Recent Reflections on the Ethical Basis of Radiological Protection

2nd International Symposium on Ethics of Environmental Health

České Budějovice, Czech Republic
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Disclaimer

some of this presentation summarises results of workshops where participants discussed a wide variety of views

this presentation does not necessarily reflect the views of the presenter, the International Commission on Radiological Protection, or any other individual or organisation

SYSTEM OF RADIOLOGICAL PROTECTION
SCIENCE
VALUES
EXPERIENCE

The Objective

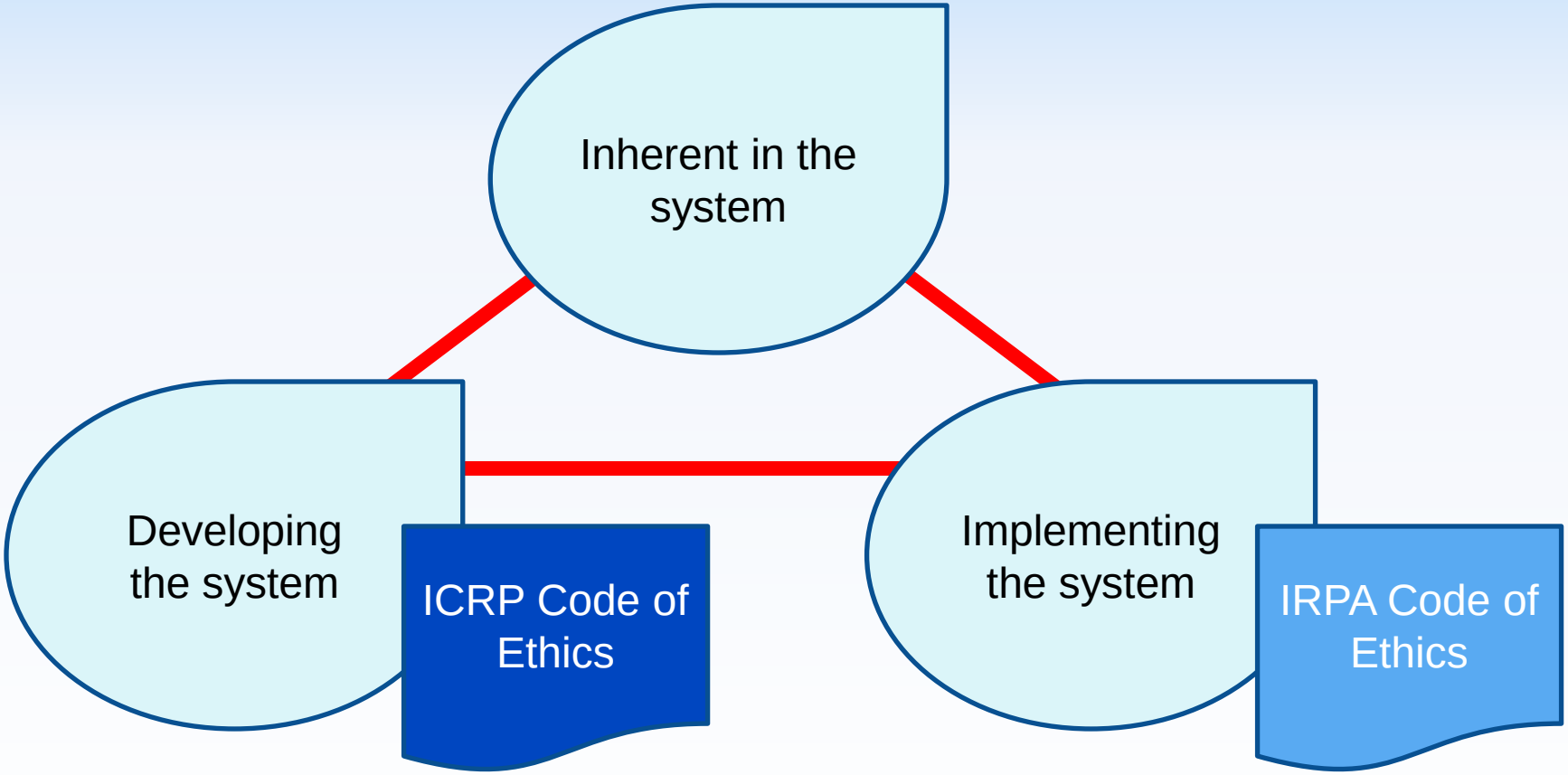
Clearer ethical framework for the system of radiological protection

(1) Professionals and public better understand what the system is designed to achieve and why

(how is more a matter for professionals)

(2) Solid basis, together with science and experience, for evolution of the system

Ethics and the System of Radiological Protection



ICRP Code of Ethics

Committed to public benefit: *ICRP acts to protect humans and the environment from the harmful effects of radiation*

Independent: *ICRP acts independently of governments and organisations, including industry and other users of radiation*

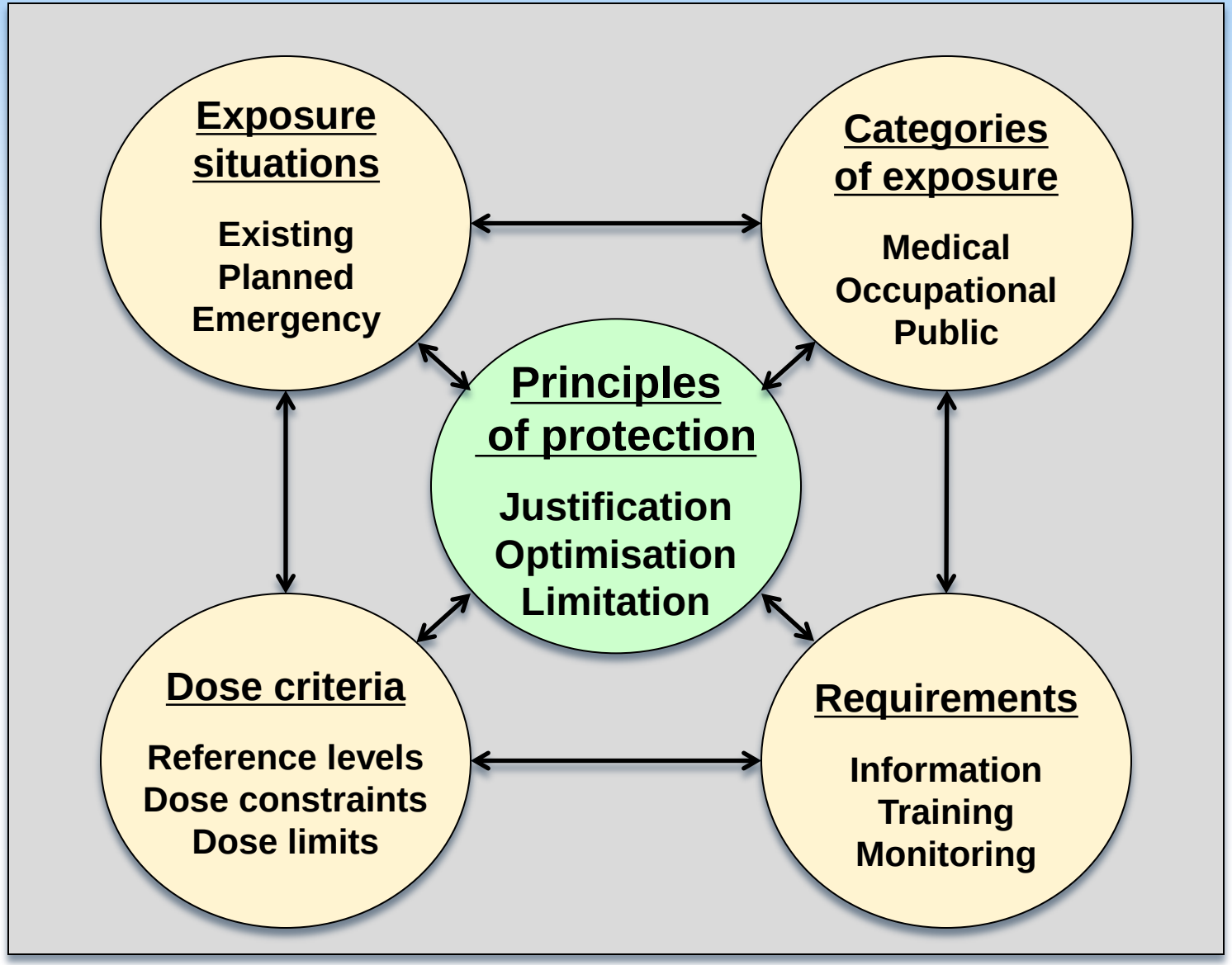
Impartial: *ICRP acts impartially in its development of recommendations and guidance*

