts
- higher levels of accurate knowledge.

This suggests that *response* efficacy should be a focus in both preparedness research and in early-stage outbreak responses. It is especially important during the early stages of an outbreak, when fear is already elevated. Emphasizing the effectiveness of recommended behaviours can support message acceptance without increasing fear *(39)*.

To assess public attitudes about specific behavioural recommendations, two simple questions should be asked:

1. Are people willing to perform the recommended behaviour?
2. Do they believe it will significantly reduce their risk of mpox?

This approach provides quick, actionable insights into how behavioural recommendations are perceived (Box 20).

Box 20. Enabling action: Examples of intervention efficacy combined with a small steps approach

Check any column if the answer is 'Yes'

Behavioural recommendations	I am willing to do the behaviour	I believe the behaviour would significantly reduce my risk of getting mpox and/or improve treatment for mpox
If mpox were spreading in my community, I would have an open conversation with my close friends and family about symptoms that I or they may have		
I would frequently wash my hands with soap and water and/or use an alcohol-based hand sanitizer		
I will look for more information about mpox – including its symptoms and how it spreads		

Response Research Toolkit

This section focuses on how to apply the toolkit during an active mpox outbreak. While the pilot study presented in the main document provided valuable baseline insights across three countries – Belgium, Netherlands (Kingdom of the) and the United Kingdom of Great Britain and Northern Ireland additional response research is essential to adapt and validate these findings within specific national and community contexts to refine and improve the responses to mpox. The WHO Regional Office for Europe's Collaborating Centre on risk communication, community engagement and infodemic management can support Member States in conducting this additional research.

Response research should be used during emergencies. Response research tools are valuable for fine-tuning strategies based on specific characteristics of the event and the affected population – such as age, gender, cultural background or education level – as well as the details of the public health emergency. They also help test messages in real outbreak settings to make sure they work. Since practitioners are the ones most likely to use and interpret these tools, they need to be practical in terms of time and available resources. This toolkit builds on lessons from COVID-19 and aligns with WHO principles for evidence-led decision-making. This section focuses on how to apply these principles to refine messaging for specific communities during mpox outbreaks. The preparedness research tools introduced seven intervention objectives: a number of them can also be used in response research, including:

- intervention objective 2: improving internalization and recommendation acceptance:
    - evaluating the contributors to mpox internalization can be done as part of response research at the outset of an outbreak in a specific community, region or country. This allows for a real-time evidence of how people are responding as the situation unfolds. It should also be part of ongoing social listening and used to build community resilience.
- intervention objective 5: using explanation to build acceptance of self-protective recommendations by understanding:
    - this includes the willingness to report mpox status to either a local doctor or public health authority and the need for support and maintaining privacy when self-reporting mpox status. These explanation-related enablers can help tailor messages to specific communities and can be used to build knowledge for rapid response message development or to fine-tune existing messages during rapid research, depending on the concerns of affected communities;
- intervention objective 6: small steps for mpox self-protective behaviour adoption; and
- Intervention objective 7: demonstrating intervention efficacy for mpox.

Rapid research for real time insights

This section explains how to apply the toolkit during an active mpox outbreak to quickly gather insights and adjust RCCE–IM strategies in real time. It focuses on how to use the toolkit's **multi-question predictors** as short sets of related survey questions that measure complex ideas like trust, perceived risk, or misinformation susceptibility. These predictors help identify what drives or blocks message acceptance in different communities.

This section focuses on three IDEA components (Internalization, Distribution, Explanation and Action) that are especially useful during outbreaks:

- **Internalization inhibitors** – factors like misinformation or low perceived risk that reduce message acceptance
- **Distribution enablers** – factors that increase trust in sources and improve information reach
- **Explanation enablers** – factors that help people understand the risk and feel supported in acting

These recommendations serve as a starting point for tailoring interventions, but further validation is needed across different countries and contexts.

How to use this table

When designing a response survey:

1. Identify intervention objective(s) (e.g. misinformation, trust, privacy).
2. Then use the table to select relevant predictors and IDEA components.
3. The "Survey Design Implication" column provides insights to decide which types of questions to include and which variables to prioritize.

Intervention Objective	Key Variables	% Pilot Variance Explained and predictor type	Survey Design Implication	Notes from pilot summary
Improve internalization by addressing perceived knowledge (Internalization inhibitor[7])	Education, Age, Household Composition, Political Ideology, Religiosity, Values	36% Demographics, (17%) Identifications 20%	To use the toolkit effectively, you should also include questions about education level, age, and household composition. These are predictors of perceived knowledge, which the pilot study found to be an inhibitor of message acceptance.	People with higher education, younger age, or who live with children tend to feel more confident about what they know about mpox—even if that knowledge isn't always accurate. This confidence, called perceived knowledge, can actually make them less open to new public health messages. On the other hand, those who live with extended family tend to feel less confident in their knowledge..
Counter misinformation (incorrect medical beliefs) (Internalization inhibitor)	Country, [8] Living with children, Political Ideology, Religiosity, Values	20% Demographics (3%), Identifications (17%)	The toolkit recommends using true/false questions to test basic medical beliefs about mpox—since incorrect beliefs are the strongest predictor of rejecting public health messages. To better understand who is most susceptible, include questions about household composition, country of residence, political views, religiosity, values, and intercultural contact, which were shown in the pilot to predict	People who hold incorrect medical beliefs about mpox are less likely to accept public health recommendations—this was identified as the strongest predictor of message rejection in the pilot study. These beliefs reflect low information literacy and are harder to correct once misinformation is internalized..

[7] Internalization inhibitors are factors that reduce the likelihood of individuals accepting and acting on public health messages.

[8] Noting that country is important; therefore, measurement within each individual country of interest is recommended

			misinformation susceptibility.	
Address conspiracy beliefs	Country, Religiosity, Values, Risk behaviours	25% Demographics, (6%) Identifications, Behaviours (18%)	Include questions on conspiracy beliefs, risky behaviours, and identity factors (e.g., religiosity, values, political orientation). These account for a significant portion of misinformation susceptibility.	Some groups are more open to public health messages than others. People with strong religious views may be more vulnerable to misinformation, while those who value societal good tend to be more receptive. Regional differences matter—local validation is key (e.g., UK residents showed lower susceptibility). Political leanings, household setup, and intercultural contact also shape trust. Watch out for overconfidence and conspiracy beliefs—they often block message acceptance.
Distribution enabler [9] Build trust in expert sources	Education, Gender, Country, Religiosity, [10]Political Ideology, Values	30% Demographics, (6%) Identifications (24%)	Use the Institutional Trust and Trusted Sources of Health Information sections of the survey to explore how much people trust scientists, doctors, national and global health organizations. To understand what shapes that trust, include questions on education, political views, religiosity, religious affiliation (e.g., secular or Christian), values, and intercultural contact.	Trust in expert sources depends more on who's speaking than where the message appears. People with higher education, liberal views, secular or Christian identities, and regular intercultural contact tend to trust official sources more. Values matter—those prioritizing societal good show greater trust. Religiosity also boosts trust, though it can increase susceptibility to misinformation.
Increase reliance on official sources (Distribution enabler)	Education, Gender, Country, Religiosity, Political Ideology, Values	26% Demographics, Identifications	To understand trust in expert sources, use the Institutional Trust and Trusted Sources sections. To explain differences, include questions from the Identifications section—education, political views, religiosity, religious affiliation, values, and intercultural contact.	Reliance on expert sources is associated with several factors. People with higher education, liberal views, secular or Christian identities, and regular intercultural contact tend to rely more on official sources. Living with children also plays a role. These patterns vary by country—Belgium showed lower reliance, while Dutch residents showed higher reliance in the pilot.
Improve trust in science	Education, Gender, Country,	26%	To explore trust in science, use the Trust	Trust in science is associated with higher education, liberal views, secular

