CNart 2019

Radiation Therapists and Digitalisation of the Healthcare Industry

Dina Gonçalves

SAFE Europe
Safe And Free Exchange of EU Radiography Professionals across Europe

Co-funded by the Erasmus+ Programme of the European Union

Ulster University (Project coordinator)

EFRS European Federation of Radiographer Societies

L-Università ta' Malta

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EmMaH

Digital Skills Role in Radiation Therapist's Profile: Case Study

Dina Isabel Pereira Gonçalves

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Digital Skills Role in Radiation Therapist's Profile: Case Study

Explore and understand the role of digital skills on radiation therapists profile

Assessment of digital skills and possible **gaps** in the profile of **radiation therapists**

Identification of possible **causes** that may be in the origin of **digital skills gaps**

User's perception assessment regarding the development of digital skills related to **upraising technological trends**

Understand the consequences of the **digital transformation**

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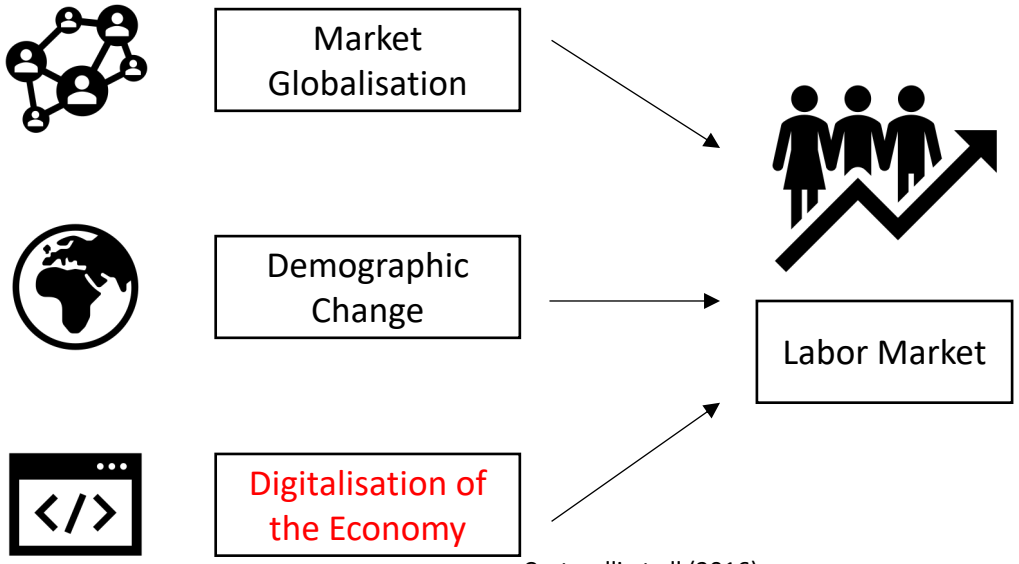
Digitalisation of the Economy

-Fourth Industrial Revolution-



Curtarelli et all (2016)

Digital Economy

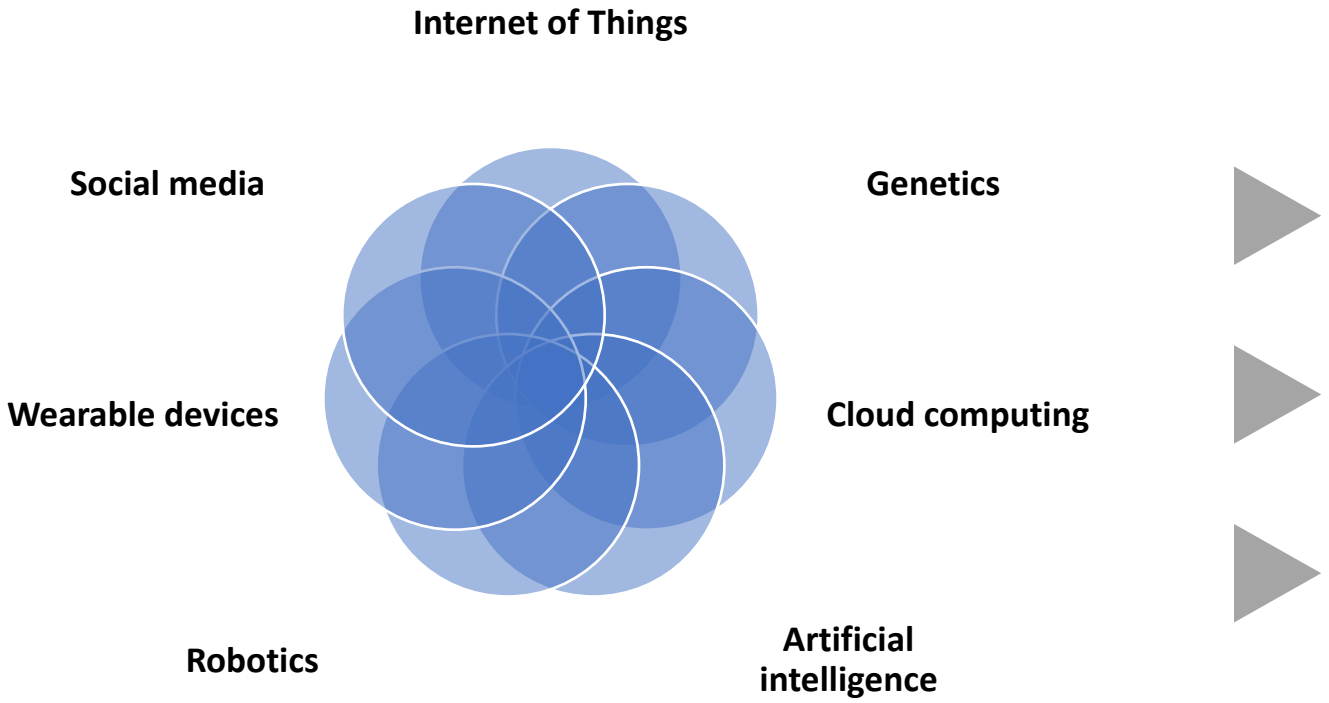
economy that is extensively based on digital computing technologies

