Bridging continents:

Postgraduate infectious diseases training programs from central Europe to Southeast Asia

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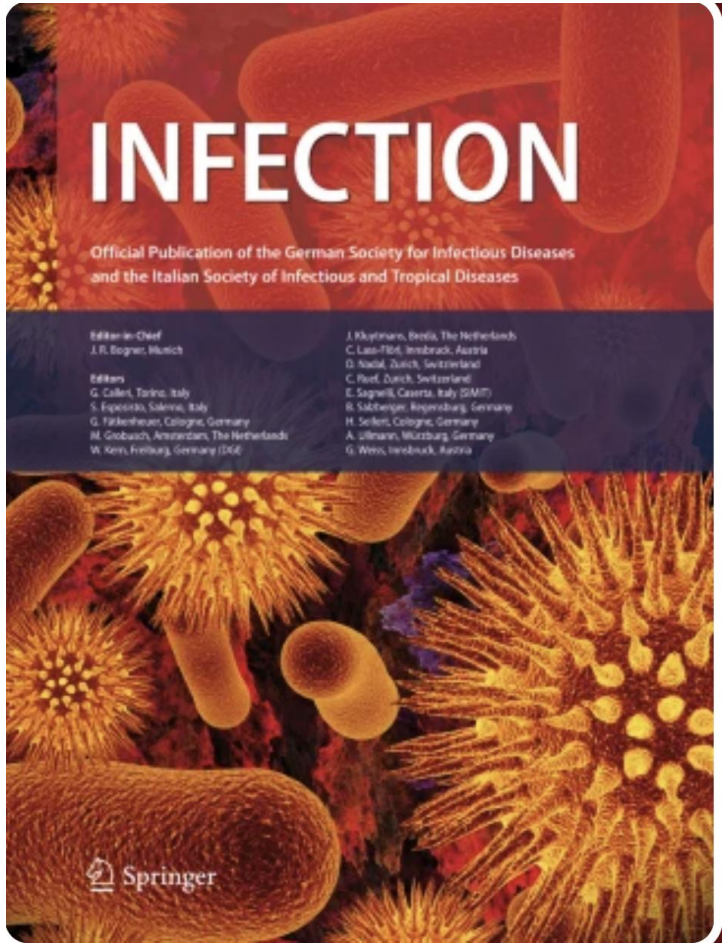
December 2026



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RESEARCH

Bridging continents: postgraduate infectious diseases training programs from central Europe to Southeast Asia

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THE REGIONS

Central Asia (Azerbaijan, Uzbekistan, the Kyrgyz Republic, Kazakhstan),

Eastern Mediterranean (Iran, Saudi Arabia, Jordan, Iraq, Oman, the United Arab Emirates, Qatar, Lebanon),

Southeast Europe (Albania, Greece, Kosovo, Slovenia, Bosnia and Herzegovina, Serbia, the Republic of North Macedonia, Croatia)

Eastern Europe (Russia, Moldova, Romania, Bulgaria),

South Asia (India, Pakistan, Afghanistan),

Southeast Asia (Malaysia)

Türkiye

Where is Türkiye?

EU- **Asociated country to Horizon Europe**

Türkiye is included in the **WHO European Region** (WHO Europe)

ECDC engages with Turkey as part of its European disease surveillance and collaboration efforts, which implies that **Turkey is included in the scope of European public health cooperation**.

UN: UNGEGN World Geographical Names- **Western Asia**

World Health Organization

Eastern Mediterranean Region

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Regions

- Africa
- Americas
- Europe
- Eastern Mediterranean
- South-East Asia
- Western Pacific

UNGEGN World Geographical Names

M49 Code	Country Name - *[Romanized Name]*	ISO2	ISO3	Continent	Region	Display	UN Member	All Available Languages	Actions
792	Turkey	TR	TUR	4-Asia	13-Western Asia	✓	✓	Turkish, Arabic, Chinese, English, French, Russian, Spanish	
780	Trinidad and Tobago	TT	TTO	2-Americas	6-Caribbean	✓	✓	English, Arabic, Chinese, French, Russian, Spanish	
798	Tuvalu	TV	TUV	6-Oceania	21-Polynesia	✓	✓	English, Tuvaluan, Arabic, Chinese, French, Russian, Spanish	
834	United Republic of Tanzania (the)	TZ	TZA	1-Africa	1-Eastern Africa	✓	✓	English, Swahili, Arabic, Chinese, French, Russian, Spanish	
804	Ukraine	UA	UKR	5-Europe	14-Eastern Europe (including Northern Asia)	✓	✓	Ukrainian, Arabic, Chinese, English, French, Russian, Spanish	
800	Uganda	UG	UGA	1-Africa	1-Eastern Africa	✓	✓	English, Arabic, Chinese, French, Russian, Spanish	
840	United States of America (the)	US	USA	2-Americas	9-Northern America	✓	✓	English, Arabic, Chinese, French, Russian, Spanish	
858	Uruguay	UY	URY		8-South America	✓	✓	Spanish, Arabic, Chinese, English, French, Russian	
860	Uzbekistan	UZ	UZB	4-Asia	11-Central Asia	✓	✓	Uzbek, Arabic, Chinese, English, French, Russian, Spanish	
670	Saint Vincent and the Grenadines	VC	VCT	2-Americas	6-Caribbean	✓	✓	English, Arabic, Chinese, French, Russian, Spanish	
862	Venezuela (Bolivarian Republic of)	VE	VEN		8-South America	✓	✓	Spanish, Arabic, Chinese, English, French, Russian	
704	Viet Nam	VN	VNM	4-Asia	12-Southern Asia	✓	✓	Vietnamese, Arabic, Chinese, English, French, Russian, Spanish	
548	Vanuatu	VU	VUT	6-Oceania	19-Melanesia	✓	✓	Bislama, English, French, Arabic, Chinese, Russian, Spanish	
882	Samoa	WS	WSM	6-Oceania	21-Polynesia	✓	✓	English, Samoan, Arabic, Chinese, French, Russian, Spanish	
887	Yemen	YE	YEM	4-Asia	13-Western Asia	✓	✓	Arabic, Chinese, English, French, Russian, Spanish	
710	South Africa	ZA	ZAF	1-Africa	4-Southern Africa	✓	✓	Afrikaans, English, Ndebele, Pedi, Sesotho, Swati, Tsonga, Tswana, Venda, Xhosa, Zulu, Arabic, Chinese, French, Russian, Spanish	
894	Zambia	ZM	ZMB	1-Africa	1-Eastern Africa	✓	✓	English, Arabic, Chinese, French, Russian, Spanish	
716	Zimbabwe	ZW	ZWE	1-Africa	1-Eastern Africa	✓	✓	English, Arabic, Chinese, French, Russian, Spanish	

THE STANDARTS

Standardization studies: By **European Union of Medical Specialists (UEMS) and ESCMID**.

These organizations have outlined **core competencies, curriculum requirements and evaluation methods** to harmonize training across the region.

