



IPEM Workforce Intelligence Unit Report on Magnetic Resonance Physics Staffing 2014

1. Introduction

The Magnetic Resonance Physics Special Interest Group (MRSIG) are planning to update IPEM's Policy Statement on Minimum Staffing Levels to provide an MR Physics Service. In order to provide evidence to support this, the Workforce Intelligence Unit (WIU) in conjunction with the MRSIG carried out a survey of staffing and equipment in MRI groups in hospital settings. The aim was two-fold, to provide information to enable the MRSIG to update the IPEM Policy Statement, and to input into the WIU UK-wide Services Survey.

2. Overview

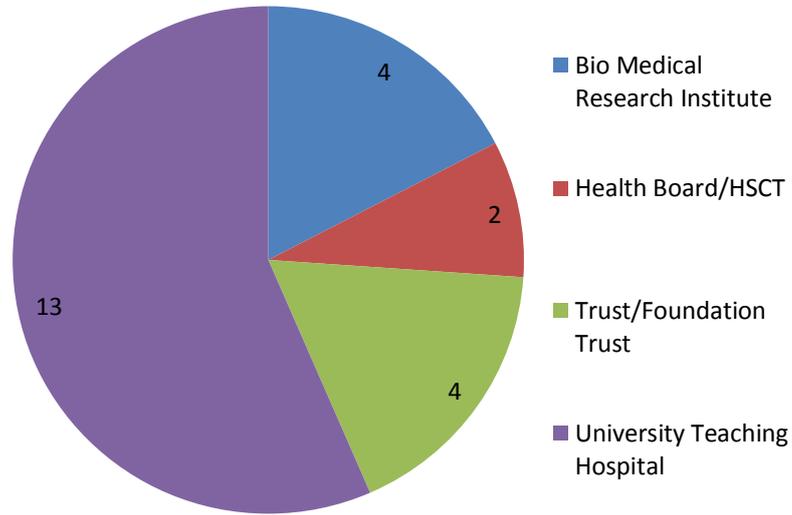
A short web-based survey was sent via the following mailing lists (MRIPHYSICS@JISCMail.AC.UK & MEDICAL-PHYSICS-ENGINEERING@JISCMail.AC.UK), appealing to UK-based MR Physicists in both NHS and private hospital settings. The survey comprised 15 questions:

- 1) How would you describe your organisation, eg, Foundation Trust, Biomedical Research Institute
- 2) How does your MR group fit into your organisation
- 3) How many MR scanners does your group support
- 4) Please list the sites within your organisation on which your group provides MR Physics support
- 5) How many systems outside of your organisation does your group support, eg through a service level agreement
- 6) Please list the sites outside of your organisation, but within the NHS (if none, please state none)
- 7) How many WTE staff are there in each of bands 4-9
- 8) How many WTE Clinical Scientists are there in your group
- 9) How many of these posts are vacant
- 10) How many WTE are effectively engaged in routine work
- 11) Does your group support advanced applications (eg fMRI, qMRI)
- 12) If yes, how much time does this engage
- 13) Does your group support other services, eg informatics
- 14) Do you feel MR Physics is adequately supported
- 15) Other comments