[9] Distribution enablers are the factors that are key to promoting public health recommendations related to self-protective behaviour

[10] Amongst demographics, participants were asked to indicate their religion in a qualitative response, these were grouped and tested for effect. Those reported here were the only ones that significantly influenced the factors evaluated.

(Explanation enabler[11])	Religiosity, Political Ideology, Values	Demographics, (9%) Identifications (18%)	in Science section of the survey. Ask about views on science's role in solving problems, improving health, and managing disease outbreaks. Include demographic and identification questions—especially education, gender, political views, religiosity, religious affiliation, values, and intercultural contact—as these help explain variations in trust across groups.	or Christian identities, and regular intercultural contact. Men showed slightly more trust than women. Country differences matter—Dutch residents showed lower trust than those in Belgium or the UK. These patterns help explain how scientific messages are received and should be validated locally.
Increase willingness to report mpox status (Explanation enabler)	Gender, Household Composition, Country, Political Ideology, Religiosity, Values	26% Demographics (6%), Identifications (20%)	To assess willingness to report mpox symptoms, use the single-item measure: "I am willing to report symptoms of mpox to my local doctor or health authority." Include demographic questions (gender, household composition, country of residence) and identification items (political views, religiosity, societal values)	Willingness to report mpox symptoms varies. Women were more likely to report, while those living with extended family were less willing. UK residents showed higher willingness than Belgium or the Netherlands. Liberal views and values focused on societal good were linked to greater openness, while higher religiosity was associated with lower willingness to report.
Build confidence in receiving support (Explanation enabler)	Household Composition, Country, Political Ideology, Religiosity, Values	25%' Demographics, (3%) Identifications (23%)	Include items asking whether respondents would report mpox symptoms under specific supportive conditions: financial support for lost work, free treatment, presence of mild symptoms, and presence of severe symptoms. Key demographics to include: household composition (partner, children) and country of residence. Key identifications: political ideology, religiosity, and societal values.	In the pilot, people living with children or who valued societal good were more likely to want support when reporting mpox. UK residents showed more interest than those in Belgium or the Netherlands. Meanwhile, those living with a partner, identifying as secular or highly religious, or living in Belgium or the Netherlands were less interested.

[11] Explanation enablers improve explanations and thus understanding of risk, which supports the adoption of self-protective behaviours related to mpox

Build confidence in privacy protection (explanation enabler)	Household Composition, Country, Political Ideology, Religiosity, Risk behaviours	18% Demographics, Identifications, Behaviours	Measure confidence in privacy protection by asking whether respondents would report mpox symptoms if they knew that police, government authorities, or friends and family would not be informed about their health, lifestyle, or migration status. Include key demographics: household composition and country of residence. Include identifications: religiosity, political identification, and intercultural contact frequency.	In the pilot, confidence that privacy would be protected when reporting mpox symptoms was higher among people living with children, those identifying as Christian or politically liberal, and individuals with frequent intercultural contact. Confidence was lower among those living with extended family and residents of Belgium or the Netherlands. Monogamous individuals also showed slightly more confidence.

The final component for this toolkit and survey design is ensuring that participants taking the survey do so ethically, with informed consent. Box 21 provides a sample informed consent letter that can be adapted for the scope, objectives, and participants recruited.

Box 21: Sample informed consent letter for an mpox survey

One of the lessons learned from our collective experience with COVID-19 was that effective communication about public health emergencies can save people's lives. Unfortunately, not everyone got the right information at the right time for them and there were preventable illness and death.

Public health organizations connected to organizations such as the World Health Organization and national public health agencies are trying to learn from mistakes made so that they can more safely and effectively communicate with everyone living in their countries or regions.

While there are many diseases that may start in Europe or be brought into Europe, we are focusing on mpox – an infectious disease that can cause a painful rash among other symptoms. ***It is not important that you know anything about mpox*** – in fact, because it is not a common disease in Europe it is a good example to use on a questionnaire like this so that we can capture the public's understanding and attitudes surrounding diseases most of us don't know much about because that's what happens in real life.

Your participation and answers to these questions will help public health organizations do a better job of reaching out to all communities in safe and effective ways. This is why ***your participation is 100% anonymous*** meaning that the researchers have no way of knowing who you are and there is no way to connect you to any of your responses. So, you can feel confident that you can be honest in your responses and ***proud that your responses will help make people safer in the future.***

Therefore, you are invited to participate in a research project where the ***main purpose is to improve community engagement about infectious disease amongst the general population and vulnerable groups in Belgium, and Netherlands (Kingdom of the) and the United Kingdom***. You are only one of about 1500 people that we are asking for help.

The objectives of the project are to:
· help public health organizations, like the World Health Organization and national public health authorities, better design and evaluate messages for the public; and

· produce a toolkit and support package of information and research that would improve tailoring health emergency messages to different groups within these countries and streamline gathering health information.

This data will also be used in developing training and teaching materials for risk communication, community engagement and infodemic management and be reported in academic research. However, all of the data is anonymous and will only be reported in aggregate.

I consent to participate and for my data to be used as described above.

☐ Yes, I consent

☐ No, I do not consent

Section 4: Detailed Results from the Pilot Study

Field to the Pilot Study Results

The pilot test of the Mpox research toolkit was carried out in the UK, Belgium, and the Netherlands with over 1,800 participants. The findings show which factors most strongly predict whether people are likely to follow public health recommendations. This guide translates those insights into practical steps for improving community engagement and message design.

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1. Key Takeaway: Predicting Behaviour

The toolkit explained **about 68% of the likelihood** that people would adopt mpox self-protective behaviours. That means the approach works: if you ask the right questions and design messages based on demographics, identifications, and IDEA factors, you can predict—and improve—compliance with health advice.