Despite these efforts, **notable heterogeneity still persists within European countries**, while some countries fully complying with **ESCMID standards**, others **modify their programs according to local needs.**

UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES
EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif — *International non-profit organisation*

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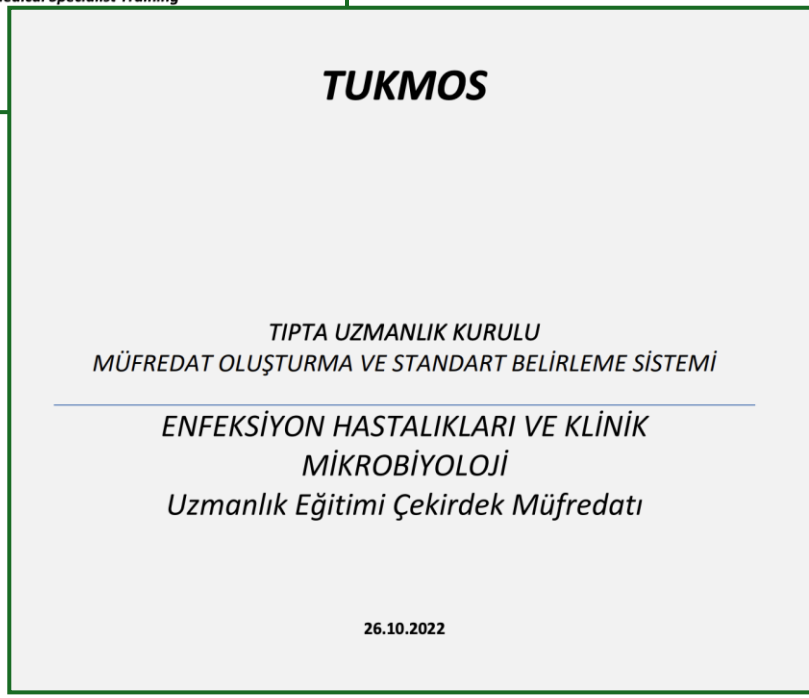
UEMS 2018/39

Training Requirements for the Specialty of Infectious Diseases

European Standards of Postgraduate Medical Specialist Training



TUKMOS

TIPTA UZMANLIK KURULU
MÜFREDAT OLUŞTURMA VE STANDART BELİRLEME SİSTEMİ

ENFEKSİYON HASTALIKLARI VE KLİNİK MİKROBİYOLOJİ
Uzmanlık Eğitimi Çekirdek Müfredatı

26.10.2022

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ENTERING
THE ID CAREER

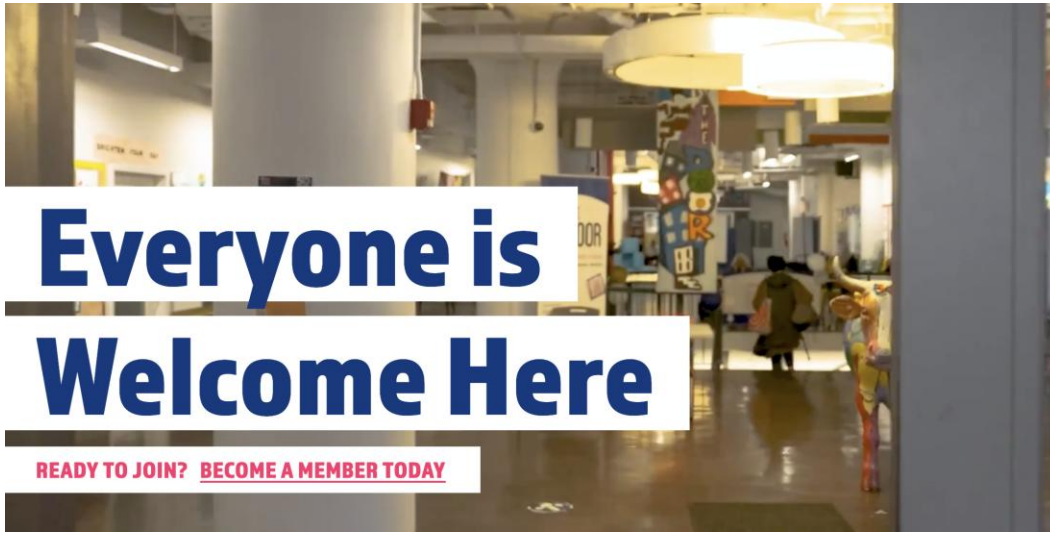
Exam is required in 17 (59%) countries.

Greece, Azerbaijan, Oman, Qatar, Romania, Iraq, Moldova, Afghanistan and Uzbekistan reported a 100% **occupancy rate** for available ID training positions in the most recent specialty exams in their countries.

Russia: 95–100%
Croatia and the Kyrgyz Republic: 90%
15 other countries: over 80%.

Perception of ID specialty in a post-COVID era

The lowest rating was reported **in Slovenia (1),** while the highest ratings were in **Iraq, Malaysia, and Uzbekistan (5)**.
Mean:3.5



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Participants from **nineteen (65.5%) countries indicated that ID is recognized as an independent specialty program** that can be pursued directly after medical school in their country.

In countries such as **Greece, Jordan, Oman, Qatar, Pakistan, India, Lebanon and Malaysia**, ID is pursued as a specialty following the completion of **Internal Medicine**.

In the **United Arab Emirates and Saudi Arabia,** ID is a specialty pursued **after completing internal medicine or pediatrics**

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Table 1 General structure of ID specialty training programs

