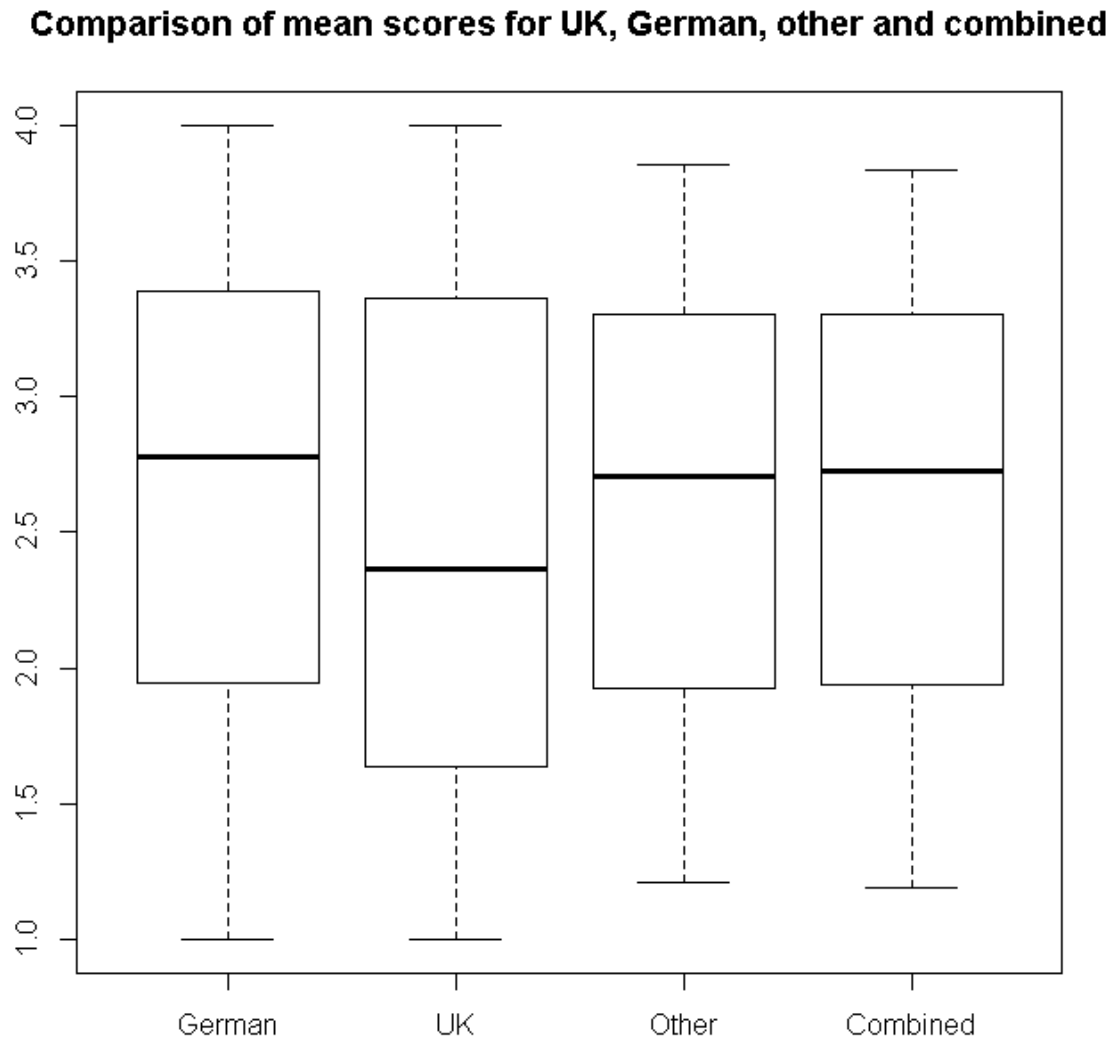
Workpackage 7 – Survey on Research Competences in medicine

Subgroup Analysis

Intra-class correlation (ICC – absolute agreement) coefficients were obtained by comparing notable subgroups (UK and Germany) with other groups (non-UK, non-German) and the entire group.

