

National Dose Registry

Overview of the Dutch dose registry

Govert de With – Manager NDRIS





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3. Dutch dose register
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1.1 Introduction of the Dutch dose registry

- 1956 TNO start starts with periodic radiation monitoring
- 1964 Introduction of a registration card with personalised dose
- 1972 Electronic storage of dose results by TNO
- 1988 Withdrawal of license for registration cards
- 1988 Introduction of a national dose registration
 - Total investment at the time € 50.000 / \$ 55.000
 - Dosimetry services could reimburse cost for a PC
- 1989 Start of NDRIS on the 1st of January

2.1 EU Legal frame work

- Dose registry in EU MS to comply with requirements under Annex X (EU-BSS)
- Minimum requirements
 - Worker identity
 - Undertaking / employment
 - Results from individual monitoring
 - Provide for outside workers
 - Provisions for radiation passbook



ANNEX X

Data system for individual radiological monitoring as referred to in Articles 43, 44 and 51

GENERAL PROVISIONS

The data system for individual radiological monitoring established by a Member State may be realized either as a network or as a national dose register. This data system may include the issuance of individual radiological monitoring documents for outside workers.

1. Any data system of the Member States for individual radiological monitoring of exposed workers shall comprise the following sections:
 - (a) particulars concerning the worker's identity;
 - (b) particulars concerning the medical surveillance of the worker;
 - (c) particulars concerning the undertaking of the worker and, in the case of an outside worker, the employer of the worker;
 - (d) the results of the individual monitoring of the exposed worker.
2. The competent authorities of the Member States shall take the measures necessary to prevent any forgery or misuse of, or tampering with, the data system for individual radiological monitoring.

A. Data to be included in the data system for individual radiological monitoring

3. Data on the worker's identity shall include the worker's:
 - ...
- B. Data on outside workers to be supplied via the data system for individual radiological monitoring**
 - ...

C. Provisions concerning the individual radiological monitoring document

1. Member States may decide to issue an individual radiological monitoring document for every outside worker.
2. The document shall be non-transferable.
3. Member States shall take the measures necessary to prevent a worker from being issued with more than one valid individual monitoring document at the same time.
4. In addition to the information required in Part A and Part B, the document shall include the name and address of the issuing body and the issuing date.

3.1 Objectives of Dutch dose registry

- Ensure adequate collection and storage of the results from individual dose information
- Signal any exceedance of the dose limits
- Provide for regular reporting on the collected dose information
- Make data available for (statistical) analysis

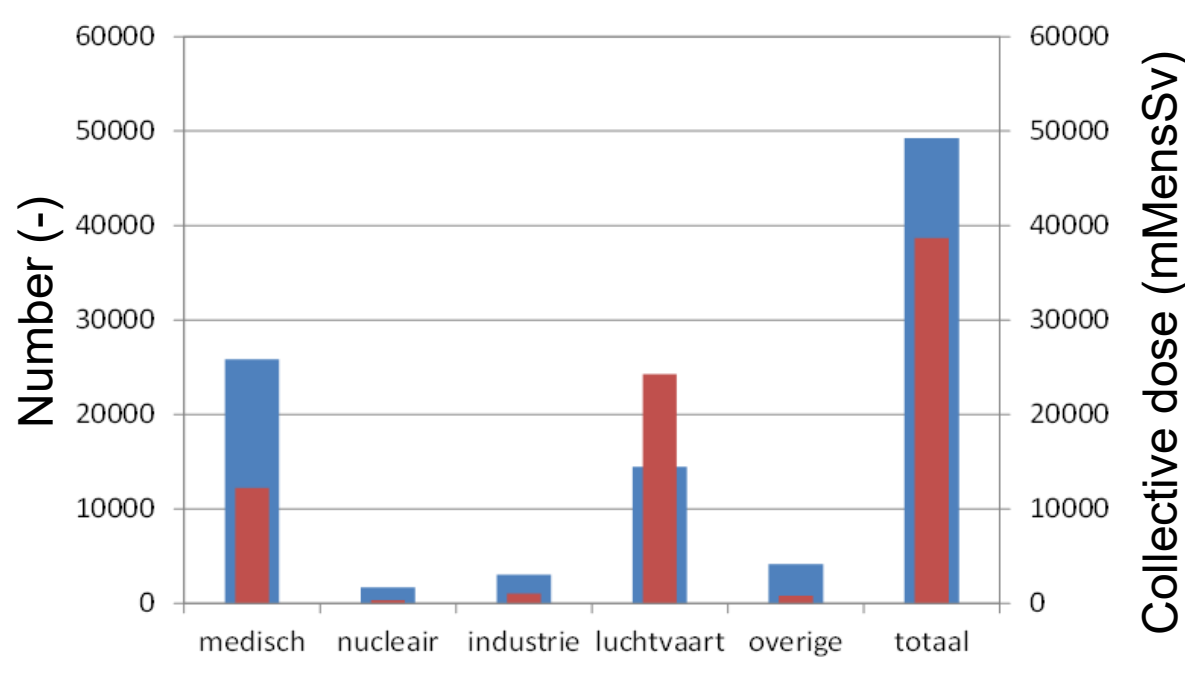


3.2 Collected dose information

- Measured dose received from the dosimetry services
- Computed dose for aircrew from airliners and large corporations
- Dose from internal contamination e.g. after incident
- Dose from outside workers



