

## SURVEY

EAHP Survey 2010 on hospital pharmacy in Europe:  
Part 6. Education and researchRoberto Frontini,<sup>1,2</sup> Tajda Miharija-Gala,<sup>1,3</sup> Juraj Sykora<sup>1,4,5</sup><sup>1</sup>European Association of Hospital Pharmacists, Brussels, Belgium<sup>2</sup>Universitätsklinikum Leipzig, Leipzig, Germany<sup>3</sup>University Medical Centre Ljubljana, Ljubljana, Slovenia<sup>4</sup>Pharmacy Department, National Cancer Institute, Bratislava, Slovakia<sup>5</sup>Slovak Medical School, Bratislava, Slovakia**Correspondence to**Dr Roberto Frontini,  
Universitätsklinikum Leipzig,  
Liebigstr. 20, Leipzig D-04103,  
Germany; [president@eahp.eu](mailto:president@eahp.eu)

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**ABSTRACT**

Hospital pharmacies in Europe are very involved in the education of pharmacy and medical students as well as in the training of technicians and nurses. The picture is similar regarding internal continuing education (which includes education on patient safety), but full or partial reimbursement of expenses is rare. Hospital pharmacists in Europe are involved in clinical research (mostly for clinical trials), drug evaluation and epidemiology studies. Oncology and general teaching hospitals are the most active in this field with general non-teaching hospitals carrying out less research.

**INTRODUCTION**

The pan-European survey on hospital pharmacy practice conducted by the European Association of Hospital Pharmacists (EAHP) is an important resource for those seeking to understand the future challenges and development needs of hospital pharmacies in Europe. The methodology and the background of the 2010 survey were previously described in this journal.<sup>1</sup> In the last of these reports, we present some data on education and research in European hospital pharmacies.

**RESULTS**

Hospital pharmacies in Europe are very involved in the education of pharmacy and medical students as well as in the training of technicians and nurses (table 1), although countries differ substantially in their educational activities. At the upper end of the scale, 95.8% of hospital pharmacies in Portugal are affiliated to a pharmacy school (although this is not usually recorded), and 92.9% of hospital pharmacies in the UK are engaged in postgraduate education, the highest percentage in the countries surveyed.

As expected, general teaching hospitals are strongly involved in education but oncology hospitals are quite similar in terms of affiliation to schools and externships for pharmacists and technicians. Geriatric hospitals are affiliated with medicines schools like general teaching ones (table 2).

There is a clear trend for larger hospitals (>1000 beds) to have more educational activities than their smaller counterparts (data not shown), with for-profit hospitals being generally less engaged in such activities.

The situation is quite similar regarding internal continuing professional education (CPE) (table 3). In some countries, such as Greece and Latvia, pharmacies offer little CPE, while elsewhere, as in Denmark, the Netherlands and the UK, CPE is

very well developed. Fewer technicians are offered CPE compared to pharmacists and other staff members.

The situation regarding reimbursement is quite similar across countries: while paid time off for education is common (75.6% of pharmacies), full reimbursement (16.4%) or even partial reimbursement (38.7%) of expenses is less frequent (table 3).

Continuing staff education in relation to patient safety is common in Europe (figure 1) and parallels the provision of general CPE by country. The education offered includes attendance at national congresses, incidental seminars and university programmes.

Hospital pharmacists in Europe are involved in clinical research (mostly for clinical trials), drug evaluation and epidemiology studies (table 4). As expected, general non-teaching hospitals carry out less research. Oncology and general teaching hospitals are the most active in this field, with approximately a third of psychiatric, geriatric and other hospitals also participating in clinical trials.

There are huge gaps between countries. According to our survey, all hospitals in Denmark and the Netherlands are involved in clinical trials, but no such activity was reported in Lithuania or Latvia (figure 2). In general, participation in clinical and other studies is less common in south-east Europe with a few exceptions such as the Czech Republic and Hungary.

**LIMITATIONS**

In addition to the general limitations of the survey,<sup>1</sup> the data on education may be biased as we did not collect information on whether or not CPE is mandatory in individual countries. The data on research may also be biased as we were not able to identify the type of activity involved in participation in clinical trials, whether it be clinical participation, production of investigational medicinal products (IMPs) or only reconstitution of IMPs in the pharmacy.