"a fusion of technologies across the physical, digital and biological worlds"

Klaus Schwab Schwab (2016 p.7)

Digitalisation of the Economy

-Fourth Industrial Revolution-



Park (2016); Schwab (2016)

Radiotherapy Challenges

Zubizarreta, Van Dyk, & Lievens (2017), WHO (2018), Abdel-Wahab, Fidarova, & Polo (2017)

Digitalisation of the Economy

-Radiotherapy Challenges-

	Increasing Cancer Incidence			Global Cancer Expenditure	
Worldwide	**9,6 Million** deaths in 2018	**70% of deaths** caused by cancer happen in Low and middle-income countries	**17 Million** new cases of cancer worldwide in 2018	**1,16 Trillion $** of economic burden in 2010	**Radiotherapy drains** about **0.5% to 1%** of the global healthcare budget
Europe	**1,93 Million** of deaths from cancer in 2018	**3,91 Million** of new cases of cancer	**Europe** has **25% share** of the global cancer burden	**Cancer** healthcare expenses are equivalent to **US$114** per citizen in the **EU**	

Digitalisation of the Economy

-Radiotherapy Challenges-

Lack of Resources

Need for Investment

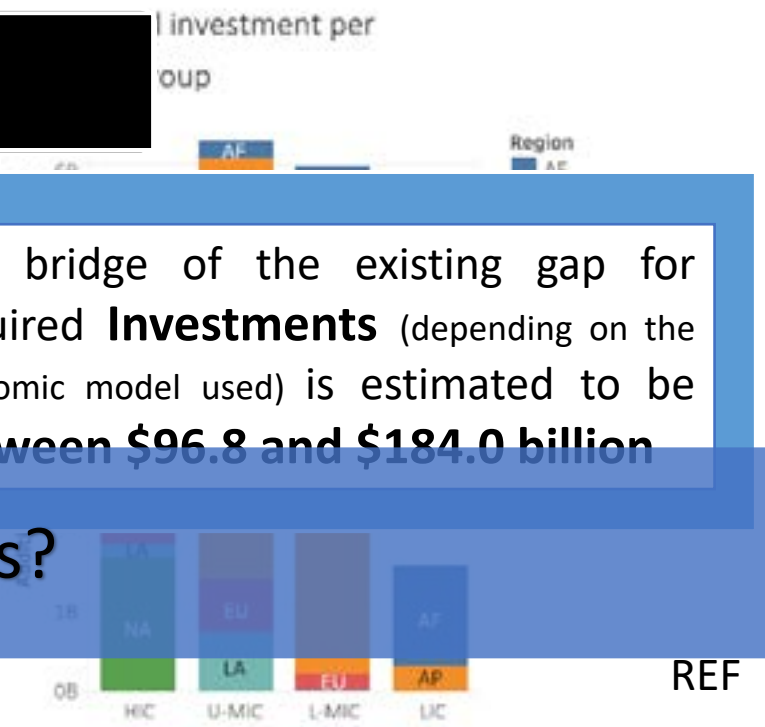
Resources' Distribution Inequity

	Physical Resources Mv units/1000 cancer cases	Treatment Capacity (50 patients/unit/year)		
L-IC	0,2	14%	Radiation oncologists	3300
			Medical physicists	2500
			RTTs	8100
LM-IC	0,7	36%	Radiation oncologists	9900
			Medical physicists	7200
			RTTs	24900
UM-IC	1,7	85%	Radiation oncologists	16800
			Medical physicists	12600
			RTTs	45300
H-IC	2,3	114%	■	■

L-IC - Low Income Countries group LM-IC - Lower Middle-Income Countries group UM-IC - Upper Middle-Income Countries group H-IC – High Income Countries group

* No information to report

Abdel-Wahab, Fidarova, & Polo (2017)



The bridge of the existing gap for required **Investments** (depending on the economic model used) is estimated to be **between $96.8 and $184.0 billion**

Digitalisation, consequences?