Rankings Compared	ICC	95% CI for ICC
German vs. Entire	0.98	(0.97, 0.99)
UK vs. Entire	0.93	(0.90, 0.95)
Other vs. Entire	0.99	(0.98, 0.99)

Comparison of the distribution of scores



The intra-class correlation coefficient measures the extent to which the different groups agree in their judgements. Values above 0.9 are extremely high and indicate strong agreement. Notably, the ICCs are high for each comparison. This means no subgroup is having an undue effect on the ranking. The UK scores differ somewhat from the other scores, though not so much as to be problematic.

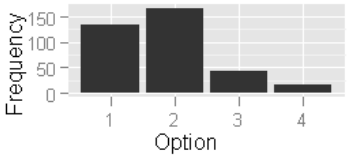
The plot on the previous page provides information on the distribution of scores for the German, UK, other and combined respondents. The thick black line indicates the median response: the UK is somewhat lower than the rest indicating UK respondents rank competencies as slightly less important on average. The boxes represent the interquartile range – the data falling between the 25^{th} and 75^{th} percentiles. A larger box indicates a wider distribution of scores. The UK has a broader distribution than the other groups, indicating respondents within this group show less agreement than the other groups. Above and below the boxes are 'whiskers' indicating the maximum and minimum scores provided within that group.

Overall these findings suggest no group is having an undue impact on rankings. However the UK scores are somewhat different to those of the other groups with a lower average ranking but also a tendency to a wider range of scores. Further investigation of the causes of this may be useful.

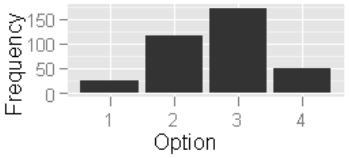
Distribution of responses

Provided below are bar graphs showing the degree of consensus for each item in the work package. For brevity each item is identified by number followed by a 1, 2, or 3 to indicate which cycle the item is referring to. The bar graphs list how many respondents selected each of the options. For each row, it is possible to view the change in consensus from the most junior to most senior cycle, moving left to right. A table of the items in full along with median and consensus measures can be found starting on page [11].

