

# EAHP SURVEY 2010

Hospital Pharmacy Practice in Europe



# EAHP Survey 2010 on hospital pharmacy in Europe

*Dr. Roberto Frontini, EAHP President*

Since 1995, every five years the European Association of Hospital Pharmacists (EAHP) has compiled and published a comprehensive survey of hospital pharmacy practice across Europe. The fourth survey was conducted in 2010, with data collected until January 2011. It is a pleasure for me to present in this booklet a summary of the results, which were published in a series in the EAHP's official journal, *European Journal of Hospital Pharmacy: Science and Practice* (EJHP), in 2012 and 2013.

The survey data are not presented question by question but rather are thematically grouped into five chapters that encompass the spread of hospital pharmacy activity:

1. General frame and staffing;
2. Procurement and distribution;
3. Production and quality assurance;
4. Clinical services and patient safety; and,
5. Education and research

In this way we hope to give a more concise overview without making concessions on the provision of detailed information by country, by type, and by size of hospital. Where sensible and according to the quality of the data gathered, we also make some comparisons to the results of the 2005 and 2000 surveys. Whilst the scale of difference in questions asked in the first EAHP survey (1995) is too high to allow comparisons with the 2010 data, it is still possible to track the developments in hospital pharmacy practice over the last decade. This comparability challenge includes the fact that the survey's reach, in terms of the number of countries covered, has increased markedly since 2004, particularly in respect to new EU member countries. The published data are the result of some iteration: after collection of the data the national coordinators scrutinised the results in terms of credibility and in some cases returned to hospital pharmacies to make corrections to any missing or incomplete data. Some of the final results presented in this document therefore contain amendments to the preliminary data presented at the EAHP Congresses in 2011 and 2012.

What is the scope of our survey? While we used statistical tools to analyse the data, the results should not be interpreted as ruthlessly scientific – rather the survey is a useful 'snapshot' of practice. Despite our unique approach of contacting every hospital pharmacy in Europe, our survey has acknowledged result bias due to differing response rates from different countries and the potential issues arising from different interpretation of the questions due to language barriers. Nevertheless the scope of the survey is to give an overview of practice in European hospital pharmacies and this is important for our profession as well as for the EAHP. The results clearly show gaps in levels of practice between countries and areas of practice where improvement should be an objective.

EAHP sets itself the mission of continuously improving hospital pharmacy practice in Europe for the benefit of patients. The data collected by the survey supports EAHP in taking decisions on effective actions to achieve this, especially in terms of education and exchange of experience. However, for every individual hospital pharmacist the survey offers the opportunity to compare practice in their own country or hospital with that in other European countries. In this respect, the survey results are designed to provide an effective benchmarking tool for self-directed practice improvement in every European health system. There is no such thing as perfect practice but there are certainly centres of excellence from which we can all learn.



It is impossible to report all of the survey information in this booklet and we recognise that colleagues may be interested in additional details. It is for this reason that we have included the original questionnaire in this booklet. A range of information about, and from, the survey is also available on the EAHP website at [www.eahp.eu/publications/surveys](http://www.eahp.eu/publications/surveys). Individuals with further queries are invited to contact the EAHP office and ask for additional analysis of the responses to a specific question. It should be understood that due to the complexity and sensitivity of the original data EAHP is not able to make available the primary data.

EAHP has always aimed to create a continuously improving survey. So now, with over 15 years of experience acquired in this project area, further refinements and modifications to future surveys are planned. These changes will aim to ensure that both the rigour and the usefulness of the exercise are maintained and built upon. Although still subject to discussion, one suggestion under consideration is for more regular, but shorter, survey activity. This could increase the precision of the survey as a tracking mechanism of practice improvement and innovation in Europe. In whatever event, as EAHP's membership and reach continues to extend, and as information technology opens up new avenues for data collection previously not possible, I am confident that EAHP surveys will continue to benefit of all those who draw inspiration and conclusions from their findings.

I convey my gratitude to my two EAHP Board colleagues who have led in the compilation of the survey, Tajda Miharija Gala (Slovenia) and Juraj Sykora (Slovakia). Without their engagement and intensive communication with the national coordinators, no reliable data would have been collected and the survey could not have been compiled.

My sincerest gratitude extends to all of the national coordinators who had the challenging task of convincing their colleagues to take the time and effort to complete the survey and provide the necessary data. Some of these coordinators went further, by providing translations of the questionnaire and making significant entries of data into the central database. The survey results and this booklet are the reflection of, and a tribute to, those efforts.

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# EAHP Survey 2010 on hospital pharmacy in Europe: Part 1. General frame and staffing

Roberto Frontini,<sup>1,2</sup> Tajda Miharija-Gala,<sup>1,3</sup> Juraj Sykora<sup>1,4,5</sup>

In 2010, the European Association of Hospital Pharmacists (EAHP) conducted its fourth survey on hospital pharmacy practice in Europe. 4748 heads of pharmacy were contacted in all member states through a network of national coordinators. 1283 hospital pharmacies from 30 countries answered the questionnaire with an overall response rate of 27.0%. The average number of beds served by one pharmacy had not changed since 2005 but there was a decrease in complete and an increase in partial hospitalisation. Pharmacists (27%) and qualified technicians (32%) make up 60% of the total staff. The number of pharmacists/100 beds varies from 0.24 (Bosnia and Herzegovina) to 4.35 (UK). Only a few countries did not experience shortages of pharmacists and technicians. European hospital pharmacy staffing (pharmacists and pharmacy technicians) remains, on average, low compared with the USA and has not grown significantly since 1995. Therefore, it can be problematic to make direct comparisons between hospital pharmacy services in the USA and Europe.

## Introduction

The pan European survey on hospital pharmacy practice is an important source in understanding the future challenges and needs for development in Europe. In 2002, the European Association of Hospital Pharmacists (EAHP) General Assembly, in Portorož, Slovenia, decided to run the survey every 5 years. In 1995, 18 countries participated, in 2000, 16 countries, in 2005, 22 countries and in 2010, 30 countries participated.

The 2010 survey was based on a questionnaire with 87 questions covering the following major topics:

1. General frame and staffing
2. Procurement and distribution
3. Production and quality assurance
4. Clinical services
5. Patient safety
6. Education and research.

## Methods

A total of 4748 heads of pharmacy were contacted in all member states through a network of national coordinators. The role of the national coordinators (NC) was to provide the contact addresses of the heads of the hospital pharmacies and then motivate them to take part in the survey, as well as facilitating completion of the questionnaire. In countries where the language barrier was

significant, NC translated the questionnaire and thus improved the response rate and number of correct answers.

The collected data were analysed by country (30 European countries), by size of the hospital (number of beds—12 groups), by type of hospital (seven groups) and also in comparison with previous EAHP surveys.<sup>1,2</sup> Where appropriate, we also compared the results with the American Society of Health System Pharmacists (ASHP) National Survey 2011.<sup>3</sup> We performed only descriptive analysis of the data but further investigation will be performed in the future.

## Results

The average response rate was 27.0% (1283/4748). As not all of the questions were answered in the questionnaires, we also calculated a weighted response rate, which is the ratio between the total number of answered questions and the total number

of questionnaires sent out in that country, multiplied by 87 (total number of questions). The total weighted response rate was 16.7%.

Response rates varied substantially across the member states. The highest response rate was achieved in FYROM (Former Yugoslav Republic of Macedonia) where all hospital pharmacies answered the questionnaire (table 1). Very good response rates above 50% were also found in Austria, Croatia, Estonia, Latvia, Luxembourg, Slovakia and Slovenia. The poorest response rates were in France, Lithuania, Poland and the UK.

Each single question was answered by a median of 960 (74.8%) of the 1283 responding pharmacists (minimum 64 (5.0%), maximum 1168 (91.0%)). The number of responding pharmacists to a specific question is indicated as n (number) and all results (in %) are related to the n of the single question.

**Table 1** Response rates by country

Country	Response rate (%)	Weighted (%)	Country	Response rate (%)	Weighted (%)
Austria	84.4	71.2	Italy	39.0	30.9
Belgium	27.0	15.6	Latvia	75.7	56.4
BiH	40.0	30.5	Lithuania	10.9	5.8
Bulgaria	30.4	23.6	Luxembourg	100.0	68.6
Croatia	81.5	53.8	Netherlands	24.7	11.2
Czech Republic	61.2	40.1	Norway	56.3	33.9
Denmark	63.6	49.2	Poland	15.1	6.0
Estonia	90.0	67.7	Portugal	41.7	28.6
Finland	33.1	18.8	Serbia	56.3	33.5
France	5.0	1.5	Slovakia	93.5	74.6
FYROM	100.0	72.3	Slovenia	92.0	67.2
Germany	30.8	19.5	Spain	26.8	13.7
Greece	24.2	17.9	Sweden	50.0	33.3
Hungary	44.4	35.7	Switzerland	57.5	38.9
Ireland	63.6	35.4	UK	34.5	8.8

BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

<sup>1</sup>European Association of Hospital Pharmacy, Brussels, Belgium

<sup>2</sup>Universitätsklinikum Leipzig, Leipzig, Germany

<sup>3</sup>University Medical Centre Ljubljana, Ljubljana, Slovenia

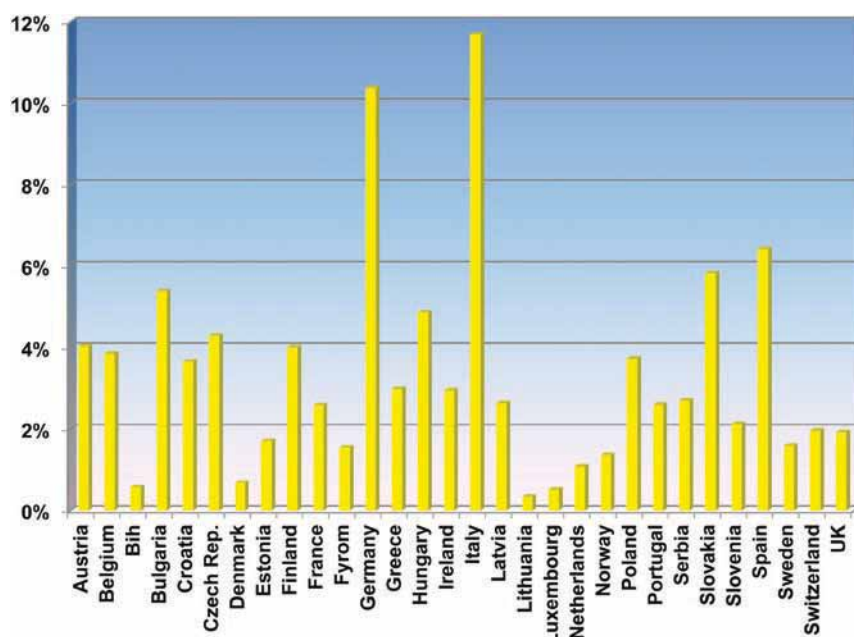
<sup>4</sup>National Cancer Institute, Bratislava, Slovakia

<sup>5</sup>Slovak Medical School, Bratislava, Slovakia

## Correspondence to

Dr. Roberto Frontini, Direktor Universitätsklinikum Leipzig – AöR Apotheke Liebigstr. 20, 04103 Leipzig, Germany; roberto.frontini@medizin.uni-leipzig.de





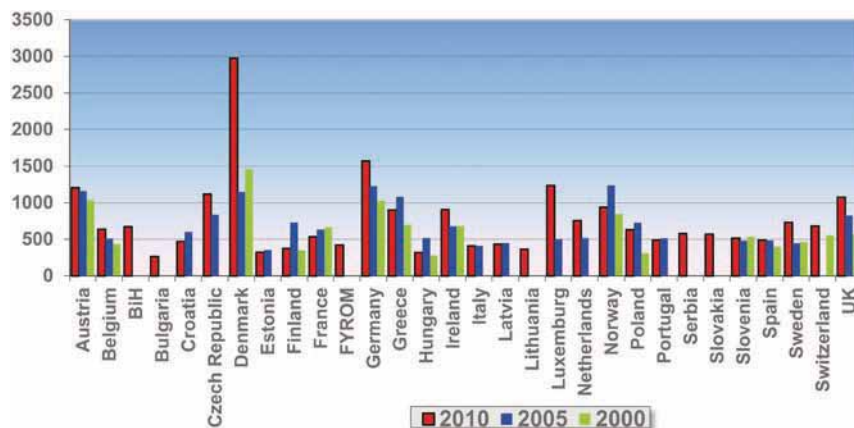
**Figure 1** Contribution (%) of single countries to the total number of responses. Percentages are weighted on the basis of answered questions. BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

**Table 2** Distribution of hospital pharmacies by number of beds served (n = 1139)

Type of pharmacy by No of beds served (complete and partial hospitalisations)	No of pharmacies	% of all pharmacies	No of beds served in total	% of total beds
1-49	15	1.3	544	0.1
50-99	53	4.7	3888	0.5
100-199	168	14.7	24985	3.1
200-299	124	10.9	30434	3.8
300-399	138	12.1	47456	5.9
400-599	184	16.2	90629	11.3
600-799	126	11.1	85463	10.7
800-999	73	6.4	65706	8.2
1000-1499	137	12.0	166701	20.8
1500-2000	55	4.8	93700	11.7
>2000	66	5.8	192437	24.0

The highest total number of responses was achieved in Italy (117=39.0% of pharmacies) and Germany (130=30.8%). The contributions of each respective

country to the total n (1233 hospital pharmacies=100%) are displayed in figure 1. Percentages are weighted on the basis of the answered questions.



**Figure 2** Average number of beds served by one pharmacy by country (n = 1139). BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

The majority of hospitals (n=1102) in Europe are publicly owned (81%). Private hospitals (10%) and church affiliated hospitals (4%) are less frequent. Of all of the hospitals, 79% (n=1168) were general hospitals (teaching=36%, non-teaching=43%). Hospital pharmacies from psychiatric (5%), oncology (3%), geriatric (2%) and ophthalmic hospitals (0.4%) also participated in the study.

