Abstract

In November 2023, the WHO Health Emergencies Programme for the WHO Regional Office for Europe conducted a functional simulation exercise called Exercise JADE (Joint Assessment and Detection of Events). This report summarizes the exercise, feedback and evaluation data, as well as recommendations for future exercises.

Keywords

- World Health Organization
- International Health Regulations
- Emergencies
- Radioactive Hazard Release
## Contents

Acknowledgements ....................................................................................................................................................................................................... vi  
Abbreviations ...................................................................................................................................................................................................................... vii  
Executive summary ..................................................................................................................................................................................................... viii  

1. Introduction ....................................................................................................................................................................................... 1  
   1.1 The role of NFPs ....................................................................................................................................................................... 1  

2. Exercise JADE 2023 ...................................................................................................................................................................................... 3  
   2.1 Objectives ...................................................................................................................................................................................................... 4  
   2.2 Exercise dates .............................................................................................................................................................................. 4  
   2.3 Participation .................................................................................................................................................................................................. 5  
   2.4 Preparations ..................................................................................................................................................................................... 6  
   2.5 JADE EMT ...................................................................................................................................................................................................... 6  

3. Results and recommendations ................................................................................................................................................................. 7  

4. Exercise JADE 2023 evaluation ....................................................................................................................................................... 21  
   4.1 General feedback from hot wash sessions ................................................................................................................... 21  
   4.2 Mentimeter feedback ....................................................................................................................................................................... 22  
   4.3 NFP feedback participant survey .......................................................................................................................................... 23  
   4.4 Results of the evaluation survey ........................................................................................................................................... 23  

5. Conclusions ........................................................................................................................................................................................................... 29  

Annex 1. JADE 2023 Exercise Design .............................................................................................................................................. 30  

Annex 2. Exercise JADE Scenario Timeline ......................................................................................................................................... 31
Acknowledgements

The WHO Regional Office for Europe’s WHO Health Emergencies Programme (WHE) would like to thank all the National IHR Focal Points (NFPs) that actively participating in JADE 2023. The NFPs provided valuable feedback, which will help enhance the exercise in the future, making it more engaging, relevant and even more challenging. The WHE Programme will continue to improve the exercise each year to ensure that it remains an effective tool for health emergency preparedness under the rights and obligations of the International Health Regulations (IHR) (2005).

We appreciate the support of the WHO Collaborating Centre for Infectious Disease Preparedness and IHR monitoring and evaluation and the National Institute for Public Health and the Environment of the Netherlands (Kingdom of the) as part of the JADE exercise management team.

WHO headquarters’ Radiation and Health Unit and the Radiation Emergency Medical Preparedness and Assistance Network provided invaluable technical input as partners in developing the scenario, and we thank them for sharing their expertise.

This year, the WHO Regional Office for Europe collaborated closely with the European Commission’s Directorate-General for Health and Food Safety (DG SANTE) and the European Centre for Disease Prevention and Control (ECDC) to use the Early Warning and Response System for notification under the IHR (2005). The Regional Office is grateful to our partners within DG SANTE and ECDC for this collaboration and firmly believes that exercise realism was improved because of this strong collaboration.
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>ARS</td>
<td>Acute Radiation Syndrome</td>
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<tr>
<td>CBRNE</td>
<td>Chemical, biological, radiological, nuclear and explosive</td>
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<tr>
<td>DO</td>
<td>Duty Officer</td>
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<tr>
<td>DG SANTE</td>
<td>European Commission's Directorate-General for Health and Food Safety</td>
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<td>ECDC</td>
<td>European Centre for Disease Prevention and Control</td>
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<td>ECURIE</td>
<td>European Community Urgent Radiological Information Exchange</td>
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<td>EEA</td>
<td>European Economic Area</td>
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<td>EIS</td>
<td>IHR Event Information Site</td>
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<td>EMT</td>
<td>Exercise Management Team</td>
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<td>EU</td>
<td>European Union</td>
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<td>EWRS</td>
<td>Early Warning and Response System</td>
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<td>I-131</td>
<td>Radioactive Iodine</td>
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<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<td>JADE</td>
<td>Joint Assessment and Detection of Events</td>
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<td>NFP</td>
<td>National IHR Focal Point</td>
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<td>PHEIC</td>
<td>Public health emergency of international concern</td>
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<td>RCCE-IM</td>
<td>Risk communication, community engagement and infodemic management</td>
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<td>RCP</td>
<td>WHO Regional IHR Contact Point</td>
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<td>RN</td>
<td>Radiological-nuclear</td>
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<td>SOP</td>
<td>Standard operating procedure</td>
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<td>SPAR</td>
<td>State Party self-assessment annual report</td>
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<td>USIE</td>
<td>Unified System for Information Exchange in Incidents and Emergencies</td>
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Executive summary

All States Parties to the International Health Regulations (IHR) 2005 must appoint a National IHR Contact Point (NFP) responsible for notifying WHO of public health risks according to Article 4 of the IHR (2005). The Joint Assessment and Detection of Events (JADE) exercise provides an opportunity for NFPs to practice notification, verification and risk assessment using IHR Annex 2 in responding to a radiation accident or potential health emergency.

The JADE 2023 exercise scenario involved an explosion at a radiopharmaceutical facility releasing radioactive Iodine (I-131) into the surrounding environment. The NFPs were asked to coordinate with their radiological-nuclear (RN) competent authority to conduct a risk assessment for the purpose of notification under the IHR (2005) and list public health response actions among other tasks. It was crucial to consider which sector-specific international reporting mechanisms would be used in a real event of this nature. NFPs were also expected to engage in bilateral communication and share principles for managing mis- and disinformation.

