Case Statement
RDA/CODATA Data Systems, Tools, and Services for Crisis Situations Working Group (DSTS_CS-WG)

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WG Charter

Introduction

The RDA/CODATA Data Systems, Tools, and Services for Crisis Situations Working Group (DSTS_CS-WG) arises out of a widespread set of activities and interests in RDA and CODATA that have developed through close interaction with leading international, regional, and national organisations playing prominent roles in crisis preparedness and response, and rebuilding architecture, crisis governance, and the management of crisis situations.

Vision

The vision of the DSTS_CS-WG is to contribute to a mapping and understanding of the scientific and (Ethical, Legal and Social Implications (ELSI) characteristics of data systems, innovative tools, and comprehensive services that contribute to reliable and resilient preparation, response, and recovery to crisis situations.

Mission

The mission of the DSTS_CS-WG is to elucidate scientific and ELSI features of data systems, tools, and services in relationship to the needs of scientists, policy/decision-makers, emergency responders, media, and affected communities by providing an overview of those characteristics and how they are expressed in the architecture, design, interoperability standards, and application of digital infrastructures to crisis situations worldwide.

Objectives

The principal objective of DSTS_CS-WG is to create a listing of the specific data-related needs and challenges arising during crisis situations mapped to data systems, tools, and services (DSTSs) indicating their applicability, interoperability, and utility, with reference to the data value chain.

The following specific objectives will be pursued by the DSTS_CS-WG:

1. identifying the digital tool needs and challenges by first responders, field workers, scientists, lab personnel, policymakers, national authorities, and communities during crises;
2. identifying the DSTSs requirements to achieve interoperable, high-quality data, and easy to communicate information for crisis management;
3. identifying DSTSs characteristics and attributes needed in their design, development, and deployment in crisis situations for the reliable and effective collection, analysis, and dissemination of information with reference to the data value chain;
4. mapping these to the more general characteristics for Research Commons as provided by e.g. the RDA GORC IG and FAIRSharing; and
5. developing a recommendation specifying the characteristics of DSTSs required to meet the needs and address the challenges in crisis situations.

Support to the ISC CODATA Decadal Programme

The DSTS_CS-WG is intended to function according to the requirements of a Working Group (WG) within the RDA and a Task Group (TG) within CODATA. Within the framework of the ISC CODATA Making Data Work for Cross-Domain Grand Challenges: the CODATA Decadal Programme, this TG directly addresses the need for contributing to one of the major global scientific and human challenge of the 21st century, particularly disaster-risk reduction, and this within the frameworks of sustainable development and an awareness of the impact of climate change. The TG sets out specific cross-domain research that seeks to understand complex systems through machine-assisted analysis at scale. The TG will address directly the current limitations in our ability to access and combine heterogeneous and disaggregated data within and across domains in crisis situations.

The TG will address all four priorities of the Decadal Programme, with particular attention to priority 2:

1. Making Data Work for Cross-Domain Grand Challenges: a programme of activity to help deliver areas of the ISC Action Plan.
2. Data Policy: promoting principles, policies and practices for FAIR Data and trustworthy, equitable and transparent science.
3. Data Science and Data Stewardship: advancing the frontiers of the science of data, particularly to enable interoperability and reusability.
4. Data Skills: building capacity for trustworthy, equitable and transparent science and data stewardship by improving data skills and education.

These priorities will be addressed through the work presented here.

Deliverables

The DSTS_CS-WG's deliverables will be developed to support broad understanding of the underlying values of the RDA and CODATA. These deliverables will be designed for use to develop capacity, particularly regarding competence building across skill sets while also contributing to training programmes, in the EU and globally.

The DSTS_CS-WG will pursue the following deliverables:

1. An assessment of the digital tool needs of and challenges for key stakeholders (see above), in crisis situations

2. Three Case Studies describing the needs and challenges as outlined above in specific areas. We currently envisage case studies on 1) earthquakes, 2) typhoons, and 3) wildfires. The precise case studies will be determined during the course of the research and related to the interests and expertise within the DSTS_CS-WG.

Final Recommendation

A Final Recommendation will be delivered specifying the characteristics of DSTSs in relation to the data research lifecycle and the data value chain required to meet the needs and address the challenges of stakeholders in crisis situations based on the needs assessments and applicable to the case studies.

Work description

The DSTS_CS-WG will contribute to this crucial global necessity for DSTSs applicable to crisis situations by examining the characteristics, interoperability, and application of DSTSs to address the needs of significant emergency or disruptive situations. Of crucial importance is that the features of DSTSs contribute to interoperable monitoring, detection, information, and alert systems that promote the use and reuse of data and information for multiple purposes in crises. This will be carried out by examining how DSTSs contribute to, interoperate with, and interconnect within data infrastructures / data commons as well as across infrastructures/commons throughout the research data lifecycle, the data value chain, and in their application to the needs of stakeholders in crisis situations.

The DSTS_CS-WG will explore the characteristics and interoperability of existing DSTSs while also examining emerging types of DSTSs, including AI applications, in the data infrastructure landscape with regard to their application to crisis situations. The DSTSs features required for crises should support risk assessments, early warning, early action, enhanced situational

awareness, response, and recovery. There is a need to understand and develop the characteristics of DSTSs that provide the data required to support explainable information, including estimates of its uncertainty, for rapid and reliable decision-making in acute crises while also reducing the cognitive loads of decision-makers.