REF

Zubizarreta et al. (2017)

Digitalisation of the Economy

-Digital Skills Impact-

Polarization of the labour market

High-skilled individuals (cognitive skills and technical knowledge)

Medium-skilled and low-skilled or non-skilled workers

Job Losses

40% to 60% EU jobs at risk due to digitalisation-induced automation

Emergence of new occupations and creating new jobs

213,578 jobs in Western Europe World Economic Forum (2013)

Transformations in existing jobs

Increased demand of digital skills

Working conditions

Work-life balance

Productivity

8% productivity time lost due to poor IT resources or inadequate digital skills

Curtarelli et al. (2016); European Union (2019); Economic Forum (2013); House of Commons Science and Technology Committee (2016);

Digitalisation of the Economy

-Digital Skills Demand-

80% EU business require rudimentary digital skills

43% European population with insufficient level of digital skills

17% European population with no digital skills

Skills Shortage and Mismatch

Fau & Moreau (2018); European Commission (2019)

Skills Shortages

Market demand by a particular skill surpasses the number of individuals available with the desired skill

Skills Mismatches

Qualitative divergence between the qualifications and skills demanded by the labour market and those owned by the individuals.

Cedefop (2015); Curtarelli et al., (2016)

Digitalisation of the Economy

-Digital Skills Demand-

Study: 207 health professionals living across 21 EU Member States

50% were using daily basic IT skills

61% never received digital skills training

54% of those who received training rated it as insufficient

European Health Parliament: Committee on Digital Skills for Health Professionals (2016)

Skills Shortage and Mismatch

Professionals in the public health and care system **frustrated** due to **lack of training in digital health**

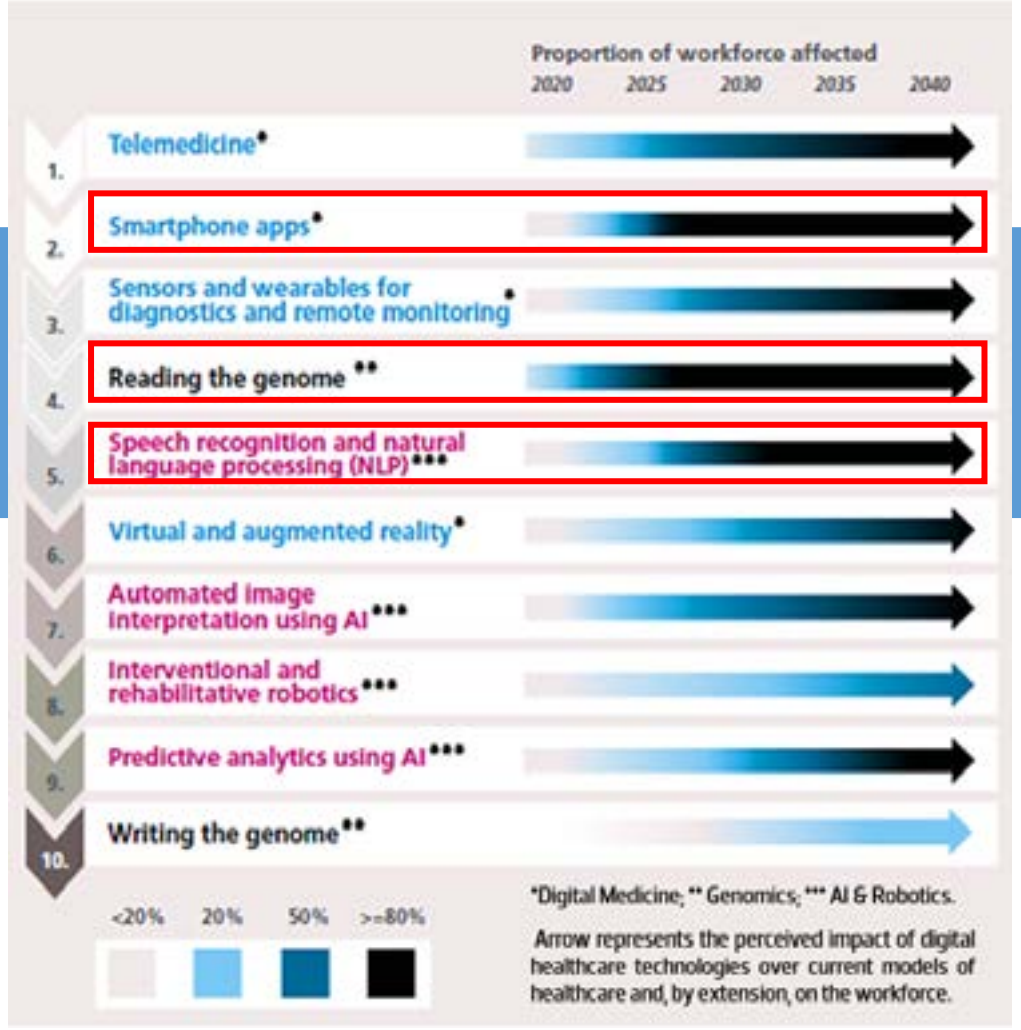
Reskilling and upskilling the healthcare workforce

