The radiation measurements and the involvement of the population. LESSONS from the Chernobyl and Fukushima accidents: results of the SHAMISEN project

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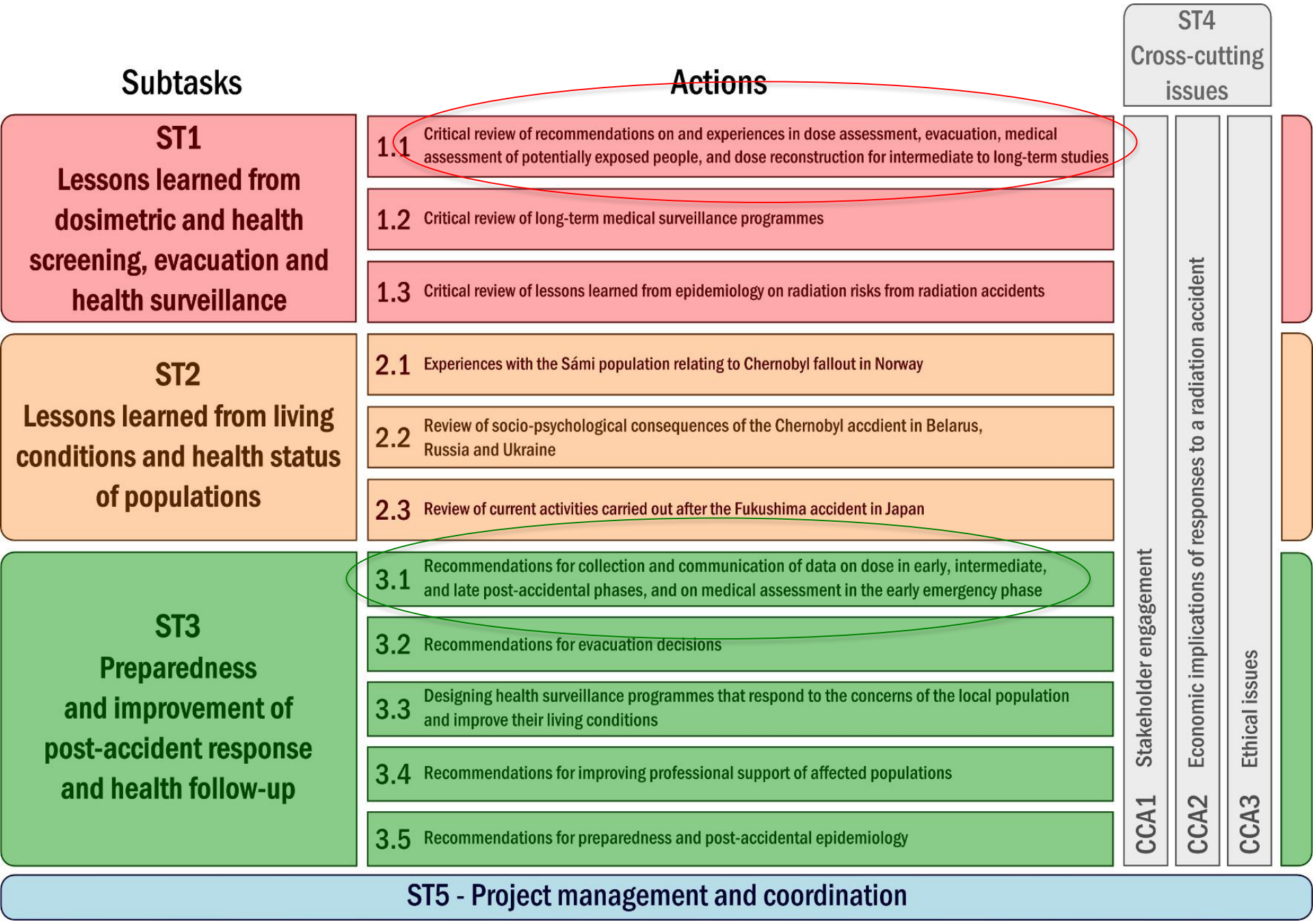
SHAMISEN

