WHO report to the 7th EPRES Crush Meeting

Dr Zhanat Carr

Oct 2018 – Stockholm
The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.
WHO Mission

- Promote health
- Keep the world safe
- Serve the vulnerable
WHO Strategic Priorities

Strategic priorities

1 billion more people with health coverage
1 billion more people made safer
1 billion lives improved
1 billion people made safer

- Access to essential, life-saving health services and interventions
- Countries equipped to mitigate risk from high-threat infectious hazards
- Strengthen core capacities required under the International Health Regulations
- Support from WHO through a well-resourced and efficient emergencies programme
All-Hazard Approach to EPR

Infectious Hazard Management

- High Threat Pathogen Detection
- Diagnostics, therapeutics, vaccines & other measures

All-Hazards Preparedness/IHR, Risk Assessment & Response

- Natural disaster
- Conflict
- Infectious outbreaks
- Chemical Incidents
- Nuclear accidents

Event Grading

WHO lead role
IASC/OCHA lead
Specialized mechanisms
Legal Basis for WHO’s role in Response to Radiation Emergences

- The WHO Constitution, 1948
- Relevant World Health Assembly Resolutions
- Two Conventions on Early Notification and Assistance (1987)
- The International Health Regulations (IHR, 2005)
- Sendai Framework for disaster risk reduction in 2015-2030 with the central focus on health
International Partnerships

- Inter-Agency Committee for Radiological and Nuclear Emergencies (IACRNA) with 11 participation international organizations
  http://www-ns.iaea.org/tech-areas/emergency/inter-agency-matters.asp

- NEA/OECD – CRPPH / Working Party on Nuclear Emergency Matters - WPNEM


- Regional partnerships (HERCA WE, NERIS, EURADOS, RENEB etc.)

- NGOs and professional societies (ICRP, IRPA, etc.)

- WHO Collaborating Centres and expert networks
  URL: WHO CC Database: http://apps.who.int/whocc/List.aspx?cc_subject=Radiation&
WHO's Relevant Emergency Networks

- **Radiation Emergency Medical Preparedness and Assistance Network** – WHO's technical expertise arm since 1987
  - directory: [https://tinyurl.com/REMPAN](https://tinyurl.com/REMPAN)

- **WHO BioDoseNet** (since 2007)
  - Global Network of Biodosimetry Laboratories
  - some 90 labs world-wide [https://tinyurl.com/WHO-BDN](https://tinyurl.com/WHO-BDN)

- **INFOSAN** – WHO-FAO joint network of national food safety authorities:
  [http://www.who.int/foodsafety/areas_work/infosan/en/](http://www.who.int/foodsafety/areas_work/infosan/en/)

- Public health emergency operations centres network (**EOC-NET**) in 38 member states
Key Functions of REMPAN

Technical support to WHO in response to actual radiological and nuclear emergencies

Strengthening national and regional preparedness to radiation emergencies
- Technical guides/tools development
- Trainings and workshops
- Exercises
- Information sharing platform

Technical support of activities aimed at implementation of International Health Regulations in the area of radiation emergencies
- IHR Emergency Committee roster
- JEE expert roster
Technical support in response to actual radiological and nuclear emergencies

The scope of WHO technical advice and response to radiological or nuclear emergencies includes the following areas:

- Public health risk assessment and response
- Emergency medical response (diagnosis and treatment)
- Biological and clinical dosimetry
- Long term follow-up of exposed populations
- Control of food, drinking water safety
- Advise on trade and travel
- Mitigation of mental health impact
- Risk communication
During and after the Fukushima accident, WHO provided technical advice and information to its member states, general public and media on matters related to:

- Public health risk assessment and response
- Food and drinking water safety
- Advise on trade and travel
- Mitigation of mental health impact
- Risk communication
- Long term follow-up of exposed populations

Two technical reports were published in 2012 and 2013.
REMPAN Functions: support strengthening preparedness in MS