One hospital pharmacy serves a median of 410 complete hospitalisation beds in Europe (n=1139, average 606 beds) and the distribution was fairly homogeneous for hospitals with between 100 and 1500 beds (table 2). From the perspective of total number of beds served, small hospitals (<300 beds) covered only 7.5% and very large ones (>1.500 beds) 35.7% of the total beds.

There were significant differences between countries in relation to the average number of beds served by one hospital pharmacy (only complete hospitalisations, figure 2). The largest numbers were in Denmark (2974), Germany (1566), the UK (1310), Lithuania (1249), Austria (1203) and the Czech Republic (1115). Comparisons with the survey from 2000 and 2005 (figure 2) showed that in most of the countries there was a trend towards increasing the number of beds served, which was probably caused by the closing and merging of pharmacies.

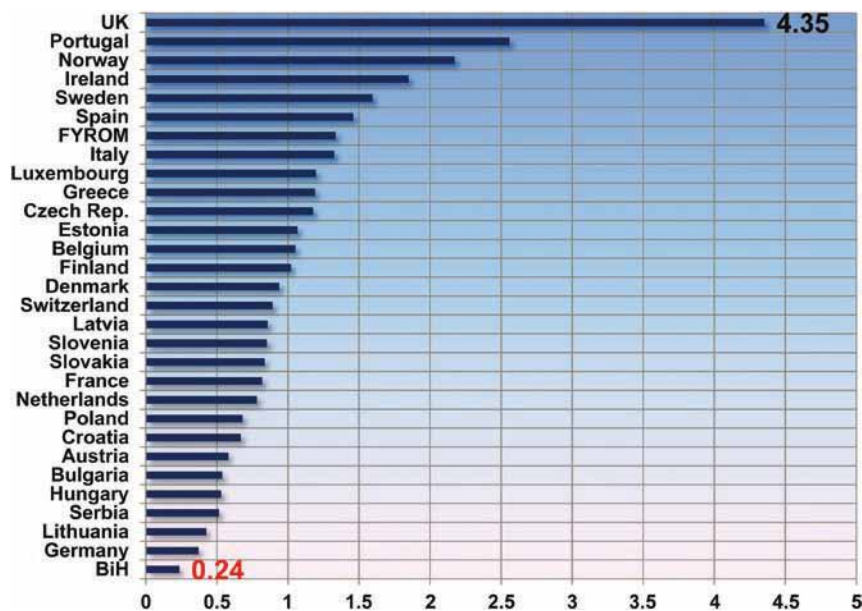
The average number of beds served by a single hospital pharmacy (complete and partial hospitalisations) increased between 2000 and 2010, from 648 to 708 beds (median 2010=427). While complete hospitalisations decreased, partial hospitalisations had an upward trend, showing a shifting in hospital services to day care.

The major groups of staff in hospital pharmacies (ie, full time equivalents (FTE)) were qualified pharmacy assistants/ technicians (PT, 32%), followed by pharmacists (27%), non-qualified pharmacy assistants (14%) and administrative staff (8%). Prescriptionists (bachelor of pharmacy) are employed in some north European countries but play only a minor role (1%).

The average number of pharmacists/100 beds (FTE in complete + partial hospitalisations) was 1.1 (median 0.9) but there were large differences across Europe (figure 3).

The country with the highest ratio was the UK (4.35) and Bosnia and Herzegovina had the lowest (0.24). In terms of total staff/100 beds the highest ratio was also in the UK (12.59) and the country with the lowest ratio was Lithuania (1.45). The average across Europe was 3.8 (median 3.5).

The number of pharmacists and PT (FTE) classified by the number of hospital



**Figure 3** Pharmacists/100 beds (full time equivalents complete + partial hospitalisations) (n = 1024). BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

**Table 3** Distribution of pharmacists and qualified technicians (full time equivalents) by number of beds served in complete and partial hospitalisations (n = 1006)

Type of pharmacy by No of beds served (complete + partial hospitalisations)	Average pharmacists FTE	FTE pharmacists/100 beds	Average qualified technicians FTE	FTE technicians/100 beds
1-49	0.8	2.3	0.4	1.1
50-99	1.3	1.7	0.7	1.0
100-199	1.9	1.2	1.3	0.9
200-299	3.4	1.2	4.5	1.2
300-399	3.7	1.1	4.3	1.2
400-599	4.4	0.9	4.7	1.0
600-799	6.4	0.9	6.0	0.9
800-999	7.9	0.9	7.6	0.8
1000-1499	10.5	0.9	12.5	1.0
1500-2000	10.4	0.6	16.0	0.9
>2000	19.8	0.7	29.1	1.0

FTE, full time equivalents.

beds served in complete and partial hospitalisations is displayed in table 3.

The number of pharmacists and PT increased, as expected, from small to large hospitals (range 0.8 to 19.8 FTE for pharmacists and 0.4 to 29.1 for PT) while the ratio of pharmacists and PT/100 beds was fairly constant. The ratio of pharmacists was quite narrow (0.6–2.3) with the trend towards a decrease with an increase in the number of beds served. These data were similar in the group of PT (range 0.8 to 1.2).

The survey also showed that there were shortages in pharmacists as well as in PT. The most striking shortages in pharmacists were in Greece, Serbia, Bosnia and Herzegovina, Hungary, the UK and Italy. The shortages in PT were high in Greece, Bosnia and Herzegovina, the UK and The Netherlands.

### Limitations

There are some limitations in our survey: The response rate varied substantially from country to country and did not reflect the weight of the population of that country in Europe. Some countries had response rates less than 10% (France, Lithuania, Poland, the UK) and thus their results are only a rough overview of the practice.

Language barriers may have created bias of responding pharmacists and some of the questions may have been misunderstood by non-native English speakers.

An important bias comparing the data of the 2010 survey with those of 2000 and 2005 is the fact that the enlargement of the EU to eastern countries and their high response rates added a substantial number of responses based on quite a different practice, as evident by analysing the data by country.

Thus average values for Europe in the 2010 survey were not fully comparable with the previous ones, and some developments have to be considered with caution.

### Discussion

The results of the 2010 survey on hospital pharmacy practice in Europe are reliable because of the good response rate by most countries, with only a few having an unacceptable response rate. The data from France, Lithuania, Poland and the UK should be interpreted with caution. Nevertheless, we can still have an overview of pharmacy practice in Europe: on average, a hospital pharmacy in Europe is providing hospital pharmacy services to a hospital with 606 beds with complete hospitalisations. The average number of hospital pharmacists in these hospital pharmacies is 4.7 (0.9 pharmacists for 100 beds) and 5.5 PT (1.0 PT/100 beds). On average, since 2005, we have seen only a small increase in the number of beds served for complete and partial hospitalisations, as well as in the number of staff. Therefore, it is interesting to look at the development of services in terms of increasing efficiency.

Comparing staffing in hospital pharmacies in Europe and the USA highlights some important differences: a hospital pharmacy in USA has, on average, 19-fold the pharmacists in Europe (17.5 to 0.9 FTE/100 beds complete hospitalisations).<sup>3</sup> Similar differences can also be observed for PT: in USA, on average, 15-fold greater numbers (1.0 to 15.0 PT FTE/100 beds complete hospitalisations). Even taking into account the different educational systems between the USA and Europe—which could have different staffing as a consequence—direct comparisons between hospital pharmacy services in the USA and Europe are problematic.

**Competing interests** None.

**Provenance and peer review** Not commissioned; not externally peer reviewed.

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# EAHP 2010 survey on hospital pharmacy in Europe: Part 2 Procurement and distribution

Roberto Frontini,<sup>1,2</sup> Tajda Miharija-Gala,<sup>1,3</sup> Juraj Sykora<sup>1,4,5</sup>

Hospital pharmacies in Europe are responsible for supplying medicines and 56.2% of them also have responsibility for medical devices. The number of medicines listed in formularies varies from 246 to 1982, with the median being 960. Hospital pharmacies in western Europe usually procure their supplies direct from industry, while in eastern Europe medicines are mainly sourced from wholesalers. Own production is significant only in Denmark. Overall, 45.7% of pharmacies join in an alliance with another pharmacy to purchase their supplies. Distribution is mostly centralised (70.1%) and unit-dose supply is common in a few countries (European average 23.4%). Services are also provided to outpatients by 66% of pharmacies. Robotic dispensing is being implemented in few western European countries (mainly The Netherlands, Portugal and Spain), where in average 3.3% of hospitals used such systems in 2005 increasing to 6.7% in 2010. Approximately one third of hospitals use barcode technology for stock control and manual selection of items. Large hospitals have more automation than small hospitals.

## Introduction

EAHP's pan-European survey of hospital pharmacy practice is an important source for understanding future challenges and development needs in Europe. The methodology and the background of the 2010 survey were previously described in this journal.<sup>1</sup> In this article we present data on procurement and distribution.

## Results

Hospital pharmacies in Europe are responsible for the procurement of medicines, which are commonly restricted to those listed in a formulary (77.4% of pharmacies, n=990). In a few countries (Croatia, former Yugoslav Republic of Macedonia, Greece, Ireland, Serbia and Slovenia) there are no formularies in <50% of hospitals. The average number of products in formularies is 1006 (median 960) with no significant changes since 2005 (average 1031) but with a large range from 246 (Bosnia and Herzegovina) to 1982 (UK). Price information is shown in 43.6% of formularies (n=748) and formularies are updated by 75.2% of pharmacies each year (n=747).

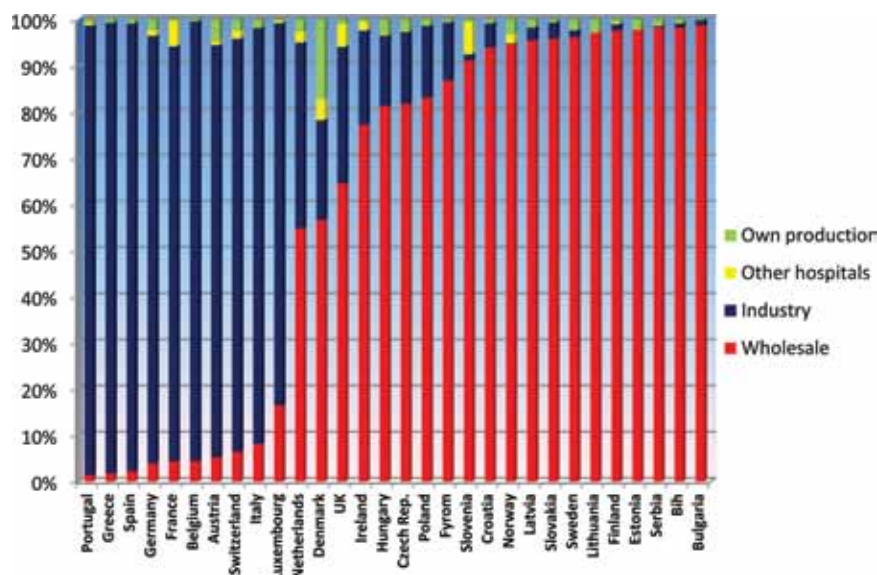
Medical devices are selected by 55.8% and purchased by 56.2% of hospital

pharmacies (n=975). Few hospital pharmacies in Denmark and The Netherlands are involved in this activity, while more than 90% of pharmacies in Slovakia, Belgium and Luxembourg are responsible for selecting and purchasing these products.

Most medical supplies are procured from wholesalers (51%) or direct from industry (46%), with only 2% being sourced from other hospitals and 1% from own production (n=892). Large hospitals purchase less from wholesalers and more from industry, with small hospitals exhibiting the opposite trend; some large hospitals produce their own supplies. There is a clear difference between north-eastern and south-western Europe, with the latter being industry orientated and the

former wholesale oriented (figure 1). Own production is significant only in Denmark (17.2% of purchasing volume). Sources of procurement have not changed significantly since 2000 in most European countries.<sup>2</sup>

Just under half of European pharmacies (45.7%) do not participate in group purchasing, ranging from 28.7% of hospitals in the UK having no alliance to 50% in eight other countries. Local (12.1%), regional (21.2%) and national (21.0%) groups are common and the size of the hospital plays only a minor role in terms of different alliances (n=949), except for very small hospitals where local alliances are preferred. National purchasing groups are significant in Bosnia and Herzegovina, Croatia, Denmark, Luxembourg, Norway and Serbia (>40% of pharmacies).



**Figure 1** Source of purchasing by country (percentage of monetary value, n=892). Bih, Bosnia and Herzegovina; Fyrom, former Yugoslav Republic of Macedonia.