Over three identical exercise days, 43 State Parties participated. The first two days were conducted in English, with 21 States Parties participating on Day 1 (14 November) and 15 States Parties on Day 2 (15 November). On the third day (16 November), conducted in the Russian language, seven States Parties participated. The NFPs and the JADE Exercise Management Team (EMT) exchanged 1409 emails throughout the exercise.

NFPs demonstrated the ability to communicate intersectoral collaboration, conduct notification and risk assessment and fulfil international reporting obligations. In JADE 2023, while 27 of NFPs reported to a WHO IHR Regional Contact Point (RCP), 25 countries within the European Union/European Economic Area (EU/EEA) created notifications through Early Warning and Response System simulation environments. However, NFPs acknowledged that there was insufficient knowledge on the specific aspects of radiological emergencies and that there was need to receive input from radiation protection experts. The event strengthened the WHO, European Commission and European Centre for Disease Prevention and Control partnership with the NFPs. This report highlights the objectives and outcomes of Exercise JADE 2023 and provides recommendations strengthen future interactions within the scope of the IHR (2005).
1. Introduction

The International Health Regulations (IHR)\(^1\) were created to ensure that countries report health emergencies promptly and transparently, to contain and stop the spread of disease or other hazards that have the potential for international spread. As part of this agreement, NFPs are responsible for notifying WHO of any relevant health incidents and responding immediately to requests for information from their WHO Regional IHR Contact Point (RCP).

The WHO Regional Office for Europe holds an annual functional simulation exercise called Joint Assessment and Detection of Events or JADE. This exercise is designed to support the function of NFPs within a safe environment and to identify and respond to public health crises caused by biological, chemical and RN hazards.

\[^{1}\ World Health Organization, International Health Regulations (2005), 3rd edition.\]
1.1 The role of NFPs

According to the IHR (2005), Article 4 mandates each State Party to designate or establish an NFP. The NFP should have the authority within its jurisdiction to comply with requirements under the IHR (2005). The NFP should always be accessible and responsible for communicating with WHO about relevant public health events under the IHR (2005).

The IHR (2005) outline several ways for communicating events related to public health emergencies, including notifying the WHO RCP (Article 6), sharing information during unexpected or unusual events (Article 7), consulting with WHO on events that do not meet notification criteria but may require advice on appropriate measures (Article 8), reporting the potential risks of international spread (Article 9), verifying health events (Article 10) and collaboration and assistance (Article 44).

In addition to the four notifiable diseases (smallpox, wild-type poliovirus, human influenza by a new subtype and severe acute respiratory syndrome or SARS), NFPs must use four criteria to determine the need to notify the RCP of a particular public health event. These criteria include the seriousness of the event’s public health impact, the unusual or unexpected nature of the event, the risk of international disease spread and the possibility of travel or trade restrictions being imposed by other countries. If the event meets two or more criteria, the State Party, through the NFP, must report the event as a potential public health emergency of international concern (PHEIC) to WHO through the RCP. WHO can declare a PHEIC based on the recommendation of the IHR Emergency Committee when a situation poses a risk to public health in other countries due to the international spread of disease. A PHEIC can be declared when the health event is serious, sudden, unusual or unexpected, or has implications for public health beyond the affected state’s border, requiring immediate international action.
2. Exercise JADE 2023

Exercise JADE is a functional simulation exercise developed and implemented by the WHO Regional Office for Europe’s WHO Health Emergencies Programme.

JADE 2023 was a valuable opportunity for NFPs to practice their obligations under the IHR (2005). By participating in this exercise, countries were able to identify gaps in their RN response plans and procedures, test their communication and collaboration channels with relevant radiation protection authorities and gain crucial insights into strengthening preparedness for and response to health emergencies under the IHR (2005).

Exercise JADE 2023 scenario

An explosion occurred at a radiopharmaceutical manufacturing facility, causing thermal burns to three workers and releasing radioactive I-131 into the environment. The radioactive substance was detected in water, grass and fresh milk. Additionally, there was a noticeable increase in gastroenteritis cases in the surrounding area, resembling potential symptoms of Acute Radiation Syndrome (ARS). Social media became a breeding ground for misinformation.

All exercise communication was conducted through email injects, which included attached documents and links to media files.
2.1 Objectives

- To evaluate two-way communications between the NFP and RCP.
- To practise NFPs' assessment of public health events using the decision-making instrument (Annex 2, IHR) and the notification process, or for EU/EEA Member States reporting under IHR (2005), through the Early Warning and Response System (EWRS).
- To test NFPs' access and use of the IHR Event Information Site (EIS), logging in and performing searches of the site, and familiarize them with the process of EIS posting (Article 11, IHR).
- To test NFPs' access and use of the IHR Event Information Site (EIS), logging in and performing searches of the site, and familiarize them with the process of EIS posting (Article 11, IHR).
- To review engagement with other relevant stakeholders within the State Party.

Exercise JADE is designed to provide a safe learning environment and engage NFPs in the region to improve their preparedness and response mechanisms for real emergencies. Its purpose is not to evaluate the performance of any State Party or individual.

2.2 Exercise dates

Three identical simulation exercises were conducted in November 2023 for three groups of States Parties. The first two days were conducted in the English language and the last in Russian. The participating States Parties were distributed across three exercise days in order to have meaningful exchange with each other. The content of each day's exercise was identical, with small adjustments being made for exercise optimization. The main difference in exercise design was the IHR notification modalities, whereby EU/EEA Member States used the EWRS, while other participating States Parties used conventional means of notification.

During the first exercise day (14 November), all three EWRS simulation exercise environments (SIM1, SIM2 and SIM3) were utilized by the EU/EEA Member States. On the subsequent exercise date (15 November), two simulation exercise environments (SIM1 and SIM2) were used.