Technical support to WHO in response to actual radiological and nuclear emergencies

- Strengthening national and regional preparedness to radiation emergencies
  - Technical guides/tools development
  - Trainings and workshops
  - Exercises
  - Information sharing platform

Technical support of activities aimed at implementation of International Health Regulations in the area of radiation emergencies
- IHR Emergency Committee roster
- JEE expert roster
Technical tools and guidelines

- Contribution to the relevant IAEA’s international safety standards and guides
  - GSR Part 3 and Part 7; GSG-2, 2.1, 2.2; GSG-11, etc.
  - EPR series on medical response, biodosimetry, first responders, etc.

- WHO guidelines on iodine thyroid blocking (2017)
  - Free download link: [https://goo.gl/yvcjY7](https://goo.gl/yvcjY7); Infographics, FAQs – in preparation
  - WHO survey of national ITB policies to monitor implementation

- IARC project on developing recommendations thyroid monitoring after nuclear emergencies

- Communicating Risk in Public Health Emergencies - A WHO Guideline for Emergency Risk Communication (ERC) policy and practice
  - Free download link: [https://goo.gl/ZRqjFB](https://goo.gl/ZRqjFB)

- Mental health and psychological support in Emergencies: mhGAP guidelines
**Education and Training programs**

- REAC/TS, Oak Ridge TN (regular programs, national, international)
- Latin American training programs with IAEA (Argentina, Brazil)
- NIRS, Chiba Japan (annual international training programs)
- KIRAMS – Seoul, S. Korea (annual regional training courses)
- Karolinska University Hospital in Sweden (biennial advanced training for MDs)
- FMBC - Moscow, Russia (on-the-job national and regional trainings)
- Fukushima Medical Univ (academic programs)
- Hiroshima University – Phoenix Program for radiation disaster management
- RERF (biodosimetry training programme)
- CDC China (regular national training programs)
The 1st REMPAN Webinar – 16 March 2018 focused on public health impact of a nuclear detonation
- Speakers from RERF, Japan, US CDC, WHO
- Link to the recording: https://goo.gl/RwkYw9

The 2nd REMPAN Webinar – 19 Sept 2018 on radiation and thyroid cancer
- Speakers from Japan, Ukraine, Germany, IAEA, WHO and Belgium
- Webcast link: https://goo.gl/MDB4E3
Mental Health impact of radiological and nuclear emergencies

- Mental health of populations exposed to biological and chemical weapons (2005) – document under revision, in final stage
  - [https://goo.gl/Mo7LZE](https://goo.gl/Mo7LZE)
  - derivative information products are being developed

- For nuclear emergencies, a similar approach to be followed in order to adopt the mhGAP guidelines to a nuclear emergency settings
  - [https://goo.gl/sWziWh](https://goo.gl/sWziWh)
  - Resources are mobilized, expert identified
  - Drafting will start in the 2nd half of 2018 after completing the above document revision
PROTECTING PUBLIC HEALTH IN NUCLEAR EMERGENCIES—THE NEED TO BROADEN THE PROCESS

Z. Carr*, W. Weiss†, N. Roehbel‡ and J. Abraham§

†Department of Public Health, Environmental and Social Determinants of Health, World Health Organization, 20 Avenue Appia, 1211 Geneva, Switzerland
‡Federal Office for Radiological Protection (retired), Hohlenstr. 31, 7932 Emmendingen, Germany
§Department of Emergency Risk Management and Humanitarian Response, World Health Organization, 20 Avenue Appia, 1211 Geneva, Switzerland
*Corresponding author: Carr@who.int

INTRODUCTION

Determinants of health in a nuclear or radiological emergency are radiation-induced health risks as well as lifestyle-related properties affected by broader social, economic and political forces that influence the vulnerability of members of the population related to the radiation hazard event and the capacity of communities and countries to manage these risks. The consideration of both aspects in the assessment, decision-making and the implementation of protective and responsive actions is in line with WHO's definition of health being a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition (the WHO Constitution 1946)[2].