Docherty et al. (2018)

Digitalisation of the Economy

-Digital Disruption in the Healthcare Industry-

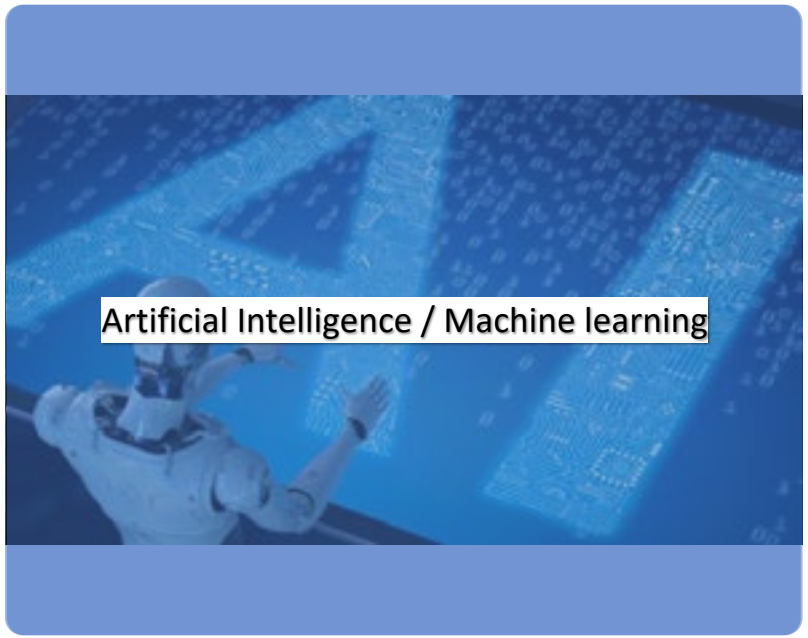
Top 10 technological advances impacting the healthcare industry



NHS (2019)