Each simulation exercise day lasted five hours, including one hour of debriefing. The JADE EMT led a daily “hot wash” debrief to decompress participants, collect feedback and gather suggestions for future exercises.
2.3 Participation

The WHO Regional Office for Europe invited all 55 States Parties in the WHO European Region to participate in JADE 2023. Of these, 43 confirmed their participation during one of the three scheduled exercise days, as listed in Table 1. During the week of the exercise, one additional States Party joined, while another rescheduled for the next day. One previously confirmed States Party did not participate.

<table>
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<th>Participating States Parties</th>
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<tr>
<td>14 November 2023</td>
<td>15 November 2023</td>
<td>16 November 2023</td>
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<td>5. Cyprus</td>
<td>5. Georgia</td>
<td>5. Tajikistan</td>
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<td>7. Denmark</td>
<td>7. Italy</td>
<td>7. Uzbekistan</td>
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<td>8. Finland</td>
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<td>9. France</td>
<td>9. Netherlands (Kingdom of the)</td>
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<td>11. Iceland</td>
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<td>12. Ireland</td>
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<td>13. Lithuania</td>
<td>13. Switzerland</td>
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<td>15. Republic of Moldova</td>
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<td>16. Norway</td>
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<td>20. Sweden</td>
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<td>21. United Kingdom</td>
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NFPs managed the simulation process remotely, eliminating the need for travel. Colleagues communicated via email or teleconferences, as they work from different workspaces and are often physically separated as they would be in a real-life scenario. The EMT encouraged NFPs to collaborate with RN - competent authorities, some reported working in the same room with the NFPs, while other relevant stakeholders only received input for relevant tasks.
2.4 Preparations

Preparations for Exercise JADE 2023 began three months prior to the exercise dates. The preparation process involved consulting with RN experts, setting objectives, developing the scenario and finalizing exercise design elements such as reporting to the RCP or the EWRS platform as outlined in the Exercise Design (Annex 1) and Scenario Timeline (Annex 2). The EMT prepared all exercise materials in advance, including country response checklists, exercise hotwash/debriefs and evaluation surveys.

The feedback from NFP participants in Exercise JADE 2022 guided the development of injects and scenarios, ensuring exercise objectives were met. Once the list of participants was finalized, the EMT sent the participant handbook, a time-zone-specific exercise schedule and requested pre-exercise system communication check to all confirmed participating States Parties. On 13 October, these materials were sent to confirmed participating state parties.

On 6 November, a communication check was conducted to ensure that all participating NFPs had functioning speakers and microphones, access to the EIS and EWRS SimEx environments (if applicable) and to clarify any questions they had regarding how to participate in the exercise.

2.5 EMT

The EMT was responsible for planning, executing and evaluating Exercise JADE. The EMT developed all the exercise materials, exercise injects, the participant handbook, action and problem log sheet, time-zone specific schedules and debriefing questions. It consisted of 18 members, including Exercise Directors, Duty Officers (Dos), DO support staff (controllers), evaluators, admin and information technology support from the WHO Regional Office for Europe Emergency Operations Centre and ECDC/DG SANTE for EWRS simulation environment access. The EMT was drawn from the WHO Health Emergencies Programme within the WHO Regional Office for Europe, WHO headquarters and associated partners (Table 2).

Table 2. Exercise JADE 2023 in numbers

| Number of participating countries | 43 |
| Number of exercise days: | 3 |
| Preparation time for Exercise JADE: | 3 months |
| Number of emails exchanged during the exercise (over 3 days): | 1409 |
| Number of EMT members: | 18 |
| Number of injects: | 14 |
| Duration of each of the three exercises (including 1-hour debrief): | 5 hours |
3. Results and recommended actions

OBJECTIVE 1:

To validate two-way communications between NFPs and RCPs
In public health emergencies, clear communication and real-time information management are crucial. The NFP is responsible for notifying and keeping WHO abreast of relevant health incidents and responding to RCPs’ requests for information. To ensure accessibility and the ability of 24/7 communication channels, the NFP should be a team rather than an individual.

Before the exercise, NFPs verified EIS contact details and updated them if necessary. During the exercise, all communications were directed to the NFPs’ official email addresses registered in the EIS. NFPs could also designate additional email addresses to participate.

State Parties communicated bilaterally, with NFPs using EIS to find contact details for other NFPs and requested public health response support.

Results
One NFP joined on the 15th instead of the 14th of November. One NFP expressed interest but did not participate. One NFP required assistance accessing the website due to security issues. Two NFPs updated their generic inbox, and one NFP added up to eight email addresses to join the exercise. Throughout the exercise, 1409 emails were exchanged in the span of the three days.
NOTIFYING OTHERS OF A NUCLEAR RISK WAS DIFFICULT; we learned a great deal about radiation safety from the RN authority.

Recommended actions

- NFP contact email addresses and Exercise JADE players’ contact details may differ. State Parties should consider internal team orientation to discuss roles and expectations before the exercise.

- The WHO Regional Office for Europe should emphasize in the JADE Participant Handbook that the scenario may include chemical, biological, RN or other hazards, wherein NFPs should be given more assistance concerning how to prepare to communicate and coordinate with different sectors.

- The Regional Office should conduct systematic communication checks with all NFPs to ensure 24/7 access. NFPs should ensure that there is a generic inbox for all IHR communication to ensure continuity in communication.
OBJECTIVE 2: To practise NFPs’ assessment of public health events using the decision-making instrument (Annex 2, IHR) and the notification process; or for EU Member States reporting under the IHR (2005) through the EWRS

NFPs need to fully understand and apply IHR (2005) Annex 2 as part of its function. The decision to notify WHO using Annex 2 is crucial, as it can enable timely response measures, limiting the potential for international spread. To practice using the Annex, the scenario was specifically designed to enable NFPs to assess whether the RN event met the criteria for formal notification to the RCP.

