Teleradiology in cross-border Healthcare

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Brussels, Belgium

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Chair of ESR Subcommitte on „Professional Issues and Economics in Radiology“ (PIER)

User Cochair in IHE – Europe (Integrating the Healthcare Enterprise)

Several other committments

e.g. DICOM Standards Committee

No disclosures in regards of topics or examples in this presentation

FACTS AND FIGURES
ABOUT THE ESR & ECR

66,175 individual members from 155 countries

45 European national member societies

16 European subspecialty and allied sciences member societies

44 non-European national member societies

MAIN ACTIVITIES OF THE ESR: Education and Training, Research, European and International Affairs, EuroSafe Imaging, European Congress of Radiology…

THE **EUROPEAN** CONGRESS OF **RADIOLOGY**

25,998

PARTICIPANTS FROM

133

COUNTRIES

8,275
INDUSTRY REPRESENTATIVES

11,796
PROFESSIONAL DELEGATES

5,927
ECR ONLINE VIEWERS

300
EXHIBITORS (26,000m²)

ESR
EUROPEAN SOCIETY OF RADIOLOGY

WHY TELERADIOLOGY?

- Geographically understaffed regions
- Access to experts, enabling subspecialisation
- Behaviour of radiologists (“Work-Life-Balance”)
- Night-services (out-of-office-hours)
- Shortage of radiologists

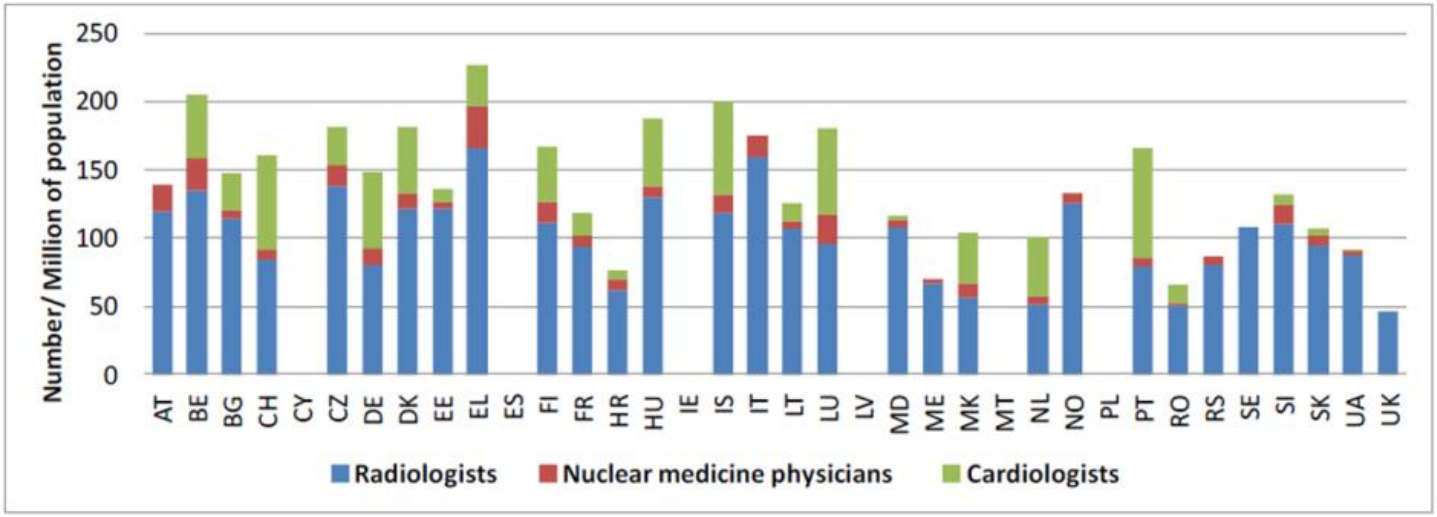


Figure 4.2. Numbers of specific health care professionals, per million of population. In case of no number, no information from the country has been available

RADIATION PROTECTION N° 180 **Medical Radiation Exposure of the European Population Luxemburg, Dezember 2014**

RADIOLOGICAL WORKFLOW

AND ASSOCIATED STEPS

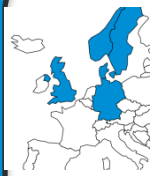
- Justification
  - Clinical conditions&questions, history&former exams, patient information&consent
- Protocol Definition
  - Select appropriate method, no. of phases, dose level etc.
- Imaging Procedure
  - Almost performed by technicians, but placement of protection material, device status (incl. replacement) etc. to be checked
- Image Interpretation
  - Primary reporting or consultation, reporting standards, clearness etc.
- Presentation and discussion with referrers
  - Regular meetings with refferers, presentation of findings, recommendations, interpretation in context with other results etc.
- Quality assurance
  - Peer review, analytics, dose optimisation etc.