Country	Mandatory national written exam for ID specialty entry (exam name)	Status of ID Specialty	Total ID specialists (national level)	Total ID training centers (national level)	ID training duration (years)	Opportunity for training abroad	Licensing exam frequency & renewal period	Academic career pathway for ID specialists (PhD requirement)
Afghanistan	Exam by national authorities—**Specialty Program Entrance Exam**	**Independent specialty**	NA	4	4	–	No	No PhD is required
Albania	Each institution makes its own	**Independent specialty**	60	1	4	–	No	PhD is required
Azerbaijan	Exam by national authorities—**Residency Entrance Exam**	**Independent specialty**	NA	7	4	–	**Yes, 5y**	PhD is required
Bosnia and Herzegovina	No written exam is needed	**Independent specialty**	120	4	5	–	No	PhD is required
Bulgaria	Each institution makes its own	**Independent specialty**	40	5	4	–	No	No PhD is required
Croatia	**Final specialist examination in ID***	**Independent specialty**	150	4 regional including 1 national	5	+	**Yes, 6y**	PhD is required
Greece	No written exam is needed	Specialty following IM	253	12	2	–	No	PhD is required
India	Exam by national authorities—**Super Specialty NEET**	Specialty following IM	200	13	3	–	No	No PhD is required
Iran	Exam by national authorities—**National Iranian Residency Program**	**Independent specialty**	1200	22	4	–	**Yes, 5y**	No PhD is required
Iraq	Exam by local authorities	**Independent specialty**	20–30	2	5	–	No	No PhD is required
Jordan	Exam by national authorities—**Jordan Medical Council**	Specialty following IM	10	0	2	–	No	No PhD is required
Kazakhstan	Exam by national authorities – **Final State Certification**	**Independent specialty**	NA	7	3	–	**Yes, 5y**	No PhD is required
Kosovo	No written exam is needed	**Independent specialty**	36	1	4	–	No	PhD is required
Kyrgyz Republic	Each institution makes its own	**Independent specialty**	240	3	3	-	**Yes, 5y**	No PhD is required
Lebanon	No written exam is needed	Specialty following IM	110	7	2	–	No	No PhD is required
Malaysia	No written exam is needed	Specialty following IM	66	16	2	–	No	No PhD is required
Moldova	No written exam is needed	Independent specialty	160	2	4	–	**Yes, 5y**	PhD is required
North Macedonia	No written exam is needed	**Independent specialty**	51	2	5	–	**Yes, 7y**	PhD is required
Oman	No written exam is needed (Written exam is needed for IM)	Specialty following IM	15	2	4	+	No	No PhD is required
Pakistan	No written exam is needed	Specialty following IM	50	9	2	–	No	No PhD is required
Qatar	Exam by national authorities—**IDSA**	Specialty following IM	33	1	3	–	No	No PhD is required
Romania	Exam by national authorities—**Residency Exam**	**Independent specialty**	1427	11	5	–	No	No PhD is required
Russia	Exam by national authorities	**Independent specialty**	7230	81	2	–	**Yes, 5y**	PhD is required
Saudi Arabia	Exam by national authorities—**Saudi Board**	Specialty following IM or pediatrics	> 100	> 30	3	+	No	No PhD is required
Serbia	No written exam is needed	**Independent specialty**	160	5	3	–	**Yes, 7y**	PhD is required

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Table 1 (continued)

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Slovenia	No written exam is needed	**Independent specialty**	73	5	6	–	No	PhD is required
Türkiye	Exam by national authorities—**Medical Specialization Exam**	**Independent specialty**	> 1200	> 80	5	–	No	No PhD is required
United Arab Emirates	Exam by national authorities **-Emirati Board (National Institute for Health Specialties)**	Specialty following IM or pediatrics	NA	2	2	–	No	No PhD is required
Uzbekistan	Each institution conducts itself	**Independent specialty**	NA	NA	2	–	No	No PhD is required

*In Crotia final specialist examination in ID is mandatory before an Examination Committee composed of three members (ID specialist & University Professors), consisting of a theoretical and practical part, taken in the institution where the president of the Examination Committee is employed, mostly a professor from the Department of ID at the leading national University Hospital for ID

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Azerbaijan	Exam by national authorities—**Residency Entrance Exam**	**Independent specialty**	NA	7	4	–	**Yes, 5y**	PhD is required
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Integral components and mandatory rotations.

Internal medicine and microbiology were reported as **core components** of all programs, followed by **infection control, epidemiology, and antimicrobial stewardship (AMS)**

Sexually transmitted diseases, travel medicine, and transplantation were included in selected programs.

The topic of **health economics** appeared to be included only in **Jordan,** while **palliative care** was included only in **Slovenia.**

Rotations in **Pediatrics, Radiology, Neurology, Hepatology, and Intensive Care** were integrated into some curricula.

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Adoption of **interactive and learner-centered methods, such as simulation-based training, mobile applications, role-playing and scenario-based learning** remains limited.

These approaches, which are essential for **developing clinical reasoning, decision-making and real-world preparedness**, were reported only in a few countries, including **Croatia, Russia, Türkiye, and Kazakhstan.**

ID trainees are required to be proficient for:

Lumbar puncture (n=23, 79%),
Urinary catheter insertion (n=16, 55%),
Pleural fluid drainage (n=12, 41%),
Abscess drainage (n=6, 21%),
Endoscopic intervention (n=3, 10%),
Bone marrow aspiration (n=2, 7%),
Bone marrow biopsy (n=1, 3%),
Joint aspiration (n=1, 3%),
Central venous access (n=1, 3%),
Skin biopsies (n=1, 3%),
Endotracheal intubation (n=1, 3%)
Abdominal paracentesis (n=1, 3%)

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Compulsory training in other institutions:

Kosovo,
Oman,
Croatia,
Saudi Arabia and
Kazakhstan

In **Oman**, ID specialty trainees **need to complete a fellowship abroad for at least 2 years**

In **Saudi Arabia,** trainees rotate through various hospitals and may spend **one year in Canada.**

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THE ID CAREER AFTER FELLOWSHIP

Table 2 Subspecialties of ID training programs

Country	Intensive Care	Parasitology	HIV&AIDS	Immunology & Allergy	Epidemiology	Microbiology	Virology	IPC	Hepatology	Public health	Travel medicine	Immunocompromised host	Clinical pharmacology	Geriatrics	Tuberculosis	Leprosy	STDs
Bosnia and Herzegovina	✓			✓	✓				✓								
Croatia	✓			✓													
Iran			✓					✓				✓					
Kyrgyz Republic		✓	✓														
Russia	✓	✓	✓	✓	✓	✓				✓							
Oman	✓					✓					✓						
Qatar		✓	✓		✓	✓	✓		✓						✓	✓	✓
Serbia	✓				✓		✓						✓	✓			
Türkiye	✓			✓													
Uzbekistan		✓															

IPC infection prevention and control, *STDs* sexually transmitted diseases

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License renewal:

9 countries reported to have **mandatory periodic license exam for ID.**

The most common renewal period of the exam was every 5 years, in six countries: **Azerbaijan, Iran, Russia, Kazakhstan, Kyrgyz Republic, and Moldova.**

Croatia: 6 years

Serbia and North Macedonia: 7 years

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Working in Other Countries/ International Career

OECD

International Migration Outlook 2025

49th Edition

5 International migration of health professionals to OECD countries

Ave Lauren (OECD), José Ramalho (OECD), Jean-Christophe Dumont (OECD), Gaetan Lafortune (OECD), Agya Mahat (WHO) and Tapas Nair (WHO)

https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/11/international-migration-outlook-2025_355ae9fd/ae26c893-en.pdf

Table 5.1. Foreign-born doctors working in OECD countries, circa 2000/01, 2010/11 and 2020/21

