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REVIEW

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Interventions to attract medical students to a career in primary health care services in the European Union and peripheral countries: a scoping review

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Abstract

Background In the European Union and peripheral countries, the availability of physicians working in primary health care services (PHCS) varies greatly and all countries report shortages and difficulties in recruiting more. The broad consensus that giving access to PHCS to all is a policy priority, reinforced by the lessons learned during the COVID-19 pandemic, implies that a sufficient fit-for-purpose workforce is available. This article focuses on physicians and reports on what countries have done, and with what success, to attract more medical students to a career in PHCS.

Methods We conducted a scoping review of articles in PubMed and Cochrane Library, and of grey literature in websites of international agencies, think-tanks, international non-governmental organizations, and European Commission-funded projects, published between January 2018 and February 2024.

Results The search retrieved 1,143 records, of which 45 were eligible for the scoping review; 25 focused on medical students. The documents report interventions in 12 countries, 14 by individual education institutions, mostly in the form of exposure of diverse duration to general/family practice in the medical curriculum (specific modules, residencies, rotations, placements, mentorship), and 11 policy interventions at national level, such as increases in the number of training places for primary health care (PHC) specialties and improvement of working conditions.

Conclusion Accessible PHCS require the availability of a fit-for-purpose workforce of multiprofessional teams, in which specially trained physicians play a central role. To address shortages, many countries increased training opportunities, a necessary step, but not sufficient. More students must accept to opt for a PHC specialty, in a context of competition with other fields of practice also in need of more students, such as public health, geriatrics, or mental health. Success requires the collaboration of numerous actors, including professional councils and organizations, and regulation bodies that specialists tend to dominate. By making PHCS a political and policy priority, decision-makers can help make attraction more effective, but to do so, they need access to convincing evidence and information on good practices that only research can produce.

Keywords Health workforce, Primary health care services, Medical students, Attraction

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Introduction

Ever since the International Conference on Primary Health Care in Alma-Ata (1978) issued a Declaration calling for "urgent and effective national and international action to develop and implement primary health care" [1], countries of the world have struggled to recruit enough health workers to respond to this objective. European Union (EU) and peripheral countries (European Free Trade Association—EFTA members, United Kingdom—UK and EU candidate countries) are no exception; all report a persistent insufficient supply of personnel available to work in primary health care services (PHCS). In many countries, the density of family doctors/general practitioners (GPs) has diminished relatively to populations and to specialists in the last 25 years.

In October 2018, participants at the "Global Conference on Primary Health Care: from Alma-Ata towards universal health coverage and the Sustainable Development Goals" [2] agreed that "the time is now to invest in building and training a sustainable and multidisciplinary primary health care team". In Europe, the proportion of GPs and family physicians in the medical profession varies considerably and generally remains low, in spite of most countries having increased their total production of physicians [3]; all countries report shortages and difficulties in recruiting and retaining staff in PHCS, and therefore specific targeted interventions are needed to scale-up the PHC medical workforce. The proportion of GPs or family doctors respective to specialists and to population diminished in spite of efforts to increase the number of training slots. For example, in Bulgaria, the proportion of generalists was 13.4% of all physicians in 2021, well below the EU average of 22%, down from 16.5% in 2011 [4]. In Malta, it was 24.3% in 2012, and 19.5% in 2021 [5], and in Spain, it was lower in 2021 than in 2018 (21% vs 22%) [6]. In France, the density of GPs of 1.5 per 1,000 population in 2012 was 1.4 in 2021 [7]. In most countries, available positions in PHCS remain unfilled, with the consequence that access to a GP or to a family physician is limited, like in Portugal, where 16% of the population do not have such access even though they are entitled to it [8].

There are four ways to bring more physicians, nurses and other professionals to work in PHCS: (1) attracting and training more new entrants in the profession; (2) retaining active practitioners for the full duration of a normal career, including by facilitating the return to work after a career break, for family, health or other reasons; (3) retraining specialists—for example, those who change their career path as they come close to retirement—and, (4) international recruitment. This article addresses the necessary conditions of the success of the first strategy, focusing on the attraction of medical students to general or family practice. Here, attraction refers to the process and actions to bring students to choose primary health care (PHC) as a career path.

To cope with shortages, some countries, typically the high-income ones, rely on international recruitment: for instance, the number of foreign-trained medical doctors entering the medical register in Ireland, Norway and Switzerland in 2019 was greater than that of domestic graduates, though not all work in PHCS [3].

There is no dearth of recommendations by health professional associations, international agencies (World Health Organization—WHO, World Bank, Organisation for Economic Co-operation and Development—OECD), as well as by practitioners and researchers on how to make work in PHCS more attractive, as is documented in a European Observatory on Health Systems and Policies on "How to increase the attractiveness of primary care for medical students and primary care physicians" [9]. This Brief surveyed the peer-reviewed literature on the topic up to 2018. Since then, the COVID-19 pandemic has highlighted the weaknesses of PHCS as a first line of defence against a health shock, in part due to shortages of personnel, an issue that acquired more visibility on the political and the policy agendas, at least temporarily. Adding to pre-existing shortages, during the pandemic, there was an excess mortality and morbidity of doctors and other front-line health and care workers, and many decided to leave clinical work, even the health labour market altogether. It is therefore worth looking more closely at what countries have done, and with what success, to attract more medical students to the choice of PHCS as their area of work.

This justified that we conducted a scoping review of the literature since 2018, asking what interventions did countries implement to attract medical students to choose to train for work in PHCS and what has been their effectiveness. This article presents the results of that review that focuses on the attraction of medical students.

Methods

We performed the scoping review in accordance with the methodological recommendations of Arksey and O'Malley [10] that include: (1) the identification of the research question(s); (2) the identification of potentially relevant documents; (3) the selection of documents for analysis; (4) data charting; and (5) summary and report of the results.

Research questions

The original review addressed two complementary questions: (1) What interventions have countries implemented to attract medical and nursing students, and practising doctors and nurses to studies and a career in PHCS? (2) What has been the effectiveness of these interventions? The protocol is available at https://osf.io/ba3fk. For the purpose of this article, the first question

is reduced to "What interventions have countries implemented to attract medical students to studies and a career in PHCS?".

Identification of relevant studies

We used the PICo (Participant, Intervention/Phenomenon of Interest, Context) search tool [11] (Additional file 1) to structure the review.

Information sources

The electronic databases and websites searched included: PubMed, Cochrane Library, international agencies and organizations, think-tanks and International non-governmental organizations, and European funded projects websites. Box 1 includes the list of information sources searched in the original review. We also did reverse citation searches of the key documents identified and publications included in the final assessment phase.

