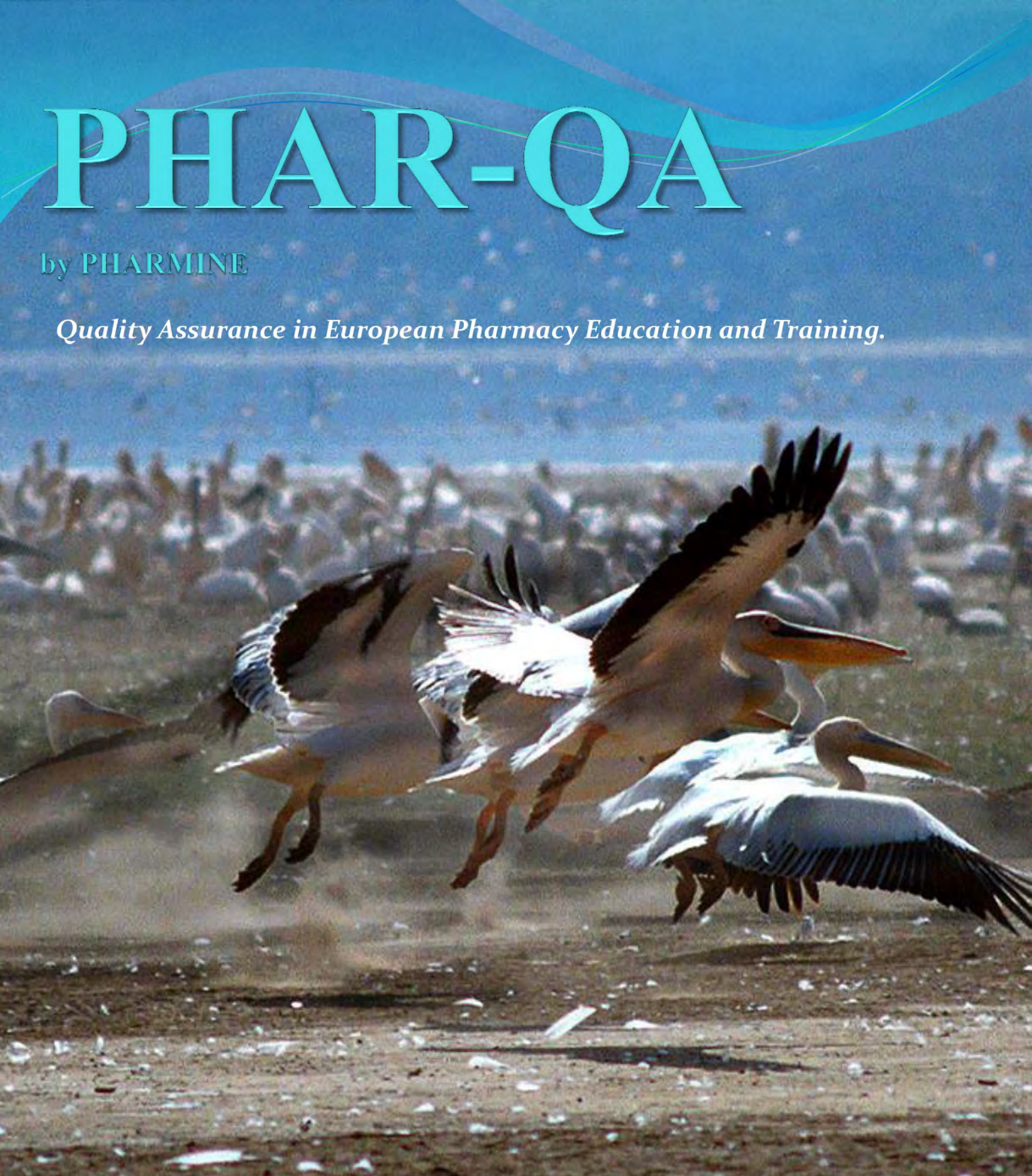
PHAR-QA

by PHARMINE

Quality Assurance in European Pharmacy Education and Training.



The Newsletter

May, 2015

Lifelong Learning Programme

PHAR-QA Quality Assurance in European Pharmacy Education and Training.

The PHAR-QA newsletter

May, 2015. *http://www.phar-qa.eu/*

Quality Assurance in European Pharmacy Education and Training: the PHAR-QA project

This special edition of the newsletter is in preparation for the Athens PHAR-QA meeting 16/5/2015.
It presents the results of the first Delphi round and the suggestions for a revised version of the PHAR-QA questionnaire based on the results and comments of this first round.

Contents.

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The PHAR-QA project: Quality Assurance in European Pharmacy Education and Training. Results of the European network Delphi round 1.

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Abstract.

PHAR-QA, funded by the European Commission, is producing a framework of competences for pharmacy practice. The framework is in line with the EU directive on sectorial professions and takes into account the diversity of the pharmacy profession and the on-going changes in healthcare systems (with an increasingly important role for pharmacists), and in the pharmaceutical industry. PHAR-QA is asking academia, students and practicing pharmacists to rank competences required for practice.

The results show that competences in the areas of “drug interactions”, “need for drug treatment” and “provision of information and service” were ranked highest whereas those in the areas of “ability to design and conduct research” and “development and production of medicines” were ranked lower. For the latter two 1/6 categories – industrial pharmacists – ranked higher than the other 5 groups.

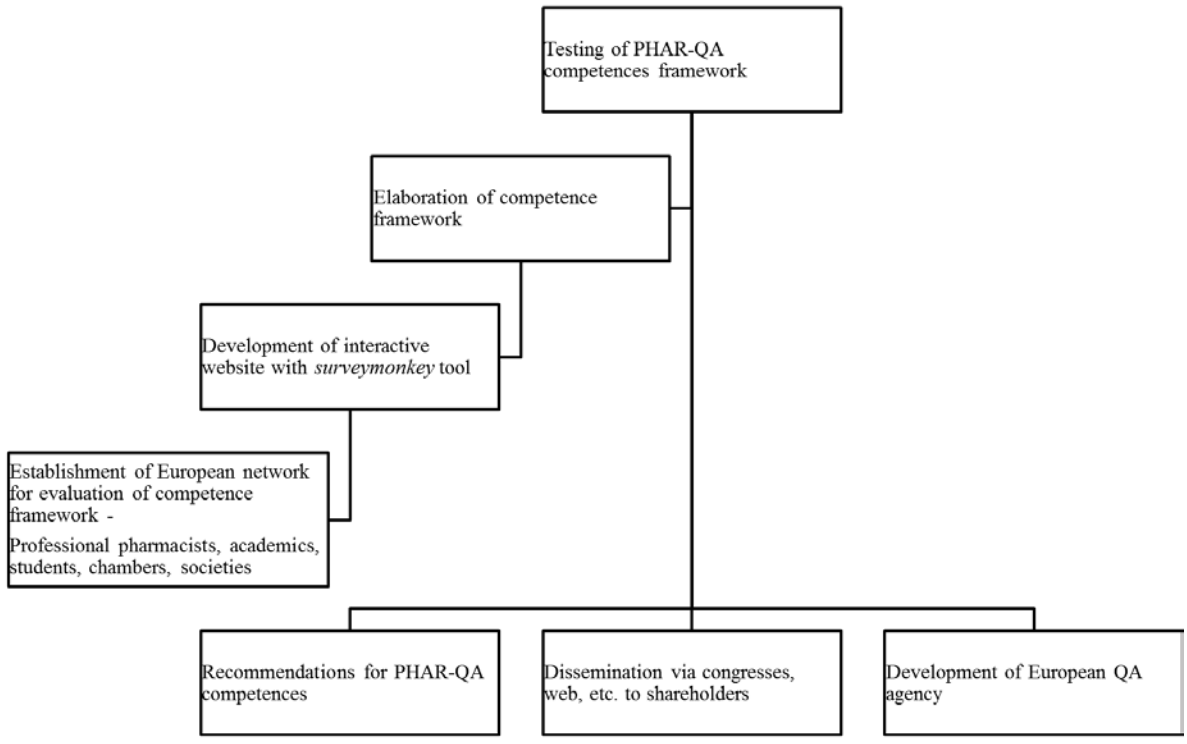
Introduction.

The PHAR-QA project[i] will produce a consensual, harmonized competence framework for pharmacy practice to be used as a base for a QA system for evaluation of university pharmacy education and training. Under the auspices of EAFP[ii], PHAR-QA assembles several of the major players in pharmacy education from “old” and “new Europe”, and from eastern, western, southern and northern Europe (the authors). It has a representative from MEDINE[iii] whose methodology it adapted to a large extent. Stakeholders are the major EU pharmacy agencies and associations: PGEU[iv], EPSA[v], EAHP[vi], and EIPG[vii]. It has connections with pharmacy education QA agencies in the USA (ACPE[viii]) and in Australia (PhLOS[ix]).

Methodology.

Figure 1 shows the 2 main phases of the PHAR-QA project: phase 1 (from left to right, ascending) from establishment of a European network in pharmacy, through Delphi-type surveying, finishing with the development of the PHAR-QA competence framework, and phase 2 (descending): finishing with the establishment by EAFP of a European QA agency.

Figure 1. The PHAR-QA methodology.