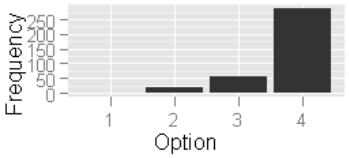
1.1



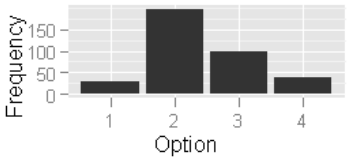
1.2



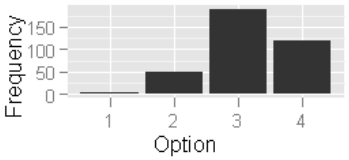
1.3



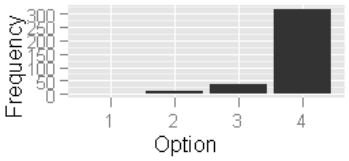
2.1



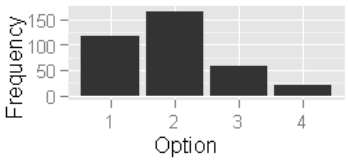
2.2



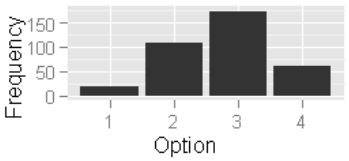
2.3



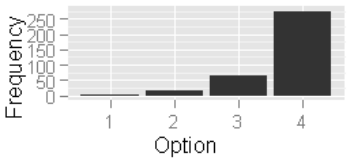
3.1



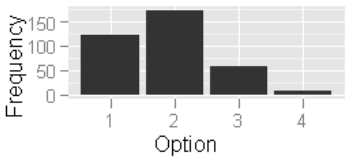
3.2



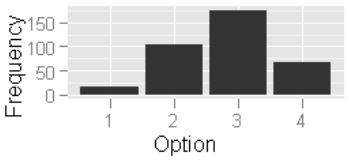
3.3



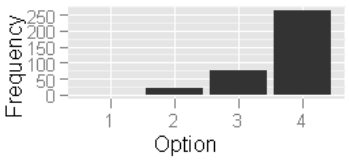
4.1



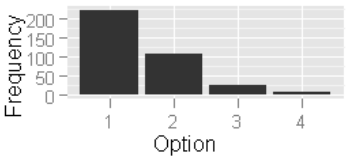
4.2



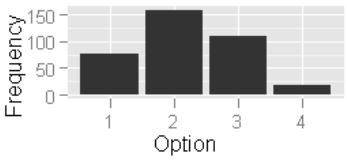
4.3



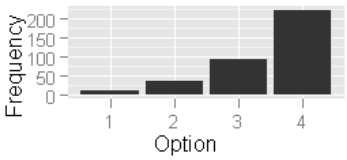
5.1



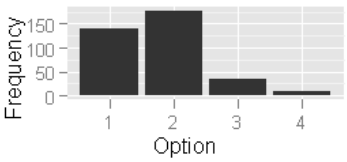
5.2



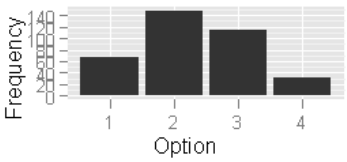
5.3



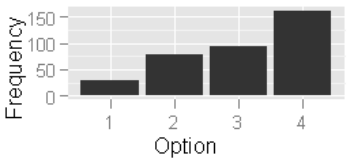
6.1



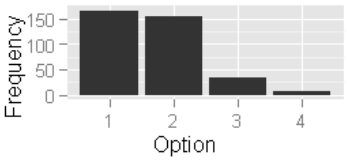
6.2



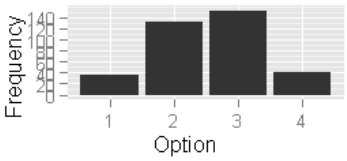
6.3



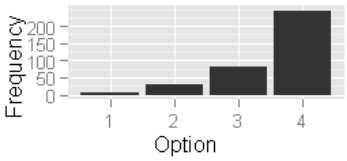
7.1



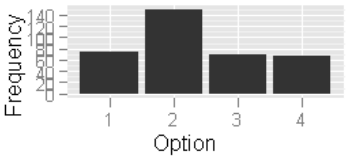
7.2



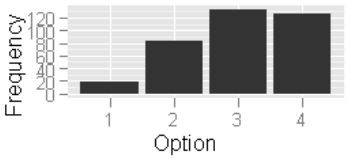
7.3



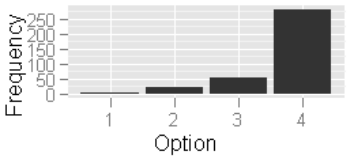
8.1



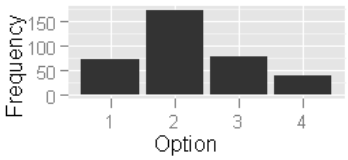
8.2



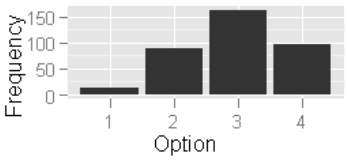