WHO Opinion:

IHR Annex 2 assessment of JADE 2023 scenario: radiation accident, I-131

Serious public health impact: YES
I-131 was deposited on the ground. I-131 was detected in water, grass and fresh milk up to 25 km from the explosion site. Radioactive iodine can contaminate open-water surfaces, vegetation and animals consuming contaminated grass when released into the environment. Exposure to radioactive iodine of young people 0–18 years of age is associated with an increased risk of thyroid cancer. Furthermore, detected signal resembling ARS was detected in nearby communities.

Unusual or unexpected: YES
An accidental release of radioactive I-131 into the environment is always unusual and unexpected, particularly in a semi-urban area.

Potential cross-border significance (“international spread of disease“): YES
In the scenario, the facility was located 10 km from the border with another country. I-131 was released into the environment and could affect the neighbouring country depending on environmental conditions (wind direction, speed, precipitation, etc.).

Potential Interference with international travel or trade: YES
There is the risk of international trade restrictions against food products since consuming contaminated fresh milk products is banned for 3 months. Likewise, there is risk of international travel restrictions to the affected areas.
Results
Out of 43 NFPs, 27 (62%) notified WHO with reports containing detailed justifications for each of the four criteria. Additionally, 25 of 26 (96%) EU/EEA countries accessed the EWRS simulation exercise environments to create a health event notification. Among these EU/EEA countries, 18 would have notified through IHR and 13 States Parties provided justifications (Fig. 1).

These findings indicate high compliance, awareness and application of IHR (2005) Annex 2. Also, NFPs acknowledged where there was insufficient knowledge on RN risk, and where they would need input from RN-competent authorities.

Fig. 1. IHR Annex 2 criteria event assessment data by NFPs (n = 43)
Expert Opinion:

Zhanat Carr  
Radiation and Health Unit, Dept. of Environment, Climate Change and Health,  
Division of Healthier Populations, WHO

In the event of actual or potential radiological and nuclear emergencies with impact on human health, the IHR NFPs provide any available information responding the four IHR Annex 2 criteria questions:

- is the public health impact serious?
- is the event unusual or unexpected?
- is there a significant risk of international spread?
- is there a significant risk of travel or trade restrictions?

Assessing the risk of radio-nuclear events should be done by considering (i) the exposure types, levels, and pathways, (ii) meteorological conditions, (iii) demographics of the affected population, (iv) the infrastructure of the affected area, and (v) the capabilities to detect, measure and assess the radiation exposure and manage the radiation risk; (vi) vulnerabilities at the national and local levels.

NFPs, representing the MOH, should also ensure accurate and timely notifications are sent to the WHO RCP. Reporting will allow for prompt and coordinated response efforts, ensuring public health and safety protection.

The WHO Headquarters shall immediately liaise inform the International Atomic Energy Agency (IAEA) of any health emergency falling under the IAEA mandate. From this point necessary inter-agency arrangements will be activated if required.

If needed, WHO will activate its’ global expert network – Radiation Emergency Medical Preparedness and Assistance Network (REMPAN). The key purpose of the network is to support WHO’s work in assisting member states in building relevant national capacities for public health and medical response to radiation.

IAEA has established the Unified System for Information Exchange in Incidents and Emergencies (USIE) system to exchange among member states and international organizations urgent notifications and follow-up information during an emergency. Likewise, Member States of the European Union are expected to provide early notification and continuous exchange of information in case of a radiation emergency through the European Community Urgent Radiological Information Exchange (ECURIE) platform, operated by the European Commission’s DG-Energy.

WHO actively participates in international exercises (ConvEx) organized by the IAEA every 4 years to test inter-agency arrangements and communication channels under Conventions on Early Notification and on Assistance in case of a nuclear accident.
Out of 43 NFPs, 16 (37%) stated that they would not have reported the RN event scenario to the WHO RCP. The following reasons were given:

- they would choose alternative channels to inform relevant authorities, such as the IAEA and ECURIE;
- only a few individuals were affected by the event and the NFP would require more information, including lab results, to make an informed decision;
- no international travel restrictions were required, except for dairy products, and there was no risk of radiation spreading beyond the affected area; and
- they would first seek guidance from the WHO under Article 8 for further assistance.

The EU/EEA countries using EWRS for reporting used different categories of hazards for the notification of the RN event. During JADE 2023, for hazards NFPs used the taxonomies chemical, environment, unknown or biological (Fig. 2).

Fig. 2. EWRS notification by category for EU and EEA countries (n = 25)
Recommended actions

- DG SANTE should include RN hazards to the EWRS taxonomy of hazards and may consider training the EWRS users on the new taxonomy. (the SCBTH Regulation does not explicitly provide a mandate for the EU on serious cross-border radiological-nuclear threats to health).2

- In all notifications, whether directly to the RCP or through EWRS, written justification using IHR (2005) Annex 2 is mandatory and States Parties should be trained and assessed on a regular basis.

- WHO Country Office National Programme Officers should be equipped to provide more detailed feedback to NFPs on the conduct of the exercise. The JADE EMT should create a guided discussion tool for this purpose.

“WE WOULD APPRECIATE MORE FEEDBACK on how well or poorly we did during the exercise.”

OBJECTIVE 3:

To test NFPs’ access and use of the EIS (logging in and performing searches within EIS) and familiarize them with the process of EIS posting (Article 11, IHR)

The EIS is a secure web-based platform that allows NFPs to fulfil their information-sharing obligations. NFPs can access this site at any time. Whenever there is a notifiable event under the IHR, the NFP will review the EIS posting drafted by the WHO RCP. The RCP will then ensure the posting is shared on this platform. The platform provides an accurate, secure and efficient way for NFPs to share valuable information about ongoing public health events.