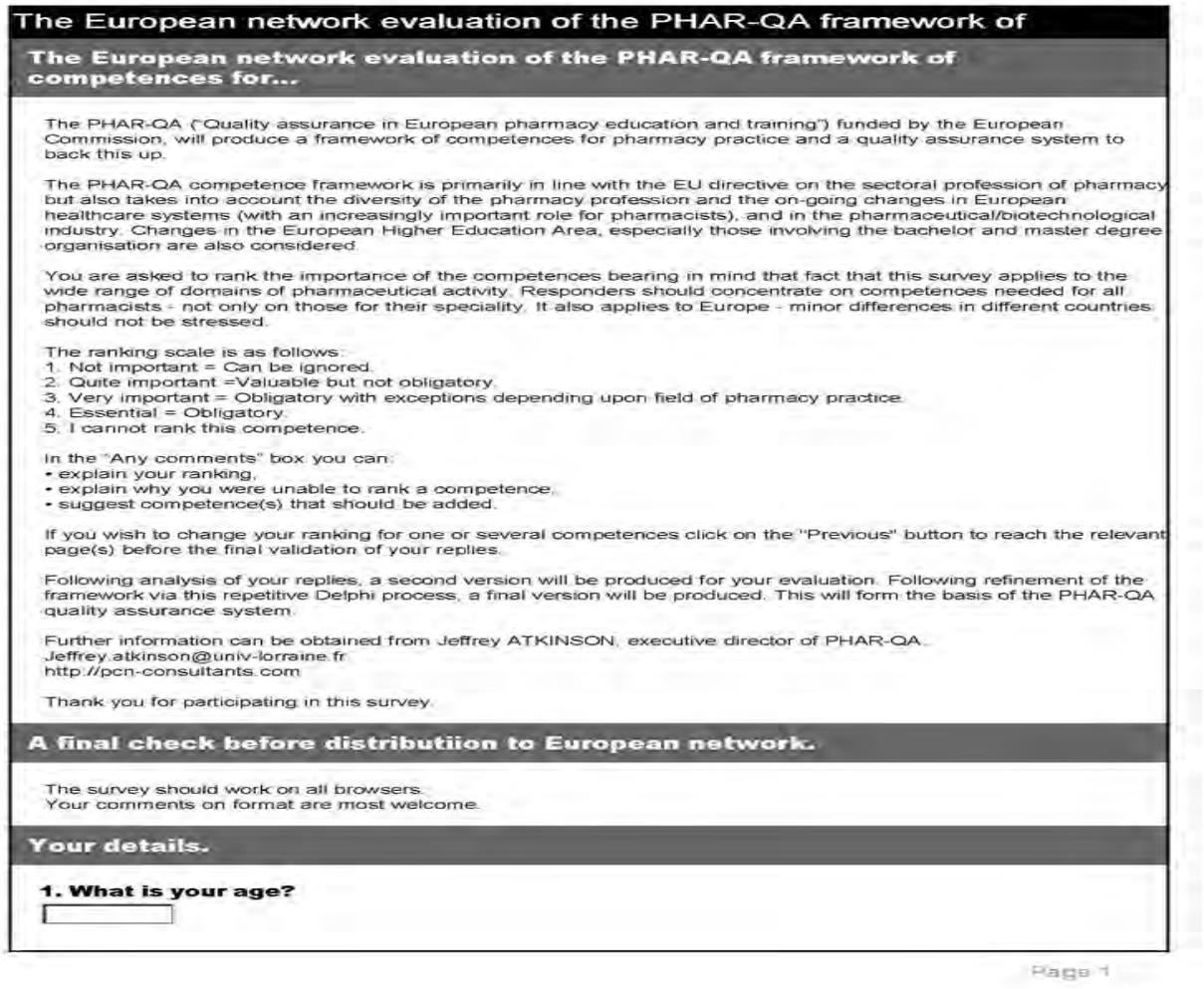


The project uses a modified Delphi approach[x]:

1. Initial questionnaire – round 1 questionnaire was produced by A. Sanchez-Pozo and D. Rekkas together with comments from the other authors

2. Evaluation by small expert panel (the authors) – round 1 questionnaire was modified in 3 Delphi rounds, the panel providing rankings and comments on what was unclear, missing, or in duplicate, *etc.*, so producing the 4th version
3. The 4th version of questionnaire consisting of 68 propositions for competences for pharmacy practice in 13 groups was submitted to a large expert panel (academics, students pharmacists from all areas of the profession (n=1,245)
4. The analysis of ranking data and comments on the 4th version, gathered using a *surveymonkey* questionnaire[xi], will lead to the production of the 5th version. The ranking data and comments on the 4th version are presented in this article. The *surveymonkey* questionnaire (figure 3) was available online from 14/2/2014 through 1/11/2014 *i.e.* 8.5 months. Such a long period was required in order to achieve (a modicum of) balance in the distribution of respondents (by profession, country, age…).
5. A second evaluation by the large expert panel will lead to the production of the final QA framework

Figure 3. The introductory page of the *surveymonkey* questionnaire.


The European network evaluation of the PHAR-QA framework of

The European network evaluation of the PHAR-QA framework of competences for...

The PHAR-QA ("Quality assurance in European pharmacy education and training") funded by the European Commission, will produce a framework of competences for pharmacy practice and a quality assurance system to back this up.

The PHAR-QA competence framework is primarily in line with the EU directive on the sectoral profession of pharmacy but also takes into account the diversity of the pharmacy profession and the on-going changes in European healthcare systems (with an increasingly important role for pharmacists), and in the pharmaceutical/biotechnological industry. Changes in the European Higher Education Area, especially those involving the bachelor and master degree organisation are also considered.

You are asked to rank the importance of the competences bearing in mind that fact that this survey applies to the wide range of domains of pharmaceutical activity. Responders should concentrate on competences needed for all pharmacists - not only on those for their speciality. It also applies to Europe - minor differences in different countries should not be stressed.

The ranking scale is as follows:
1. Not important = Can be ignored.
2. Quite important =Valuable but not obligatory.
3. Very important = Obligatory with exceptions depending upon field of pharmacy practice.
4. Essential = Obligatory.
5. I cannot rank this competence.

In the "Any comments" box you can:
- explain your ranking,
- explain why you were unable to rank a competence,
- suggest competence(s) that should be added.

If you wish to change your ranking for one or several competences click on the "Previous" button to reach the relevant page(s) before the final validation of your replies.

Following analysis of your replies, a second version will be produced for your evaluation. Following refinement of the framework via this repetitive Delphi process, a final version will be produced. This will form the basis of the PHAR-QA quality assurance system.

Further information can be obtained from Jeffrey ATKINSON, executive director of PHAR-QA.
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http://pcn-consultants.com

Thank you for participating in this survey.

A final check before distributiion to European network.

The survey should work on all browsers.
Your comments on format are most welcome.

Your details.

1. What is your age?

Page 1

There were 6 questions on the profile of the respondent:

1. Age
2. Country of residence
3. Current occupation: community, hospital or industrial pharmacist, pharmacist working on other area, student, academic

4. If you are a student, what is your year of enrolment?
5. If you are a professional (licensed practitioner, academic staff...), how long have you been practising?
6. Job title

There were 13 questions on groups of competences with a total in all of 68 competences (see annex). Questions in groups 7 through 11 were concerned with personal competences and in groups 12 through 19 with patient care competences:

Personal competences

7. Learning and knowledge.
8. Values.
9. Communication and organizational skills.
10. Knowledge of different areas of the science of medicines.
11. Understanding of industrial pharmacy.

Patient care competences

12. Patient consultation and assessment.
13. Need for drug treatment.
14. Drug interactions.
15. Provision of drug product.
16. Patient education.
17. Provision of information and service.
18. Monitoring of drug therapy.
19. Evaluation of outcomes.

Respondents were asked to rank the proposals for competences with a Likert scale:

1. Not important = Can be ignored.
2. Quite important =Valuable but not obligatory.
3. Very important = Obligatory with exceptions depending upon field of pharmacy practice.
4. Essential = Obligatory.

This even-numbered scale was the same as that used by MEDINE. A pilot MEDINE experiment using a 5-point Likert scale, with a rank 3 = "neutral", showed that respondents tended to "opt out" by replying with rank 3 throughout (M.T. Ross and A. Cummins, personal communication, 2012).

Respondents had the possibility to opt for "I cannot rank this competence" or to leave the answer blank. Finally, they could add their comments.

The distribution of surveymonkey to potential respondents was organised by the PHAR-QA regional directors, *viz* for northern Europe J. Hirvonen, for eastern B. Bozic, for western D. Rekkas, and for southern: A. Sanchez-Pozo. The stakeholders (EPSA, PGEU, EAHP, and EIPG) also distributed the questionnaire to their members. More than one-off emailing was required to obtain some balance in distribution of the profiles of the respondents; numerous telephone contacts and personal contacts were also made. The numbers of respondents snowballed through individual, local contacts.

Results are presented here in the form of scores based on the methodology used in MEDINE2[xii]: score = (frequency rank 3 + frequency rank 4) as % total.

For example: data for community pharmacists ranking competence number 1:

Rank	Frequency
1	3

2	121
3	480
4	622

Total = 1,226 $f3 + f4 = 1,102$ Score = (1,102/1,226) x 100 = 90%

Scores give more granularity and a better pictorial representation. A comparison with medians and means is given in the annex.

Statistical analysis.

Data presented in this paper are for:

- Overall rankings by 6 groups of respondents
- Comparisons of ranking by community pharmacists with that of the 5 other professional groups of respondents

Differences between rankings of competences or between rankings by different categories of respondents were determined by the chi-square test (confidence level 95%).

Estimated sample size was calculated with a 95% confidence interval and a 10% error[xiii]. The confidence interval (also called margin of error) is the "plus-or-minus". The confidence level is a measure of confidence. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. Most researchers use the 95% confidence level. For example: for community pharmacists (estimated population size: 400,000, 95% confidence interval and 10% confidence interval (margin of error)), the minimal sample size is 97. With a sample of 258 out of 400,000, a confidence level of 95% and a 10% error, for a score of 90% the confidence interval is 4, thus giving a score range of 86%-94%.

Results.

There were 1,613 entries in the *surveymonkey* questionnaire. Of these 1,245 (77%) went beyond the profile description questions (first 6) and ranked the competence ranking questions (groups 7 through 19).