TELERADIOLOGY IN EUROPE

- 3 models:
  - hospital employees working off-site shifts
  - commercial companies providing the whole service
  - Expert consultation (2nd Opinion)
- Technology no barrier anymore
- Little international variation in image interpretation
- ESR standardised curriculum for training and lifelong learning
- European Diploma in Radiology as uniform test of competence
- Concerns on justification, accreditation, patient involvement…

TR CROSS-BORDER CASE STUDIES

TMC

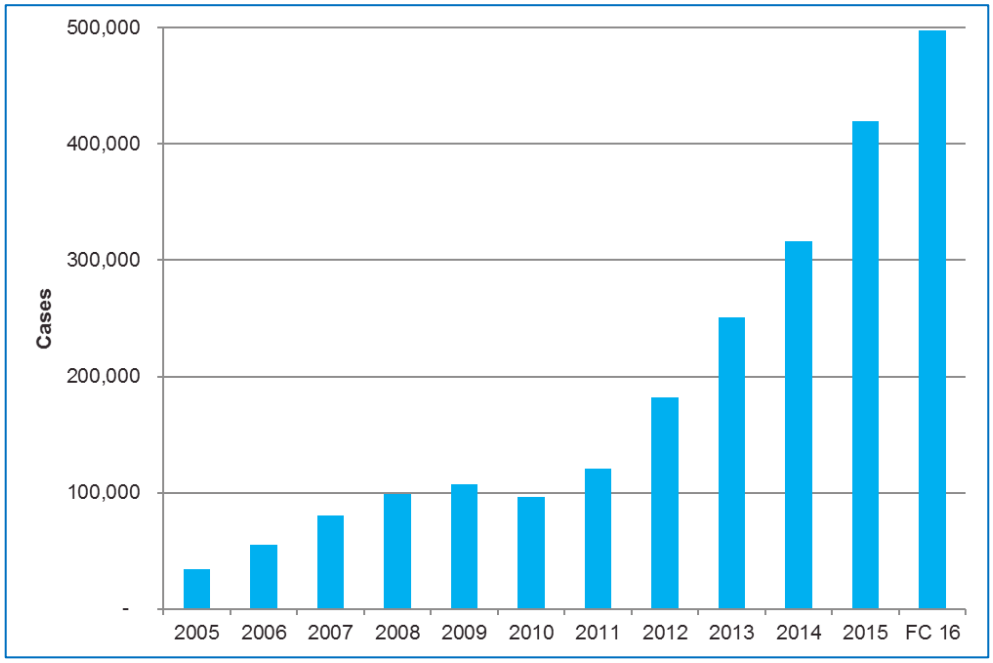


Leading european TR- and Telepatholgy-Provider

2002 founded by swedish physicians

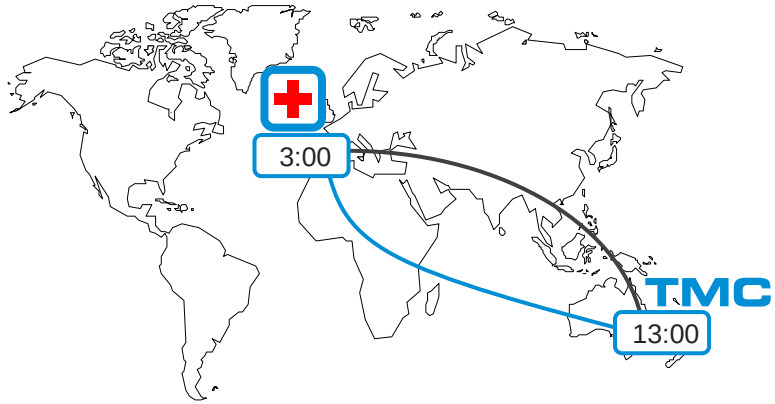
2016

- 192 Radiologists
- 7 Pathologists
- 100 additional staff



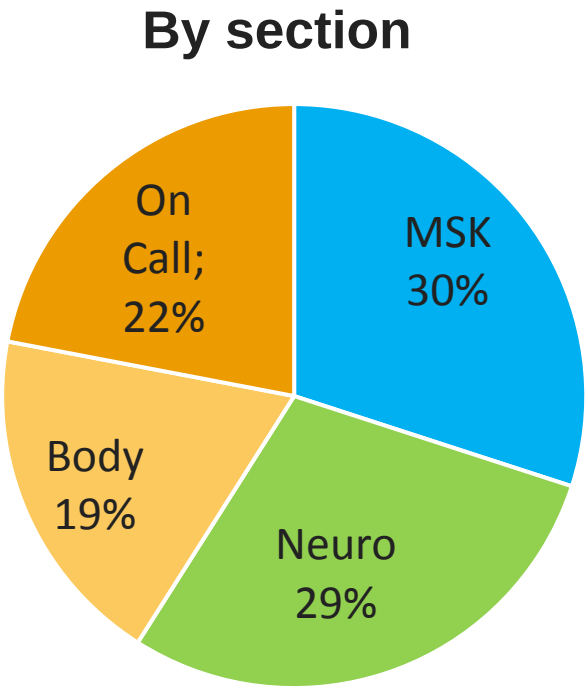
TMC On-Call