On the first day of the exercise, the EMT requested the NFPs to verify the accuracy of a draft EIS posting. The draft post contained intentional inaccuracies and errors to test the situational awareness of NFPs and engage them in fact-checking the EIS posting. NFPs made corrections to the first EIS draft, including the number of people affected by the explosion, the amount of radioactive I-131 released and the samples where radioactive I-131 was detected. However, some NFPs found this task time-consuming and less valuable, as reviewing a posting in real life takes longer. Therefore, the EMT decided not to include this task in subsequent exercise dates. Instead, the EMT only shared the final EIS posting for this scenario.

Out of 43 NFPs, 39 (90%) logged in to the EIS without any issues. One NFP faced security challenges in accessing the system. Also, there were auto-undelivered mail responses in a particular country. Although one country accessed the system during the communications check, it failed to do so on the exercise date.

Recommended actions

- NFPs should have a codified standard operating procedure (SOP), updated on a regular basis with up-to-date contact details, in place to immediately share information updated in EIS with relevant national stakeholders.

- Regular use of EIS to enhance situational awareness on ongoing events both within and outside the WHO European Region that may affect a State Party could be beneficial for prevention and preparedness.

- NFPs should have SOPs in place at national level to avoid losing EIS credentials.

- WHO should continue to develop training and simulation exercises, such as small-scale tabletop exercises, on preparedness and response to the health consequences of RN events, including on effective notification through IHR (2005) channels.

- EIS should be developed as a multi-functional portal to allow for bilateral communication to occur in a secure environment; direct notification and other forms of communication with WHO, for example IHR (2005) Article 8 on confidential consultations with WHO.
AS AN EPIDEMIOLOGIST, I FOUND THE EXERCISE VERY VALUABLE, mainly because I had not previously dealt with radio-nuclear events. Fortunately, we learned from RN specialists who participated in the exercise."
OBJECTIVE 4:

To practice exchange of information between IHR States Parties
As per IHR Article 44, States Parties are required to collaborate and assist each other in detecting and evaluating health events covered by these regulations. This collaboration can be done through various channels, such as bilateral or regional networks, WHO regional offices, intergovernmental organizations or international bodies.

NFPs (Country A) were given a task to establish contact with another NFP (Country B) by the instructions provided by the EMT. The primary objective of this communication was to request or offer support related to public health response. This exercise served as practice for NFPs to search for the contact details of another NFP through the EIS portal.

Thirty-nine countries engaged in bilateral communications. Four had issues accessing the EIS, which prevented them from contacting another NFP. One NFP stated that in real life, an internal communications and approval through the Civil Protection and EURATOM network would be necessary. Additionally, NFPs worked alongside their Environmental Protection colleagues to define the scope and details of the request.

Recommended actions from the IHR NFP participants

- The EMT should create a supplemental report or a peer-reviewed article summarizing lessons learned from Exercise JADE conducted in 2018, 2019, 2022 and 2023.

- The EMT should continue creating scenarios that encourage collaboration and communication among different national and international sectors, including rare events such as a chemical hazard.

- The EMT should inform all participating NFPs before the next Exercise JADE, to emphasize the key sectors likely to be involved. This will help better understand the exercise objectives and improve overall preparedness.
OBJECTIVE 5:

To review engagement with other relevant stakeholders within the State Party

The IHR (2005) provide guidelines on the coordination of prevention, detection and response activities across sectors. Each State Party establishes an NFP for communication, externally, with the WHO RCP as a single-entry point; and for internal communication and coordination with relevant sectors and stakeholders involved in public health all-hazard emergencies management.

A number of different international alert and response networks exist for reporting events that may have an impact on human and/or animal health. For example, the Food and Agriculture Organization of the United Nations/WHO International Food Safety Authorities Network (or INFOSAN) is responsible for food safety events, the World Animal Health Information System (or WAHIS) for animal diseases and the Strategic Approach to International Chemicals Management (or SAICM) for chemical management. In the case of RN events, the IAEA’s USIE is the primary network. Within the EU, alert and notification systems include Rapid Alert System for Food and Feed products or iRASFF and Animal Disease Information System or ADIS for animal health. The ECURIE is the early notification system for radiological or nuclear emergencies. All these networks must collaborate to consolidate information from different sectors, ensuring consistent information is shared globally.

Results

In case of a radiation accident in a radiopharmaceutical facility, NFPs responded that they would immediately activate their chemical, biological, radiological, nuclear, explosives (CBRNE) plan, coordinate with appropriate authorities or consult WHO [Fig. 3].

Fig. 3. NFP immediate actions in managing a potential RN hazard (n = 14)
Accessible expert authorities are crucial for effective coordination and information exchange among field experts. During the exercise, 40 of 43 NFPs informed the EMT that they could communicate with an RN expert. One NFP needed to call an RN expert of another country to get access and request for input. Moreover, 37 States Parties reported having an RN emergency plan.

**International reporting obligations**

As mentioned above, 27 NFPs stated that they would notify WHO during the exercise. Thirty-six participating countries would report through various other channels such as IAEA, ECURIE, the USIE and the Radiation Detection Network (RADNET) – although these reporting channels may not be from the health sector. The scenario was designed in such a way to encourage dialogue between sectors and to share international and regional reporting pathways that the other sector was not aware of.

**Other national collaborations**

In this scenario, besides RN authorities, nine NFPs further responded that they would collaborate with critical agencies such as food safety and agriculture, civil protection and public communication agencies (Fig. 4).