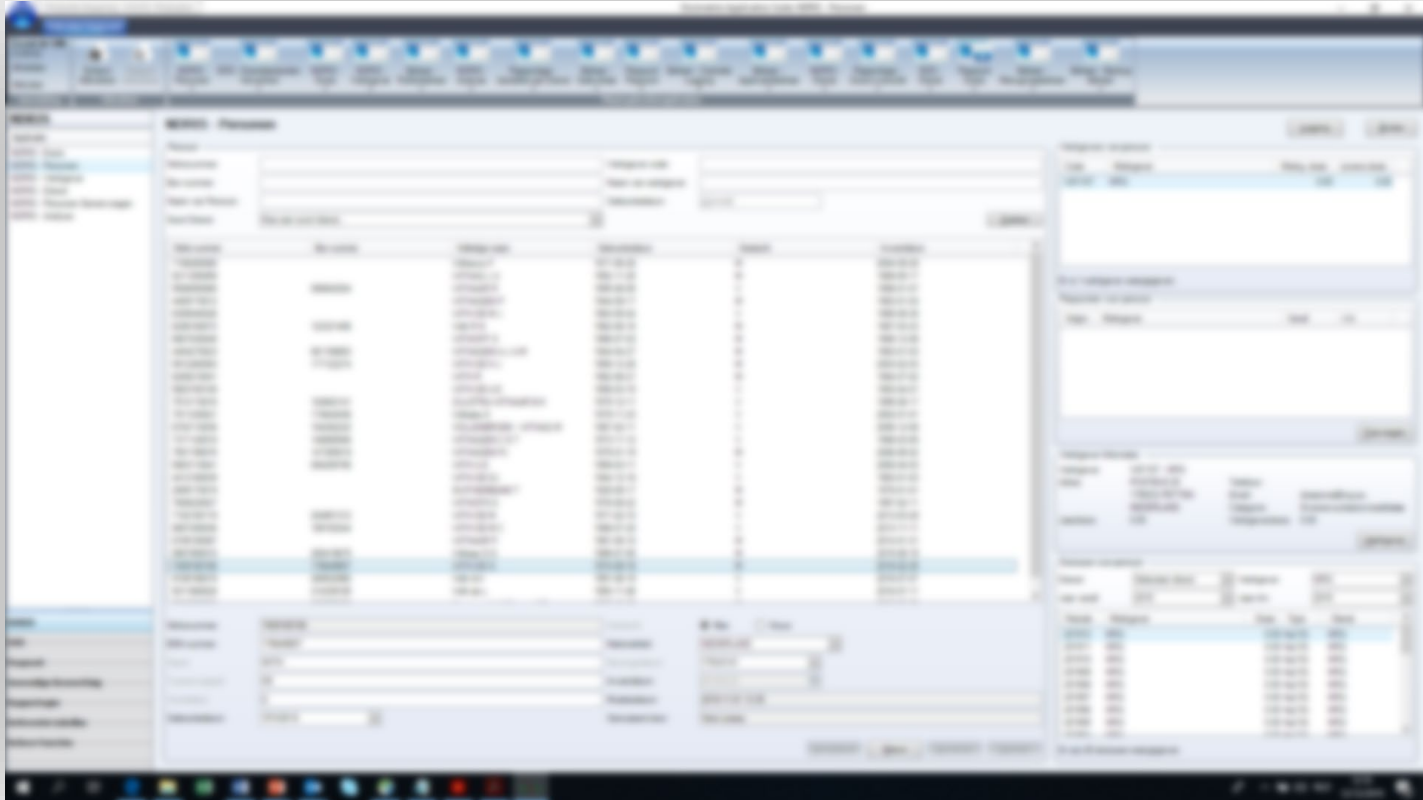
3.3 Summary 2018



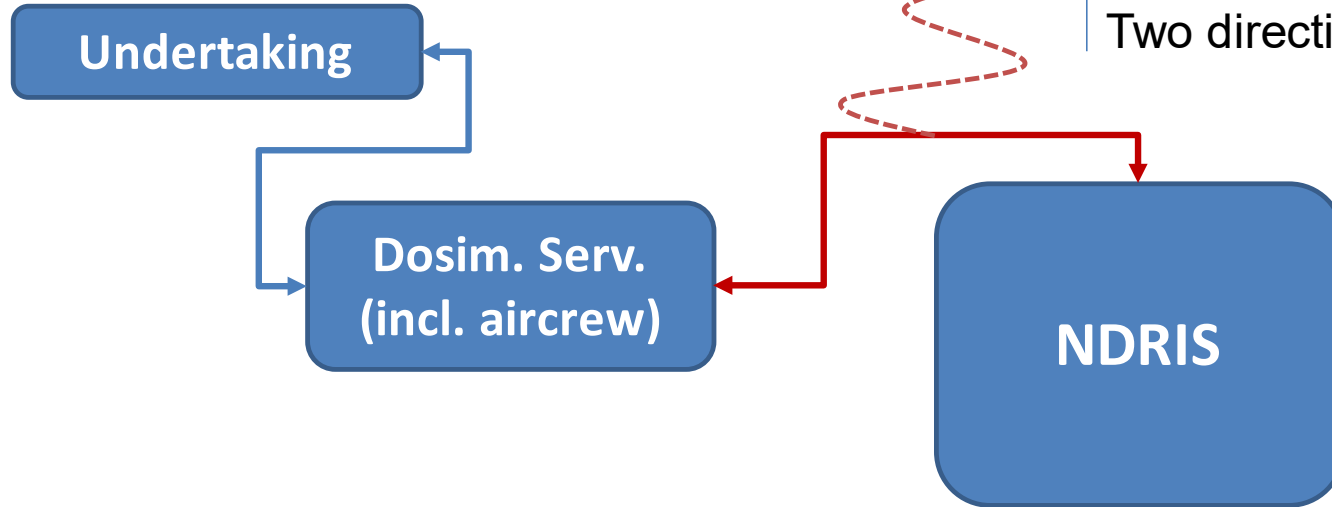
Medical	0,47 mSv
Nuclear	0,19 mSv
Industry	0,34 mSv
Aircrew	1,68 mSv
Remain	0,19 mSv
Total	0,79 mSv