Transparent: *ICRP engages stakeholders and strives to be transparent in its actions and judgements*

Accountable: *ICRP is accountable to the framework that governs the activities of a charity*

“Fundamentals” of the system of radiological protection

The System of Radiological Protection



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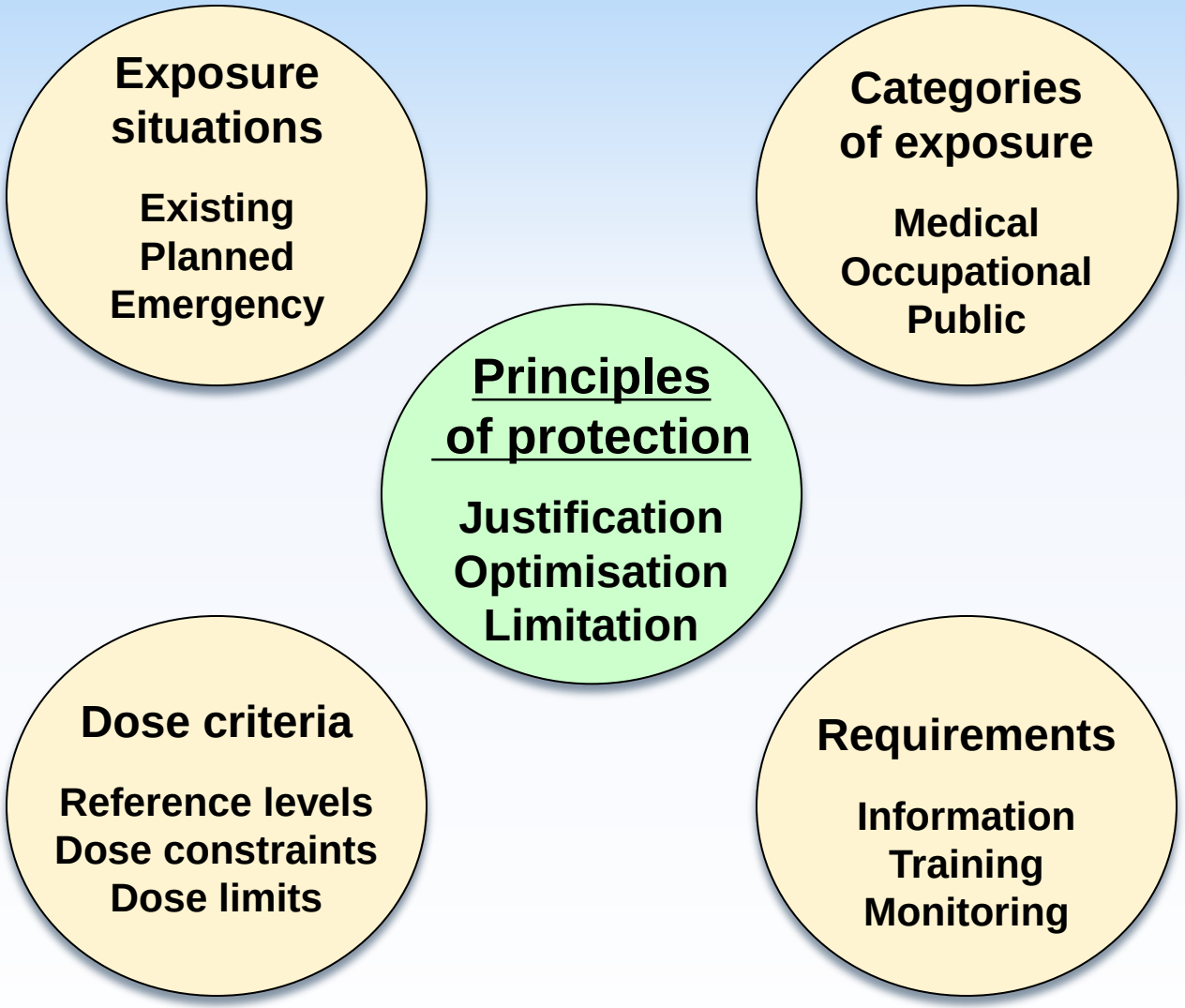

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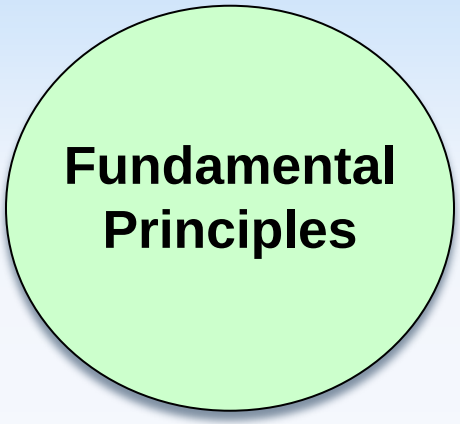
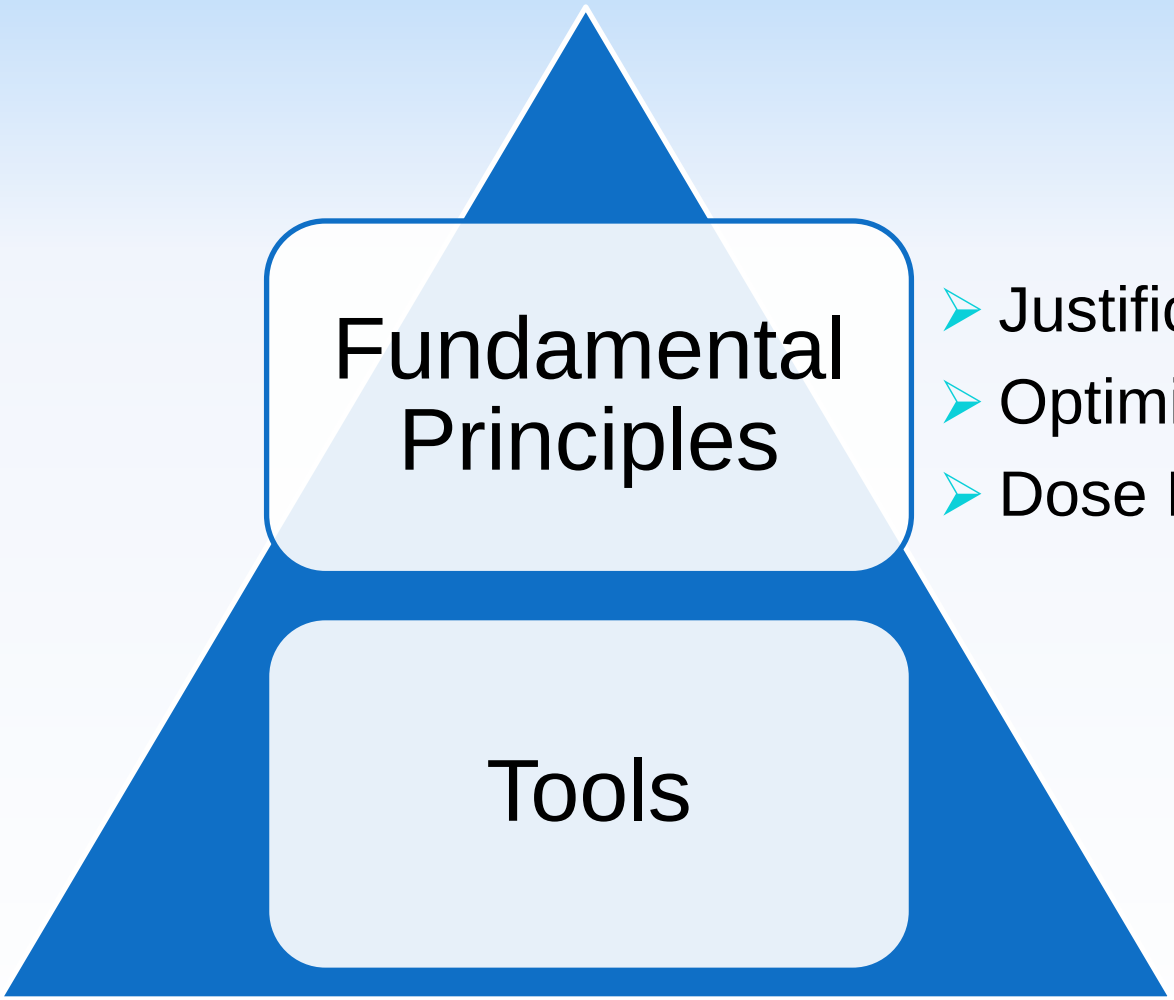