<sup>1</sup>European Association of Hospital Pharmacists, Brussels, Belgium

<sup>2</sup>Universitätsklinikum Leipzig, Pharmacy, Germany

<sup>3</sup>University Medical Centre Ljubljana, Ljubljana, Slovenia

<sup>4</sup>National Cancer Institute, Bratislava, Slovakia

<sup>5</sup>Slovak Medical School, Bratislava, Slovakia;

**Correspondence to** Dr Roberto Frontini, European Association of Hospital Pharmacists, Rue Abbé Cuyper 3, Brussels B-1040, Belgium; president@eahp.eu



**Table 1** Type of distribution services by country (%)

Country	Centralised service	Decentralised service	Unit-dose service	24/7 Unit-dose service	24/7 On call service	Medication at discharge
All countries	70.1	6.5	23.4	14.6	47.9	49.5
Austria	78.9	10.5	10.5	2.9	30.6	7.7
Belgium	50.0	2.9	47.1	27.8	91.9	34.6
Bosnia and Herzegovina	62.5	12.5	25.0	0.0	33.3	100.0
Bulgaria	64.5	0.0	35.5	10.9	63.6	66.7
Croatia	94.9	0.0	5.1	7.7	25.0	30.0
Czech Republic	95.1	2.4	2.4	0.0	19.5	80.0
Denmark	66.7	11.1	22.2	0.0	85.7	40.0
Estonia	84.2	10.5	5.3	0.0	0.0	50.0
Finland	79.6	2.0	18.4	7.0	4.7	36.0
France	64.4	0.0	35.6	18.5	48.4	25.0
FYROM	77.8	11.1	11.1	12.5	62.5	87.5
Germany	80.4	0.9	18.8	7.1	65.7	28.4
Greece	72.1	0.0	27.9	6.5	93.1	60.0
Hungary	81.0	1.7	17.2	6.5	68.8	60.5
Ireland	81.1	0.0	18.9	0.0	23.3	27.3
Italy	65.7	19.0	15.3	11.1	46.6	100.0
Latvia	75.0	16.7	8.3	3.6	21.4	27.3
Lithuania	80.0	0.0	20.0	0.0	No data	0.0
Luxembourg	71.4	0.0	28.6	0.0	60.0	100.0
Netherlands	35.0	15.0	50.0	54.5	100.0	42.9
Norway	88.2	0.0	11.8	0.0	No data	No data
Poland	65.9	26.8	7.3	0.0	35.7	50.0
Portugal	50.0	0.0	50.0	88.0	48.0	50.0
Serbia	51.3	20.5	28.2	22.2	42.9	28.6
Slovakia	100.0	0.0	0.0	0.0	34.5	47.6
Slovenia	86.4	13.6	0.0	4.5	26.1	20.0
Spain	49.6	1.7	48.7	85.0	42.9	37.9
Sweden	81.0	4.8	14.3	10.5	78.9	100.0
Switzerland	52.4	33.3	14.3	5.3	63.2	0.0
UK	62.5	0.0	37.5	0.0	100.0	75.0

FYROM, former Yugoslav Republic of Macedonia.

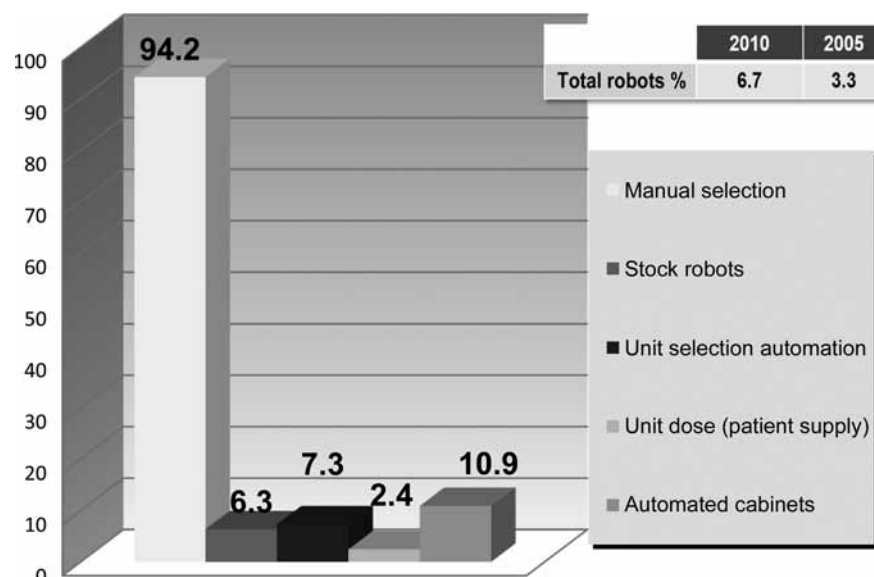
Drug distribution in European hospitals (n=1024) is mostly centralised (70.1%). Decentralised (6.5%) and patient oriented services (unit-dose 23.4%) are less common but vary substantially from country to country (table 1). Patient oriented distribution services are very well developed in The Netherlands and Portugal (50%), Spain (48.7%) and Belgium (47.1%), but 24/7 unit-dose services are uncommon in these countries and elsewhere (on average 14.6%, n=994) and provided for only 67.9% of serviced beds (n=118). A 24/7 on-call service is provided by 47.9% of pharmacies surveyed with provision differing quite markedly across Europe (0–100%, n=1013) (table 1). Supply of medicines to patients at discharge is also common (average 49.5%, n=654) but rates also vary across Europe from 0 to 100% (table 1).

The size of the hospital does not significantly influence the distribution method, but medium-sized hospitals (100–599 beds) provide slightly more medication services at discharge.

Overall, 66% of hospital pharmacies in Europe (n=916) provide services to

both inpatients and outpatients through either the hospital inpatient pharmacy department or a separately licensed outpatient pharmacy. In 62.5% of

cases, the sources and prices of drugs for inpatients and outpatients are the same (n=600), ranging from 14.3% in Hungary to 100.0% in Bosnia and Herzegovina,



**Figure 2** Use of manual selection and robotics in hospital distribution (%; n=949). Totals may be > 100% as more than one system can be in use.



**Table 2** Use of robotics (n=949) and barcoding (n=1000) by hospital size (%)

Hospital size (beds)	Manual selection	Stock robot	Unit selection by robot	Unit-dose automation	Automated cabinets	Use of bct for stock management of medicines	Use of bct for stock management of medical devices	Use of bct for manual selection
All hospitals	94.2	6.3	7.3	2.4	10.9	27.4	13.9	17.0
1-49	100.0	0.0	2.1	0.0	0.0	30.4	13.0	19.6
50-99	97.1	0.0	0.0	0.0	0.0	11.6	4.7	7.0
100-199	97.1	0.0	1.5	0.7	5.1	16.8	10.5	11.2
200-299	93.4	1.9	3.8	0.9	6.6	22.3	10.7	13.4
300-399	98.3	2.5	5.9	0.8	8.4	16.5	9.9	8.3
400-599	94.0	3.3	6.0	3.3	9.9	28.7	14.6	17.8
600-799	95.5	7.9	11.2	1.1	14.6	27.3	9.1	20.2
800-999	95.0	8.3	13.3	11.7	20.0	28.3	8.3	20.0
1000-1499	83.5	14.7	11.0	2.8	18.3	35.8	23.3	24.2
1500-2000	93.3	13.3	17.8	0.0	20.0	47.8	23.9	21.7
>2000	92.3	30.8	15.4	7.7	19.2	60.4	30.2	34.0

Totals may be >100% as more than one system can be in use.  
bct, barcode technology.

**Table 3** Use of robots (n=949) and bar coding (n=1000) by country (%)

Country	Manual selection	Stock robot	Unit selection by robot	Unit-dose automation	Automated cabinets	Use of bct for stock management of medicines	Use of bct for stock management of medical devices	Use of bct for manual selection
All countries	94.2	6.3	7.3	2.4	10.9	27.4	13.9	17.0
Austria	100.0	3.0	3.0	0.0	0.0	13.9	13.9	11.1
Belgium	91.4	2.9	20.0	0.0	40.0	19.4	8.3	8.3
Bosnia and Herzegovina	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulgaria	96.3	0.0	0.0	0.0	1.9	3.6	0.0	3.6
Croatia	100.0	0.0	0.0	0.0	7.9	2.5	2.5	0.0
Czech Republic	92.5	0.0	0.0	0.0	15.0	90.5	50.0	2.4
Denmark	100.0	0.0	0.0	16.7	33.3	83.3	66.7	33.3
Estonia	100.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0
Finland	94.9	0.0	12.8	0.0	2.6	44.2	14.0	14.0
France	100.0	0.0	4.2	4.2	16.7	21.4	7.1	21.4
FYROM	100.0	0.0	0.0	0.0	6.3	12.5	0.0	0.0
Germany	86.3	25.3	12.6	0.0	9.5	41.0	21.0	34.0
Greece	100.0	0.0	0.0	0.0	0.0	16.1	3.2	3.2
Hungary	92.5	7.5	0.0	0.0	17.5	2.1	2.1	0.0
Ireland	100.0	3.3	0.0	0.0	0.0	16.7	0.0	26.7
Italy	94.0	3.4	3.4	3.4	9.4	39.3	23.9	38.5
Latvia	100.0	0.0	0.0	0.0	0.0	14.3	7.1	7.1
Lithuania	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Luxembourg	100.0	0.0	20.0	20.0	20.0	60.0	20.0	20.0
Netherlands	100.0	0.0	54.5	0.0	9.1	50.0	33.3	16.7
Norway	100.0	0.0	0.0	0.0	0.0	68.8	43.8	37.5
Poland	97.1	0.0	0.0	0.0	0.0	5.0	2.5	2.5
Portugal	90.9	13.6	45.5	18.2	22.7	32.0	16.0	20.0
Serbia	92.3	0.0	0.0	0.0	7.7	7.1	3.6	3.6
Slovakia	100.0	0.0	0.0	0.0	0.0	14.0	8.8	15.8
Slovenia	95.0	0.0	0.0	0.0	5.0	22.7	13.6	13.6
Spain	78.2	23.6	32.7	12.7	49.1	27.4	14.5	29.0
Sweden	100.0	11.1	11.1	0.0	16.7	64.7	23.5	23.5
Switzerland	94.4	0.0	0.0	0.0	0.0	21.1	10.5	15.8
UK	85.7	57.1	14.3	35.7	21.4	71.4	21.4	21.4

Totals may be >100% as more than one system can be in use.  
bct, barcode technology; FYROM, former Yugoslav Republic of Macedonia.

Estonia, Greece, Latvia, Luxembourg and the UK.

Automation (n=949) is not generally used in Europe (figure 2, table 2), although

there has been some development with the total of 3.3% of hospital pharmacies using automation in 2005 increasing to 6.7% in 2010.<sup>2</sup> Portugal, Spain and The Netherlands

have significantly increased automation since 2005 compared with other countries.

The use of bar coding technology (n=1000) to manage medicines and medical

devices in stock as well as for manual selection is more frequent but has only been implemented in less than one in three hospitals (table 2). The size of the hospital is relevant in that larger hospitals are generally more automated than smaller ones (table 2) and more frequently use barcode technology (up to 60.4% of very large hospitals). Automated cabinets are the most implemented technology in small and medium-sized hospitals and stock robotics are most frequently used in very large hospitals.

There are large differences in the use of robotics and barcodes from country to country (table 3). Automation is not used in eastern Europe in contrast to the situation in Germany, The Netherlands, Portugal, Spain and the UK where automation and the use of barcodes is more popular. Barcode technology is also used more in eastern and northern Europe.

### Limitations

In addition to the general limitations of the EAHP survey,<sup>1</sup> some results concerning robotics have to be considered with caution. A zero percentage does not necessarily mean that the technology is not used as the number of answering hospitals may have been too small to detect low implementation. Also, some of the results are inaccurate, as not all hospitals stated how medicines are distributed, so the sum of manual selection and robotic technology is less than 100%.

### Discussion

Roughly half the hospital pharmacies in Europe have responsibility for medical devices, so hospital pharmacists should promote their competence and expertise in this field.

Interestingly, eastern Europe pharmacies purchase medicines significantly more through wholesalers than western countries, perhaps because of the concentration of the pharmaceutical industry in western Europe and the fact that prices of medicines are almost identical for hospitals and ambulatory care in eastern Europe where there are also fewer large hospitals with a huge turn-over.

Compared with the results of a similar survey in the USA,<sup>3</sup> it seems that distribution in Europe is more centralised (70%) than in the USA (37%). This is also apparent when unit-dose services are examined: almost every hospital in the USA offers this service compared to only 23% in Europe.

In Europe, 49% of pharmacies provide medication at discharge and 66% provide services for outpatients, but the services are not implemented for all patients. There is therefore a need to improve hospital pharmacy provision of seamless care.

There are huge differences in technology between the USA and Europe: for example, unit-dose technology is very common in the USA but is only used by 14.6% of European pharmacies. Automated cabinets are used by 89.1% of US hospitals but only 10.9%

of European ones. The use of barcoding technology for stock management is similar in the USA (33.9%) and Europe (27.4%). The reluctance in Europe to use technology is due to both economic cost and tradition; the question may be whether technology could free up human resources and improve patient safety.

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**Competing interests** None.

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

**Data sharing statement** Detailed analyses can be provided by EAHP on request.

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# EAHP Survey 2010 on hospital pharmacy in Europe: Part 3. Production and quality assurance

R Frontini,<sup>1,2</sup> T Miharija-Gala,<sup>1,3</sup> J Sykora<sup>1,4</sup>

The number of hospital pharmacies in Europe producing sterile as well as non-sterile medicines has decreased significantly since 2000. In addition, the number of pharmacies preparing total parenteral nutrition, cytotoxics and intravenous admixtures (24.6%, 43.8% and 8.0% of pharmacies, respectively) is quite low and depends to a large extent on the size of the pharmacies, with larger units generally demonstrating significantly higher production activity. There are some differences between eastern and western Europe. Quality control and good manufacturing practice (GMP) seem to be well implemented (61.3% of pharmacies have adopted GMP) and many pharmacies have external certification.

## Introduction

The pan-European survey of hospital pharmacy practice conducted by the European Association of Hospital Pharmacists (EAHP) is an important source of information for understanding future professional challenges and system development needs in Europe. The methodology and the background of the 2010 survey were previously described in this journal.<sup>1</sup> In this article we present the production and quality assurance findings.

## Results

In general, the number of hospital pharmacies across Europe producing medicines for stock and for individual prescriptions has decreased substantially since 2000 (figure 1).<sup>2</sup> This is especially the case for the production of stock sterile medicines, which the 2010 survey shows to be less than half of that recorded in the 2000 survey (decreasing from 66.8% to 29.9% of pharmacies). However, the 2010 survey also recorded a 32% decrease (from 71.0% to 48.5% of pharmacies) since 2000 in pharmacy involvement in the production of individual sterile preparations. Production for all preparations is highly dependent on the size of the hospital (table 1) with the larger units recording significantly more production activity.