**DISCUSSION**

CPE is a key issue for pharmacists as new developments in pharmaceutical science are continuous and can occur rapidly. CPE should be mandatory for hospital pharmacists as hospitals treating acute illnesses with complex and possibly risky medicines face difficult challenges. However, CPE is mandatory in only a few European countries. Our survey data indicate that hospital pharmacists are particularly interested in CPE, while hospital managers may consider CPE to be more of an attractive

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## Research

**Table 1** Educational activity in hospital pharmacies by country (% of pharmacies)

Country	Affiliation with teaching programmes (n=952)				Externship training (n=958)		
	Pharmacy school	Medical school	Technical college	Nursing school	Pharmacy students	Postgraduate pharmacist training	Technicians
All countries	39.6	41.2	29.9	50.2	55.6	32.9	37.9
Austria	8.3	30.6	11.1	80.6	27.8	25.0	13.9
Belgium	39.4	39.4	21.2	60.6	75.8	42.4	36.4
Bih	60.0	60.0	40.0	40.0	40.0	40.0	40.0
Bulgaria	13.0	25.9	11.1	20.4	14.5	5.5	20.0
Croatia	15.4	51.3	12.8	69.2	13.2	23.7	31.6
Czech Rep.	75.0	45.0	57.5	42.5	87.8	41.5	48.8
Denmark	83.3	16.7	83.3	50.0	83.3	16.7	100
Estonia	11.1	16.7	16.7	16.7	5.6	5.6	5.6
Finland	36.8	39.5	28.9	47.4	28.9	2.6	39.5
France	36.8	31.6	21.1	57.9	36.8	26.3	47.4
Fyrom	75.0	31.3	56.3	25.0	93.8	12.5	56.3
Germany	28.3	43.4	11.1	80.8	57.8	37.3	23.5
Greece	6.5	3.2	3.2	12.9	80.6	6.5	29.0
Hungary	78.7	61.7	68.1	48.9	87.0	39.1	69.6
Ireland	31.0	65.5	31.0	62.1	44.8	41.4	48.3
Italy	42.2	36.2	15.5	34.5	65.8	71.8	13.7
Latvia	0.0	32.1	0.0	35.7	10.7	3.6	0.0
Lithuania	0.0	100	0.0	50.0	25.0	0.0	0.0
Luxembourg	0.0	20.0	60.0	60.0	60.0	0.0	80.0
Netherlands	75.0	62.5	62.5	62.5	100	62.5	75.0
Norway	64.3	28.6	50.0	28.6	92.9	35.7	64.3
Poland	34.3	25.7	34.3	28.6	70.0	10.0	40.0
Portugal	95.8	83.3	91.7	83.3	92.3	34.6	92.3
Serbia	11.5	42.3	30.8	61.5	21.4	35.7	64.3
Slovakia	32.1	26.8	28.6	25.0	38.6	5.3	29.8
Slovenia	40.9	68.2	31.8	72.7	34.8	26.1	52.2
Spain	85.7	57.1	73.2	69.6	89.5	54.4	75.4
Sweden	33.3	53.3	13.3	66.7	66.7	6.7	20.0
Switzerland	42.1	42.1	10.5	57.9	63.2	52.6	21.1
UK	64.3	57.1	71.4	57.1	85.7	92.9	100

Bih, Bosnia-Herzegovina; Fyrom, the former Yugoslav Republic of Macedonia; Rep., Republic.

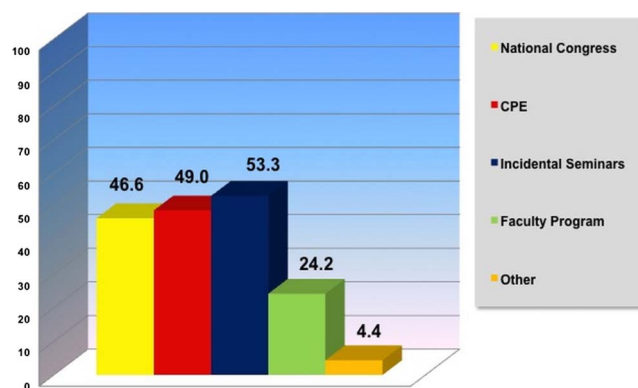
**Table 2** Educational activity in hospital pharmacies by type of hospital (% of pharmacies)

Hospital type	Affiliation with teaching programmes (n=943)				Externship training (n=950)		
	Pharmacy school	Medical school	Technical college	Nursing school	Pharmacy students	Postgraduate pharmacist training	Technicians
General teaching	58.5	69.4	63.8	43.5	72.0	46.0	54.3
General non-teaching	30.4	36.6	25.7	22.2	48.6	28.8	28.3
Oncology	43.3	46.7	50.0	33.3	61.3	16.1	45.2
Psychiatric	23.8	54.8	23.8	19.0	31.0	16.7	23.8
Geriatric	12.5	62.5	25.0	12.5	37.5	12.5	25.0
Other	22.7	39.2	35.1	20.6	38.1	17.5	24.7