■ Number ■ Collective dose

3.4 NDRIS software application



3.5 NDRIS database



Secure internet *ISO 27001*

NDRIS accumulates individual dose

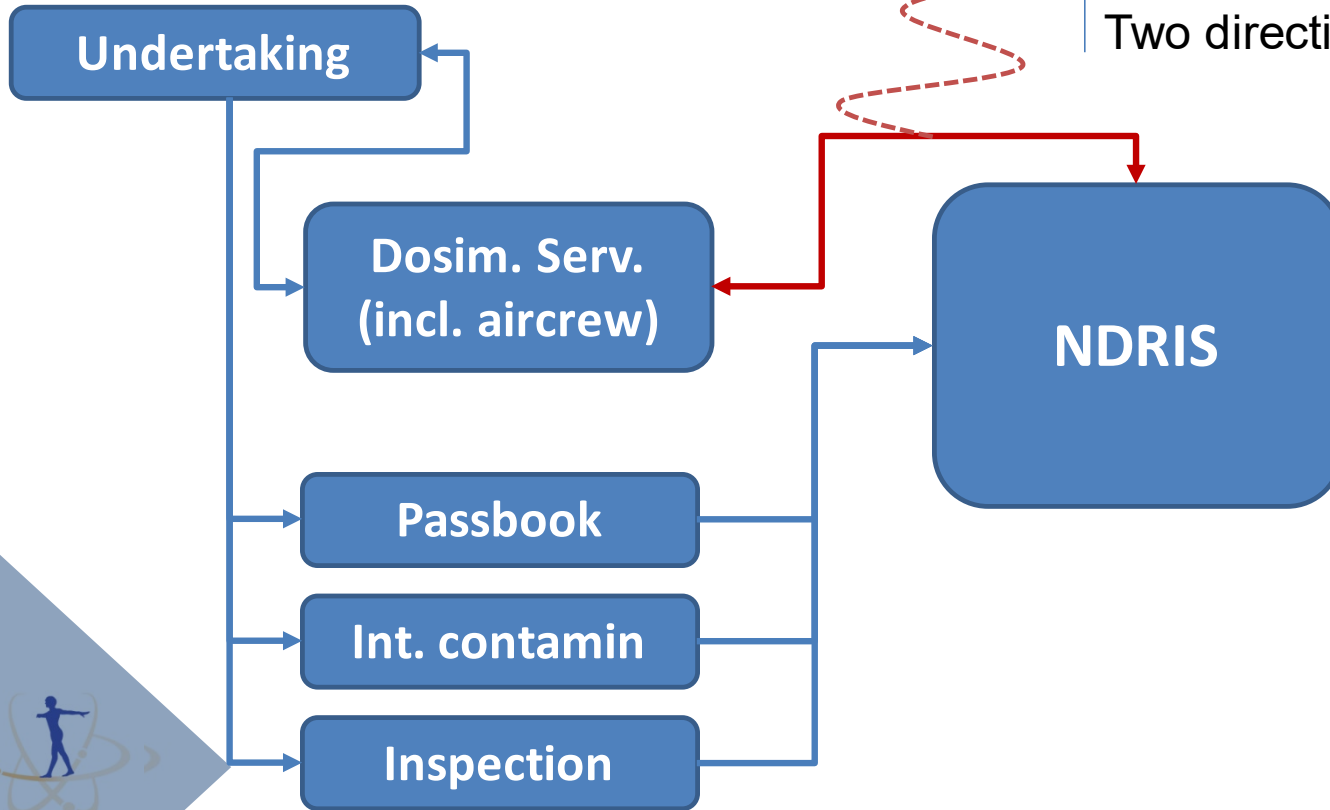
Two direction information transfer



3.5 NDRIS database

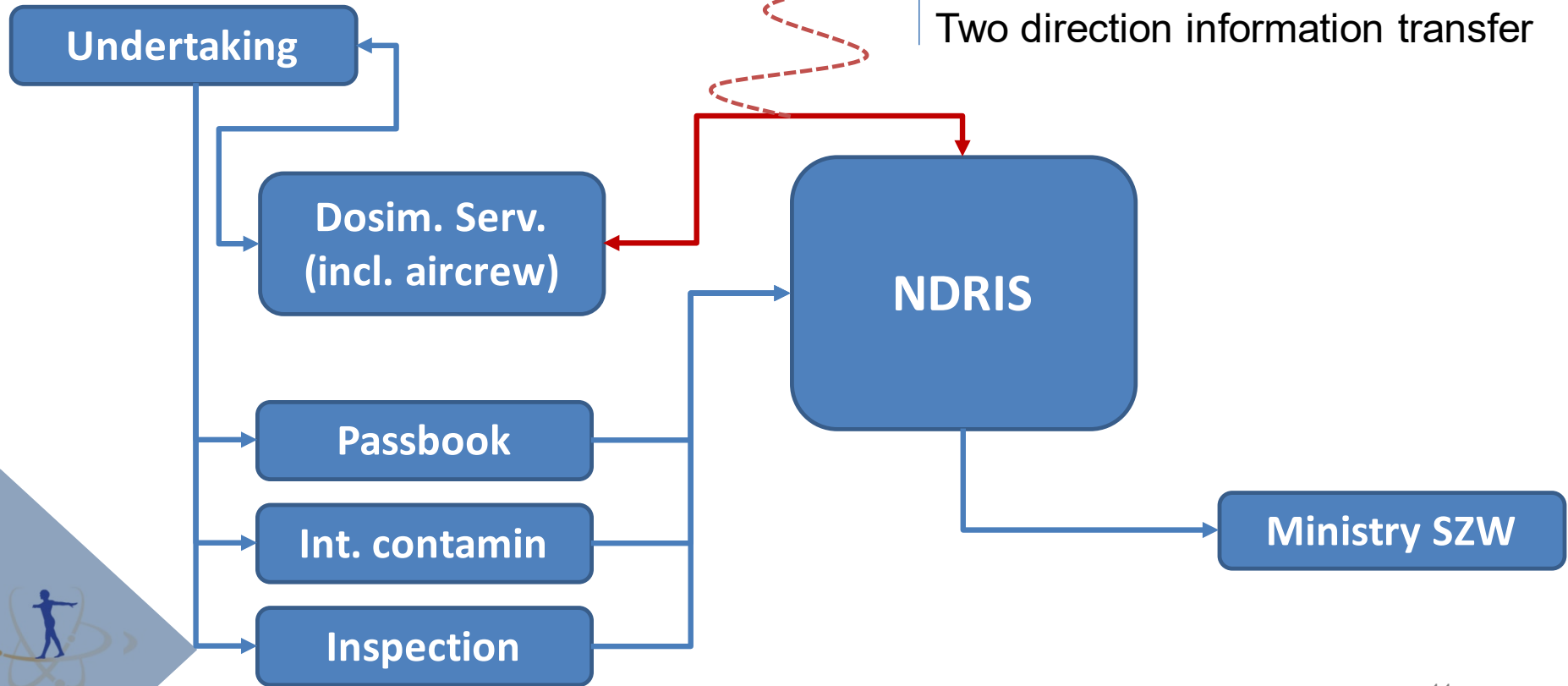
Secure internet *ISO 27001*

NDRIS accumulates individual dose
Two direction information transfer



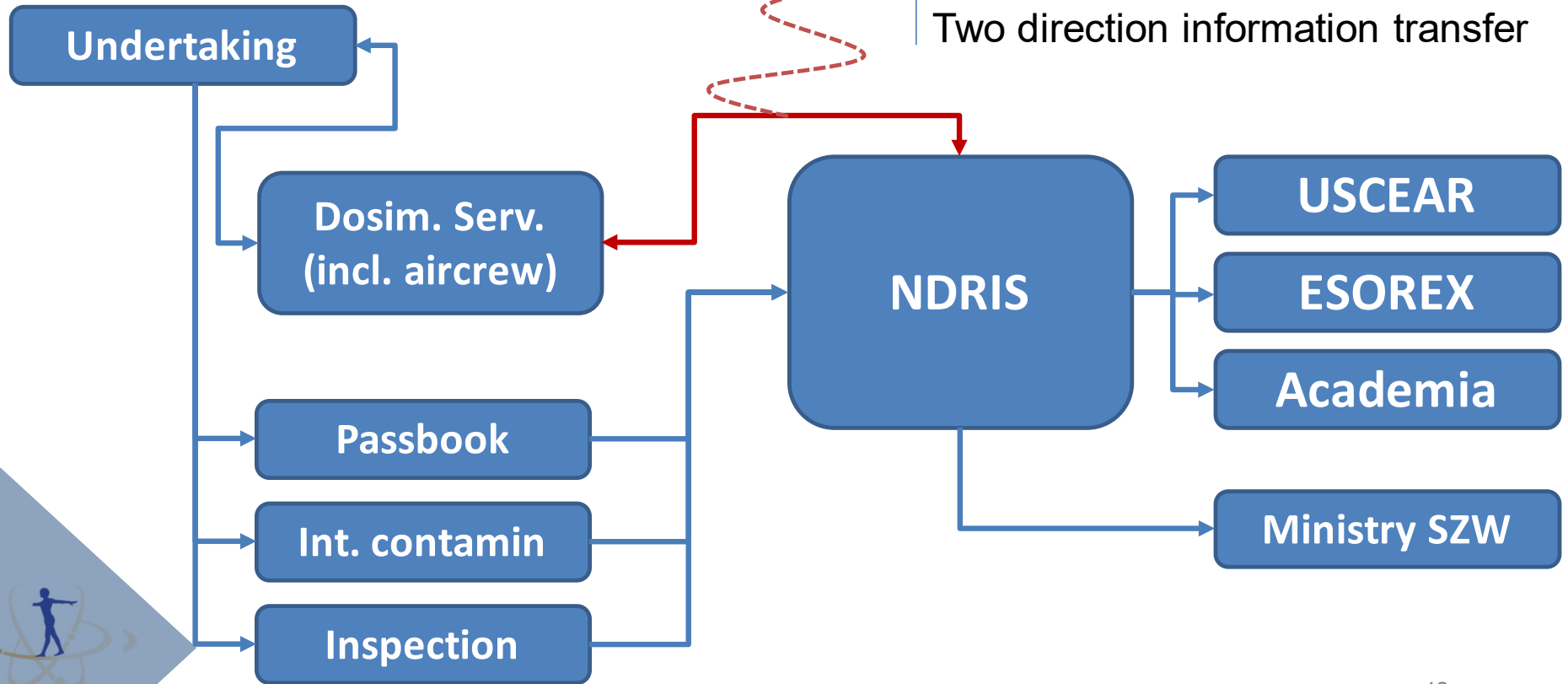
3.5 NDRIS database

Secure internet *ISO 27001*
 NDRIS accumulates individual dose
 Two direction information transfer



3.5 NDRIS database

Secure internet *ISO 27001*
 NDRIS accumulates individual dose
 Two direction information transfer



3.5 NDRIS database

- Workers are labelled according to
 - sector
 - application
 - Source
- Labels consistent with EU initiatives

Code	Omschrijving
S11	Röntgentoestellen <100 kV
S12	Röntgentoestellen ≥100 kV
S13	Diverse röntgentoestellen
S14	Parasitaire röntgenstraling uitzendende toestellen (b.v. radar)
S21	Lineaire versnellers
S22	Cyclotrons
S30	Reactoren
S41	Ingekapselde bronnen, niet neutronen
S42	Ingekapselde neutronenbronnen op basis van α/n reactie
S43	Ingekapselde neutronenbronnen op basis van spontane splijting
S44	Ingekapselde bronnen, diverse
S51	Open bronnen C/D niveau