👉 **For practitioners:** These findings give you a roadmap. Focus your surveys and interventions on the strongest predictors rather than wasting resources on less useful measures.

---

2. Critical Factors to Collect

The pilot showed that **demographics alone** (like age or gender) only explain part of the picture. For best results, combine them with **identifications** and behaviour questions.

Collect these core details:

- **Demographics:** age, gender, education, marital status, household composition, country/region of birth, and country of residence.
- **Identifications:** political ideology, religiosity (how much religion shapes daily life), and personal/social values.
- **Previous behaviours:** risky practices (e.g., sexual behaviour, travel, animal contact) and prior self-protective actions.

👉 **Field tip:** Don't assume findings from one country apply elsewhere. Always collect local data, even if only a quick survey.

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3. Applying IDEA Components

The pilot confirmed that the **IDEA model** (Internalization, Distribution, Explanation, Action) helps identify where to focus interventions.

Internalization: Making Mpox Relevant

- People act only if they see mpox as relevant to them or their community.
- Barriers include low risk perception and misinformation.
- **Application:** Use local examples, show small but real disruptions (missed work, isolation), and involve trusted voices to link mpox to daily life.

Distribution: Using Trusted Sources

- The strongest driver of acceptance was **who delivers the message**.
- People trust experts and official sources—not influencers or celebrities.
- **Application:** Use doctors, scientists, health authorities, and public health services as messengers. Share across all platforms (social media, TV, community meetings) but keep the messenger credible.

Explanation: Framing Risks and Responses

- Communities want clear explanations of what mpox is, why it matters, and how they'll be treated if affected.
- **Application:** Build trust by highlighting transparency, fairness, and support. Use simple, direct messaging that explains both the disease and the systems in place to help.

Action: Enabling Protective Behaviours

- Compliance improves when actions are explained clearly and connected to **effectiveness cues** (why the behaviour works).
- **Application:** Promote small, manageable steps (e.g., handwashing, seeking medical care) before larger commitments (weeks of isolation). Show evidence that these actions reduce risk.

---

4. Golden Rules for Practitioners

- **Don't rely only on demographics**—values, politics, and religiosity matter just as much.
- **Always use trusted messengers** (experts, health services).
- **Explain the "why"**—not just what to do, but why it matters.
- **Promote small wins**—small protective actions lead to broader compliance.
- **Collect local data**—context matters; don't copy-paste from other countries.
- **Address stigma and privacy concerns**—people are more likely to report symptoms if they trust their information won't be misused.

👉 In practice: Use these pilot findings to **prioritize what to measure, who to engage, and how to frame messages**. Doing so makes communication more relevant, trusted, and actionable—and increases the likelihood communities will follow mpox protective recommendations.

Section 4: In Detail

Pilot Test Sample Information

The pilot test included a paid-for general population sample from three countries in the European region with diverse populations including the UK (N = 606), Belgium (N = 612), and the Netherlands (N = 608). Across the sample, 809 identified as men, 932 as women, and 4 as other. The age range was 18-69. Eighty-nine percent were both inside the European region (including the EU and Central Asia), 5% outside, and an additional 6% declined to share where they were born. Additionally, 22% of the population self-identified as either immigrants or migrants to the country in which they were living.

Data were analysed using correlations and regression analysis. The percent of variance predicted summarises how much the model including the independent variables analysed predict the changes in the dependent variable. For example, a value of 100% means that the independent variables perfectly explains all of the variance in the dependent variable. The proportion of unexplained variance represents what is not accounted for by the independent variables – what is yet unknown.

Factor Validity Table of Factors From the Exploratory Factor Analysis

Variable	Questions	Eigen-value	Variance Explained	Factor Loading	Alpha
Mpox High Risk Behaviours	Within the last year have you….	4.11	41.13		.85
	-travelled to central, eastern, or western Africa			.60	
	-had sex/sexual contact w/ more than 1 partner			.61	
	-paid for sex/sexual contact			.80	
	-been paid for sex/sexual contact			.81	
	-consumed raw wild animal meat/blood/parts			.65	
	-engaged in IV drug use			.72	
	-worked in hotel or laundromat			.71	
	-moved internationally			.70	
Mpox Risk Behaviours	Within the last year have you…	N/A	N/A	N/A Single	
	-had sex/sexual contact with 1 woman			Single	

	-had sex/sexual contact with 1 man				
Institutional Trust	Public health orgs - national or international	5.07	72.43		.94
	-Give me a trustworthy impression			.85	
	-Are typically truthful			.88	
	-Demonstrate dedicated to being 'good'			.86	
	-Give me a feeling of trust			.88	
	-Share information freely with the public			.83	
	-Provide all the latest info about their activities			.83	
	-Are transparent			.85	
Trust in Science	Science and technology…	2.79	69.66		.85
	-makes lives healthier, easier, & comfortable			.87	
	-can solve nearly any problem			.77	
	-important to econ. & industrial development			.85	
	-effective responding to disease & outbreaks			.84	
Mpox Info. accuracy institutions & community leaders	I trust ___ to provide accurate info on MPOX	3.97	66.09		.90
	-scientists, doctors, & health experts			.85	
	-national health organizations			.90	
	-global health organizations (e.g., WHO)			.86	
	-national (i.e., British, Belgian, or Dutch) govt			.85	
	-leaders w/in my local community			.77	
Trusted Sources of Health Info: Health Experts	Trust info about healthcare, emergencies from:	6.43	45.91		.87
	-national public health service			.83	
	-my local or regular doctor			.77	
	-a different national public health service			.75	
	-health-related nonprofits or charities			.72	
	-health-related advocacy groups			.69	
	-the govt of country/region I'm living in			.75	
Trusted Sources of Health Info: Non-Health Experts	Trust info about healthcare, emergencies from:	2.13	15.18		.88
	-my religious leader(s)			.67	
	-people on social media			.87	
	-influencers on social media			.90	
	-celebrities			.83	
	-journalists			.60	
	-members of my community			.61	
Source Reliance for Health: Cross-Platform Official Sources	Info on health, emergencies, diseases, rely on:	8.22	54.79		.93
	-site/social media from public health orgs			.78	
	-site/social media from governments			.77	
	-site/social media from health-related orgs			.71	
	-site/social media from news orgs			.62	
	-TV news broadcasts from residence country			.75	
	-newspapers/pubs from residence country			.73	
	-press conferences by public health experts			.80	
	-press conferences by govt officials			.76	
	-press conferences by health advocacy groups			.73	
Source Reliance for Health: Cross-Platform Non-Expert Sources	Info on health, emergencies, diseases, rely on:	1.71	11.39		.90
	-site/social media from individual journalists			.66	
	-site/social media from influencers I follow			.87	
	-site/social media from influencers don't follow			.88	
	-Entertainment sources from residence country				
	-Entertainment sources from other countries			.76	
				.81	
Mpox Perceived Knowledge	Confidence in your current knowledge…	2.49	83.07		.90
	-Extensive knowledge about MPOX			.91	
	-Accurately describe how MPOX is spread			.92	
	-Accurately describe MPOX symptoms			.91	
Mpox Susceptibility: Confidence	An eval of how easy it is to contract MPOX	3.76	53.68		.86
	-Public skin-to-skin contact w/exposed			.71	
	-Public skin-to-skin contact w/symptomatic			.78	
	-Non-sexual skin-to-skin close contact w/exposed			.74	
	-Non-sexual skin-to-skin close contact w/symptomatic				
	-Sexual contact w/exposed			.77	
	-Sexual contact w/symptomatic				
	-Contact w/surfaces touched by infected			.71	
				.74	
				.68	
Mpox Knowledge Score	30 = Answered all T/F questions correctly	N/A	N/A	N/A	N/A