8.3



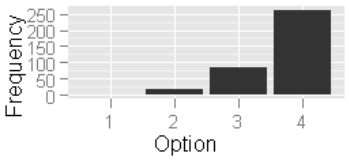
9.1



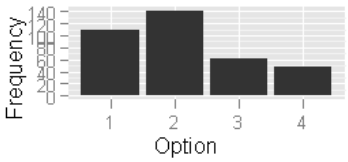
9.2



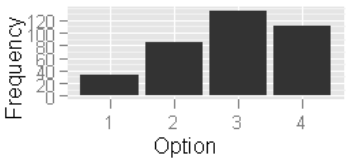
9.3



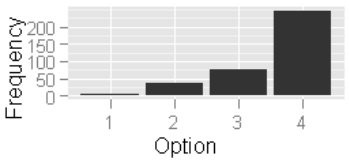
10.1



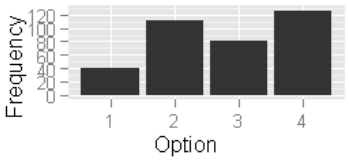
10.2



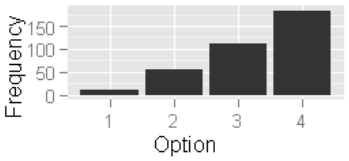
10.3



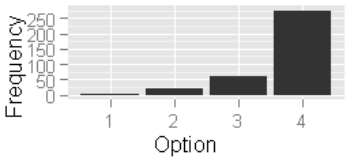
11.1



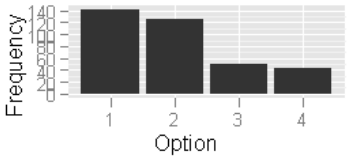
11.2



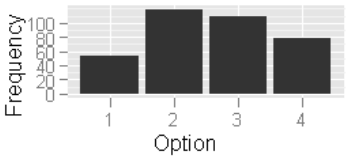
11.3



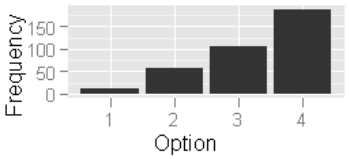
12.1



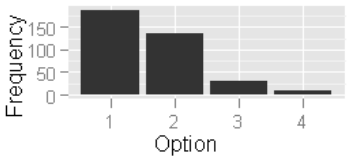
12.2



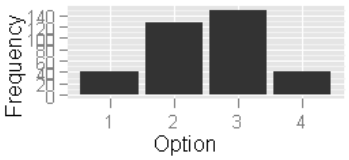
12.3



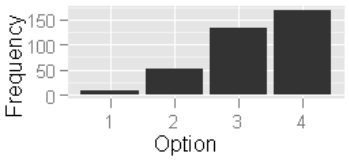
13.1



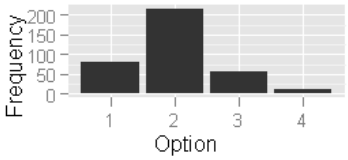
13.2



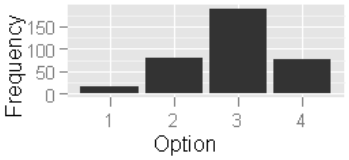
13.3



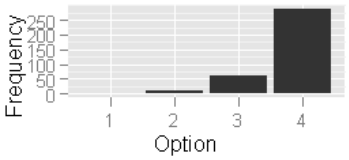
14.1



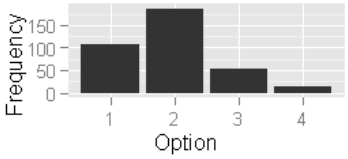
14.2



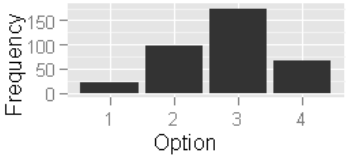
14.3



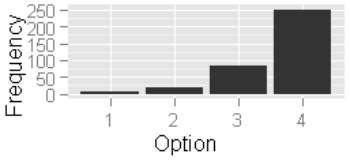
15.1



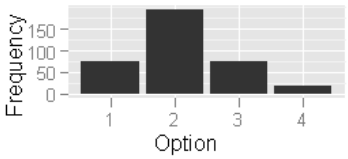
15.2



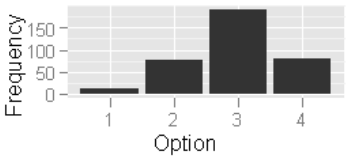
15.3



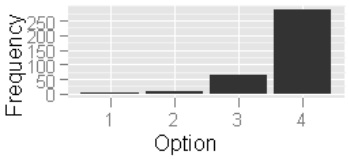
16.1



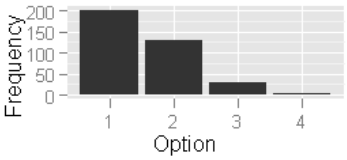
16.2