Radiological Protection Tools

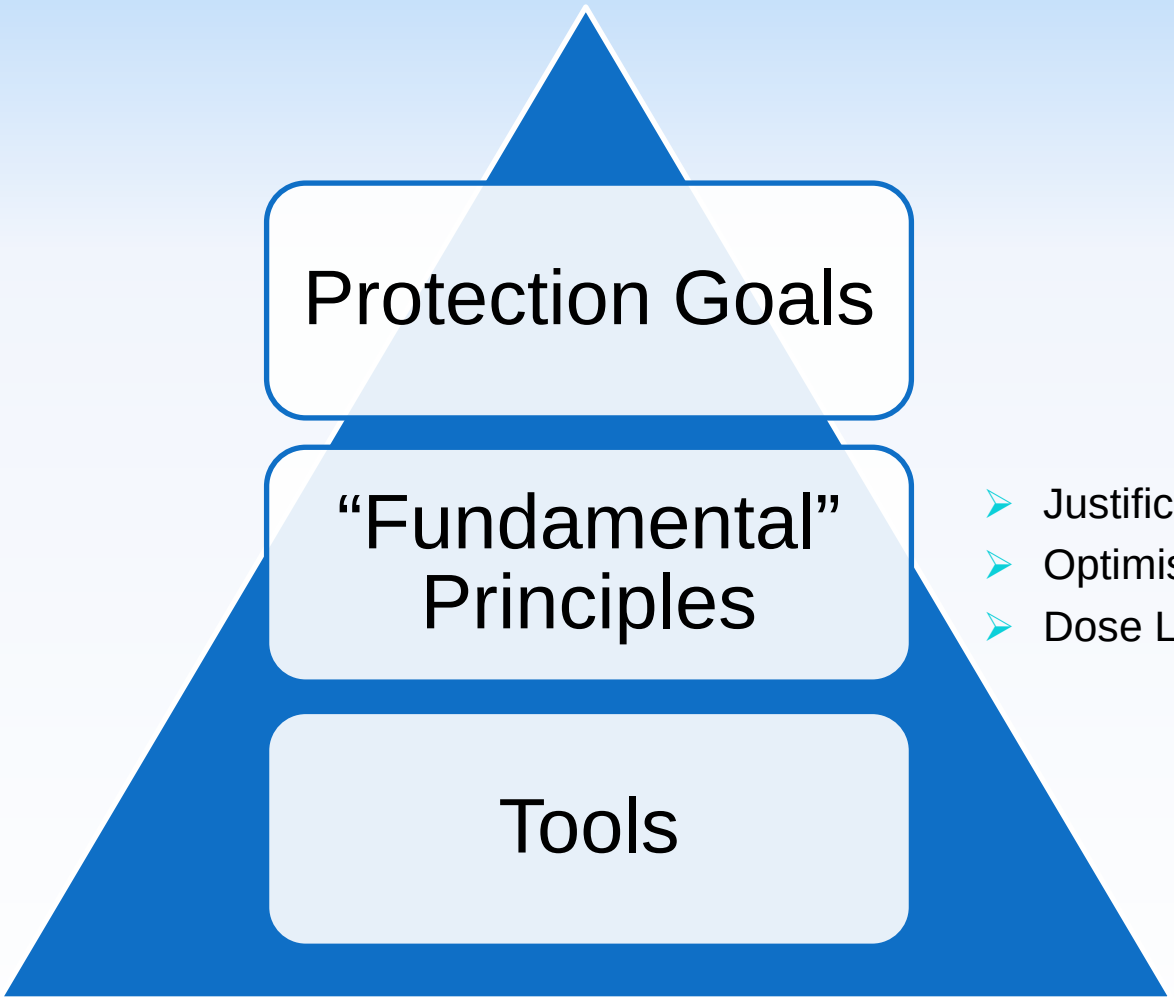
Categories of Exposure	Exposure Situations	Limits, Reference Levels, Constraints	Information, Training, Monitoring

The System of Radiological Protection



- Justification
- Optimisation
- Dose Limitation

The System of Radiological Protection



- Justification
- Optimisation
- Dose Limitation

Protection of Human Health

Manage and control exposures so that:

- Deterministic effects (harmful tissue reactions) are **prevented**

- The **risks** of stochastic effects (cancer or heritable effects) are **reduced** to the extent reasonably achievable