Scientific principles

The DSTS_CS-WG will use the following three principles to frame its examination of DSTSs characteristics:

1. the extent to which the DSTSs are designed to provide the interoperable, high-quality, and efficiently shared data required to address crisis situations;
2. the extent to which past and recent DSTSs, based on existing models and case studies, have been successfully implemented into addressing crisis situations; and
3. the extent to which recent innovations in data science, DSTSs design, and AI contribute to the evolving discussion and requirements for crisis preparation, response, and recovery (in the context of selected national, regional, and global crises data infrastructures).

In the context of these principles, the following DSTSs core characteristics needed for crisis situations will be examined and outlined by the DSTS_CS-WG:

Real-time or near real-time data collection and processing: Timeliness is critical to preparing for, responding to, and recovering from crisis situations. The WG will examine the characteristics needed for DSTSs to be capable of processing and analysing data in real-time or near real-time to provide timely insights and support decision-making. This will include an examination of how real-time data collection and processing can enable early detection of patterns, trends, emerging issues, response needs, and reconstruction priorities. The WG will consider the role of DSTSs in the development of information for multi-hazard and multi-risk assessments. It will consider how DSTSs contribute to evidence-based crisis management and the monitoring of relevant indicators.

Scalability and flexibility: The WG will explore how DSTSs can meet the scalability and flexibility requirements to handle the increased volume and variety of data during a crisis. It will examine how DSTSs can accommodate sudden surges in data collection and analysis while maintaining reliable performance. This includes an examination of scalable, fit-to-purpose infrastructure and cloud-based solutions needed in crises.

Interoperability, integration, and interconnectedness: The WG will consider the importance of the architecture and interoperability in the design of DSTSs for seamless integration with the needs of scientists and first responders as well as affected communities. It will examine how DSTSs can connect and exchange data with other systems and platforms used by different stakeholders involved in crises response. The WG will examine available techniques to manage data from different sources for the early identification of anomalies and to monitor the research data lifecycle, the data value chain, and data tool interoperability during crisis situations. It will highlight the importance of interoperability standards, open APIs, and models of interconnectedness across discrete infrastructures and systems to facilitate smooth collaboration across data infrastructures and data sharing.

User-friendly interfaces: It is critical that during crises, response teams and stakeholders have access to DSTSs that provide user-friendly interfaces ensuring ease of use and minimisation of

the learning curve. The WG will explore intuitive, visually appealing, and other forms of interfaces that improve usability and adaptability while enabling users to access and analyse data efficiently.

Geospatial capabilities: Increasingly, geospatial data is being recognized as having a significant role in crisis management, providing insights into spatial patterns, resource allocation, and impact assessment. The WG will investigate the geospatial capabilities of DSTSs for facilitating data integration, analysis, visualisation, and adoption into critical activities and decision-making structures. The WG will examine how various DSTSs are mapped to interfaces, spatial analysis tools, and geospatial data layers of value for situational awareness and decision support.

Data security and privacy: Personal data as well as other forms of sensitive data require that DSTSs are capable of prioritising data privacy and data security. The WG will examine the characteristics of DSTSs needed to ensure robust security measures, such as encryption, access controls, and secure data storage, required to protect data from unauthorised access or breaches. Work previously performed in the EOSC-Future/RDA Artificial Intelligence and Data Visitation Working Group (AIDV-WG), the RDA COVID-19 Working Group, and GOSC as well as related work in associated organisations will assist in investigating compliance with relevant data protection regulations and ethics guidelines. This WG's deliverables will also contribute to a better understanding of how to facilitate decision-making during cybersecurity crises through an improved understanding of DSTSs, their contexts, interoperability, and infrastructure interconnectivity.

Collection and communication: The WG will explore the extent to which DSTSs architecture, designs, and features facilitate collaboration among multiple stakeholders in crisis situations. DSTSs should facilitate collaboration and communication through reliable and trustworthy features, such as data interoperability, systems and tools interoperability, shared workspaces, messaging systems, document sharing, and task assignment capabilities. The WG will review how DSTSs related to social media use and collaboration with citizen scientists / virtual volunteers to gather and analyse data.

Accessibility and connectivity: The WG will investigate how DSTSs are made accessible for all stakeholders involved in preparing for, responding to, and recovery/rebuilding efforts related to crises, including scientists, first responders and their organisations, policymakers, governments, and affected communities. The accessibility of these DSTSs across various devices and platforms, as well as in the field and in laboratories, is vital for interconnectivity, timeliness, and reliability. This may include mobile-friendly interfaces and offline capabilities that may be particularly useful in resource-constrained or disrupted environments.

Data resilience and redundancy: The WG will examine the need for built-in resilience and redundancy within DSTSs to withstand disruptions caused by crises. Redundant data storage, backup systems, and disaster recovery plans are crucial to ensure data availability and integrity, even in the face of infrastructure failures or disruptions. The WG will further examine the ways DSTSs contribute to the post-event collection of damage and loss data.

