

Appendix B: Results of individual sources of evidence

Reference number	Year	Country	Population age	Location	Image modality	Body region	Sample size	% Overuse	Indicator of overuse	Indicator of overuse categories	Impacts
1	2022	Kenya	Indeterminate	A&E	CT, X-ray, ultrasound	Other	737 (225, 98, 414)	49.3, 23.7, 37.2	ACR	ACR Appropriateness criteria	None noted
2	2015	Lebanon	Indeterminate	Tertiary referral center	MRI	Heart and vessels	142	8.4	Asian society of cardiac imaging guidelines 2010	International society guideline	None noted
3	2021	Iran	Adult	Hospital	CT	Head and neck	160	16.9 - 31.2	Merritt's textbook of neurology	Research paper or textbook	None noted
4	2020	Brazil	Adult	Tertiary hospital	SPECT	Head and neck	119	5	No change in management	No change in management	None noted
5	2023	Kazakhstan	Adult and child	Two major hospitals	CT and MRI	Other	9,725	13	ACR and RCR guidelines	ACR Appropriateness criteria	None noted
6	2014	South Africa	Adult and child	Hospital	CT and MRI	Other	219	6.4	ACR and RCR	ACR Appropriateness criteria	None noted
7	2022	Ethiopia	Adult and child	Specialized hospital	CT	Head and neck	443	11.7	ACR	ACR Appropriateness criteria	None noted
8	2019	Bosnia and Herzegovina	Adult	University hospital	CT	Spine	69	71	International Classification of Diseases	International society guideline	None noted
9	2016	Brazil	Adult	Tertiary hospital	SPECT	Heart and vessels	190	12	Appropriate Use Criteria for Cardiac Radionuclide Imaging published in 2009.	International society guideline	Budget impact analysis showed that the use of appropriateness criteria, applied to the population referred to myocardial perfusion scintigraphy within 1 year, could generate savings of \$ 64,252.04 dollars. savings of 18.6%

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10	2021	Ghana	Adult	Tertiary hospital	Ultrasound	Reproductive system	314	9.6	American College of Radiology (ACR) - American Institute of Ultrasound in Medicine (AIUM) - American College of Obstetricians and Gynecologists (ACOG) practice guidelines + experts	ACR Appropriateness criteria and expert opinion	None noted
11	2021	South Africa	Adult and child	Hospital	CT	Other	515	11.2	ACR	ACR Appropriateness criteria	None noted
12	2011	Iran	Adult	Public hospital and private centers	SPECT	Heart and vessels	291	16.8	American College of Cardiology Foundation (ACCF) and the American Society of Nuclear Cardiology (ASNC) + expert panel	International society guideline	None noted
13	2010	Uganda	Adult	Peri-urban health center	Ultrasound	Reproductive system	232	53.4	A previous research paper: Thompson E, Freake D, Worrall G. Are rural general practitioner--obstetricians performing too many prenatal ultrasound examinations? Evidence from western Labrador. CMAJ. 1998 Feb 10;158(3):307-13.	Research paper or textbook	None noted
14	2021	Ghana	Adult and child	4 tertiary government hospitals and one private hospital	CT	Head and neck	11,806	69	ACR	ACR Appropriateness criteria	None noted
15	2022	Argentina	Adult	Private hospital	Ultrasound	Reproductive system	1,997	75.7	requested upon a health check or without a problem documented in the medical history to support its performance - inappropriate	Other	None noted

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16	2019	Iran	Adult	Public and private imaging centers	MRI	Spine	614	39.7	Clinical guideline scenarios	Other	Total cost of inappropriate prescriptions was \$10 310, including the costs paid by insurance organizations (38.8%), direct patient costs (39%), and indirect patient costs (22.1%)
17	2014	Iran	Indeterminate	3 imaging centers	CT	Head and neck	400	37	Expert panel	Expert opinion	None noted
18	2014	Iran	Indeterminate	Four radiographic centers in two public hospitals, a private imaging center and a hospital affiliated with National Iranian Oil Company in Tehran	MRI	Spine	400	53.3	ACR and CAR Standard for Magnetic Resonance Imaging. Ottawa, Canada: Canadian Association of Radiologists (CAR) and expert panel	ACR Appropriateness criteria and expert opinion	None noted
19	2022	Iran	Indeterminate	Teaching hospitals	CT	Chest	216	38-49.5	Expert pulmonologists, ACR guidelines	ACR Appropriateness criteria and expert opinion	None noted
20	2021	Iran	Adult	3 public teaching hospitals	MRI	Head and neck	385	21.6	Salari H, Ravanbod M R, Akbari Sari A, Farzanegan G, Esfandiari A. Developing Appropriate Indications for Prescriptions of Brain MRI using RAND Appropriateness Method. Evid Based Health Policy, Manag Econ. 2017;1(4):205-210.	Research paper or textbook	If taking 21.6 percent of all MRIs in the 3 hospitals. The financial burden of inappropriate brain MRIs on the patients and insurers for "without injection", "with and without injection" and all MRIs were \$50,848, \$49,140 and \$99,988 USD, respectively

