Implementation Support for the PREPARED Code

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Abstract. Research ethics and integrity codes lay the foundation for ethical research. However, stakeholders in research may struggle to move from reading codes to applying them, especially during times of crisis when there is increased uncertainty and risk. To bridge this gap, the PREPARED project team has developed adaptable tools to support implementation of the PREPARED Code for research ethics and research integrity during pandemics. These include training clips to accompany each code article, an experiential learning app, and how-to style guidelines for enhancing the resilience of stakeholder-specific processes. In this chapter, we summarise PREPARED's approach to code implementation, elaborate on each tool developed, and provide tips for future initiatives seeking to improve the practical application of ethics codes. We also present an example of how our tools were utilised during an African Vaccine Regulatory Forum (AVAREF) training session and provide a resource bank to support the integration of our materials into ethics training programmes.

Keywords: Research ethics and integrity guidance · research ethics and integrity training · research ethics and integrity case studies · the PREPARED app

1 Introduction

In the early 2020s, unprecedented collaboration between research bodies enabled the rapid development of COVID-19 vaccines and treatments. The research process was marked by urgency, taking place within multistakeholder networks (Xie et al. 2024). Moreover, research extended beyond the ivory tower of abstract theory. While policymakers and funders swiftly allocated resources, scientists spearheaded pandemic-related projects and healthcare workers, social workers and community leaders actively participated in research and took responsive actions on the front lines.

As a Nature (2021) editorial noted, the metaphor "standing on the shoulders of giants" widened in scope during the pandemic: "Today, such 'giants' are not only the

K. Chatfield and M. Singh (Eds.): *Research Ethics and Integrity During Pandemics*, SRIG, pp. 76–93, 2025.
https://doi.org/10.1007/978-3-031-91324-2_6

investigators […] but also every other participant in the research process. The future lies in standing on the shoulders of crowds."

Recognising the collective nature of this new research ecosystem, shaped by diverse contributors across disciplines and borders, the PREPARED Code seeks to ensure that research during pandemics can be accelerated without compromise of ethics and integrity values. But in the face of a crisis, can a global ethics code alone guarantee that research ethics and research integrity are upheld?

The world's largest ethics code library, the Illinois Institute of Technology's Codes of Ethics Collection, houses around 4,000 codes, including many with a focus on research ethics and research integrity (Illinois Tech n.d.; Sutrop et al. 2020). As research has become increasingly professionalised and institutionalised (Amsterdamski 1992), the development of ethics codes appears to have become standard practice.

However, concerns have emerged about whether ethics codes guide real-world ethical decision-making effectively. Although people value ethics codes, empirical research reveals a gap between their existence and practical use. For example, some working professionals admit to not using their codes or being ignorant of their content (Lere and Gaumnitz 2007). This finding extends to actors in research: in a small study, half of the researchers interviewed acknowledged that they relied solely on their institution's ethics codes and did not reference external ones at all (Schroeder et al. 2024). Thus, we cannot rely upon the existence of ethics codes alone to ensure adherence to research ethics and research integrity values. Bridging this gap demands an approach that translates ethical values and guidance into practical decision-making.

The effective implementation of ethics codes requires a clear understanding of the code guidance, which commonly takes the form of a number of *articles* (the specific rules, requirements or guidelines governing ethical behaviour). In this chapter, we explain how the PREPARED team set out to increase the impact of their code by creating a wide range of brief multimedia modules or texts, which we call training clips, that clarify the meaning of each article in the code and adapt it for real-world application.

Ethical dilemmas by their nature do not have straightforward solutions, which is why researchers are often trained to cultivate ethical reflexivity (von Unger 2021). In line with this approach, we explain how we developed an app, built on experiential learning techniques and incorporating a wide range of functionalities, to engage diverse learners and to catalyse ethical reflection.

We then explore how ethical decision-making can depend upon resilient research systems, highlighting the importance of procedural, stakeholder-specific how-to guidelines to complement ethics codes. To illustrate this, we present examples of the documents the PREPARED team developed to support the PREPARED Code, including guidelines on:

- fast-tracking ethics reviews to maintain fair and transparent yet accelerated desk reviews by journal editors
- prioritising research proposals in ethics committees without compromising review quality
- addressing the politicisation of science.