The numbers of the respondents in the 6 groups are given in table 1. The relative size of the professional groups was: students > community pharmacists = academics > hospital pharmacists = industrial pharmacists > pharmacists working in other professions. The "other" group included pharmacists working in government agencies (regulatory affairs…), in wholesale, in marketing and sales, *etc*. In all groups sample sizes were well above calculated minimal sampling size (table 1).

Table 1. Respondents by professional group, and sampling rates.

Professional groups	Number of respondents	%	Estimated European population (x 1,000)	Calculated minimal sample size (95% confidence level, 10% error)
Community pharmacists	258	20.7	400 (PGEU)	97
Hospital pharmacists	152	12.2	12 (EAHP)	96
Industrial pharmacists	135	10.8	10 (EIPG)	96

Others	77	6.2	?	?
Students	382	30.7	200 (PHARMINE)	96
Academics	241	19.4	10 (PHARMINE)	96
Total	1,245	100	400+12+10+200+10 = 632	97

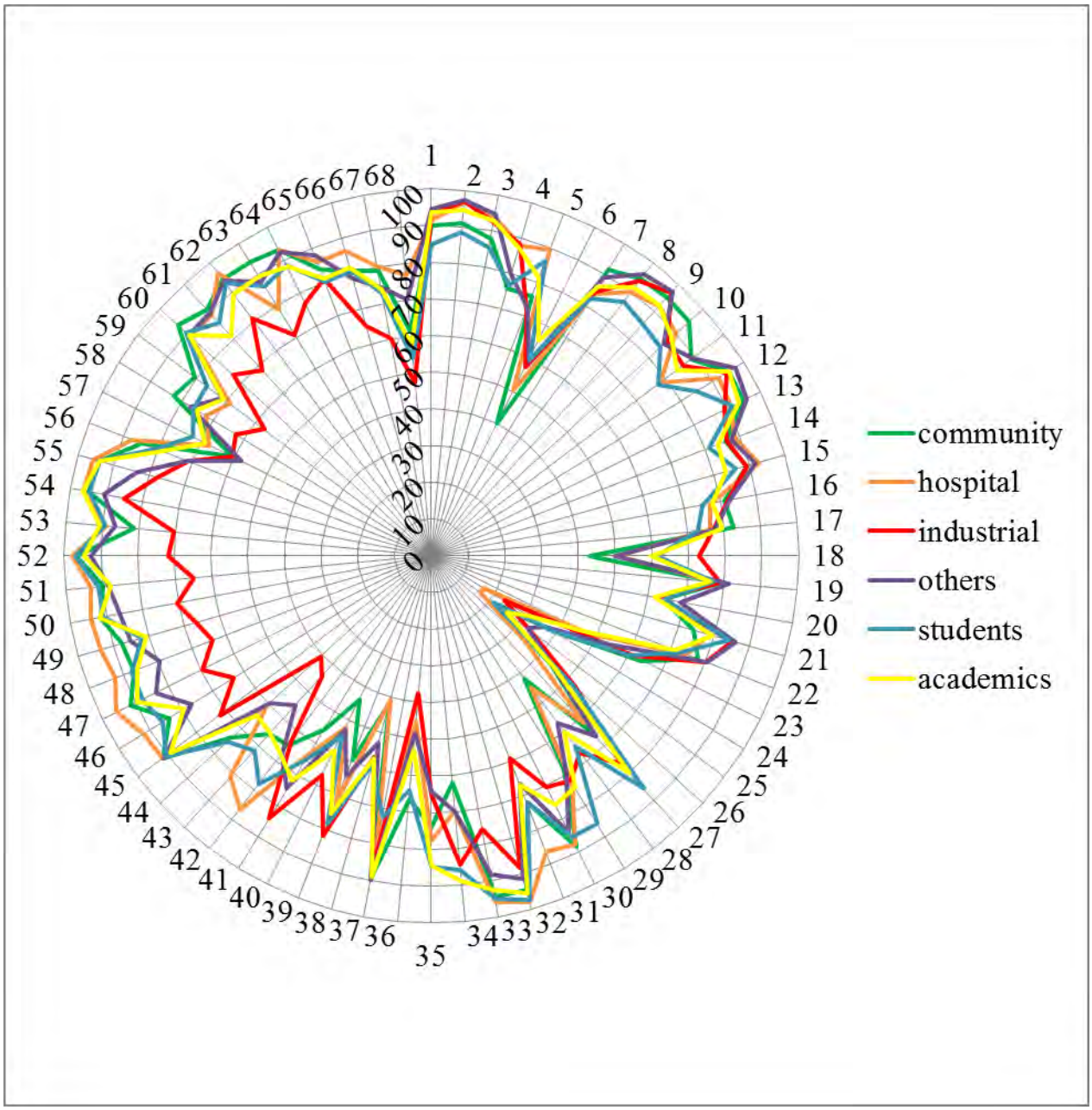
The ranking of the majority of the 1,245 respondents (rank 3 + rank 4: 69.7%, table 2) showed that the respondents considered the proposed competences were obligatory for pharmacy practice. 12.3 % considered that competences were not important (rank 1), could not rank or left blanks. 9.4% either could not rank or left blanks.

Table 2. Global ranking for entire population of respondents, n = 1,245.

Rank	Number	%
1	2,470	2.9
2	14,933	17.6
3	30,132	35.6
4	29,194	34.1
Cannot rank	1,764	2.1
Blank	6,167	7.3
Theoretical total	*= 68 x 1,245 = 84,660*	*100%*

Figure 2 shows the ranking of the 68 competences by the 6 groups of respondents. There was overall agreement between groups. Scores greater than 90% were observed for competences in groups 7, 8, 9, 10, 14, 15 and 17, and scores less than 50% for competences in groups 7, 9, 10, 11 and 12.

Figure 2. Ranking of the 68 competences by the 6 groups of respondents (community pharmacists: green, industrial pharmacists: red, hospital pharmacists: orange, others: purple, students; blue, academics: yellow). Numbers on the circumference refer to competences (1 through 68). Numbers on the vertical axis refer to % score (0 through 100).



Comparisons between community pharmacists and other groups are given below.

Figure 3 shows that there was little difference in the rankings of hospital and community pharmacists. Ranking for competences 23, 24, 36 and 63 was community > hospital, and for competences 42, 43 and 68 community < hospital.

Figure 3. Comparisons of rankings by hospital (orange) and community pharmacists (green).
Numbers on the circumference refer to competences (1 through 68). Numbers on the vertical axis refer to % scores (0 through 100).

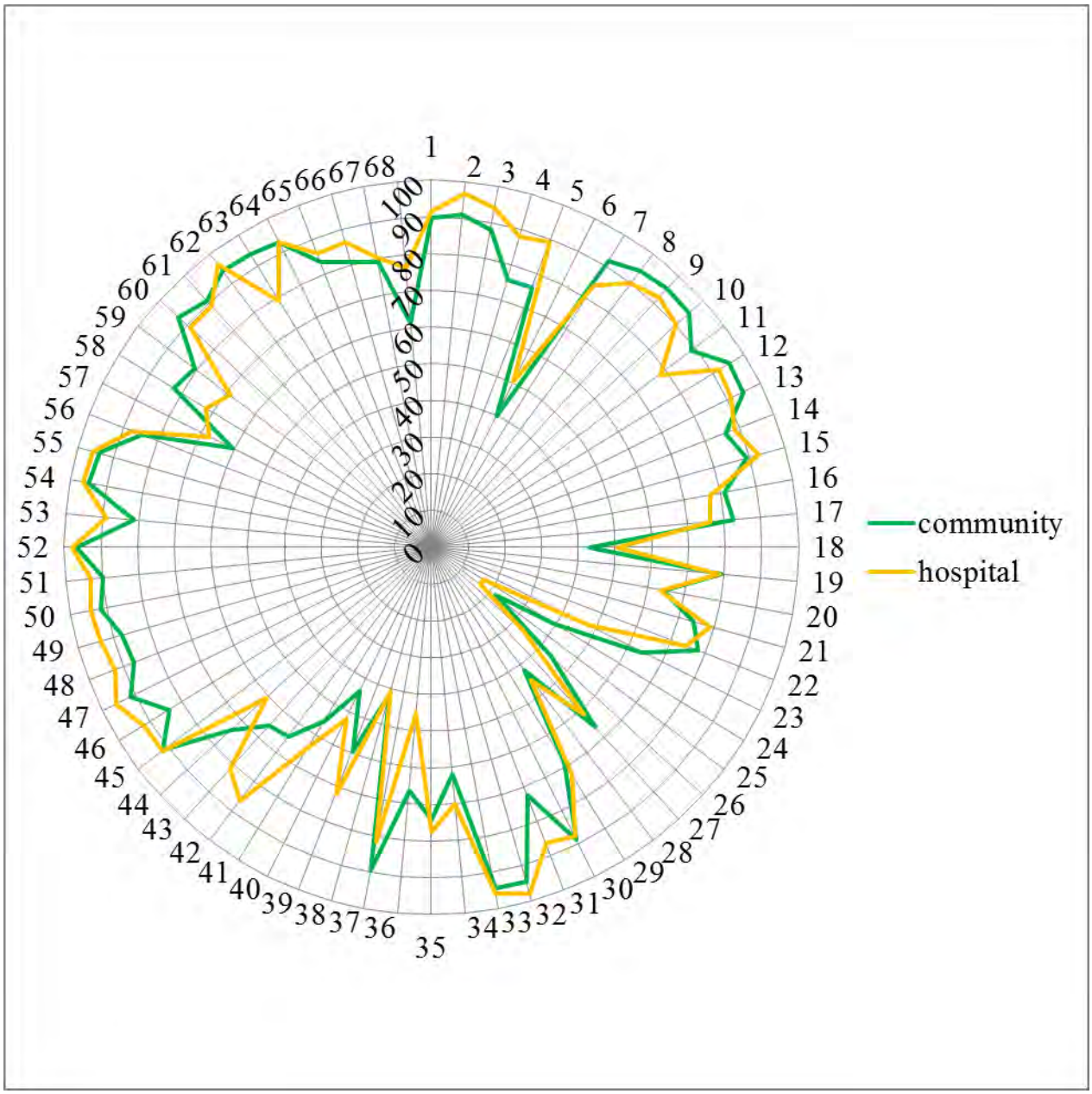


Figure 4 shows that industrial pharmacists scored differently from community pharmacists. Ranking for competences 24, 30, 33, 36, 43-52, 55, 58, 60, 61, 63, 64, 66 and 67 was community > industrial, and for competences 6, 18, 28, 34 and 38-41 community < industrial.