Digital Disruption in the Healthcare Industry

-Applications in Radiation Oncology / Therapy-



QA Assurance

Predict the passing rates of the individualized IMRT QA

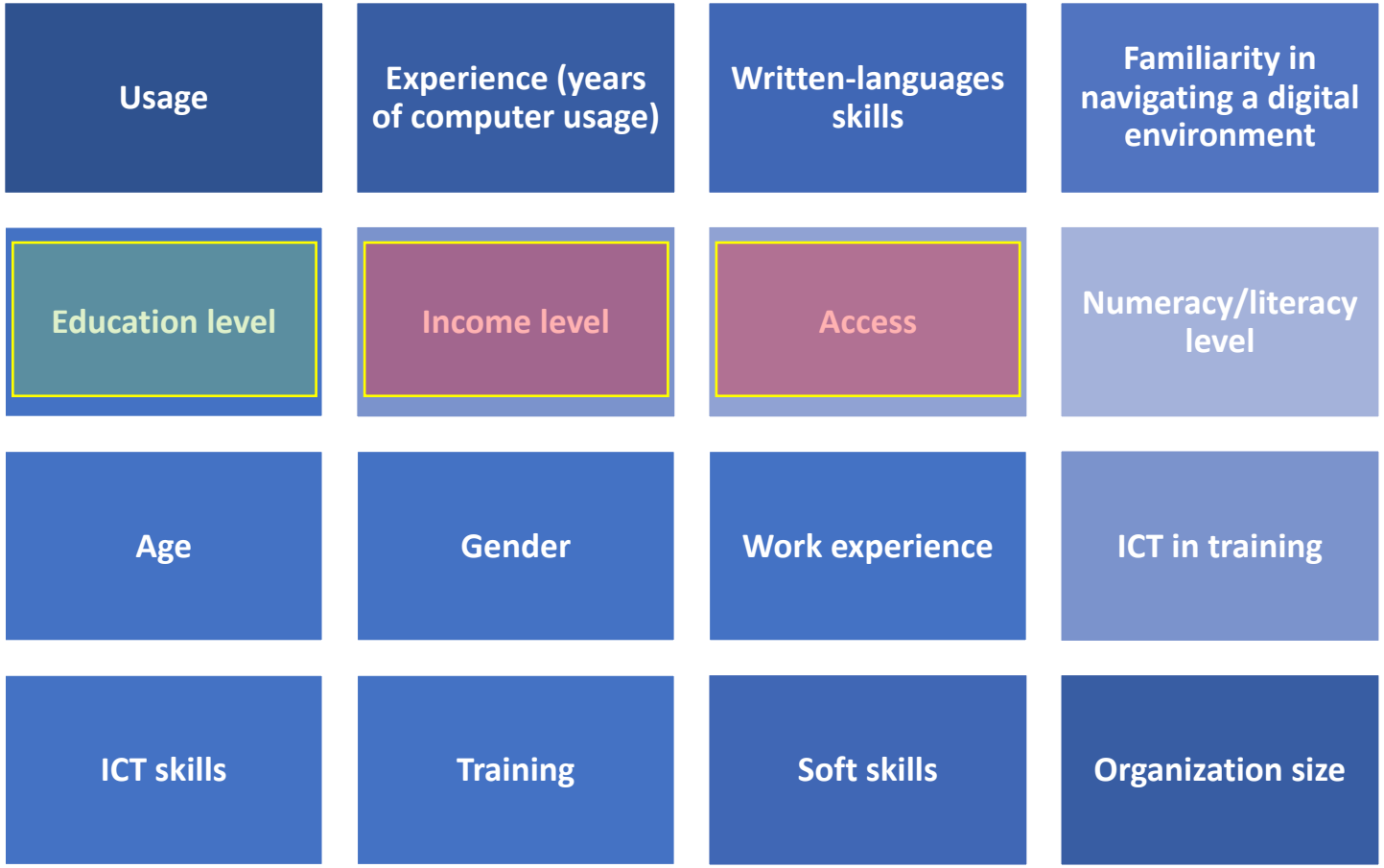
Help in the management of resources

Predict errors in linear accelerators execution and in image guidance systems

Analyse equipment data to apply preventive maintenance and decreasing machine downtime and other technical failures

Digitisation of the Economy

-Digital Skills Indicators-



Cedefop (2016); Curtarelli et al. (2016); European Commission (2019); Fau & Moreau (2018); House of Commons Science and Technology Committee (2016); OECD (2016, 2017, 2018)