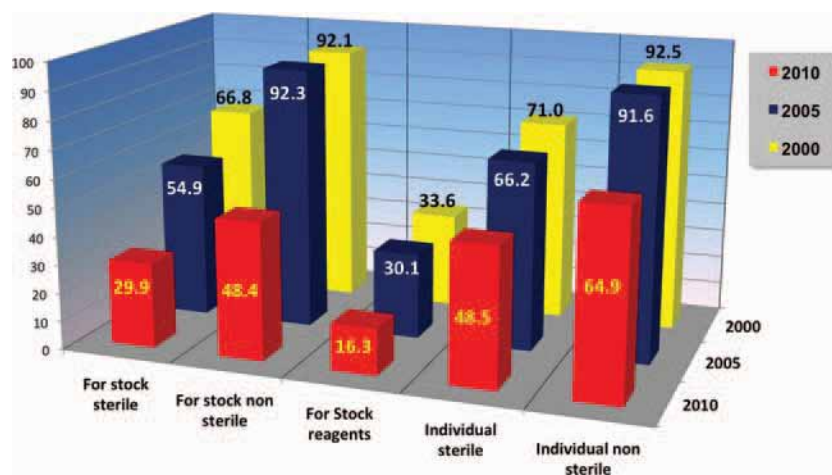
While reagents for laboratories are seldom produced in hospital pharmacies (16.5% of pharmacies), production of non-sterile medicines is common, especially for individual prescriptions (65.8 of pharmacies). Across Europe, only 43.8% of pharmacies reconstitute cytotoxics: this practice occurs in around 80% of large hospitals but in <20% of small hospitals (as they may not need this service). Centralisation of admixtures is still quite low (max. 8.5% of pharmacies for all units and 23.5% for special units) but in contrast compounding of total parenteral nutrition (TPN) seems to be well developed (64.7% of the very large hospitals). This is not surprising considering the high costs of the facilities needed in particular for the aseptic production.

As regards determining the cost-effectiveness of production, 77.5% of pharmacies record the costs of the raw materials (n=920) and 42.7% labour costs, while only 23.7% take into consideration equipment depreciation and 28.4% quality control costs. Regulations across Europe in

relation to hospital pharmacy production differ and a licence to supply own products to other hospitals is not mandatory in all countries. Only 18.5% of pharmacies supply other hospitals (n=999) and 41% of these do so in order to generate hospital revenue (n=159).

There are also some differences between eastern and western Europe, particularly as regards licences for in-house production and manufacture for other hospitals and outpatients (table 2).

In eastern Europe, only in the Czech Republic and Hungary are a large number of pharmacies (57.1% and 57.4%, respectively) licensed to produce investigational medicinal products (IMPs). In western Europe, Denmark (100%), Sweden (81.3%) and Spain (62.7%) have the highest percentages of IMP licences. Very few hospital pharmacies are involved in advanced therapies and only 1.9% have a gene therapy licence. Only Austria, Denmark, Germany, Hungary, Italy, Norway, Portugal and Spain have issued such licences, with Denmark having the most (28.6%)



**Figure 1** Production of medicines in hospital pharmacies: percentages of pharmacies producing medicines for stock (n=982) and for individual prescriptions (n=988).

<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>National Cancer Institute and Slovak Medical School, Bratislava, Slovakia;

**Correspondence to** Dr Roberto Frontini, Universitätsklinikum Leipzig, Liebigstr. 20, D-04103 Leipzig, Germany; president@eahp.eu

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**Table 1** Percentage of pharmacies producing medicines for stock (n=982) and for individual prescriptions (n=988)

Hospital size (by number of beds)	Production for stock			Production for individual prescriptions				Intravenous admixtures for all units	Intravenous admixtures only for special units (eg, ICU)
	Sterile products	Non-sterile products	Reagents	Sterile products	Non-sterile Products	TPN	Cytotoxics		
All hospitals	30.4	49.3	16.5	48.6	65.8	24.6	43.8	2.7	8.0
1-49	0.0	7.7	0.0	7.7	7.7	0.0	15.4	0.0	0.0
50-99	0.0	11.6	2.3	9.1	22.7	2.3	11.4	0.0	0.0
100-199	5.7	22.9	4.3	15.6	37.6	9.2	12.8	1.4	2.1
200-299	12.9	37.6	8.9	27.1	50.5	9.0	23.4	0.9	2.7
300-399	21.2	44.9	12.7	41.4	62.9	16.8	33.6	2.5	1.7
400-599	31.1	50.9	13.0	50.3	74.5	20.6	48.1	2.5	5.6
600-799	27.8	49.5	12.4	57.1	72.4	25.3	51.5	1.0	9.1
800-999	45.6	61.4	15.8	64.9	80.7	40.7	62.7	6.8	11.9
1000-1499	58.8	73.9	28.6	81.5	89.9	45.7	72.4	5.2	18.1
1500-2000	66.0	85.1	48.9	91.5	95.7	51.1	78.7	8.5	23.4
>2000	73.1	86.5	50.0	88.5	92.3	64.7	84.3	2.0	23.5

n=997 respondents for cytotoxics and intravenous admixtures.  
TPN, total parenteral nutrition.

licensed pharmacies. Only oncology hospitals are involved in advanced therapy (6.3%).

Quality of production is high as 61.3% of pharmacies reported that GMP has been implemented (n=949) and 64.4% have a written procedure for the recall of their own products (n=964). However, the

situation differs by country (figure 2). For example, there is quite a gap between some countries (Denmark, Finland, Sweden and UK) and eastern Baltic countries, where only a few hospitals have implemented GMP, possibly because of economic constraints.

Awareness of quality control and assurance is also demonstrated by the high number of hospital pharmacies who have achieved certification (figure 3). Due to the existence of other implemented certification systems, in some countries such as France and Belgium ISO certification is

**Table 2** Percentage of pharmacies with a production licence (n=972)

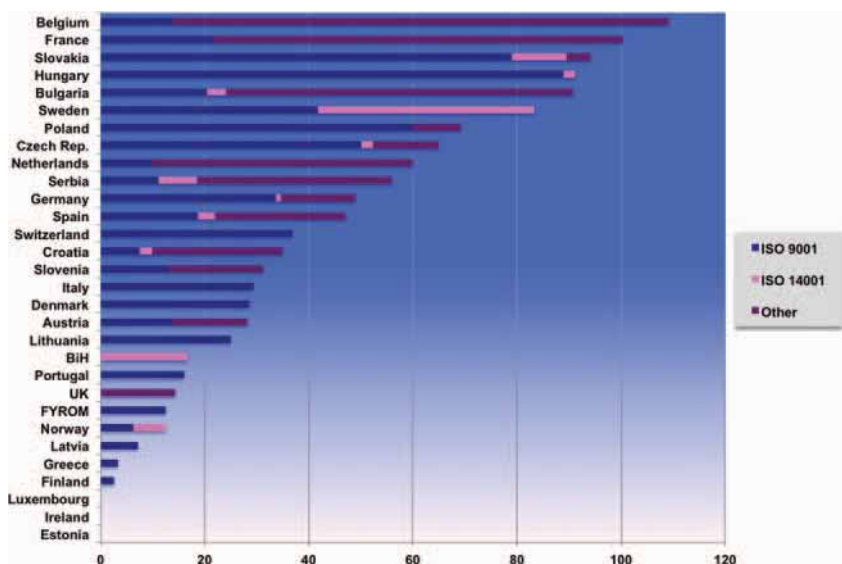
Country	Inpatients		Outpatients and other hospitals		Medicines for clinical trials	Gene therapy
	Sterile products	Non-sterile products	Sterile products	Non-sterile products		
All countries	44.0	65.7	19.0	24.0	30.5	1.8
Austria	76.5	88.2	32.4	29.4	52.9	8.8
Belgium	57.1	71.4	14.3	14.3	48.6	0.0
BiH	16.7	83.3	0.0	0.0	16.7	0.0
Bulgaria	7.3	45.5	0.0	3.6	0.0	0.0
Croatia	27.5	75.0	0.0	0.0	5.0	0.0
Czech Republic	69.0	97.6	45.2	76.2	57.1	0.0
Denmark	100	100	85.7	85.7	100	28.6
Estonia	11.1	83.3	5.6	11.1	11.1	0.0
Finland	42.9	52.4	14.3	14.3	19.0	0.0
France	46.2	50.0	15.4	15.4	26.9	0.0
FYROM	18.8	43.8	6.3	0.0	6.3	0.0
Germany	43.9	50.0	13.3	16.3	26.5	2.0
Greece	43.3	80.0	30.0	56.7	50.0	0.0
Hungary	42.6	83.0	14.9	40.4	57.4	4.3
Ireland	0.0	3.3	0.0	0.0	0.0	0.0
Italy	44.7	50.0	19.3	21.1	24.6	4.4
Latvia	21.4	60.7	0.0	0.0	0.0	0.0
Lithuania	50.0	75.0	0.0	0.0	25.0	0.0
Luxembourg	60.0	80.0	20.0	40.0	20.0	0.0
Netherlands	54.5	72.7	45.5	54.5	45.5	0.0
Norway	100	93.8	68.8	75.0	56.3	6.3
Poland	39.3	85.7	7.1	14.3	14.3	0.0
Portugal	60.0	64.0	28.0	36.0	44.0	4.0
Serbia	14.3	46.4	0.0	0.0	17.9	0.0
Slovakia	24.1	94.8	0.0	3.4	17.2	0.0
Slovenia	30.4	60.9	8.7	21.7	30.4	0.0
Spain	86.4	93.2	50.8	57.6	62.7	3.4
Sweden	93.8	68.8	81.3	68.8	81.3	0.0
Switzerland	72.2	72.2	27.8	27.8	38.9	0.0
UK	35.7	7.1	35.7	7.1	28.6	0.0

BiH, Bosnia-Herzegovina; FYROM, former Yugoslav Republic of Macedonia.





**Figure 2** Percentage of pharmacies implementing good manufacturing practice (GMP) by country (n=949). BiH, Bosnia-Herzegovina; FYROM, former Yugoslav Republic of Macedonia.



**Figure 3** External certification (%) by country (n=973). Total may be >100% as some pharmacies have two different certificates. BiH, Bosnia-Herzegovina; FYROM, former Yugoslav Republic of Macedonia.

not the most commonly used accreditation standard, and, at least in Belgium, some pharmacies have two certificates (which explains the total percentage being >100%). There are large differences across Europe with some countries (Estonia, Ireland and Luxembourg) having no certification according to our data.

The survey suggests that the presence of quality control systems is highly dependent on the size of the hospital in question (table 3, n=986), with large hospitals more commonly having such systems. The quality control of chemical and physical elements is generally less robust than that of microbiological stability. Raw materials and finished products are well tested (67.3% and 67.9% of pharmacies, respectively) with packaging material less so (22.3%). In general the tests are performed in the pharmacy (67.3% of pharmacies) but also at external locations (67.9%) or in other laboratories of the same hospital (22.3%).

### Limitations

In addition to some of the previously discussed and accepted limitations of the EAHP survey,<sup>1</sup> since 2005 a number of eastern countries with low hospital pharmacy production and quality control have joined EAHP. This may have created a bias by increasing the true decline in such activities. Also the results concerning GMP are surprising and should be treated with caution; it is possible that some respondents may have misinterpreted the term ‘GMP’ (which means fulfilling the EU directive) as meaning a more general ‘best practice’.

### Discussion

The decrease in the numbers of hospital pharmacies involved in sterile batch production could be due to increased

**Table 3** Percentage of pharmacies (n=986) implementing quality control measures

Hospital size (by number of beds)	Quality control			Test performed					
	Chemical stability	Physical stability	Micro-biological stability	On raw materials	On packaging material	On finished product	In the pharmacy	In other hospital laboratory	External laboratory
All hospitals	25.3	25.9	41.8	67.3	22.3	67.9	67.3	22.3	67.9
1-49	0.0	0.0	0.0	NA	NA	NA	NA	NA	NA
50-99	6.8	6.8	11.4	100	0.0	0.0	100	0.0	0.0
100-199	6.5	8.0	18.1	56.3	18.8	46.9	56.3	18.8	46.9
200-299	15.7	19.4	25.9	62.9	14.3	51.4	62.9	14.3	51.4
300-399	17.1	20.5	32.5	72.7	20.5	52.3	72.7	20.5	52.3
400-599	17.5	17.5	45.6	61.7	11.1	66.7	61.7	11.1	66.7
600-799	23.7	26.8	48.5	64.0	24.0	70.0	64.0	24.0	70.0
800-999	32.2	33.9	57.6	56.3	21.9	65.6	56.3	21.9	65.6
1000-1499	50.4	48.7	63.9	65.9	26.4	80.2	65.9	26.4	80.2
1500-2000	59.6	55.3	72.3	83.8	35.1	73.0	83.8	35.1	73.0
>2000	66.7	58.8	74.5	81.6	32.7	83.7	81.6	32.7	83.7

n=463 respondents for type of material tested and n=471 respondents for laboratory location. Multiple answers are possible. NA, not applicable (no data).

reliance on industrial manufacture, as well as the concentration of production in larger hospital pharmacies. There are similar decreases in production activity in relation to individual preparations, at least for small and medium-sized hospitals. This development is regrettable in light of the needs of personalised medicine and the fact that only pharmacists are competent within hospitals to create such preparations. Nevertheless, the EAHP survey did not seek information about the outsourcing of production, which might have been relevant in terms of the results. It is also surprising that only 43.8% of the pharmacies surveyed offered centralised cytotoxic reconstitution. Even though only some hospitals are involved in oncology, this percentage is low with only 53.1% of oncology hospitals offering such a service (data not shown). We were unable to determine from the survey results

whether this is the result of outsourcing or of reconstitution in the ward, both of which practices contravene the recommendations of the International Pharmaceutical Federation (FIP) Basel statements of 2008.<sup>3</sup> Also the preparation of intravenous admixtures needs to be improved as they can be very sensitive microbiologically and should therefore be prepared in the pharmacy as suggested in Basel statement 36.<sup>3</sup> The low percentage of hospital pharmacies meeting this standard (max 23.5%) is therefore unsatisfactory.

