Ethical aspects of testing for individual radiosensitivity

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Current practice

Dose limit recommendations are consistently based on a population average of the expected detriment, rather than on data for subpopulations.

Contents of this presentation

1.Philosophical analysis of *whether* recommendations should take variations in radiosensitivity into account.
2.Brief discussion of *how* this can be done.

Example 1:

An efficient drug against hypertension kills about 1 patient out of 100,000. This is because 1 in 100,000 has a metabolic abnormality that turns the drug into a killer.

Information to sensitive persons:
Certainty of death.

Information to non-sensitive persons:
No risk.

Risk management decision:
Not given to sensitive persons.

Example 2:

An efficient drug against hypertension kills about 1 patient out of 100,000. The risk is 1 in 50,000 for women and 0 for men.

Information to women:
Risk of 1/50,000.

Information to men:
No risk.

Risk management decision:
Decisions based on sex-specific information.

Example 3:

A chemical workplace exposure causes uterine cancer in 1 out of 50,000 exposed women. It causes no risks for men.

Information to women:
Risk of 1/50,000.

Information to men:
No risk.

Risk management decision:
Women should be protected against a risk of 1/50,000, not against one of 1/100,000.

Example 3:

A chemical workplace exposure causes uterine cancer in 1 out of 50,000 exposed women. It causes no risks for men.

Workplace A
Only women

Protection against 1/50,000.

Workplace B
Half women, half men

Protection against 1/50,000.

Example 4:

A chemical workplace exposure causes primary liver cancer in 1 out of 50,000 exposed women. It causes no risks in men.

Information to women:
Risk of 1/50,000.

Information to men:
No risk.

Risk management decision:
Women should be protected against a risk of 1/50,000, not against one of 1/100,000.

Example 5:

A chemical workplace exposure causes cancer in 2 out of 50,000 exposed women and 1 out of 50,000 men.

Information to women:
Risk of 2/50,000.

Information to men:
Risk of 1/50,000.

Risk management decision:
Women should be protected against a risk of 2/50,000, and men against one of 1/50,000.

Example 6:

A radiological workplace exposure causes cancer in 2 out of 50,000 exposed women and 1 out of 50,000 men.

Information to women:
Risk of 2/50,000.

Information to men:
Risk of 1/50,000.

Risk management decision:
Women should be protected against a risk of 2/50,000, and men against one of 1/50,000.

Ethical conclusions

1. A person who is exposed to radiation has the right to receive the best possible information about the risk to herself. In particular, if she is a member of an identifiable group for which specific risk information is available, then she has a right to that group-specific information.

Ethical conclusions

2. If testing can provide information about whether or not an exposed person belongs to some radio-sensitive group, then she has a prima facie *right to be tested if she so desires.*

Ethical conclusions

3. Regulations and recommendations in radiological protection have to be defensible in the perspective of each affected person. In order to justify that a certain person is exposed to a radiation dose, it is not sufficient to show that the hypothetical risk to which she would have been exposed if she had average radiosensitivity would have been acceptable. It is necessary to show that the risk to which she is exposed is acceptable.

Two modes of protection

Differentiated vs. Unified

Cheaper
Risk of discrimination

Reasons for unified protection

- ✓Small difference in risk
- ✓Low costs of protection
- ✓Identification is difficult (pregnancy!)
- ✓Identification is privacy sensitive
- ✓The alternative is unemployment
- ✓The affected are already socially disadvantaged

Thank you for your attention!