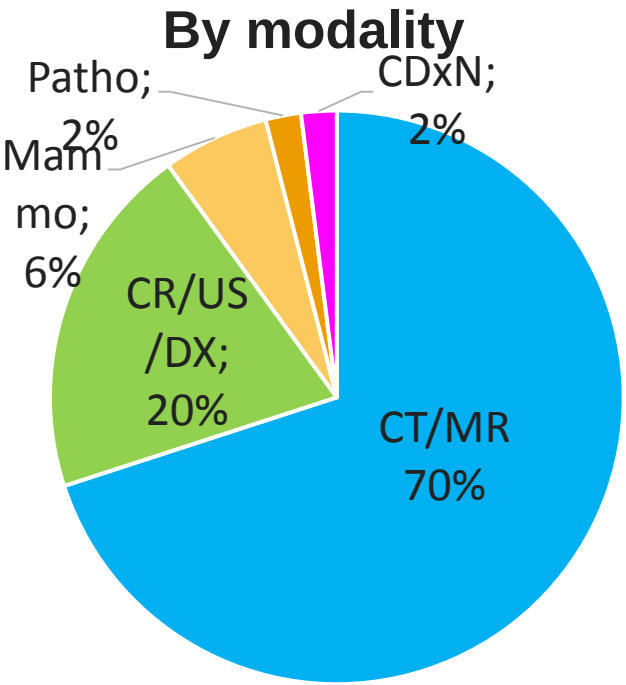
Off-hours service from Australia

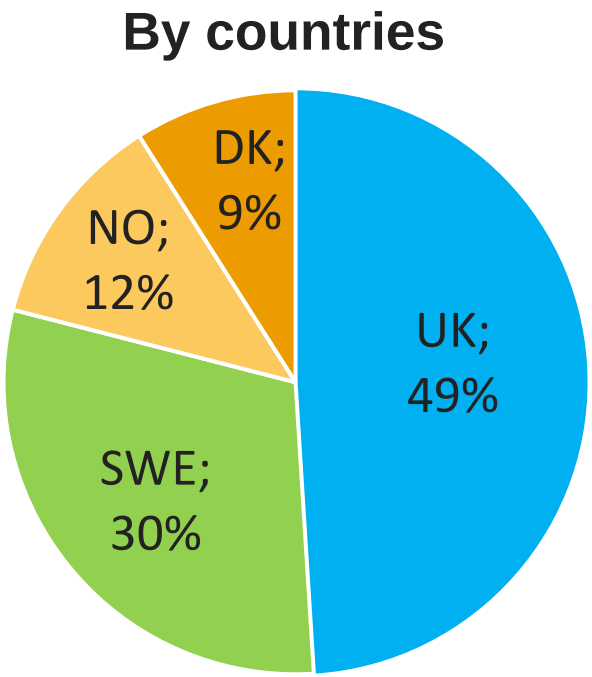


Courtesy: Alexander Boehmcker, CEO TMC

Distribution of cases in 2015: n=420.000







Discrepancy rates over all, ~10% going through peer review

ALL COMPANY	Total 14	Total 15	Jan	Feb	March	April	May	June	July	Aug	Avg. 16	KPI
Level 5	88,6%	86,3%	80,3%	83,0%	83,5%	83,8%	83,3%	83,9%	82,2%	77,1%	82,5%	80%
Level 4	8,6%	10,3%	15,6%	12,7%	11,6%	12,5%	12,3%	12,3%	13,4%	17,3%	13,2%	15%
Level 3	2,7%	3,3%	3,8%	3,9%	4,4%	3,3%	3,9%	3,4%	3,6%	5,2%	3,9%	4%
Level 2	0,1%	0,1%	0,2%	0,4%	0,4%	0,4%	0,4%	0,3%	0,7%	0,3%	0,4%	1%
Level 1	0,01%	0,01%	0,1%	0,0%	0,1%	0,0%	0,0%	0,1%	0,1%	0,1%	0,06%	0,00%
2nd Reads:	63.866	76.119	5.651	6.381	6.486	6.707	7.198	5.319	3.527	3.715	44.984	