Figure 4. Comparisons of rankings by industrial (red) and community pharmacists (green).
Numbers on the circumference refer to competences (1 through 68). Numbers on the vertical axis refer to % score (0 through 100).

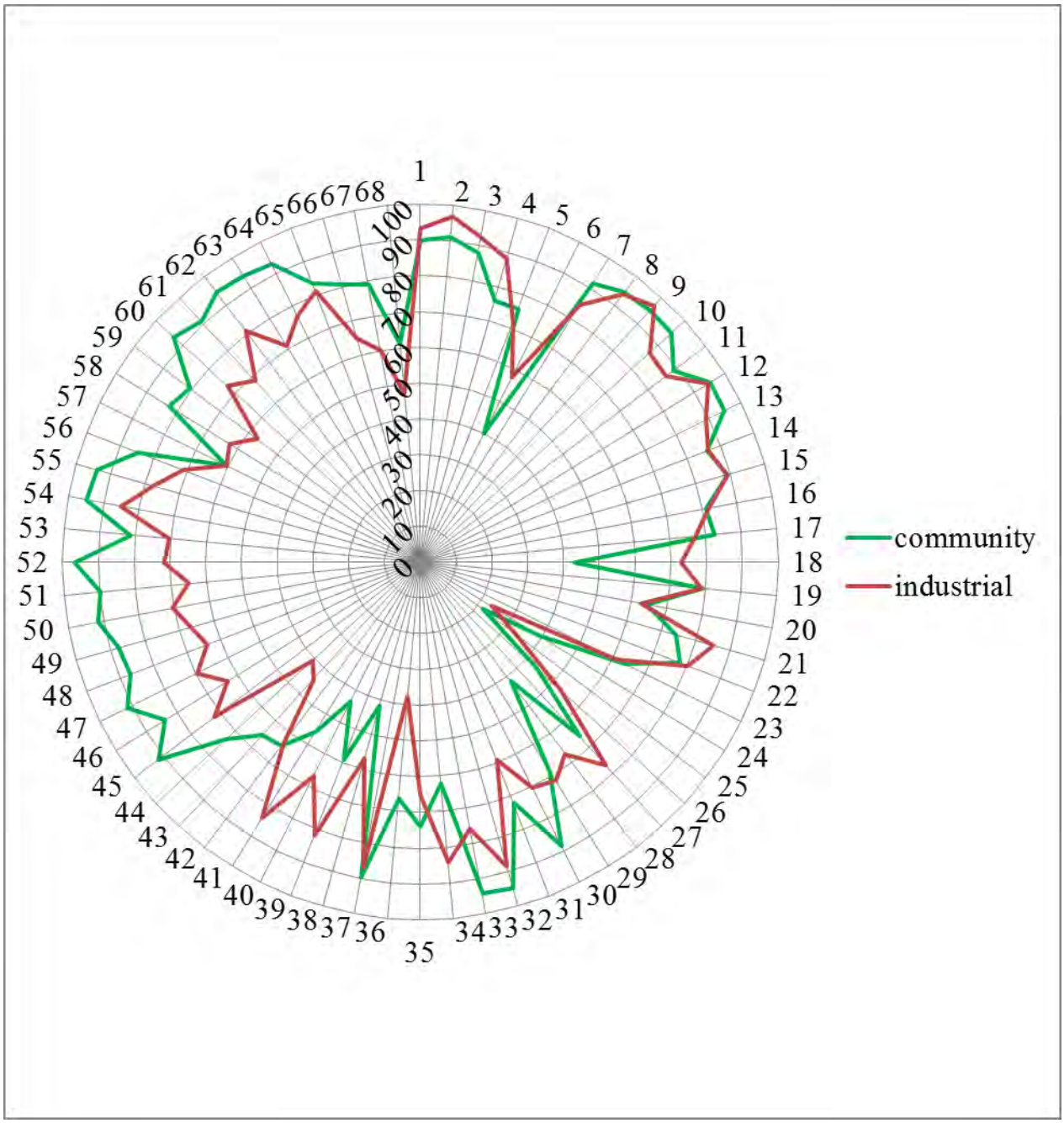


Figure 5 shows that pharmacists working in professions other than community, industrial or hospital pharmacy gave scores similar to those of community pharmacists. Ranking for competence 36 was community > industrial, and for competences 6, 28 and 41 community < industrial.

Figure 5. Comparisons of rankings by pharmacists working in other professions (purple) and community pharmacists (green).
Numbers on the circumference refer to competences (1 through 68). Numbers on the vertical axis refer to % score (0 through 100).

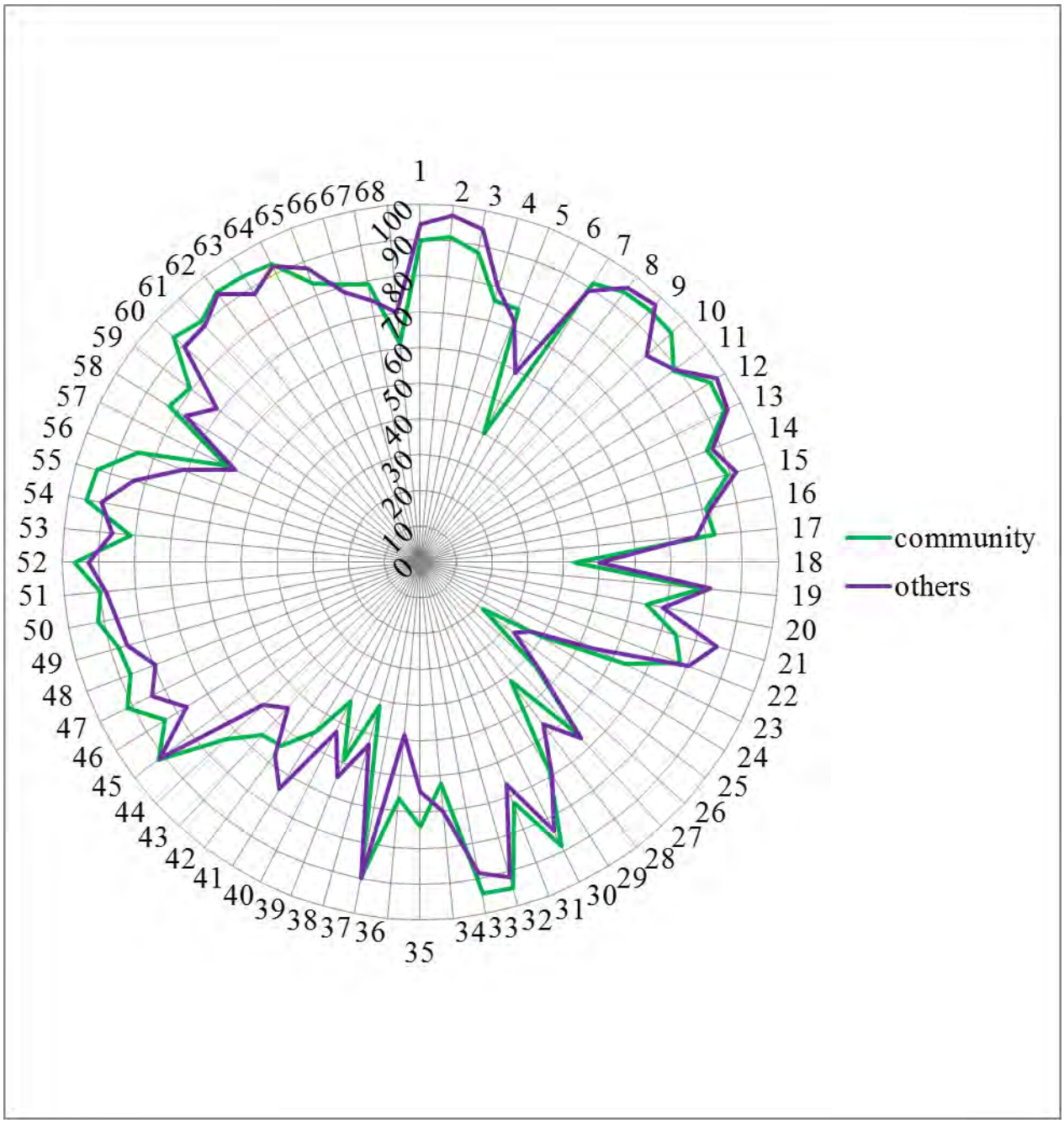
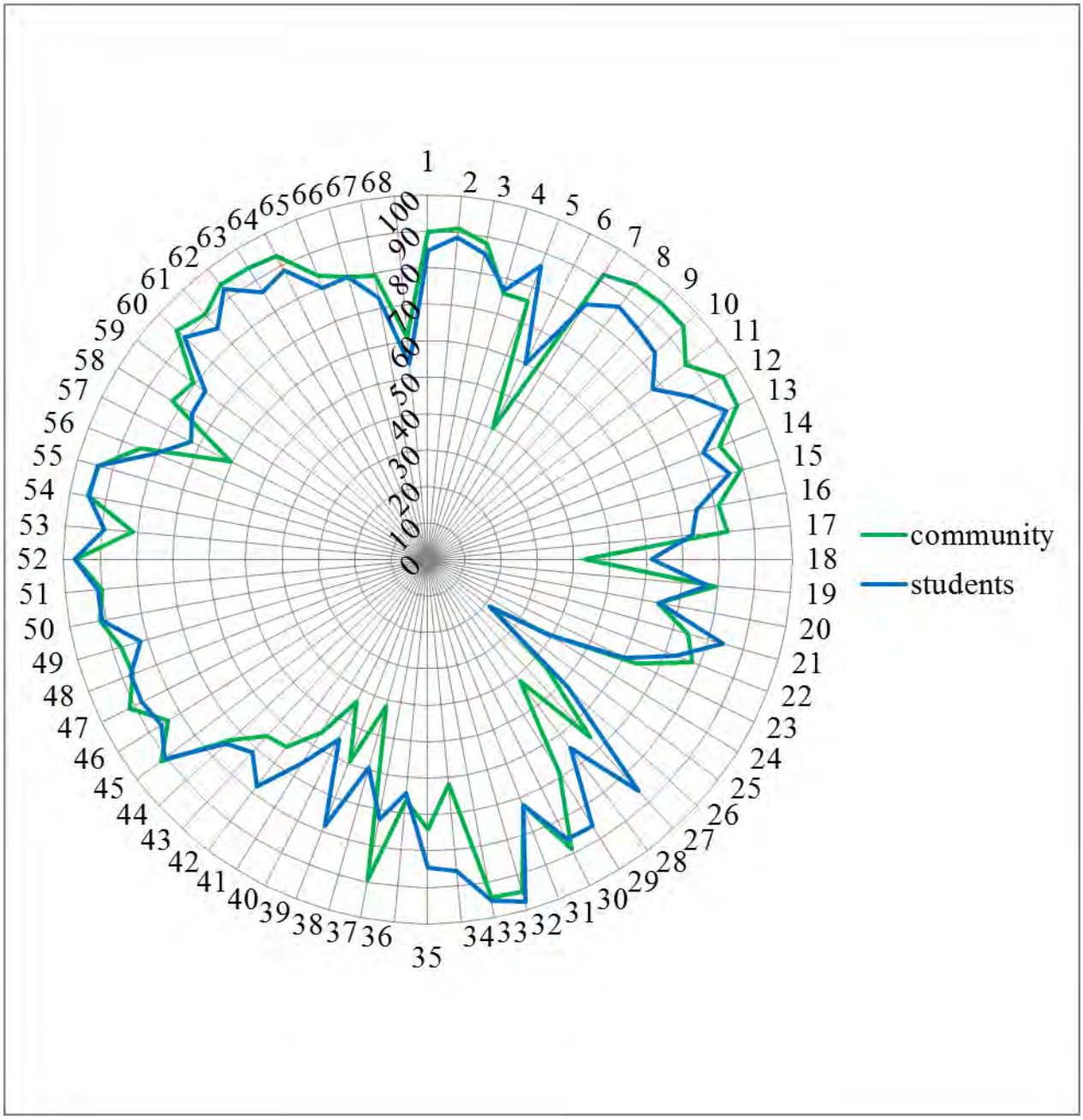