The above statement from the WHO Constitution suggests that some people are more exposed to health threatening situations due to race, religion, political belief, economic or social condition and that this is unjust.

As well documented, ionising radiation can induce early or delayed health effects. Early health effects (risk-term cancers, skin burns, loss of hair, and sterility are some examples) can occur within days to a few years of exposure. These are primarily among survivors who received high doses of radiation. Late health effects (non-radiation-induced cancers, leukemia, and genetic disorders occurring in children of exposed parents) can occur many years after the exposure. Cancer following radiation exposure, even at very low doses due to nuclear emergencies, is a major concern in the long term after a nuclear emergency.

Nuclear accidents affect public health well beyond the direct induced effects of radiation (e.g., cancer, non-cancer disorders or organ effects at high doses). Long-term psychological consequences, as a non-direct impact of nuclear emergencies, are not well documented and they are increasingly recognised.

In addition to the direct and non-direct consequences of nuclear accidents, the social determinants of health (SDH) also have a strong influence on the vulnerability to the environmental hazards and they play a major role in the aftermath of such an emergency. The SDH are the conditions in which people are born, grow, work, live, and age and the wider set of forces and systems shaping the conditions of daily life. The SDH approach focuses on explaining social/ political risk factors in health and, in this case, of unequal health outcomes of disaster[4, 5]. These determinants include among many others, low recognition[6]. They disrupt the social fabric of everyday life of the affected communities—both of the affected evacuees and receiving communities. Some problems are brought on by the emergency, some by the response to the event, and others are pre-existing. Significant social problems may include the following:

- Emergency-induced: family separation, safety, discrimination, loss of livelihoods, loss of trust in authorities and lack of resources. In addition, anger, despair, concerns about health risks and about the health of children. Last but not least, the social stigmatisation of persons affected by ionising radiation is also exacerbating the social impact on affected populations.
- Response-induced: overcrowding, lack of privacy in shelters, loss of community and traditional support.

Problems of a more psychological nature that may occur after an emergency situation are the following:

- Emergency-induced: grief, distress, anxiety and depression, including post-traumatic stress disorder.
WHO-NEA cooperation on non-radiological health effects of radiation emergencies

- Working Party on Nuclear Emergency Matters (NEA/OECD) and WHO agreed to develop a joint project addressing psycho-social impact on radiological and nuclear emergencies.

- A two-phase project started in 2018
  - Year 1: Development of a policy framework document on application of WHO guidelines on mental health to radiation emergencies (WHO-led task).
  - Year 2: Development of practical arrangements to support emergency response planners and managers to provide tools for efficient mitigation of psychosocial impact (WPNEM-led task).

- Year 3: A joint NEA-WHO workshop.
Long-term follow-up of persons over-exposed to ionising radiation

2005, under revision since 2015

2006

2006

2013

2015

2018
Thyroid screening in Fukushima

- A thyroid ultrasound screening program is currently being conducted in Fukushima prefecture as a part of the Health Management Survey (166 thyroid cancer cases diagnosed by end 2015)

- This screening for thyroid disease with highly sensitive technology lead to an increase in the incidence of thyroid diseases due to earlier detection of non-symptomatic cases (a.k.a. “screening effect”, also seen at the Adult Health Study (AHS) of the Japanese survivors of the atomic bombings of Hiroshima and Nagasaki)

- Social, psychological, legal implications of such programs can be significant and must be considered when planning/implementing such programmes

- Clinical management of pediatric micro-carcinomas is not always straightforward and obvious and there is scientific debate ongoing in Japan
Papillary thyroid microcarcinoma: time to shift from surgery to active surveillance?