Courtesy: Alexander Boehmcker, CEO TMC

TR CROSS-BORDER CASE STUDIES II

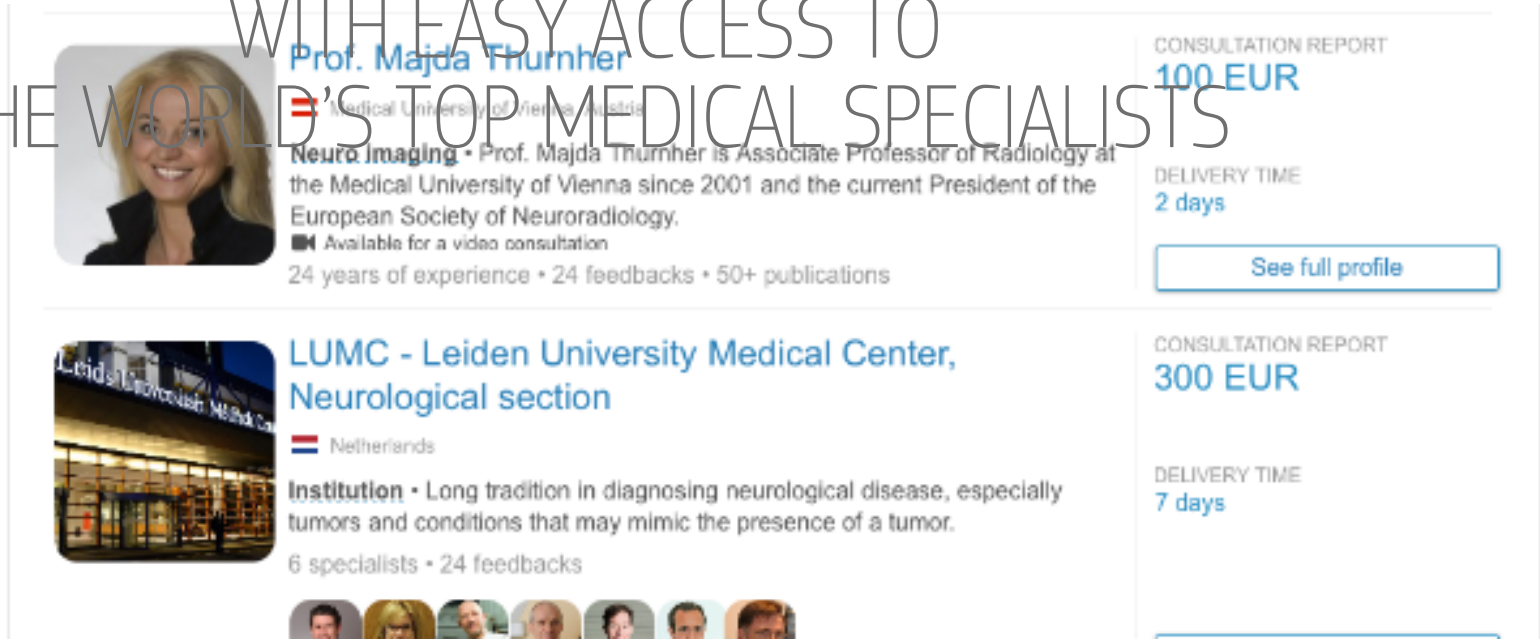
diagnose.me

Client identifies his/her health problem and chooses from a shortlist of pre-filtered specialists.

Client provides symptoms' details and medical documentation (MRI, CT, X-ray, etc), asks questions.

Client gets medical advice from the specialist, within maximum 5 working days.

PROVIDING PATIENTS WITH EASY ACCESS TO THE WORLD'S TOP MEDICAL SPECIALISTS



Courtesy: Erik Ranschaert, MD Chief Medical Officer of Diagnose.me

ESR PUBLICATIONS ON TELERADIOLOGY

- 2006: Teleradiology in the European Union White Paper
- 2014: ESR white paper on teleradiology
  - an update from the teleradiology subgroup
- 2016: ESR teleradiology survey
  - 2 surveys: - national radiology societies in Europe
  - practising radiologist ESR members