Radiation Therapists and Digitalisation of the Healthcare Industry

-Radiation Therapists and Digital Skills-

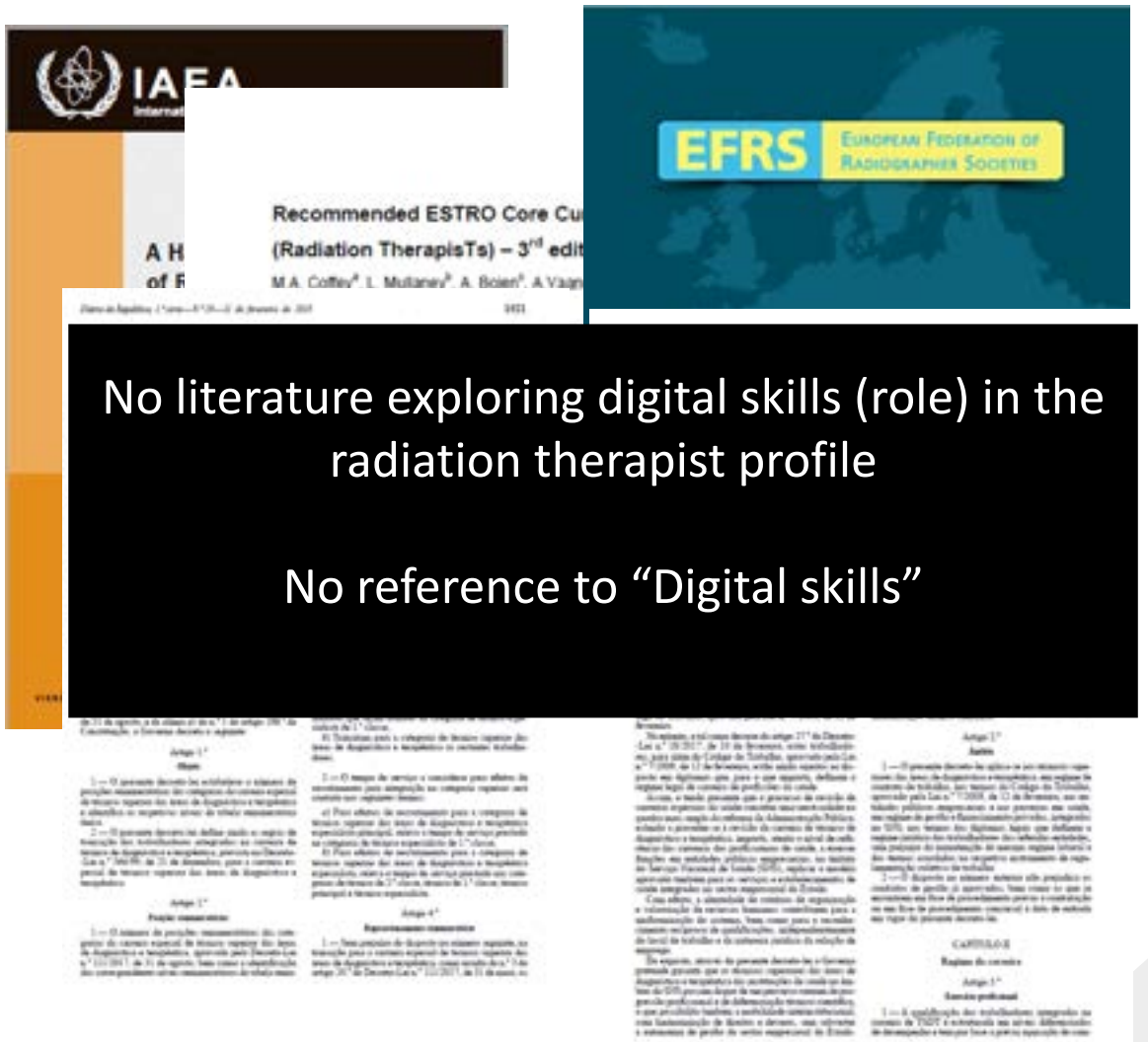
Modern Radiation Therapy

Continuous development of

- New skills (digital skills)
- New competencies

Constant progression and complexity of the technology and techniques

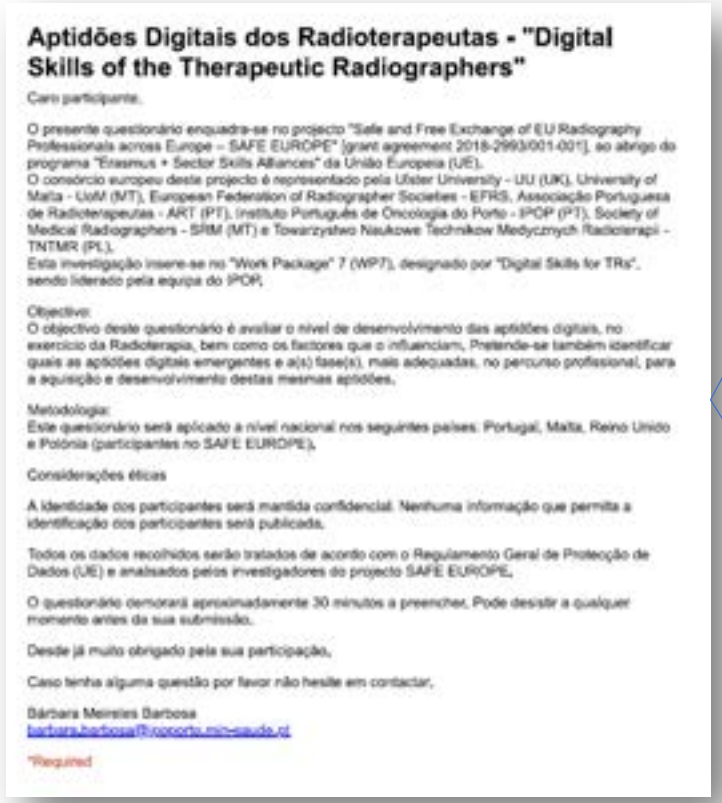
IAEA. (2014)



Digital Skills Role in Radiation Therapist's Profile: Case Study

-Results-

3rd - 15th of August 2019



Aptidões Digitais dos Radioterapeutas - "Digital Skills of the Therapeutic Radiographers"

Caro participante,

O presente questionário enquadra-se no projecto "Safe and Free Exchange of EU Radiography Professionals across Europe – SAFE EUROPE" [grant agreement 2018-2993/001-001], ao abrigo do programa "Erasmus + Sector Skills Alliances" da União Europeia (UE).
O consórcio europeu deste projecto é representado pela Ulster University - UU (UK), University of Malta - UoM (MT), European Federation of Radiographer Societies - EFRS, Associação Portuguesa de Radioterapeutas - ART (PT), Instituto Português de Oncologia do Porto - IPOP (PT), Society of Medical Radiographers - SRM (MT) e Towarzystwo Naukowe Techników Medycznych Radioterapii - TNTMR (PL).
Esta investigação insere-se no "Work Package" 7 (WP7), designado por "Digital Skills for TRs", sendo liderado pela equipa do IPOP.

Objectivo:
O objectivo deste questionário é avaliar o nível de desenvolvimento das aptidões digitais, no exercício da Radioterapia, bem como os factores que o influenciam. Pretende-se também identificar quais as aptidões digitais emergentes e a(s) fase(s), mais adequadas, no percurso profissional, para a aquisição e desenvolvimento destas mesmas aptidões.

Metodologia:
Este questionário será aplicado a nível nacional nos seguintes países: Portugal, Malta, Reino Unido e Polónia (participantes no SAFE EUROPE).

Considerações éticas

A identidade dos participantes será mantida confidencial. Nenhuma informação que permita a identificação dos participantes será publicada.