Box 1. sources searched: reference bases, websites

- Electronic databases: PubMed and Cochrane Library.
- International organizations: World Health Organization (Headquarters and Regional Office for Europe), European Commission, European Observatory on Health Systems and Policies, Organisation for Economic Co-operation and Development and World Bank.
- Think-tanks and International non-governmental organizations: The Training for Health Equity Network (THEnet), Health Foundation, Nuffield Trust and King's Fund.
- European professional associations/organizations: WONCA Europe, European Nursing Council, European Federation of Nurses Associations, European Board for Accreditation of Continuing Education for Health Professionals, European Council of Medical Orders, Association for Medical Education in Europe, European Forum of National Nursing and Midwifery Associations, European Specialist Nurses Organisation, European Health Management Association, European Medical Students' Association, Union of General Practitioners, European Federation of Nurse Educators, Union of General Practitioners, European Federation of Salaried Doctors, European Federation of Internal Medicine and European Junior Doctors.
- European funded projects: AHEAD (Action for Health and Equity: Addressing medical Deserts), OASES (Promoting evidence-based reforms on medical deserts), Route-HW (A Roadmap OUT of mEdical deserts into supportive Health WorkForce initiatives and policies) and TASHI (Empowering EU health policies on Task SHIfting).

Search

The search strategy covered peer-reviewed articles and technical and political documents published between January 2018 and February 2024 in English, French, Italian, Portuguese, and Spanish. Most search terms were according to the controlled health vocabulary MeSH (Medical Subject Headings). We included relevant words not captured in the keyword search as free terms. The search strategy conducted from 4th January to 13th February 2024 is described in Additional file 2.

Document selection

Selection of sources of evidence and Eligibility criteria

The EndNote [12] software served to collect, organize and manage references retrieved from searches and remove duplicates. Data eligibility was established using Rayyan [13]. One reviewer carried out the literature search in the databases, and two reviewers did the search of the websites. They then applied eligibility and exclusion criteria (Table 1) to the abstracts. When eligibility criteria were met, two reviewers did a full-text analysis of the selected documents; these resolved any discrepancies through consensus. Figure 1 describes the inclusion process as recommended by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [14].

Data charting process

Selected documents were randomly divided among two reviewers for data extraction, Reviewers used an Excel spreadsheet adapted from the data extraction instrument from the Joanna Briggs Institute (JBI) Manual of Evidence Syntheses [15].

Data items

The following data items were extracted: bibliographic information (author, title, year), study design, professional category and sample size if applicable, country, interventions (type and information such as level, location, sector and actors involved) and results, according to the data extraction instrument (Additional file 3).

Synthesis of results

We presented the results in a narrative way, and summarize the characteristics of the included documents using descriptive statistics. We grouped the findings in each specific intervention domain of the intervention and outcome. For each outcome, we summarized the type of study and method in selected studies, the context of the intervention, and the results. We also discussed the body of evidence for each intervention domain, the type of intervention, and the outcome.

Table 1 Eligibility criteria

Inclusion criteria	Exclusion criteria
• Population: primary care physicians (family physicians, general practitioners), nurses, and medical and nursing students as targets of the intervention(s); this article will focus on medical students; • Intervention/phenomenon of interest: interventions to attract these professionals implemented at national, sub-national/regional, and local levels, (irrespective of the date of the start of their implementation); • Context: Primary care services in European member states and candidate countries, European Economic Area, European Free Trade Association countries, and the United Kingdom; • Type of document: qualitative, mixed methods, quantitative, observational studies, experimental and quasi-experimental studies, technical and policy documents; • Documents concerning several countries must include information on specific eligible countries; • Full text must be available (word, pdf); • Published between January 2018 to February 2024 in English, French, Italian, Portuguese or Spanish	• Intervention/phenomenon of interest and population: intervention(s) not explicitly targeting included professional categories; • Type of document: commentary (letters, editorial), research-protocol, conference abstracts, internet pages and poster presentations (will be excluded but can serve in the discussion of the findings); • Full text not available in electronic format; • Another period or language than the ones covered in this review

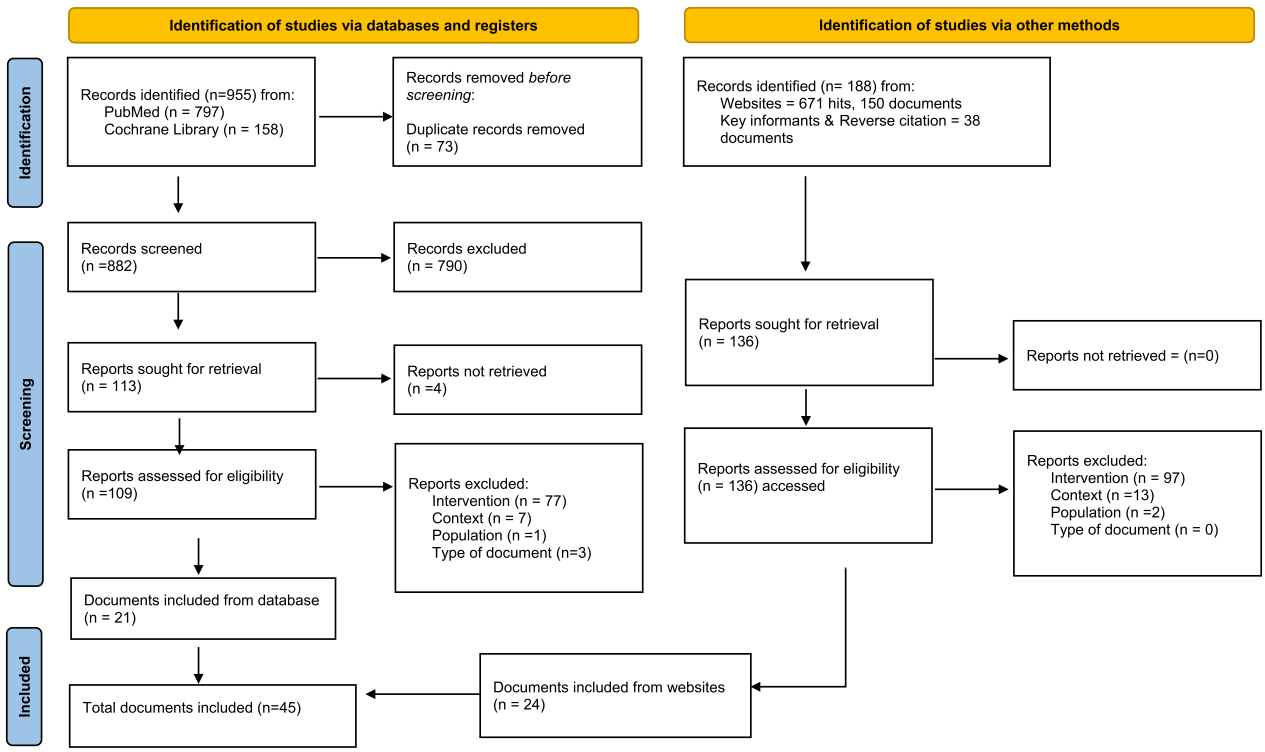

Fig. 1 PRISMA flow diagram

Results

Selection of sources of evidence

The initial search identified 1,143 records, of which 45 were eligible for the scoping review; 25 focused on medical students (excluded records are available in Additional file 4). Figure 1 summarizes the results in line with the PRISMA-ScR reporting tool [16].