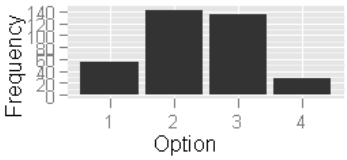
16.3



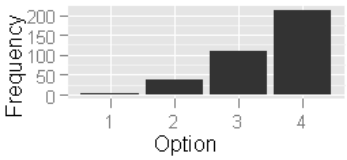
17.1



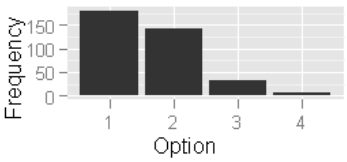
17.2



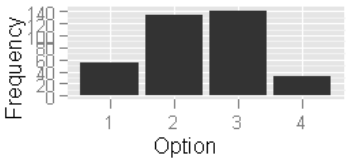
17.3



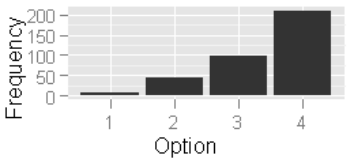
18.1



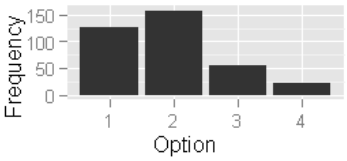
18.2



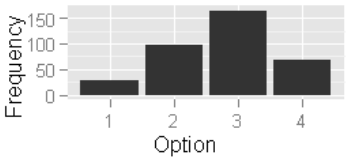
18.3



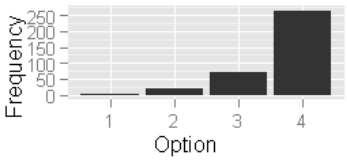
19.1



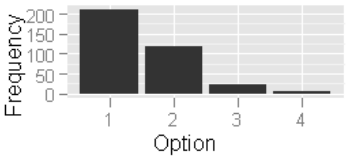
19.2



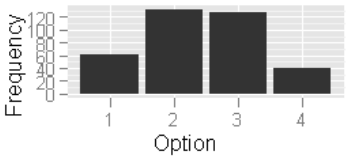
19.3



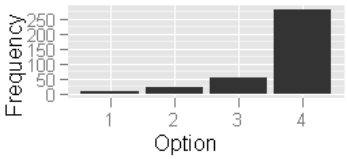
20.1



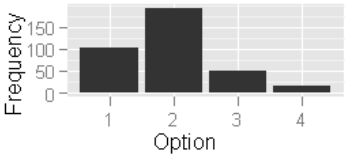
20.2



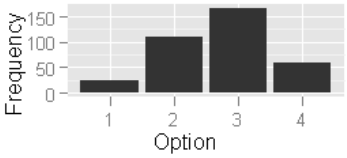
20.3



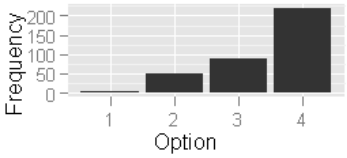
21.1



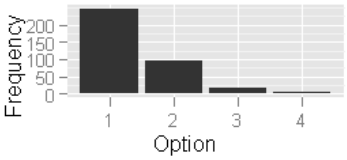
21.2



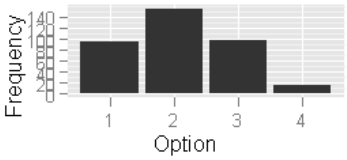
21.3



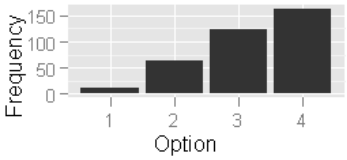
22.1



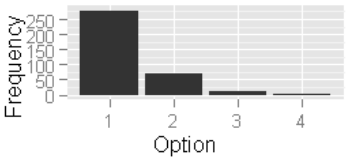
22.2



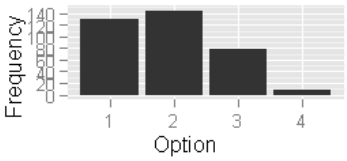
22.3



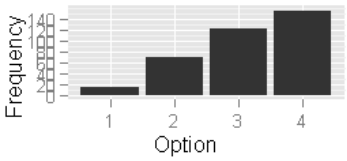
23.1



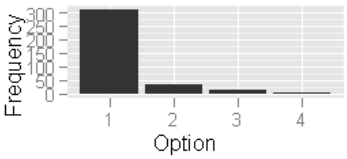
23.2



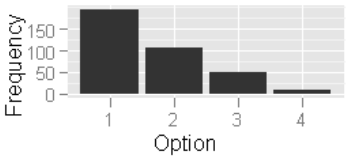
23.3



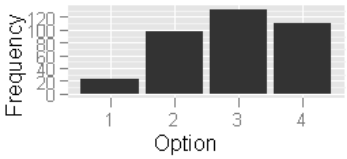
24.1



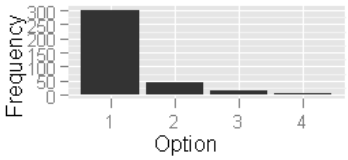