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**Fig. 4. National collaborating agencies identified by NFPs in this scenario \(n = 36\)**

- Food safety/agriculture/veterinary services: 25%
- Civil protection/defense: 21%
- Emergency/crisis centre: 18%
- Environmental protection: 14%
- Public communications: 10%
- Others (poison centre, medical devise, trade, economic relations, foreign affairs): 12%
Infodemic management
NFPs were asked to determine their familiarity with the principles of managing misinformation. In this case, 27 countries shared the principles they follow to manage an infodemic. Some of the infodemic management principles that NFPs mentioned included comparing data with correct information, reviewing sources, assessing damage, debunking false information, responding directly in comments, utilizing fact-checkers and sharing with the media.

Expert Opinion:

Stefan Voinea, Infodemic Management Officer, Risk Communication, Community Engagement and Infodemic Management, WHO Health Emergencies Programme, WHO Regional Office for Europe

Risk communication, community engagement and infodemic management (RCCE-IM) are a crucial component of the WHO State Party self-assessment annual report (SPAR) and JEE assessments. IHR capacity should consist of a mix of communication and engagement strategies, such as media and social media communications, health promotion, mass awareness campaigns, stakeholder engagement, community engagement and infodemic management. Infodemic management is a public health practice that should be integrated into RCCE-IM health system structures with sufficient human and financial resources dedicated.

During a radiation accident, such as the one presented in the JADE 2023 exercise, social listening can be leveraged to understand the information ecosystem. Truthful, authoritative information must be easily accessible to those affected or at risk. When encountering false or misleading information through social listening, conduct a risk assessment process considering the signal’s reach, health risks and source influence. Use digital tools to collect signals, but risk assessment and insights generation should be supervised by a human analyst, not outsourced to technology.

To summarize, when it comes to infodemic management in the context of RCCE-IM, remember these three things:

1. Listen. RCCE-IM uses social listening to understand communities during emergencies. Monitor traditional and social media, offline sources and ongoing public concerns.
2. Understand. After a concerning signal is detected that causes concern, it is important to assess whether the information it contains is accurate or false. To determine the risk of a false or misleading signal, you should consider the following factors: the extent of the signal’s reach, the potential health risks associated with the information and the credibility of the source.
3. Engage. Debunk false information through effective communication channels, partners and communities. Be timely, accurate, empathetic and respectful. Engage with journalists, fact-checkers, health-care professionals, youth groups or religious leaders as needed.
Recommended actions

- NFPs should ensure that within their RN response plan consideration is given to the obligation of reporting under IHR to WHO using IHR (2005) Annex 2 criteria.

- NFPs may consider early consultation with the WHO RCP under Article 8 of the IHR (2005).

- NFPs should be given sufficient time to discuss EIS posting during either hotwash or an extended debriefing with WHO counterparts in their respective countries.

- JADE 2023 should not be considered as a one-off event: States Parties may consider regular dialogues or exercises to ensure effective information sharing during an RN event.

- Exercise JADE should be made available online for NFPs for training and evaluation. The availability of these exercises will not only enable NFPs to develop and improve their skills in responding to crises and emergencies but can also be an opportunity to advocate for the important role of NFPs in collaborating for their national stakeholders.

- While not a mandatory function of the NFPs, in collaboration with RCCE-IM experts, NFPs should understand infodemic management principles to share accurate public health information and practices.

“WORKING WITH EWRS WAS A POSITIVE EXPERIENCE, allowing NFP to contact WHO quickly in an emergency.”
4. JADE 2023 exercise evaluation

4.1 General feedback from hot wash sessions

During the exercise, NFPs found RN specialists’ participation valuable. NFPs, mostly infectious disease experts or epidemiologists, had not previously dealt with RN events. This was an excellent opportunity to refresh their knowledge and practice the ability to assess and respond to a potential RN threat. The exercise also helped to deepen their collaboration with national stakeholders. Having RN experts in the same room as NFPs was particularly valuable. However, additional feedback to gauge performance would have been appreciated. NFPs found collaborating with other stakeholders to be the most beneficial aspect of the exercise.

Users of EWRS in the EU/EEA countries largely appreciated the integration of EWRS simulation exercise platforms in the exercise. It formed an opportunity to train more junior staff in the use of EWRS, as well as more realistically practising the way that countries operate on a day-to-day basis.

In many cases NFPs can easily contact risk communication experts to manage misinformation on social media. This is somewhat expected because it is not a mandatory nor optional NFP function.

National IHR Focal Point centre for Ireland
4.2 Mentimeter feedback

Note: A Mentimeter survey was not conducted for the Russian-speaking exercise.

"HOW ARE YOU FEELING?"

The most common responses were:

“EXCITED”, “FINE”

“USEFUL” and “HAPPY”
4.3 NFP participant survey feedback

After the four-hour exercise and one-hour hotwash session had ended, participants were asked to provide feedback on the quality of the exercise, learning points and areas where the exercise could have improved. A link was provided to an online evaluation survey for this purpose. The feedback received was compiled into tables and graphs highlighting the value of the exercise.

Of the 33 respondents, 97% agreed that the exercise served its purpose and objectives. Respondents had high praise for the exercise’s organization, rating it an average of 4.7 out of 5 on the Likert scale. Additionally, 31 out of 32 respondents (97%) found the exercise valuable in strengthening the NFP network.

The most significant endorsement was that all respondents agreed or strongly agreed to participating in next year’s Exercise JADE. This positive and unanimous agreement serves as a clear indication of the exercise’s effectiveness.

4.4 Results of the evaluation survey

The results of the evaluation survey are visually summarized in Figs 6-12 and Table 3.