Documents included in the review

Characteristics of sources of evidence

The characteristics of the included sources of evidence are reported in Table 2. Of the 25 documents reviewed in this article, 14 are articles and 11 are technical and policy documents, all written in English. Eight articles present qualitative studies based on interviews, questionnaires

and focus group, and four are cross-sectional studies. The documents report four interventions in Germany, three each in England, Estonia, France and Ireland, two each in Scotland and Switzerland and one each in Belgium, Greece, Italy, Slovakia and Türkiye. Interventions identified fall in two groups: by individual education institutions (N = 14) and policy interventions at national level ($N = 11$). These targeted undergraduate ($N = 11$) and postgraduate ($N = 14$) medical students. In 16 documents, the results of the intervention are available.

Table 2. Documents included in the review.

Results of individual sources of evidence

Interventions by individual education institutions

There have been education interventions in six countries, reported in 14 documents. Interventions at undergraduate level in Germany include introducing an extracurricular longitudinal teaching project, called 'Leipziger Kompetenzpfad Allgemeinmedizin' ('Leipzig Competency Pathway for General Practice'—LeiKA), that provides mentoring and networking [25], and the inclusion of a workshop on physicians' earning opportunities, workload and job satisfaction as part of a mandatory general practice clerkship [26]. Other interventions are the creation of a longitudinal integrated clerkship (18 weeks) in an Irish university [28], and, in England, a near-peer teaching model (senior learners mentoring more junior learners) [38] and doubling to 4 weeks of exposure to general practice (with 4 weeks module for 4th-year medical students at Nottingham University) [40].

In England, interventions at regional level consisted of exposure to general practice in the first year of the two-year Foundation Programme that follows undergraduate medical studies [39]. In the Canton of Bern, in Switzerland, there are new postgraduate curricula and longitudinal internships, supported by a ten-year state-funded vocational training programme [36]. At national level, the state has invested, since 2000, in Institutes for PHC that introduced various curriculum changes to attract more students to PHC, including an expanded GP training module (Praxis Assistenz) that places trainees in GP offices for 6–12 months [35]. In France, postgraduate general practice residents alternate clinical training in hospitals and in PHC settings, in principle, under the supervision of a GP trainer (Maître de stage). However, not all settings have staff trained to provide that supervision [21].

As regards results of these interventions, the German LeiKA and the workshops on general practice initiatives have had a positive influence on students' views of working as a GP, but no discernable impact on choosing a career in PHCS [25, 26]. In England, increased exposure to general practice with innovative, paired, career tutorials and exposure in the first year of the two-year Foundation Programme augmented the likelihood of considering a career as a GP [38–40]. In Switzerland, longer, part-time internships and training modules on general practice were associated with higher rates of choosing a career in PHCS [35, 36]. In France, a study of the density of GPs in all the country's municipalities showed that, for the years 2018–2021, it had augmented by 1.36% where postgraduate students had done their residency in general practice under supervision [21].

Some documents reported interventions that had the objective to attract students to practise in underserved areas, such as rural, remote, poor urban or with marginalized populations. Even if it was not explicit, these would principally target future GPs or family physicians. The Martin Luther University Halle-Wittenberg and the University of Leipzig introduced the MiLaMed [23] ("Central German Concept for the Longitudinal Integration of Rural Medical Training Content and Experience in Medical Studies", [https://www.milamed.de]) that includes adding "rural" content in the compulsory and elective parts of the curriculum, supplementary online teaching and support during rural placements in four target regions. Also, a study describes how students in three German medical faculties—Erlangen, Würzburg and Regensburg—undergo a practical year in a rural general practice before choosing a specialty [24]. In Scotland, in 2016, the University of Dundee School of Medicine piloted a 40-week Longitudinal and Comprehensive Integrated Internship for Year 4 students in rural areas [32]. Moreover, in Scotland, a "Targeted Enhanced Recruitment Scheme", offered a financial incentive (£20,000) to GP trainees accepting a targeted post, typically in a rural area or an urban one with a history of difficulty of recruitment [33]. In Ireland, the North Dublin City General Practitioner Training Programme (NDCGP) is designed to train future GPs to work in areas of deprivation and with marginalized groups [27]. The NDCGP was the most successful, as almost all participants eventually chose to pursue a career as a GP in an underserved area [27]. German MiLaMed [23] and the Scottish Long Comprehensive Longitudinal Integrated Clerkship [32] had a positive effect on intentions to continue training in general practice [23] and reporting of positive feelings about eventually working in PHCS [32]. Scotland's financial incentive scheme had a low impact on the choice of a targeted posting [33]. The North Dublin specific training programme was more successful as almost all participants eventually chose to pursue a career as a GP in an underserved area [27].

Table 2 Documents included in the review

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
OECD & European Observatory on Health Systems and Policies 2019 [17]	Political and technical document	N/A	Medical students (post-graduates)	Belgium	Policies	Increase in the number of internship training places	Not identified The number of new medical graduates undertaking their training in general medicine increased from about 350 per year between 2011 and 2013 to over 600 in 2017. The number increased greatly in 2018 to over 1 100, but 2018 was an exceptional year since two cohorts of students graduated at the same time, following a reduction in the length of medical studies by one that was introduced a few years ago. As a share of all internship places, the share in general medicine reached a new high of 41% in 2018, up from 25% in 2011, meaning that a large wave of new GPs should become available by 2020. However, this will be a 'one-off' event, and the number of newly trained GPs is expected to be lower in the following years
European Observatory on Health Systems and Policies 2023 [18]	Political and technical document	N/A	Medical students (post-graduates)	Estonia (The University of Tartu & Ministry of Social Affairs)	Policies	Increase in the number of posts for residency trainees in family medicine programme—by 10% in the University of Tartu	The University of Tartu runs specialist medical training (residency) programmes for medical doctors. The admission quotas for state-funded residencies are formalized in a contract between the University and the Ministry of Social Affairs (MoSA) after consultation between the University, the MoSA, the EHIF Supervisory Board and specialist associations As a result, Estonia is still not training enough family physicians, with an estimated need of 50 newly trained family physicians per year (De Maeseneer, 2016)

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
OECD & European Observatory on Health Systems and Policies 2023 [19]	Political and technical document	N/A	Medical students (post-graduates)	Estonia	Policies	Medical specialty training reform—allowing for greater flexibility and part-time options	Not identified Too recent to show results While recent changes have made medical specialty training more flexible, health workforce shortages remain an urgent issue (p.22)
WHO 2018 [20]	Political and technical document	N/A	Medical students (post-graduates)	Estonia	Policies	Increase in the number of posts for residency trainees in family practice	In 1993, Estonia became the first post-Soviet country to establish family practice as a medical specialty (4), with the goal of improving the quality of front-line PHC services and reducing reliance on hospital-based specialists. In addition to establishing a postgraduate training curriculum in family medicine, Estonia systematically retrained large numbers of practising physicians (primarily paediatricians and internal medicine specialists) as family practice specialists, and started a family residency training programme (7). Since 2007, the number of posts for residency trainees in family practice has increased; also, the number of active family doctors per 100 000 increased from 39.2 in 2000 to 71.9 per 100 000 in 2014 (8). Together, these steps have helped to elevate the status of family doctors and make them a key part of future health system reforms (9)