Sophie Leboulex, R Michael Tuttle, Furio Pacini, Martin Schlumberger

The incidence of differentiated thyroid cancer is increasing greatly in high-income countries. Roughly 50% of this increase is attributable to the identification of intrathyroidal papillary thyroid microcarcinomas. Since mortality associated with these tumours remains low and stable, the increasing diagnosis has led to concerns about overdiagnosis and overtreatment. Management of papillary thyroid microcarcinomas should take into account the reported absence of mortality when diagnosed in the absence of lymph node metastases and distant metastases, as shown even in recent studies promoting active surveillance; a low recurrence rate of 1–5%; and the risk of permanent complications from surgery that cannot be decreased to less than 1–3%, even in high-volume tertiary care centres with experienced surgeons. On the basis of these data, active surveillance with curative intent, in which active treatment is delayed until the cancer shows signs of significant progression to avoid side-effects of treatment, should be considered in properly selected patients.

It is important to avoid overdiagnosis and overtreatment of thyroid cancer as well as to avoid the fear of thyroid cancer after the nuclear accident, however, simultaneously the risk estimates of radiation-induced thyroid cancer and its differential diagnosis of naturally occurring thyroid cancer are critically important using the ultrasound survey data after the Fukushima Nuclear Power Plant accident.
NEW!!! WHO IARC Recommendations for Thyroid Monitoring after a nuclear accident

- Over-diagnosis or an increased case ascertainment resulted from the thyroid screening of Fukushima children and adolescents and have caused numerous debates and interpretations of the results.

- Upon request of the Government of Japan, IARC has convened an expert consultation in 2017 with the view of developing an authoritative recommendations, should a similar situation occur in future.


- Lancet-Oncology published on 01 Oct 2018: [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(18)30680-6/fulltext#back-bib1](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(18)30680-6/fulltext#back-bib1)
REMPAN e-NewsLetter

http://www.rempan.ukw.de/aktuelles/who-rempan-e-newsletter.html
WHO BioDoseNet – global network for biodosimetry


EPR-BioDose conference
REMPAN Survey
Geneva consultation
Identifying labs and building BDN
1st BDN meeting – Hanover NH, USA
Asian BDN meeting – Japan
RadRes paper on BDN
DBN Capacity Survey
Web-based scoring exercise
2nd BDN meeting – France, 2010
Revision of IAEA's TR 405
1st BDN Inter-comparison
3rd BDN meeting – Leiden, 2013
BDN-RENEB Inter-comparison
4th BDN meeting – Hanover, US, Oct 2015
The 2nd BioDoseNet Capacity Survey

- Based on the 2010 survey questionnaire
- Sent out in July 2015, to 80 labs with 4 week timeframe for response
- Results published in 2016

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<tr>
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<th>Survey 2010</th>
<th>Survey 2015</th>
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<tr>
<td>Labs invited</td>
<td>65</td>
<td>~80</td>
</tr>
<tr>
<td>Labs completed</td>
<td>57</td>
<td>52</td>
</tr>
<tr>
<td>Response rate</td>
<td>87%</td>
<td>65%</td>
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World Health Organization
MEETING REPORT

WHO 1st Consultation on the Development of a Global Biodosimetry Laboratories Network for Radiation Emergencies (BioDoseNet)

William F. Blakely, Zhanat Carr, May Chin-May Chu, Renu Dayal-Drager, Kenzo Fujimoto, Michael Hopmeier, Ulrike Kulka, Patricia Lillis-Herne, Gordon K. Livingston, David C. Lloyd, Natalie Maznyk, Maria Del Rosario Perez,


Global Networking for Biodosimetry Laboratory Capacity Surge in Radiation Emergencies

Derek H. Christie, May C. Chu, and Zhanat Carr

Abstract—For the public health management of radiation emergencies, one of the essential components of integrated dosimetry is to quickly and accurately assess and manage the exposure. In addition to other methods, biodosimetry is instrumental in supporting decision-making for: 1) effective triage in a hospital response phase; 2) multi-site approach for defining best-treatment strategies for severely exposed; 3) clinical prognosis and assessment and re-assessment and psychological support for those initially exposed, or "worried-well." In large-scale events, the number of victims, and especially those worried-well, may overwhelm hospital and laboratory capacities in the affected area. This is already being addressed through working approaches within several countries and regions around the world. The paper reports about WHO’s activity coordination of these regional efforts and the International BioDoseNet, a collaborative network of biodosimetry laboratories worldwide.