24.2



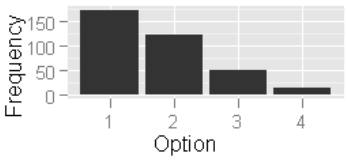
24.3



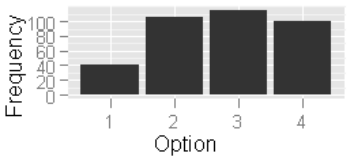
25.1



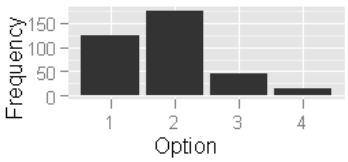
25.2



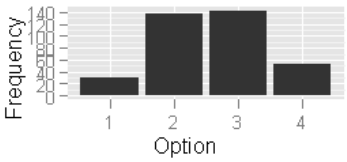
25.3



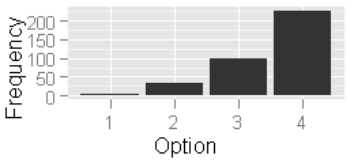
26.1



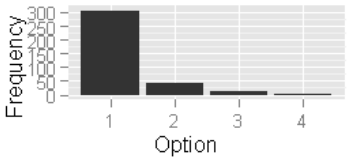
26.2



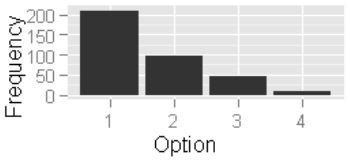
26.3



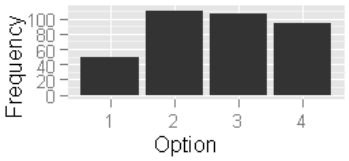
27.1



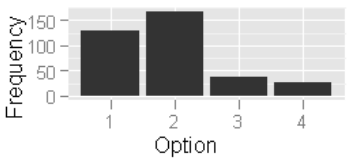
27.2



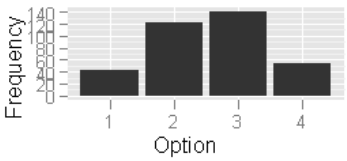
27.3



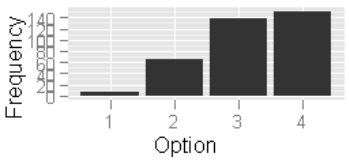
28.1

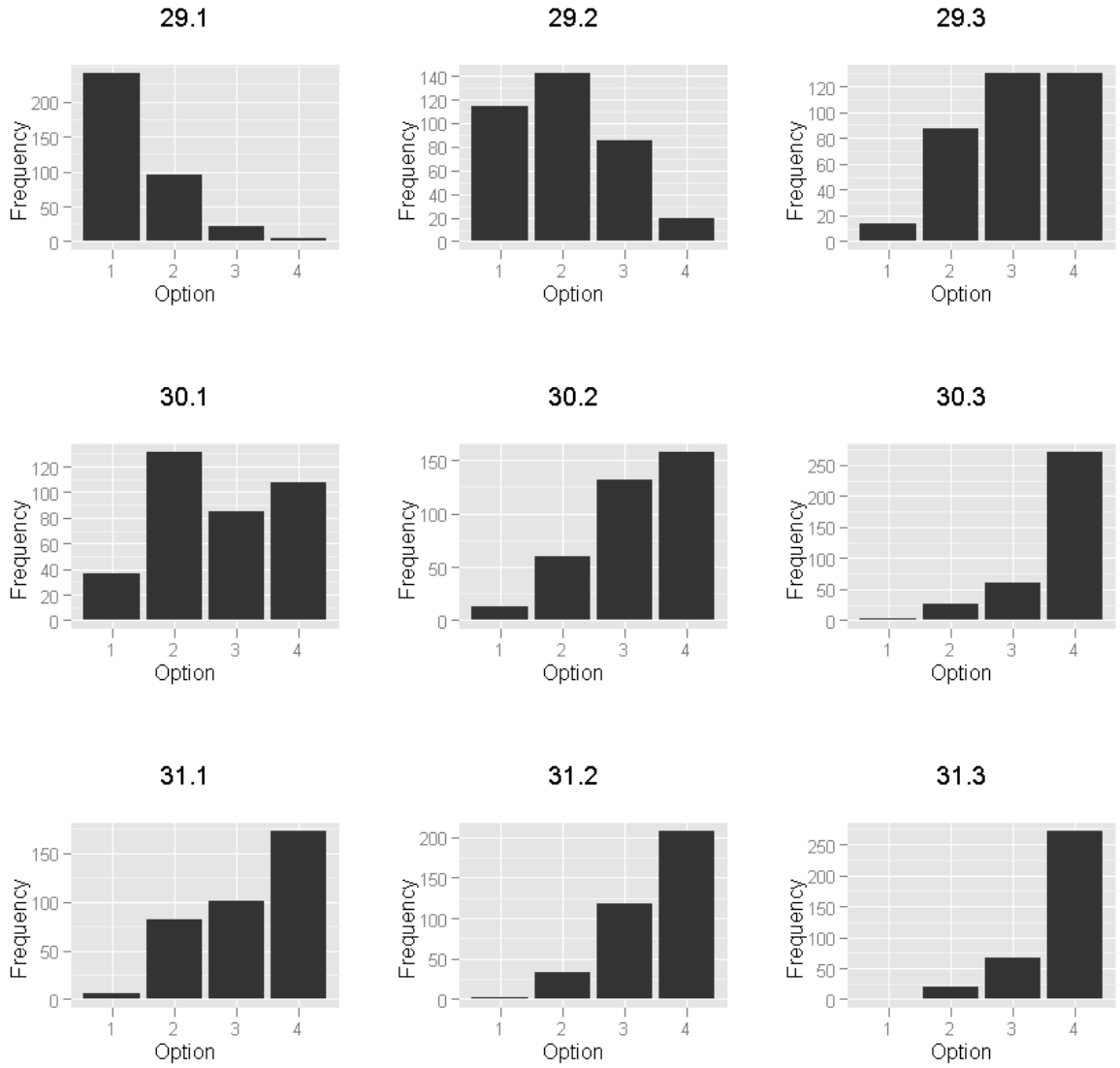


28.2



28.3





Measures of Consensus

In order to test the degree of agreement for each individual item, we calculated the Leik measure of ordinal consensus (Leik, 1966) for each item and cycle. This uses the frequency with which each option is endorsed to assess how much consensus there is for the ranking of each item. The results are presented in tabular form below along with the median score, which indicates the most endorsed option for the item.

As a guideline, values below 0.20 are poor, values between 0.21 and 0.40 are fair, values between 0.41 and 0.60 are moderate, values between 0.61 and 0.80 are substantial and values above 0.80 are good. Higher numbers always imply a greater degree of consensus.

Importantly, the degree of consensus varied across cycles so that some items begin with a high degree of consensus in cycle 1 which declines significantly by cycle 3 or vice-versa. For example, when asked to rank the importance of the “ability to apply ethical principles and analysis to research, seeking ethical approval where appropriate,”, there was only moderate consensus on the importance of this in the first cycle, but by the third cycle the consensus was

on the borderline between substantial and good. On the other hand, when asked to rank the importance of the "ability to supervise research students," the consensus was initially good, but by the third cycle the consensus had declined to only moderate. As such it is important not just to look at each item but how respondents have addressed it in each cycle.

In general the consensus tends to vary between substantial and good. None are poor or fair, though some items are towards the low end of the moderate range.