S52	Open bronnen B niveau
S60	Natuurlijke bronnen
S90	Niet in te passen

Code	Omschrijving	Code	Omschrijving
	Medische toepassingen		Bedrijfsmatige toepassingen
M10	Algemene radiologie	B11	Industriële radiografie, vaste opstelling
M11	Ingrepen onder doorlichting, arts	B12	Industriële radiografie, mobiele opstelling
M12	Ingrepen onder doorlichting, overige	B20	Transport (excl. splijtstoffen)
M20	Radiotherapie	B30	Isotopenproductie
M31	Nucleaire geneeskunde excl. PET	B40	Industriële bestraling
M32	PET-toepassingen	B50	Mijnbouw inclusief olie- en gaswinning
M40	Tandheelkundige radiologie	B60	Meet- en regeltechniek
M50	Diergeneeskundige radiologie	B71	Luchtvaart cockpitbemanning
M90	Overige medische toepassingen	B72	Luchtvaart cabinepersoneel
		B90	Overige bedrijfsmatige toepassingen
	Toepassingen in splijtstofcyclus		Overige toepassingen
K10	Splijtstofverrijking	D10	Onderwijs, onderzoek en ontwikkeling
K21	Kernenergie eigen personeel	D20	Onderhoud en reparatie toestellen
K22	Kernenergie extern personeel	D30	Beveiliging, veiligheid en inspectie
K30	Ontmanteling	D90	Niet in te passen toepassingen
K40	Afvalverwerking en opslag		
K50	Opslag splijtstoffen		
K60	Transport splijtstoffen		
K70	Onderzoek in splijtstofcyclus		
K90	Overige nucleaire toepassingen		