Openness and interoperability standards: The WG will look to see how and the extent to which DSTSs promote openness and adherence to interoperability standards of vital importance during a crisis, including with regard to transparency, data sharing, and collaboration across stakeholders. The WG will promote open data principles and interoperability standards that

enable seamless integration with existing systems, facilitate data exchange or data visitation, and encourage innovation in the preparation for, response to, and recovery from crisis situations.

The DSTS_CS-WG will consider the importance of data policy, data governance, data management, FAIR data, and data curation throughout the data and research lifecycles, the data value chain, and in relation to the scientific, field, and public policy needs to be addressed by DSTCs in crisis situations. The WG will consider how DSTCs collect, curate, and aggregate data in crises and how this affects the utility of the data for stakeholders, including the impact of DSTCs generating ex situ data versus those maintaining in situ data. This will also include an examination of the importance and roles of structured and unstructured data as well as that of disaggregated data.

ELSI for DSTSs in crisis situations

The DSTS_CS-WG will investigate the ethical, legal, and social implications (ELSI) that support these scientific principles in developing DSTSs and their application to society. The development and application of DSTSs in the context of disasters, emergencies, and crises may give rise to ethical, legal, and social issues, thus potentially impacting individuals and society in ways that affect the rights and freedoms of persons and communities. Examining only the science and practical aspects of DSTSs would threaten to be insufficient and perhaps irresponsible for drawing architect, design, and interoperability conclusions. This is particularly important as more advanced AI is applied through DSTSs to crisis situations. The WG will ensure that the ELSI principles and learnings are integrated into the scientific and practical findings. Work previously performed in the EOSC-Future/RDA Artificial Intelligence and Data Visitation Working Group (DSTS_CS-WG) and the RDA COVID-19 Working Group as well as related work in associated organisations will assist in investigating compliance with relevant data protection regulations and ethics guidelines is essential.

The following ELSI considerations will be investigated by DSTS_CS-WG:

1. Ethical considerations: The development and application of DSTSs for addressing crisis situations should prioritise ethical frameworks and principles. The WG will examine how DSTSs ensure the promotion of the common good, ensure accountability and transparency, and protect and promote individual freedoms, scientific freedoms, the ability to express oneself freely, and community justice.

2. Legal and regulatory compliance: DSTSs for crisis situations should comply with applicable laws, regulations, and ethical guidelines. The WG will evaluate the ways in which DSTSs adhere to data protection laws, intellectual property rights, security standards, and any other relevant legal requirements in various jurisdictions around the world. It will also investigate how legal provisions impact DSTSs regarding privacy protection for managing data in crisis situations. The WG will also examine how a description of the core characteristics of DSTSs can contribute to more harmonised data standards and impact the design and implementation of legislation and regulatory requirements.

3. Human rights and humanitarian principles: The use of DSTSs in crisis situations need to be aligned with human rights and fundamental freedoms while supporting humanitarian principles, including humanity, impartiality, neutrality, and independence. The WG will examine the conditions and characteristics needed for DSTSs to ensure human rights and fundamental

freedoms are not violated and essential ethics principles are followed, including the respect for the dignity of persons and communities, the right to life and the pursuit of happiness, protection from harm, and non-discrimination.

4. Transparency and accountability: The development and deployment of DSTSs for crisis situations should be transparent, with clear explanations of their functioning, limitations, and potential biases. The WG will examine the DSTSs mechanisms that ensure accountability for their use and impact.

5. Consent and autonomy: The use of DSTSs involves data and potentially human tissue collection from individuals, at times coming from specific populations. The WG will examine how DSTSs may promote individual and community autonomy in data collection and analysis as well as in information distribution. It will look at the evolving role and nature of consent in traditional and digital settings, particularly in the context of DSTSs, in relation to autonomy and the ethical processing of data in crisis situations.

6. Community engagement: The WG will consider the ways in which DSTSs are designed and applied for engagement with affected communities and stakeholders in crisis situations. The perspectives, knowledge, and needs of the various affected and engaged communities is of importance in the design and implementation of DSTSs.

7. Privacy and data protection: DSTSs in crisis situations nearly always involve the collection, analysis, and sharing of personal or other forms of sensitive data. The WG will examine the conditions of application and the characteristics of DSTSs (including the involvement of AI features in their design, deployment, and use) that ensure that privacy is respected and data protection measures are in place to safeguard individual and community confidentiality while also preventing misuse or unauthorised access to data.

8. Equity and access: DSTSs in crisis situations should be designed and implemented in a way that ensures equitable access for scientific bodies, governments, first responders and their organisations as well as for the affected individuals and communities. The WG will consider the ways in which DSTSs may mitigate hindering factors, such as language barriers, digital literacy, socioeconomic disparities, censorship, political barriers, economic disparities, and accessibility.

It is important for stakeholders involved in developing and deploying DSTSs for disasters, emergencies, and crises to address these ELSI considerations in explicit ways that ensure responsible and ethical practices prioritising the well-being and rights of affected individuals and communities.

Description of principles and context supporting the DSTS_CS-WG's activities

The DSTS_CS-WG will facilitate the development of tools, policy, and practices that promote EOSC Services (PIDs for EOSC, EOSC Marketplace, PID policies and compliance, AAI, AI ELSI outputs), ESOC Exchange (data transfer, research data as a service), and the EOSC Interoperability Framework (EOSC Interoperability Framework, ways of implementing the interoperability framework). The DSTS_CS-WG will attempt to align with its work using the tools designed by initiatives examining interoperability and interconnectedness across open science platforms, such as GOSC and GORC.