This chapter is a practical resource: as such, it provides tips in each subsection to guide readers in developing their own training to complement ethics codes. We also

summarise the tools developed to support the PREPARED Code in a resource bank. In addition, to demonstrate the possible application of these tools, we explain how they were used to build a course for African regulators who assess clinical trials. The tools are summarised in Fig. 1.

Fig. 1. PREPARED Code implementation tools

2 Training Clips

Concrete examples make ethics code implementation more effective: they help actors understand how to apply guidance in practice, bridging the gap between abstract knowledge of ethics and sound decision-making in the real world (Schwarz 2004). However, if the intention is to keep the code globally relevant, concise and jargon-free, as with the PREPARED Code (see Chap. 3), these examples cannot be integrated into the code itself.

On the one hand, many codes are long and complex, which can induce code fatigue and render codes less user-friendly (Schwarz 2004; Lere and Gaumnitz 2007). On the other hand, overgeneralising in a code for the sake of brevity can lead to what has been called the "trap of analyticity" (Evers 2003, in Sutrop et al. 2020), where the need for broad consensus among heterogeneous actors results in vague provisions that lack clarity and conviction, ultimately reducing the ethics code's effectiveness. Thus, developers of ethics codes face a persistent challenge: balancing the need for wide-ranging applicability and inclusivity with the need for brevity and practical usefulness.

The global relevance of ethics codes is especially important during crises like pandemics. Crises require collaboration among diverse actors (Olsén et al. 2023), and a global framework provides a shared baseline of ethical values, ensuring coordinated and consistent responses under high-pressure conditions. For instance, during the COVID-19 pandemic, close collaboration among policymakers, funders, industry and ethics committees – particularly in regulatory processes and intellectual property negotiations – played a key role in enabling the development of vaccines in record time (Leisinger and Schroeder 2024).

Moreover, language plays an important role in the accessibility and usability of ethics codes. As Giorgini et al. (2015) argue, codes should be written in a way that allows them to be "readily encoded", necessitating clear and accessible wording. Global codes, however, often need to function across a range of linguistic and cultural contexts, which can introduce challenges. Tréguer-Felten (2017), for example, notes that some language used in global codes may be difficult to translate, while Adelstein and Clegg (2015) caution that "effusive and vague" language can impede understanding. To address these issues, the PREPARED team sought to provide additional context to mitigate linguistic and cultural misunderstandings related to the phrasing of the code's articles.

In response to the challenge of keeping a code practical and usable on a global scale while maintaining brevity and conciseness, the PREPARED team produced short training clips for each article of the PREPARED Code. These clips tie each article in the code directly to examples of the real-world risks that informed their creation. Consisting of short explanatory texts, videos and links to external sources, this material allows a deepened comprehension of the code by clarifying the meaning of the articles, grounding ethical values in real-world scenarios and ensuring accessibility without compromising depth. Where applicable, references were included to lend further credibility and offer pathways for extended learning.

An important technique to make training engaging is the use of professionally designed visual materials (Shabiralyani et al. 2015). Accordingly, the primary training material for the PREPARED Code relies heavily on visual content. Each of the 27 articles, along with select introductory sections, is elucidated through video clips. These clips are embedded where misunderstandings might arise, an approach we believe to be unique among ethics codes and one that we hope will significantly enhance understanding and uptake. In other words, the website (https://preparedcode.uclancyprus.ac.cy/) which presents the code is built in such a way that each article is accompanied by a short explanatory video.

For example, for Article 6 ("Research teams should share the additional responsibilities associated with a pandemic fairly among their members to avoid exacerbating existing inequalities"), a video was created highlighting how women researchers, disproportionately burdened by domestic and caregiving responsibilities in the workplace, experienced a decline in academic productivity during the pandemic compared to male researchers (Inguaggiato et al. 2024).

To clarify Article 1 ("Data and scientific insights about new infectious agents should be quality controlled and shared as swiftly as possible with the scientific community and other stakeholders, without prejudice to the sharer"), a senior South African law professor discusses how South African researchers did not hesitate to share data on the

Omicron variant of COVID-19, only for the country to face punitive travel restrictions in response.