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Taha et al. 2022 [21]	Article	Cohort study	Medical students (post-graduates)	France	Education	Training supervision (supervise postgraduate students in general practice education)	Evolution of the density of GPs per 10 000 inhabitants between 2018 and 2021, number of training supervisors, and other factors supposed to influence the evolution of the density of GPs The training supervision is associated with a better evolution of density of GPs in French municipalities (…) seems to improve the attractiveness of a territory. This justifies considering the training supervision as a facilitating factor to regulate the distribution of GPs across the national territory A total of 34 990 (99.9%) French municipalities were included in the follow-up. Among these, 9427 (26.9%) had a GP and 3866 (11%) had a GP involved in the training supervision. The density of GPs in French cities decreased on average by 2.17% between 2018 and 2021. Territories without training supervisors decreased by 4.63% while those with at least one increased by 1.36% ($p < 0.01$). This significant relationship was also found in multivariate analysis The evolution of medical density from 2018 to 2021 was analysed with other identified variables. A relationship was found between a favourable evolution of the density and the presence of TS in municipalities, the existence of multiprofessional practices on the territory and the proportion of GPs under 40 s in the municipality. A relationship was found between an unfavourable evolution of the density and the existence of financial aid or having GPs over 60 s

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
OECD & European Observatory on Health Systems and Policies 2023 [22]	Political and technical document	N/A	Medical students (postgraduates)	France	Policies	40% of postgraduate internship positions have been allocated to general medicine + GP students have to undertake one additional year of training in ambulatory care settings, and encouraged to do it in underserved areas	Not identified
OECD & European Observatory on Health Systems and Policies 2021 [7]	Political and technical document	N/A	Medical students (postgraduates)	France	Policies	During their final year of postgraduate training, GPs must complete half of their rotations in ambulatory care settings, including underserved areas, receiving a monthly stipend (As part of the National Health Strategy 2018–2022)	(output) Engaging with medical students to increase access in deprived areas has been successful. Between 2010 and 2019, 2 696 access contracts were signed with students and residents
Herget et al. 2021 [23]	Article	Cross-sectional study	Medical students (undergraduates)	Germany (Medical schools Leipzig and Halle-Wittenberg)	Education	Establishing a new rural curriculum and promoting clerkships	Not identified

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Ludwig et al. 2018 [24]	Article	Qualitative pre-post-survey	Medical students (undergraduates)	Germany (medical faculties in Erlangen, Würzburg and Regensburg)	Education	Medical students go through a Practical Year (in rural GP surgeries) before choosing a specialty, with one site using in combination with an expense bonus (in the GP tertiary)	The PY General Practice Tertiary ("targeted work experience) itself appears to have a positive impact on the individual barriers expressed before the PY The results present the statements of the pre- and post-interviews of 19 PY students. Of these, 13 participants completed their PY in one of the selected rural practices, six participants in urban practice. 13 of the participants were firmly committed to continuing GP training, 12 of whom aspired to opening a practice in a rural area. Another three were considering GP training, three had decided against it after the PY. After the PY, some of the previously anticipated individual barriers were now perceived in a more differentiated manner as a result of practical experience. The barriers "work-life-balance", "compatibility with family", "recreational opportunities" and "infrastructure" had been largely eliminated The influence of financial compensation on the choice of a rural practice was given by the participants as being between 0 and 50%. (…) The financial expense allowance for participants choosing rural practices may also have influenced the choice of practices. But this made the practicalities of transport or even changing residence more feasible for students

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Geier et al. 2019 [25]	Article	Cross-sectional study	Medical students (undergraduates)	Germany (University of Leipzig)	Education	LeiKA, a new extracurricular longitudinal general practice (GP) teaching project	The project offers 30 slots per year for interested study entrants, and has capacity for ~ 10% of first-semester students 720 questionnaires (from both LeiKA participants and non-participants) were completed, corresponding to a response rate of 75.0% (720/960) for all study entrants 2016–2018 The extracurricular programme was taken up by a broad range of students, indicating its potential to attract more students to become GPs LeiKA participants were compared with non-participants regarding baseline characteristics, career intentions and attitudes associated with GP careers. There was also a qualitative analysis of the reasons for taking part**.** Although more participants definitely favoured a GP career (13.1% vs 4.9%, p = 0.001), it was a possible option for most students in both groups (78.6% vs 74.0%). Early acquisition of skills and patient contact were the main motives for taking part, stated by 60.7% and 41.7% of the participants, respectively

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Heine et l 2022 [26]	Article	Cross-sectional—data based on fourth-year (of six) medical students' post hoc evaluations	Medical students (undergraduates)	Germany (University of Leipzig)	Education	A workshop on physicians' earning opportunities, workload and job satisfaction, as part of a mandatory general practice clerkship	Students who completed the clerkship between October 2017 and September 2018 (one cohort) took part in the workshop. (…) The workshop was conducted with small groups of 8 to 15 students at the end of their mandatory two-week general practice clerkship at the University of Leipzig More than half of participants reported an increase regarding the attractiveness of working self-employed and working as a general practitioner, most frequently regarding earning opportunities, but also in general and in respect to job satisfaction, cost–benefit ratio and workload. This increase was significantly higher among students favouring or at least considering a general practice career

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Carroll & O'Reilly 2019 [27]	Article	Mixed-methods—self-administered questionnaire	Medical students (post-graduates)	Ireland (North Dublin)	Education	Specifically trains GPs to work in areas of deprivation and with marginalized groups	An evaluation of North Dublin City General Practitioner NDCGP training programme was conducted by sending a self-administered questionnaire to all graduates of the programme (2013–17). Thirty-seven graduates (88%) responded to the questionnaire. Thirty six (97%) were either working as GPs in an area of deprivation or their work included services to a marginalized group. These 36 (97%) respondents indicated that continuing to serve deprived communities was in their long-term plans. The training provided trainees with the knowledge, understanding and a specific skill set to equip them to work with the underserved Through teaching and exposure placements, trainees' confidence and empathy had increased and their prejudice and fear towards underserved patients had decreased

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Glynn et al. 2021 [28]	Article	Cross-sectional study	Medical students (undergraduates)	Ireland (University of Limerick)	Education	Longitudinal integrated clerkship in general practice (18-week)	Survey of career destination of 3 cohorts of medical students 6–8 years after graduation to assess the impact of having gone through a 18-week longitudinal integrated clerkship The most common career destination across the three graduating cohorts 6 and 8 years after graduation was general practice, with a total of 43% engaged in this speciality. There did not appear to be any gender difference across the three graduating cohorts with identical numbers of males and females working in the speciality. However, it did appear that general practice as a career choice was more popular among non-EU students with 52% choosing it in comparison with 39% of EU students
OECD & European Observatory on Health Systems and Policies 2023 [29]	Political and technical document	N/A	Medical students (postgraduates)	Ireland	Policies	Increase in the number of vacancies for GP residency trainees (the Health Service Executive allocated funding in 2023 to expand the National Specialist GP Training Programme by 12%)	Not identified