	2000/01			2010/11			2020/21		
	Total	Foreign-born	% Foreign-born	Total	Foreign-born	% Foreign-born	Total	Foreign-born	% Foreign-born
Australia[1]	48 211	20 452	42.9	68 795	36 076	52.8	109 484	59 404	54.3
Austria[1]	30 068	4 400	14.6	40 559	6 844	16.9	42 434	8 398	19.8
Belgium	..	..	..	..	..	..	48 759	8 133	16.7
Canada[1]	65 110	22 860	35.1	79 585	27 780	34.9	105 200	38 985	37.1
Czechia	..	..	..	39 562	3 468	8.8	43 985	5 130	11.7
Denmark[1]	14 977	1 629	10.9	15 403	2 935	19.1	25 754	4 104	15.9
Estonia	..	..	..	4 145	747	18.0	4 453	640	14.4
Finland[1]	14 560	575	4.0	18 937	1 454	7.7	21 821	2 260	10.4
France[1]	200 358	33 879	16.9	224 998	43 955	19.5	270 794	49 005	18.1
Germany[1]	282 124	28 494	11.1	366 700	57 210	15.7	412 029	88 855	21.6
Greece	..	..	..	49 114	5 348	10.9	58 816	5 347	9.1
Hungary[1]	24 671	2 724	11.0	28 522	3 790	13.3	33 293	4 657	14.0
Ireland[1]	8 208	2 895	35.3	12 832	5 973	46.6	125 00[2]	6 102	48.8
Israel	..	..	..	23 398	11 519	49.2	35 531	14 841	41.8
Italy	..	..	..	234 323	11 822	5.0	236 074	11 088	4.7
Latvia	..	..	..	..	..	..	6 673	753	11.3
Lithuania	..	..	..	..	..	..	13 269	752	5.7
Luxembourg[1]	882	266	30.2	1 347	536	40.0	2 264	1 541	68.1
Mexico	205 571	3 005	1.5	..	..	..	447 535	6 895	1.5
Netherlands[1]	42 313	7 032	16.7	57 976	8 429	14.6	77 206	12 227	15.8
New Zealand[1]	9 009	4 215	46.9	12 708	6 897	54.3	20 238.	10 281	50.8
Norway[1]	12 761	2 117	16.6	19 624	4 460	22.7	26 103	7 049	27.0
Poland[1]	99 687	3 144	3.2	109 652	2 935	2.7	112 832	2 970	2.6
Portugal[1]	23 131	4 552	19.7	36 831	6 040	16.4	43 749	6 162	14.1
Slovak Republic	..	..	..	21 552	823	3.8	23 497	933	4.0
Slovenia	..	..	..	5 556	1 006	18.1	..	..	..
Spain	126 248	9 433	7.5	..	..	..	190 773	32 285	16.9
Sweden[1]	26 983	6 148	22.9	47 778	14 173	29.8	47 320	15 155	32.0
Switzerland[1]	23 039	6 431	28.1	43 416	18 082	41.6	50 531	25 003	49.5
Türkiye	82 221	5 090	6.2	104 950	3 003	2.9	..	..	..
United Kingdom[1]	147 677	49 780	33.7	236 862	83 951	35.4	269 620	109 512	40.6
United States[1]	807 844	196 815	24.4	838 933	221 393	26.4	980 215	291 184	29.7
OECD Total[1]	1 881 613	398 408	21.2	2 261 457	552 914	24.4	2 663 387	742 854	27.9
OECD Total for a given year	2 295 653	415 936	18.1	2 744 058	590 650	21.5	3 772 752	829 651	22.0
	(22 countries)			(27 countries)			(29 countries)		

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Table 5.9. Recognition and licensing of foreign-trained doctors (D) and nurses (N) in selected OECD countries

	Czechia		France		Germany		Poland		Sweden		United Kingdom		United States	
	D	N	D	N	D	N	D	N	D	N	D	N	D	N
Language requirements (CEFR equivalent)	Not specified	Not specified	B2	B2	C1	B2	Not specified	Not specified	C1	C1	C1	C1	C1	B2–C1, depending on state
Automatic recognition of medical and nursing diplomas with select countries	Yes[1] (incl. former USSR until 2000)	Yes[1] (incl. former USSR until 2000)	Yes[1] (incl. Quebec)	Yes[1] (incl. Quebec)	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1] (incl. some Commonwealth and English-speaking countries)	Yes[1]	No	No
Possibility for supervised work allowed before recognition of diplomas (outside compulsory training)	Yes[2]	Yes[2]	No	No	Yes	Yes	Yes[2]	Yes[2]	No	No	No	No	No	No
Possibility for supervised work allowed before full licensing (outside compulsory training)	Yes[2]	Yes[2]	Yes[2]	Yes[2]	Yes	Yes	Yes[2]	Yes[2]	No	No	Yes	Yes	Varies by state	Varies by state
Recognition of previous internships or postgraduate training	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Varies by state	Varies by state
Written exam required for licensing	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes[3]	Yes	Yes	Yes
Simplified recognition conditions in the context of free movement	No	No	No	Yes[4]	Yes	Yes	No	No	No	No	No	No	No	No
Special measures in place for displaced Ukrainians	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No

1. Countries with automatic recognition of medical and nursing diplomas with the EU, EEA, and Switzerland.
2. Primarily in the context of special measures aimed at specific migrant groups (e.g. displaced Ukrainians).
3. Required in most cases, but waived for physicians who have passed a licensing exam in Australia, Canada or the United States – considered acceptable overseas registration clinical exams.
4. Third-country nursing degrees are generally not recognised in France, but if previously recognised in the EU/EEA/Switzerland, an equivalence assessment is conducted.

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Are more dissatisfied UK doctors really moving abroad?

BMJ 2025 ; 391 doi: https://doi.org/10.1136/bmj.r2113 (Published 09 October 2025)
Cite this as: *BMJ* 2025;391:r2113

Linked Feature
The highs and lows of quitting the NHS for Australia and New Zealand

Article | Related content | Metrics | Responses

Elisabeth Mahase

https://www.bmj.com/content/391/bmj.r2113

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Corrections

Revolving door: You are free to influence us "behind the scenes," FDA tells staff leaving for industry jobs

BMJ 2024 ; 386 doi: https://doi.org/10.1136/bmj.q1565 (Published 15 July 2024)
Cite this as: *BMJ* 2024;386:q1565

Article | Related content | Metrics | Responses

This feature article (*BMJ* 2024;386:q1418, 1 July 2024, doi:10.1136/bmj.q1418) described two bills recently introduced in the US Congress that seek to amend the law regulating post-employment activities of health agency employees. The article mistakenly described the two bills as different, when in fact they are identical bills, both referred to as the "FAUCI Act," with one introduced in the Senate and the other in the House of Representatives. The article also inaccurately described one bill as proposing a permanent ban on future board membership, when in fact the ban would be limited to eight years. The online version of the article has been amended to accurately describe the bills.

https://www.bmj.com/content/386/bmj.q1565

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gateway to recognition of qualifications

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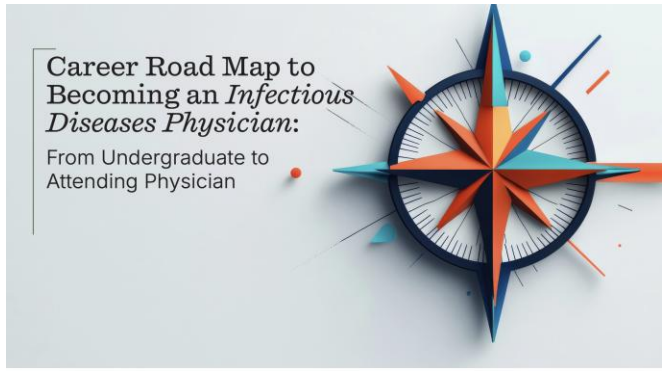
ABOUT | COUNTRIES OF THE NETWORKS | RECOGNITION TOOLS & PROJECTS | TOPICS | RECOGNITION CONVENTIONS | EVENTS