ICRP *Publication 103* §29

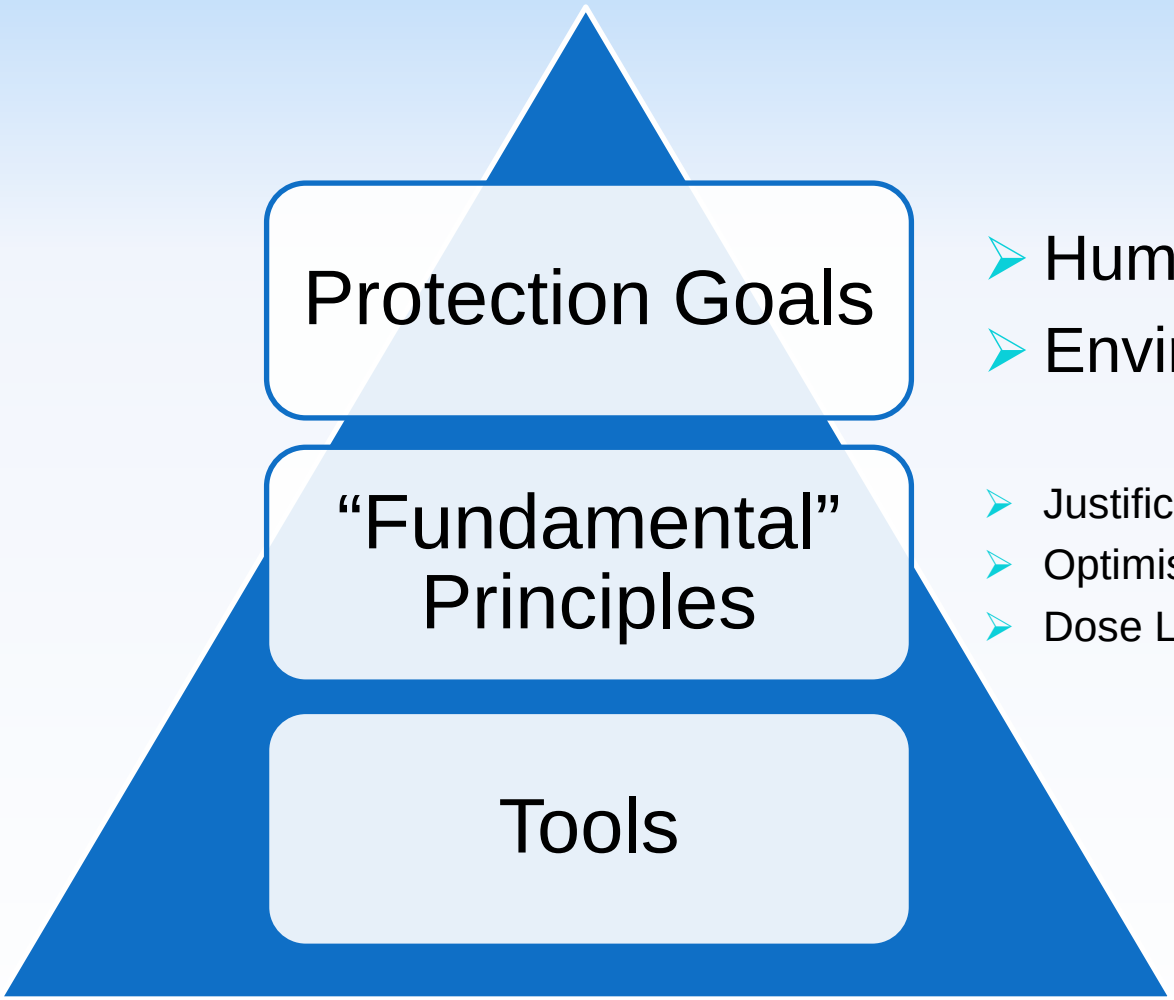
Protection of the Environment

Prevent or reduce the frequency of deleterious radiation effects to have a negligible impact on:

- the maintenance of **biological diversity**
- the **conservation of species**
- the health and status of natural **habitats, communities and ecosystems**

- *No universal definition of environmental protection*
- *Radiation is one factor to consider, often likely to be a minor one*