The clips were produced in the following manner, summarised in Fig. 2 below:

1. Members of the PREPARED team with expertise in the relevant code article volunteered to create a training clip.
2. In collaboration with the lead author of the PREPARED Code, the most suitable format – animation, interview or video clip – was determined.
3. If an animation was selected (the most time-intensive option), the assigned experts drafted an initial script, aiming for a length of approximately one page.
4. The script was then reviewed for quality by other experts, as needed, and by the lead author. For clips incorporating video, images and graphics, a provisional voice-over was recorded to test clarity and effectiveness. This step helped eliminate overly long sentences and excessive jargon, as some script authors initially wrote in an academic style that was not suited to engaging visual content.
5. Once the script was finalised, the script authors selected visual materials from stock imagery and videos. Rather than having the designer make the initial selections, it was agreed that the experts would take the lead, with the designer assisting when needed.
6. The experts who wrote the script also selected appropriate stock music.
7. In most cases, the voice-over was provided by the colleagues who wrote the script, with the authors' own varied voices and accents regarded as more engaging than those of professional English-speaking voice artists.
8. The final clip was professionally edited and produced by an award-winning designer, who also identified and addressed any potential concerns.
9. After multiple iterations involving the script authors, the lead author and the designer, the final version of the clip was completed.

Developing effective training clips to clarify and contextualise an ethics code is key to bridging the gap between understanding and ethical decision-making. When creating such materials, future ethics projects could consider the following advice.

1. Ethics codes are more effective when accompanied by engaging, visually conceived training materials. Incorporate short videos, animations and explanatory clips to illuminate the guidance.
2. Instead of providing general training, rather target areas where comprehension challenges are likely to arise, especially due to linguistic or cultural differences.
3. Ensure that experts in the subject matter lead the creation of training materials to maintain accuracy and relevance. Where possible, encourage their collaboration with designers and communicators in order to enhance accessibility and avoid overly technical language.
4. While ethics codes often aim for global applicability, training materials should incorporate region-specific examples to enhance relatability. Ethics projects should address ethical challenges in different cultural and regulatory contexts to promote greater engagement.
5. Allow time for repeated rounds of review of the training clips, including quality control by experts and practical testing, to eliminate jargon and ensure clarity.

Fig. 2. Steps in the development of training clips

3 The PREPARED App

Ethics training has two main aims. The first substantive aim focuses on increasing understanding and raising awareness of specific issues (Montgomery and Walker 2012). The second seeks to enhance engagement in deep ethical reflection and the development of ethical competency (Andersson et al. 2022). To address both aims, the PREPARED team developed a mobile app offering full training courses with information on ethical and integrity-related aspects and presenting case study dilemmas designed to encourage ethical reflection.

The effectiveness of case studies, which allow learners to apply theoretical decision-making frameworks to real-world situations, stems from their ability to elicit active participation from learners (Escartín et al. 2015). For this reason, the PREPARED team developed a diverse set of case studies based on ethical dilemmas that research actors face during crises.

For training to be effective, it must be both accessible and engaging. As 69% of the world's population owns a smartphone (Laricchia 2024), the team opted to develop a mobile app to present these training elements. Beyond basic text and images, engagement is fostered through interactive elements in the app, like polls, multiple-choice questions,

mini-games, simulated dialogues and professionally produced film clips and animations to encourage active learning. For example, when presented with an ethical dilemma, users participate in a poll and can later view aggregated responses from other learners, prompting reflection on their own decisions.

To accommodate the limitations of mobile devices, each case study is structured into pages corresponding to smaller steps that learners complete progressively. This allows users to proceed through the material at their own pace, either finishing a case study in one session or pausing and resuming as needed. Figure 3 shows several screenshots from the app.