The DSTS_CS-WG will also consider the need for training and capacity-building for the discrimination and implementation of its outputs.

The DSTS_CS-WG will include and promote the following principles:

- The FAIR Data Principles: Findable, Accessible, Interoperable, and Reusable.
- The TRUST Principles for Data Repositories: Transparency, Responsibility, User focus, Sustainability and Technology
- The CARE Principles for Indigenous Data Governance: Collective Benefit, Authority to Control, Responsibility, and Ethics.
- The RDA Guiding Principles: Openness, Consensus, Inclusive, Harmonisation, Community-driven, Non-profit and technology-neutral.
- The RDA Code of Conduct

The DSTS_CS-WG will strive to facilitate data interoperability in crisis situations nationally and internationally in ways that support the Sustainable Development Goals (SDGs) across their 17 global goals and associated 169 targets.

Value proposition

The DSTS_CS-WG will provide significant added value to the global data community, to the development of DSTSs, to the urgent need to develop stronger and more integrated DSTSs for crisis preparedness and response architecture, crisis governance, and the management of crisis situations. The WG will contribute substantially to alleviating the disruptions, suffering, and social impacts of crisis situations that undo lives, threaten the functioning of society, impact progress and threaten the maintenance of peace. It will contribute to frameworks and practical approaches for developing countermeasures to disruptive events that threaten the coherence of society and reduce the likelihood of local disruptions escalating into national or international crises. The WG will make an important contribution to strategic crisis management architecture by identifying the characteristics of DSTSs designed to be fit for purpose in crisis situations and contributing to the capacity to take urgent decisions under conditions of uncertainty, while maintaining public trust and mitigating the potential negative effects on society of crisis policies and countermeasures.

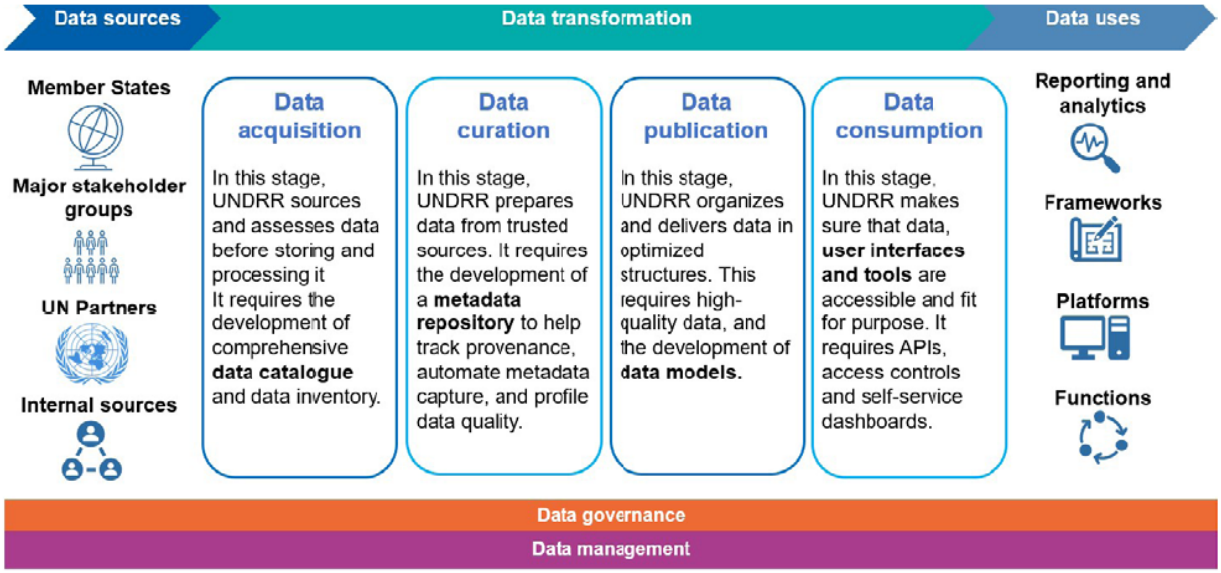
The DSTS_CS-WG will help to integrate and provide practical value to DSTSs and other outputs from the RDA, CODATA, and associated organisations in relation to crisis situations.

Engagement with existing work in the area

There is an increasing awareness of the need for DSTSs addressed to the contexts of disasters, emergencies, and crises as well as how these core digital elements should be accessible in timely and reliable manners that are interrelated and interoperable. Leading inter-governmental, international, and national agencies as well as emergency response organisations and frontline workers and communities have recently expressed this need. Examining the applicability and interoperability of data systems, tools, and services is a critical step to developing more cohesive, supportive, and complementary mechanisms for preparedness, response, and recovery to crisis situations. Doing so will also lead to synergies across international, regional, and national institutions and initiatives. The DSTS_CS-WG will contribute to addressing the governance and management of cascading and transboundary crises by strengthening the understanding of the characteristics and interoperability of data systems, tools, and services fundamental to policy and governance for strategic crisis management.