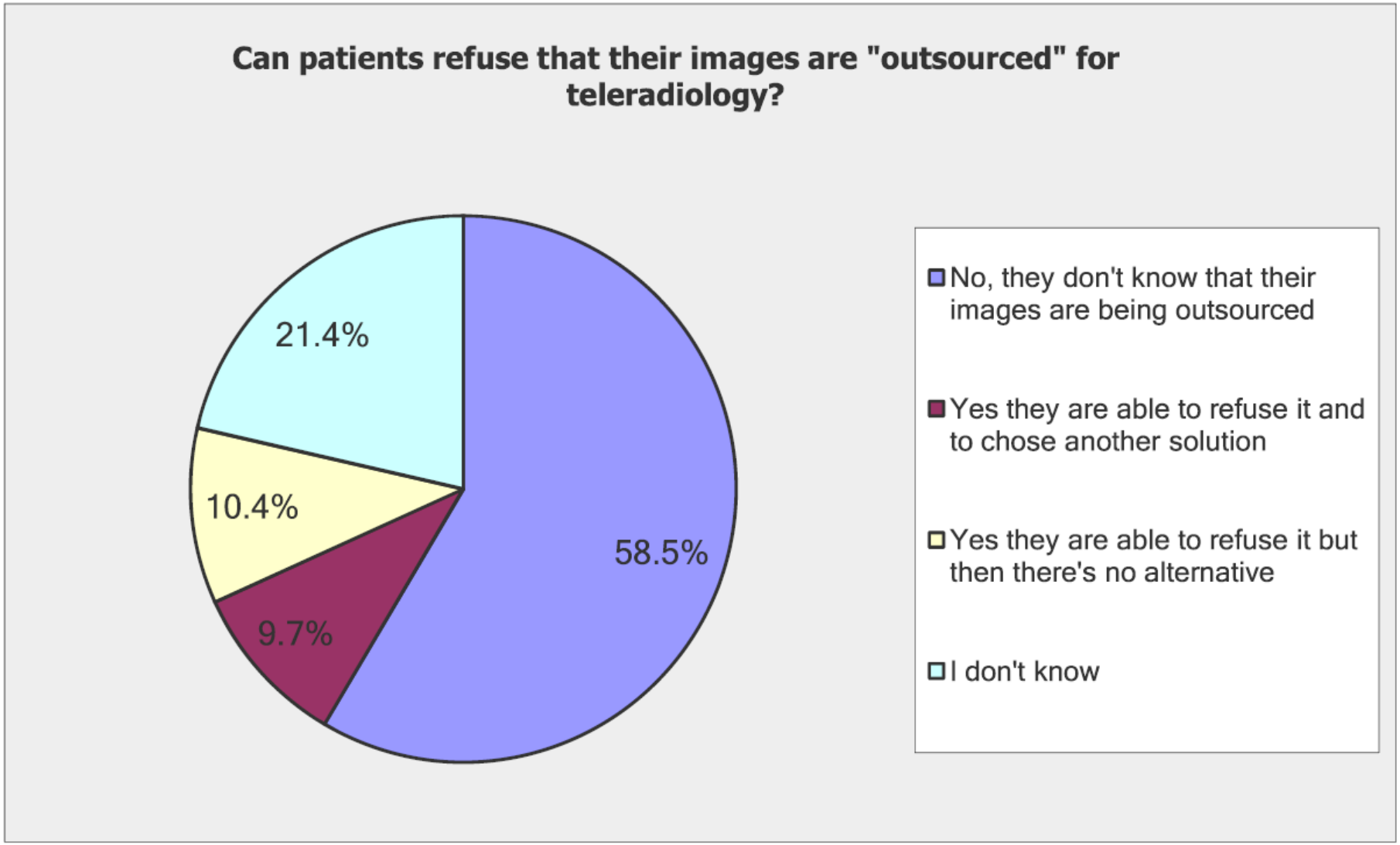
ESR PUBLICATIONS ON TELERADIOLOGY

- **2014: ESR white paper on teleradiology: an update from the teleradiology subgroup**

  - Teleradiology services are increasingly integrated in the workflow of radiology departments
  - Technological possibilities open the way for cross-border healthcare services including teleradiology
  - Teleradiology should be part of the spectrum of radiology services, not a separate tradable commodity
  - The same quality standards should apply to images and reporting
  - Patients need to be fully informed when teleradiology is used

EUROPEAN SOCIETY OF RADIOLOGY

ESR TELERADIOLOGY SURVEY 2016



AREAS FOR IMPROVEMENT in eHEALTH

(SELECTION)

- Justification
- Radiation protection
- Reporting
- Documentation & Quality Assurance
- Communication & Access

Table 5.4. The Top 20 total frequencies of x-ray procedures per 1000 of population for all countries and for the main groups (plain radiography, fluoroscopy, computed tomography and interventional radiology). LV: no Top 20 data provided. Plain radiography of the Top 20 method does not include dental procedures.