Albania	Denmark	Latvia	Romania
Andorra	Estonia	Liechtenstein	Russian Federation
Armenia	Finland	Lithuania	San Marino
Australia	France	Luxembourg	Serbia
Austria	Georgia	Malta	Slovak Republic
Azerbaijan	Germany	Moldova	Slovenia
Belarus	Greece	Monaco	Spain
Belgium	Holy See	Montenegro	Sweden
Bosnia and Herzegovina	Hungary	Netherlands	Switzerland
Bulgaria	Iceland	New Zealand	Turkmenistan
Canada	Ireland	North Macedonia	Türkiye
Croatia	Israel	Norway	Ukraine



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1

Step 1: Before medical school

- Complete prerequisite courses
- Build experience via research, volunteer work or clinical exposure
- Prepare for and take the MCAT
- Draft your CV and personal statement
- Request letters of recommendation
- Apply to medical school
- Earn a bachelor's degree
- Consider a post-baccalaureate program

2

Step 2: Medical School

- Stay open-minded when choosing a specialty
- Take ID electives
- Gather experiences that support your interests
- Complete licensing exams (USMLE Step 1 & 2 or COMLEX)
- Update your CV and personal statement; request letters of recommendation
- Apply for residency; if interested in ID, match into internal medicine or pediatrics
- Earn your medical degree

DETOUR

What if you aren't accepted to medical school? Click HERE to learn more.

3

Step 3: Residency

- Consider taking an ID elective; participate in a quality improvement or research project
- Join a committee on antimicrobial stewardship, infection control or hospital-acquired infections
- Apply for your pediatric or combined adult/pediatric ID fellowship program
- Update CV and personal statement; obtain letters of recommendation
- Complete licensing exam (USMLE Step 3 or COMLEX)
- Take your specialty or subspeciality board exam
- Complete residency

M

4

Step 4: Fellowship

- Identify your area of expertise by selecting a research focus and developing your project
- Refine your CV to reflect your growing experience
- Take your specialty or subspecialty board exam
- Complete a fellowship in ID to gain advanced training in diagnosing and treating infectious diseases

MENTORSHIP is critical along your path. Click HERE to learn more.

5

Step 5: Life After Fellowship

- Obtain board certification in ID by passing the subspecialty board exam
- Join IDSA or PIDS
- Understand the academic promotion process if pursuing academia
- Keep your board certification through continuing ed and recertification

IDSA

Table 6 Assessment of ID trainees

Country	Logbook/ Portfolio	Annual exam	Summative formal exam					Thesis
			Written	Oral	Clinical	Lab	OSCE	
Afghanistan		✓	✓		✓			
Albania		✓	✓					✓
Azerbaijan		✓	✓					
Bosnia and Herzegovina	✓	✓						
Bulgaria								
Croatia	✓			✓	✓	✓		
Greece	✓		✓	✓				
India			✓	✓	✓			
Iran	✓	✓	✓		✓		✓	✓
Iraq	✓		✓	✓	✓			
Jordan			✓				✓	✓
Kazakhstan	✓		✓					
Kosovo	✓	✓		✓	✓	✓		
Kyrgyz Republic	✓	✓	✓	✓	✓			
Lebanon		✓						
Malaysia	✓	✓		✓				
Moldova	✓	✓	✓	✓	✓			
North Macedonia	✓	✓		✓	✓			✓
Oman								
Pakistan	✓		✓		✓			
Qatar	✓							
Romania	✓		✓		✓	✓		✓
Russia	✓	✓	✓	✓				
Saudi Arabia		✓	✓					
Serbia				✓	✓			
Slovenia	✓			✓	✓			
Türkiye	✓	✓	✓	✓				✓
United Arab Emirates	✓	✓						
Uzbekistan	✓	✓	✓	✓				✓

34.5% of the countries reported a PhD requirement for academic career.

PhD requirements in medical specialties vary globally and may affect career mobility

Infection (2025) 53:2565–2585
https://doi.org/10.1007/s15010-025-02597-7

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Global Research Report
The changing research landscape of the Middle East, North Africa and Turkey

Jonathan Adams, Jamal El Ouahi,
David Pendlebury and Martin Szomszor

	(1) Population	(2) GDP	(3) Output	GDP/ capita	Output/ GDP	Output/ capita
Algeria	43,053	169,988	18,121	3.95	0.11	0.42
Bahrain	1,641	38,574	1,235	23.51	0.03	0.75
Egypt	100,388	303,175	66,058	3.02	0.22	0.66
Iran	82,913	445,345	188,163	5.37	0.42	2.27
Iraq	39,309	234,094	9,247	5.96	0.04	0.24
Israel	9,053	395,099	74,605	43.64	0.19	8.24
Jordan	10,101	43,744	9,674	4.33	0.22	0.96
Kuwait	4,207	134,761	4,976	32.03	0.04	1.18
Lebanon	6,856	53,367	9,116	7.78	0.17	1.33
Libya	6,777	52,076	1,237	7.68	0.02	0.18
Morocco	36,472	118,725	12,200	3.26	0.10	0.33
Oman	4,975	76,983	4,729	15.47	0.06	0.95
Qatar	2,832	183,466	12,482	64.78	0.07	4.41
Saudi Arabia	34,269	792,967	80,552	23.14	0.10	2.35
Syria	17,070	40,405	1,269	2.37	0.03	0.07
Tunisia	11,695	38,798	23,046	3.32	0.59	1.97
Turkey	83,430	754,412	157,579	9.04	0.21	1.89
U.A.E	9,771	421,142	16,540	43.10	0.04	1.69
Yemen	29,162	27,591	1,511	0.95	0.05	0.05

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Figure 3: Tree-map to show the relative volume of published output indexed in the Web of Science for countries in the MENAT region in two five-year periods.