The United Nations Office for Disaster Risk Reduction's 'Sendai Framework for Disaster Risk Reduction 2015-2030' addresses the need '[t]o promote real time access to reliable data, make use of space and in situ information, including geographic information systems (GIS), and use information and communications technology innovations to enhance measurement tools and the collection, analysis and dissemination of data'. On 31 January 2023 the United Nations General Assembly's 'Main findings and recommendations of the midterm review of the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030' stated that 'Data ecosystems, including for disaggregated data, need to be strengthened, including through enhanced interoperability across systems.' The DSTS_CS-WG will contribute to improving data ecosystems and enhanced digital tool interoperability during crisis situations.

The UNDRR Data Strategy Roadmap: 2023-2027 further develops this approach in the direction the DSTS_CS-WG will work: 'The changing overall data ecosystem and data maturity require us to revisit our current data products and practices and then improve or strengthen them to meet the new requirements.' In particular, the UNDRR here points to the importance of the data value chain as a research and policy asset needing to be considered from acquisition/collection to curation/analysis to use (publication/dissemination/consumption):



In 2022 the Group of Chief Scientific Advisors in its Scientific Advice Mechanism 'Strategic crisis management in the EU', described the need for the approach put forward here by the DSTS_CS-WG in its first recommendation, 1. Overarching Recommendation:

> [I]nstruments and mechanisms still need to become part of a systemic framework suited to tackle the crises of the future. We recommend developing a roadmap for such a systemic framework.
>
> 1.1. Foresee adaptive instruments to deal with cascading failures and transboundary and cross-sectoral impacts, to overcome the tendency of adding new specific tools at each crisis.
>
> 1.2. Consider that facts and values cannot be disentangled in risk and crisis management.

Further in the same report, Recommendation 6 expresses the need specifically regarding data and data systems:

> [To] provide interoperable, high-quality data, and easy to communicate information for crisis management. Rather than suffering from lack of data, crisis managers are now faced with the challenge of actionable information (Derczynski et al. 2018) that requires innovation in the way IT systems enable managing "flows of information to support the decision-making process in a networked manner" (Meesters 2021).

However, as this report and other leading publications indicate, at present there exists no concerted international, multi-disciplinary, and multi-sectoral engagement to examine the characteristics, functionalities, and organisational structures of DSTSs in their application to health emergencies, national disasters, geo-political disruptions or (generally) crisis situations. The digital research data infrastructure landscape comprises an enormous amount and variety of tools for managing and sharing research data across various stages of the research data lifecycle and the data value chain. These tools vary according to disciplines, user requirements, provider, and how data is categorised. However, the application of the data systems, tools, and services to crisis situations is insufficiently studied, described, and categorised. What is recognized is that there is an urgent need to undertake this work if we are to improve crisis governance and management.

As our societies become increasingly digital and increasingly reliant on science driven by digital tools and systems, it is necessary that we move toward greater understanding and sharing through open science:

> As the world becomes increasingly interconnected, it is ever more urgent to build systems of cooperation that allow multiple and diverse actors to collaborate and make use of a dedicated framework for sharing information, expertise, and experience. It could seem particularly crucial to develop a standardized approach to data in certain sectors or at certain moments, such as in times of humanitarian crisis, as this will ultimately enable more coordination and prevent harmful fragmentation. Given the multiple and complex interactions between regulations and asymmetries at local, national, and international levels, fragmentation may have profound implications on individuals and businesses, both intended and unintended, for virtually all aspects of our daily lives.[1]

The DSTS_CS-WG was launched following a session held during the RDA Plenary 20 in Gothenburg on 23 March 2022. Since the initial meeting a core group has been examining within the RDA community and outside the interests in and desired format and work for the DSTS_CS-WG. Careful attention has been given to the interests of the RDA and CODATA communities, while ensuring that there was a need (within the data community and outside among scientists and policymakers and publishers), while also defining the gaps in the data landscape as well as the methods and outcomes required to address these gaps. Careful consultation has taken place inside and outside RDA.

[1] THEGOVLAP, Mapping and Comparing Data Governance Frameworks A benchmarking exercise to inform global data governance deliberations. February 16, 2023. Annex 1 - Mapping and Comparing Data Governance Frameworks.pdf (unsceb.org)

Outside the RDA, the working group was discussed over several months within CODATA in relation to its work on data policy in times of crisis and submitted for formal acceptance to the CODATA Executive Committee with a positive decision in May 2023. The working group was also discussed with the International Science Council in connection with the work of its Center for Future Science, the UK Health Security Agency in relation to its Global Health Disaster Risk Reduction Department, and the UKRI ESRC Digital Footprints programme. We further consulted with The Royal Society (UK), and the ECO-ASCO Meeting on the Impact of the War in Ukraine on Cancer The working group has also been discussed with UNESCO in the context of contributing to the development of a toolkit for its Declaration on Open Science and also presented and discussed at the GA4GH 2023 April Connect, The Royal Society, London, 20 April 2023.

The WG was further included in discussions for input and to gauge potential membership at the United Nations World Data Forum satellite meeting at the United Nations University in Macau, 25 April 2023; the 'Technical workshop: validation of the prototype for the new losses and damages tracking system', organised by the United Nations Office for Disaster Risk Reduction, World Meteorological Organization, and the United Nations Development Programme, Bonn, DE, 3-4 May 2023; the Data Science for Health in Africa Virtual Networking Exchange on Cape Town, South Africa, 3 May 2023; the Global Open Science Cloud (GOSC) SDG-13 [Take urgent action to combat climate change and its impacts] on 16-18 May 2013, Bangkok, Thailand; and the Digital Capabilities in Medicines Development, King's College London, United Kingdom, 22 May 2023.