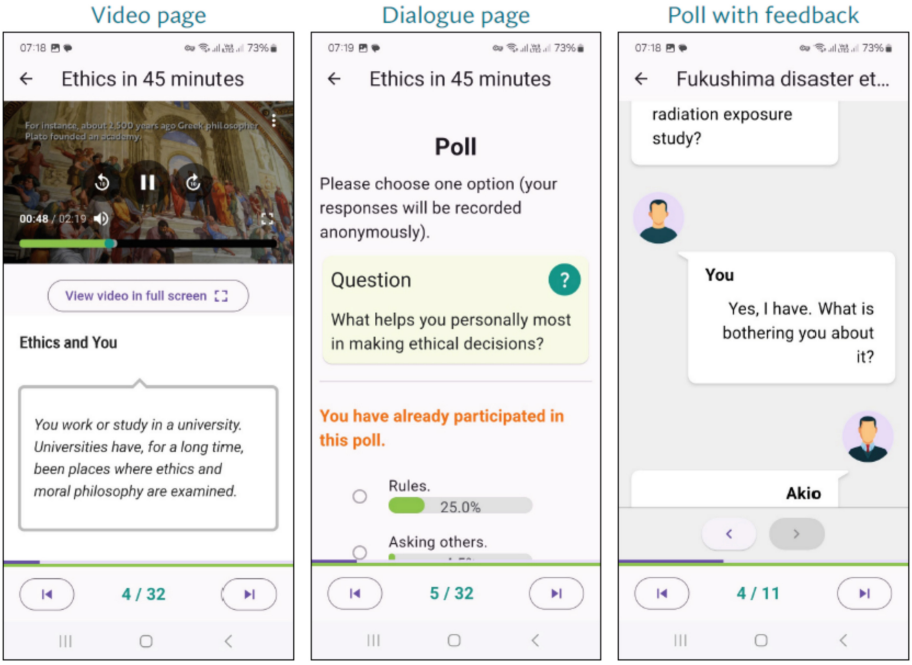

Fig. 3. Screenshots from the app

A key interactive feature is the dialogue simulation, designed to resemble a text-based conversation. Learners navigate a step-by-step discussion, taking part in a simulated exchange where two individuals debate different aspects of an ethical dilemma. In addition, mini-games, such as a decision-making exercise, prompt learners to assess and categorise factors related to the case – such as pros and cons – while receiving feedback on their choices.

With its accessible and interactive design, designed primarily for mobile devices, the PREPARED app is open to a broad range of stakeholders, including researchers and students. Its clear, jargon-free approach also makes it suitable for the public, including those not directly involved in research.

At the time of writing, the PREPARED app contained 27 professionally designed video clips, ranging in length from two minutes to four minutes 45 s. It currently includes two short courses and five case studies, which are described in Table 1.

Table 1. PREPARED app courses and case studies

Type	Topic	Overview
Short course	Ethics in 45 min	The role of rules, virtues, values and ethics codes in ethical decision-making, and an ethical dilemma applying the values of fairness and respect
	The TRUST Code in 45 min	Inequities in global research, such as ethics dumping and helicopter research, and how they can be tackled through the TRUST Code: A Global Code of Conduct for Equitable Research Partnerships
Case dilemma	Are SARS-CoV-2 human challenge studies ethical?	Pros and cons of human challenge studies to be investigated by the learner before providing their own view
	AI ethics and research during crisis	AI research that is meant to contribute to achieving the UN's Sustainable Development Goals, but can have severe negative implications for the worst off
	Ethical challenges for research ethics committees during COVID-19	A fictional dilemma about a psychology project seeking approval by a research ethics committee
	Scientific collaboration during war	The positions taken around the world on whether to collaborate with Russian institutions following the Ukraine war, and finding one's own position among the possibilities
	Navigating ethical challenges following the nuclear accident in Fukushima	A data and informed consent dilemma that examines the borderline between research and public health crisis management

In summary, we would advise future ethics projects to consider the following:

1. Ethical decision-making is best learned through context. Develop diverse case studies that reflect real-world dilemmas. These can accompany informative course materials to enhance understanding of relevant ethics and integrity matters.

2. Deliver ethics training via a mobile app to promote broad accessibility. When planning an app, design content for smaller screens and be aware of the limitations of mobile functionalities.
3. Include interactive features such as polls, multiple-choice questions, simulated dialogues and mini-games.
4. Combine text with professionally designed videos, animations and audio elements to increase learners' retention.

4 How-To Guidelines

Ethics codes can establish foundational values and principles while also offering stakeholder-specific guidance. However, during crises, the practical implementation of this guidance can be challenging, as research systems rely on specific processes that may be disrupted. To address this, the PREPARED team developed how-to guidelines tailored to the research governance systems of groups like research ethics committees, publishers and research integrity officers. These are intended to pinpoint steps to improve these systems during "normal times", thereby strengthening the resilience of the research ecosystem.

Though resilience has many definitions, they generally emphasise minimising the negative impact that a crisis has on a "system's performance" (Hosseini et al. 2016). Additionally, resilience must be proactively built through coordination within these systems during "normal times" rather than only in response to crises (Reiss et al. 2024). To strengthen resilience in existing research systems during periods of non-crisis, the PREPARED team developed practical how-to guidelines tailored to different research stakeholders and designed for fluid integration into existing processes within the research ecosystem.