	120 = Answered all T/F questions incorrectly				
Mpox Threat: Us	Susceptibility + Severity, greatest threat is to:	5.16	64.55		.93
	-you personally			.88	
	-your family			.90	
	-your friends			.89	
	-your local community			.80	
Mpox Threat: Them	Susceptibility + Severity, greatest threat is to:	1.28	16.05		.88
	-immigrants or migrants			.88	
	-people in other countries in Europe			.79	
	-people in other non-European countries			.90	
Mpox Risks: Serious	Severity of MPOX threat to you personally:	2.99	49.81		.82
	-I could face serious social consequences			.79	
	-I could face discrimination			.75	
	-I could be physically disfigured			.78	
	-I could be seriously ill			.84	
Mpox Social Risks	Disruptions to life from MPOX by me/family:	2.29	45.89		.78
	-cancellation of social plans			.87	
	-self-isolation			.88	
Mpox Work, Travel Risks	Disruptions to life from MPOX by me/family:	1.42	28.42		.82
	-going to my workplace			.91	
	-travel			.91	
Mpox Financial Losses	Disruptions to life from MPOX by me/family would include financial losses	1.01	12.47	.90	N/A
Mpox Misinformation Susceptibility: Medical Beliefs	Correct (low)/incorrect (high) knowledge:	6.29	20.96		.81
	-avoiding direct skin-to-skin contact w/ people who have a rash that looks like MPOX			.67	
	-avoiding wild animals in areas w/MPOX			.63	
	-washing hands can lower MPOX risk			.69	
	-aside from rash, other symptoms include fever, headache, muscle aches, back pain, low energy, &/or swollen glands			.69	
	-number of MPOX sores range 1-1000's				
	-anyone w/close contact with MPOX is at risk			.61	
				.69	
Mpox Misinformation Susceptibility: Conspiracy Beliefs	Correct (low)/incorrect (high) knowledge:	3.50	11.67		.70
	-MPOX was created in a lab			.64	
	-MPOX is related to COVID-19			.69	
	-MPOX is caused by COVID-19 vaccines			.66	
	-cuddling with someone with MPOX is ok			.62	
Likelihood to Self-Report mpox	Willingness to report your symptoms of MPOX to your local doctor/health authority?	N/A	N/A	N/A	N/A
Reasons to Report: Money & Health	More likely to report if:	5.24	52.38		.85
	-I would receive financial support for lost work b/c of self-isolation requirements			.74	
	-receiving treatment would not cost me money			.74	
	-feeling unwell/ seeing first/minor symptoms			.74	
	-skin-to-skin contact w/symptomatic person			.77	
	-experiencing severe symptoms of MPOX			.73	
Reasons to Report: Privacy Protection	More likely to report if I knew that:	1.11	11.11		.84
	-police would not be informed about health, lifestyle, &/or migration status			.75	
	-government would not be informed about health, lifestyle, &/or migration status			.81	
	-friends & family would not be informed about health, lifestyle, &/or migration status			.74	
Compliance with Public Health Recommendations: Basic Self-Protective	Health recommendations willingly comply w/:	7.68	59.08		.94
	-self-isolation after suspected exposure – 1 wk			.75	
	-self-isolation after suspected exposure – 2 wk			.62	
	-avoid traveling to places w/MPOX outbreaks			.81	
	-practicing safer sex (including limiting #)			.79	
	-keeping hands clean			.83	
	-avoiding contact w/wild animals			.85	
	-cooking meat-based food thoroughly			.84	
	-if contract MPOX, notifying contacts, isolating self until lesions crusted over, scabs fallen off, & new layer of skin has formed			.81	

Compliance with Public Health Recommendations: Longterm Self-Isolation	Health recommendations willingly comply w/: -self-isolation after suspected exposure – 3 wk -self-isolation after suspected exposure – 4 wk -self-isolation after suspected exposure – 5 wk -self-iso after suspected exposure – 6-8 wks	1.84	14.17	 .77 .87 .91 .90	.39
Willingness to Follow Official Recommendations: Self-Protective Behaviours	For each behaviour listed, indicate willingness: -open conversation face-to-face -avoiding close contact, including sex -wash/sanitize hands - seek medical advice on MPOX -fully self-isolate w/MPOX -use condoms for 3 mo after recovery -avoid wild animal contact -avoid improperly cooked meat -seek info about MPOX -discuss vaccination for travel to affected areas w/ doctor -discuss vaccination for MPOX if exposed w/doctor -if traveling where prevalent, seek info -if exposed, follow health advice from authorities -if symptomatic, no traveling -if symptomatic, seek immediate medical care -if symptomatic after travel, inform of travel history -if symptomatic, inform health provider about lifestyle factors	1.56	4.86	 .62 .73 .71 .74 .74 .73 .75 .76 .70 .73 .72 .68 .71 .69 .66 .69 .67	.97
Willingness to Follow Official Recommendations: Other-Protective Behaviours	For each behaviour listed, indicate willingness: -having friends/fam deliver things to me -protect others by self-isolating in separate rm -protect others by using separate bathroom or cleaning surfaces -cleaning surfaces that I touched -avoiding sweeping/vacuuming -cleaning all utensils, objects, electronics -not sharing towels, bedding, clothes -doing my own laundry -open windows for good ventilation -encouraging everyone in house to wash hands -limit risk by avoiding touching others -limit risk by washing hands regularly -limit risk by covering rash -limit risk by all wearing medical mask -limit risk by maintaining 1m distance	20.76	65.87	 .64 .71 .71 .73 .73 .73 .73 .76 .75 .74 .76 .76 .73 .77 .78	.96
Likelihood of Following Official Recommendations: Self-Protective Behaviours	For each behaviour listed, indicate likelihood: -open conversation face-to-face -avoiding close contact, including sex -wash/sanitize hands -seek medical advice on MPOX -fully self-isolate w/MPOX -use condoms for 3 mo after recovery -avoid wild animal contact -avoid improperly cooked meat -seek info about MPOX -discuss vaccination for travel to affected areas w/ doctor -discuss vaccination for MPOX if exposed w/doctor -if exposed, follow health advice from authorities	1.70	5.30	 .60 .65 .63 .62 .60 .62 .64 .66 .60 .60 .60 .60	.89
Likelihood of Following Official Recommendations: Other-Protective Behaviours	For each behaviour listed, indicate willingness: -protect others by self-isolating in separate rm -cleaning surfaces that I touched -cleaning all utensils, objects, electronics -not sharing towels, bedding, clothes -doing my own laundry -open windows for good ventilation	12.51	39.09	 .60 .61 .62 .60 .64 .60	.90