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
OECD & European Observatory on Health Systems and Policies 2023 [30]	Political and technical document	N/A	Medical students (postgraduates)	Italy	Policies	Increase in the number of places—expanded the number of students admitted to medical faculties and postgraduate residency training positions	Not identified Notably, the number of medical residency slots for general practice more than doubled between 2018 and 2021 compared to previous four years – an achievement partly supported by Italy's Recovery and Resilience Plan The outcomes of these substantial increases are projected to fully materialize towards the end of the decade, when the inflow of newly qualified medical specialists is projected to more than offset retirement attrition
OECD & European Observatory on Health Systems and Policies 2023 [31]	Political and technical document	N/A	Medical students (undergraduates)	Greece	Policies	Pilot programme on preliminary clinical training periods (the family medicine module is being added to the basic curriculum and extended to over 75% of universities)	Not identified

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Bartlet et al. 2019 [32]	Article	Mixed-methods	Medical students (undergraduates)	Scotland (Dundee University School of Medicine)	Education	Long comprehensive Longitudinal Integrated Clerkship—rural and remote areas (40 weeks—an entire academic year, and it is in the penultimate year)	Ten places for year 4 students are available which are shared between two regions of Scotland which are largely rural areas by UK definitions. For the evaluation, data were collected from the first cohort of seven students, four health service employed staff (two with leadership roles and two with regional student facing roles), 21 General Practitioner tutors The groups of stakeholders generally reported positive experiences (also positive opinions regarding its potential effects on model of clinical education as well as benefits on recruitment to GP careers) and remain committed to it as an educational strategy for clinical students. Early challenges of workload for the GP tutors in the first few months and students' access to secondary care services are settling with time. Students have reported that they feel engaged with their communities, useful in their practices and have successfully involved themselves in the care of their patients over time

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Lee and Cunningham 2019 [33]	Article	Qualitative -survey	Medical students (post-graduates)	Scotland	Education	Targeted Enhanced Recruitment Scheme—Financial incentive—offering a £20,000 payment to General Practice Specialty Training (GPST) trainees accepting a targeted post	A survey was developed and sent to GP trainees taking up a GPST post in August 2017. Ninety-five out of 245 doctors responded (response rate of 39%). Only 21% of GPSTs aware of TERS were influenced by it in their choice of training location. The locations of family, spouse or partner, and of pre-existing geographical preferences were more influential than TERS Where TERS had a positive influence on choice of training location respondents were asked what this had been and to indicate all that applied. The majority (55%) expressed a preference for a TERS programme that was geographically close to their preferred location. Fourteen respondents were aware of TERS but did not know if their chosen rotation had attracted the TERS payment
OECD & European Observatory on Health Systems and Policies 2019 [34]	Political and technical document	N/A	Medical students (undergraduates)	Slovakia	Policies	Training schemes were revised—a reform of training curricula (example, inclusion of training sessions in outpatient facilities during undergraduate)	Not identified

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Studerus et al. 2018 [35]	Article	Cohort study	Medical students (post-graduates)	Switzerland (national)	Education	Optional GP training module in GP practice (trainees in WHM GP training are assigned to a GP office, where they are supervised by a GP—trainer)	The cohort was all participants in the Foundation for the Promotion of Education in Primary Care (WHM) training programme between 2006 and 2015 (n = 381) Of 351 (92.1%) of 381 former GP trainees who participated in WHM programme, 218 (57%) were practising GPs by 2016. Longer and part-time training modules were associated with higher rates of being a practising GP. Most (81%) practising GPs thought their optional GP training module was (very) important in their choice of specialty
Baumann et al. 2020 [36]	Article	Qualitative—cross-sectional survey	Medical students (post-graduates)	Switzerland(Bern)	Education	Partly state-funded vocational training programme in GP practices—optional GP training (clinical and practical experience in a primary care setting for 6–12 months and provide programmes to educate GPs in their roles as tutors and mentors)	Who participated in a traineeship in general practice from 2008 to 2017 in the canton of Bern asked if residents had taken a subsequent career choice as a general practitioners GP and if so in which region Out of 165 residents who participated in a traineeship, 151 (92%) completed our survey Up to 10 years after the implementation of the vocational training programme, 81% had chosen a career as a GP or were on track to become a GP after having completed a GP traineeship, with almost half of them becoming GPs in the offices of their mentors or in the area A vocational training programme helped motivating young doctors to become GPs and underserved regions of the canton of Bern to gain new GPs We could show an increase in GP practices in the canton of Bern, not only in urban but also accordingly in rural areas

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
WHO 2018 [37]	Political and technical document	N/A	Medical students (post-graduates)	Turkey	Policy	Mix interventions: such as re-trained primary care doctors to recertify as family doctors, medical schools increased their enrolment and developed postgraduate family doctor training programme	In 2003, the government of Turkey, led by the Ministry of Health (MoH), launched the Health Transformation Plan (HTP), in conjunction with the World Bank and the World Health Organization (WHO) Turkey successfully added 111 000 health care providers to the workforce (including a 20% increase in family doctors), which contributed to a reduction in socioeconomic and geographical inequities in access to primary care (5), although some isolated rural areas may remain underserved (6). By the late 2000s, Turkey had achieved near-universal health insurance coverage, and by 2012 it had reduced out-of-pocket expenditures to 15% of total health expenditures (6,7) These policy interventions successfully led to the establishment of nearly 20 000 new family medicine teams from 2005 onwards (10)
Jones et al. 2020 [38]	Article	Qualitative—semi-structured interviews and focus groups	Medical students (undergraduates)	UK—England (North London)	Education	Near-peer teaching model (senior learners mentoring more junior learners)	The formalization of near-peer teaching in general practice is relatively novel We interviewed 26 stakeholders. Students valued trainee's generalist expertise and helping make explicit areas of medicine There are strong educational benefits for these learners and teachers clearly influenced by the social context of learning. There are suggestions of positive career role modelling for students by trainees

Table 2 (continued)

Author and year	Type of publication	Study type	Professional (study population)	Country coverage	Areas of interventions	Theme (summary of the intervention)	Results (output, outcomes, impact)
Sales et al. 2019 [39]	Article	Qualitative—electronic feedback survey	Medical students (Year 1 Foundation Programme))	UK—England (Wessex)	Education	GP taster experience for Foundation Year 1 (FY1) doctors using GP Speciality Trainee Year-3 doctors (GP registrar/resident equivalent), as 'near-peer' mentors, rather than GP trainers	Responses for the 2015 feedback survey were received from 14 FY1 doctors (47%) and 17 GPST3 doctors (57%), reflecting 19 pairings, whereas in 2016 we received responses from 12 FY1s (52%) and 13 GPST3s (57%), reflecting 15 pairings Twenty-four FY1 doctors said that they would recommend the taster course, 17 FY1 doctors reported that they were considering GP as a career, with eight reporting that their career intentions had been changed by the taster experience
Allsopp and Taggar 2018 [40]	Article	Qualitative—pre and post-placement questionnaire	Medical students (undergraduates)	UK—England (Nottingham University)	Education	New 4-week module for 4th year (doubling the exposure to general practice, including 2 workshops)	Paired evaluation was completed (Open-ended questions on current career choices and a 5-point Likert scale "Is General Practice is a possible career choice for me?") 100% response was achieved (218/218) with 80 (36.7%) giving a higher score in tutorial 2, suggesting they were more likely to choose general practice as a future career, 107 (49.1%) had no change in score and 31 (14.2%) provided a lower score These results show that increasing medical student exposure to general practice with innovative, paired, careers tutorials may increase the number of students who would consider a career in general practice