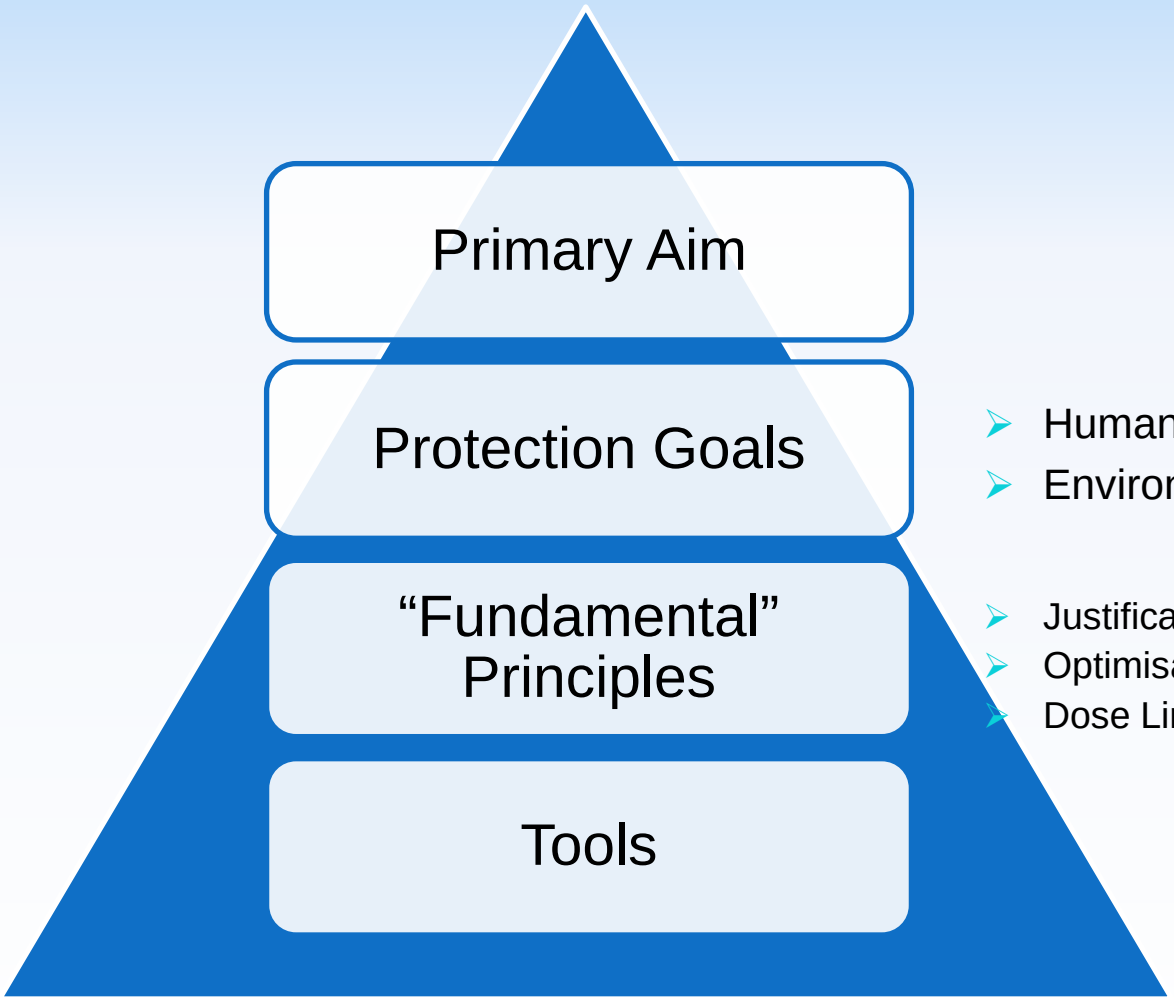
The System of Radiological Protection



- Human Health
- Environment

- Justification
- Optimisation
- Dose Limitation

The System of Radiological Protection



- Human Health
- Environment

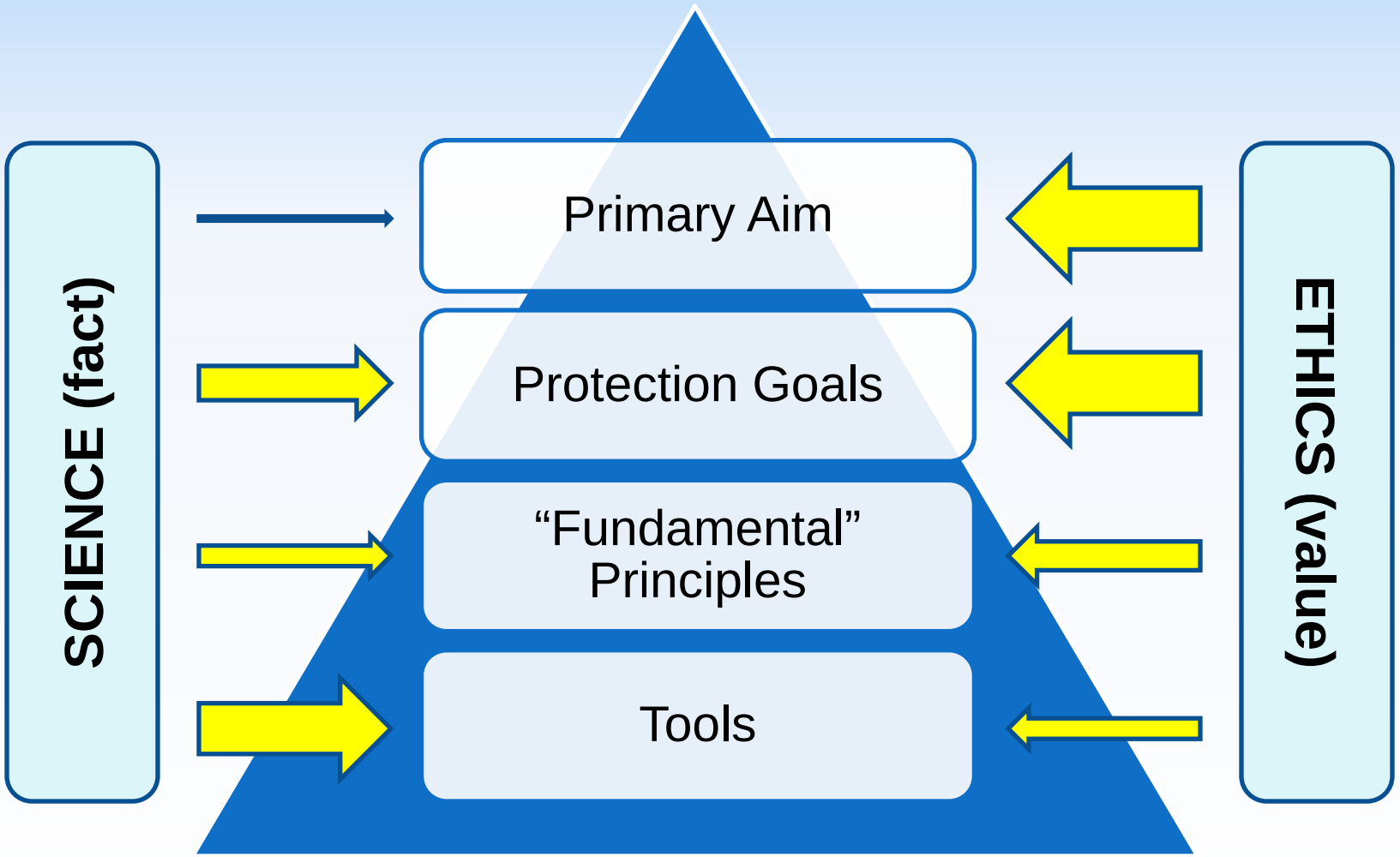
- Justification
- Optimisation
- Dose Limitation

The System of Radiological Protection: Primary Aim

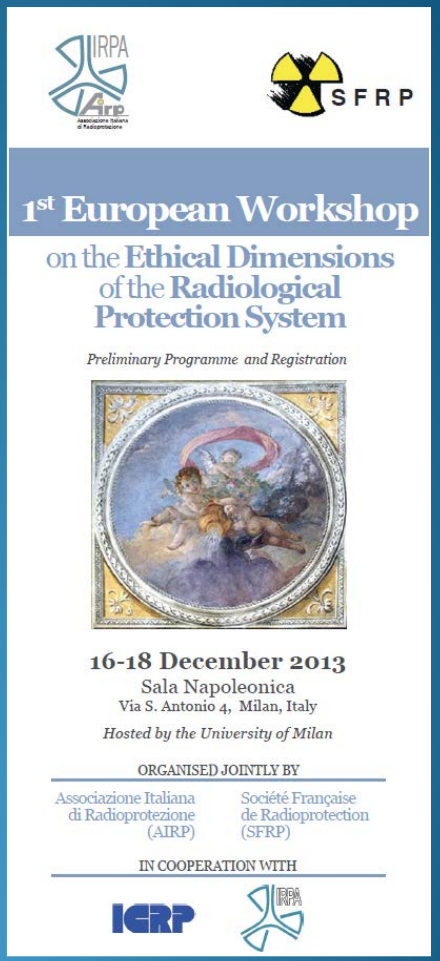
to contribute to an appropriate level of protection for people and the environment … without unduly limiting the desirable human activities that may be associated with such exposure

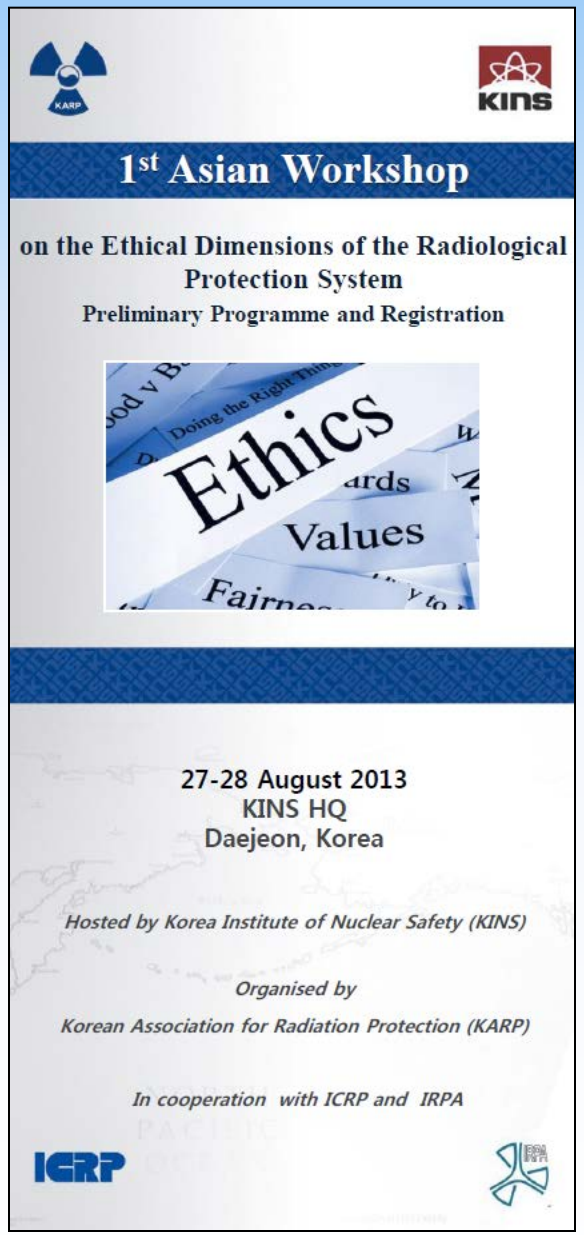
ICRP *Publication 103* §26

The System of Radiological Protection



Some results of two recent workshops





1st Asian Workshop

1st Asian Workshop on the Ethical Dimensions of the Radiological Protection System

2013 Aug 27-28, Daejeon, Korea

Organised by the Korean Association for Radiation Protection (KARP), and hosted by the Korea Institute of Nuclear Safety (KINS) and

Main Points: Daejeon

(Public) Communication

- Complexity of the system of radiological protection
- Communicating radiological protection in simpler language
- Failure of patriarchal top-down approach to risk communication
  - Need to address questions asked by the public
- Public misunderstanding
  - Living in a “radiation free” world
  - Equating radiation with atomic bombs

Main Points: Daejeon

Tolerability/Acceptability of risk

- Failure of broad acceptance due to overemphasis of solely scientific approach
- Primarily a question of ethics, informed by science