	-encouraging everyone in house to wash hands			.65	
	-limit risk by avoiding touching others			.68	
	-limit risk by washing hands regularly			.64	
	-limit risk by covering rash			.60	
	-limit risk by all wearing medical mask			.62	
	-limit risk by maintaining 1m distance			.67	
Ability to Follow Official Recommendations: Self-Protective Behaviours	For each behaviour listed, indicate willingness: -open conversation face-to-face -avoiding close contact, including sex -wash/sanitize hands - seek medical advice on MPOX -fully self-isolate w/MPOX -use condoms for 3 mo after recovery -avoid wild animal contact -avoid improperly cooked meat -seek info about MPOX -discuss vaccination for travel to affected areas w/ doctor -discuss vaccination for MPOX if exposed w/doctor -if traveling where prevalent, seek info -if exposed, follow health advice from authorities -if symptomatic, no traveling -if symptomatic, seek immediate medical care -if symptomatic after travel, inform of travel history -if symptomatic, inform health provider about lifestyle factors	14.99	46.83	 .60 .65 .69 .67 .64 .62 .67 .66 .63 .68 .65 .61 .62 .60 .63 .62 .64	.94
Ability to Follow Official Recommendations: Other-Protective Behaviours	For each behaviour listed, indicate willingness: -having friends/fam deliver things to me -protect others by self-isolating in separate rm -protect others by using separate bathroom or cleaning surfaces -cleaning surfaces that I touched -avoiding sweeping/vacuuming -cleaning all utensils, objects, electronics -not sharing towels, bedding, clothes -doing my own laundry -open windows for good ventilation -encouraging everyone in house to wash hands -limit risk by avoiding touching others -limit risk by washing hands regularly -limit risk by covering rash -limit risk by all wearing medical mask -limit risk by maintaining 1m distance	1.66	5.18	 .60 .62 .66 .66 .61 .64 .66 .68 .65 .69 .69 67 .66 .61 .66	.94
Effectiveness of Following Official Recommendations: Self-Protective Behaviours	For each behaviour listed, indicate willingness: -open conversation face-to-face -avoiding close contact, including sex -wash/sanitize hands - seek medical advice on MPOX -fully self-isolate w/MPOX -use condoms for 3 mo after recovery -avoid wild animal contact -avoid improperly cooked meat -seek info about MPOX -discuss vaccination for travel to affected areas w/ doctor -discuss vaccination for MPOX if exposed w/doctor -if traveling where prevalent, seek info -if exposed, follow health advice from authorities -if symptomatic, no traveling -if symptomatic, seek immediate medical care -if symptomatic after travel, inform of travel history -if symptomatic, inform health provider about lifestyle factors	16.36	51.14	 .60 .68 .66 .74 .65 .67 .70 .67 .65 .73 .72 .68 .62 .67 .63 .65	.91

				.61	
Effectiveness of Following Official Recommendations: Other-Protective Behaviours	For each behaviour listed, indicate willingness: -having friends/fam deliver things to me -protect others by self-isolating in separate rm -protect others by using separate bathroom or cleaning surfaces -cleaning surfaces that I touched -avoiding sweeping/vacuuming -cleaning all utensils, objects, electronics -not sharing towels, bedding, clothes -doing my own laundry -open windows for good ventilation -encouraging everyone in house to wash hands -limit risk by avoiding touching others -limit risk by washing hands regularly -limit risk by covering rash -limit risk by all wearing medical mask -limit risk by maintaining 1m distance	1.95	6.10	 .66 .68 .68 .73 .64 .69 .69 .71 .70 .75 .70 .72 .66 .70 .71	.95
Advice Resistant to Following Official Recommendations: Self-Protective Behaviours	For each behaviour listed, indicate willingness: -open conversation face-to-face -avoiding close contact, including sex -wash/sanitize hands - seek medical advice on MPOX -fully self-isolate w/MPOX -use condoms for 3 mo after recovery -avoid wild animal contact -avoid improperly cooked meat -seek info about MPOX -discuss vaccination for travel to affected areas w/ doctor -discuss vaccination for MPOX if exposed w/doctor -if traveling where prevalent, seek info -if exposed, follow health advice from authorities -if symptomatic, no traveling -if symptomatic, seek immediate medical care	1.00	3.13	 .73 .75 .79 .77 .74 .67 .72 .70 .71 .63 .60 .68 .66 .69 .69	.97
Advice Resistant to Following Official Recommendations: Self-Protective Behaviours	For each behaviour listed, indicate willingness: -having friends/fam deliver things to me -protect others by self-isolating in separate rm -protect others by using separate bathroom or cleaning surfaces -cleaning surfaces that I touched -avoiding sweeping/vacuuming -cleaning all utensils, objects, electronics -not sharing towels, bedding, clothes -doing my own laundry -open windows for good ventilation -encouraging everyone in house to wash hands -limit risk by avoiding touching others -limit risk by washing hands regularly -limit risk by covering rash -limit risk by all wearing medical mask -limit risk by maintaining 1m distance	22.87	71.46	 .67 .71 .77 .78 .76 .80 .76 .67 .64 .69 .78 .67 .66 .73 .77	.98
Amount of Regular Intercultural Contact	How often do you have contact w/ people from other cultures: -at school or work -in your neighborhood -socially	2.35	78.43	 .86 .90 .90	.86
Political Ideology: Liberalism	Identify agreement with the following: -govt's responsibility to protect environment -govt healthcare to undocumented migrants -govt subsidize art & entertainment -freedom of religion, different from most -women allowed contraception & abortion -all consensual human sex acts legal	6.44	46.09	 .62 .79 .71 .60 .71 .62	.84