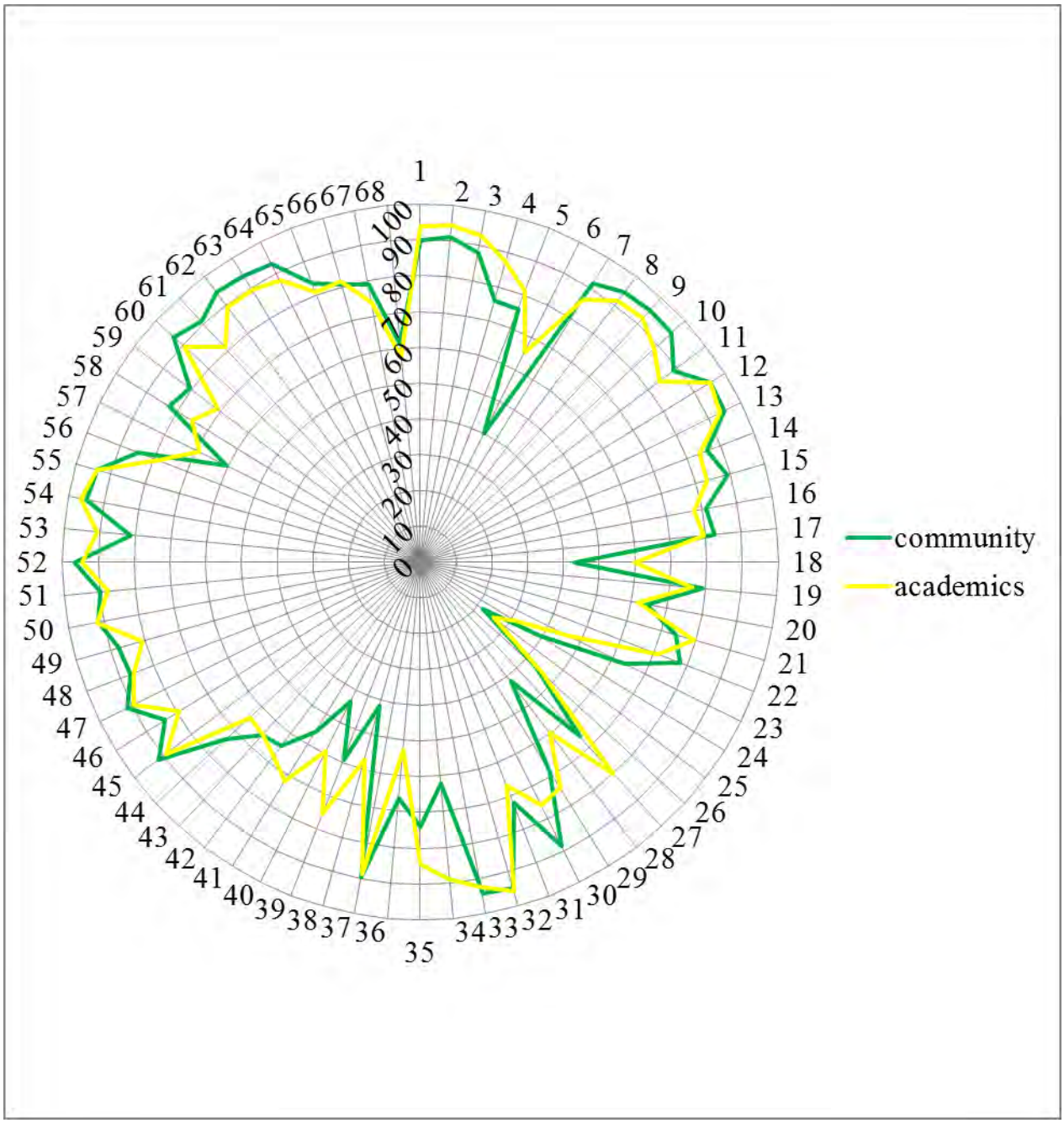
Figure 6 shows that students often gave higher scores than community pharmacists. Ranking for competence 37 was community > students, and for competences 6, 18, 27-29, 34, 38 and 39 community < students.

Figure 6. Comparisons of rankings by students (blue) and community pharmacists (green).
Numbers on the circumference refer to competences (1 through 68). Numbers on the vertical axis refer to % scores (0 through 100).



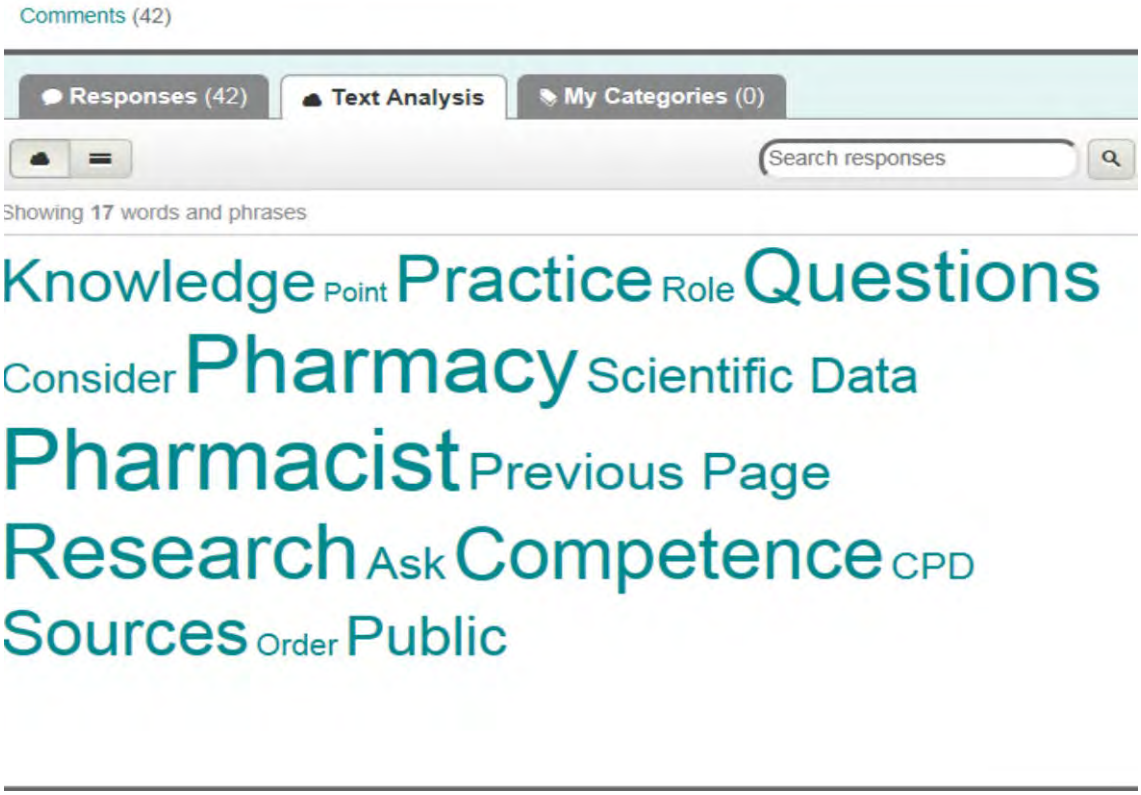
Academics often scored higher than community pharmacists. Figure 8 shows that ranking for competence 23 was community > academics, and for competences 6, 18, 28, 34 and 38-41 community < academics.