A session on 'Data for emergencies' with members of this working group was held at the ALLEA General Assembly's Symposium on 'Crisis and the importance of research' 22 June 2023 at The Royal Society in London which has helped to align this project with work in the European Federation of Academies of Sciences and Humanities (ALLEA) and the Science Advice fir Policy by European Academies (SAPEA). The project will be further presented at the China World Youth Summit Thinktank on 4 July 2023, the International Training Workshop on Open Science and SDGs in Beijing, China, on 28 August to 8 September 2023; the International Symposium on Open Science Clouds (ISOSC) on 4-6 September 2023 in Chinese Academy of Sciences (CAS) Information Plaza, Beijing, China; and the US-UK Scientific Forum on 'Researcher Access to Data: Changes and Challenges' at the US National Academy of Science (NAS) 12-13 September 2023, Washington, DC.

The feedback has been positive and encouraging. Widespread interest has been shown for the need of this working group as well as for participation in it. The DSTS_CS-WG will continue this international consultation as part of the working group's strategy to ensure inclusivity, outreach, and the eventual dissemination and impact of its results.

The RDA hosts a range of DSTSs developed for scientific disciplines and applications as well as expertise across these DSTSs. Specific RDA initiatives include the following:

- RDA COVID-19 Working Group
- EOSC-Future/RDA Artificial Intelligence and Data Visitation Working Group (AIDV-WG)
- RDA Global Open Research Commons Interest Group

- RDA-OfR Mapping the digital research data infrastructure landscape
- Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT)
- Korea Research Data Commons / Korea Institute of Science and Technology Information
- GORC International Model WG
- Malaysian Open Science Platform (MOSP)
- The Digital Research Alliance of Canada (the Alliance)
- National Information Infrastructure (NII) Research Data Cloud (NII RDC), Japan
- Working with PIDS in Tools IG
- Life Science Data Infrastructures IG
- FAIRsharing Registry: Connecting data policies, standards and databases RDA WG
- Data Repository Attributes WG
- Education and Training on Handling of Research Data IG
- FAIR for Virtual Research Environments IG
- Repository Platforms for Research Data IG
- Research Data Architectures in Research Institutions IG

In related ways the International Science Council's Committee on Data (CODATA) brings a deep experience as well as a broad range of current projects and expertise related to the architecture, design, of DSTSs that are or can be related to crisis situations. It also brings rich cooperation with top-tier global scientists and science-related organisations. CODATA's outputs and ongoing related projects including following:

- The CODATA International Data Policy Committee
- Global Open Science Cloud (GOSC) - in particular the Case Study on SDG-13
- The WorldFAIR Project - in particular WP12
- FAIR Data for Disaster Risk Research
- CODATA-RDA Schools of Research Data Science
- Data Science Journal

Further, several important global, regional, and national initiatives exist that bring together DSTSs in structured organized manners on platforms of open science, data commons, or inter-related tools and databases intended to support data interoperability and data sharing. These include the following:

- European Open Science Cloud (EOSC)
- European Federation of Academies of Sciences and Humanities (ALLEA)
- Open Science Framework
- DataONE
- China Science and Technology Cloud (CSTCloud)
- Australian Research Data Commons (ARDC)
- African Open Science Platform

- Development Data Partnership
- Digital Curation Centre (DCC)
- Research Data Netherlands (RDNL)
- UK Data Service
- ELIXIR Tools and Data Services Registry
- FAIRsharing
- Bioinformatics Resource Centers (BRCs)
- Research Software Directory (ReSA)
- Re3data
- SciLifeLab
- OpenDOAR
- COAR
- OpenAIRE Graph
- EOSC Strategic Innovation Research Agenda (SRIA)
- Research Data Framework (RDaF) (NIST)
- REGOSH – Rede Latino Americana de Tecnologias Livres / free and open technologies for science and education
- NASA Open-Source Science Initiative (OSSI)
- Digital Research Alliance of Canada (DRAC)

The DSTS_CS-WG will engage with relevant working groups and projects in RDA, CODATA, and other expert groups and communities engaged in work related to DSTSs for crisis situations. While we will not be able to interact with all groups and initiatives listed here, we will connect with many of these to inform our activities and deliverables. A considerable number of contacts and expressions of interest have already been achieved, and several WG members are already involved in some of the groups and initiatives listed here.

UN Sustainable Development Goals (SDGs)

Most of the United Nations (UN) Sustainable Development Goals (SDGs) address aspects that are directly related to the need for the collection, analysis, sharing, and interpretation of data in crisis situations: e.g., SDG 1, 2, 3, 4. 5. 8. 9, 10, 11, 16, 17. The United Nation's 2030 Agenda, adopted by the UN General Assembly in 2015, recognizes the importance of high-quality, timely, and disaggregated data to support the implementation and monitoring of the SDGs. It emphasises the need for data-driven decision-making and evidence-based policies to effectively address development challenges. The UN has called for collaborative efforts among governments, organisations, and stakeholders to strengthen data systems, tools, and services.

