

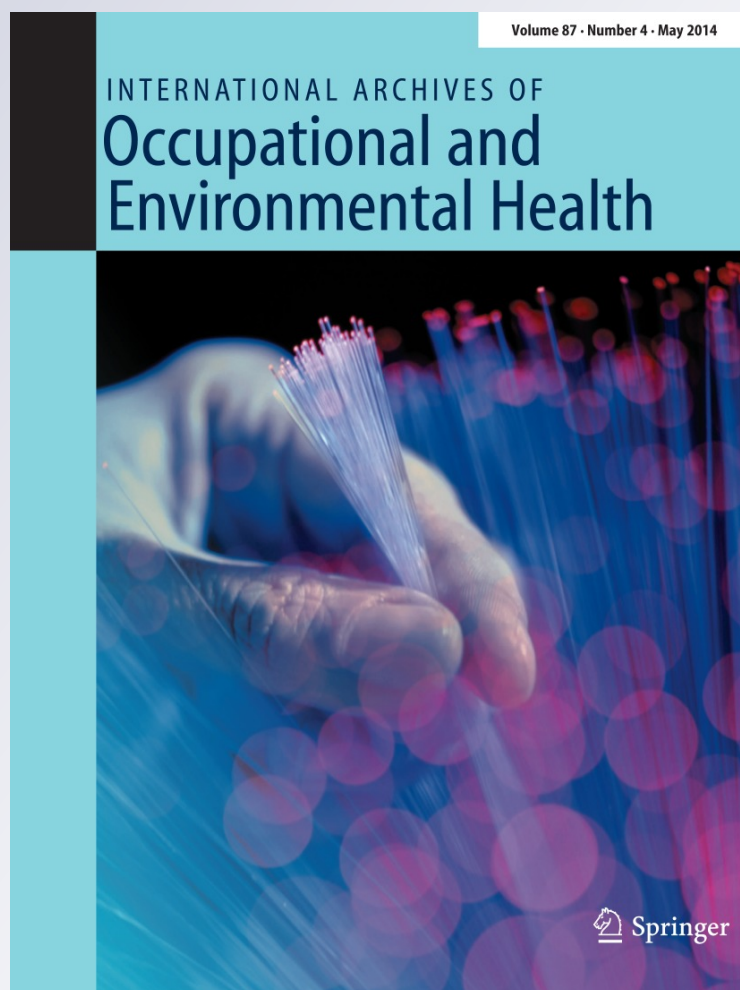
# *Undergraduate teaching of occupational medicine in European schools of medicine*

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# Undergraduate teaching of occupational medicine in European schools of medicine

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## Abstract

**Purpose** General practitioners play or should play a role in occupational medicine (OM), either in diagnosing occupational diseases or in counseling on return to work. Nevertheless, their training has been reported to be insufficient in most single country studies.

**Aims** The objectives of this study were to analyze the content and extent of undergraduate teaching of OM in European medical schools.

**Methods** An e-mail questionnaire survey of the teaching of OM to undergraduates was undertaken from December 2010 to April 2011 in all medical schools and medical faculties listed in 27 European countries ( $n = 305$ ).

**Results** Among the 305 universities identified, 135 answered to the questionnaire, giving a response rate of

44 %. The mean number of hours given to formal instruction in occupational medicine to medical undergraduates was 25.5 h. Nevertheless, this number of hours varied widely between countries, but also within countries. Overall, 27 % of medical schools gave their students 10 h of teaching or less, 52 % 20 h or less and 69 % 30 h or less. Whereas occupational diseases and principles of prevention were covered in most schools, disability and return to work were very poorly represented among the topics that were taught to students.

**Conclusion** Dedicated undergraduate teaching on occupational health or OM in European medical schools is present in most medical schools, usually at a low level, but is very variable between and within countries. Medical schools across Europe are very unequal to provide qualifying doctors education on the topics they will frequently come across in their working lives.