3. Results and Data

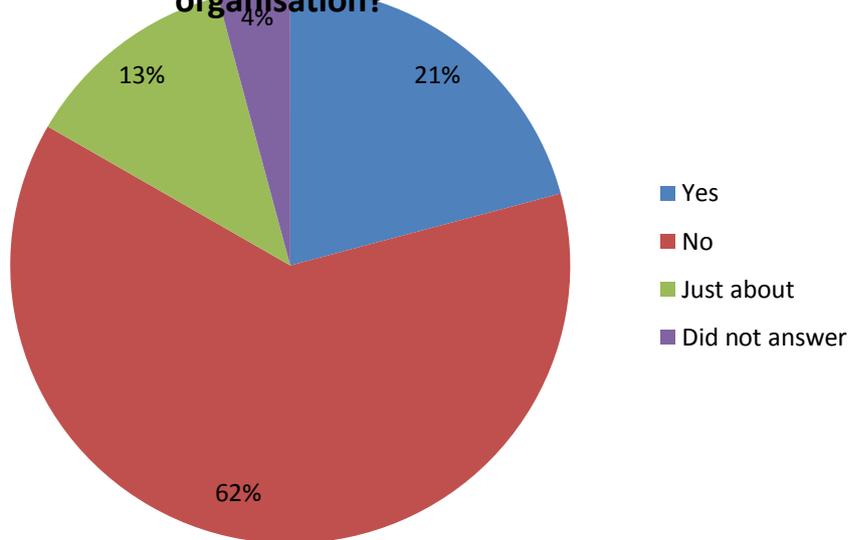
The survey was open for completion for 52 days, and within this time, 48 respondents started the survey, although only 33 finished it. Of these, 4 declined to answer critical questions, 1 appeared to be outside the UK, and 4 contained anomalous staffing information so in total **24 responses** were analysed. There were responses from a range of NHS organisations, including large and medium Teaching Hospital Trusts and Scottish and Welsh Health Boards, which cover a wide geographic region. The data suggests Biomedical Research Centres have more adequate staffing levels than other organisation.

Type of organisation responding to survey



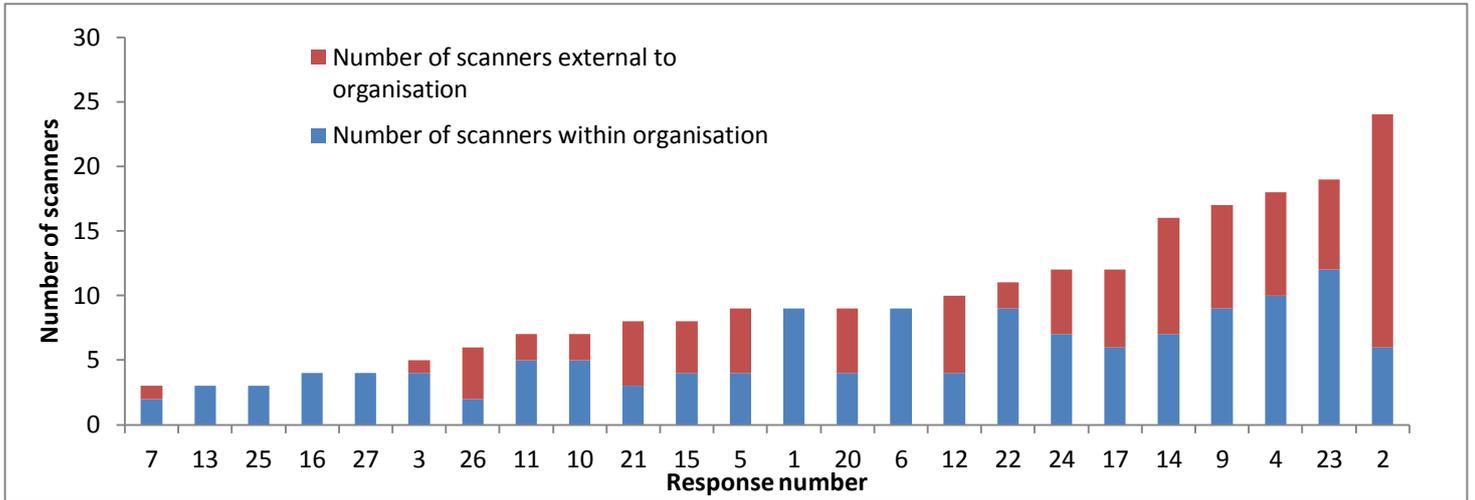
Labelled with number of responses from that type of organisation

Is MR Physics adequately staffed in your organisation?