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21	2022	Uganda	Indeterminate	Faith-based, private non-profit	CT	Head and neck	262	47-53	iGUIDE, a CIG application software for the European Society of Radiology	International society guideline	None noted
22	2012	Uganda	Indeterminate	Multiple hospitals	CT, X-ray, ultrasound	Other	207	6	Expert panel	Expert opinion	Given the total imaging load (22,772 inappropriate examinations), 20,385,415.00 shillings were wasted in inappropriate imaging
23	2022	Iran	Child	Children's hospital	CT	Abdomen and pelvis	22	32	North American Society for Pediatric Gastroenterology Hepatology and Nutrition Pancreas Committee guideline for management of acute pancreatitis in the pediatric population	International society guideline	None noted
24	2022	India	Adult and child	Tertiary hospital	CT	Head and neck	1,142	57	Normal findings	Negative result	None noted
25	2017	Iran	Adult and child	Tertiary hospital	CT	Head and neck	370	9.1	ACR	ACR Appropriateness criteria	None noted
26	2020	Ghana	Adult	Tertiary hospital	MRI	Other	840	20-32.4	Ministry of Health Policies	Local guidelines	None noted
27	2016	Iran	Indeterminate	Private centers, public imaging hospital	MRI	Spine	279 (144, 135)	19.4, 29.6	Guidelines which an expert panel developed for the study	Expert opinion	None noted
28	2018	Ghana	Adult	N/A	MRI	Head and neck	161	19	ACR Appropriateness criteria	ACR Appropriateness criteria	None noted

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29	2016	Iran	Adult	Referral institution in 110 patients (73.3%) was a private office and in 40 patients (26.7%) was a state hospital	MRI	Musculoskeletal	115	45.2	Local clinical guideline	Local guidelines	Financial burden of 39,204,000 IRR, 70% of which burdened insurance companies
30	2008	Iran	Indeterminate	Private imaging center	MRI	Other	1,650	No evidence of overuse	Proportion of normal findings. Only 17.2% of scans were normal suggesting there is no overuse	Other	None noted
31	2018	Iran	Indeterminate	MRI imaging center	MRI	Musculoskeletal	274	24.8	Vojdani et al's study	Research paper or textbook	None noted
32	2011	Lebanon	Adult	MSCT laboratory medical center	CT	Heart and vessels	100	45-49	2006, 2010 ACCF	International society guideline	None noted
33	2019	Brazil	Adult	Private hospital	CT	Abdomen and pelvis	834	52.6 - 91.7	When the CT did not change the diagnosis	No change in management	None noted
34	2015	India	Child	Tertiary hospital	CT	Other	1,392	4.6	'Justification' and 'Optimization' principles of ALARA	Other	None noted
35	2021	India	Indeterminate	Tertiary care	SPECT	Heart and vessels	1,015	12	Appropriate use criteria (AUC) in cardiac radionuclide imaging" was formulated by the American College of Cardiology Foundation and the American Society of Nuclear Cardiology, 2009	International society guideline	None noted
36	2021	Cameroon	Adult	Peripheral referral hospital	CT	Other	352	8.2	ACR	ACR Appropriateness criteria	None noted

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37	2020	Cameroon	Adult and child	Urban imaging center	CT	Other	432	16.4	ACR	ACR Appropriateness criteria	None noted
38	2022	Brazil	Adult		Ultrasound	Limbs	168	8.3	CDUS was requested in patients with low probability according to the WellsScore and a negative DD result	Other	None noted
39	2013	Serbia		ICU of university teaching hospital	X-ray	Chest	717	55.9	Clinician opinion	Expert opinion	None noted
40	2016	China		3 general hospitals	MRI	Spine	3,107	58.3	Was determined to be inappropriate if it did not find anything of clinical relevance. expert panel	Negative result	None noted