Our data show that hospital pharmacies are not yet ready to prepare advanced medicines. This is not yet an acute need but may be so in the future. As regards personalised medicines, preparation competencies within hospital pharmacies should be maintained.

Hospital pharmacies in Europe in general show a good understanding of

quality control and assurance and have often achieved external certification. Nevertheless, the need to meet GMP requirements in the future may challenge some small pharmacies and the trends towards concentration in larger production facilities—as suggested by our results from 2000 and 2005—will probably continue.

**Provenance and peer review** Commissioned; internally peer reviewed.

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## SURVEY

## EAHP survey 2010 on hospital pharmacy in Europe: parts 4 and 5. Clinical services and patient safety

Roberto 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>National Cancer Institute, Bratislava, Slovakia<sup>5</sup>Slovak Medical School, Bratislava, Slovakia**Correspondence to**Dr R Frontini,  
European Association of Hospital Pharmacists, Rue Abbé Cuyper 3, B-1040 Brussels B-1040, Belgium; president@eahp.eu

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**ABSTRACT**

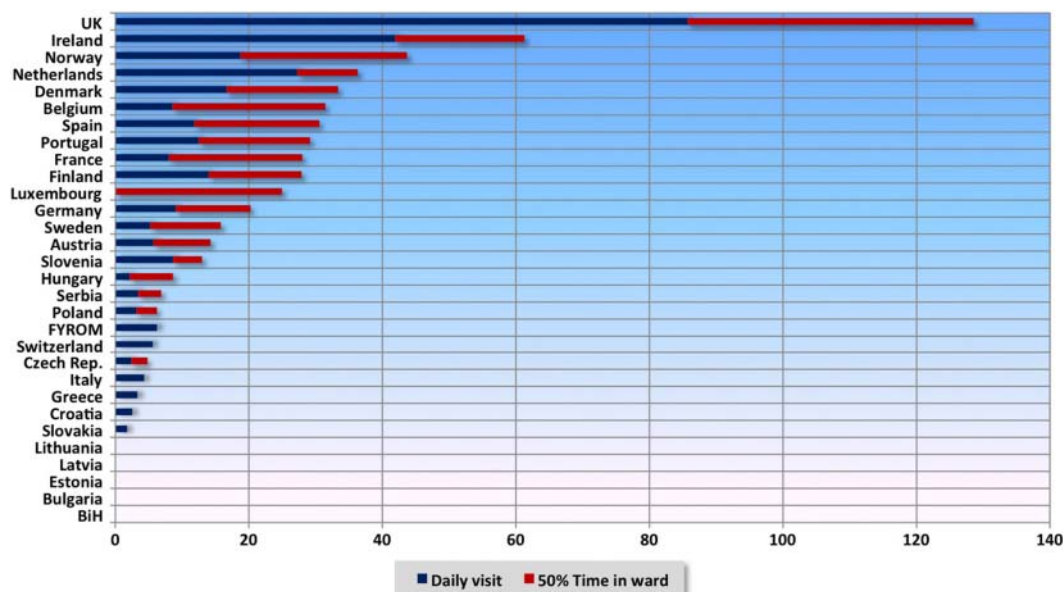
Decentralised clinical services, with a pharmacist working in the ward at least 50% of the time or with pharmacists visiting the ward daily, are not very common in Europe. For-profit hospitals offer the service remarkably less than other hospitals, and 39.8% of hospital pharmacies offer clinical services occasionally. There is a variety of patient oriented clinical activities delivered by European hospital pharmacies, including the provision of drug information, pharmacokinetic consultations, therapeutic drug monitoring, management prevention of adverse drug reactions and medication errors. Hospital pharmacy involvement in managing the interface between primary and hospital care is less common. In general, clinical activities are not well documented. For inpatients, on average, only 14.7% and 21.9% of the hospital pharmacies that took part in the survey said they write down their interventions in the medical records and in pharmacy records, respectively. IT systems are broadly used in the provision of drug information but also in profiling patient medication and for dosage calculations. Patient safety is a major interest of hospital pharmacists and, on average, 55.0% of hospital pharmacies recorded that they have implemented a system to ensure patient safety.

**INTRODUCTION**

The European Association of Hospital Pharmacists' (EAHP) pan-European survey on hospital pharmacy practice is an important source in understanding the future challenges and needs for development in Europe. The methodology and the background of the 2010 survey were previously published in this journal.<sup>1</sup> In this article, we present data on clinical services and implementation of safety procedures for patients.

**RESULTS**

Decentralised clinical services, with a pharmacist working in the ward at least 50% of the time or with pharmacists visiting the ward daily, are not very common in Europe (figure 1, n=981). Only a few countries (ie, the UK and Ireland) have developed these services to a significant extent. There is a remarkable difference between for-profit and non-for-profit hospitals in this respect: while for-profit hospitals offer these services on a European average of 3.2% and 3.5%, respectively, corresponding figures for not-for-profit hospitals are 9.5% and 10.3%, respectively. In general, hospitals offer clinical services in the ward occasionally (European average 39.8%, range by country 3.6–79.2%) with



**Figure 1** Percentage of pharmacies with either daily visits on the wards by pharmacists or having pharmacists working at least 50% of their time on the ward (n=981). Total may be >100% as some pharmacies have both services. BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

**Table 1** Patient oriented activities by country (percentage of pharmacies with)

Country	TDM n=1061	Drug information	Patient visits at admission	Patient counselling at discharge	Pharmacokinetic consultation (n=966)		Patient care service on ADR (n=966)		Patient care service concerning medication errors (n=968)	
					Inpatients	Outpatients	Inpatients	Outpatients	Inpatients	Outpatients
All countries	25.0	54.6	16.9	22.1	18.7	5.5	50.1	23.4	50.0	21.4
Austria	5.7	74.3	17.1	8.6	8.3	0.0	52.8	0.0	45.5	3.0
Belgium	23.5	64.7	23.5	23.5	23.5	0.0	52.8	0.0	80.6	2.8
BiH	16.7	50.0	33.3	66.7	33.3	0.0	16.7	0.0	50.0	0.0
Bulgaria	14.5	61.8	12.7	18.2	27.3	7.3	25.9	11.1	22.2	5.6
Croatia	29.0	51.6	22.6	19.4	7.7	5.1	22.5	2.5	7.7	0.0
Czech Republic	30.6	40.8	16.3	57.1	7.3	4.9	19.5	41.5	15.0	32.5
Denmark	16.7	66.7	16.7	16.7	16.7	0.0	50.0	33.3	100	16.7
Estonia	0.0	16.7	5.6	5.6	0.0	0.0	5.6	0.0	0.0	0.0
Finland	7.3	27.3	5.5	14.5	2.4	0.0	40.0	12.5	46.3	9.8
France	11.8	70.6	23.5	23.5	14.3	4.8	76.2	28.6	76.2	19.0
FYROM	5.9	17.6	23.5	52.9	18.8	0.0	37.5	0.0	25.0	0.0
Germany	27.8	68.5	24.1	11.1	35.4	2.0	54.0	5.0	59.2	7.1
Greece	9.4	78.1	31.3	28.1	3.3	3.3	46.7	46.7	48.4	48.4
Hungary	29.2	70.8	33.3	47.9	12.8	6.4	61.7	44.7	48.9	26.7
Ireland	46.4	67.9	39.3	39.3	60.7	10.7	71.4	25.0	89.7	34.5
Italy	55.6	64.1	10.3	31.6	0.9	0.0	77.8	32.5	69.6	28.7
Latvia	0.0	26.9	23.1	19.2	0.0	0.0	14.8	0.0	14.3	0.0
Lithuania	50.0	50.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0
Luxembourg	16.7	50.0	0.0	50.0	20.0	0.0	60.0	40.0	80.0	40.0
Netherlands	53.3	40.0	6.7	13.3	100	100	80.0	30.0	100	30.0
Norway	25.0	33.3	25.0	41.7	20.0	0.0	20.0	26.7	42.9	35.7
Poland	6.8	37.3	11.9	8.5	0.0	0.0	31.3	0.0	23.5	0.0
Portugal	35.7	64.3	10.7	7.1	30.8	7.7	76.0	80.0	73.1	65.4
Serbia	0.0	61.3	0.0	0.0	28.6	3.6	70.4	22.2	56.7	16.7
Slovakia	17.2	41.4	0.0	0.0	3.4	0.0	31.6	12.3	22.4	10.3
Slovenia	30.0	50.0	20.0	15.0	39.1	4.3	52.2	8.7	39.1	4.3
Spain	31.5	50.6	15.7	22.5	45.8	27.1	74.1	81.0	80.0	78.3
Sweden	21.4	42.9	0.0	0.0	0.0	0.0	26.7	20.0	26.7	20.0
Switzerland	31.6	84.2	15.8	5.3	16.7	0.0	57.9	10.5	73.7	10.5
UK	34.6	50.0	46.2	53.8	64.3	50.0	76.9	61.5	100	85.7

ADR, adverse drug reactions; BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia; TDM, therapeutic drug monitoring.

**Table 2** Clinical counselling activities by country (percentage of pharmacies with)

Country	Anticoagulant therapy n=897	LLD	Antibiotics	CIN	Immunosuppressive therapy	Other	TPN n=959	Enteral nutrition
All countries	13.6	5.6	38.1	19.6	10.8	14.4	10.3	31.9
Austria	16.1	0.0	48.4	38.7	16.1	3.2	2.9	82.9
Belgium	12.9	3.2	41.9	12.9	0.0	9.7	20.6	52.9
BiH	16.7	0.0	66.7	0.0	0.0	33.3	0.0	33.3
Bulgaria	11.3	7.5	37.7	9.4	5.7	15.1	0.0	5.6
Croatia	10.5	7.9	28.9	2.6	7.9	5.3	0.0	20.0
Czech Republic	12.8	10.3	20.5	10.3	7.7	15.4	2.4	46.3
Denmark	0.0	0.0	0.0	16.7	0.0	0.0	50.0	0.0
Estonia	0.0	0.0	0.0	0.0	0.0	5.6	0.0	5.6
Finland	5.4	5.4	27.0	8.1	5.4	8.1	4.9	9.8
France	31.6	5.3	47.4	10.5	10.5	10.5	21.1	52.6
FYROM	18.8	6.3	37.5	6.3	0.0	12.5	0.0	0.0
Germany	13.5	6.3	50.0	35.4	9.4	15.6	9.2	54.1
Greece	43.3	30.0	60.0	40.0	40.0	46.7	9.7	0.0

Continued



Table 2 Continued

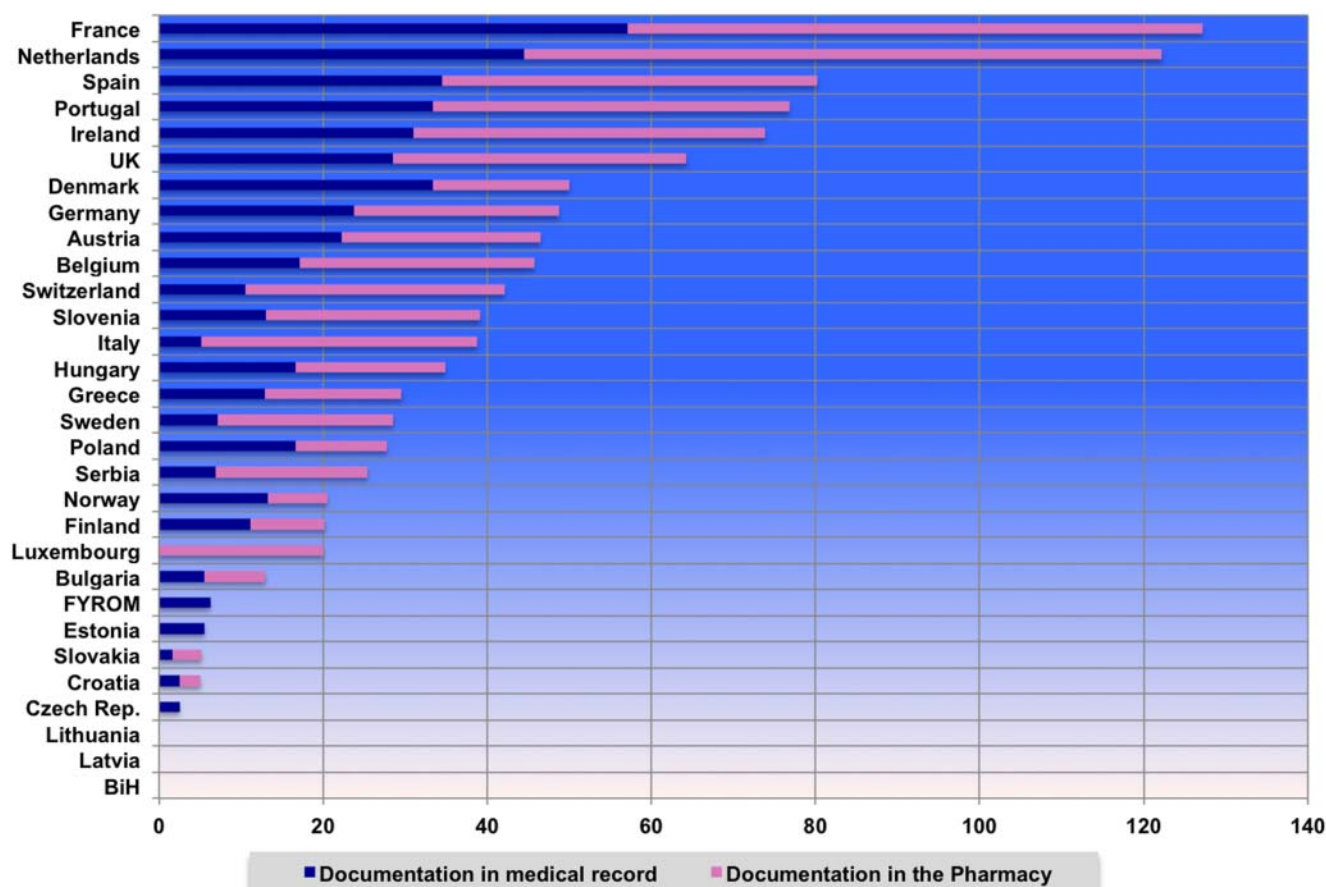
Country	Anticoagulant therapy n=897	LLD	Antibiotics	CIN	Immunosuppressive therapy	Other	TPN n=959	Enteral nutrition
Hungary	20.0	15.6	48.9	22.2	15.6	20.0	9.1	25.0
Ireland	35.7	0.0	60.7	28.6	17.9	25.0	17.2	24.1
Italy	1.2	1.2	8.2	5.9	2.4	4.7	14.7	43.1
Latvia	0.0	0.0	18.5	0.0	0.0	3.7	0.0	0.0
Lithuania	33.3	0.0	100	33.3	66.7	66.7	0.0	0.0
Luxembourg	25.0	0.0	25.0	50.0	0.0	25.0	0.0	40.0
Netherlands	37.5	12.5	75.0	50.0	50.0	25.0	77.8	11.1
Norway	8.3	0.0	8.3	16.7	16.7	8.3	14.3	14.3
Poland	5.9	2.9	20.6	5.9	2.9	0.0	0.0	12.5
Portugal	4.2	0.0	66.7	54.2	37.5	8.3	19.2	53.8
Serbia	24.1	3.4	58.6	17.2	10.3	44.8	11.1	7.4
Slovakia	1.9	0.0	31.5	5.6	7.4	5.6	10.3	6.9
Slovenia	15.0	10.0	45.0	5.0	5.0	20.0	4.3	17.4
Spain	16.9	8.5	69.5	55.9	20.3	28.8	11.9	67.8
Sweden	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0
Switzerland	5.6	0.0	5.6	5.6	0.0	0.0	16.7	72.2
UK	69.2	7.7	76.9	53.8	46.2	23.1	64.3	35.7