Well-being

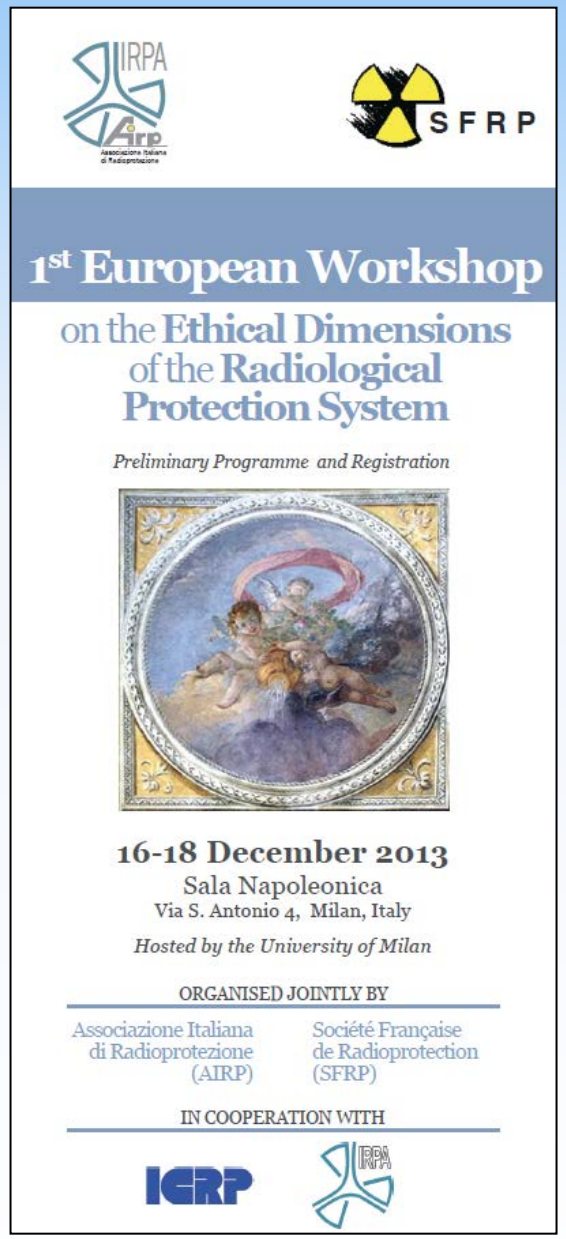
- For protection of people: consider well-being vs. “classical” health protection
- People need to be protected from harm AND to feel “safe”

WHO Definition of Health

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

From the Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

The Definition has not been amended since 1948.



1st European Workshop

1st European Workshop on the Ethical Dimensions of the Radiological Protection System

2013 Dec 16-18, Milan, Italy

Organised jointly by the Associazione Italiana di Radioprotezione (AIRP), and Société Française de Radioprotection (SFRP)

Main Points: Milano

A set small of central **values** were identified

Focus on understanding and applying these values, rather than worrying too much about classical philosophical traditions

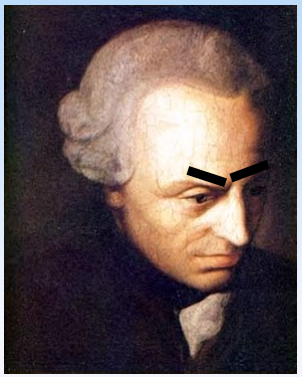
Use plain language and examples of practical application of these values to ensure a broad common understanding

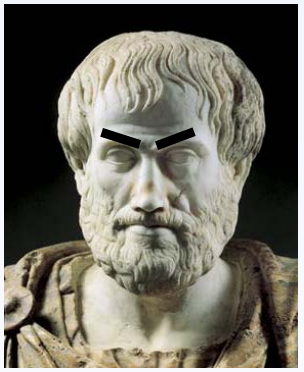
ICRP is charged with development of the System of Radiological Protection, but it is essential to prepare the ethics publication cooperatively with the broader RP community

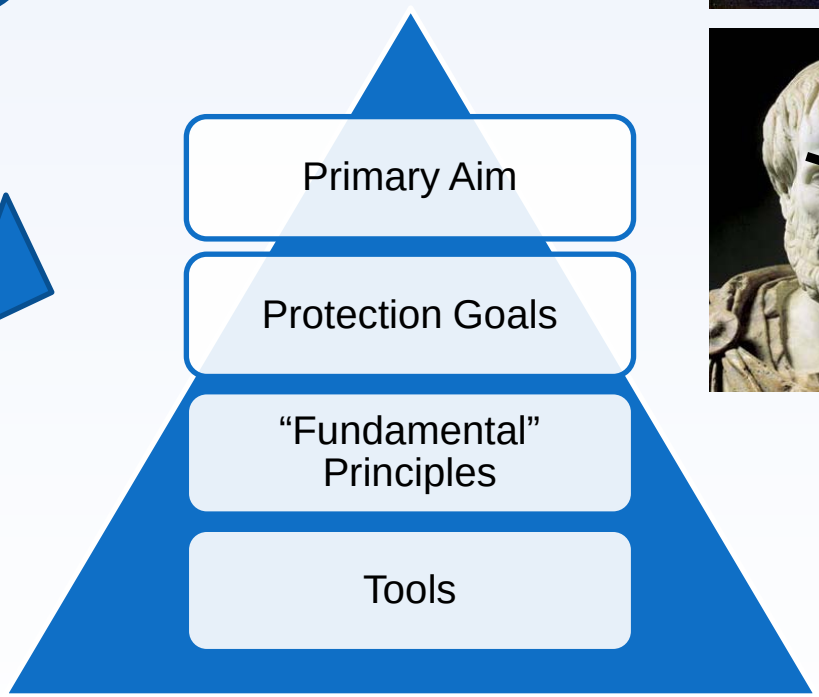
Moving from competing ethical schools to a common set of values

Behind the System of Protection

Ethical schools of thought





Behind the System of Protection

Ethical schools of thought

Ethical values

Primary Aim

Protection Goals

“Fundamental” Principles

RP Tools

Ethics and Radiological Protection

- The system of RP is a guide to human conduct, individual and societal, in the domain of radiological protection
- Conduct is about action, so focus on right and wrong action
- Actions can be right
  - Because they produce good (Bentham)
  - Inherently (Kant)
  - Because they arise from virtue (Aristotle)

Ethics (Moral Philosophy)

The study of the moral value of human conduct

Normative Ethics: *Figuring out what is right and wrong behaviour*

VIRTUE	DUTY	CONSEQUENCE
Virtue Ethics	**Deontological Ethics**	**Utilitarian Ethics**
Focus on habits of character of a person	Actions are judged based on duty or obligation	Actions are judged by their consequences

Ethical Theories

- Kant: actions are inherently right or wrong (deontology)
- Aristotle: right actions are those that arise from virtuous character (virtue ethics)
- Bentham: right actions are those that result in good outcomes (utilitarianism)

Value Judgements in Radiological Protection

Utilitarian Ethics

- *Actions are judged by their consequences*

- **Justification**
  - Do more good than harm
- **Optimisation**
  - Maximize good vs. harm

Deontological Ethics

- *Actions are based on duty or obligation*

- **Dose Limitation**
  - No individual is unduly harmed
  - Dose Constraints aid optimization & increase equity

Elegant but Flawed

Utilitarianism

Consequence is central

Problems with justice

e.g. killing one person for the happiness for millions

Unknowable consequences

Calculating total utility (good) is as impossible as predicting the future

Deontology

Duty is central

Duty is not always clear

It does not always seem rational to ignore the consequences

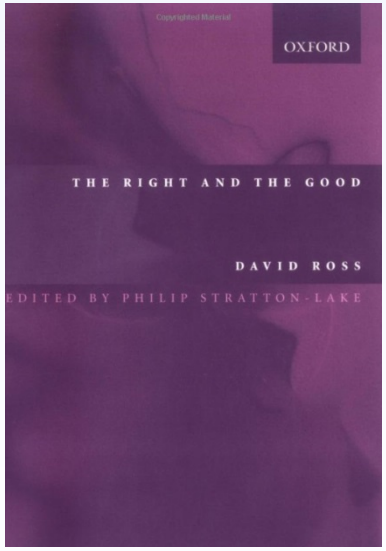
Duties cannot all be categorical

In case of moral dilemma, relative stringency must be considered

A More “Complex” Alternative

W.D. Ross (1877-1971)
“The Right and the Good” (1930)

- Rejects ideal utilitarianism and Kantian deontology
- Emphasises the complexity of ethical decisions
- **Obligations must be balanced depending on each circumstance**
- Ethical intuitionism



W.D. Ross: Balancing Obligations

What is right is a matter of balancing potentially conflicting responsibilities (values)

Which Values?