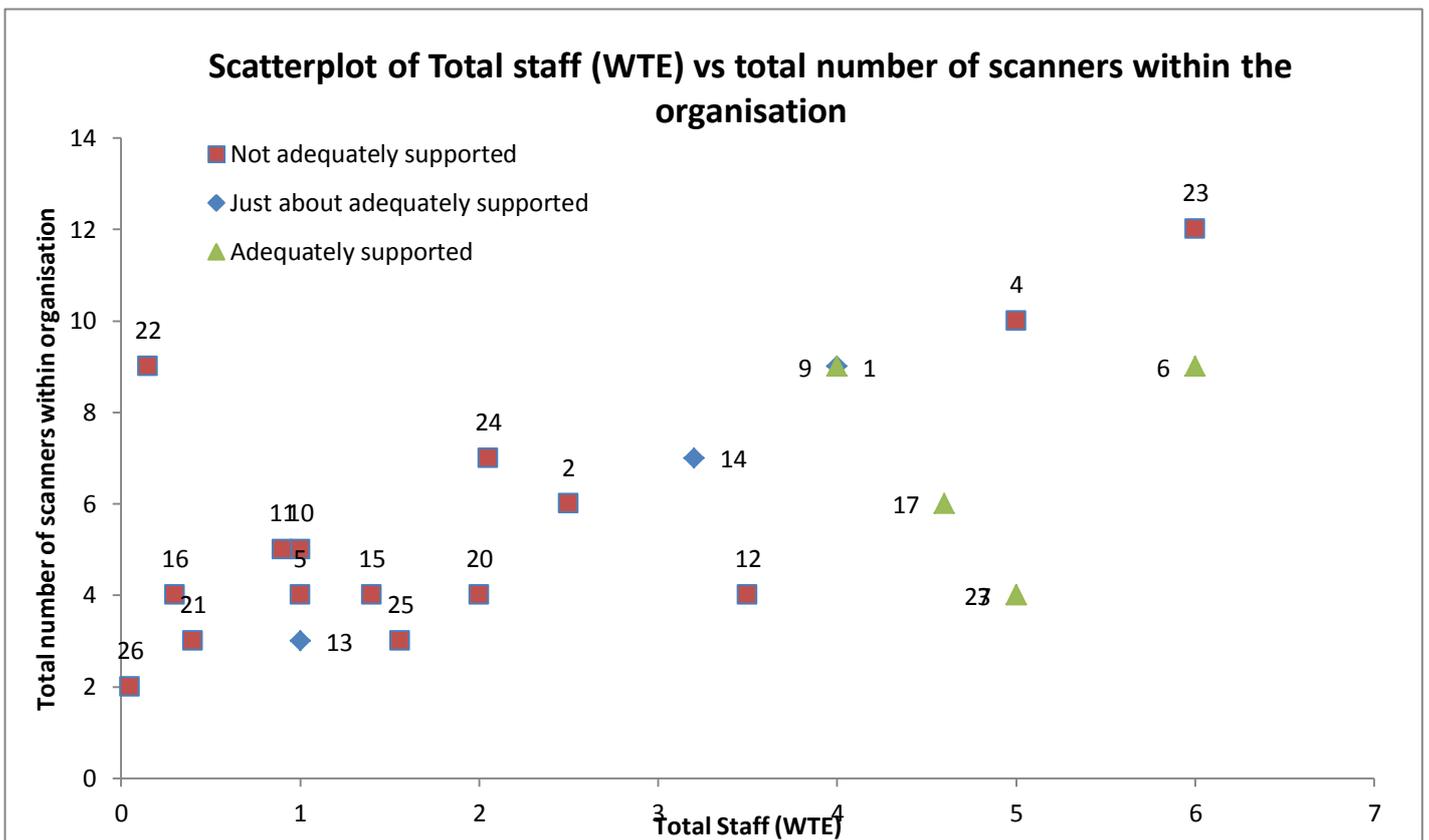


The majority of respondents (62%, 15/24) felt that their activities were not adequately supported, a further 13%, 3/24) feeling that their activities were just about adequately supported at present, but that workload was increasing. 21% (5 respondents) believed their activities were adequately supported, 3 of these were Biomedical Research Centres, confirming the supposition that these centres are better supported than average. Informally a number of respondents stated that they routinely include final year trainees in the WTE count, as they are involved and required for adequately supporting the MR service they provide. All four of the responses which were not included in the analysis also believed their service was not adequately supported.