Importantly, one set of guidelines also addresses the proliferation of ethics guidance (see Chap. 3) in an unusual way. Generally, ethics codes do not "work" with each other. While there may be cross-references (for instance, the PREPARED Code cross-references to the Declaration of Helsinki), there is generally no deeper engagement. To increase the usefulness of the PREPARED Code, the team therefore took an innovative step at the recommendation of the European & Developing Countries Clinical Trials Partnership (EDCTP).

In 2020, the UK Collaborative on Development Research (UKCDR) and the Global Research Collaboration for Infectious Disease Preparedness (GloPID-R), a funder network focused on new or re-emerging infectious diseases, issued a set of seven principles to encourage high-quality, ethical research during epidemics and pandemics (Norton et al. 2020). These are:

1. alignment to global research agendas and locally identified priorities
2. research capacity for rapid research
3. supporting equitable, inclusive interdisciplinary and cross-sectoral partnerships
4. open science and data sharing
5. protection from harm
6. appropriate ethical consideration
7. collaboration and learning through enhanced coordination.

The seven principles build on best-practice guidance generated by the earlier work of UKCDR, GloPID-R, the World Health Organization (WHO), the European Commission and others. They provide a basis for guiding both funder and researcher expectations for COVID-19 and for future epidemics and pandemics. The principles are globally relevant and of particular importance for research in low-resource settings (Norton et al. 2020).

As the EDCTP is part of this initiative *and* part of the PREPARED team, it encouraged the team to examine possible links between the two. The PREPARED Code was found to be an ideal companion to help operationalise the seven principles set out above. A guideline explaining how this can be done is due to be published in June 2025, and should reduce the proliferation of ethics codes by encouraging innovative collaborations.

Schwartz (2004) shows that people are more likely to remember parts of a code that relate to their everyday tasks. When codes are disconnected from processes within these systems, users may view them as irrelevant (Marnburg 2000; Salvioni et al. 2015). Effective ethics codes must therefore be easily "translated into practical action" and be embedded within systems (Lindner 2014). In an increasingly formalised research environment (Shaw et al. 2005), research is advanced through systems like funding pipelines, ethics reviews and publishing protocols that must be targeted through tailored guidelines to make ethics codes effective.

To identify the stakeholder groups requiring specific guidance, the PREPARED team leveraged stakeholder engagement platforms. These included researchers, funders, non-governmental organisations, publishers and editors, industry representatives and governance actors such as research ethics committees and research integrity officers. Insights into their needs were gathered through surveys, focus groups and stakeholder-specific literature reviews (Seedall and Tambornino 2022).

Throughout the development of the PREPARED Code, which included gathering empirical evidence and facilitating consultations with stakeholder groups, the team analysed existing research systems to understand how ethical values and principles were applied in practice and to identify operational gaps where additional support may be needed before the advent of the next crisis. Concise, jargon-free guidance was subsequently developed to help stakeholders implement research governance processes aligned with the values of the PREPARED Code.

For example, during the COVID-19 pandemic, research ethics committees faced overwhelming pressure to process a surge of COVID-19-related research proposals (Reyes 2020). A survey of European research ethics committees (Seedall and Tambornino 2022), scoping reviews (e.g. Seedall and Tambornino 2024), an analysis of existing ethics codes and validation workshops conducted with research ethics committee members revealed a key challenge: research ethics committees were inundated with research proposals related to COVID-19, many of which were of low quality. Despite this, they were tasked with prioritising studies that addressed urgent societal needs. To navigate this challenge, committees required guidance on streamlining their review processes while maintaining standards for ethical research (Tamariz et al. 2021).

To respond to these challenges, a set of recommendations for expediting ethics review during crises was developed (Kornioti et al. 2024). Kornioti et al. (2024) identify seven key obstacles that research ethics committees encountered during the COVID-19 pandemic. Their report offers practical strategies for fast-tracking research protocols. Each

challenge is paired with real-life examples of good practice implemented by research ethics committees during the pandemic, making the guidance practicable. The recommendations focus primarily on strengthening institutional processes during stable periods to prepare better for future crises. For example, committees and research institutions are advised to adopt remote workflows, establish systems of mutual recognition and implement sustainable funding and compensation models.