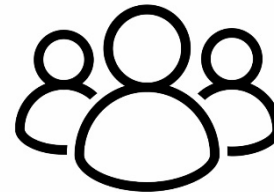
3.6 Human resources and services

NDRIS human resource

- NDRIS management (2 persons)
 - Manager
 - Deputy
- Secretarial support (3 persons)
 - First responsible
 - NDRIS support during office hours
- Back-office (3 persons)
 - Legal officer (DPO)
 - Security manager
 - IT expert

NDRIS services

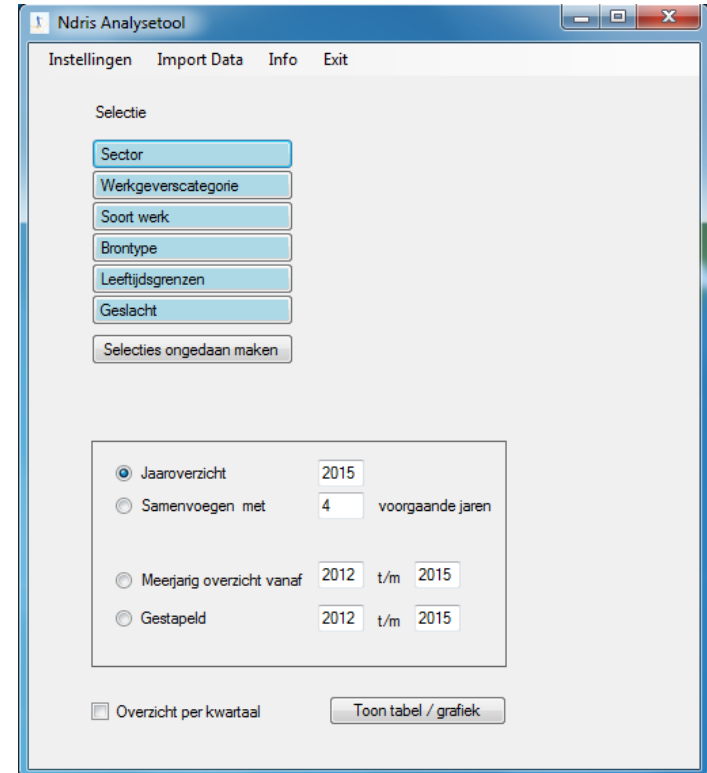
- Formal reporting (2 / yr)
- Radiation passbook (~200 / yr)
- Dose history (~20 / yr)
- Dose correction (~30 / yr)
- Request for internal dose (< 5 / yr)
- General requests (~20 / yr)
(Experts, students, public)



The NDRIS team

3.7 NDRIS data tool

- Use of NDRIS data for policy development.
- Initial development of the tool in 2014.
- Used by governmental organisations



Ndris Analysetool

Instellingen Import Data Info Exit

Selectie

Sector

Werkgeverscategorie

Soort werk

Brontype

Leeftijdsgrenzen

Geslacht

Selecties ongedaan maken

Soort werk

Geselecteerd	SoortWerkCode	Omschrijving
<input checked="" type="checkbox"/>	B11	Industriële radiografie, vaste opstelling
<input type="checkbox"/>	B12	Industriële radiografie, mobiele opstelling
<input type="checkbox"/>	B20	Transport (excl. splijtstoffen)
<input type="checkbox"/>	B30	Isotopenproductie
<input type="checkbox"/>	B40	Industriële bestraling
<input type="checkbox"/>	B50	Mijnbouw inclusief olie- en gaswinning
<input type="checkbox"/>	B60	Meet- en regeltechniek
<input type="checkbox"/>	B71	Luchtvaart cockpitbemanning
<input type="checkbox"/>	B72	Luchtvaart cabinepersoneel
<input type="checkbox"/>	B90	Overige bedrijfsmatige toepassingen
<input type="checkbox"/>	D10	Onderwijs, onderzoek en ontwikkeling
<input type="checkbox"/>	D20	Onderhoud en reparatie toestellen
<input type="checkbox"/>	D30	Beveiliging, veiligheid en inspectie
<input type="checkbox"/>	D90	Niet in te passen toepassingen
<input type="checkbox"/>	K10	Splijtstofverrijking
<input type="checkbox"/>	K21	Kernenergie eigen personeel
<input type="checkbox"/>	K22	Kernenergie extern personeel
<input type="checkbox"/>	K30	Ontmanteling
<input type="checkbox"/>	K40	Afvalverwerking en opslag
<input type="checkbox"/>	K50	Opslag splijtstoffen
<input type="checkbox"/>	K60	Transport splijtstoffen
<input type="checkbox"/>	K90	Overige nucleaire toepassingen
<input type="checkbox"/>	M10	Algemene radiologie
<input type="checkbox"/>	M11	Ingrepen onder doorlichting, arts
<input type="checkbox"/>	M12	Ingrepen onder doorlichting, overige
<input type="checkbox"/>	M20	Radiotherapie
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<input type="checkbox"/>	M40	Tandheelkundige radiologie
<input type="checkbox"/>	M50	Diergeneeskundige radiologie
<input type="checkbox"/>	M90	Overige medische toepassingen

Jaaroverzicht 2015
 Samenvoegen met 4 voorgaande jaren
 Meerjarig overzicht vanaf 2002 t/m 2015
 Gestapeld 2002 t/m 2015

Overzicht per kwartaal

Ndris Analysetool

Instellingen Import Data Info Exit

Selectie

Sector
Werkgeverscategorie
Soort werk
Brontype
Leeftijdsgrenzen
Geslacht
Selecties ongedaan maken

