

Ethical aspects of non-medical human imaging

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Overview

- Introduction
- Key ethical concepts
- Application to different scenarios
- Conclusions

Introduction

- WHO's 13th General Programme of Work defines **six core functions** for the organization, one of them being:

"Articulating **ethical** and evidence-based
policy options"

- Ethics facilitates public health programmes

Ethics at the heart of WHO's 13th Global Programme of Work

"...WHO must continue to ensure that policy-makers and health implementers – both at the international and at the national level – **keep ethics at the heart of their decision-making**. By focusing on individual values such as human dignity, and respect; by bringing in the language of obligations and responsibilities; and by advocating at a national and global level for solidarity, reciprocity, and mutual understanding amongst other values, WHO can foster trust, improve transparency, and enhance accountability. **WHO will work to ensure that all policies, public health interventions and research are grounded in ethics....."**

Introduction

- IAEA Safety Standards "Justification of Practices, Including Non-Medical Human Imaging" (2014):

Foreword by Director General Yukiya Amano:

...**"Governments, regulatory bodies and operators everywhere must ensure that nuclear material and radiation sources are used beneficially, safely and ethically."**...

Key ethical concepts

- Justice: distribution of risks & benefits; resources
- Autonomy: Informed decision-making, consent
- Beneficence / non-maleficence
- Privacy & confidentiality
- Prudence and precaution
- Weighing risks & benefits

Informed consent



<https://understandingmyositis.org/informed-consent/>

- Based on principle of autonomy
- Necessary information
 - Information that is understandable and tailored to individual and scenario
 - Should include what is proposed, how it will be done, associated risks, consequences of consent, consequences of refusal to consent
- Voluntary consent
 - Without undue influence or coercion
 - Opportunity to refuse or withdraw consent
- Explicit vs. implicit consent

Prudence and precaution

- Prudence suggests assessing potential and likelihood of harm:
 - Obligation for oversight? – who?
 - How to monitor?
 - What limits to set?
- Avoidable harm – need a benefit to outweigh
- Maximize protections to reduce harm as much as possible



Weighing risks and benefits

- Individual risks
- Community risks
- Individual benefits
- Community benefits



Weighing risks and benefits

- Medical use (e.g. diagnostic radiology):

Benefit accrues to the individual subjected to the risk

- Non-medical use:

Benefit in most cases only to the public, but risk to individual

- Assessing benefits:

- Value judgements necessary
- Often subjective -> need for ethical decision-making

Conflicting goals

- Individual rights and public interests
- Business interests vs employer obligations vs employee rights
- Efficient use of public resources and individual or special needs (e.g. vulnerable populations)

Application to different scenarios



Framing questions

- Is imaging done within a medical setting (category 1) or outside (category 2)?
- What is the nature of the relationship between the provider of the imaging and the individual?
- And what implications does that have on the 'care' the individual receives?

Scenarios

Category 1: Medical equipment and medical staff

Medical Ethics

- Immigration x-rays to identify TB
- X-rays to determine age of refugees without documentation
- X-rays for employment purposes
- Imaging of suspected drug smugglers?

Category 2: Non-medical equipment and non- medical staff

- Cargo screening to detect humans at border
- Security scanning at airports
- Imaging of mine employees for theft detection
- Imaging of suspected drug smugglers?

Category 1 practices

- Medical setting & equipment and medical staff
- Principles of **medical ethics**, including:
 - First do no harm
 - Weighing of risks & benefits
 - Strong informed consent obligations
 - Obligation for treatment and/or referral
 - Etc.
- But:
In some circumstances, public health (or safety/security) can require infringements on individual rights

World Medical Association Declaration of Geneva



AS A MEMBER OF THE MEDICAL PROFESSION:

- I SOLEMNLY PLEDGE to dedicate my life to the service of humanity;
- **THE HEALTH AND WELL-BEING OF MY PATIENT will be my first consideration;**
- **I WILL RESPECT the autonomy and dignity of my patient;**
- I WILL MAINTAIN the utmost respect for human life;
- **I WILL NOT PERMIT considerations of age, disease or disability, creed, ethnic origin, gender, nationality, political affiliation, race, sexual orientation, social standing, or any other factor to intervene between my duty and my patient;**
- **I WILL RESPECT the secrets that are confided in me, even after the patient has died;**
- **I WILL PRACTISE my profession with conscience and dignity and in accordance with good medical practice ;**
- I WILL FOSTER the honour and noble traditions of the medical profession;
- I WILL GIVE to my teachers, colleagues, and students the respect and gratitude that is their due;
- **I WILL SHARE my medical knowledge for the benefit of the patient and the advancement of healthcare ;**
- I WILL ATTEND TO my own health, well-being, and abilities in order to provide care of the highest standard;
- **I WILL NOT USE my medical knowledge to violate human rights and civil liberties, even under threat;**
- I MAKE THESE PROMISES solemnly, freely, and upon my honour.

Category 1 practices – potential ethical implications

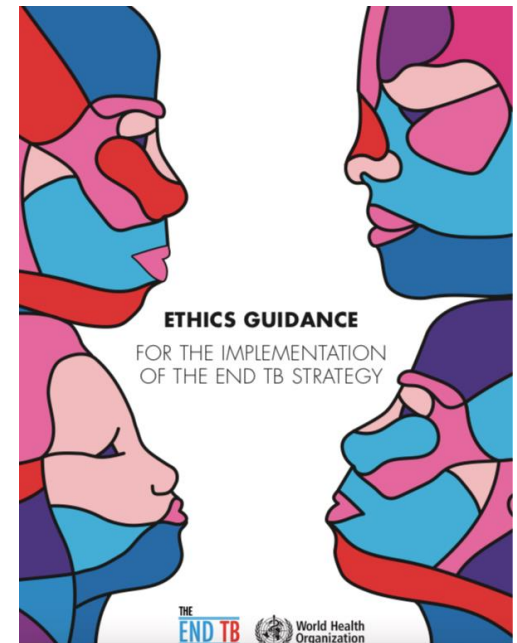
Medical equipment and medical staff



- Informed consent – individual interaction
 - Can they decline?
 - Coercion?
- Therapeutic misconception
- Impact future trust in health system
- “Unnecessary” exposure of staff
- Moral distress in staff
- Confidentiality of incidental findings?
- Follow-up of incidental findings – at whose cost?
Responsibility?
- Archive of findings for future medical use? – privacy and confidentiality

Immigration x-rays: detection of active or past disease

- Chest x-ray to detect active or past tuberculosis
- Justified on basis of population health
- Consequence of diagnosis: Deportation or treatment?
- Voluntary consent?
- Targeting vs. discrimination?
- Incidental findings?
 - Follow-up?
 - Costs?
 - Impact on immigration/refugee application?



International Health Regulations (2005)

- International legal instrument that is binding on 196 countries across the globe, including all WHO Member States.
- Aim: help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide.

International Health Regulations (2005)

Article 32 Treatment of travellers

In implementing health measures under these Regulations, States Parties shall treat travellers with respect for their dignity, human rights and fundamental freedoms and minimize any discomfort or distress associated with such measures, including by:

- (a) treating all travellers with courtesy and respect;
- (b) taking into consideration the gender, sociocultural, ethnic or religious concerns of travellers; and
- (c) providing or arranging for adequate food and water, appropriate accommodation and clothing, protection for baggage and other possessions, appropriate medical treatment, means of necessary communication if possible in a language that they can understand and other appropriate assistance for travellers who are quarantined, isolated or subject to medical examinations or other procedures for public health purposes.