Country	Plain radiography	Fluoroscopy	Computed tomography	Interventional radiology	TOP 20 total frequency per 1000
AT	514,9	22,8	63,4	0,4	602
BE	487,6	15,9	164,3	11,5	679
BG	248,7	15,5	33,3	0,8	298
CH	445,2	7,8	88,5	2,4	544
CY	323,7	10,8	95,6	1,9	432
CZ	617,1	13,1	87,4	5,2	723
DE	357,5	28,4	104,9	2,8	494
DK	274,2	3,7	76,5	1,6	356
EE	359,1	11,1	143,2	1,4	515
EL	466,9	21,3	93,8	1,7	584
ES	637,1	12,1	88,8	1,3	739
FI	367,7	5,0	58,4	1,4	432
FR	452,9	9,7	108,9	2,0	573
HR	311,1	22,9	43,2	2,2	379
HU	750,7	27,3	97,5	1,9	877
IE	540,7	9,9	59,2	4,0	614
IS	340,9	11,9	140,4	2,4	496
IT	459,0	15,4	116,2	2,5	593
LT	650,5	34,7	51,2	1,4	738
LU	406,1	10,3	167,3	0,9	584
LV					

TELERADIOLOGY REFERRALS

- Quality of imaging referrals key to appropriate imaging
- In teleradiology, communication between referrers and radiologists can be challenge
- ESR advocates decision support for imaging referrals to improve appropriateness – ESR iGuide

- Access to referral guidelines within electronic workflows:
  - supports referrer in selecting appropriate procedure
  - provides clear indications for teleradiologists
- Clinical Decision Support (CDS) facilitates application of evidence-based standards and more consistent clinical practice
- National or even local specific adoption possible
  - e.g. limited MR capacity

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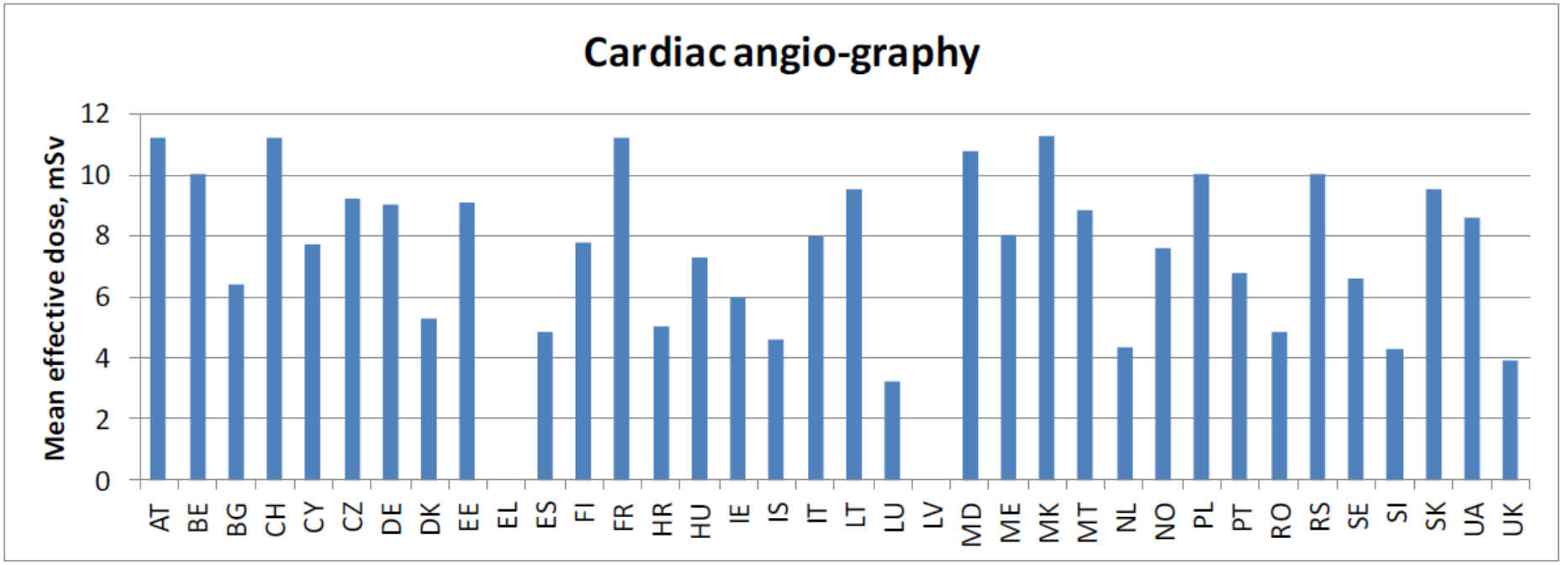
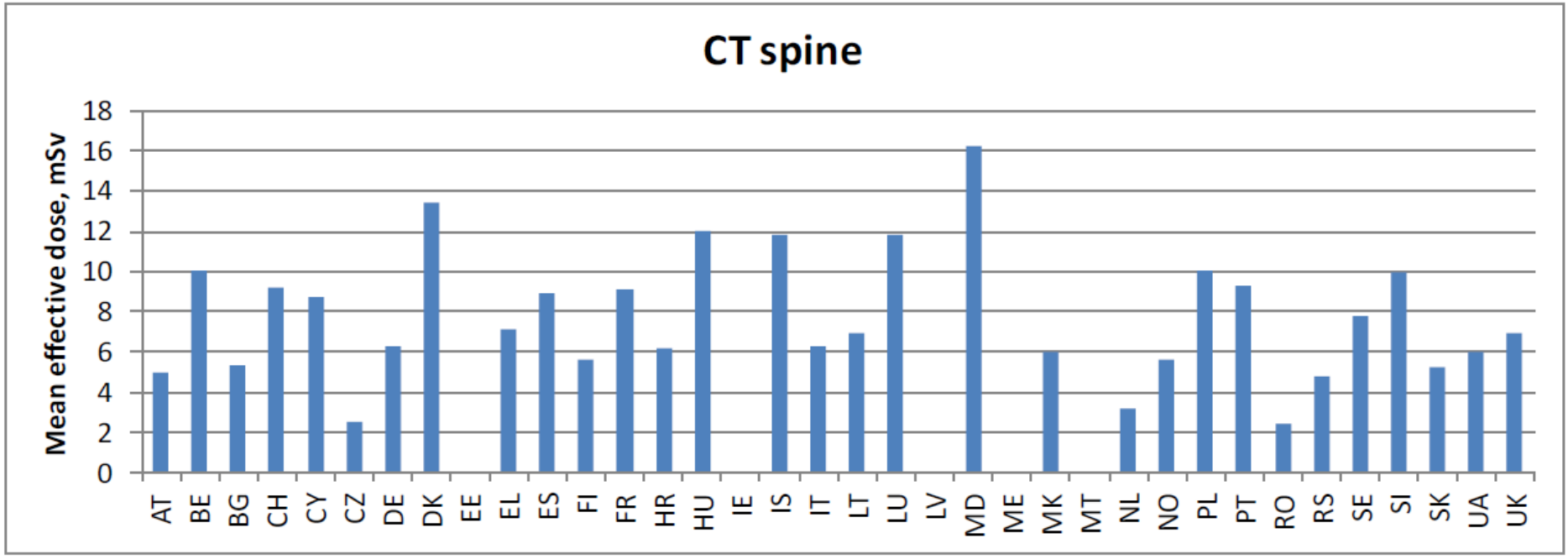