Figure 3a: 2000-2004

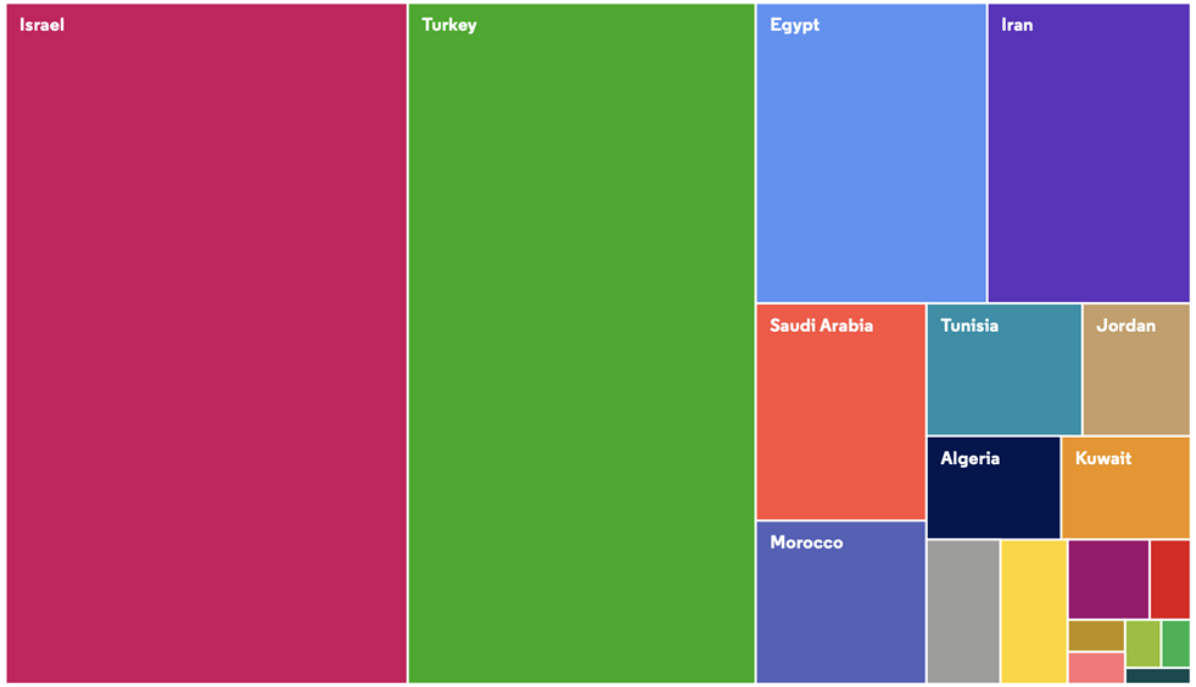

Figure 3b: 2015-2019

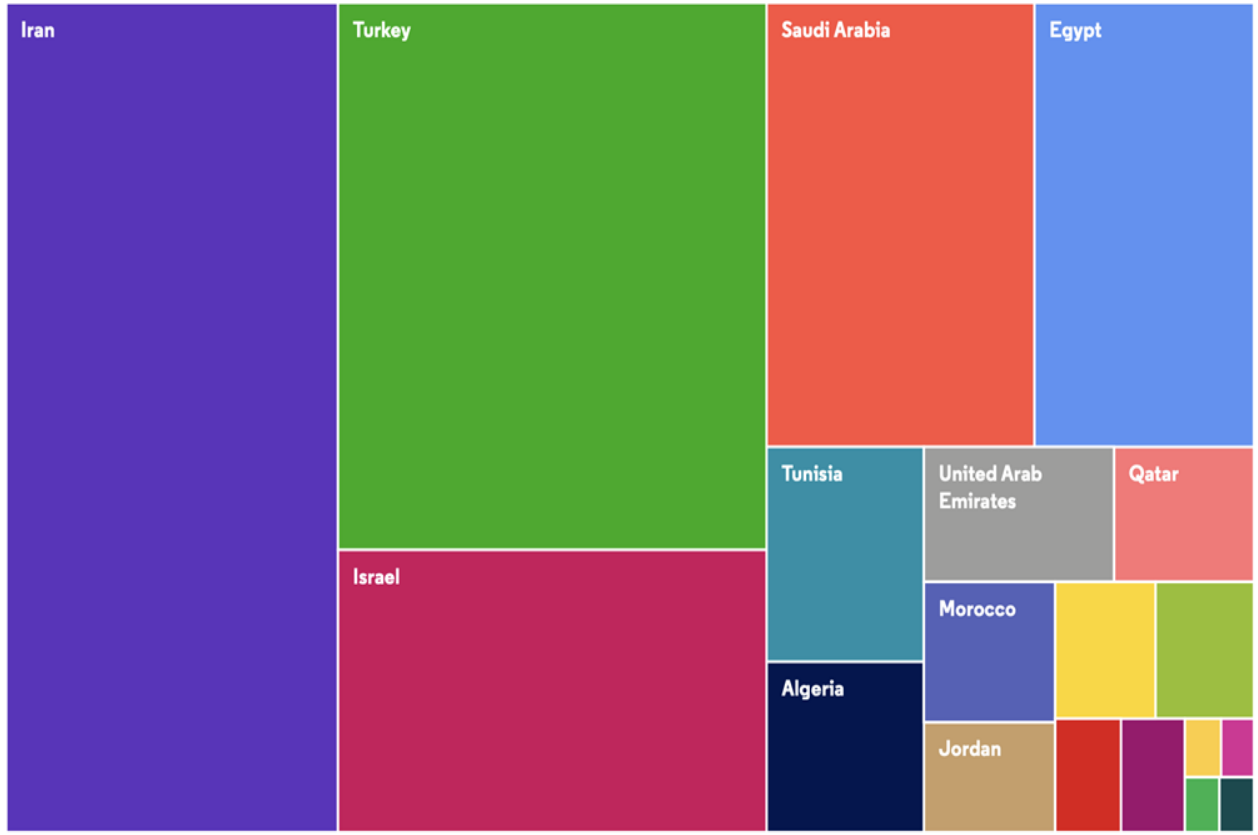

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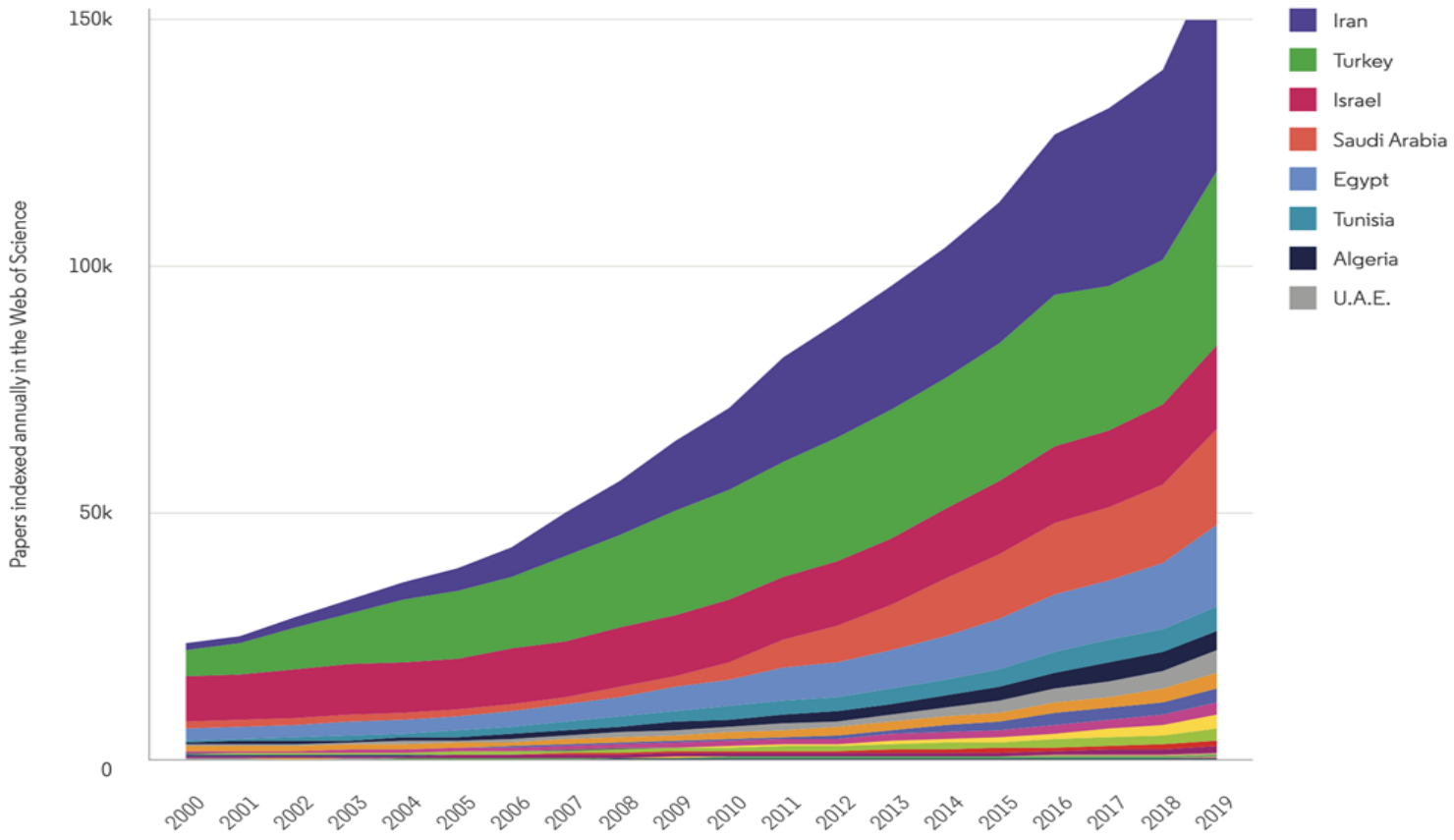
Figure 2: Trajectory of rising output among MENAT countries (2000-2019), shown as stacked volume (the apparent total for summed countries in region exceeds actual deduplicated total in Figure 2 because of collaboration between countries).