- Accountability
- Accuracy
- Adaptability
- Benevolence
- Candor
- Charity
- Clarity
- Compassion
- Competence
- Confidence
- Consistency
- Correctness
- Credibility
- Decisiveness
- Dignity
- Effectiveness
- Efficiency
- Empathy
- Environmental protection
- Fairness
- Fidelity
- Gratitude
- Harmonisation
- Honesty
- Human health
- Individual autonomy
- Individual benefit
- Integrity
- Justice
- Knowledge
- Leadership
- Logic
- Mercy
- Meticulousness
- Modesty
- Non-maleficence
- Open-mindedness
- Partnership
- Paternalism
- Peace
- Practicality
- Pragmatism
- Precaution
- Promise-keeping
- Promotion of aggregate good
- Protection of animals
- Protection of children
- Protection of future generations
- Privacy
- Rationality
- Reasonableness
- Reparation
- Responsibility
- Human rights
- Scientific correctness
- Significance
- Simplicity
- Sincerity
- Social benefit
- Societal autonomy
- Soundness
- Stability
- Timeliness
- Tolerance
- Trustworthiness
- Truth
- Understanding
- Usefulness
- Vision
- Wisdom

Group 3

- Values of RP ethics
  - Tolerance of people's views (positive and negative aspects)
  - Human dignity
  - Justice
  - Respect for persons
  - Beneficence
  - Prudence
  - Understanding / simplicity
  - Wellbeing
    - Physical, mental, and social aspects

Borrowed from: Breakout group 3 at Daejeon Workshop

One of the most widely used frameworks of biomedical ethics is the one developed by Beauchamp and Childress (1979).
It is based on four principles

1) Autonomy
2) Non-Maleficence
3) Beneficence
4) Justice

These are assumed to be rooted in a “common morality”, which is “not relative to cultures or individuals, because it transcends both”.

Borrowed from: Friedo Zölzer

Ross on Right: Balancing Fundamental Responsibilities (*prima facie* duties)

Fidelity
(keeping promises)

Reparation
(righting our wrongs)

Gratitude
(returning services to those from whom we have accepted benefits)

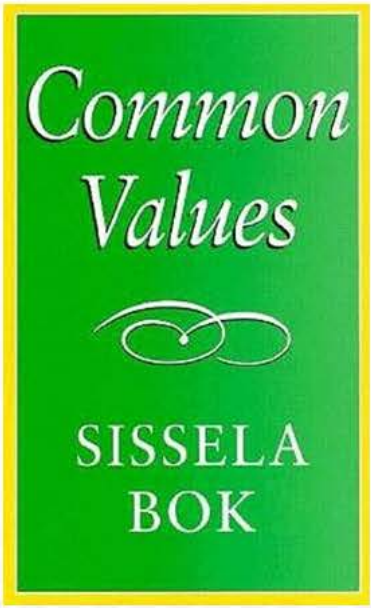
Non-maleficence
(avoidance of the bad)

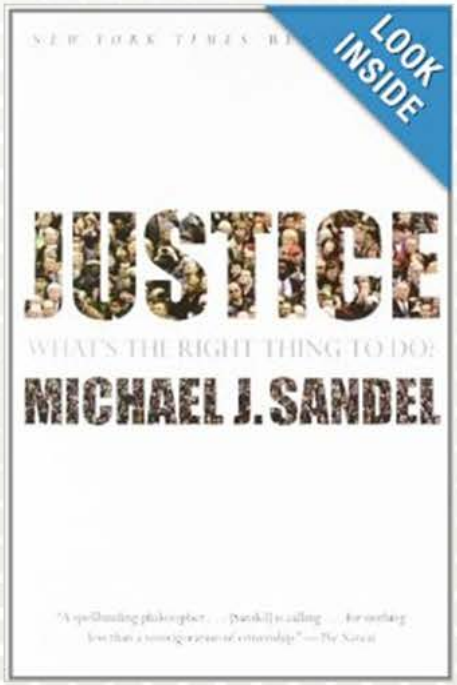
Promotion of aggregate good
(including justice and self-improvement)

Underlying Ethical Values

- **Autonomy** and Dignity, Personal Control
- **Justice** and Distribution of Risks
- **Community Values** and Societal Impacts

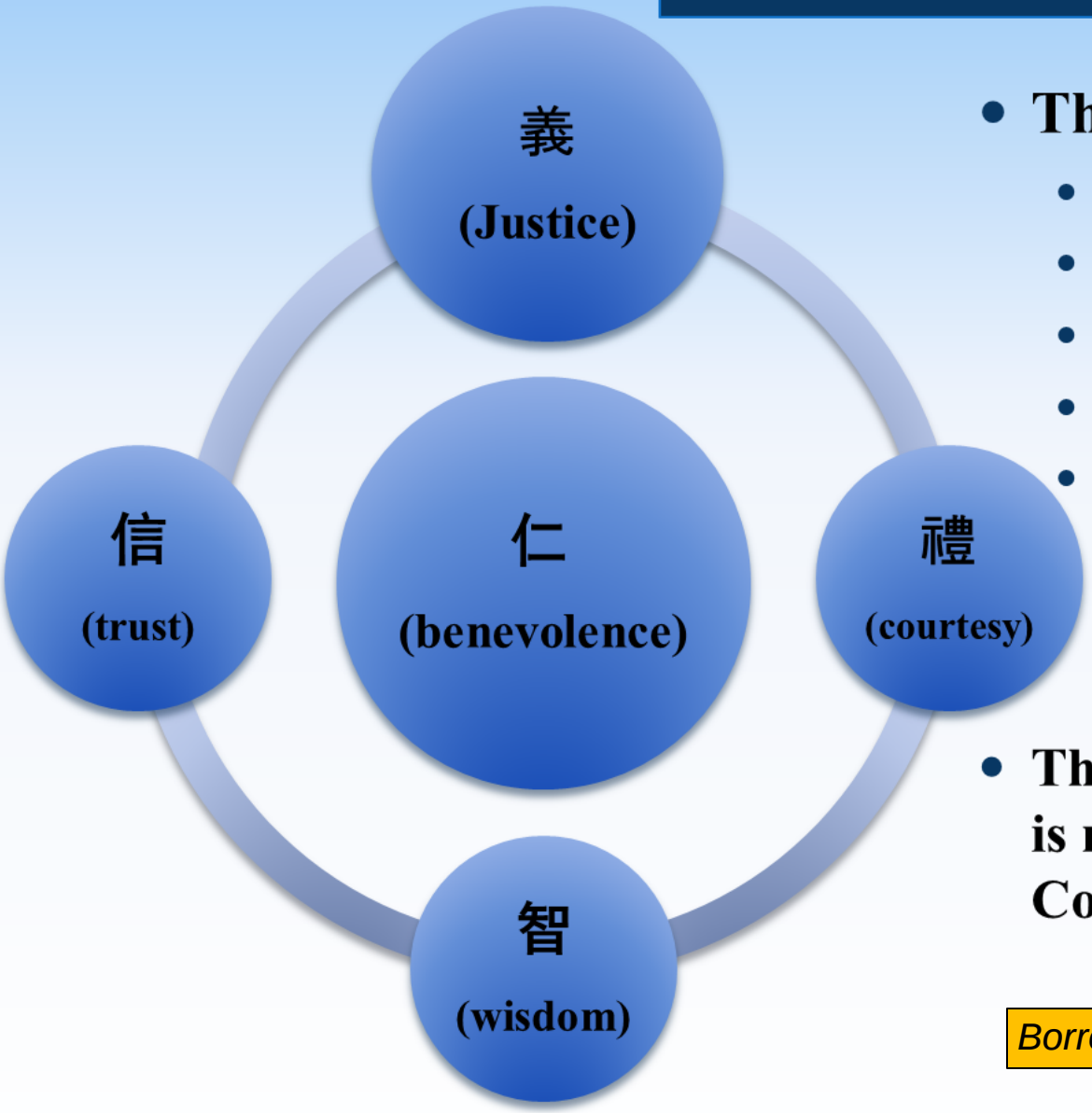
Relevance can be grounded in ethical theories, common cultural values, biomedical principles, …