In addition, prioritisation guidelines were developed for research ethics committees, though these have not yet been published at the time of writing. Based on the results of a survey of more than 320 research ethics committees from over 80 countries, this document will guide research ethics committees when deciding how systems of prioritisation could be changed, the criteria upon which these decisions should be based, and the potential implications of such decisions. These guidelines will enhance resilience by enabling committees to establish and justify prioritisation decisions in advance, and helping them to efficiently manage high volumes of protocol submissions during crises.

Downstream – in the research dissemination process – academic journals also faced a very high increase in submissions. Throughout the project, publishers and editors informed the team that journals, already overstretched, had been inundated with manuscripts during the COVID-19 pandemic. Many lacked streamlined processes for the swift and fair evaluation of submissions (Seedall and Tambornino 2022), which made it difficult for publishers and editors to disseminate research findings promptly.

To address this, guidance for editors and publishers was developed, drawing from a targeted literature review and consultations with stakeholders (Chatfield 2024). This guidance suggests measures for streamlining the initial review stage, enabling editorial teams to assess manuscripts transparently and efficiently. The recommendations aim to support the swift publication of research while maintaining fairness and quality in editorial desk assessments. These recommendations can improve resilience as they help to ensure that editorial systems are equipped with transparent processes to handle surges in submissions.

Lastly, guidance is being developed to address harassment and the politicisation of science, though it has not yet been published. Validation workshops conducted during the project, as well as a survey carried out by the Finnish Committee for Public Information (TJNK 2024), revealed that researchers are increasingly concerned about the risks of speaking publicly about research, particularly due to harassment on social media. During the COVID-19 pandemic, some early-career researchers avoided studying controversial topics in order to escape potential harassment, which amounted to self-censorship. While social media was a major source of harassment, some incidents also originated within the research community itself, including conflicts related to workplace dynamics and internal disagreements.

In response, guidelines developed in a collaboration between the PREPARED team and TENK, the Finnish National Board on Research Integrity, will outline steps for funders, research institutions and policymakers to develop mechanisms to monitor the environment surrounding their researchers. These guidelines will support resilience, creating systems that address harassment and conflicts before the next crisis to reduce the long-term impact on researchers and the broader research community.

Developing effective how-to guidelines for implementing ethics codes requires an approach that is both systematic and collaborative. From our experience, this process can be conducted in alignment with the following steps:

1. First, identify and liaise with the stakeholder groups for whom the guidelines will be written. These groups may include researchers, research ethics committees, publishers, funders and industry representatives. Establishing these connections ensures that the guidelines address real-world challenges and reflect diverse perspectives.
2. Next, communicate with individual stakeholder groups to uncover challenges within their governance systems which may be exacerbated by a crisis. During the development of an ethics code, gaps and operational questions often emerge. Engaging with stakeholders through surveys, focus groups or consultations can highlight specific pain points and areas where procedural support is needed to complement an ethics code.
3. Once challenges have been identified, draft jargon-free procedural documents tailored to each stakeholder group. These documents should provide practicable steps that stakeholders can take and integrate into their existing systems in "normal times". Avoid technical language to ensure that the guidelines are accessible to a wide audience.
4. Validate these documents through stakeholder input and refine them. Sharing drafts with stakeholders and incorporating their feedback not only ensures that the guidelines are applicable, it also fosters stakeholder buy-in and increases the likelihood of successful adoption.
5. Finally, launch guidelines in high-profile venues to relevant stakeholders. For instance, the PREPARED Code and the harassment guidelines will be launched at an event hosted by UNESCO, at their headquarters in Paris, in June 2025.

5 Implementation Example: AVAREF Training of African Regulators

In this section, using examples from training sessions that were developed for the African Vaccine Regulatory Forum (AVAREF), we illustrate how the PREPARED materials can be effectively adapted to regional settings.

AVAREF, managed by the WHO Regional Office for Africa (WHO AFRO) and supported by the EDCTP, deployed facilitators to regional training sessions to equip African regulators with comprehensive skills in clinical trials assessment and oversight. Training was conducted in the three official working languages of WHO AFRO, English, French and Portuguese. In 2024, this training was conducted in Namibia and Senegal.

The training sessions aimed to equip selected nominees from regulatory authorities in African regional economic communities with the skills to assess nonclinical data, clinical trial data, biostatistics data and clinical quality data, as well as to improve knowledge regarding emergency use authorisation (in accordance with World Health Assembly resolution WHA75.8; see Fig. 4).