Cardiac angio-graphy
Mean effective dose, mSv
0
2
4
6
8
10
12
AT BE BG CH CY CZ DE DK EE EL ES FI FR HR HU IE IS IT LT LU LV MD ME MK MT NL NO PL PT RO RS SE SI SK UA UK


CT spine
Mean effective dose, mSv
0
2
4
6
8
10
12
14
16
18
AT BE BG CH CY CZ DE DK EE EL ES FI FR HR HU IE IS IT LT LU LV MD ME MK MT NL NO PL PT RO RS SE SI SK UA UK

RADIATION PROTECTION

- Indicating and selecting the appropriate imaging is very relevant in respect of radiation protection
- esp. CT-exams are increasing globally
- Medical exposures similar to / outweigh natural radiation already
- Careful planning of imaging protocols relevant
- Benchmarking limited by different coding systems
- Imaging quality and radiation protection optimized with “up-to-date” equipment (ESR publication on Renewal of Equipment, 2014)

REPORTING

- Reporting almost widely different by institution, personal behaviours, access to history&former imaging studies
- Language issues
  - Patient don´t understand reports well, increased when in other languages
- "Suboptimal" or defensive reporting could led to additional, probably risky follow-up examinations
- Radiological societies and Standardisation / Profiling bodies (DICOM / IHE) are working on "Structured Reporting" globally
- "Structured Reporting" (IHE MRRT profile) enables categorisation, coding, improved clearness, data-mining, well accepted by referrers
  - Basic tools are available
  - Common understanding of coding suboptimal
  - Structured and coded reports could reduce language barriers

DOCUMENTATION & COMMUNICATION & ACCESS & QUALITY ASSURANCE

- Personal relationship between radiologists and patient and/or referrers improves interpretation (wording, recommendations etc.)
- Radiology is a key player in "Multidisciplinary Team Meetings"
  - -> special challenges for cross-border teleradiology
  - eHealth and videoconferencing could be helpful
- Access to patient history and former imaging studies mandatory
- Documentation of radiation exposure and findings part of the reporting (EU legislation on Basic Safety Standards 2013)
- Dose reports could be used (anonymously) for benchmarking and quality assurance / improvement (IHE REM profiles)
- Standardisation on eHealth infrastructure throughout Europe
- Patient access to their informations should be guaranteed