**Table 3** Internal continuing education activity (% of pharmacies)

Country	Continuing education programmes (n=960)			Reimbursement (n=951)		
	Pharmacists	Technicians	Other staff	Paid time off	Fully reimbursed	Partially reimbursed
All countries	50.1	40.2	20.8	75.6	16.4	38.7
Austria	57.1	40.0	31.4	94.1	17.6	64.7
Belgium	58.8	55.9	23.5	81.8	42.4	48.5
Bih	40.0	40.0	20.0	80.0	20.0	0.0
Bulgaria	56.4	36.4	16.4	49.1	7.3	21.8
Croatia	17.9	28.2	2.6	76.3	13.2	44.7
Czech Rep.	68.3	65.9	24.4	85.0	17.5	75.0
Denmark	83.3	83.3	83.3	85.7	57.1	42.9
Estonia	16.7	16.7	5.6	94.4	11.1	66.7
Finland	57.9	31.6	28.9	84.2	42.1	57.9
France	55.6	44.4	27.8	55.6	22.2	44.4
Fyrom	75.0	37.5	0.0	81.3	0.0	31.3
Germany	51.5	42.4	21.2	82.8	20.2	60.6
Greece	9.7	3.2	6.5	64.5	0.0	3.2
Hungary	52.2	50.0	17.4	59.6	14.9	40.4
Ireland	55.2	37.9	27.6	69.0	3.4	51.7
Italy	33.6	14.7	5.2	93.2	3.4	8.5
Latvia	7.1	3.6	0.0	51.9	0.0	7.4
Lithuania	33.3	33.3	33.3	33.3	0.0	33.3
Luxembourg	40.0	80.0	60.0	80.0	20.0	60.0
Netherlands	75.0	87.5	50.0	100	75.0	25.0
Norway	61.5	53.8	23.1	92.9	42.9	50.0
Poland	68.3	58.5	26.8	26.5	5.9	26.5
Portugal	61.5	57.7	50.0	76.9	3.8	30.8
Serbia	58.6	55.2	10.3	79.3	0.0	27.6
Slovakia	50.9	47.4	28.1	77.2	17.5	36.8
Slovenia	27.3	31.8	4.5	78.3	43.5	39.1
Spain	64.9	45.6	22.8	63.6	20.0	36.4
Sweden	75.0	66.7	58.3	83.3	33.3	25.0
Switzerland	78.9	52.6	36.8	94.7	42.1	57.9
UK	85.7	85.7	78.6	85.7	14.3	85.7

Bih, Bosnia-Herzegovina; Fyrom, the former Yugoslav Republic of Macedonia; Rep., Republic.



**Figure 1** Education of staff in relation to patient safety (% of pharmacies, European average, n=935). CPE, continuing professional education.

option than a prerequisite to safeguard the patient. Reimbursement of individual expenditure for CPE is not common and many pharmacists have to spend their own money, time and resources in maintaining their skills despite the fact that CPE is a key issue for the quality and safety of patient care. In those hospitals that do provide CPE, it is mostly offered to pharmacists rather than to other staff. While pharmacists have the greatest responsibility for medicines, it is noteworthy that only approximately half of the hospital pharmacies surveyed also offer CPE to other staff members. Insufficient staff education threatens elements of the medication supply chain, for example the compounding and reconstitution of medicines, and heightens the potential risk to patient safety.

Pharmacists are important in the management of IMP and the fact that approximately half of the hospital pharmacies surveyed are involved in clinical trials underlines this fact. Nevertheless, there are huge gaps in participation across Europe. This may be

## Research

**Table 4** Research activity in hospital pharmacies by type of hospital (% of pharmacies, n=951)

Type	In-patients			Out-patients		
	Clinical trials	Drug evaluation	Epidemiology studies	Clinical trials	Drug evaluation	Epidemiology studies
All hospitals	50.2	20.7	11.6	28.4	26.5	10.3
General teaching	72.0	23.1	15.6	33.1	41.2	12.4
General non-teaching	37.0	20.6	10.2	28.0	16.8	10.2
Oncology	64.5	22.6	9.7	22.6	41.9	16.1
Psychiatric	29.3	14.6	2.4	19.5	2.4	0.0
Geriatric	30.0	10.0	20.0	50.0	20.0	0.0
Other	35.7	15.3	7.1	17.3	21.4	6.1

**Figure 2** Involvement in clinical trials by country (in-patients, % of pharmacies, n=959). BIH, Bosnia-Herzegovina; FYROM, the former Yugoslav Republic of Macedonia; Rep., Republic.

due to different national attitudes and cultures, but may also be the result of lower industry interest in performing clinical trials in some countries.

We conclude that despite some regional differences, CPE and research are generally well implemented and common in European hospital pharmacies.

**Competing interests** None.

**Provenance and peer review** Not commissioned; internally peer reviewed.

## REFERENCE

- 1 Frontini R, Miharija-Gala T, Sykora J. EAHP Survey 2010 on hospital pharmacy in Europe: Part 1. General frame and staffing. *Eur J Hosp Pharm* 2012;19:385–387.



## EAHP Survey 2010 on hospital pharmacy in Europe: Part 6. Education and research

Roberto Frontini, Tajda Miharija-Gala and Juraj Sykora

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