Figure 8. Comparisons of rankings by academics (yellow) and community pharmacists (green). Numbers on the circumference refer to competences (1 through 68). Numbers on the vertical axis refer to % score (0 through 100).



The *surveymonkey* text analysis tool allows the frequency of key words and key terms to be determined thus illustrating the relative importance of the terms. In Figure 10 the font size is proportional to number of citations.

Figure 10. The *surveymonkey* text analysis tool (example for profile question group 10: Personal competences: learning and knowledge).



Comments that occurred frequently included:

- Target audience
  - "…refer to daily work in a community pharmacy"
  - "focus on practising pharmacists"
  - "for specialists"
  - "Not really the role of primary care, but important for some knowledge and awareness."
  - "Things that every pharmacist should be familiar with and even more in patient care fields, as in hospital or community pharmacy."
  - "For community pharmacists the above are essential, but for other pharmacists less."
  - "Can imagine it to be important in hospitals..."
  - "For clinical and hospital pharmacists."
- University level
  - "Competences recorded as "very important" cannot be fully obtained on pre-graduate level and also postgraduate training is needed."
  - "Competence 66 cannot be fully achieved during the pre-graduate training and requires also postgraduate education."
- Difficulties in application
  - "Are subject areas professional competences?"
  - "If not commercially available I would contend that we should change what we are prescribing. I do not believe in 'specials' which in the UK are abused and contribute hugely and inappropriately to our drugs bill."
  - "There are always people who need some special drug which is not commercially available."
  - "Not sure how most pharmacists would be able to manufacture?"
  - "General information on diet or exercise is important but the specific recommendations for the patient should be made by the experts in those areas (f. ex. dietician or physiotherapist)."
  - "Information should be basically provided by doctors, before pharmacists."

    - "I am not sure that pharmacists know current clinical guidelines. If medicine is prescribed we give it to patient."
- Suggestions for further inclusions, *etc*.
    - "Acquire other competencies for new services like vaccinations in the pharmacy, screening tests (colon cancer, heart disease, COPD, *etc*.) Public Health services in general, NCD (non-communicable diseases)"
    - "Services like vaccinations, screenings (colon cancer, kidney, COPD, Heart disease, etc.) and others should become essential in the curriculum in order to be able to perform the services in the future."
    - "Pharmacist should also provide information about medical devices and other items available in the pharmacy."
    - "The knowledge on drug therapies and reactions on failing therapies are core fields for pharmacists."
    - "Radio-pharmacy"
- Technical difficulties with the survey
    - "In my browser section 6 appears blank"
    - "Never ask 2 things in the same question…"
    - "No possibility of open-ended questions…"
- Language difficulties
    - "Too complicated for my simple English…"
    - "I cannot rank this competence for I don't fully understand the meaning of the competence."

Discussion.

The results show that competences in the areas of "drug interactions", "need for drug treatment" and "provision of information and service" were ranked highest whereas those in the areas of "ability to design and conduct research" and "development and production of medicines" were ranked lower. For the latter two 1/6 categories – industrial pharmacists – ranked higher than the other 5 groups. The impact of the professional group status on the ranking will be dealt with in a future paper.

Another question that scored low was that concerned with the subject area "physics". This, however, is not a competence as such. The question to be asked here was probably "adequate knowledge of the following areas (physics…) in the science of medicines is necessary to support pharmaceutical practice" but once again one is not dealing with competences for practice. Perhaps the best way to consider this is to take the teaching of certain subject areas as an essential, integral part of the acquirement of given competences for practice.

This PHAR-QA survey is based on the PHARMINE survey[xiv] the main characteristic of which was the fact that it was based on competences rather than on subject areas. The main difference of the PHAR-QA with the PHARMINE survey is that the former is shorter and more concise. Furthermore the use of the Delphi process is to ensure that the PHAR-QA framework is consensual and harmonized. This was done by using the surveymonkey IT with extensive, random, snowballing recruitment. The recruitment was not entirely random as it was distributed by PHAR-QA regional directors and stakeholders – all pharmaceutical in nature – and was thus aimed at a specific population. The survey aimed at balance throughout European countries, professional and age groups. This was largely attained although some groups (e.g. students) and some countries (e.g. Germany) were over-represented in terms of the number of actual respondents compared to the number of potential respondents.

There was a relatively large number of respondents who did not go beyond the profile questions (23%). These were mainly students and this may be related to issues with the English language.

The number of respondents (1,245) far exceeded the sample size number of 100 respondents estimated for a total population of 632,000 potential respondents. As the numbers in all 6 categories are large this will allow inter- and intra-group comparisons. In this article are presented comparisons between ranking by community pharmacists and the ranking by the other 5 professional groups. Many other comparisons are possible such as 1st year students versus 5th / 6th year students, academics with community pharmacists, different age groups, *etc*. These will be the subject of further publications. One particular comparison is of great interest: that concerning the ranking in different countries. Ever since the pioneering work of Bourlioux and the founder members of the EAFP[xv] there has been a move to harmonization of pharmacy education throughout the EU driven partly by the publication of EU directives on the sectoral profession of pharmacy[xvi]. It will be interesting to know whether professionals in different member states have (or have not) similar views on the importance of the different competences for practice.

The question can be asked as to whether the respondents were suitably armed to reply to the questionnaire. It is unfortunate that 23% of respondents did not go beyond the first 6 profile questions. However of the 1,245 respondents x 68 questions = 84,660 potential replies there were "only" 2.1% "cannot rank" and 7.3% blanks.

Regarding statistics, as the ordinal data of the Likert scale has only 4 units (1, 2, 3 or 4), the score was an attempt to introduce more granularity into the results than can be obtained with the use of medians. Scores measure the degree to which competences are considered "obligatory" (ranks 3 and 4). Although this adds granularity it does not convert the ordinal data into ratio data.

Conclusions.

The results show that competences in the areas of "drug interactions", "need for drug treatment" and "provision of information and service" were ranked highest whereas those in the areas of "ability to design and conduct research" and "development and production of medicines" were ranked lower.

This PHAR-QA framework does not, however, replace member state law or the EU directive on qualifications for the sectoral profession of pharmacy. The PHAR-QA framework document will not be a lobbying document.

The PHAR-QA framework simply represents the consensual opinion of several hundred European pharmacy professionals, academics and students.

Perspectives.

The project started in October 2012 and will finish in March 2016, thus it is now entering its critical, final stage.

The task at hand now is to produce a 5th version of the competence framework taking into account:

- The ranking of the 4th version of the framework presented in this paper
- The comments of the respondents, namely
    - Need for simplified construction of questions
    - Attention given to use of easy to understand English
- The need to ask 2 more questions, namely
    - At which higher education level should competences be taught –bachelor, master or post-registration (continuous professional development)?
    - Did we miss anything? Suggestions for competences to be included (open-ended question)

Acknowledgement.

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Annex.

Ranking data for competences (n=1,245).

	Number of competence	Mean ranking	Median ranking	Score 3+4%
7. Personal competences: learning and knowledge.				
1. Ability to identify learning needs and to learn independently (including continuous professional development (CPD)).	1	3.4	4	89.89
2. Analysis: ability to apply logic to problem solving, evaluating pros and cons and following up on the solution found.	2	3.5	4	92.70
3. Synthesis: capacity to gather and critically appraise relevant knowledge and to summarise the key points.	3	3.4	4	89.70
4. Capacity to evaluate scientific data in line with current scientific and technological knowledge.	4	3.2	3	81.38
5. Ability to interpret preclinical and clinical evidence-based medical science and apply the knowledge to pharmaceutical practice.	5	3.2	3	81.02
6. Ability to design and conduct research using appropriate methodology.	6	2.7	3	55.47
7. Ability to maintain current knowledge of relevant legislation and codes of pharmacy practice.	7	3.3	3	85.96
8. Personal competences: values.				
1. Demonstrate a professional approach to tasks and human relations.	8	3.4	4	91.09
2. Demonstrate the ability to maintain confidentiality.	9	3.5	4	91.74
3. Take full personal responsibility for patient care and other aspects of one's practice.	10	3.4	4	88.43
4. Inspire the confidence of others in one's actions and advice.	11	3.2	3	82.84
5. Demonstrate high ethical standards.	12	3.6	4	91.88
9. Personal competences: communication and organisational skills.				
1. Effective communication skills (both orally and written).	13	3.4	4	92.60
2. Effective use of information technology.	14	3.1	3	84.63
3. Ability to work effectively as part of a team.	15	3.3	3	87.76
4. Ability to identify and implement legal and professional requirements relating to employment (e.g. for pharmacy technicians) and to safety in the	16	3.1	3	78.43