Todos os dados recolhidos serão tratados de acordo com o Regulamento Geral de Protecção de Dados (UE) e analisados pelos investigadores do projecto SAFE EUROPE.

O questionário demorará aproximadamente 30 minutos a preencher. Pode desistir a qualquer momento antes da sua submissão.

Desde já muito obrigado pela sua participação.

Caso tenha alguma questão por favor não hesite em contactar.

Bárbara Meireles Barbosa
barbara.barbosa@ipoporto.min-saude.pt

*Required

- I- Sociodemographic Evaluation
- II- Digital Skills – Generic
- III- Digital Skills – Transversal
- IV- Digital Skills – Specific
  - A – Image
  - B – Treatment Planning
  - C – Treatment Delivery
- V- Digital Skills - Quality, Security and Risk Management
- VI- Digital Skills – Management and Research
- VII- Digital Skills – Training
- VIII- Digital Skills – Technology

N= 46

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art Associação Portuguesa de Radioterapeutas

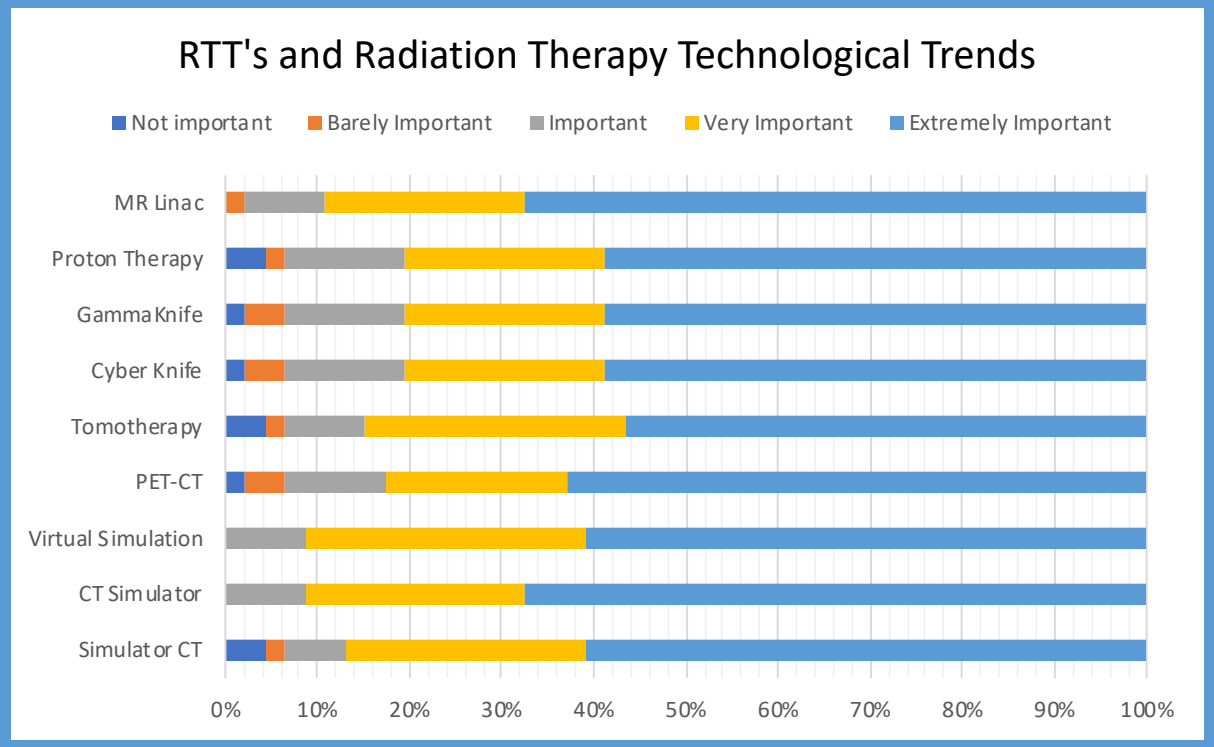
IPO Porto

Società Tar-Radjografi Mediċi

Digital Skills Role in Radiation Therapist's Profile: Case Study

-Radiation Therapists and Technological Trends-

Over 55%



	Not important	Barely Important	Important	Very Important	Extremely Important
MR Linac	0 (0,0%)	1 (2,2%)	4 (8,7%)	10 (21,7%)	31 (67,4%)
Proton Therapy	2 (4,3%)	1 (2,2%)	6 (13,0%)	10 (21,7%)	27 (58,7%)
GammaKnife	1 (2,2%)	2 (4,3%)	6 (13,0%)	10 (21,7%)	27 (58,7%)
Cyber Knife	1 (2,2%)	2 (4,3%)	6 (13,0%)	10 (21,7%)	27 (58,7%)
Tomotherapy	2 (4,3%)	1 (2,2%)	4 (8,7%)	13 (28,3%)	26 (56,5%)
PET-CT	1 (2,2%)	2 (4,3%)	5 (10,9%)	9 (19,6%)	29 (63,0%)
Virtual Simulation	0 (0,0%)	0 (0,0%)	4 (8,7%)	14 (30,4%)	28 (60,9%)
CT Simulator	0 (0,0%)	0 (0,0%)	4 (8,7%)	11 (23,9%)	31 (67,4%)
Simulator CT	2 (4,3%)	1 (2,2%)	3 (6,5%)	12 (26,1%)	28 (60,9%)