Fig. 6. Evaluation survey: general questions

- The exercise achieved the stated purpose and objectives
- The exercise is useful tool to strengthen the IHR NFP network in the WHO European Region
- I plan to participate in exercise JADE next year

Number of responses

[Bar charts with responses summary]
Fig. 7. Evaluation survey: exercise impact

- The exercise improved my understanding of my role and function within the IHR system.
- The exercise contributed to increasing my level of understanding of the assessment of public health events using the decision-making instrument contained in Annex 2 of the IHR (2005) and its notification process including an EIS posting.
- The exercise contributed to improving my understanding of how and when to communicate with the WHO RCP using registered contact details.
- The exercise contributed to understanding of communication channels among other sectors dealing with RN events.

![Chart showing evaluation survey results]

**Number of responses**

- 1 Do not agree
- 2
- 3
- 4
- 5 Strongly agree

Fig. 8. The use of EWRS facilitated the exchange of information with regards to radiological and nuclear events. Scores ranging from 1 (do not add value) to 5 (essential to the system).

![Chart showing EWRS facilitation ratings]

- 1 Do not add value
- 2
- 3
- 4
- 5 Essential to the system

37% 37%

16% 10%

Fig. 9. Challenging NFP tasks during the scenario

- EIS access and use
- Information on country RN response plan
- EWRS access and use
- Review bilateral communication and assistance modality
- Use of Annex 2 (IHR)

- 7%
- 14%
- 31%
- 21%
- 27%
Table 3. Key strengths and areas for improvement identified by NFPs

<table>
<thead>
<tr>
<th>Strengths*</th>
<th>Areas for improvement*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication channels and collaboration with relevant sectors</td>
<td>Use of Annex 2 with RN experts</td>
</tr>
<tr>
<td>Preparedness and response plans were available.</td>
<td>Communication, notification and flow of procedure for RN incidents</td>
</tr>
<tr>
<td>Technical knowledge on risk assessment and notification via EIS and EWRS</td>
<td>Strengthen national and international network (other IHR NFPs) for RN incidents</td>
</tr>
</tbody>
</table>

*Most common feedback from participants

Fig. 10. Evaluation survey: organization of the exercise

- The exercise was well organized
- The information contained in the participant guide was clear and useful for me to participate in this exercise
- The questions and tasks were clear
- The post exercise debrief (‘hotwash’) was useful to share my experiences and hear from other participants
- The pace of the exercise was appropriate
- The scenario was realistic

Number of responses

1 Do not agree  2  3  4  5 Strongly agree
Fig. 11. Scenario (story or event) most relevant for IHR Exercise JADE 2024

Vector-borne diseases
Chemical event
Managing concurrent events
Vaccine-preventable diseases
Foodborne disease event
Influenza event
Radiation event (transboundary)
Others (new mutated agent, STI, AMR, terrorist attack)

Number of responses

Fig. 12. Evaluation survey: which optional NFP functions would you like to see included for JADE 2024 in addition to the mandatory functions?

Intercountry or regional coordination and information exchange
Management of misinformation and infodemic
Providing advice to government officials on notifications to WHO
Coordination with the national emergency response systems
Liaising with relevant authorities on points of entry
Engaging in collaborative risk assessment with WHO regarding PHEIC
Providing advice to government officials on WHO recommendations
Coordinating public messages by WHO and national authorities
Engaging with relevant government sectors

Number of responses
Recommended actions from the IHR NFP participants

- The EMT should create a supplemental report or a peer-reviewed article summarizing lessons learned from Exercise JADE conducted in 2018, 2019, 2022 and 2023.

- The EMT should continue creating scenarios that encourage collaboration and communication among different national and international sectors, including rare events such as a chemical hazard.

- The EMT should inform all participating NFPs before the next Exercise JADE, to emphasize the key sectors likely to be involved. This will help better understand the exercise objectives and improve overall preparedness.

Feedback from action and problem log sheet
The EMT provided an action and problem log sheet to NFPs to monitor their activities and decisions during the exercise. The tool is designed to help participants identify learning gaps and follow-up actions. Twenty-seven NFPs submitted their log sheets to the EMT.

In a radiation emergency, the NFPs will work with RN authorities and agencies such as Civil Protection to activate their RN response plans. Many NFPs will review their communication channels at the domestic and international levels. The RN authority will lead the incident and crisis management, while Civil Protection authorities will engage in bilateral discussions.
Procedural problems identified by NFPs during the exercise:

- slight delay in finding Capacity 15 (Radiation Emergency) SPAR score.
- injects were sent to one email, but additional users were added, causing delayed communication during the exercise.
- lack of immediate access to the RN emergency action plan by relevant stakeholders
- access issues with the EWRS simulation platform which lasted for 10 minutes.

For future Exercise JADE, NFPs, their RN and risk communication counterparts or other subject matter experts, plan to engage in face-to-face discussions to gather relevant information for the risk assessment while the exercise is ongoing. The need for more familiarity with EWRS notification has highlighted the necessity for training. The training will enable NFPs to fully understand what kind of information should be provided in the EWRS.

“RISK COMMUNICATION INJECTS WERE NEW FOR US, and it took time to find answers. Next time, we will invite risk comms experts.”
5. Conclusions

Exercise JADE is a valuable tool for NFPs to practise their obligations under the IHR (2005). The exercise showed that countries gained crucial insights into strengthening preparedness for and response to health emergencies under the IHR (2005) by identifying gaps in their RN response plans and procedures and testing their communication and collaboration channels with the relevant radiation safety authorities. As in previous iterations of Exercise JADE, JADE is exclusively reviewing the role of the NFP under the International Regulations (2005) as stated in the objectives of the exercise. The role of any national or international actor involved in radiation protection was not subject to review nor involved, by design, in the conduct of the exercise.