Work plan

The following items make up the work plan:

1. developing the form and description of the Final Recommendation of the WG;

2. developing the form and description of milestones and intermediate documents, code or other deliverables that will be developed during the course of the WG's work;
3. developing a description of the WG's mode and frequency of operation (e.g. on-line and/or on-site, how frequently will the group meet, etc.);
4. developing a description of how the WG plans to develop consensus, address conflicts, stay on track and within scope, and move forward during operation; and
5. developing description of the WG's planned approach to broader community engagement and participation.

The DSTS_CS-WG will complete its activities over an 18-month period, utilizing monthly web meetings, work streams, and focused discussions on its deliverables. The deliverables will all be due within 18 months of the start period. The work of the WG will be designed such that it will not overrun its 18-month period.

Deliverables

The DSTS_CS-WG's deliverables will be developed to support broad understanding of the underlying values of the RDA and CODATA. These deliverables will be designed for use to develop capacity, particularly regarding competence building across skill sets while also contributing to training programmes, in the EU and globally. Through its inclusive and open design, the DSTS_CS-WG's outputs RDA and CODATA as well as other national and international engaged in researching and managing data for crisis situations and working in the area of open research commons initiatives. The DSTS_CS-WG working methods are based on co-creation and cultivation, founded on the following principles: Trust - Shared Vision - Leadership - Open Communication - Democratic Engagement - Clear Roles - Goal Driven - Growth/Vibrancy - Standards and Processes - Discovery Enabling - Resourcefulness.

The DSTS_CS-WG will pursue the following deliverables:

1. An assessment of the digital tool needs of and challenges for key stakeholders (see above), in crisis situations
2. Three Case Studies describing the needs and challenges as outlined above in specific areas. We currently envisage case studies on 1) earthquakes and 2) typhoons, with a third yet to be determined, but this may change depending on the interests of the WG members.

Final Recommendation

A Final Recommendation will be delivered specifying the characteristics of DSTSs in relation to the data research lifecycle and the data value chain required to meet the needs and address the challenges of stakeholders in crisis situations based on the needs assessments and applicable to the case studies.

Methods of working

The DSTS_CS-WG will work within the RDA and CODATA frameworks promoting

- Organisational collaboration and trust-building measures
- ELSI Principles
- Data quality, sharing, and interoperability
- Data governance, including law, ethics, and social responsibility

- Capacity building

The following methods will be used by the DSTS_CS-WG:

1. Monthly Zoom meetings
2. Focused meetings
3. Running agenda items, including reports of ongoing projects and additional items added given upcoming events or emerging opportunities aligned with deliverables or collaboration with partnering organisations
4. Co-chairs may also meet outside of these monthly meetings to manage the workflow and the achievement of the work according to the deadlines
5. Sessions will be proposed to RDA, CODATA, and other organisations to provide public updates on the working group's progress and activities as well as to encourage community feedback and build collaborations
6. Workstreams will be developed per deliverable
7. Webinar and meeting participation will be promoted for mutual learning and sharing
8. Mentoring: a number of junior researchers will be assigned to each work stream to be mentored by a leader of the workstream
9. Publication of each deliverable using open access platforms/journals, social media, and other forms of open communication of data, science, and policy
10. Sharing of survey materials and data according to the FAIR Principles and open science values and principles
11. Dissemination of the deliverables through RDA, CODATA, and other groups and communities, including those working on the policies, governing, and response to crises

The DSTS_CS-WG will meet monthly. The co-chairs will share responsibility for developing the meeting agendas, organising meetings, leading discussions, keeping track of the work and deadlines, and arranging participation in and plenary sessions. Specific work streams will be established to ensure progress on the identified deliverables with regular reporting. A mailing list will be used for asynchronous communications. Other tools may be used for collaborating on and tracking deliverables. Additional focused meetings may be developed for specific topics of importance to the DSTS_CS-WG and bringing in external expertise for education and guiding purposes.

These meetings will frame the following activities:

1. Surveying community and users' interests and concerns with Data Systems, Tools, and Services for Crisis Systems
2. Workstream sub-meetings to address specific work streams
3. A mentorship program
4. An outreach program
5. Webinars and conferences provided by the DSTS_CS-WG or participation in such by its members
6. Conduct outreach to outside organisations and experts to gain support on outputs

7. Communicate to CODATA and the RDA Groups and Secretariat the importance of adopting the deliverables, together with DSTS_CS-WG members, actively look for adopters.
8. Provide the ERA Secretariat with a publishable version of the DSTS_CS-WG's deliverables, a maintenance plan, contact details of two early adopters, and other information required for publishing the deliverables and for the endorsement process.