The AVAREF training incorporated both TRUST and PREPARED materials, with a targeted session on equitable research partnerships and another on research during pandemics. These sessions included videos on the TRUST Code as well as case studies

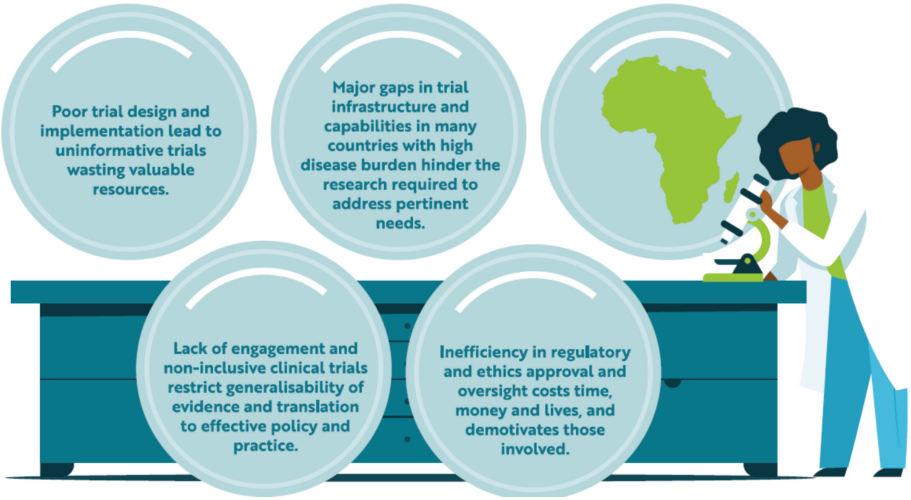

Fig. 4. Background to WHA75.8: Barriers in clinical trials that put public health at risk

from the PREPARED app. Participants were also invited to provide feedback on a draft of the PREPARED Code (see Chap. 5).

Trainers emphasised the need to introduce the foundations of both ethics codes, including their values-based approach, before discussing specific articles. This was achieved using training clips and the TRUST Code training programme available in the PREPARED app. Trainers also found the translated versions of the codes useful for participants whose first language was not English.

When using case studies, trainers observed high levels of engagement but noted that participants needed an overview of the activity and a clear explanation of its purpose – specifically, why working with ethical dilemmas was useful and how ethical reflection informed decision-making. Trainers also found that discussing case studies in smaller groups before sharing insights with the larger group was a more effective approach than purely whole-group discussions.

The training revealed the need for a wider range of case studies. Participants preferred discussing cases relevant to their region, reinforcing the need to adapt training materials to different global contexts.

Finally, format was key to making the training effective. Trainers found that video clips, for example, maintained trainee attention better than traditional slide presentations.

6 Resource Bank

Where multiple complementary resources exist, some training materials may lack discoverability. For that reason, we have summarised our training materials below in the form of a resource bank. This resource bank includes the training clips, mobile app and how-to guidelines described above, with a brief description of each training resource and where to find it.

6.1 The PREPARED Code

The PREPARED Code: A Global Code of Conduct for Research During Pandemics
The PREPARED Code targets researchers, research ethics committees and research integrity officers and is reproduced in Chap. 2. The code was written in English and has been translated into 11 languages: Arabic, simplified Chinese, Finnish, French, German, Greek, Italian, Korean, Lithuanian, Portuguese, Spanish and Swahili. Further information about the code and the downloadable translations are available online here: https://prepared-project.eu/prepared-code/

The TRUST and PREPARED Values
The PREPARED Code is underpinned by the values of fairness, respect, care and honesty, the same values that underpin the TRUST Code. This video explains how the fundamental values of the TRUST Code also apply to research challenges in global crises, such as the COVID-19 pandemic: https://youtu.be/LEUXu-ZyhYg.

6.2 PREPARED Code Training Resources

Article Training Clips
The home of the PREPARED Code contains 27 concise clips linked to each article of the code. These clips aim to contextualise and clarify the articles of the code. They include videos, filmed interviews and references to additional publications and guidelines developed within the project, and are available here: https://preparedcode.uclancyprus.ac.cy.