Six countries dominate this picture and account for more than 80% of total regional publications.

Iran is the largest producer among the studied countries. Its world share of the **Web of Science literature, just 0.2% in 2000, reached 2.3% by 2019**

Tunisia (almost 10 times its 2000 volume), Türkiye and Egypt (both seven times) have also seen **substantial growth**

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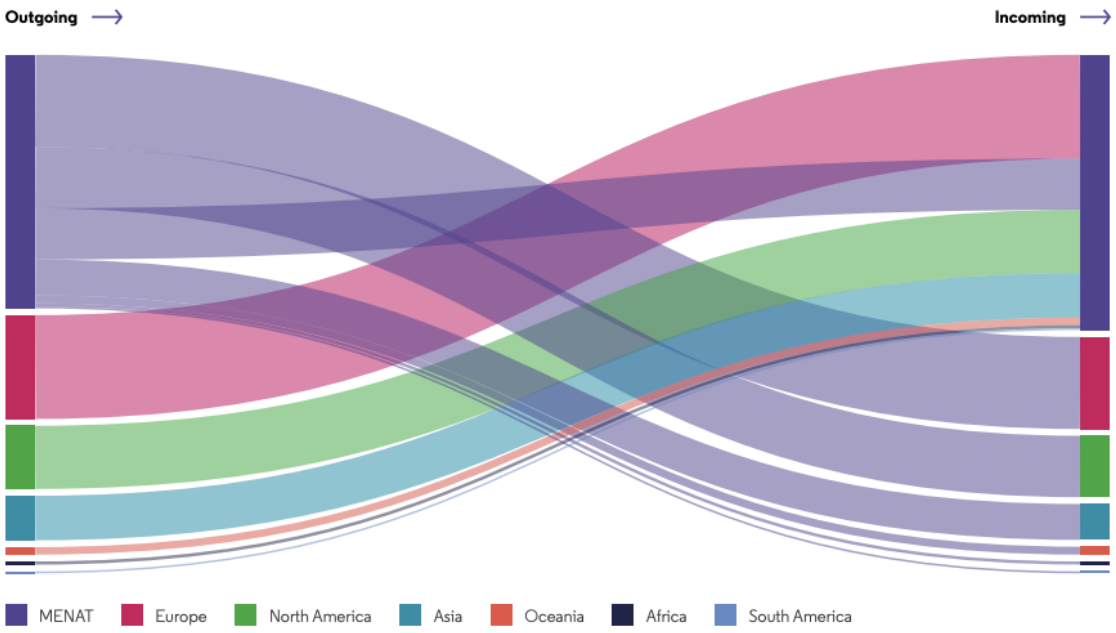
Figure 6: MENAT mobility flows at the regional level (2008-2017).



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The most common target and source region for regional research mobility was **Europe, with North America** as the second.

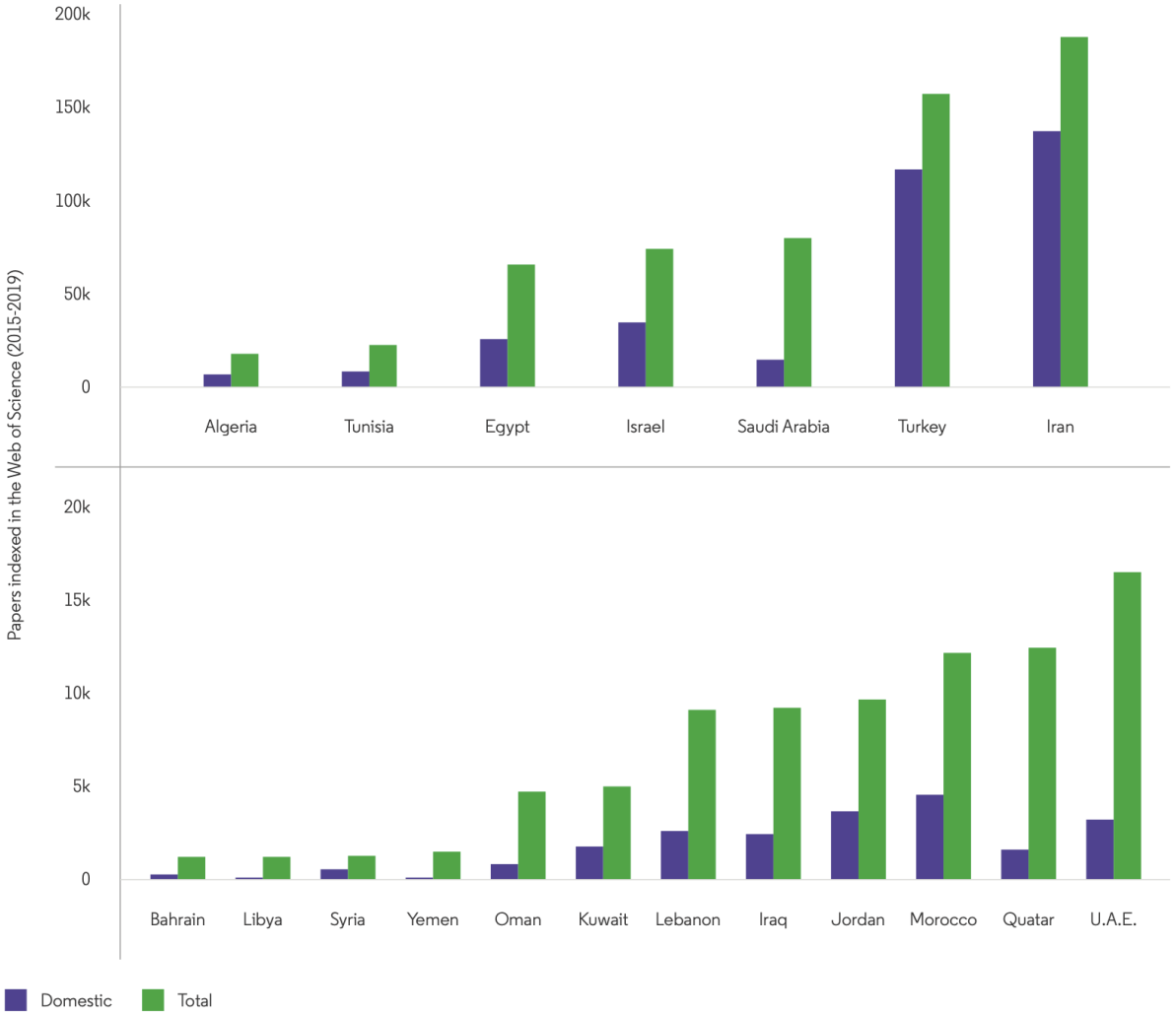
The regional inward and outward flows were similar.