Country	Profiles
Austria	XCA, PDQV3, XDS, ATNA, CT, PIXV3, PDQV3, PDQ, XUA, XDS-I *CDA R2 based Profiles*: XD*-Lab, XDS-MS, XDS-SD
Austria regions	XDS, ATNA, CT, PIXV3, PDQV3, PDQ, XUA, XDS-I, XD*-Lab, XDS-MS, DSUB
US States (Vermont, New York, Texas, Pennsylvania, etc.)	XCA, XCPD, XDS, ATNA, CT, PIXV3, XUA, BPPC, DSUB. *CDA R2 based Profiles:* XDS-XPHR (C-CDA), XDS-SD
Nagoya City	XDS, XDS-I, PIX, ATNA, XDS-SD, CT
Dutch regions	XDS, XDS-I, PIX, CT, ATNA, XDS-SD, XD*LAB
European Cross-Border (epSOS now moving to CEF/DSI)	XCA, XCPD, CT, ATNA, XUA *CDA R2 based Profiles:* XDS-XPHR, XDS-SD, PRE, DIS
US ehealth Exchange (Sequoia & Care Equality)	XCA, XCPD, CT, ATNA, XUA, XDR *CDA R2 based Profiles:* US C-CDA R1.1 and R2.1 (based on XDS-XPHR).
US CommonWell	XCA,PDQV3, CT, ATNA, XUA *CDA R2 based Profiles:* US C-CDA R1.1 (based on XDS-XPHR).
France	XDS, XDS-I, PIX , ATNA, XDS-SD, XD*LAB
Italian Regions	XDS, PIX, CT, ATNA, XDS-SD, XD*LAB, XDS-I, XDW, DSUB
Denmark Regions Denmark (PHR)	XDS, XDS-I, PDQ, CT, ATNA, XDS-SD, XD*LAB, XDW, PHMR
Luxembourg	XDS, XDS-I.b, XCA, XUA, PIX, PAM, PDQ, XCPD, CT, NAV, ATNA, DSUB
German Regions	XDS, XDS-I, PIX, PDQ, HPD, CT, ATNA, XUA, BPPC, APPC/XACML, XCA, XCPD
German Case-related electronic patient record (EFA)	XDS, XCA, CT, ATNA, XUA
Switzerland Regions Switzerland	XDS, XDS-I.b, , XUA, PIX, PDQ XCA, XCPD, CT, ATNA *CDA R2 based Profiles:* XDS-XPHR, XDS-SD, XD*-Lab
Slovenia	XDS, PIX, PDQ, CT, ATNA, XUA, BPPC
Finland	XDS, XDS-I, ATNA, CT
US Interop Standards Advisory	XDS, HPD, RFD, XCA, XCPD, PIX, PDQ, PIXV3, PDQV3, DEC, DSUB
US National Record Location Service (Surescript)	XCA, XCPD, CT, ATNA, XUA, *CDA R2 based Profiles:* US C-CDA R1.1 and R2.1 (based on XDS-XPHR).
Uruguay,	XDS
South Africa,	PIX, PDQ, PAM, RID, HPD, MHD, XDS, XDS-SD, XDM, BPPC, XDS-MS, PRE, DIS, PADV, XD*-LAB, APS, LDS, XDS-I, ATNA, CT
Japan	XCA, XDS, PIXV3, ATNA, CT *CDA R2 based Profiles:*

ESR POSITION & SUMMARY

- Definition of teleradiology as a medical act
- EU-wide accreditation criteria needed
- Application of international quality standards with Audits
- Full information of patients and informed consent in teleradiology
- Radiological imaging is not "reporting only" – workflows more complex
- Several fields for improvement (coding, reporting, dose registers…)
- Interoperability with optimised IT-Infrastructure relevant for eHealth
  - Inclusion of IHE profiles on Reporting (MRRT) and Radiation dose Exposure Monitoring (REM)
- Provision of teleradiology in the best interest of patients, not as a solution for the shortage of radiologists or cost-cutting measure

→ **Always put the patient's needs and quality of care first!**

EUROPEAN SOCIETY OF RADIOLOGY

European Congress of Radiology

ECR 2017

VIENNA
MARCH 1–5

THE FLOWER GARDENS
of RADIOLOGY

the annual meeting of

ESR
EUROPEAN SOCIETY
OF RADIOLOGY