workplace.				
5. Ability to contribute to the learning and training of staff.	17	3.0	3	77.46
6. Ability to design and manage the development processes in the production of medicines.	18	2.7	3	56.59
7. Ability to identify and manage risk and quality of service issues.	19	3.1	3	77.99
8. Ability to identify the need for new services.	20	2.8	3	64.00
9. Ability to communicate in English and/or locally relevant languages.	21	3.2	3	80.67
10. Ability to evaluate issues related to quality of service.	22	2.9	3	75.07
11. Ability to negotiate, understand a business environment and develop entrepreneurship.	23	2.7	3	56.62
10. Personal competences: knowledge of different areas of the science of medicines.				
1. Plant and animal biology.	24	2.2	2	32.87
2. Physics.	25	2.0	2	23.65
3. General and inorganic chemistry.	26	2.5	2	46.50
4. Organic and medicinal/pharmaceutical chemistry.	27	3.1	3	75.26
5. Analytical chemistry.	28	2.7	3	56.29
6. General and applied biochemistry (medicinal and clinical).	29	3.0	3	75.74
7. Anatomy and physiology; medical terminology.	30	3.2	3	82.86
8. Microbiology.	31	2.9	3	71.21
9. Pharmacology including pharmacokinetics.	32	3.7	4	95.21
10. Pharmacotherapy and pharmaco-epidemiology.	33	3.6	4	91.98
11. Pharmaceutical technology including analyses of medicinal products.	34	3.2	3	78.24
12. Toxicology.	35	3.1	3	77.92
13. Pharmacognosy.	36	2.7	3	56.07
14. Legislation and professional ethics.	37	3.3	3	83.13
11. Personal competences: understanding of industrial pharmacy.				
1. Current knowledge of design, synthesis, isolation, characterisation and biological evaluation of active substances.	38	2.6	3	52.39
2. Current knowledge of good manufacturing practice (GMP) and of good laboratory practice	39	3.0	3	72.60

(GLP).				
3. Current knowledge of European directives on qualified persons (QPs).	40	2.6	3	54.44
4. Current knowledge of drug registration, licensing and marketing.	41	2.9	3	67.36
5. Current knowledge of good clinical practice (GCP).	42	3.0	3	71.96
12. Patient care competences: patient consultation and assessment.				
1. Ability to perform and interpret medical laboratory tests.	43	2.9	3	66.46
2. Ability to perform appropriate diagnostic or physiological tests to inform clinical decision making e.g. measurement of blood pressure.	44	2.8	3	66.27
3. Ability to recognise when referral to another member of the healthcare team is needed because a potential clinical problem is identified (pharmaceutical, medical, psychological or social).	45	3.4	4	88.86
13. Patient care competences: need for drug treatment.				
1. Retrieval and interpretation of relevant information on the patient's clinical background.	46	3.2	3	82.23
2. Retrieval and interpretation of an accurate and comprehensive drug history if and when required.	47	3.4	4	87.83
3. Identification of non-adherence and implementation of appropriate patient intervention.	48	3.3	3	84.80
4. Ability to advise to physicians and - in some cases – prescribe medication.	49	3.2	3	83.10
14. Patient care competences: drug interactions.				
1. Identification, understanding and prioritisation of drug-drug interactions at a molecular level (e.g. use of codeine with paracetamol).	50	3.5	4	89.35
2. Identification, understanding, and prioritisation of drug-patient interactions, including those that preclude or require the use of a specific drug (e.g. trastuzumab for treatment of breast cancer in women with HER2 overexpression).	51	3.4	4	87.51
3. Identification, understanding, and prioritisation of drug-disease interactions (e.g. NSAIDs in heart failure).	52	3.6	4	93.61
15. Patient care competences: provision of drug				

product.				
1. Familiarity with the bio-pharmaceutical, pharmacodynamic and pharmacokinetic activity of a substance in the body.	53	3.3	3	85.62
2. Supply of appropriate medicines taking into account dose, correct formulation, concentration, administration route and timing.	54	3.6	4	94.03
3. Critical evaluation of the prescription to ensure that it is clinically appropriate and legal.	55	3.5	4	91.87
4. Familiarity with the supply chain of medicines and the ability to ensure timely flow of drug products to the patient.	56	3.1	3	80.26
5. Ability to manufacture medicinal products that are not commercially available.	57	2.9	3	66.57
16. Patient care competences: patient education.				
1. Promotion of public health in collaboration with other actors in the healthcare system.	58	3.1	3	75.53
2. Provision of appropriate lifestyle advice on smoking, obesity, etc.	59	3.0	3	73.07
3. Provision of appropriate advice on resistance to antibiotics and similar public health issues.	60	3.3	3	88.66
17. Patient care competences: provision of information and service.				
1. Ability to use effective consultations to identify the patient's need for information.	61	3.2	3	84.84
2. Provision of accurate and appropriate information on prescription medicines.	62	3.5	4	91.81
3. Provision of informed support for patients in selection and use of non-prescription medicines for minor ailments (e.g. cough remedies...).	63	3.4	4	86.09
18. Patient care competences: monitoring of drug therapy.				
1. Identification and prioritisation of problems in the management of medicines in a timely manner and with sufficient efficacy to ensure patient safety.	64	3.3	3	89.01
2. Ability to monitor and report to all concerned in a timely manner, and in accordance with current regulatory guidelines on Good Pharmacovigilance Practices (GVPs), Adverse Drug Events and Reactions (ADEs and ADRs).	65	3.2	3	82.35
3. Undertaking of a critical evaluation of prescribed medicines to confirm that current clinical	66	3.1	3	79.88

guidelines are appropriately applied.				
19. Patient care competences: evaluation of outcomes.				
1. Assessment of outcomes on the monitoring of patient care and follow-up interventions.	67	3.0	3	74.14
2. Evaluation of cost effectiveness of treatment.	68	2.7	3	59.60

References.

[i] The PHAR-QA project: Quality Assurance in European Pharmacy Education and Training. www.phar-qa.eu

[ii] European Association of Faculties of Pharmacy (EAFP) http://www.eafponline.eu/

[iii] The TUNING network. Competences: medical doctors. http://www.unideusto.org/tuningeu/subject-areas/medicine.html and MEDINE - Medical Education in Europe. http://medine2.com/

[iv] PGEU - Pharmaceutical Group of the European Union. www.pgeu.eu/

[v] EPSA - European Pharmaceutical Students Association online. www.epsa-online.org/

[vi] EAHP – European Association of Hospital Pharmacists. www.eahp.eu/

[vii] EIPG - European Industrial Pharmacists Group. www.eipg.eu/

[viii] ACPE - Accreditation Council for Pharmacy Education. https://www.acpe-accredit.org/

[ix] Stupans, I., McAllister, S., Clifford, R., Hughes, J., Krass, I., March, G., Owen, S., Woulfe, J. Nationwide collaborative development of learning outcomes and exemplar standards for Australian pharmacy programmes. *International Journal of Pharmacy Practice 2014.* http://onlinelibrary.wiley.com/doi/10.1111/ijpp.12163/pdf

[x] Hsu, C.C., Sandford, B.A. The Delphi Technique: Making Sense of Consensus. *Practical Assess. Res. Eval.* 2007, **12**. http://pareonline.net/getvn.asp?v=12&n=10

[xi] SurveyMonkey (online survey development cloud). https://www.surveymonkey.com/

[xii] Marz, R., Dekker, F.W., Van Schravendijk, C., O'Flynn, S. and Ross, M.T. Tuning research competences for Bologna three cycles in medicine: report of a MEDINE2 European consensus survey. *Perp. Med. Educ.* 2013, **2.**). http://download-v2.springer.com/static/pdf/799/art%253A10.1007%252Fs40037-013-0066-z.pdf?token2=exp=1429779128~acl=%2Fstatic%2Fpdf%2F799%2Fart%25253A10.1007%25252Fs40037-013-0066-z.pdf*~hmac=8cc61f57990544e852082e9749b6e580c1306f08bbab0d0864cc9b01433864f8

[xiii] Survey Software - The Survey System. http://www.surveysystem.com/sscalc.htm

[xiv] Bates, I. *et alii.* Identifying and defining competencies: Exploitation of results - recommendations on competency curriculum for professional pharmacists. http://www.pharmine.org/wp-content/uploads/2014/05/WP3-Final-report-identifying-and-defining-competences-for-pharmacists.pdf

[xv] Bourlioux, P., *et alii.* Heterogeneity of Pharmacy Education in Europe. www.phar-qa.eu

[xvi] EUA Briefing Note on Directive 2013/55/EU, containing the amendments to Directive 2005/36/EC on the Recognition of Professional Qualifications. http://www.eua.be/Libraries/Higher_Education/EUA_briefing_note_on_amended_Directive_January_2014.sflb.ashx

PHAR-QA data analysis (n = 1,245) and proposal for 2nd Delphi round for EU network (overall 5th Delphi round including rounds within PHAR-QA consortium).

Original numbering maintained.

10. Personal competences: adequate understanding of different areas of the science of medicines to support pharmaceutical practice.	mean	number
1. Plant and animal biology.	2.2	24
2. Physics.	2.0	25
3. General and inorganic chemistry.	2.5	26
4. Organic and medicinal/pharmaceutical chemistry.	3.1	27
5. Analytical chemistry.	2.7	28
6. General and applied biochemistry (medicinal and clinical).	3.0	29
7. Anatomy and physiology; medical terminology.	3.2	30
8. Microbiology.	2.9	31
9. Pharmacology including pharmacokinetics.	3.7	32
10. Pharmacotherapy and pharmaco-epidemiology.	3.6	33
11. Pharmaceutical technology including analyses of medicinal products.	3.2	34
12. Toxicology.	3.1	35
13. Pharmacognosy.	2.7	36
14. Legislation and professional ethics.	3.3	37
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
7. Personal competences: learning and knowledge.		
1. Ability to identify learning needs and to learn independently (including continuous professional development (CPD).	**3.4**	1
2. Ability to apply logic to problem solving and evaluating pros and cons	**3.5**	2
3. Ability to gather and critically appraise relevant knowledge and to summarise the key points.	**3.4**	3
4. Ability to evaluate scientific data in line with current scientific and technological knowledge.	**3.2**	4
5. Ability to apply preclinical and clinical evidence-based medical science to pharmaceutical practice.	**3.2**	5
7. Ability to apply current knowledge of relevant legislation and codes of pharmacy practice.	**3.3**	7
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
8. Personal competences: values.		