The majority of groups also support scanners external to their organisation, either in other NHS organisations or privately run scanners by way of service level agreements. Each individual response was allocated a number, and summary anonymised responses are shown in the table in the appendix. The numbers of scanners supported is summarised in the figure overleaf.

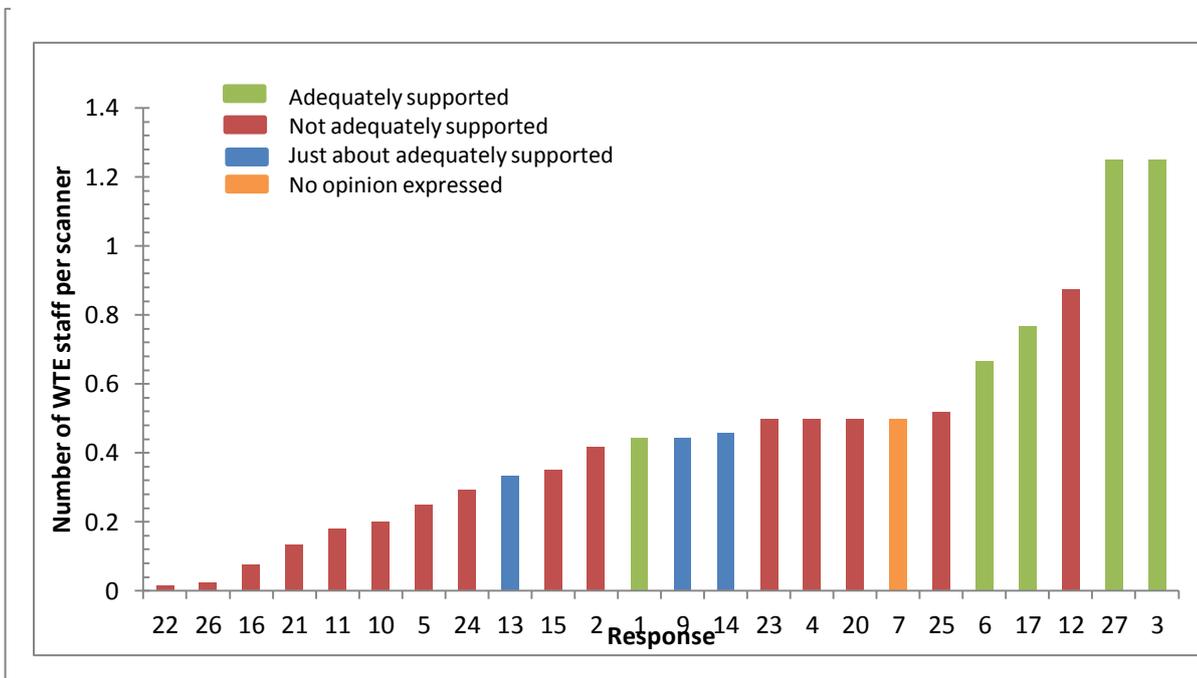


A scatter plot of total staff (WTE) against number of scanners supported is shown below. It is perhaps self-evident that staffing requirements for an MR Physics service are more complicated than simply a total of WTE staff (of all bands) to scanner ratio, but as these groups are mostly small in terms of WTE staff it provides a useful starting point.



The points are coloured by whether the respondent felt the group was adequately staffed for the workload, which is a subjective observation, but the groups fall into clear categories.

The chart overleaf shows the ratio of staff:scanner considering only scanners within the organisation.



The following table reports summary statistics to investigate the relationship between the number of WTE MRI clinical scientists the number of internal scanners. These ratios were formally assessed to determine if the data meet normality assumptions using a Shapiro-Wilks-W test. Consequently, medians and inter-quartiles are reported.