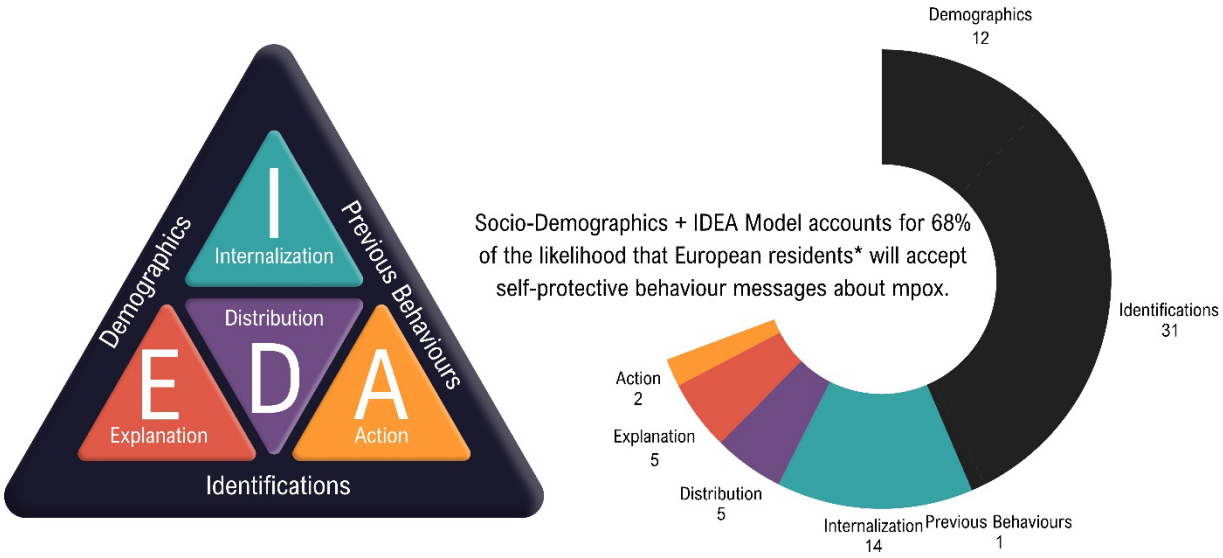
	-govt should not limit free speech			.67	
	-govt provides public education at all levels			.67	
	-govt provides healthcare to all citizens			.68	
	-govt provides healthcare to all legal residents			.63	
Religiosity	Identify agreement with the following:	16.18	77.06		.99
	-I regularly attend religious services			.83	
	-I pray everyday			.83	
	-I pray more than once a day			.86	
	-I read the sacred text of my religion			.85	
	-I participate in religious social gatherings			.88	
	-I provide financial support to my religion			.88	
	-I use religious teaching to make important decisions			.87	
	-I participate in groups affiliated w/my religion				
	-Religion is impt when choosing a job			.89	
	-Religion is impt when dating			.89	
	-Religion is impt when looking at the news			.89	
	-Religion is impt in food choice			.88	
	-Religion is impt in drinking choices			.88	
	-Religion is impt in reading choices			.90	
	-Religion is impt in film choices			.91	
	-Religion is impt in music choices			.90	
	-Religion is impt in tv choices			.91	
	-Religion is impt in education choices for me, my children			.91	
	-Religion is impt in my voting choices			.86	
	-Religion is impt in my clothing choices				
	-Religion is impt in my charity donation			.85	
				.90	
				.86	
Values: Societal Good	Identify agreement with the following:	5.31	44.23		.91
	-social justice			.72	
	-unity with nature			.77	
	-protecting the environment			.79	
	-preventing pollution			.78	
	-equality			.79	
	-peace			.82	
	-helpfulness			.77	
	-respecting the earth			.83	
Values: Personal Good	Identify agreement with the following:	2.41	20.09		.82
	-influence			.69	
	-social power			.88	
	-authority			.87	
	-wealth			.73	

Findings Predicting Self-Protective Behaviours

As noted at the beginning of the theoretical framework section, the mpox research toolkit began as a much larger and more comprehensive set of measures, but after being informally reviewed by community actors and then pilot tested for general populations in Belgium, Netherlands, and UK it has narrowed to focus on the most important factors in these recommendations. While more work needs to be done to continue to develop and adapt the toolkit to different regions in the European area, different countries, and refine it for specific target populations; the starting point demonstrates strength and promise in the approach (see Figure 3) in predicting nearly 70 percent of the likelihood that participants across three diverse countries were willing to enact self-protective behavioural recommendations for mpox. Overall, the pilot of the research tool provides critical insights into the potential impact that well-tailored interventions may be possible to have to improving core public health self-protective behaviour recommendations for mpox. Collectively, the pilot project suggests that accounting for demographics, identifications, and IDEA factors as *independent variables* can account for approximately 68 percent of the likelihood that people will adopt core public health self-protective behavioural recommendations.

For each of the independent variables, they are discussed as *enablers* or *inhibitors* from acceptance of mpox self-protective behaviour recommendations. The enablers are those factors that help in targeting or designing messages to improve acceptance. The inhibitors can be viewed as those factors that, without any engagement, limit the effectiveness of risk communication interventions. However, they also represent the opportunities and needs for direct community engagement on mpox.