THE CAPACITY, CAPABILITIES AND NEEDS OF THE WHO BIODOSENET MEMBER LABORATORIES

N. A. Maznyk, R. C. Wilkins, Z. Carr and D. C. Lloyd

1 Institute for Medical Radiology of the Academy of Medical Sciences of Ukraine, Pavlinsky St. 82, Kyiv 01024, Ukraine
2 Health Canada, Ottawa, ON, Canada, K1A 0K9
3 World Health Organization, Geneva, Switzerland
4 Public Health England, Chilton, Didcot, Oxfordshire, OX11 0RQ, UK

Key words: accidents, handling; biodosimetry; cytogenetic cytodeoxy

AN UPDATE OF THE WHO BIODOSENET: DEVELOPMENTS SINCE ITS INCEPTION

R. C. Wilkins1, Z. Carr2 and D. C. Lloyd

1 Health Canada, Ottawa, ON, K1A 0K9, Canada
2 World Health Organization, Geneva, Switzerland
3 Public Health England, Chilton, Didcot, Oxfordshire, OX11 0RQ, UK

*Corresponding author: Ruth.Wilkins@hc-sc.gc.ca

In 2007 the World Health Organization established an international network of biodosimetry laboratories, the BioDoseNet. The goal of this network was to support international cooperation and capacity building in the area of biodosimetry around the world, including harmonization of protocols and techniques to enable them to provide mutual assistance during a mass casualty event. In order to assess the progress and success of this network, the results of the second survey conducted in 2015 that assessed the capabilities and capacities of the members of the network, were compared to the similar first survey conducted in 2009. The results of the surveys offer a unique cross-section of the global status of biodosimetry capacity and demonstrate how the BioDoseNet has brought together laboratories from around the world and strengthened the international capacity for biodosimetry.
REMPAN Functions: Support IHR Implementation

Technical support to WHO in response to actual radiological and nuclear emergencies

- Strengthening national and regional preparedness to radiation emergencies
  - Technical guides/tools development
  - Trainings and workshops
  - Exercises
  - Information sharing platform

Technical support of activities aimed at implementation of International Health Regulations in the area of radiation emergencies
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- JEE expert roster
International Health Regulations

• An international law adopted by 196 State Parties that sets provisions for
  – Health surveillance (e.g. unknown origin outbreaks) in addition to radiological monitoring
  – Emergency notification through National Focal Points
  – Secure information sharing on Event Information Site (EIS)
  – Ongoing monitoring of travel and trade measures

• Mechanism and tools for assessment, monitoring, and assistance on strengthening preparedness and response capacity of Member States

• IHR scope includes radiation emergencies

• [http://www.who.int/ihr/en/](http://www.who.int/ihr/en/)
IHR all-hazard framework to assess national capacities

IHR (2005): Capacity to detect, assess, report and respond to all Public Health Events of International Concern

- Human infectious pathogens
- Zoonotic pathogens / Food safety
- Radio nuclear hazards
- Chemical hazards

- Legislation and Policy
- Coordination
- Financing
- Surveillance
- Response
- Preparedness
- Risk Comm.
- Human Resources
- Laboratory

World Health Organization
IHR Key Components

- Annual Reporting
  - Transparency
  - Mutual accountability
  - Trust building
  - Appreciation of public health benefits
- After Action Review
- Exercises
- Joint External Evaluation
  - Dialogue
  - Sustainability

World Health Organization
Joint External Evaluation Tool

- WHA 68/22 resolution: “…to move from exclusive self-evaluation to approaches that combine self-evaluation, peer review and voluntary external evaluations involving a combination of domestic and independent experts” – rolled out in 2016.