National policy interventions

There have been policy interventions in eight countries, reported in 11 documents. The most common policy intervention is increasing the number of places for residencies in general practice or family medicine, as occurred in Belgium, Estonia, France, Ireland, and Italy [17, 18, 20, 22, 29, 30]. France also increased the period of general practice residency by one additional year of postgraduate training in ambulatory care settings, preferably in underserved areas) [22]. In 2020, Estonia implemented a national reform of medical specialty training to make it more flexible and to offer part-time options [19]. This is expected to augment the number of GPs, though not at a sufficient level to meet the projected [18, 20].

Slovakia created a residency programme for GPs including training in outpatient facilities during undergraduate medical studies [34]. Türkiye used a mix of interventions to increase enrolment in medical schools in general and in postgraduate family medicine programmes in particular. It also re-trained PHC doctors to recertify as family doctors [37]. Greece has introduced a new compensation system to attract more physicians to PHC. In education, innovations include the offer of a family medicine module in the basic curriculum, now available in 75% of universities and a pilot programme of training periods in general practice to help undergraduate students make "informed decisions" about their choice of a specialty [31]. Only the combination of interventions in Türkiye showed results with an increase in the number of family physicians [37]. Increases in the number of residency places implemented in Belgium, Italy, Ireland and France [17, 22, 29, 30], are too recent to show results.

Discussion

Summary of evidence

In spite of the abundant advocacy in favour of increasing the PHC workforce, out of the 45 countries listed in the selection criteria, only 12 report interventions. There are probably more who have intervened, but their interventions are not documented in the peer-reviewed literature or otherwise. The most frequent interventions are the initiative of individual or groups of education institutions, with no explicit link with a national health workforce policy. The latter are typical to increase the number of places in general or family practice programmes, with a view to attract more graduates to underserved areas, like rural, remote or poor urban ones. Such measure does not mechanically augment the number of students; indeed, it is common that some places remain vacant, like in Portugal [41] (585 vacant places out of 978 in 2023) and in Spain [42] (224 vacancies in 2022–2023), hence the need for additional measures of attraction. Many countries added modalities of increased exposure to work in PHCS, such as new modules in the curriculum, extended periods of residency, rotations or clerkships in PHC settings and access to mentorship. The results of a number of these interventions are not available, due to their recent implementation.

The post-2018 literature does not present major differences from the literature of previous years reviewed by Kroezen, Rajan and Richardson [9]. The volume of interventions is similarly low and there are few examples of countries using a mix of interventions, rather than single ones. There were changes to the traditional medical curriculum (more compulsory and elective primary healthcare contents, longer clerkships), but also rural doctor quota ("Landarztquote" introduced in Germany's federal states) [43], the creation of "interest groups" offering activities such as readings by family physicians, newsletters and conferences [44], and student-run free clinics, three interventions not mentioned in our review.

In our search for literature, we found a number of articles on factors or reasons that influence medical students to choose (or not) PHCS as an area of future practice. This literature is important to inform the design of interventions whose effectiveness may depend on its alignment with the perceptions of students. Out of 11 articles addressing that issue, four surveyed students in German-speaking Switzerland, three in the UK, two in Norway, one in multiple countries ($N=8$), and one was a literature review. Participants were medical students at different stages of their education: one in their first-year, five at the end of their studies and three over a continuing period of four years. One study included doctors who had quit general practice and another one was an analysis of active practitioners' reasons for choosing to be a GP. Methods included questionnaires, face-to-face interviews, focus groups and, in one instance, the analysis of diaries written over a period of ten months. Surveys were limited to one to four schools of medicine and to samples of respondents of between 4 (study of diaries) and 262. This literature mentions a broad set of reasons for not choosing, or in one case, for quitting general practice. These include: value of community-based work and social status of general practice perceived as low; observation of the pressures under which GPs work; lack of exposure to academic role models and of primary care-based research opportunities [45]; loneliness of working in general practice [46]; lack of visibility of results of one's actions, as is possible in acute care; image of GPs passively sitting at their desk or in meetings contrary to perceptions of being an active care provider; perception of a GP career as default; entry to GP training perceived as having little or no competition; gender stereotyping of career choices, hospital doctors using mistakes made by GPs as material for a teaching session; and perpetuating the sense that

GPs were intellectually inferior [47]. Doctors who abandoned general practice reported that they did so because of too many obligations, an excessive administrative burden, the difficulty of being self-employed, and the cost of establishing a private practice [48]. Positive reasons mentioned by students for choosing PHC practice include quality of teaching and of clerkships in general practice, access to positive role models, positive placement experience, diversity of work, feelings of being able to contribute and rewarding and continuous relationships with patients. Additionally, factors like personality characteristics (interest in people's lives, a strong ability to cope with different situations and patients, open-mindedness, curiosity) [46, 49], sex (women tend to be more attracted by PHC practice) or the rural origin of students [49], and support for work-life balance.

As expected, all articles in our review concluded that educators and planners should take into consideration their findings, even though they had a limited external validity. Like Kroezen, Rajan and Richardson [9], we conclude to the need for more evidence on the effectiveness of interventions to inform the policy process. In fact, the literature surveyed up to 2018 includes studies that tend to be descriptive, with little information on what works and why and what does not work and why. The literature in our review presents the same characteristics.

The absence of solid evidence does not mean that policy-makers should not act. Many recommendations, such as implementing multifaceted interventions that take into account the aspirations and expectations of future practitioners, exposing students to family practice, improving professional recognition, or offering better career prospects have enough face validity to guide policy development. Yet, the question policy-makers, planners, educators and other stakeholders ask is "how to design and implement these recommendations?". For example, the recommendation to expose students to PHCS work may be consensual [50], but it does not respond to practical issues such as type of exposure (placements, residency, rotations, participation in research on PHCS, mentorship), duration, stage of the education process, trainers/supervisors and their qualifications, and what costs. All recommendations raise similar practical questions, hence the need for evaluative research on the various dimensions of interventions, e.g. design, process of implementation and results. Lessons learned from such evaluations will be context-specific, but they will have a high informative value and offer guidance in the PHC workforce planning process.