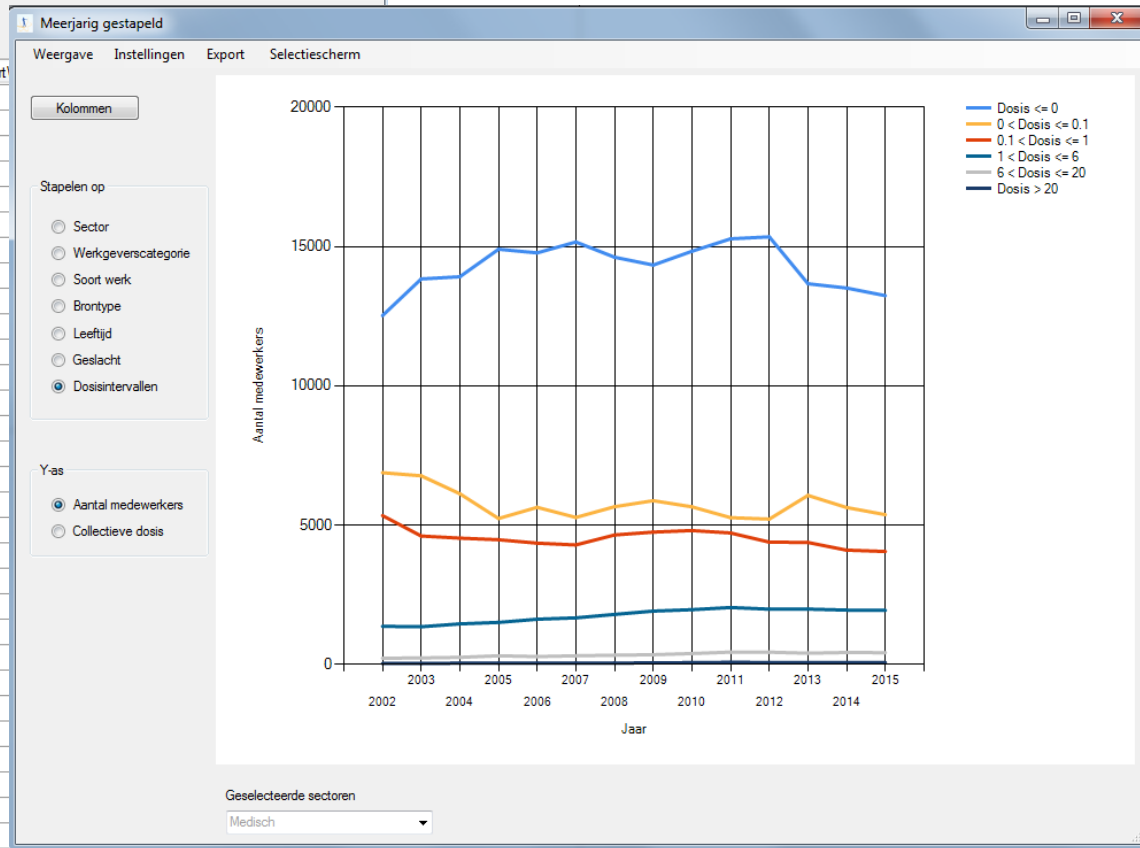
Soort werk

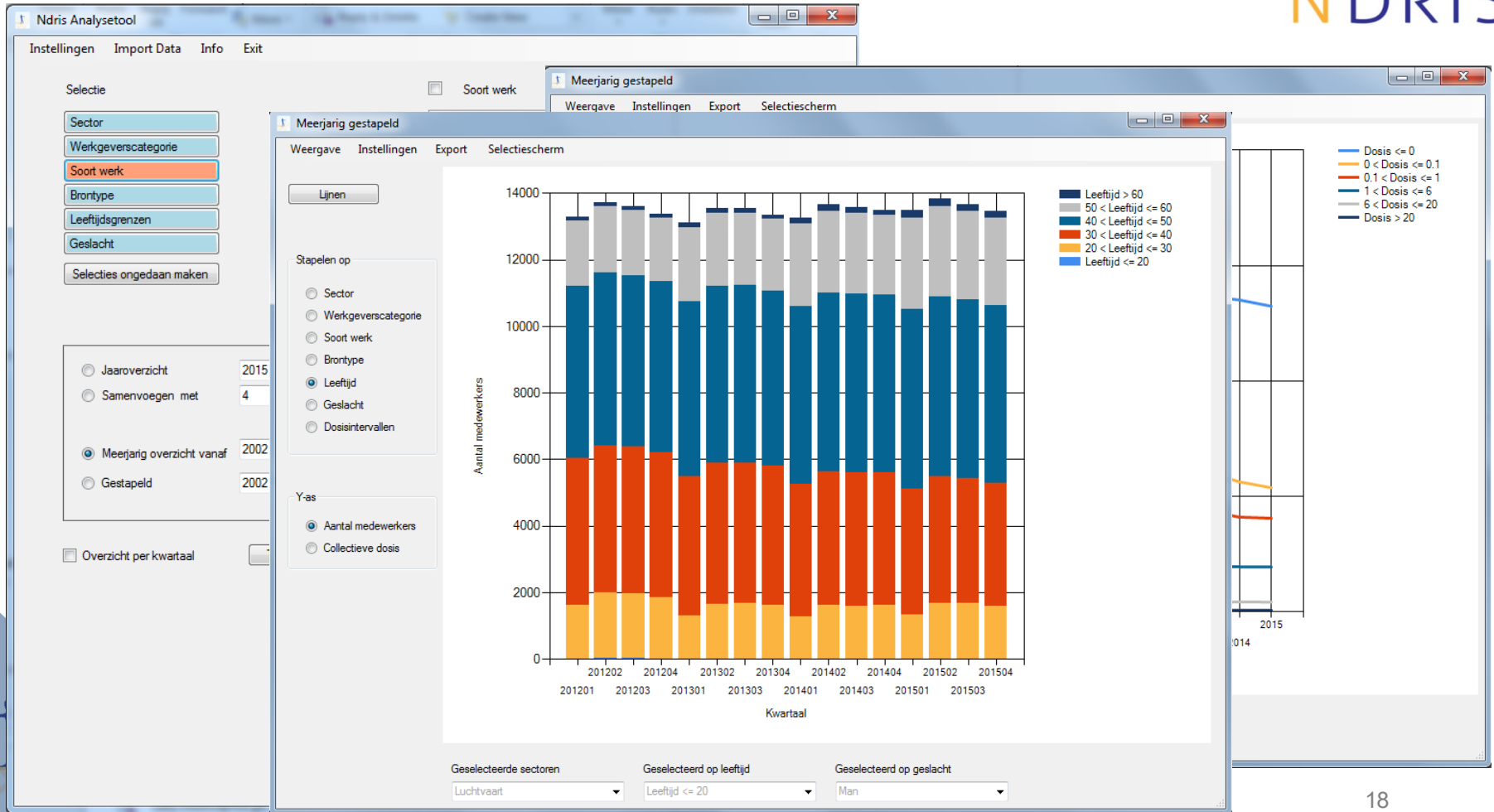
Geselecteerd Soort

<input checked="" type="checkbox"/>	B11
<input type="checkbox"/>	B12
<input type="checkbox"/>	B20
<input type="checkbox"/>	B30
<input type="checkbox"/>	B40
<input type="checkbox"/>	B50
<input type="checkbox"/>	B60
<input type="checkbox"/>	B71
<input type="checkbox"/>	B72
<input type="checkbox"/>	B90
<input type="checkbox"/>	D10
<input type="checkbox"/>	D20
<input type="checkbox"/>	D30
<input type="checkbox"/>	D90
<input type="checkbox"/>	K10
<input type="checkbox"/>	K21
<input type="checkbox"/>	K22
<input type="checkbox"/>	K30
<input type="checkbox"/>	K40
<input type="checkbox"/>	K50
<input type="checkbox"/>	K60
<input type="checkbox"/>	K90
<input type="checkbox"/>	M10
<input type="checkbox"/>	M11
<input type="checkbox"/>	M12
<input type="checkbox"/>	M20
<input type="checkbox"/>	M31
<input type="checkbox"/>	M32
<input type="checkbox"/>	M40
<input type="checkbox"/>	M50
<input type="checkbox"/>	M90

Overzicht per kwartaal Toon tabel / grafiek

Jaaroverzicht 2015
Samenvoegen met 4 voorgaande jaren
 Meerjarig overzicht vanaf 2002 t/m 2015
 Gestapeld 2002 t/m 2015