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## Introduction

In many European countries, employees of small and medium sized enterprises do not have access to occupational health services, so they have to rely on the knowledge and competencies in occupational medicine (OM) of their general practitioners (GPs). Moreover, GPs are the immediate gatekeepers to the sickness benefit system, and their role in keeping people in work is of paramount importance (Morrison 2011). Unfortunately, the interaction and communication of GPs with occupational physicians are often lacking (Beach and Watt 2002; Beaumont 2003; Anema et al. 2002; Elms et al. 2005). Barrier to addressing

occupational health needs in primary care was, among others, lack of knowledge (Elms et al. 2005). Its source is mostly to be found in undergraduate medical education, and the amount of time devoted to occupational medicine in basic medical education has been criticized in many countries (WHO 1988; Shanahan et al. 2000; LaDou 2002; Wynn et al. 2002; Gehanno et al. 2005; Williams et al. 2011). In an era of increasing movement of workers and physicians between European countries, data on the way future doctors are trained in OM are not readily available.

Therefore, the purpose of this study was to analyze the content and extent of undergraduate teaching of occupational medicine in European medical schools and medical faculties.

## Methods

An e-mail questionnaire survey of the teaching of OM to undergraduates was undertaken from December 2010 to April 2011 in all medical schools and medical faculties listed in 27 European countries ( $n = 305$ ).

The questionnaire was based upon the questionnaires used in earlier studies of undergraduate OM teaching in the UK and in France (Wynn et al. 2002; Gehanno et al. 2005).

The questionnaire used in the current study was revised according to the views of the different participants of the project team. The questionnaire was pilot tested among the universities of the authors and revised according to their comments. The final version was a 2-page, closed questionnaire, with a possibility to add comments at the end.

Questionnaires were sent to the teachers in charge of undergraduate teaching of occupational medicine in all medical schools, identified through the European Association of Schools of Occupational Medicine (EASOM) network. When no teacher was identified, the questionnaire was sent to the dean of the medical faculty.

A reminder mail was sent after 1 month and again at 2 months to all non-responders.

## Results

Among the 305 universities identified, 135 answered to the questionnaire, giving a response rate of 44 %. These 135 universities represented a total of 108,400 undergraduate medical students. The response rate varied widely, ranging from 0 % (Poland, Malta) to 100 % (e.g., Denmark, the Netherlands or Serbia) (Table 1).

Some schools known to have a particular postgraduate department active in occupational medicine, and therefore, teachers in Occupational medicine did not answer, especially in the UK and in Germany.

Among respondents, undergraduate teaching of occupational medicine existed in 95 % of the schools ( $n = 128$ ) and was compulsory for all students in 88 % of them ( $n = 113$ ).

The mean number of hours given to formal instruction in occupational medicine to medical undergraduates was 25.5 h. Nevertheless, this number of hours varied widely between countries, but also within countries (Table 1). Overall, 27 % of medical schools gave their students 10 h of teaching or less, 52 % 20 h or less and 69 % 30 h or less.

The teaching methods used were mostly oriented toward passive learning of students, since 91 % ( $n = 117$ ) and 52 % ( $n = 66$ ) of the schools used lectures and seminars, respectively, but other methods were also applied (Table 2).

The top five topics covered by the medical schools were principles of prevention (96 %), occupational respiratory disease (89 %), occupational health law and ethics (85 %), occupational toxicology (85 %) and occupational musculoskeletal disorders (81 %). Those least often reported as covered were writing medico-legal reports (30 %), assessment of disability (30 %), disability and return to work (44 %) and environmental impact of industrial activity (46 %) (Table 3).

Most of the schools (91 %) had specific learning objectives in occupational medicine for students. Nevertheless, these objectives had been defined at the national level for 59 % of the Universities. One hundred and three (80 %) schools had an OM manual or syllabus.

One hundred and four schools (81 %) set questions specifically relating to occupational health/OM issues in the end-of-year examinations, but there was no homogeneity in all countries. In Italy, all the schools had a mandatory examination in OM for students, whereas in France, 4 of the schools that provided teaching in OM (out of 34) did not have any examination specific to OM. In the Netherlands, 3 schools (out of 8) had a mandatory examination.

## Discussion

This study found evidence that dedicated undergraduate teaching on occupational health or OM in European medical schools is present in most schools, but usually at a low level, and is very variable between and within countries. We obtained a very high level of answers, with 135 medical faculties representing more than 100,000 undergraduate students. This is, to our knowledge, the most comprehensive study on undergraduate teaching on occupational in Europe.

