



Research priorities of the health consequences of the Chernobyl accident – report of ARCH

DOREMI/ARCH

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Dr Ausrele Kesminiene

International Agency for Research on Cancer
Lyon, France



introduction to ARCH



- support action funded through the EC FP7
- scientific review of the current evidence of the health effects of the Chernobyl accident
- 'scoping study' to advise on future needs for research and on potential value of the proposed research for public health decision making
- result of 2 years work by experts from the EU, Belarus, Russian Federation, Ukraine, US and Japan

ARCH - Agenda for Research on Chernobyl Health - Windows Internet Explorer

http://arch.iarc.fr/index.php

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Favoritos ARCH - Agenda for Research on Chernobyl Health

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public health PL EXPOSURE CHERNOBYL UA radiation risk

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ARCH is a European Commission FP7 Project to develop a strategic research agenda for the health consequences of the Chernobyl accident



The Chernobyl accident led to the most serious exposure of a normal human population to ionising radiation, apart from the atomic bombings in Japan. **Unlike the bombing, the health impact of Chernobyl has not been comprehensively studied.** In some areas (eg thyroid cancer), research has been intensive and informative; in others, little work has been conducted. The validity of extrapolating radiation risk estimates mainly based on whole body exposures at the atomic bombings to exposures of public health is controversial but of great public concern.

Questions relate to the choice of models for transport of risk between populations; projection of risk over time; extrapolation of risks from external high dose-rate exposure to low dose and low dose-rate exposures from internal radiation. Questions also concern non-cancer risks and the importance of non-targeted effects following low levels of radiation. Chernobyl has an iconic status in the public eye, and the accident provides a unique opportunity to answer these questions, to provide the authoritative studies needed to inform the nuclear debate, and to test novel hypotheses about radiation effects and biology/genetics in general.

Because the range of potential studies is so vast, this project is to develop of a strategic



© ARCH 2008. Radiation map of Europe

ARCH NEWS

► The main deliverable from the ARCH project, the **Strategic Research Agenda (SRA)** has been submitted to the European Commission.

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ARCH objectives



- to develop a comprehensive long-term **strategic research agenda (SRA)** peer-reviewed by independent experts
 - ❖ discussing the implications both in terms of public health and of knowledge of radiation effects
- to develop detailed project proposals for **urgent priority** research topics

why do we need SRA?

- to improve health of those exposed to Chernobyl or to future nuclear accidents
- to realistically assess present and future health consequences to aid health planning for those exposed after Chernobyl, and after future accidents
- to improve our understanding of radiation effects and direct future radiation protection measures

it is essential to reduce the public confusion over radiation risks and confidence in the radiation protection standards in the likely event of the future expansion of the nuclear power generation



SRA – why 25 y after?



- Health effects from this European accident continue and future effects are uncertain
- Past knowledge of radiation effects is largely based on atomic bomb studies, but Chernobyl involved a very different type of exposure
- Assumptions on the risk of low dose exposure have been challenged by recent advances in radiobiology
- Estimates of health effects and deaths due to the Chernobyl accident vary widely
- The recent accident at Fukushima endorses the importance that research into the consequences of Chernobyl receives long term support



highlights of current research on Chernobyl health – (1)



- Significant advances in knowledge have already been made through a number of studies, especially of **thyroid cancer following exposure in childhood**
- Although much has been learned about thyroid cancer, the size of the outbreak afford an unprecedented opportunity for answering a number of questions of scientific and health related importance:
 - ❖ the risk to those who were adults at exposure
 - ❖ the change in risk with time since exposure
 - ❖ the role of dietary iodine and other environmental factors
 - ❖ the role of inherited factors, such as mutations in DNA repair genes
- **Other types of cancer** with a longer latency, such as breast cancer, may now be increasing in incidence and need study



highlights of current research on Chernobyl health – (2)



- Increase in mortality from cardiovascular diseases has been reported among Chernobyl liquidators with low to moderate dose exposures and need to be addressed in further careful epidemiological studies
- A study of **lens opacities** among Chernobyl liquidators from Ukraine challenges the current position that there is a threshold dose at 500mGy and full assessment requires continuing study

The current overall picture is one of a series of uncoordinated studies, valuable in themselves but forming a patchwork rather than a comprehensive, structured attempt to delineate the overall health consequences of the accident



what is proposed ?



- **Chernobyl Health Effects Research Foundation (CHERF)**
 - ❖ a mechanism to coordinate and fund studies to enable assessment of the overall long-term health effects of this disaster
 - ❖ a virtual institute consisting of:
 - ✓ a **Management Board** (MB) with representatives of the funding organisation(s) and the countries most involved
 - ✓ a **Scientific Advisory Board** which would help determine priorities for funding and advise the MB on projects to be supported.
- a key to the success of the ARCH recommendations is the creation, maintenance and follow-up of **Life Span cohorts**, including
 - ❖ **cohorts exposed to fallout as children** in Belarus and Ukraine with detailed thyroid dose measurements (*BelAm, UkrAm cohorts*)
 - ❖ **cohorts of liquidators**
 - ❖ *If feasible, cohorts of evacuees and offspring*



prioritization of research projects



Monitoring of cancer trends in general population and liquidators

- Evolution of thyroid cancer endemics (clinical and molecular)
- Breast cancer
- Non-cancer effects (e.g. cataracts in liquidators)

- Analytical epidemiological studies: e.g. thyroid cancer
- Effects of preconceptional and in utero exposure

- Analytical epidemiological studies of other tumours, as appropriate





ARCH experts and advisors



- *Keith Baverstock, Finland;*
- *Dmitryi Bazyka, Ukraine;*
- *Andre Bouville, USA;*
- *David Brenner, USA;*
- *Elisabeth Cardis, Spain;*
- *Zhanat Carr, WHO, Switzerland;*
- *Vadim Chumak, Ukraine;*
- *Malcolm Crick, UNSCEAR, Austria;*
- *June Crown, UK;*
- *Scott Davis, USA;*
- *Yuri Demidchik, Belarus;*
- *Vladimir Drozdovitch, Belarus, currently USA;*
- *Yuri Dubrova, UK;*
- *Ian Fairlie, UK;*
- *Bernd Grosche, Germany;*
- *Maureen Hatch, USA;*
- *Viktor Ivanov, Russian Federation;*
- *Ausrele Kesminiene, IARC/WHO, France;*
- *Christoph Reiners, Germany;*
- *Sisko Salomaa, Finland;*
- *Margot Tirmarche, France;*
- *Klaus Trott, UK;*
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www.arch.iarc.fr

The screenshot shows the top section of the ARCH website. At the top left, there are language options for 'ENGLISH' and 'FRANÇAIS'. Below this is the IARC logo and the text 'International Agency for Research on Cancer' and 'Centre International de Recherche sur le Cancer'. To the right is the 'ARCH' logo and the text 'Agenda for Research on Chernobyl Health'. A search bar with a 'Search' button is located to the right of the ARCH logo. Below the header is a banner with a background image of the Chernobyl site. On the left of the banner is a blue navigation menu with arrows and the text 'ЧОРНОБИЛЬ', 'МАКАРІВКА', and 'СУКАЧІ'. In the center of the banner is a sign that says 'КІЇВ ДИТЯКИ'. On the right of the banner is a map of Europe with a radiation symbol and the text 'EXPOSURE', 'radiation risk', 'UA', and 'CHERNOBYL'. At the bottom of the banner is the text 'IARC, 150 Cours Albert-Thomas, 69372 Lyon Cedex 08, France. Tel: +33 (0)4 72738485 - Fax: +33 (0)4 72738575'.

International Agency for Research on Cancer



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