Ndris Analysetool

Instellingen Import Data Info Exit

Selectie

Sector

Werkgeverscategorie

Soort werk

Brontype

Leeftijdsgrenzen

Geslacht

Selecties ongedaan maken

Soort werk

Meerjarig gestapeld

Weergave Instellingen Export Selectiescherm

Meerjarig gestapeld

Weergave Instellingen Export Selectiescherm

Lijnen

Stapelen op

Sector

Werkgeverscategorie

Soort werk

Brontype

Leeftijd

Geslacht

Dosistijd

Y-as

Aantal

Collectie

Overzicht per kwartaal

Jaaroverzicht 2015

Samenvoegen met 4

Meerjarig overzicht vanaf 2002

Gestapeld 2002

Instellingen

NRi	<input type="text" value="0"/>	<input type="text" value="0.1"/>	<input type="text" value="1"/>	<input type="text" value="6"/>	<input type="text" value="20"/>
Percentielen	<input type="text" value="25"/>	<input type="text" value="50"/>	<input type="text" value="75"/>	<input type="text" value="90"/>	
Leeftijdsgrenzen	<input type="text" value="20"/>	<input type="text" value="30"/>	<input type="text" value="40"/>	<input type="text" value="50"/>	<input type="text" value="60"/>

Opslaan

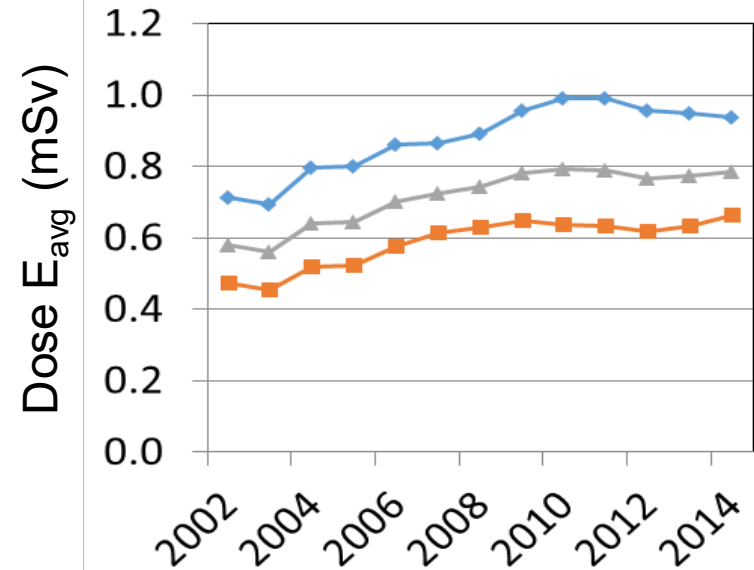
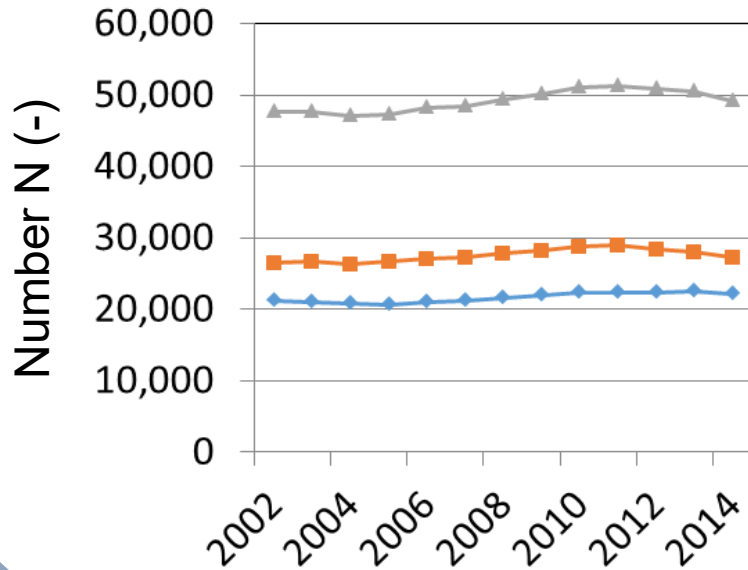
Geselecteerde sectoren: Luchtvaart

