

FOLLOW-UP ACTIONS FOR THE RESIDENTS AFTER CHERNOBYL ACCIDENT

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LIQUIDATORS

Emergency workers or
recovery operation
workers

- Personnel from Chernobyl and other NPPs
- Military service-men
- Medical staff
- Civil personnel



EVACUATION

27.04 during 3 h from town Pripyat

was evacuated

45 000 citizens including

17 000 children



EVACUATION FROM THE 30-KM ZONE

116 000 persons during April-
September, 1986



CHERNOBYL EXPERIENCE: ESTABLISHMENT OF REGISTRIES

- “Liquidators” — clean-up workers
- Evacuees from 30 km zone
- Residing or working in areas with Cs-137 contamination $> 15 \text{ Ci/km}^2$ or resettled from those territories after Chernobyl accident
- Children was born from 3 above groups

CHERNOBYL REGISTRIES

- **Russian National Medical and Dosimetric Registry – 638, 334**
- **Belarus - State Chernobyl Registry –1,610,478**
- **Ukraine –State Chernobyl Registry – 2,405,890**

FOLLOW-UP

IAEA-TECDOC-1432

Development of an extended framework for emergency response criteria

*Interim report for comments
jointly sponsored by IAEA and WHO*



IAEA

International Atomic Energy Agency

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IAEA-TECDOC-1432

- Experience of short-term and long-term medical response after the Chernobyl accident showed that scientifically grounded criteria should be developed and used for medical screening, treatment and long-term medical follow-up of the affected people.

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- Application of routine procedures for health care or social support in an acute stage of the emergency can lead medical personnel and policy makers into problems that will be difficult or even impossible for them to solve. It is important that medical records record only facts about a disease and do not wrongly attribute radiation exposure since this can lead to anxieties in the population and subsequent medical examinations that cannot be justified from a radiation medicine perspective.

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- From another point of view, when long-term follow-up is medically (and radiologically) justified, it could be very effective. Medical screening of the thyroid gland of exposed populations in Belarus and Ukraine after the Chernobyl accident has been effective for earlier diagnosis of the disease and, therefore, more efficient treatment. The number of deaths among those with thyroid cancer is significantly less than the international mortality rate for thyroid cancer.

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- There are different reasons to perform long-term medical follow-up of affected people, such as:
- to provide advanced medical care for affected people;
- to decrease public concern with regard to their health status, and
- to obtain new scientific knowledge.

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- Each of the reasons could form the basis for medical follow-up. However, for medical care of the affected population, the reason for establishing a registry and providing medical follow-up is: early detection, and hence effective treatment of cancer that may be induced by radiation.

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- Having this as an objective, the following should be taken into account while establishing the registry: level of exposure expressed in dose and possibility to detect cancer among the exposed population.
- Current data show that radiation induced cancer cases (excess above background cases) could be observed in humans at effective doses in excess of 0.1 Sv delivered at high dose rates.

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- These data are based on epidemiological studies of well-defined populations (e.g., the Japanese atomic bomb survivors and medical patients) exposed to high doses delivered at high dose rate. Epidemiological studies have not demonstrated such effects in individuals exposed to small doses (less than 0.1 Sv) delivered over a period of many years. UNSCEAR 2000 states "...further follow-up and improved information on the doses received will be needed before the shape of the dose response at low doses for both morbidity and mortality can be determined with confidence at doses below about 100-200 mSv..."

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- Long term medical follow-up has both potential benefits and risks. Early recognition of the cancer represents a net benefit both to the individual and to society. However, potential penalties both to the patient and to the medical care system should be also considered.
- Potential risk for the patient includes performing invasive and potentially harmful procedures (e.g., fine needle biopsy of thyroid), ultrasound detection of clinically insignificant nodules (leading to false positive results), and the psychological pressure of regular examination, which influences the quality of life.

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- The potential risks to the consequences for the medical care system, e.g. overload in terms of both personnel and equipment, need to be identified and appropriate cost- and risk-benefit analyses should be undertaken. Cost- and risk-benefit analysis should include not only morbidity and mortality associated with surgery, but also the need for long-term patient compliance and the necessity for life-long medication (e.g. replacement hormone therapy after removal of the thyroid gland) and follow-up. This should be of special consideration for countries with limited resources allocated for long-term medical follow-up of people with very low risk of radiation-induced cancer.

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- Having in mind the necessity of long-term medical follow-up for the purpose of early detection, and hence effective treatment of potential radiation induced cancer, it's necessary to establish dose criteria in advance.

RECOMENDATIONS



Chernobyl Forum Vienna 6-7 September 2005


- Continue annual medicals, including cardiovascular exams, on ARS survivors
- Reconsider medical follow-up of persons exposed to < 1 Gy. Such follow-up programs are very unlikely to be cost-effective
- Use funds saved to improve general health care programs
- Continue thyroid cancer screening for adults exposed as children, but evaluate this at intervals for cost-benefit and expected number of cases
- Maintain high quality cancer registries to assist allocate public health resources and research

RECOMENDATIONS

International Conference
CHERNOBYL:
Looking Back to
Go Forwards

6-7 September 2005
Vienna, Austria



 Organized by the
IAEA International Atomic Energy Agency
on behalf of the Chernobyl Forum

Chernobyl Forum Vienna 6-7 September 2005

- **Monitor incidence rates of childhood leukaemia in highly exposed populations.. increases may yet occur**
- **Continue eye examinations in highly exposed populations; new information on radiation-induced cataracts at lower doses may come**
- **Continue local registers on reproductive effects; may not be useful for research but may reassure the population**
- **Inform local populations of the Forum results, including through health care professionals**

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Some key questions to follow-up

- What will be the incidence of various cancers in highly exposed Chernobyl populations (emergency workers and resident of highly contaminated territories)?
- Will there be an excess risk of thyroid cancers in adults?
- What are the uncertainties in the estimates of thyroid doses?
- What is the role of radiation on the induction of cardiovascular disease? Studies should be conducted under a joint protocol with the 3 affected countries participating cooperatively.
- What is the effect of high doses of radiation on the immune system (particularly in ARS survivors)?

MEDICAL EXAMINATION

“Liquidators” — clean-up workers

Evacuees from 30 km zone

- therapist, endocrinologist, ophthalmologist, otolaryngologist, neurologist, gynecologist, oncologist, as well as blood tests (with thrombocytes estimation), ECG, thyroid ultrasound examination.

MEDICAL EXAMINATION

Residing or working in areas with Cs-137 contamination $> 15 \text{ Ci/km}^2$ or resettled from those territories after Chernobyl accident

- pediatrician, therapist, endocrinologist, they are subjected to blood examination (ESR, leucocytes, hemoglobin) and dosimetry control.

MEDICAL EXAMINATION

Children was born from 3 above groups

- only general blood test is taken. Examination by the specialists depend on age group: adults are examined by therapists, children and adolescents . by pediatrician and endocrinologist.

FUTURE ACTIVITY

**OPTIMISATION OF
FOLLOW-UP**

OPTIMISATION

- People who was 0-18 y at time of accident (screening thyroid cancer and non-cancer thyroid diseases)
- Recovery operation workers
- Residents of the contaminated areas who have the cumulative doses 100 mSv

Thank you for attention