The responders included most of the schools with an established department of academic OM. Nevertheless,

**Table 1** Response rate per country and hours given to formal instruction in occupational medicine (lectures and seminars/tutorials) to medical undergraduates in Europe

Country	Number of universities	Answers	Response rate (%)	Hours allocated to occupational medicine		
				Mean	Min	Max
Belgium	9	8	89	13.4	0	45
Bosnia and Herzegovina	5	4	80	53.5	45	64
Croatia	4	2	50	35.0	20	50
Czech Republic	8	1	13	24.0	24	24
Denmark	3	3	100	35.0	30	40
Finland	5	1	20	71.0	71	71
France	36	34	94	10.3	2	18
Germany	30	5	17	34.8	12	56
Greece	7	7	100	21.1	3	33
Hungary	4	1	25	15.0	15	15
Italy	33	29	88	34.6	10	70
Malta	1	0	0	–	–	–
Republic of Moldavia	1	1	100	–	–	–
Montenegro	1	1	100	63.0	63	63
Netherlands	8	8	100	37.1	2	100
Norway	4	3	75	36.3	9	75
Poland	13	0	0	–	–	–
Portugal	6	1	17	0.0	0	0
Republic of Macedonia	3	1	33	65.0	65	65
Romania	9	3	33	32.7	26	42
Serbia	5	5	100	36.8	15	64
Slovenia	2	2	100	37.5	30	45
Spain	31	8	26	27.7	0	64
Sweden	6	0	0	–	–	–
Switzerland	5	2	40	17.0	14	20
Turkey	36	2	6	15.5	15	16
UK	30	3	10	6.0	5	8
Total	305	135	44	25.5	0	100

**Table 2** Educational methods used by medical schools teaching occupational medicine to undergraduate students (more than 1 answer possible)

Method	No. of schools ( $n = 128$ )	Percentage (%)
Lectures	117	91
Seminar tutorials	66	52
Workplace visits	48	38
Short-term internship	37	29
Problem-based learning	33	26
E-learning	26	20
Project work	21	16
Ward-based tuition	11	9

many medical schools failed to answer, despite several efforts including reminders and personal contacts through the teachers of OM, members of EASOM. Consequently, it

is probable the results may overestimate current activity in OM undergraduate teaching.

The case of UK is particular since a similar study had been recently performed when we sent the questionnaire (Williams et al. 2011). This hampered the answers from most of UK schools.

The mean number of hours that medical schools gave to students displays an inexact picture of what really happens in most countries. In Finland, the number of hours is 71, but based on only one respondent out of the 5 medical universities. The medical schools from the Balkans are above 35 h of training of undergraduate students. Nevertheless, among the biggest countries in Europe, Germany and Italy are close to 35 h, whereas the UK, France and Belgium are under 15 h. Although the number of UK medical schools who answered the questionnaire was low, the recent study performed in this country, with a response rate of 66 %, showed that only 5 medical schools, out of

**Table 3** Occupational medicine issues, covered in any form, during undergraduate teaching in European medical schools ( $n = 122$ ) and mean number of hours of teaching for each subject

Subject area	No. of schools teaching the subject	Percentage (%)	Mean no. of hours
Principles of prevention	117	96	1.7
Occupational respiratory disease	108	89	2.5
Occupational toxicology, for example, lead	104	85	2.8
Occupational health law and ethics	104	85	1.2
Occupational-related musculo-skeletal disorders	99	81	1.6
Health and safety risks to doctors in the clinical environment	96	79	1.3
Occupational skin disease	95	78	1.4
Occupational cancers	94	77	1.6
Risk assessment in the workplace	88	72	1.9
Occupational stress/mental health and work	88	72	1.6
Workers' compensation issues	84	69	1.3
Occupationally acquired infections	79	65	1.3
Occupational history taking	71	58	1.5
Principles of work ergonomics	71	58	1.5
How to collaborate with the occupational physician	69	57	0.9
History of occupational medicine	59	48	1.1
Workability assessment	58	48	1.6
Environmental impact of industrial activity	56	46	1.7
Disability and return to work	54	44	1.1
Writing medico-legal reports	37	30	1.4
Assessment of disability	36	30	1.4

the 32 who participated, provided more than 6 h of formal instruction in occupational medicine to undergraduate students (Williams et al. 2011).