Figure 3. Outcomes of the pilot test of the mpox research tool

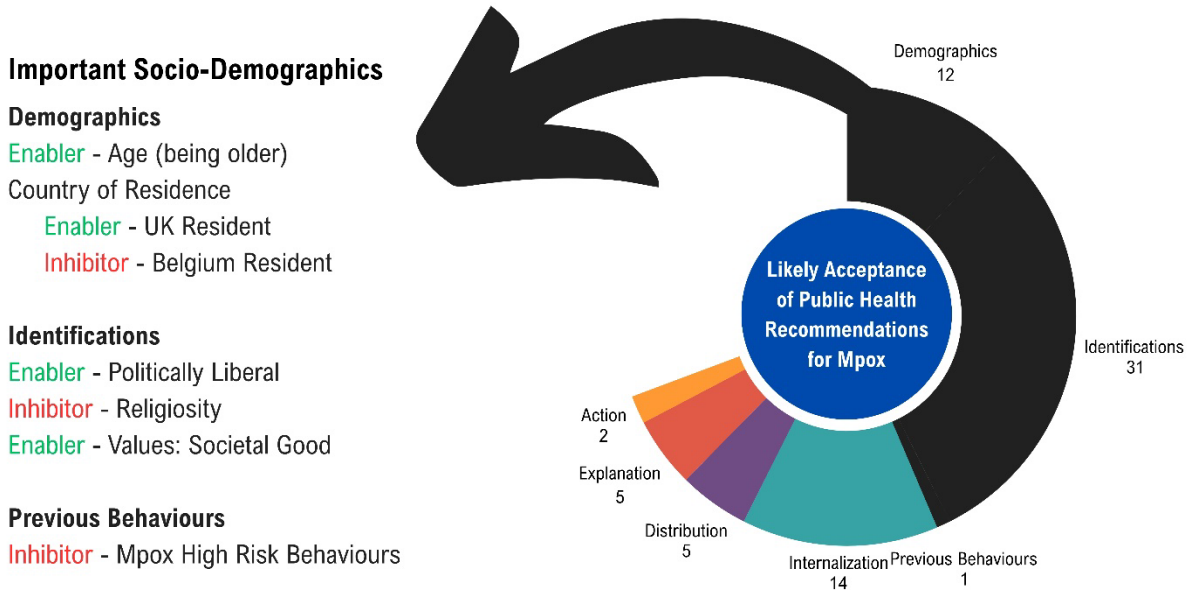


*Based on samples from the Belgium, Netherlands, & UK

Socio-Demographics to Know to Maximise Intervention Impact

Pilot testing on the toolkit demonstrates that socio-demographics account for about 44 percent of participants' likelihood to follow self-protective behaviour recommendations. Based on these results, the most critical questions to ask focus two demographics, three identifications, and two types of previous behaviours (see Figure 4). Of course, country of residence is only relevant for cross-national comparisons. But because there were significant differences between the three countries included in the pilot test, it does suggest that countries need to strategically prioritise applying these tools to maximise rapid mpox response through pre-outbreak capacity building. Relying on findings from other countries may not be sufficient. Generally in survey design it is good practice to collect demographics for: age, gender, education, marital status, household composition (living with a partner, children, extended family, with unrelated roommates, or alone), and birth region (i.e., EU/Non-EU) as these may be relevant across the European region.

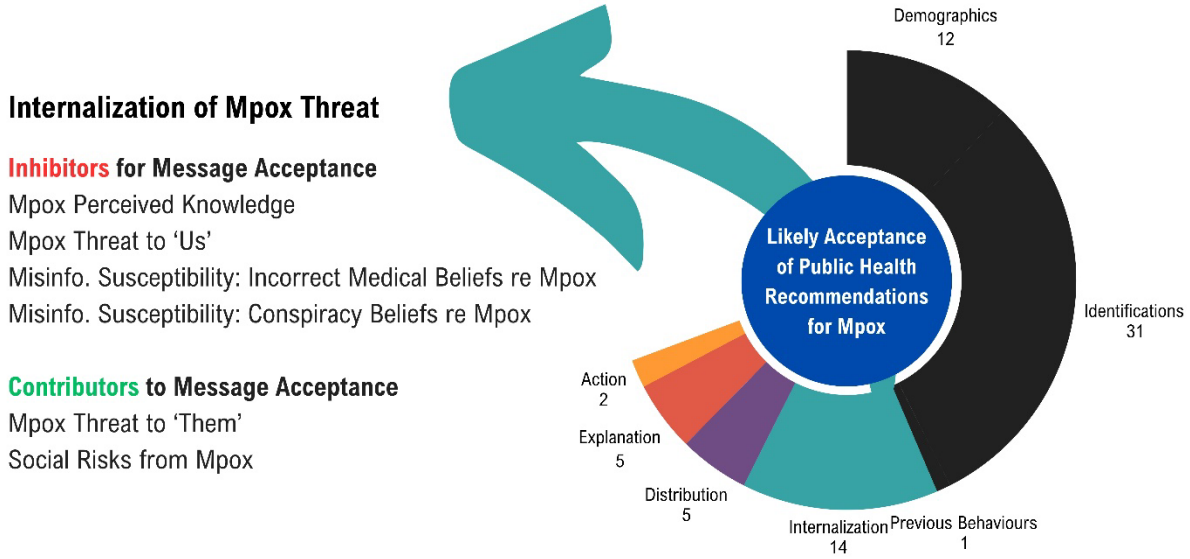
Figure 4. Summary of Socio-Demographics to Improve Mpox Response



Internalization: Improving the Relevance of Mpox to People

The pilot test demonstrates that segmenting people beyond socio-demographics improves the likelihood of creating interventions with positive impact by nearly one-third. *Internalization* focuses on the degree that people believe that mpox is relevant to them [2]. If people do not believe mpox is relevant to them, they are likely to ignore the public health recommendations. However, in an infodemic world, there are a number of inhibitors and contributors to potentially understand (see Figure 5).

Figure 5. Summary of Internalization Factors Influencing Mpox Recommendation Compliance



By addressing mpox's relevance to members of the community, internalization is grounded in a tradition of *community risk assessment* [3]. While this does makes it one of the more complex factors to consider, the reward is that it makes a meaningful contribution to designing better community engagement plans and specific interventions to improve compliance with public health recommendations. Yet, it is still possible to

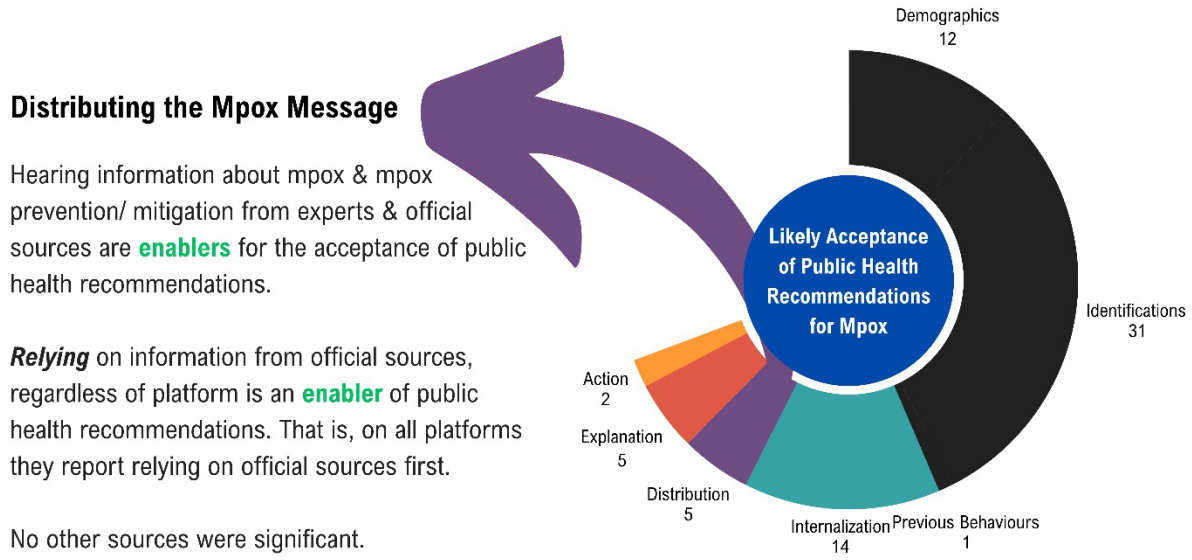
make the research needed for rapid response more pragmatic because the toolkit is flexible enough to customise the focus depending on intervention objectives.