Nuclear Emergency Situations Improvement of Medical and Health Surveillance


Subtasks
Actions
ST4 Cross-cutting issues
ST1
Lessons learned from dosimetric and health screening, evacuation and health surveillance
1.1 Critical review of recommendations on and experiences in dose assessment, evacuation, medical assessment of potentially exposed people, and dose reconstruction for intermediate to long-term studies
1.2 Critical review of long-term medical surveillance programmes
1.3 Critical review of lessons learned from epidemiology on radiation risks from radiation accidents
ST2
Lessons learned from living conditions and health status of populations
2.1 Experiences with the Sámi population relating to Chernobyl fallout in Norway
2.2 Review of socio-psychological consequences of the Chernobyl accdient in Belarus, Russia and Ukraine
2.3 Review of current activities carried out after the Fukushima accident in Japan
ST3
Preparedness and improvement of post-accident response and health follow-up
3.1 Recommendations for collection and communication of data on dose in early, intermediate, and late post-accidental phases, and on medical assessment in the early emergency phase
3.2 Recommendations for evacuation decisions
3.3 Designing health surveillance programmes that respond to the concerns of the local population and improve their living conditions
3.4 Recommendations for improving professional support of affected populations
3.5 Recommendations for preparedness and post-accidental epidemiology
CCA1 Stakeholder engagement
CCA2 Economic implications of responses to a radiation accident
CCA3 Ethical issues
ST5 - Project management and coordination

Actions 1.1 and 3.1

Action 1.1

Draw **lessons** from Chernobyl and Fukushima experiences on radiation measurements and dosimetry, focusing on the methods used to evaluate individual/group doses.

Doses relevant for:

- ❑ **medical surveillance**
- ❑ **health effects studies**
- ❑ **communication to stakeholders and local population**

Action 3.1

To draft **recommendations** to provide improvement in the procedure and to give a **better support to populations** affected by past and future radiation accidents.

Methods - How did we draft lessons learned?

Critical review of:

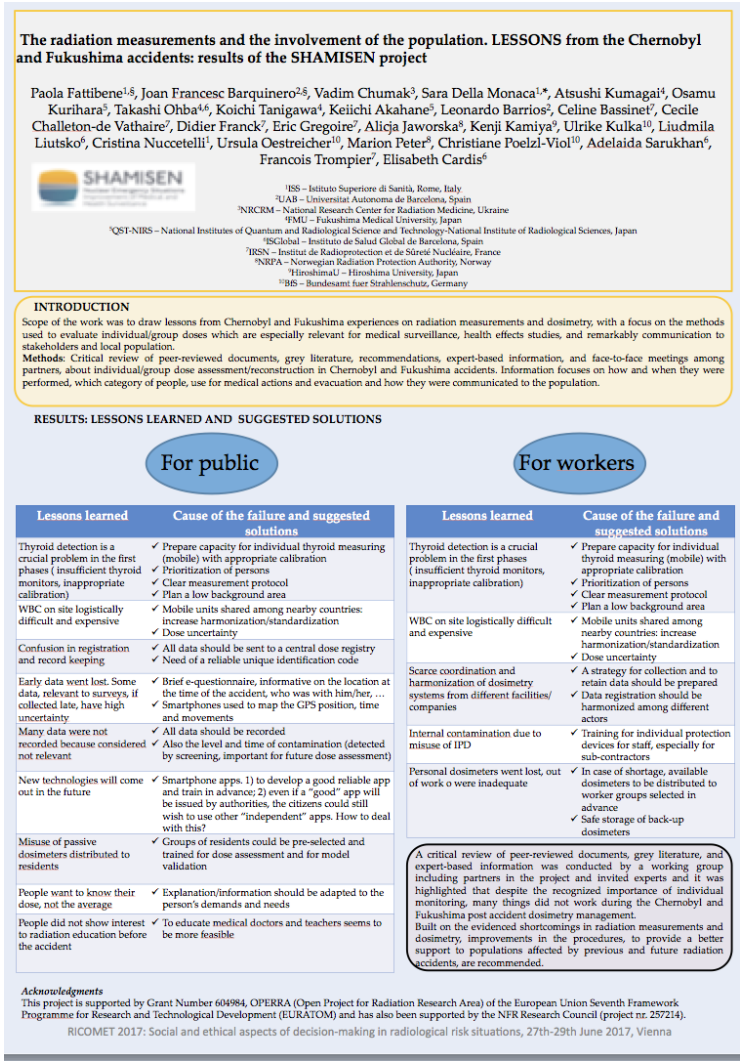
peer-reviewed documents, grey literature, recommendations, expert-based information, and face-to-face meetings among partners, about individual/group dose assessment/reconstruction in Chernobyl and Fukushima accidents.