The few studies that have been already performed on this subject outside of Europe give roughly similar results. In the US, in 1997, only 50 % of the medical schools provided teaching in occupational medicine to undergraduate students, and among those who did, the mean number

of teaching was 6 h (LaDou 2002). In Australia and New Zealand, undergraduate students receive 12.5 h of occupational medicine (Shanahan et al. 2000), and 18 h in the United Arab Emirate University (Newson-Smith and Nicol 2004).

The topics covered by most schools were around occupational diseases, which we could name “traditional” occupational medicine, despite the fact that occupational history taking was taught in only one half of the medical schools. It is interesting to note that topics concerning return to work, that is, assessment of disability, disability and return to work or workability assessment, were considered in less than one half of the medical schools. Such a result was also observed in the UK by Williams et al. (2011). The assessment of fitness to work, providing advice on return to work, the importance of work and health and providing advice to facilitate a return to work are all now expected of doctors, and we can therefore challenge their preparation during their undergraduate studies.

The teaching methods used by medical schools which answered to the survey were mostly oriented toward passive learning of students. For example, workplace visits were used as a teaching method by only 38 % of respondents. The teaching value of such method has been a matter of debate. Workplace visits appear to have been successfully incorporated into undergraduate teaching, although not formally evaluated (Newson-Smith and Nicol, 2004). Nevertheless, in a study on UK undergraduate students, Grime et al. (2006) showed that students demonstrated a dichotomy of opinion about the value of a workplace visit. Overall, they valued the brevity of the session that resulted from removing the workplace visit. In a recent study performed in Belgium, Braeckman et al. (2009) demonstrated that, although workplace visits were superior to case scenarios in raising awareness of students of risk factors and preventive measures, students rated themselves the case scenarios as more relevant.

In general, teaching public health to undergraduate students is particularly challenging for medical educators because of students' lack of interest (Tyler et al. 2009). All too often, students see in the field of occupational health only the administrative aspects related to workers' compensation (Baillargeon et al. 2011). Such negative perceptions require that more dynamic and interactive methods be developed and that relevance to clinical practice be emphasized. Yet, Baillargeon et al. (2011), from the University of Montreal, have demonstrated that, by introducing a dynamic educational approach using a combination of different interactive teaching methods, students gained a better understanding of the importance of clinicians asking about their patients' work and of the basic principles of providing care to workers with work-related injuries or diseases.

In 2009, Guidotti argued for a reform of postgraduate training in occupational medicine (Guidotti 2009). It may also be time to plead for a change in undergraduate occupational medicine education in Europe with more interactive teaching methods, more relevant topics and more involvement of the students, so that they will “truly enjoy learning” (Nassif 2010).

Despite the existence of several European regulations concerning occupational health, its organization is quite different from one country to another, and we could consider that differences in training of future doctors among countries were to be expected.

Nevertheless, it was very surprising to observe the wide variability within country, in terms of number of hours of teaching received by the students and, to a lesser extent, in terms of topics covered. This was obvious in the countries in which we obtained a high response rate, such as the Netherlands, France, Italy or Belgium. This might appear contradictory with the fact that most of the schools had learning objectives elaborated at a national level. This also raises an ethical question on the fact that patients, within and between countries, will face doctors with very different skills in terms of diagnosis of occupational diseases, compensation issues and advice on return to work, and may have therefore different occupational health outcomes.

Our study demonstrated that medical schools across Europe are very unequal in providing qualifying doctors with education on the topics they will frequently come across in their working lives, notably management of occupational diseases, sickness certification, compensation issues, disability and work and vocational rehabilitation. Some of them may even fail to provide future doctors with the skills and competencies to enable them to practice as competent physicians. Despite European regulations and free movement of workers across Europe, we face very different levels of education in occupational health in European countries. This warrants a debate on the competencies that every doctor should have in occupational medicine and the definition of a core curriculum for undergraduate teaching in occupational medicine in Europe.

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**Conflict of interest** The authors declare they have no conflict of interest.

**Ethical standard** This research did not involve human subjects and no ethical approval was sought.

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