Question	Graph Key	Leik Measure of Consensus	median
Ability to formulate a research question as a hypothesis and design experiments to test it	1.1	0.608	2
	1.2	0.603	3
	1.3	0.823	4
Ability to define and carry out an appropriate literature search	2.1	0.621	2
	2.2	0.673	3
	2.3	0.889	4
Ability to keep track of the pertinent scientific literature	3.1	0.601	2
	3.2	0.623	3
	3.3	0.804	4
Ability to critically appraise published medical literature including observational, interventional, and meta analysis using established critical appraisal guidelines	4.1	0.636	2
	4.2	0.629	3
	4.3	0.782	4
Ability to design a research project, including project planning and allocation of resources	5.1	0.673	1
	5.2	0.594	2
	5.3	0.645	4
Ability to carry out laboratory procedures	6.1	0.642	2
	6.2	0.548	2
	6.3	0.452	3
Ability to choose the appropriate qualitative or quantitative research method	7.1	0.603	2
	7.2	0.549	3
	7.3	0.719	4
Ability to apply ethical principles and analysis to research, seeking ethical approval where appropriate	8.1	0.487	2
	8.2	0.546	3
	8.3	0.795	4
Ability to recognize, discuss and prevent scientific misconduct	9.1	0.577	2
	9.2	0.610	3
	9.3	0.780	4
Ability to obtain and record informed consent for participation in research	10.1	0.501	2

	10.2	0.522	3
	10.3	0.701	4
Ability to maintain confidentiality and protect data	11.1	0.409	3
	11.2	0.533	4
	11.3	0.797	4
Ability to apply national and European law to research	12.1	0.488	2
	12.2	0.437	3
	12.3	0.535	4
Ability to carry out research on medical practice	13.1	0.594	1
	13.2	0.531	3
	13.3	0.566	3
Ability to analyse research findings (qualitative or quantitative data)	14.1	0.708	2
	14.2	0.653	3
	14.3	0.828	4
Ability to select and carry out appropriate statistical tests and interpret the results	15.1	0.651	2
	15.2	0.616	3
	15.3	0.738	4
Ability to synthesise findings and draw conclusions	16.1	0.662	2
	16.2	0.666	3
	16.3	0.841	4
Ability to propose and carry out the next step in a research project	17.1	0.636	1
	17.2	0.546	2
	17.3	0.640	4
Ability to disseminate research findings	18.1	0.583	2
	18.2	0.518	2
	18.3	0.599	4
Ability to present research results to peers, e.g. in scientific meetings	19.1	0.584	2
	19.2	0.584	3
	19.3	0.777	4
Ability to write a scientific paper suitable for publication	20.1	0.655	1
	20.2	0.503	2
	20.3	0.793	4
Ability to present research results obtained by others, e.g. in a journal club	21.1	0.658	2
	21.2	0.596	3
	21.3	0.636	4
Ability to contribute to research-funding proposals	22.1	0.743	1
	22.2	0.590	2
	22.3	0.538	3
Ability to write research-funding proposals	23.1	0.819	1
	23.2	0.586	2
	23.3	0.533	3
Ability to supervise research students	24.1	0.871	1
	24.2	0.566	1

	24.3	0.536	3
Ability to supervise laboratory technicians	25.1	0.849	1
	25.2	0.533	2
	25.3	0.472	3
Ability to contribute effectively to a research team	26.1	0.625	2
	26.2	0.538	3
	26.3	0.673	4
Ability to lead a research team	27.1	0.869	1
	27.2	0.608	1
	27.3	0.439	3
Ability to communicate scientific findings to lay people	28.1	0.596	2
	28.2	0.514	3
	28.3	0.575	3
Ability to critically evaluate research proposals	29.1	0.719	1
	29.2	0.559	2
	29.3	0.548	3
Ability to write and speak in English	30.1	0.422	3
	30.2	0.551	3
	30.3	0.769	4
Ability to use computers effectively	31.1	0.509	3
	31.2	0.644	4
	31.3	0.788	4

Leik, R. K. (1966). A Measure of Ordinal Consensus. *The Pacific Sociological Review, 9*(2), 85-90.