Distribution: Improving Acceptance Through Effective Source Selection

A hallmark to effective RCCE-IM is *distribution* – that is getting the right message, delivered by the right sources, and placed on the right *platforms*. One of the constant concerns about the infodemic is that people will pay attention to the 'wrong' sources – especially in social media; however, extensive research about misinformation reveals that infodemics are less attributable to access to misinformation and more attributable to both a lack of competing information available (commonly known as information voids) ***and*** confidence in the sources of the information [4-10].

The pilot test (see Figure 6) confirms that in the context of mpox, having messages distributed by experts and official sources of information while also understanding what sources people typically rely on for health and mpox-related information from are the most important distribution factors. No other sources were significant contributors ***or*** inhibitors to public willingness to enact public health recommendations for mpox risk mitigation. In fact, all of this was platform neutral meaning that public health should amplify its message across all platforms used – people are looking for experts and official sources [5, 11, 12].

Figure 6. Summary of Distribution's Impact on Mpox Recommendation Acceptance[12]

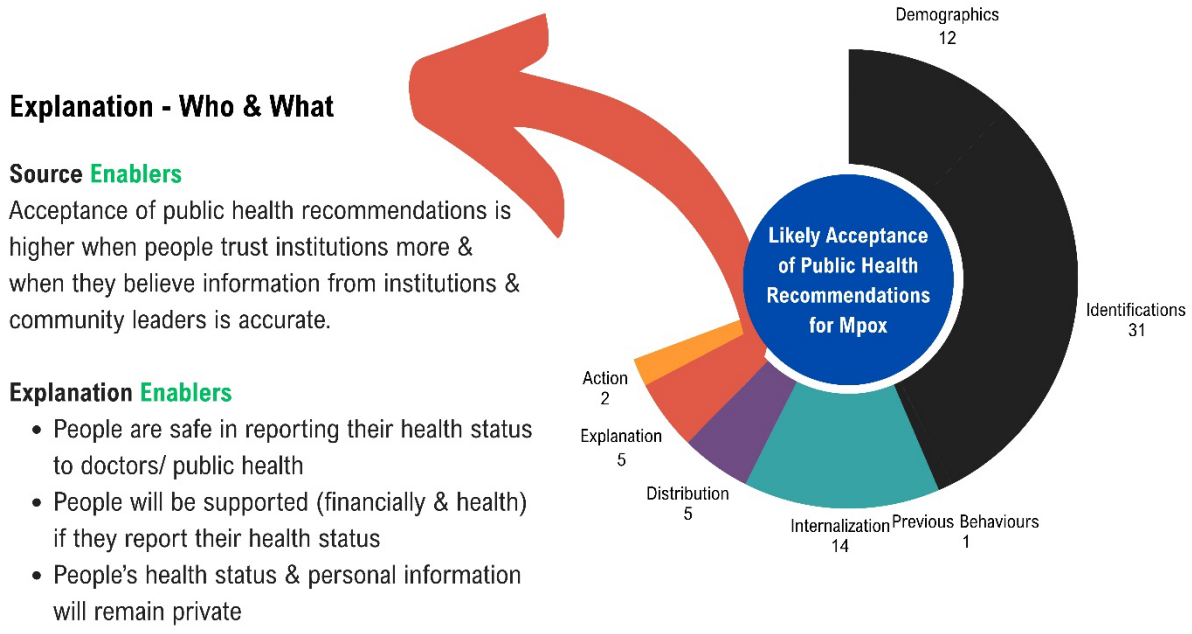


[12] In this case, compliance was used in the pilot to ensure participants understood that they were being asked about agreement with recommendation *and* intention to perform the behaviour

Explanation: Improving Acceptance Through Effective Risk Messaging

Whereas distribution focuses on the right sources and platforms, the explanation component tackles the elements of the right messages that are needed for effective RCCE-IM about mpox. The distribution component emphasises that the source information about public health should be 'expert', explanation involves three equally important elements – *who* is actually communicating the risk with communities, *what* communities need to understand about mpox, and *how* should expect to be treated [2]. The pilot test confirms (see Figure 7) that these two factors are important. Annex A provides the specific wording for the toolkit measures summarized for explanation-related objectives.

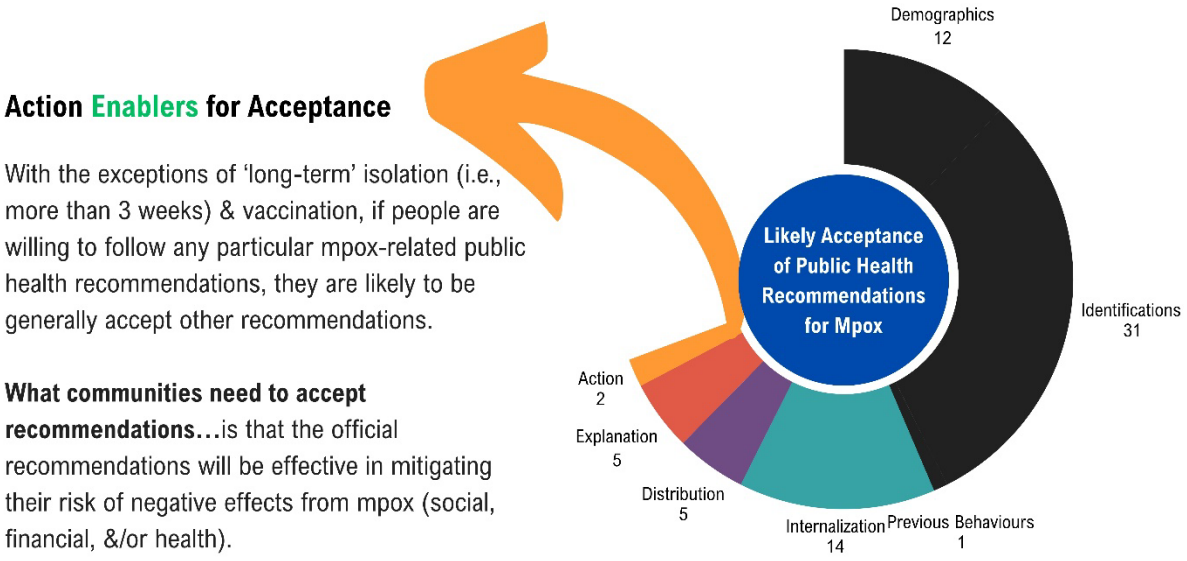
Figure 7. Summary of Explanation's Impact on Mpox Recommendation Acceptance



Action: Enablers For Taking Action to Reduce Risk for Mpox

Very clearly, *action* emphasises the specific behaviours that people are being instructed to take to reduce their risk from mpox [13]. However, it is possible to enhance the quality of the instruction by connecting the specific action with cues for action. The research toolkit characterises these in two ways – as related actions and then as contextualisation to give communities confidence in the effectiveness of the actions themselves (see Figure 8). Annex A provides the full text of questions.

Figure 8. Action Enablers to Improve Acceptance of Mpox Behavioural Recommendations



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