Information focuses on:

- ❖ how and when they were performed
- ❖ which category of people
- ❖ use for medical actions and evacuation
- ❖ how they were communicated to the population.

Output: lessons learned and recommendations

Come and visit me at my poster!



The radiation measurements and the involvement of the population. LESSONS from the Chernobyl and Fukushima accidents: results of the SHAMISEN project

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INTRODUCTION

Scope of the work was to draw lessons from Chernobyl and Fukushima experiences on radiation measurements and dosimetry, with a focus on the methods used to evaluate individual/group doses which are especially relevant for medical surveillance, health effects studies, and remarkably communication to stakeholders and local population.

Methods: Critical review of peer-reviewed documents, grey literature, recommendations, expert-based information, and face-to-face meetings among partners, about individual/group dose assessment/reconstruction in Chernobyl and Fukushima accidents. Information focuses on how and when they were performed, which category of people, use for medical actions and evacuation and how they were communicated to the population.

RESULTS: LESSONS LEARNED AND SUGGESTED SOLUTIONS

For public

Lessons learned	Cause of the failure and suggested solutions
Thyroid detection is a crucial problem in the first phases (insufficient thyroid monitors, inappropriate calibration)	✓ Prepare capacity for individual thyroid measuring (mobile) with appropriate calibration ✓ Prioritization of persons ✓ Clear measurement protocol ✓ Plan a low background area
WBC on site logistically difficult and expensive	✓ Mobile units shared among nearby countries: increase harmonization/standardization ✓ Dose uncertainty
Confusion in registration and record keeping	✓ All data should be sent to a central dose registry ✓ Need of a reliable unique identification code
Early data went lost. Some data, relevant to surveys, if collected late, have high uncertainty	✓ Brief e-questionnaire, informative on the location at the time of the accident, who was with him/her, … ✓ Smartphones used to map the GPS position, time and movements
Many data were not recorded because considered not relevant	✓ All data should be recorded ✓ Also the level and time of contamination (detected by screening, important for future dose assessment)
New technologies will come out in the future	✓ Smartphone apps. 1) to develop a good reliable app and train in advance; 2) even if a "good" app will be issued by authorities, the citizens could still wish to use other "independent" apps. How to deal with this?
Misuse of passive dosimeters distributed to residents	✓ Groups of residents could be pre-selected and trained for dose assessment and for model validation
People want to know their dose, not the average	✓ Explanation/information should be adapted to the person's demands and needs
People did not show interest to radiation education before the accident	✓ To educate medical doctors and teachers seems to be more feasible

For workers

Lessons learned	Cause of the failure and suggested solutions
Thyroid detection is a crucial problem in the first phases (insufficient thyroid monitors, inappropriate calibration)	✓ Prepare capacity for individual thyroid measuring (mobile) with appropriate calibration ✓ Prioritization of persons ✓ Clear measurement protocol ✓ Plan a low background area
WBC on site logistically difficult and expensive	✓ Mobile units shared among nearby countries: increase harmonization/standardization ✓ Dose uncertainty
Scarce coordination and harmonization of dosimetry systems from different facilities/ companies	✓ A strategy for collection and to retain data should be prepared ✓ Data registration should be harmonized among different actors
Internal contamination due to misuse of IPD	✓ Training for individual protection devices for staff, especially for sub-contractors
Personal dosimeters went lost, out of work o were inadequate	✓ In case of shortage, available dosimeters to be distributed to worker groups selected in advance ✓ Safe storage of back-up dosimeters

A critical review of peer-reviewed documents, grey literature, and expert-based information was conducted by a working group including partners in the project and invited experts and it was highlighted that despite the recognized importance of individual monitoring, many things did not work during the Chernobyl and Fukushima post accident dosimetry management.
Built on the evidenced shortcomings in radiation measurements and dosimetry, improvements in the procedures, to provide a better support to populations affected by previous and future radiation accidents, are recommended.

Acknowledgments
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