Limitations

This review focused on only one professional category, an obvious limitation knowing that the delivery of PHCS requires the collaboration of various categories of providers working as multiprofessional teams of nurses, pharmacists, nutritionists, rehabilitation professionals, and others. It focuses only on one type of intervention to augment the availability of PHCS and does not discuss others, such as scaling-up the productivity of PHC teams by expanding the functions of nurses, pharmacists and others [51] and by increasing the use of communication tools like teleconsulting. There is a potential publication bias linked to the choice of databases. Due to language limitations to English, French, Italian, Portuguese, and Spanish, the review has likely missed publications in other languages, such as from Germany or Norway, two countries that have been active in addressing health workforce problems. The limited number of interventions reviewed and the lack of evaluative studies imply that we cannot draw firm conclusions on the effectiveness of interventions, let alone on their replicability.

Conclusion

To make PHCS accessible to all requires the availability of a fit-for-purpose workforce of multiprofessional teams, in which specially trained physicians play a central role. At present, all countries surveyed in our review report shortages of GPs or family physicians. Opening more training opportunities is a necessary step towards reducing these shortages, but it is not sufficient; more students must accept to opt for a PHC specialty. The attraction of more students is a major challenge for planners, educators and leaders of professional organizations as it faces the competition of hospital specialties and of other fields of practice also in need of more students, such as public health, geriatrics, rehabilitation, or mental health. Successful strategies of attraction require the collaboration of numerous actors, including professional councils and organizations, and of regulation bodies that specialists tend to dominate. More than advocacy, the COVID-19 pandemic provided real-life arguments for the need of more responsive PHCS, and for a more numerous and better prepared workforce to deliver them. Decision-makers are more likely to make the PHCS workforce stronger a political and policy priority, they need access to convincing evidence and information on good practices that only research can produce. In Europe, the "Joint Actions" supported by the European Commission offer an example of multi-country collaborative research. A joint action on how countries are strengthening the PHC workforce could map what countries currently do to, their successes and failures and draw lessons that can augment the probability of effectiveness of future

attraction strategies covering all components of the PHC workforce.

Abbreviations

MiLaMed	Central German Concept for the Longitudinal Integration of Rural Medical Training Content and Experience in Medical Studies
EFTA	European Free Trade Association
EU	European Union
GPs	General Practitioners
OECD	Organisation for Economic Co-operation and Development
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PHC	Primary Health Care
PHCS	Primary health care services
JBI	The Joanna Briggs Institute
NDCGP	The North Dublin City General Practitioner Training Programme
UK	United Kingdom
WHO	World Health Organization

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APCO and GD designed the review. APCO defined the search strategies and APCO and GD conducted the database and websites base search, and selected eligible documents. APCO and GD produced this version of the manuscript. Both authors read and approved the final manuscript. The authors alone are responsible for the content of this manuscript.

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References

1. WHO Regional Office for Europe. Declaration of Alma-Ata. WHO Regional Office for Europe; 1978. https://iris.who.int/handle/10665/347879. Accessed 20 Apr 2024.
2. World Health Organization, United Nations Children's Fund. Report of the Global Conference on Primary Health Care: from Alma-Ata towards universal health coverage and the Sustainable Development Goals. Geneva: World Health Organization; 2019. https://iris.who.int/handle/10665/330291. Accessed 20 Apr 2024.
3. WHO Regional Office for Europe. Health and care workforce in Europe: time to act. Copenhagen: WHO Regional Office for Europe; 2022. https://iris.who.int/handle/10665/362379. Accessed 22 Apr 2024.
4. OECD, European Observatory on Health Systems and Policies. Bulgaria: Country Health Profile 2023. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023. https://doi.org/10.1787/8d90f882-en.
5. OECD, European Observatory on Health Systems and Policies. Malta: Country Health Profile 2023. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023. https://doi.org/10.1787/2a821e8a-en.
6. OECD, European Observatory on Health Systems and Policies. Spain: Country Health Profile 2023. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023 https://doi.org/10.1787/71d029b2-en.
7. OECD, European Observatory on Health Systems and Policies. France: Country Health Profile 2021. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2021; https://doi.org/10.1787/7d668926-en.
8. Diário de Notícias. Número de utentes sem médico de família aumentou 9,8% em 2023. Global Media Group. 2024 https://www.dn.pt/7036442390/numero-de-utentes-sem-medico-de-familia-aumentou-98-em-2023/. Accessed 20 Apr 2024.
9. Kroezen M, Rajan D, Richardson E. Strengthening primary care in Europe: How to increase the attractiveness of primary care for medical students and primary care physicians? Policy Brief 55. European Observatory on Health Systems and Policies; 2023.
10. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8:19–32.
11. Booth A, Noyes J, Flemming K, Moore G, Tunçalp Ö, Shakibazadeh E. Formulating questions to explore complex interventions within qualitative evidence synthesis. BMJ Glob Health. 2019;4:e001107. https://doi.org/10.1136/bmjgh-2018-001107.
12. Clarivate Analytics. EndNote. [computer software]. Philadelphia, United States; 2021. https://www.myendnoteweb.com/. Accessed 22 Apr 2024.
13. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. Syst Rev. 2016;5:210. https://doi.org/10.1186/s13643-016-0384-4.
14. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021. https://doi.org/10.1136/bmj.n71.
15. Aromataris E, Lockwood C, Porritt K, Pilla B, Jordan Z. JBI Manual for evidence synthesis. 2024th ed. Adelaide: JBI; 2024 [cited 2024 Mar 26]. https://doi.org/10.46658/JBIMES-20-01. Accessed 26 Mar 2024.
16. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169:467–73.
17. OECD, European Observatory on Health Systems and Policies. Belgium: Country Health Profile 2019. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2019. https://www.oecd-ilibrary.org/social-issues-migration-health/belgium-country-health-profile-2019_3bcb6b04-en. Accessed 7 Apr 2023.
18. European Observatory on Health Systems and Policies, Kasekamp K, Habicht T, Võrk A, Köhler K, Reinap M, et al. Estonia: health system review. Health Systems in Transition. Copenhagen: World Health Organization Regional Office for Europe; 2023. https://iris.who.int/handle/10665/374315. Accessed 7 Apr 2023.
19. OECD, European Observatory on Health Systems and Policies. Estonia: Country Health Profile 2023 [Internet]. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023. https://doi.org/10.1787/bc733713-en
20. World Health Organization. Country case studies on primary health care: Estonia: the development of family practice to support universal health coverage. Country case studies on primary health care. Geneva: World Health Organization; 2018. p. 12. https://iris.who.int/handle/10665/326088. Accessed 7 Apr 2024.
21. Taha A, Dawidowicz S, Orcel V, Puszkarek T, Bayen M, Bayen S. Relationship between training supervision and evolution of the density of GPs: a 3-year cohort study on French cities between 2018 and 2021. Hum Resour Health. 2022;20:39.
22. OECD, European Observatory on Health Systems and Policies. France: Country Health Profile 2023. Paris and Brussels: OECD; 2023. https://www.oecd-ilibrary.org/social-issues-migration-health/france-country-health-profile-2023_07c48f9f-en. Accesssed 7 Apr 2024.