Geselecteerd op leeftijd: Leeftijd <= 20

Geselecteerd op geslacht: Man

2015

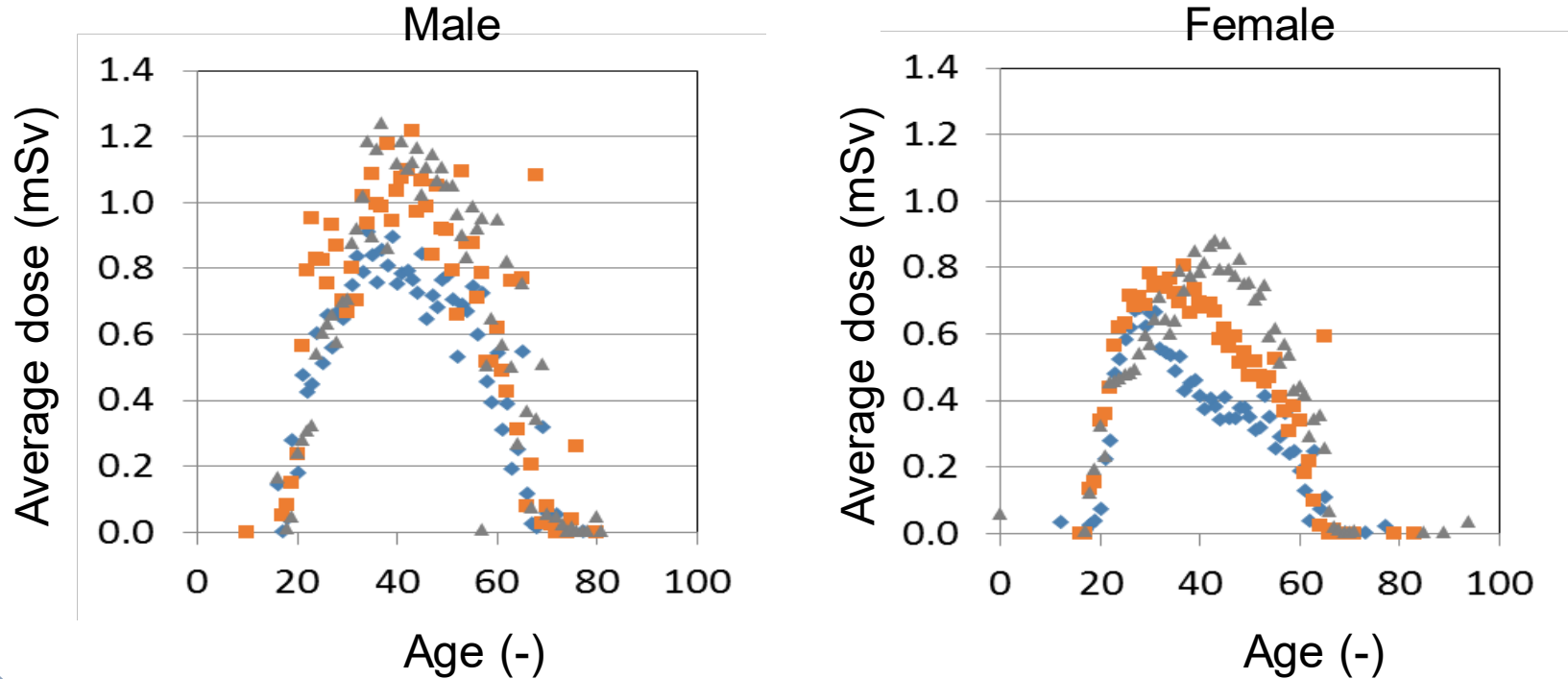
3.9 Average effective dose E_{eff}



◆ Male ■ Female ▲ Total



3.10 Dose distribution for age and sex



◆ 2002 ■ 2008 ▲ 2014

4.1 HERCA NT on dose collection

- The objective of the network
 - Share experiences & best practices in the field of collection, registration and reporting of occupational doses.
 - Share dose information from HERCA Network members, to perform analysis and interpretation

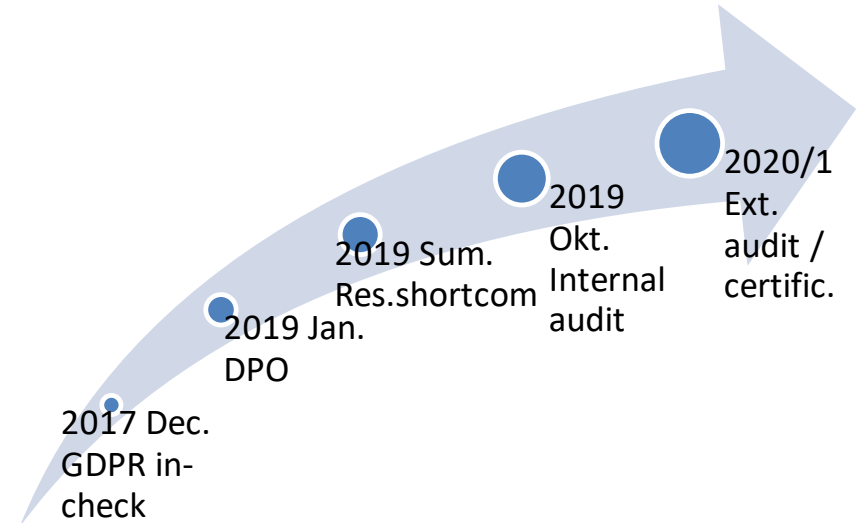


HERCA Network on Occupational Dose Collection, Registration and Reporting



4.2 General Data Protection Regulation

- Initial check in 2017 with some major conclusions:
 - Dose information must be classified as a special category of personal data
 - Data protection officer (DPO) mandatory
 - Privacy agreements to be drafted with all organizations involved
- Since 2019 with DPO reviewing work procedures and resolving short-comings



5.1 Conclusions

- NDRIS is the Dutch dose registry
- Around 45.000 radiological workers in NL
- Required competences include: RP, legal, quality and IT
- New challenges in GDPR compliance and IT security
- EU HERCA network on dose collection to address common needs



QUESTIONS?