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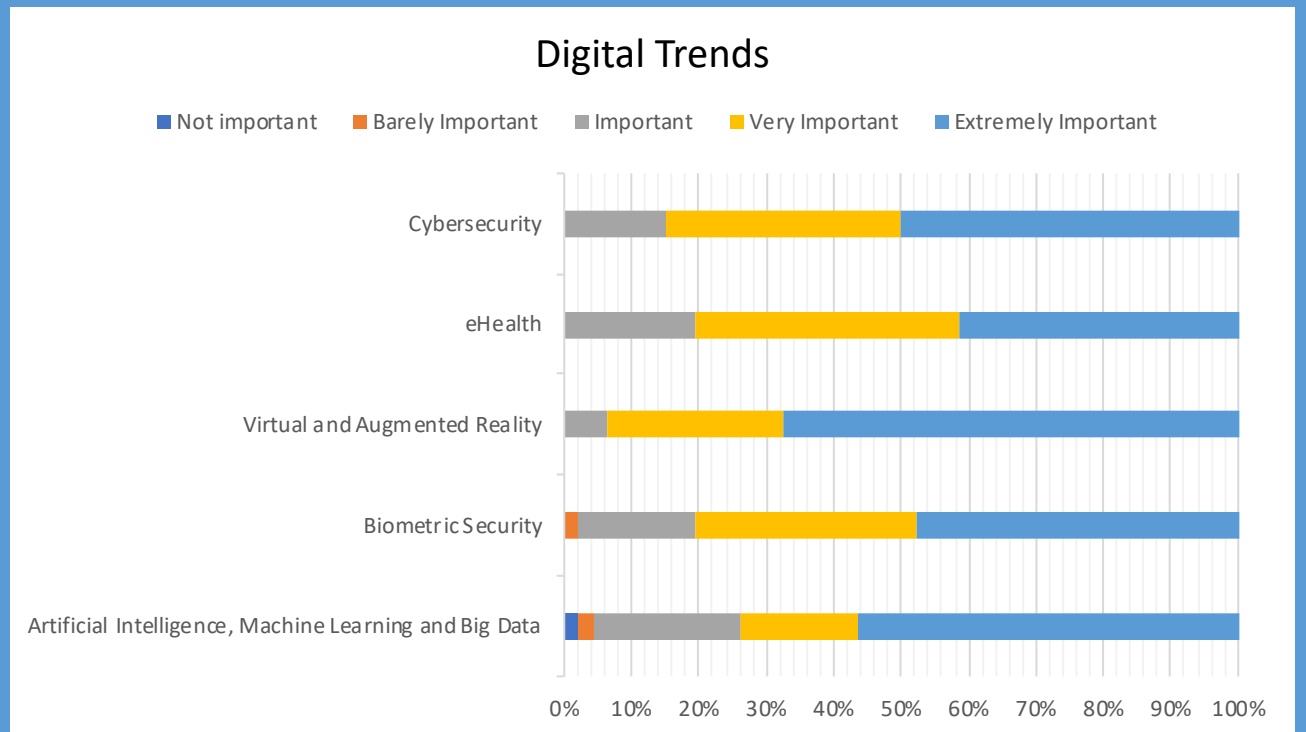
-Radiation Therapists and Technological Trends-



Over 40%

	Not important	Barely Important	Important	Very Important	Extremely Important
Cybersecurity	0 (0,0%)	0 (0,0%)	7 (15,2%)	16 (34,8%)	23 (50,0%)
e-Health	0 (0,0%)	0 (0,0%)	9 (19,6%)	18 (39,1%)	19 (41,3%)
Virtual and Augmented Reality	0 (0,0%)	0 (0,0%)	3 (6,5%)	12 (26,1%)	31 (67,4%)
Biometric Security	0 (0,0%)	1 (2,2%)	8 (17,4%)	15 (32,6%)	22 (47,8%)
Artificial Intelligence, Machine Learning and Big Data	1 (2,2%)	1 (2,2%)	10 (21,7%)	8 (17,4%)	26 (56,5%)

Take Home Message

RTT's

Patients

Radiation Therapists and Digitalisation of the Healthcare Industry

Recommendations

- Review and update existing curricula, integrating digital knowledge, skills and competency requirements
- Investment in the professionals digital skills training
- Creation of digital skills training programmes - technological trends inherent digital skills

Thank You For Your Attention

SAFE EUROPE Project

Study Participants, IPOP

Dr. Luís Antunes, Epidemiology Department, IPOP