Borrowed from: Deborah Oughton

The value system of Classic Confucianism



- **The five virtues:**
  - **Benevolence**
  - **Righteousness/justice**
  - **Courtesy (Propriety, Manners)**
  - **Wisdom**
  - **Sincerity/trust**

- **The traditional ethics in China is mainly derived from Classic Confucian thought.**

Borrowed from: Senlin Liu / KunWoo Cho

Courtesy of Mr. Senlin Liu, ICRP C4
& slightly modified by K. Cho, ICRP C4

Ethical and societal values underlying the system
- Where are we after the Daejeon seminar? -

- **Benevolence :** to do more good than harm
- **Prudence :** to keep exposure ALARA
- **Justice:** to reduce inequities in the dose distribution
- **Dignity:** to involve stakeholders
- Two 'values' to be carefully considered: **reasonableness** and **tolerability**
- A prospective question: should we broaden the objective of protection and consider moving to the promotion of the **well-being** of persons?

Borrowed from: Jacques Lochard

Values: A Pragmatic Way Forward

Seek a set of values:

- Relevant to the system of radiological protection
- Common (or at least acceptable) to the widest possible range of cultures today
  - International recommendations must be broadly applicable
- That stand the test of being applied to current and foreseeable problems, with sensible results

Towards a Set of Common and Relevant Values

Beneficence / Non-maleficence

Do good / do no harm

Prudence

Wisdom, avoidance of unnecessary risk

Justice

Fairness, people get what they deserve

Dignity/Autonomy

Treat people with respect

Beneficence / Non-Maleficence

Central to medical ethics, where implications of balancing beneficence and non-maleficence are well studied

Beneficence: Do good

Non-Maleficence: Do no harm

- Not absolute: doing good may do or risk lesser harm

Prudence

- Long ethical tradition: Aristotle, Buddhism, Confucianism, ancient peoples of Oceania and America

- In early use: The **wisdom** to see what is virtuous

- OED: “The ability to recognize and follow the most suitable or sensible course of action … caution”
- MW: “The ability to govern and discipline oneself by the use of reason … good judgment ... caution … as to danger or risk”

Prudence & Precaution

- Prudence can be seen as reluctance to accept unnecessary risks

- Rio 1992: “the precautionary approach … where there are threats of serious or irreversible damage, lack of full scientific certainty shall be not used as a reason for postponing cost-effective measures to prevent environmental degradation”

Justice (1/2)

- Justice: the perpetual and constant will of rendering to each one his right
- Linked to fairness, entitlement and equality
- In natural law: justice means individuals or groups get what they deserve, merit, or are entitled to
- In radiological protection: fair sharing of benefits and detriments

Justice (2/2)

Look beyond humans today as the only moral entities:

+ Descendants → protection of future generations

+ “Environment” → protection of the environment for its intrinsic value not just its instrumental value

+ Animals → questions of animal welfare

Dignity

"All human beings are born free and equal in dignity and rights"

(Article 1 of The universal declaration of human rights adopted by the UN General Assembly on 10 December 1948)

- Something is due to every person because she/he is human. Every individual deserves unconditional respect regardless of age, sex, health, social condition, ethnicity, religion, etc.
- Dignity requires that individuals are treated as subjects, not objects
- *"Act in such a way that you treat humanity, whether in your own person or in the person of any other, never merely as a means to an end, but always at the same time as an end."* (Immanuel Kant, Grounding for the Metaphysics of Morals, 1785)

Dignity & Autonomy

- Related to dignity, autonomy is about having control over one's life:
  - freedom, i.e., the absence of constraint
  - the capacity to deliberate, decide and act

Possible conflict: decision makers with a duty of beneficence which may conflict with the autonomy of those effected (paternalism vs. individualism)

Values in Radiological Protection (1/2)

Beneficence / Non-maleficence

- *Avoid unduly limiting beneficial uses of radiation*
- *Prevent harmful tissue reactions (equivalent dose limits)*
- *Justification: positive net benefit*
- *Protection of vulnerable groups*

Prudence

- *Reduce risks of stochastic effects to the extent reasonably achievable (optimisation)*
- *Assume there may be risks even at very low doses*

Values in Radiological Protection (1/2)

Justice

- *Protection of people and the environment from radiation balanced with beneficial uses of radiation*
- *Ensure no individual carries an unfair share of risk/harm (effective dose limits)*
- *Reduce inequities in dose distribution (optimisation with constrains and reference levels)*
- *Protection of future generations*

Dignity/Autonomy

- *Right to know*
- *Stakeholder involvement*
- *Self-help protection*

Values: Next Steps

Using a “draft” set of values:

- **Describe** each (and interactions between) in reference to the system of radiological protection
- **Examine** the broad acceptability of the set
- **Test** and **refine** the set through application to current and foreseeable problems (Rawls’ reflective equilibrium or Habermas’ discourse?)

www.icrp.org

Nomenclature: What are we balancing?

- values
- principles
- (primae facie) duties
- (primae facie) obligations

ASIDE

Prudence in Radiological Protection

From ICRP Publication 103:

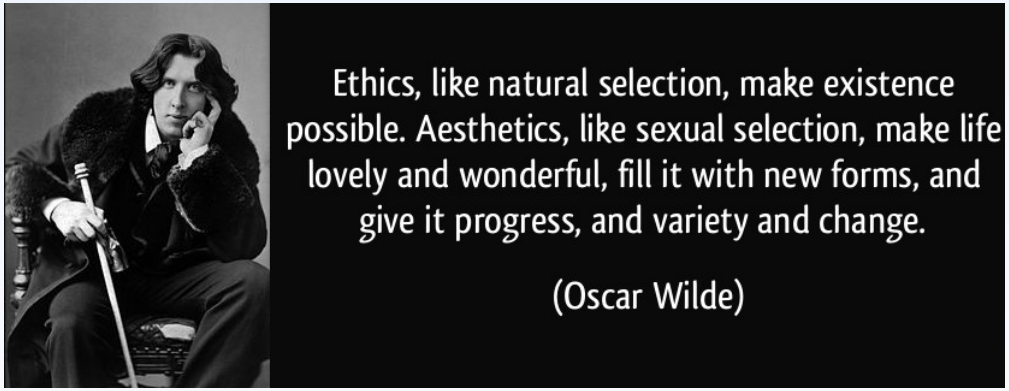
(35) … It is **prudent** to take uncertainties in the current estimates of thresholds for **deterministic effects** into account … Consequently, annual doses rising towards 100 mSv will almost always justify the introduction of protective actions.

(36) At radiation doses below around 100 mSv in a year, the increase in the incidence of **stochastic effects** is assumed by the Commission to occur with a small probability and in proportion to the increase in radiation dose … the LNT model remains a **prudent** basis for radiological protection at low doses and low dose rates.

(74) There continues to be no direct evidence that exposure of parents to radiation leads to excess heritable disease in offspring. However, ... there is compelling evidence that radiation causes **heritable effects** in experimental animals. Therefore, the Commission **prudently** continues to include the risk of heritable effects in its system of radiological protection.

Value

Axiology is the philosophical study of value and value judgments, including their classification, principally:



Aesthetics

- Art, beauty, harmony

Ethics

- “Good”, “Right”, and “Virtuous”
- Individual and collective conduct

Aesthetics

“To create these x-ray artworks serious risks and procedural hurdles need to be managed. The results are worth the hassle. X-ray allows us to see what is normally hidden to the human eye. It reveals the subjects from the inside out and allows us to appreciate what the world around us is truly made of.”

“In a nutshell, the work is a statement against society’s obsession with superficiality.”

http://nickveasey.com/