The PREPARED App
The PREPARED app provides a digital platform to complement training in research ethics and research integrity decision-making during global crises. The app presents research ethics training that is engaging, interactive and conveniently packaged so that it is accessible using a smartphone (Android and iOS). Functionalities include polls, sorting buckets, quizzes, professionally designed animations, interview clips, guided dialogues and audio clips. Free download of the app is available on the Apple App Store and Google Play Store: https://prepared-project.eu/app/

6.3 PREPARED How-To Guidelines

Recommendations for Expediting Ethics Review during Times of Crisis
This guidance sets out seven major challenges that research ethics committees experienced during the COVID-19 pandemic. It provides recommendations for effective fast-tracking of study protocols and a good-practice example for each challenge. Available here: https://prepared-project.eu/fast-track-guidance/

Guidance for Fair and Fast Desk Assessment of Submitted Manuscripts during Times of Crisis
This guidance for editors and publishers covers the process for identifying manuscripts that meet the threshold criteria for peer review and the criteria against which submissions can be assessed fairly. Available here: https://prepared-project.eu/fast-track-guidance/

6.4 TRUST Code Training Resources

The TRUST Code in 45 min
This is a short course to explain the development of the value-based TRUST Code: A Global Code of Conduct for Equitable Research Partnerships.

The training is available in two versions: first, by free download of the PREPARED app, as mentioned earlier: https://prepared-project.eu/app/ and second, as a stand-alone web-based training resource: https://trustcodetraining.uclancyprus.ac.cy.

Short Video Clip about the TRUST Code
For those not using the 45-minute course on the TRUST Code, we recommend the screening of a short clip about the TRUST Code. Available online here: https://youtu.be/3nRFWNmx1Y4.

6.5 Research Ethics and Research Integrity Training Materials

Ethics in 45 min
This short course, developed by the University of Central Lancashire for students and academics, provides a concise and motivational introduction to ethics and ethical decision-making. It connects ethical thinking across ages and continents; distinguishes between rules, values and virtues; explains different types of ethics codes; and tests insights into a moral dilemma. The short course is available via the PREPARED App, which can be downloaded free from the Apple App Store and the Google Play Store: https://prepared-project.eu/app/

Training Videos
Partners in the PREPARED consortium have created short videos to slot into training programmes. These include the following:

- Who benefits in research?
- Benefit-sharing
- AI ethics in five minutes
- Ethics dumping
- Ethical controversies around human challenge studies
- Healthy volunteers and human challenge studies
- AI ethics and helicopter research
- AI ethics and the Sustainable Development Goals
- Scientific collaboration during war
- Lockdown and the experience of Nairobi sex workers

The videos are available at https://www.youtube.com/@trustandprepared1000/videos and https://prepared-project.eu/free-training-materials/

7 Conclusion

During the COVID-19 pandemic, research was shouldered by crowds rather than giants (Nature 2021). Hence, ethics guidance needs to be relevant to a broad range of stakeholders. At the same time, we argue that global ethics codes alone are not enough to ensure ethical decision-making. This raises the question: how can a global ethics code be both effective and relevant to a growing plurality of actors in the research ecosystem?

The PREPARED project answer to this lies in the development of a range of resources that are intended to support understanding and implementation of the PREPARED Code. Above all, the materials aim to promote ethical reflection, encouraging those involved in research to go beyond theoretical understanding and actively consider the dilemmas they may face during crises. This emphasis on ethical reflexivity is particularly evident in the case studies developed for the PREPARED app.

The PREPARED Code is designed for a global audience. Alongside its sister code, the TRUST Code – which has been adopted by institutions worldwide – the PREPARED Code has been developed by a diverse and engaged international team. To keep the code succinct while ensuring its accessibility across cultural and linguistic contexts, training clips were developed that clarify and contextualise each article in the code.

Recognising that a resilient research ecosystem relies on the adaptation of existing research processes, stakeholder-specific how-to guidelines were developed that speak to the procedures already being followed by research ethics committees, publishers and editors, and research-performing institutions.

Formats that enhance engagement, such as video clips, polls and interactive dialogues, were prioritised. To ensure accessibility, many of the training materials are hosted on a mobile app, the PREPARED app, making them available to a global audience.

In summary, we strongly encourage future ethics projects to support implementation of their codes and guidance with tools that enhance ethical reflection, global applicability, accessibility and system resilience, and include engaging formats.

As crises continue to reshape the global research landscape, the challenge is no longer just to develop ethics codes: we must ensure that they are both understandable to diverse actors and applied appropriately to guide ethical decision-making.

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