23. Herget S, Nafziger M, Sauer S, Bleckwenn M, Frese T, Deutsch T. How to increase the attractiveness of undergraduate rural clerkships? A cross-sectional study among medical students at two German medical schools. BMJ Open. 2021;11:e046357–e046357.
24. Ludwig K, Machnitzke C, Kühlein T, Roos M. Barriers to practicing general practice in rural areas—results of a qualitative pre-post-survey about medical students during their final clinical year. GMS J Med Educ. 2018;35:Doc50–Doc50.
25. Geier AK, Saur C, Lippmann S, Nafziger M, Frese T, Deutsch T. LeiKA: an optional German general practice teaching project for first-semester medical students: who is taking part and why? A cross-sectional study. BMJ Open. 2019;9: e032136.
26. Heine A, Geier AK, Lippmann S, Bleckwenn M, Frese T, Deutsch T. Workshop with medical students on physicians' earning opportunities, workload and job satisfaction increases the attractiveness of working self-employed and working in general practice. BMC Med Educ. 2022;22:134.
27. Carroll OA, O'Reilly F. Medicine on the margins. An innovative GP training programme prepares GPs for work with underserved communities. Educ Primary Care. 2019;30:375–80.
28. Glynn LG, Regan AO, Casey M, Hayes P, O'Callaghan M, O'Dwyer P, et al. Career destinations of graduates from a medical school with an 18-week longitudinal integrated clerkship in general practice: a survey of alumni 6 to 8 years after graduation. Ir J Med Sci. 2021;190:185–91.
29. OECD, European Observatory on Health Systems and Policies. Ireland: Country Health Profile 2023. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023. https://doi.org/10.1787/3abe906b-en.
30. OECD, European Observatory on Health Systems and Policies. Italy: Country Health Profile 2023 [Internet]. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023. https://doi.org/10.1787/633496ec-en.
31. OECD, European Observatory on Health Systems and Policies. Greece: Country Health Profile 2023. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2023. https://doi.org/10.1787/dd530c3e-en
32. Bartlett M, Dowell J, Graham F, Knight K, Law S, Lockwood P, et al. Dundee's longitudinal integrated clerkship: drivers, implementation and early evaluation. Educ Prim Care. 2019;30:72–9.
33. Lee K, Cunningham DE. General practice recruitment - a survey of awareness and influence of the Scottish targeted Enhanced Recruitment Scheme (TERS). Educ Prim Care. 2019;30:295–300.
34. OECD, European Observatory on Health Systems and Policies. Slovak Republic: Country Health Profile 2019. Paris and Brussels: OECD and European Observatory on Health Systems and Policies; 2019. https://doi.org/10.1787/c1ae6f4b-en.
35. Studerus L, Ahrens R, Häuptle C, Goeldlin A, Streit S. Optional part-time and longer GP training modules in GP practices associated with more trainees becoming GPs—a cohort study in Switzerland. BMC Fam Pract. 2018;19:5.
36. Baumann K, Lindemann F, Diallo B, Rozsnyai Z, Streit S. Evaluating 10 years of state-funded GP training in GP offices in Switzerland. PLoS ONE. 2020;15:e0237533–e0237533.
37. World Health Organization. Country case studies on primary health care: Turkey: family practice for quality in universal health coverage. Geneva: World Health Organization; 2018. https://iris.who.int/handle/10665/326253. Accessed 7 Apr 2024.
38. Jones M, Kirtchuk L, Rosenthal J. GP registrars teaching medical students-an untapped resource? Educ Prim Care. 2020;31:224–30.
39. Sales B, Masding M, Scallan S. General practice tasters for foundation doctors. Clin Teach. 2019;16:125–30.
40. Allsopp G, Taggar J. Innovative, paired careers tutorials: increasing the number of medical students choosing general practice as a career. Educ Prim Care. 2018;29:301–6.
41. Lusa A, CNC. Só 40% das vagas abertas no concurso de medicina geral e familiar foram preenchidas. CNN Portugal. 2023 May 19 https://cnnportugal.iol.pt/saude/ministro-da-saude/so-40-das-vagas-abertas-no-concurso-de-medicina-geral-e-familiar-foram-preenchidas/20230519/64677730d34ef47b875408fc. Accessed 2 May 2024.
42. World Health Organization Regional Office for Europe. Primary health care transformation in Spain: current challenges and opportunities: primary health care policy paper series. Copenhagen: World Health Organization Regional Office for Europe; 2023. https://iris.who.int/handle/10665/373464. Accessed 6 Apr 2024.
43. Selch S, Pfisterer-Heise S, Hampe W, van den Bussche H. On the attractiveness of working as a GP and rural doctor including admission pathways to medical school – results of a German nationwide online survey among medical students in their "practical year." GMS J Med Educ. 2021. https://doi.org/10.3205/zma001498.
44. Kerr Jonathan R, Seaton Bianca M, Zimcik Heather, McCabe Jennifer, Feldman Kymm. How do family medicine interest groups influence medical students? Canadian Family Physician. 2008; 54: 78–9. https://www.cfp.ca/content/54/1/78.long
45. Barber S, Brettell R, Perera-Salazar R, Greenhalgh T, Harrington R. UK medical students' attitudes towards their future careers and general practice: a cross-sectional survey and qualitative analysis of an Oxford cohort. BMC Med Educ. 2018;18:160.
46. Harris M, Wainwright D, Wainwright E. What influences young doctors in their decision-making about general practice as a possible career? A qualitative study. Educ Primary Care. 2020;31:15–23. https://doi.org/10.1080/14739879.2019.1697967.
47. Parekh R, Jones MM, Singh S, Yuan JSJ, Chan SCC, Mediratta S, et al. Medical students' experience of the hidden curriculum around primary care careers: a qualitative exploration of reflective diaries. BMJ Open. 2021;11:e049825. https://doi.org/10.1136/bmjopen-2021-049825.
48. Birkeli CN, Rosta J, Aasl OG, Rø KI. Why are doctors opting out of general practice? Tidsskr Nor Laegeforen. 2020;140:1.
49. Le Floch B, Bastiaens H, Le Reste JY, Lingner H, Hoffman R, Czachowski S, et al. Which positive factors give general practitioners job satisfaction and make general practice a rewarding career? A European multicentric qualitative research by the European general practice research network. BMC Fam Pract. 2019;20:96. https://doi.org/10.1186/s12875-019-0985-9.
50. Amin M, Chande S, Park S, Rosenthal J, Jones M. Do primary care placements influence career choice: What is the evidence? Educ Prim Care. 2018;29:64–7.
51. Apuzzo L, Michelutti P, Batenburg R, Brembo EA, Čiurlionis M, Cserhati Z, et al. D5.2 Guidebook on task-shifting. Budapest: Consortium, Semmelweiss University; 2023. https://tashiproject.eu/wp-content/uploads/2024/03/D5.2-Guidebook-on-task-shifting_revised_final_ISBN.pdf. Accessed 14 May 2024.

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