BiH, Bosnia and Herzegovina; CIN, cytotoxic induced nausea; FYROM, Former Yugoslav Republic of Macedonia; LLD, lipid lowering drugs; TPN, total parenteral nutrition.

an increasing percentage proportional to size by number of beds. In 24.5% of hospitals (range by country 0.0% to 90.9%, n=990), technicians are involved in services in the ward mainly in relation to stocking (20.7%) and information activities (10.1%). Only in Denmark, The Netherlands and the UK is

counselling part of the technician's activities (>50% of the hospitals). In other countries, this practice is less usual and thus the average in Europe is only 4.9%.

There are a variety of patient oriented clinical activities in European hospital pharmacies (table 1). Drug information is the



**Figure 2** Percentage of pharmacies documenting their clinical activities (inpatients) in medicals records or in the pharmacy (n=950 and n=935, respectively). Total may be >100% as some pharmacies use both documentation systems. BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

**Table 3** Use of IT technology in clinical services by country (n=984)

Country	Patient medication profiling	Drug information databases	Dosage calculation
All countries	31.4	62.2	27.0
Austria	11.4	88.6	45.7
Belgium	73.5	76.5	44.1
BiH	33.3	83.3	16.7
Bulgaria	31.5	25.9	1.9
Croatia	5.3	26.3	5.3
Czech Republic	14.3	76.2	31.0
Denmark	33.3	83.3	50.0
Estonia	0.0	29.4	5.9
Finland	24.4	53.7	9.8
France	68.0	84.0	12.0
FYROM	6.3	25.0	0.0
Germany	29.0	86.0	56.0
Greece	58.1	77.4	9.7
Hungary	27.7	78.7	14.9
Ireland	35.5	61.3	32.3
Italy	24.6	68.4	22.8
Latvia	15.4	3.8	3.8
Lithuania	0.0	0.0	0.0
Luxembourg	20.0	100	40.0
Netherlands	81.8	100	90.9
Norway	21.4	92.9	21.4
Poland	4.5	11.4	9.1
Portugal	92.3	34.6	50.0
Serbia	0.0	35.7	7.1
Slovakia	10.3	36.2	1.7
Slovenia	9.1	86.4	22.7
Spain	94.9	98.3	69.5
Sweden	0.0	83.3	38.9
Switzerland	44.4	88.9	50.0
UK	64.3	71.4	50.0

BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

most common of these (54.6% of pharmacies), and on average 29.2% of surveyed hospitals have a specific pharmacist dedicated to information services (n=989), corresponding to a median of 1.0 full time equivalent (n=273); 25.0% of pharmacies offer the service additionally for healthcare professionals and patients outside of hospital (n=967), mostly (90%) for free (n=242). In 21.2% of pharmacies (n=987), the drug information centre is a formal division or programme of the hospital. On average, half of hospital pharmacies also offer specific services for inpatients concerning prevention, monitoring, documenting, reporting and managing of adverse drug reactions and medication errors. The survey results indicate such services are not implemented to a similar level for outpatient services.

Pharmacokinetic consultation is offered for inpatients and outpatients and includes, in order of the most common categories: antibiotics (aminoglycosides, teicoplanine, vancomycin); antiepileptic drugs (carbamazepine, phenobarbitone, phenytoin); immunosuppressive drugs (cyclosporin, tacrolimus); and others such as lithium, digoxin, theophylline and warfarin (n=857). Therapeutic drug monitoring as an additional service to pharmacokinetic consultation is performed, on average, by approximately 25% of hospital pharmacies.

Management of the interface between primary and hospital care is not yet a priority of hospital pharmacists as, on average, only 16.9% of pharmacies offer this service on admission and 22.1% at discharge. There is large heterogeneity in the results between countries but not by size or type of hospital (data not shown).

Regarding counselling activities in hospital, the most common activity is related to the use of antibiotics, followed by enteral nutrition and cytotoxic induced nausea, with significant heterogeneity between countries and activities (table 2).

In general, the EAHP survey suggests that hospital pharmacy clinical activities are not well documented. On average, only 14.7% (inpatients) and 5.3% (outpatients) of pharmacies record their interventions in medical records (n=950). Documentation in the pharmacy is implemented in 21.9% (inpatients) and 10.2% (outpatients) of pharmacies (n=935). Again, there were notable differences across Europe (figure 2), with the countries in the geographic east generally indicating less recording of hospital pharmacy clinical activities.

There was a weak correlation ( $r^2=0.3591$ ) between the index of activity of pharmacies and the documentation index (defined as the total percentage of clinical activity in the ward and the total percentage of documentation per country, respectively) showing that documentation seems to be considered optional. Written standards are in use for drug information in 39.6% of hospital pharmacies, for pharmacokinetic consultation in 11.3%, for therapeutic drug monitoring in 18.5%, for enteral nutrition in 22.3% and for patient counselling in 22.1% of pharmacies (n=961), with large heterogeneity across European countries and a trend to more frequent use in large hospitals (data not shown).

IT systems are broadly used in drug information but also in profiling patient medication and for dosage calculations (table 3, n=984). Results from Latvia and Lithuania may demonstrate a need for improvement.

Patient safety is a major concern for hospital pharmacists and, on average, 55.0% of hospital pharmacies responding to the survey have implemented a system to ensure patient safety (figure 3, n=914), despite some discernible gaps, especially in southern and eastern parts of Europe. The type of hospital did not remarkably influence implementation but there was a small trend to higher percentages for larger hospitals. On average, 55.1% of hospital pharmacies have a clinical incident reporting system, 38.1% established a committee for safe medication practice and 35.2% have a dedicated team including physicians, pharmacists and nurses (n=928); 24.8% of pharmacies were involved in national surveys on safe medication practice (median 6 surveys/country with a median response rate of 81%, n=872) and 19.8% in campaigns (median 5 campaigns, n=701).

## LIMITATIONS

In addition to the general limitations of the survey,<sup>1</sup> the definition of 'clinical activity' might be perceived differently, depending on cultural aspects in different countries. Also, the function of a pharmacist working on a ward can vary from country to country, as was clearly evident from the answers to the questions about activities of technicians. We were not able to differentiate more, and thus we have to take some bias into account.

## DISCUSSION

Compared with the results of our survey in 2005,<sup>2</sup> it appears only small changes are visible in clinical practice in European hospital pharmacy (data not shown). The difference between US and European practice<sup>3</sup>—even taking into account the



**Figure 3** Percentage of hospital pharmacies with an implemented system to ensure patient safety (n=914). BiH, Bosnia and Herzegovina; FYROM, Former Yugoslav Republic of Macedonia.

limitations discussed above—is wide. In the USA, in 34% of hospitals, pharmacists work on the ward for 8 h/day<sup>3</sup>; in Europe, only 6% of pharmacies have pharmacists spending at least 50% of their time on the ward. In 71% of US hospitals, pharmacists review and approve all medication orders before the first dose is administered (except in procedure and emergency situations). We do not have specific data on this for Europe but the results on general clinical activities do not suggest such involvement. It is important to develop this role in terms of patient safety and proper use of medicines, as studies repeatedly indicate the value hospital pharmacists can bring to safe patient care in this area. Our data also show that development of these roles is of major interest to European hospital pharmacists.

The survey suggests that the level to which hospital pharmacists are documenting pharmaceutical interventions in medical records or in the pharmacy is quite low and should be improved to create more awareness of the added value of hospital pharmacists. The fact that a weak but still detectable correlation is evident between the index of activity of pharmacies and the documentation index could be interpreted as showing that good documentation helps persuade hospital administrations to provide the resources necessary to enable clinical pharmacy services.

Management of medication at the interface between primary and hospital care is generally not common in European hospitals. There is a need for improvement, as hospital pharmacists

have a major contribution to make in reducing errors in this very sensitive field of patient care.

### Key messages

- ▶ Clinical services are still not very well implemented in Europe
- ▶ There is a lack of documentation of clinical activities
- ▶ Patient safety is in focus of the activities of Hospital pharmacists in Europe but the management of the interface between hospitals and primary care needs some improvement

**Contributors** RF analysed the data and wrote the article. TM-G and JS reviewed the article.

**Competing interests** None.

**Provenance and peer review** Commissioned; not externally peer reviewed.

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## 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

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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



**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.

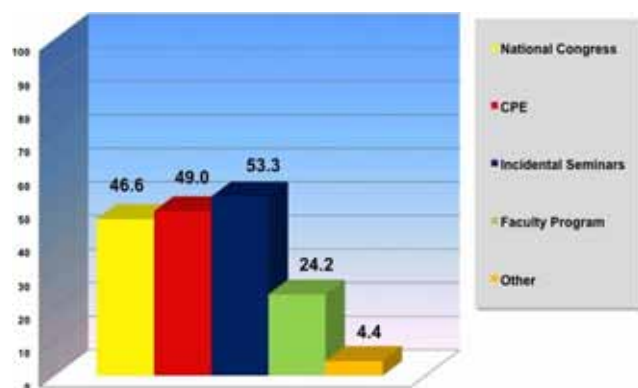
**Table 2** Educational activity in hospital pharmacies by type of hospital (% of pharmacies)

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

**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.

Identification number :

Country

Number



## SECTION I

### HOSPITAL CHARACTERISTICS

1. How many beds are served by your pharmacy ?

***In complete hospitalisation***

*(the patient stays day + night)*

    beds

***In partial hospitalisation***

*(the patient stays during the day,  
part of the day, or only at night)*

    beds

2. Tick the description which best fits your hospital(s) :

*(A teaching hospital is a hospital affiliated to a university medical school which trains doctors at undergraduate and postgraduate level)*

- |                                    |                          |     |                          |    |
|------------------------------------|--------------------------|-----|--------------------------|----|
| 2.1. General Teaching hospital     | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 2.2. General non Teaching hospital | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 2.3. Ophthalmic hospital           | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 2.4. Oncology hospital             | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 2.5. Psychiatric hospital          | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 2.6. Geriatric hospital            | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 2.7. Other                         | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |



3. What is your hospital(s)'s average bed occupancy percentage for the last year ?

   ,  %

4. What was the average duration of stay for inpatients during the last year ?

*(Round days to the nearest one decimal place, e.g. 6.1 days)*

   ,  days

5. Is your hospital(s) :

*(Tick the statement that best describes the situation of your pharmacy)*

- |   |                          |     |                          |    |
|---|--------------------------|-----|--------------------------|----|
| 5.1. A public (i.e. owned by the Government) Hospital ? | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 5.2. A Church affiliated Hospital ?                     | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 5.3. A private hospital ?                               | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 5.4. Other ?  | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |

6. Is your hospital(s) :

*(Tick the statement that best describes the situation of your pharmacy)*

- |  |                          |     |                          |    |
|--|--------------------------|-----|--------------------------|----|
| 6.1. A profit making institution ?     | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
| 6.2. A non profit making institution ? | <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |



**7. Personnel**

7.1. How many nurses, calculated in Full Time Equivalent (FTE) are employed in the hospital(s) served by your pharmacy ? .....

7.2. How many doctors, calculated in Full Time Equivalent (FTE) are employed in the hospital(s) served by your pharmacy ? .....