The objectives of JADE 2023 were successfully achieved with active participation from 43 out of the 55 invited States Parties in the WHO European Region. The quality of the involvement by NFPs was generally high, as evidenced by their responsiveness to the injects, effective hotwash or debriefing, submission of the action and problem log sheet and prompt answering of the Evaluation survey. Participants expressed eagerness to participate again. Feedback from the evaluation survey will guide future JADE exercises.

The exercise results showed that communication procedures under the IHR (2005) are well-established in the participating countries. The JADE exercises provide an annual opportunity for NFPs to practise, improve and evaluate their procedures and communication among national stakeholders as well as with WHO under the IHR (2005), including promoting information sharing through the EIS.

JADE 2023 was a helpful exercise in preparing for a RN event. NFPs reviewed their radiation emergency response procedures and communication channels with relevant stakeholders.

The JADE EMT is eager to continue collaborating closely with the NFPs and other partners to develop functional and practical simulation exercises.
ANNEX 1.
JADE 2023
Exercise Design

Evaluators
(use country checklist tool)

Exercise Control (JADE EMT)
Eurocontrol@who.int

Primary injects
Sent by Eurocontrol@who.int

JADE EMT Duty Officers
Follow up to injects and country response

ECDC/DG SANTE
EWRS Simulation Environment platform

Simulator A (JADE EMT)
EUROsimulatorA@who.int
(MOH, IPH)

SIMULATOR B (JADE EMT)
EUROsimulatorB@who.int
(RN authority, RRT, EIOS)

National IHR Focal point
(Participants)

National IHR Focal point
(Participants)

Actions and responses to inject received

LEGEND:
JADE, Joint Assessment and Detection of Events; EMT, Exercise Management Team; MOH, Minister of Health; IPH, Institute of Public Health; RN, radiological-nuclear; RRT, rapid response team; EIOS, Epidemic Intelligence Open Source; EWRS, Early Warning and Response System; ECDC, EU Center for Disease Control; DG SANTE, Director General of Health and Food Safety
Background

- DEJATech is a global medical technology company focused on research for cancer diagnostics and therapeutics with 40 years of experience in helping design, build, and operate Positron Emission Tomography centres to produce radiopharmaceuticals for detecting and treating cancer and other critical diseases. The gamma and beta radiation emitting isotope I-131 produced in DEJATech Radiopharmaceutical Solutions is used for therapeutic purposes to treat cancers and conditions including hyperthyroidism and thyroid cancer. I-131 significantly improves the symptoms of the disease and improves the overall survival rate of patients.

13 October

- A new article reported that DEJATech Radiopharmaceuticals Solutions delivered the first Iodine 131 (I-131) to patients at the Cancer Medical Centre in YOUR CITY.

13 November

- There was an explosion, leading to the release of radioiodine. Three workers suffered thermal burns to their arms and face, as well as minor injuries from metal fragments. In response to the incident, DEJATech immediately shut down the production site, dispatched a specialized ambulance and fire crew to the scene equipped with protective equipment, treated burn injuries and evacuated staff from the facility.

14 November

- DEJATech contacted the Minister of Health regarding an incident. The RN authority then sent an Incident Report to the National IHR Focal Point, which included an on-site map of the affected area. Environmental sampling, including water, vegetation, and fresh milk products begins.
15 November

- An article in the news suggested that the rise in gastrointestinal cases might be linked to a radiation accident. At DEJATech Medical Centre in YOUR CAPITAL, five farmers were treated for mild dehydration and were immediately discharged. Furthermore, five more farmers showed symptoms of nausea and headache but did not seek medical attention. They felt better within a few hours.

- The All-Hazards Rapid Response Team submitted a report on the Radiation Accident, which detected I-131 in the environment, including water, vegetation and fresh milk. Additionally, they have sent an Event-based Surveillance Report in response to the rising number of gastrointestinal cases with pending laboratory results.

16 November

- The IHR Regional Contact Point identifies a media article that reported an increase in cases of gastroenteritis with speculations of being linked to an incident at a RN isotope production site. The IHR Regional Contact Point requested NFP verification and notification. The IAEA provided information on radiation accidents, public health risks and public health response and communication.

17 November

- IHR’s Regional Contact Point created an event information post and shared the final version to the NFP.

18 November

- NFP used EIS to find contact information for another NFP. They needed trained health-physics personnel and environmental monitoring equipment. The receiving NFPs replied positively to the request.

19 November

- The laboratory result from the Institute of Public Health was submitted to the NFP, confirming that the outbreak of gastroenteritis was not caused or linked to the radiation accident.

The Ministry of Health Epidemic Intelligence Open-Source team identified several social media reports and alerted the NFP to consider principles of managing infodemics.
In the next exercise, we will involve other sectors and update the CBRNE plan.

CBRNE was a challenge, but it was good to highlight, RN experts will invite us to their next SimEx.
Member States

Albania  Latvia
Andorra  Lithuania
Armenia  Luxembourg
Austria  Malta
Azerbaijan  Monaco
Belarus  Montenegro
Belgium  Netherlands (Kingdom of the)
Bosnia and Herzegovina  North Macedonia
Bulgaria  Norway
Croatia  Poland
Cyprus  Portugal
Czechia  Republic of Moldova
Denmark  Romania
Estonia  Russian Federation
Finland  San Marino
France  Serbia
Georgia  Slovakia
Germany  Slovenia
Greece  Spain
Hungary  Sweden
Iceland  Switzerland
Ireland  Tajikistan
Israel  Turkìye
Italy  Turkmenistan
Kazakhstan  Ukraine
Kyrgyzstan  United Kingdom
Uzbekistan

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