- Focuses on health security, cross-sector coordination, and includes 19 categories - areas of evaluation, including legislation, finance, surveillance, reporting, preparedness and response, workforce, lab capacities, AMR, immunization, zoonoses, risk coms, points of entry, chemical and radiation emergencies

Strategic Partnership Portal (SPP) : JEE Dashboard

![Graph showing the number of completed, in pipeline, and express interest projects in various regions.]

- **African Region**: 43 completed projects, 6 in pipeline, 37 express interest.
- **Region of the Americas**: 3 completed projects, 3 in pipeline, 0 express interest.
- **Eastern Mediterranean**: 18 completed projects, 1 in pipeline, 17 express interest.
- **European Region**: 18 completed projects, 7 in pipeline, 11 express interest.
- **South-East Asia Region**: 11 completed projects, 7 in pipeline, 4 express interest.
- **Western Pacific Region**: 14 completed projects, 4 in pipeline, 10 express interest.

**World Health Organization**
SPP: JEE reports
https://extranet.who.int/sph/jee-dashboard
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<tr>
<th>Name</th>
<th>Title</th>
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<tr>
<td>Chunsheng Li</td>
<td>Research Scientist</td>
<td>Health Canada</td>
</tr>
<tr>
<td>Jean-Francois Lafortune</td>
<td>General Manager</td>
<td>International Safety Research Inc. (ISR)</td>
</tr>
<tr>
<td>Fahad Mohamed Al Blooshi</td>
<td>Manager, Emergency Preparedness &amp; Federal Authority for Nuclear Regulation Response</td>
<td>(FANR)</td>
</tr>
<tr>
<td>Mohammed RBAI</td>
<td>Head of Health Security and Surveillance Division</td>
<td>Military Health Services, Royal Armed Forces Morocco</td>
</tr>
<tr>
<td>Wael Elkhouly</td>
<td>Head of Safety Sector of Radiation Facilities &amp; Sources</td>
<td>Egyptian Nuclear and Radiological Regulatory Authority</td>
</tr>
<tr>
<td>Nick Gent</td>
<td>Senior Medical Specialist</td>
<td>Public Health England</td>
</tr>
<tr>
<td>Andrey Bushmanov</td>
<td>Physician</td>
<td>Federal medical-Biological Agency</td>
</tr>
<tr>
<td>Christophe Murith</td>
<td>Head of Section</td>
<td>Swiss Federal Office of Public Health</td>
</tr>
<tr>
<td>Makoto Akashi</td>
<td>Executive Officer</td>
<td>National Institutes for Quantum and Radiological Science and Technology (QST)</td>
</tr>
<tr>
<td>Alexandre de Ruvo</td>
<td>Higher Radiation Protection Scientist</td>
<td>Public Health England</td>
</tr>
<tr>
<td>Wolfram Rother</td>
<td>Radiation protection officer</td>
<td>Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit</td>
</tr>
<tr>
<td>Zhanat CARR</td>
<td>Scientist</td>
<td>Radiation Programme, FWC/PHE/IHE, WHO HQ</td>
</tr>
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2018 EVENTS

- Co-sponsorship of the regional IRPA conferences in 2018
  - AOCRP-5 – Melbourne, Australia, 20-23 May
  - European IRPA-2018 – The Hague, Netherlands, 4-8 June
  - AFRIRPA-5 – Tunis, 6-8 Sept
- The 12th Int. Conference on Health Effects of Incorporated Radionuclides (HEIR-12) – 8-11 October, 2018 – Paris, France
Summary

- WHO applies Emergency Conventions and IHR(2005) frameworks to support member states in capacity building efforts for radiological and nuclear emergencies.

- REMPAN as technical arm of WHO, supports WHO’s work including contribution to:
  - development and implementation of the relevant international radiation safety standards requirements and guides
  - developing technical guidelines for public health decision makers
  - Providing opportunities for training, exercise, R&D

- Promotes international cooperation in the EPR area through its global expert networks.
Thank you!

CarrZ@who.int