*A Full Time Equivalent (FTE) is a measure to convert total staff numbers including part time and full time personnel into a single figure for purposes of comparison. One FTE is the standard number of hours worked in your country for a specific category of staff.*

*Example : In Italy, 1 FTE in hospital pharmacy is 42 hours . Therefore, a hospital with one pharmacist who works 21 hours and one who works 42 hours per week has 1.5 FTE pharmacists. The number of hours per FTE varies from profession to profession and from country to country.*

**8. Is the hospital pharmacy director responsible for other departments in the hospital ?**

Yes ..... If Yes, mark all that apply : (Tick one or more if applicable)

- |                            |                              |                             |
|----------------------------|------------------------------|-----------------------------|
| 8.1. Sterilisation         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8.2. Infection Control     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8.3. Medical Analysis Lab. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8.4 Medical devices        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8.5 Waste Management       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8.6. Other                 | <input type="checkbox"/> Yes | <input type="checkbox"/> No |



**9. To whom is the pharmacy director responsible ?**

(Tick the statement that best describes the situation of your pharmacy)

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 9.1. To the hospital Chief Executive Officer (Hospital Director) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9.2. To an outside pharmacy Director                             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9.3. To a contract administrator                                 | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9.4. To a clinical medical Director                              | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9.5. To a local Authority  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9.6. To nobody   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9.7. Other   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |



**10. As a percentage of the total hospital budget, what is the total cost of :**

(Round the percentage to one decimal place)

10.1. Operating the pharmacy (all expenses including salaries, drugs, sterile fluids, supplies)? .....    ,  %

10.2. The budget only for the acquisition of drugs for the past year? .....    ,  %

**11. Has the pharmacy director freedom to allocate some resources within the hospital budget to his department ?**

Yes  No

**12. Is there a budget :**

(Tick the statement that best describes the situation of your pharmacy)

- 12.1. For pharmacy equipment ?  Yes  No
- 12.2. For research in your pharmacy ?  Yes  No
- 12.3. For clinical audit ?  Yes  No



**SECTION II**  
**PHARMACY CHARACTERISTICS**



**II.1. PHARMACY STAFFING**

**13. How many Full Time Equivalent personnel work in your pharmacy ?**

(Round number to one decimal place)

**A) Personnel in the hospital pharmacy:**

- 13.1. Pharmacists .....   ,
- 13.2. Trainee pharmacists (interns) .....   ,
- 13.3. Pharmacy students .....   ,
- 13.4. Prescriptionists (Bachelor of Science in Pharmacy) (if applicable) .....   ,
- 13.5. Qualified pharmacy assistants / Technician staff .....   ,
- 13.6. Non qualified pharmacy assistants .....   ,
- 13.7. Cleaning personnel (0 if cleaning centralised) .....   ,
- 13.8. Administrative Staff .....   ,
- 13.9. Nurses .....   ,
- 13.10. Others .....   ,

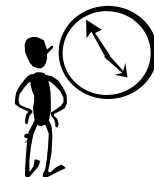
**B) Personnel in the hospital: Are there pharmacists in your hospital who are not member of the hospital pharmacy staff?  Yes  No**

- 13.11. Pharmacists .....   ,

**14. How many hours per day is your pharmacy open and available to provide service?**

(In each case, enter the total number of hours open)

- 14.11. Monday to Friday  Yes  No   ,
- 14.12. Saturday  Yes  No   ,
- 14.13. Sunday  Yes  No   ,



**15. Does your pharmacy provide a 24 hour on call service?**

- Yes  No

**16. Is there a residency service in the hospital(s), with an on call pharmacist living in the hospital at night?**

- Yes       No

## II.2. INPATIENT DRUG DISTRIBUTION SERVICES

**17. Drug distribution services**

*(Tick one or more if applicable)*

- 17.11. Have you a centralised pharmacy service : drug distribution is made by the central pharmacy ? .....  Yes       No
- 17.12. Have you decentralised pharmacy services : drug distribution is made by satellites (i.e. ward based pharmacy outlets supplied from the central pharmacy) ? .....  Yes       No
- 17.13. Have you patient oriented distribution with medications supplied to each individual patient (i.e. unit dose drug distribution)? .....  Yes       No

**18. Use of bar codes in the drug distribution system in your hospital**

*(Tick one or more if applicable)*

- 18.11. Do you use EAN-barcodes in the stock management of the medicinal products (product receipt and/or preparation of internal distribution)? .....  Yes       No
- 18.12. Do you use the barcodes printed by your supplier in the stock management of medical devices (product receipt and/or preparation of internal distribution)? .....  Yes       No
- 18.13. Do you label the medicinal products prepared in your pharmacy with bar code? .....  Yes       No
- 18.14. Does hospital staff use barcode readers for manual picking of medicinal products in your pharmacy? .....  Yes       No
- 18.15. Does hospital staff use or plan to use barcode readers at the bedside to capture information about the dispensation of medicine products to the patient? .....  Yes       No

**19. Drug distribution system**

*(Tick one or more if applicable)*

*(Definitions : An individual patient drug supply system is one in which drugs are dispensed for each patient on an individual basis, for several days, and a medication profile is kept for each inpatient at the pharmacy. The drugs do not need to be supplied in unit dose package.*

*A 24 hour unit-dose dispensing system is a particular kind of individual patient drug supply system in which drugs are dispensed for each patient on an individual basis, but for not more than 24 hours and a medication profile also kept for each inpatient at the pharmacy. The medications are dispensed in single unit dose packages, with medicines in a ready to use form.)*

- 19.11. Have you an individual patient supply system ? .....  Yes       No  
If Yes, for how many beds ?
- 19.12. Have you a 24 hours unit dose dispensing system ? .....  Yes       No  
If Yes, for how many beds ?
- 19.13. Have you a ward stock system ? .....  Yes       No

**20. Drug distribution and robotics ►► do you use :**

*(Tick one or more if applicable)*

*Computerised picking systems and robotic systems are now used in some hospital pharmacies.  
Computerised drug trolleys are also used in some hospitals at ward level.*

20.1. Manual picking of medicines ?

Yes                       No

20.2. Computer dispensing machines (e.g. ATC machine) to pick doses for individuals?

Yes                       No

20.3. Computer picking systems to pick drugs for stock (e.g. Rowa Machine)?

Yes                       No

20.4. Robotic picking systems to pick individual patient supplies (e.g. APS Robot)?

Yes                       No

20.5. Integrated computer systems for ordering, picking and ward storage (e.g. Pyxis)?

Yes                       No

**21. Clinical pharmacy services ►► have you :**

*(Tick one or more if applicable)*

21.1. Centralised clinical pharmacy services, and pharmacists visiting each patient care area at least once daily ?

Yes                       No

21.2. Centralised clinical services and pharmacists occasionally visiting patient care areas but not on a daily basis ?

Yes                       No

21.3. Decentralised clinical services and pharmacists spending at least 50 % of their time in the wards/patient care areas?

Yes                       No

22. **Do you assign clinical services to pharmacy technicians in your hospital ? ..**  Yes  No

23. **If Yes to question 22, what tasks are assigned to pharmacy technicians?** *(Tick one or more if applicable)*

23.1. ward stock                       Yes                       No

23.2. drug information                       Yes                       No

23.3. patient counselling                       Yes                       No

23.4. member of committees                       Yes                       No

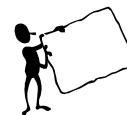
23.5. member of audit                       Yes                       No

23.6. other.....                       Yes                       No

**24. In the patient care areas, who orders ward stock drugs from your pharmacy ?**

*(Tick one or more if applicable)*

- 24.1. Nursing staff       Yes     No  
 24.2. Pharmacy staff     Yes     No  
 24.3. Medical staff       Yes     No



**25. Does your pharmacy provide intravenous (I.V.) admixture services ?** *Tick one or more if applicable)*

- No  
 Yes, pharmacy prepares nearly all I.V. admixture products for almost all patient care areas  
 Yes, pharmacy prepares nearly all I.V. admixture products but only for special units within the hospital(s) (e.g. ICU, CCU...)  
 Yes, pharmacy prepares total parenteral nutrition (TPN)  
 Yes, pharmacy prepares cytotoxic medications

**26. Which of the following are under the control of your pharmacy ?** *(Tick one or more if applicable)*

- |   |                              |                             |  |                              |                             |
|---|------------------------------|-----------------------------|--|------------------------------|-----------------------------|
| 26.1. Intravenous fluids                                | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.13. Tax free alcohol  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.2. Haemodialysis fluids                              | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.14. Chemical reagents   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.3. Irrigation fluids                                 | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.15. Enteral nutrition products  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.4. Premixed I.V. solutions                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.16. Investigational drugs of agents                                       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.5. I.V. fluid administration sets                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.17. Wound care products   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.6. Infusion pumps and controllers                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.18. Sutures   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.7. General anaesthetics other than pressurised gases | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.19. Surgical instruments  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.8. Medical gases                                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.20. In vitro diagnostic tests (e.g. urinalysis sticks, glucose meters...) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.9. Stable blood derivatives                          | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.21. Cytotoxic drugs   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.10. Labile blood derivatives                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.22. Medicines   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.11. Radiographic contrast materials                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 26.23. Other   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 26.12. Radio pharmaceuticals                            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |  |                              |                             |





**SECTION III**

**COMPUTERISATION**

*(If your department is in the midst of installing a computer system, answer as though the installation was completed)*

**27. Equipment**

Has your pharmacy a computerised system ?

Yes       No



If yes, is it for : *(Tick one or more if applicable)*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 27.1. getting the prescriptions from the wards ?           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.2. stock control and stock distribution ?               | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.3. drug consumption                                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.4. patient medication profiling ?                       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.5. outpatient drug distribution ?                       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.6. drug information databases (Medline, Micromedex...)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.7. dosage calculation ?                                 | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.8. sterile production control ?                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.9. compounding ?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 27.10. product release                                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**28. Mainframe**

*(Tick one or more if applicable)*

28.1. Is the pharmacy a part of the hospital(s)'s mainframe computer system ?

Yes       No

28.2. Has the pharmacy a stand alone system that interfaces with the mainframe or other departments ?

Yes       No

28.3. Has the pharmacy a stand alone system that does not interface with the mainframe or other departments ?

Yes       No

**29. Is there at least one personal computer in your pharmacy ?**

Yes       No

**30. Is your pharmacy connected to Internet ?**

Yes       No

 **SECTION IV**

**PHARMACEUTICAL PRODUCTION**

**31. Do you have a government licence for the manufacture of :**

*(Tick one or more if applicable)*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 31.1. Sterile pharmaceuticals for use in the hospital ?                              | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 31.2. Non sterile pharmaceutical for use in the hospital ?                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 31.3. Sterile pharmaceuticals for use in other hospitals or in patients' homes ?     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 31.4. Non sterile pharmaceuticals for use in other hospitals or in patients' homes ? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 31.5. Drugs for clinical trials?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 31.6. Gene therapy   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**32. Does your pharmacy prepare the following in batches for storage ?** *(Tick one or more if applicable)*

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| 32.1. Sterile pharmaceuticals     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 32.2. Non sterile pharmaceuticals | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 32.3. Laboratory reagents         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**33. Does your pharmacy prepare the following for individual patients on prescription ?**

*(Tick one or more if applicable)*

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| 33.1. Sterile pharmaceuticals     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 33.2. Non sterile pharmaceuticals | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**34. Does your pharmacy operate (inside or outside) quality control and analytical procedures for:**

*(Tick one or more if applicable)*

- |                                |                              |                             |
|--------------------------------|------------------------------|-----------------------------|
| 34.1. Chemical stability ?     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 34.2. Physical stability ?     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 34.3. Microbiological safety ? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**35. Does your pharmacy follow GMP directive for the manufacture of all products ?**

*(GMP: Good Manufacturing Practice)*

- Yes       No

**36. Does your pharmacy use a written procedure for the recall of all batches produced if an error has been discovered?**

- Yes       No

**37. When calculating the costs of production, what is taken in account in your system ?**

*(Tick one or more if applicable)*

- 37.1. Raw material costs  Yes  No  
 37.2. Labour costs  Yes  No  
 37.3. Depreciation of equipment  Yes  No  
 37.4. Quality control  Yes  No



**38. Does your pharmacy sell products to other hospitals or outside pharmacies ?**

- Yes  No

**39. If Yes to question 38, do you operate for profit ?**

- Yes  No

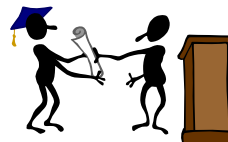
**40. Has your pharmacy a licence to sell products to other hospitals ?**

- Yes  No  Not obligatory



**SECTION V**

**QUALITY ASSURANCE & CONTROL**



**41. Are tests (analytical, microbiological, pyrogen tests) carried out ?**

*(Tick one or more if applicable)*

- 41.1. Tests are carried out  Yes  No

If, Yes, tests are carried out on the following:

- 41.1.1. Chemical raw material  Yes  No  
 41.1.2. Packaging materials  Yes  No  
 41.1.3. Finished batches  Yes  No

**42. If tests are carried out (question 41), is the analysis done :**

*(Tick one or more if applicable)*

- 42.1. In the pharmacy department ?  Yes  No  
 42.2. In another hospital department ?  Yes  No  
 42.3. By an external laboratory ?  Yes  No

**43. Is there a formal quality assurance process that uses written standards for the following ?**

*(Tick one or more if applicable)*

- |                                    |                              |                             |
|------------------------------------|------------------------------|-----------------------------|
| 43.1. Drug dispensing              | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.2. Sterile product preparation  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3. Clinical pharmacy services : |                              |                             |
| 43.3.1. Clinical trials            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.2. Pharmacokinetics           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.3. Drug treatment monitoring  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.4. Drug Information Services  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.5. Patient Counselling        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.6. Anticoagulant clinic       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.7. Lipid Clinic               | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.8. Pain Control Team          | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.9. Enteral nutrition          | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.3.10. Other                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |



**43.A Do you have external quality certification?**

*(Tick one or more if applicable)*

- |                       |                              |                             |
|-----------------------|------------------------------|-----------------------------|
| 43.A.1. ISO 9001      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.A.2. ISO 14001     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 43.A.3. Others: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |



**SECTION VI**

**ANALYTICAL AND CLINICAL CHEMISTRY CONTROL**

**44. Are drug level analysis carried out in your pharmacy itself ?**

- Yes       No

**45. If Yes, are blood samples collected by a member of your pharmacy staff ?**

- Yes       No



## SECTION VII

### OUT PATIENT PHARMACY SERVICES

*(Definition : for the purpose of this survey, outpatients are considered to be either ambulatory patients, patients being discharged, hospital staff, homecare patients, and the general public)*

**46. Does your hospital(s) provide pharmacy service to any of these patients ?**

- Yes, through the hospital in inpatient pharmacy department (a)  
 Yes, through a separately licensed outpatient pharmacy (b)  
 Both a) and b) above  
 No

**46.A Is the source and price of the drugs for outpatients the same?**

- Yes       No

**47. Does your pharmacy routinely provide patients with medication at discharge from the hospital ?**

- Yes       No

**48. If Yes to question 47, do you supply :**

- 48.1. all patients ?       Yes       No  
 48.2. only some patients (e.g. AIDS, cancer..)?       Yes       No

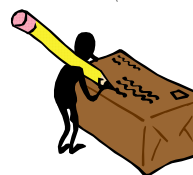
**49. If Yes to question 47, how many days' supply is given to the patient ? .....**

--	--	--

**50. Do you supply to outpatients, for administration at home :**

*(Tick one or more if applicable)*

- 50.1. Cytotoxic injections ?       Yes       No  
 50.2. Total parenteral nutrition solutions ?       Yes       No  
 50.3. Analgesic infusions ?       Yes       No  
 50.4. Antibiotic infusions ?       Yes       No  
 50.5. Routine prescribed medication ?       Yes       No



**51. Do you charge a fee to outpatients for these services ?**

- Never       Always  
 Yes, for some patients only       Yes, for some drugs only





**SECTION VIII**

**PHARMACY PRACTICE**

**52. Is your pharmacy staff regularly providing patient care service concerning adverse drug reactions (prevention, monitoring, documenting, reporting, managing..) for :**

52.1. Inpatients ?  Yes  No

52.2. Outpatients ?  Yes  No

52.3. None ?  Yes  No

**53. Is your pharmacy staff regularly providing patient care service concerning medication errors (prevention, monitoring, documenting, reporting, managing...) for :**

53.1. Inpatients ?  Yes  No

53.2. Outpatients ?  Yes  No

53.3. None ?  Yes  No

**54. For pharmacist intervention concerning patient care, is a written report put in the patients' medical record for at least 80% of the patients:**

54.1. Inpatients ?  Yes  No

54.2. Outpatients ?  Yes  No

54.3. None ?  Yes  No

**55. For every pharmacist intervention concerning patient care, is a written report recorded in your pharmacy for at least 80% of the patients:**

55.1. Inpatients ?  Yes  No

55.2. Outpatients ?  Yes  No

55.3. None ?  Yes  No

**56. Do pharmacists participate in :**

	For inpatients		For outpatients		None	
56.1. Research (including clinical drug trials) ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
56.2. Medicine or drug use evaluation programmes (MUE, DUE) ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
56.3. Pharmaco epidemiological studies ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No

**57. With regard to medical devices, does your pharmacy participates in :** *(Tick one or more if applicable)*

- 57.1. Selection ?  Yes  No  
 57.2. Evaluation ?  Yes  No  
 57.3. Purchasing ?  Yes  No  
 57.4. Vigilance ?  Yes  No



**58. What is the role of your pharmacy in the decisions about nutrition support ?**

*(Tick the statement that best describes the situation of your pharmacy)*

- 58.1. Participation in TPN team only  Yes  No  
 58.2. Participation in TPN/Enteral nutrition team  Yes  No  
 58.3. Not involved in decisions about nutrition prescription  Yes  No

**59. Does your pharmacy provide pharmacokinetic consultations for :**

*(A pharmacokinetic consultation consists of at a minimum review of clinical laboratory or serum drug concentrations and oral/written follow-up with the prescriber)*

- 59.1. Inpatients ?  Yes  No  
 59.2. Outpatients ?  Yes  No  
 59.3. None ?  Yes  No

**60. For which following drug therapies does your pharmacy routinely provide pharmacokinetic consultations ?**

*(Tick one or more if applicable)*

- |                      |  |                      |  |
|----------------------|--|----------------------|--|
| 60.1. Aminoglycoside | <input type="checkbox"/> Yes <input type="checkbox"/> No | 60.8. Tacrolimus     | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 60.2. Carbamazepine  | <input type="checkbox"/> Yes <input type="checkbox"/> No | 60.9. Theophylline   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 60.3. Cyclosporine   | <input type="checkbox"/> Yes <input type="checkbox"/> No | 60.10. Teicoplanin   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 60.4. Digoxin        | <input type="checkbox"/> Yes <input type="checkbox"/> No | 60.11. Vancomycin    | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 60.5. Lithium        | <input type="checkbox"/> Yes <input type="checkbox"/> No | 60.12. Warfarin      | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 60.6. Phenobarbitone | <input type="checkbox"/> Yes <input type="checkbox"/> No | 60.13. Others: _____ | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 60.7. Phenytoin      | <input type="checkbox"/> Yes <input type="checkbox"/> No |                      |  |

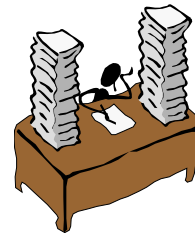
**61. For which following drug therapies does your pharmacy routinely provide additional clinical consultations ?**

*(Tick one or more if applicable)*

- 61.1. Anticoagulant clinic prescribing       Yes     No  
 61.2. Lipid clinic prescribing                 Yes     No  
 61.3. Antibiotic therapy                         Yes     No  
 61.4. Cytotoxic induced nausea             Yes     No  
 61.5. Immunosuppressive therapy          Yes     No  
 61.6. Other                                         Yes     No



**SECTION IX**  
**DRUG INFORMATION SERVICES**



**62. Is there a specific pharmacist on your staff dedicated to the provision of drug information service ?**

- Yes                       No

**63. If Yes to question 62, enter the total full time equivalent (FTE) assigned to drug information service : .....**

--	--	--

**64. Is there a drug information centre as a formal division (or programme) within your pharmacy ?**

- Yes                       No

**65. Does your pharmacy provide drug information service to persons outside the hospital ?**

*(Tick the statement that best describes the situation of your pharmacy)*

- 65.1.                       Yes  
                                 65.1.1. With a charge for this service       Yes     No  
                                 65.1.2. With no charge for this service     Yes     No  
 65.2.                       No

**66. Has your pharmacy a contract with another hospital to obtain drug information service ?**

- 66.1.  Yes
- 66.1.1. With a charge for this service  Yes  No
- 66.1.2. With no charge for this service  Yes  No
- 66.2.  No



**SECTION X**

**HOSPITAL COMMITTEES**

**67. Indicate the existence of hospital committees, and the pharmacy's participation by marking all that apply to your hospital(s) :**

	Existence in the hospital		Participation of pharmacists	
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.1. Drug and Therapeutics.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.2. Cardio-pulmonary Resuscitation (CPR) .....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.3. Ethics / Research.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.4. Infection Control.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.5. Nutrition support / TPN .....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.6. Quality improvement .....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.7. Health and Safety.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.8. Medical Devices assessment (users group).....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.9. Pain control .....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.10. Information Systems / Information technology ...	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.11. Risk management.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67.12. Others.....	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No



**SECTION XI**

**DRUG FORMULARY MANAGEMENT SYSTEM**

**68. Is there a drug formulary in your hospital(s) ?**

- Yes  No

**69. How many chemical entities are in your formulary ? .....**

**70. How many products are in your formulary ? .....**

**71. How often is your formulary updated ?** *(Tick the statement that best describes the situation of your pharmacy)*

- every year  
 every 2 years  
 > 2 years

**72. What does your formulary contain ?**

*(Tick one or more if applicable)*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 72.1. Price information  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 72.2. Dosage/ prescribing information                              | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 72.3. Hospital drug use policies                                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 72.4. Local bacterial sensitivity to antibiotics                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 72.5. Antibiotic prescribing protocols for surgical prophylaxis    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 72.6. Antibiotic prescribing protocols for treatment of infections | <input type="checkbox"/> Yes | <input type="checkbox"/> No |



**73. What type of buying group do you use to purchase drugs ?**

*(Tick one or more if applicable)*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 73.1. National multi hospital alliance           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 73.2. Regional group                             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 73.3. Local group                                | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 73.4. You do not participate in group purchasing | <input type="checkbox"/> No  |                             |

**74. What percentage of medicines up to 100 % (in term of money value) are purchased from :**

- |   |                      |                      |   |                      |   |
|---|----------------------|----------------------|---|----------------------|---|
| 74.1. Wholesalers ? .....               | <input type="text"/> | <input type="text"/> | , | <input type="text"/> | % |
| 74.2. Direct from the Industry ? .....  | <input type="text"/> | <input type="text"/> | , | <input type="text"/> | % |
| 74.3. Other hospital pharmacies ? ..... | <input type="text"/> | <input type="text"/> | , | <input type="text"/> | % |
| 74.4. Own production ? .....            | <input type="text"/> | <input type="text"/> | , | <input type="text"/> | % |





**SECTION XII**

**TRAINING AND STAFF DEVELOPMENT PROGRAMMES**



**75. Is your hospital(s) affiliated with any of the following teaching programmes?**

*(Affiliation is defined as a routine training site for students, residents, interns, externs or other trainees.  
The employment of a salaried pharmacy student does not constitute an affiliation with a pharmacy school)*

*(Tick one or more if applicable)*

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| 75.1. University Pharmacy School                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 75.2. Nursing school                                | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 75.3. University Medical School                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 75.4. College offering pharmacy technician training | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 75.5. None of the above                             | <input type="checkbox"/>     |                             |

**76. Does your pharmacy :**

*(Tick one or more if applicable)*

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| 76.1. Serve as externship training site for pharmacy students ? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 76.2. Offer a post graduate pharmacy training programme ?       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 76.3. Is involved in technician staff training programme ?      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 76.4. None of the above ?                                       | <input type="checkbox"/>     |                             |

**77. Has your pharmacy an internally organized continuing education programme designed to enhance the knowledge or skills of :**

*(Tick one or more if applicable)*

- |                              |                              |                             |
|------------------------------|------------------------------|-----------------------------|
| 77.1. Pharmacists ?          | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 77.2. Pharmacy technicians ? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 77.3. Other pharmacy staff ? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 77.4. None of the above ?    | <input type="checkbox"/>     |                             |

**78. Concerning continuing education for professional staff, does your pharmacy :**

*(Tick one or more if applicable)*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 78.1. Allows paid time off for continuing education programmes ?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 78.2. Pays all the expenses ?                                      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 78.3. Pays at least some of the expenses, e.g. registration fees ? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 78.4. None of the above ?  | <input type="checkbox"/>     |                             |

**79. If a specialization in hospital pharmacy is established in your country, how many pharmacists (in full time and part-time employment) have this specialization in your hospital pharmacy?**

79.1. Number of pharmacists with the specialization in hospital pharmacy in your pharmacy:

79.2. Total number of pharmacists in your pharmacy:

**80. Do pharmacists in your hospital pharmacy have also other specializations?**

Yes  No

If yes, name the specializations they have and indicate the number of pharmacists with this specialization

80.1 Specialization in clinical pharmacy  Yes  No

80.1.1. Number of pharmacists with the specialization in clinical pharmacy in your pharmacy:

80.2. Other specialization (name of the specialization):

.....

80.2.1. Number of pharmacists with this specialization in your hospital pharmacy:

80.3. Other specialization (name of the specialization):

.....

80.3.1. Number of pharmacists with this specialization in your hospital pharmacy:

80.4. Other specialization (name of the specialization):

.....

80.4.1. Number of pharmacists with this specialization in your hospital pharmacy:

80.5. Other specialization (name of the specialization):

.....

80.5.1. Number of pharmacists with this specialization in your hospital pharmacy:

**81. Have you experienced any shortages of pharmacists in your hospital pharmacy in the past 2 years?**

Yes  No

**82. Have you experienced any shortages of pharmacy technicians in your hospital pharmacy in the past 2 years?**

Yes  No



**SECTION XIII**  
**PATIENT SAFETY**

**83. Is there a Patient Safety System implemented in your hospital?**

Yes       No

**84. Was your hospital involved in any activities conducted in your country in the field of patient safety in the last year?**

84.1. national survey in hospitals       Yes       No  
       Number of surveys.....Response rate (if known).....

84.2. campaigns       Yes       No  
       Number of campaigns.....  
       Title of campaign.....

**85. Was professional staff in your hospital pharmacy involved in any educational or continuing educational programmes on safe medication practice issues in the last year?**

85.1. national congress       Yes       No  
 85.2. continuous professional development programmes       Yes       No  
 85.3. incidental seminars       Yes       No  
 85.4. education included in faculty programme       Yes       No  
 85.5. other.....       Yes       No

**86. Does your hospital have a:**

86.1. policy on safe medication practice ?       Yes       No  
 86.2. committee for safe medication practice ?       Yes       No  
 86.3. teams doctor –pharmacist – nurse with defined system for  
       medication errors reporting ?       Yes       No  
 86.4. clinical incident reporting system ?       Yes       No

**87. Which activities in the field of safe medication practice are implemented in your hospital on regular basis (more than 50%)? (Tick one or more if applicable)**

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 87.1. unit dose dispensing                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.2. centralized cytotoxic reconstitution           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.3. centralized intravenous administration service | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.4. therapeutic drug monitoring                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.5. drug information                               | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.6. patient visits at admission                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.7. patient counselling at discharge               | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 87.8. others .....                                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

***End***  
***Thank you for your cooperation !***



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