At country level the **U.S., France, U. K., Germany, Canada, Malaysia and Mainland China** are frequent non-regional destinations and origins.

France is the preferred destination for researchers from **Morocco, Algeria and Tunisia**.

The U.K. is a frequent destination for **Saudi Arabia, the UAE and Qatar.**

Researchers from **Egypt and Jordan mostly migrate to Saudi Arabia** and secondarily to **the U.S**.



Comparison between the total numbers of papers published by researchers in MENAT countries (2015-2019) and the numbers of papers that were domestic (with no co-author outside the country)

The impact of research for Iran and Türkiye is a clear index of their national performance

The larger research producers (including **Türkiye, Iran, Egypt, Tunisia, Algeria and Morocco**) were **performing less well, for international collaborations**, **than the regional average** whereas the correct analysis would take note of the smaller international contribution to the research capacity of those countries.

Table 2: The numbers of papers shared by the six largest MENAT economies (by research output). Data are shown for those international partners that co-authored 10,000 or more MENAT articles and reviews (2015-2019) published in journals indexed in the Web of Science.

Regional total		Iran	Turkey	Saudi Arabia	Israel	Egypt	Tunisia
188,162	Iran		3,171	1,616	219	1,278	236
157,578	Turkey	3,171		2,804	1,436	1,548	369
80,550	Saudi Arabia	1,616	2,804		369	15,878	2,660
78,605	Israel	219	1,436	369		259	113
66,057	Egypt	1,278	1,548	15,878	259		423
23,046	Tunisia	236	369	2,660	113	423	
33,050	France	2,864	4,605	3,428	4,968	2,118	6,975
32,705	U.K.	4,989	6,643	6,227	6,626	3,755	588
28,108	Germany	4,591	6,307	4,159	8,022	4,374	649
21,308	Italy	4,443	5,507	2,891	5,332	2,233	1,266
16,935	Spain	3,066	4,274	2,790	3,760	1,961	1,548
10,880	Netherlands	1,856	3,369	1,482	3,391	742	187
75,764	U.S.	12,018	13,904	12,812	20,289	8,085	866
21,750	Canada	5,590	2,837	3,837	4,219	2,507	643
16,463	Australia	4,673	2,491	3,798	3,013	1,340	264
25,158	China, Mainland	4,065	4,060	9,216	3,758	3,866	414
15,883	India	2,434	2,562	7,388	1,734	2,201	359
12,041	Pakistan	1,564	2,358	7,464	193	1,531	197
11,431	Malaysia	3,746	1,684	3,714	693	1,414	147
10,202	Japan	1,376	2,171	2,099	2,143	2,807	246
9,282	South Korea	2,347	1,958	3,061	1,031	2,016	165

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Table 3: The 10 research journal categories in which the six MENAT economies with the greatest research output have a high share (%) of papers indexed in the Web of Science (2015-2019) compared to global publication counts in that category (text highlights: bold against name is overall global share; purple = technology; crimson = medicine; green = agriculture).

Iran	**2.17**	**Turkey**	**1.82**	**Egypt**	**0.76**
Engineering, petroleum	8.07	Folklore	14.6	Andrology	3.30
Materials, composites	7.02	Andrology	7.23	Chemistry, medicinal	2.60
Thermodynamics	6.64	Textiles science	6.54	Anatomy morphology	2.21
Mechanics	6.21	Emergency medicine	5.41	Dairy animal science	2.12
Engineering, geological	6.01	Otorhinolaryngology	4.76	Microscopy	2.01
Engineering, civil	5.98	Area studies	4.66	Pharmacy	1.92
Materials characteriz'n	5.97	Ophthalmology	4.62	Veterinary sciences	1.70
Andrology	5.62	Anatomy morphology	4.62	Entomology	1.70
Engin'ng, mechanical	5.56	Oral surgery medicine	4.61	Parasitology	1.70
Quantum technology	5.09	Obstetrics gynecology	4.39	Chemistry, organic	1.67
Saudi Arabia	**0.93**	**Israel**	**0.92**	**Tunisia**	**0.27**
Mathematics, applied	2.37	Social work	3.34	Automation control	0.98
Oral surgery medicine	2.21	Psychoanalysis	3.30	Textiles science	0.92
Telecommunications	2.20	Religion	3.29	Agricultural engin'ng	0.84
Engineering, petroleum	2.18	Archaeology	3.26	Business finance	0.80
Thermodynamics	2.16	Logic	3.24	Mathematics, applied	0.74
Information systems	2.05	Area studies	3.20	Agronomy	0.73
Mathematics	1.91	Psychology, social	2.81	Mathematics	0.73
Maths, interdisciplinary	1.88	Asian studies	2.62	Condensed matter	0.70
Artificial intelligence	1.88	Education, special	2.53	Chemistry, applied	0.68
Chemistry, medicinal	1.87	Obstetrics gynecology	2.49	Engin'ng, manufact'ng	0.64

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"'….Türkiye, by contrast to others, has a particular focus on specialist areas of **medical science**."

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Internationally collaborative papers have, on average, higher impact than purely domestic papers, partly because **collaboration implies an endeavour to solve major challenges** not amenable to a solo effort but also because the paper reaches a wider audience.

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Bridging continents: postgraduate infectious diseases training programs from central Europe to Southeast Asia

Research | Open access | Published: 08 July 2025

Volume 53, pages 2565–2585, (2025) Cite this article

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Thank you

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