X-rays for age determination

- Justification - Inaccuracy of tests
- Benefits – minors are often granted asylum
- Harms – radiation, mental/emotional
- Consent – consequences of not giving consent
- Confidentiality – who owns the results and how will they be used?
- Conflicting loyalty for physicians– medical exam without medical reason, obligations and relationship to minors

Scenarios

Category 1: Medical equipment and medical staff

Medical Ethics

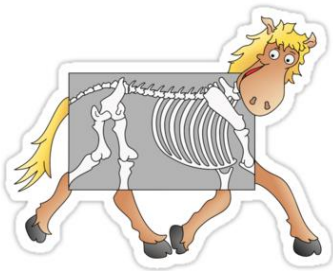
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Category 2: Non-medical equipment and non- medical staff

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Category 2 practices – potential ethical implications

Non-medical equipment and non-medical staff

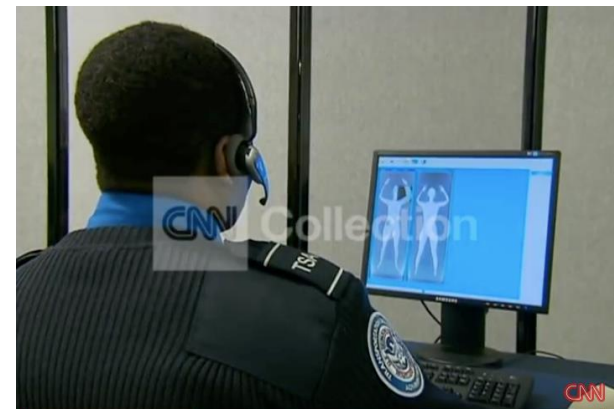


<https://www.doctorramey.com/lets-talk-x-rays/>

- Human rights impact?
- Presumed consent when all well informed
- How much individual latitude vs. efficiency
- Presumption of guilt in case of “screening for theft” – disrespectful
- Risk to those handling radiation – who monitors standards, equipment?
- Individual risk vs. benefit of another (employer, society?)
- Obligation to quantitate total dose? – who has oversight?

Security screening at airports

- Justified on basis of air travel safety & trust
- Implicit consent
- Is use of X-rays necessary?
- Airline workers – increased exposure
- Privacy concerns – production of body image – can be addressed where stick figures are used and images immediately deleted
- Storage of data and images?



Cargo screening to detect humans

- Arguments in favour: cost and efficiency
- Competing principles – individual rights and border security
- No consent – signs may be displayed but cannot be seen or read by occupants
- Vulnerable/sensitive populations (e.g. children, pregnant women etc.)

Other non- medical imaging scenarios

- X-rays to assess fitness for employment, e.g. sport or corporate positions
 - Medical setting: Informed consent etc.
- Scanning for suspected drug smugglers
 - Justification/Alternatives
 - Number imaged vs number of detections?
 - Need for targeting (strong suspicion)
 - Clear criteria
 - Consent?



Imaging of mine employees

- Justified by employers on basis of (high?) incidence of diamond theft – Xrays may detect and/or deter
 - Could this be tackled in a more “civilized” way? – improve working conditions, remuneration
 - Random scanning?
- Employee rights vs. commercial interests
 - What are alternatives?
- High frequency, daily exposure
 - Mining itself poses risk of lung disease and cancer -> risk exacerbated by screening?
 - Accountability of companies for life-long health consequences?
- Number needed to screen to detect one case?
 - Risk of false positive -> Human rights violations?
- Voluntary participation/ informed consent? Can employees refuse? What are the alternatives?

Central ethical considerations in use of non-medical radiation

- Individual interest vs. the common (public) good
 - *Medical and non-medical*
- Balance of system “efficiency” (safety, financial) vs. individual medical and social risk?
- What level of risk is acceptable?
 - Radiation exposure – dose, duration, frequency?
 - Data collection, storage
 - Quality of radiation equipment?
- How much coercion is justifiable?
 - Occupational screening
- How to ensure adequate transmission, comprehension of information?
 - Informed consent – Required? How operationalized? Can someone decline?
- Potential medical consequences
 - Follow-up if abnormality detected
 - Exposure during pregnancy
 - Radiation exposure may exacerbate an already increased occupational risk
 - Therapeutic misconception and erosion of trust

Conclusion: key issues

- Ethics is integral and relevant, not an “add-on” or “nice to have”
- Information is always possible and an ethical requirement
- Justice – use of public resources
- Confidentiality of health and personal information is key
- Ethically acceptable balance between risks and benefits for individual and the public
- Ethical standards will facilitate trust and public safety

Thank you !



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