Timeline

Date	Activity
May 2023 - July 2023	Core members of the WG have been meeting regularly to develop the WG Case Statement. Submission of this Case Statement to RDA
September 2023 - March 2025	The WG will meet monthly on a fixed day and time (tbc) for the duration of the WG. WG members will liaise with relevant activities in UNESCO, CODATA, OSCs and with RDA groups
July - September 2023	Consultation on the Case Statement within the RDA & CODATA communities as well as with potential outside collaborators Active recruitment of new members, including potential adopters, ECRs and mentors Definition of the mentoring program Case statement revision (as required) Preliminary work on an assessment of the needs and challenges of assessment of the digital tool needs of and challenges for key stakeholders in crisis situations
September 2023	Official start of the WG (tbc) Mentoring program starts
October 2023	First WG session at RDA P21 (if accepted) Definition of the three case study areas Work starts on the assessment of the digital tool needs of and challenges for key stakeholders in crisis situations

Date	Activity
November - December 2023	Work starts on the three case studies Definition of the outreach program, then ongoing dissemination and outreach as defined in the program Presentation of the draft work to the RDA Plenary 21 Meeting and to a UNESCO Meeting
February 2024	Work starts on the Final Recommendation Draft needs assessment document shared with community for feedback
March - May 2024	Feedback collated on needs assessment document and final version published Draft case studies shared with community for feedback Presentation of the draft work to the United Nation's Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs (STI Forum)
June - July 2024	Feedback collated on case studies and final versions published
August - September 2024	Draft Recommendation shared with community for feedback
October 2024	Feedback collated and revision of draft Recommendation starts
November 2024	Presentation of the outcomes to the UN Data Forum, Medellín, Colombia
January 2025	Final Recommendation submitted for RDA endorsement
March 31, 2025	Final Recommendation of the DSTS_CS-WG

Adoption plan

The DSTS_CS-WG will collaborate continually with the RDA and CODATA communities across related workstreams and projects, including those listed above. In addition, the WG will cooperate with international and national organisations involved with developing and implementing measures to prepare for, respond to, and assist recovery when crises arise.

The DSTS_CS-WG plan for the dissemination, adoption, and implementation of its deliverables includes the following:

1. Clear and well-defined WG deliverables have been established in consultation with and consideration of the needs of stakeholders. The deliverables will be prepared to be user-friendly, accessible, and widely available. All deliverables will be published.
2. Key stakeholders and target audiences for the WG's deliverables have been identified and engaged in the preparation of this WG's case statement, these include RDA, CODATA, and international projects as listed above, policymakers, emergency management agencies, humanitarian organisations, researchers, and technology providers.
3. The activities, progress, and outcomes of the WG will be communicated through various channels, including websites, social media platforms, mailing lists, conferences, workshops, and collaborations with relevant organisations.
4. A strategic dissemination plan will be developed to reach the appropriate stakeholders as well as the wider scientific, policy, governmental, and citizen/community audiences. The WG benefits from a strong existing network, partnerships, and engagement with professional societies that will facilitate the wide dissemination of the deliverables.
5. The WG recognizes that crisis situations vary across regions and contexts, and will work to see that its deliverables can be regularly revised as well as customized and adapted to local needs to ensure relevance and applicability to different geographical and socio-cultural settings. In this context the WG will collaborate with local partners, regional organisations, and national agencies to adapt and contextualise the deliverables for specific regions or countries.
6. The WG may organize or contribute to training workshops, webinars, and capacity-building sessions to educate and train stakeholders on the effective use and implementation of its deliverables.
7. As appropriate, the WG will encourage and perhaps facilitate pilot projects to evaluate the practical application and impact of its deliverables in real-world crisis situations.
8. The WG will document and share the outcomes, lessons learned, and best practices to inspire adoption and implementation by other stakeholders.
9. The WG will foster collaborations and partnerships with relevant organisations, including international bodies, research institutions, technology providers, and crisis management agencies. It will engage stakeholders early in the development process to promote ownership and sustainability of the deliverables.
10. The WG will establish mechanisms to collect feedback from users and stakeholders on the effectiveness, usability, and impact of the deliverables. It will continually allow for its deliverables to be evaluated and updated within crisis management systems.
11. Within RDA and CODATA the WG will foster a community of practice and knowledge exchange where users can share experiences, insights, and challenges related to the implementation and adoption of the deliverables.

By following this plan the working group will effectively disseminate, promote adoption, and support the implementation of their deliverables while maximizing the impact of appropriate designed and applied DSTSs for crisis situations.

Initial membership

Initial Membership of the WG includes the following:

Name	Organisation	Country
Stefanie Kethers	Australian Research Data Commons	Australia
Gnana Bharathy	Australian Research Data Commons	Australia
Perihan Elif Ekmekci	TOBB ETU	Turkey
Burcak Basbug Erkan	Middle East Technical University	Turkey
Simon Hodson	CODATA	France
Virginia Murray	United Kingdom Health Science Authority	UK
Francis P. Crawley	Good Clinical Practice Alliance - Europe (GCPA) & Strategic Initiative for Developing Capacity in Ethical Review (SIDCER)	Belgium

The DSTS_CS-WG will develop an open and inclusive membership across countries, regions, and sectors. The membership will engage data producers, users and stewards, from different disciplines and sciences as well as different stages of data processing and exchange. The DSTS_CS-WG will reach out across the RDA international community on its neutral social platform and assist in furthering open science goals in data and data tools interoperability, data sharing, education, data management plans, and the application of data DSTSs to crisis situations and the needs of society. We encourage membership from a broad range of disciplines (including the natural, life, and social sciences) and sectors who are at the forefront of DSTSs, are directly involved in managing crisis situations, and/or be involved with communities affected by recent or threatening crisis situations.