1. A professional approach to tasks and human relations.	3.4	8
2. Ability to maintain confidentiality.	3.5	9
3. Ability to take full personal responsibility for patient care and other aspects of practice.	3.4	10
4. Ability to inspire the confidence of others in one's actions and advice.	3.2	11
5. Demonstration of high ethical standards.	3.6	12
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
9. Personal competences: communication and organisational skills.		
1. Ability to communicate effectively (oral and written).	3.4	13
9. Ability to communicate in English and/or locally relevant languages.	3.2	21
2. Ability to effectively use information technology.	3.1	14
3. Ability to work effectively as part of a team.	3.3	15
4. Ability to implement general legal requirements that impact upon the practice of pharmacy (e.g. health and safety legislation, employment law	3.1	16
5. Ability to contribute to the training of staff.	3.0	17
7. Ability to manage risk and quality of service issues.	3.1	19
8. Ability to identify the need for new services.	*2.8*	20
10. Ability to evaluate issues related to quality of service.	*2.9*	22
11. Ability to understand a business environment and develop entrepreneurship.	*2.7*	23
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
11. Personal competences: understanding of medicines research and industrial pharmacy.		
6. Ability to design and conduct research using appropriate methodology.	*2.7*	6
1. Current knowledge of design, synthesis, isolation, characterisation and biological evaluation of active substances.	*2.6*	38
2. Current knowledge of good manufacturing practice (GMP) and of good laboratory practice (GLP).	3.0	39
3. Current knowledge of European directives on qualified persons (QPs).	*2.6*	40
4. Current knowledge of drug registration, licensing and marketing.	*2.9*	41
6. Ability to design and manage the development processes in the production, and analysis of medicines.	*2.7*	18
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
12. Patient care competences: patient consultation and assessment.		
5. Current knowledge of good clinical practice (GCP).	3.0	42
1. Ability to interpret medical laboratory tests.	2.9	43
2. Ability to perform appropriate diagnostic tests e.g. measurement of blood pressure.	2.8	44

3. Ability to recognise when referral to another member of the healthcare team is needed because a potential clinical problem is identified (pharmaceutical, medical, psychological or social).	**3.4**	45
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
13. Patient care competences: need for drug treatment.		
1. Ability to retrieve and interpret information on the patient's clinical background.	**3.2**	46
2. Ability to compile and interpret a comprehensive drug history for an individual patient.	**3.4**	47
3. Ability to identify non-adherence to medicine therapy and implement an appropriate patient intervention.	**3.3**	48
4. Ability to advise to physicians on the appropriateness of prescribed medicines and - in some cases – to prescribe medication.	**3.2**	49
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
14. Patient care competences: drug interactions.		
1. Ability to identify and prioritise drug-drug interactions and so advise an appropriate changes to medication	**3.5**	50
2. Ability to identify and prioritise drug-patient interactions, including those that preclude or require the use of a specific drug, based on pharmacogenetics , and so advise on appropriate changes to medication	**3.4**	51
3. Ability to identify and prioritise drug-disease interactions (e.g. NSAIDs in heart failure) and so advise on appropriate changes to medication	**3.6**	52
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
15. Patient care competences: provision of drug product.		
1. Understanding of the bio-pharmaceutical, pharmacodynamic and pharmacokinetic activity of a substance in the body.	**3.3**	53
2. Ability to supply appropriate medicines taking into account dose, pharmaceutical formulation, administration route and timing.	**3.6**	54
3. Ability to undertake a critical evaluation of a prescription to ensure that it is clinically appropriate and legally valid.	**3.5**	55
4. Understanding of the supply chain of medicines and the ability to ensure timely flow of quality drug products to the patient.	**3.1**	56
5. Ability to manufacture medicinal products that are not commercially available.	*2.9*	57
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
16. Patient care competences: patient education.		

1. Ability to promote public health in collaboration with other professionals within the healthcare system.	**3.1**	58
2. Ability to provide appropriate lifestyle advice to improve patient outcomes *(e.g*. on smoking, obesity, etc.)	3.0	59
3. Ability to use pharmaceutical knowledge and provide evidence based advice on public health issues involving medicines.	**3.3**	60
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
17. Patient care competences: provision of information and service.		
1. Ability to use effective consultations to identify the patient's need for information.	**3.2**	61
2. Ability to provide accurate and appropriate information on prescription medicines.	**3.5**	62
3. Ability to provide evidence-based support for patients in selection and use of non-prescription medicines	**3.4**	63
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
18. Patient care competences: monitoring of drug therapy.		
1. Ability to identify and prioritise problems in the management of medicines in a timely and effective manner and so ensure patient safety.	**3.3**	64
2. Ability to monitor and report to all concerned in a timely manner, and in accordance with current regulatory guidelines on Good Pharmacovigilance Practices (GVPs), Adverse Drug Events and Reactions (ADEs and ADRs).	**3.2**	65
3. Ability to undertake a critical evaluation of prescribed medicines to confirm that current clinical guidelines are appropriately applied.	**3.1**	66
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		
19. Patient care competences: evaluation of outcomes.		
1. Ability to monitor patient care outcomes and so optimise treatment in collaboration with the prescriber..	3.0	67
2. Ability to contribute to the of the cost effectiveness of treatment by collection and analysis of data on medicines use	*2.7*	68
At which higher education level – bachelor, master, or postgraduate – do you think that the above competences should be taught (drop-down question).		
Open-ended question: If you have any further comments about the above competences or think we have missed anything please respond below.		

Greater than global median of 3* (Wilcoxon signed rank test). *Less than global median of 3.*

*Rank 3: Very important = Obligatory with exceptions depending upon field of pharmacy practice. Rank 4: Essential = Obligatory.


Pharmine
Lifelong Learning Programme
PHAR-QA: Quality Assurance in European Pharmacy Education and Training
PHAR-QA M32 meeting with EAFP
Athens, 16/5/2015
Programme
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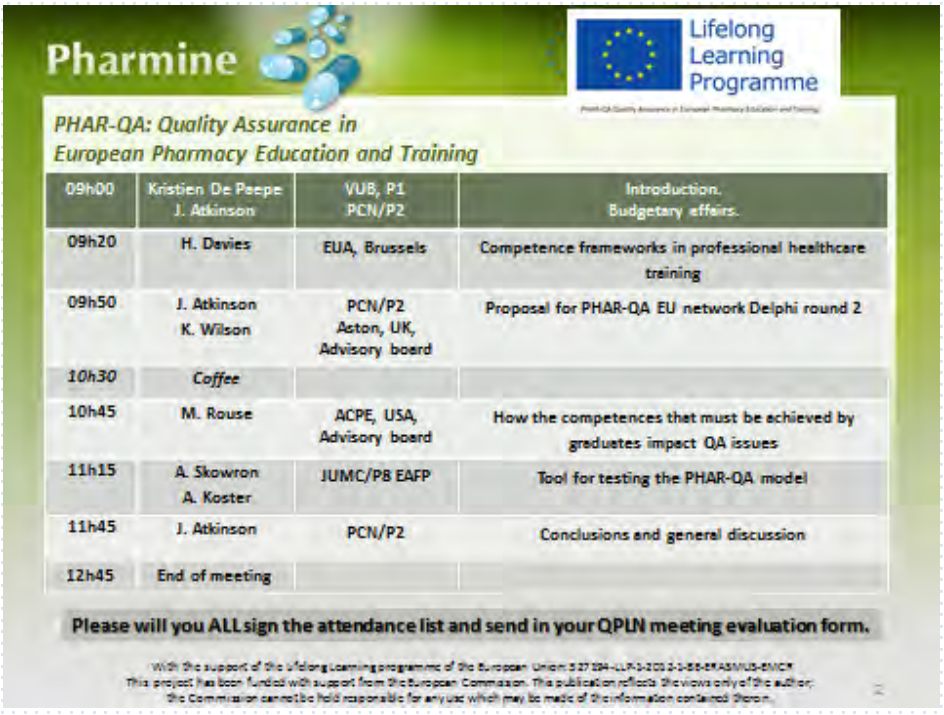
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Lifelong Learning Programme
PHAR-QA: Quality Assurance in European Pharmacy Education and Training
09h00 | Kristien De Paepe J. Atkinson | VUB, P1 PCN/P2 | Introduction. Budgetary affairs.
09h20 | H. Davies | EUA, Brussels | Competence frameworks in professional healthcare training
09h50 | J. Atkinson K. Wilson | PCN/P2 Aston, UK, Advisory board | Proposal for PHAR-QA EU network Delphi round 2
10h30 | Coffee
10h45 | M. Rouse | ACPE, USA, Advisory board | How the competences that must be achieved by graduates impact QA issues
11h15 | A. Skowron A. Koster | JUMC/P8 EAFP | Tool for testing the PHAR-QA model
11h45 | J. Atkinson | PCN/P2 | Conclusions and general discussion
12h45 | End of meeting
Please will you ALL sign the attendance list and send in your QPLN meeting evaluation form.
With the support of the Lifelong Learning programme of the European Union 527194-LLP-1-2012-1-BE-ERASMUS-EMCR
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PHAR-QA Quality Assurance in European Pharmacy Education and Training.

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Quality Assurance in European Pharmacy Education and Training,