Internal Scanners Only	Number of WTE MRI Clinical Scientists per scanner
Summary of all responses	0.44 [0.24-0.51]
Summary of responses (stating either just about or adequately covered)	0.56 [0.44-0.88]
Summary of responses (stating adequately covered)	0.77 [0.67-1.25]

The three groups with the lowest number of staff/scanner do not support advanced techniques, which provides an explanation as to how these groups can support a service with such low staffing provision. Additionally routine support may come from other departments. When defining minimum staffing levels, the provision of advanced techniques should be taken into consideration. The above table suggests that approximately 0.67 to 1.25 WTE staff/scanner for an adequately supported service.

Other points for consideration are

- This survey represents a sample of MR groups within the UK.
- Service level agreements supporting scanners external to the organisation vary in the complexity in the level of service provided.
- Organisations that cover a large number of sites over a large geographical area will have higher staffing requirements.
- Sites on which there is significant research activity, may have staff employed solely in a research capacity, but who also contribute to the provision of MR safety, thereby creating resilience within the service
- The role of Part 2 trainees has not been captured. Informal information suggests that some sites are utilising 3rd year trainees to support service delivery.

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2014

Appendix: Anonymised full data set

Colour coded Red = inadequately supported
 Green = adequately supported
 Blue = Just about adequately supported
 Orange = No comment on adequacy of support

Number	Total no of scanners within organisation	Total no of scanners external to organisation	Total WTE staff (all bands, excl. Pt2 trainees)	No of Clinical Scientists	No of Vacancies	How many engaged in routine clinical services	Advanced applications?	How much time does this engage?	Any other activities
1	9	0	4	3	0	3	Yes	2	Yes-support research activities on site
2	6	18	2.5	2.5	0	1.1	Yes	1.4	No
3	4	1	5	4.5	0	2	Yes	1.5	Group also supports imaging informatics within Radiology
4	10	8	5	5	0	3.3	Yes	0.5	No
5	4	5	1	1.5	0	0.6	Yes	0.4	Research and development within the Faculty of Medicine and wider University
6	9	0	6	6 however only 2 are exchequer funded, 4 are on a range of research funding	There will be one shortly	About 2.5 but this is understaffed,	Yes	Some 10 staff	Our informatics support has grown from our MR group
7	2	1	1	0.3	0	0.3	No		no
9	9	8	4	4	0	1	Yes	3	No.
10	5	2	1	1	0	0.8 - 1.0	Yes	0.1 - 0.2	None
11	5	2	0.9	0.8	0	0.4	Yes	0.4	No
12	4	6	3.5	3.5	0	2.1	Yes	0.5	
13	3	0	1	0	0	less than 0.1	No	N/A	No

14	7	9	3.2	3.2	0	2.1 (split 1.6 routine as above, 0.5 teaching/training)	Yes	1.1 (split 0.5 Clinical, 0.6 Research support)	No.
15	4	4	1.4	1.4	0.6	1.4	Yes	0.8	No
16	4	0	0.3	0.3 involved in MRI physics activities	none	0.2	No	NB - support for these applications is anticipated in the near future 4.6 (all staff are expected to participate with routine and advanced tasks)	No
17	6	6	4.6	4.6	None	4.6	Yes		Not routinely.
20	4	5	2	2	0	0.8	Yes	0.2	0.25 WTE ultrasound, STP trainees, medical computing
21	3	5	0.4	0.4	0	0.4	Yes	0.05	formally no, informally yes
22	9	2	0.15	0.05	0	0.15	No		No
23	12	7	6	6	2	6	Yes	3.5	Informatics, image analysis, research support, support for clinical trials, clinical reporting
24	7	5	2.05	2	0	2	Yes	0.2	work with DR & T
25	3	0	1.56	0.2	0	0.2	Yes	0.2	assistance with image exchange-sending data to other groups when participating in multi-centre trials
26	2	4	0.05	0.025	0	0.05	No		
27	4	0	5	5	0	2.5	Yes	2	scientific computing and research imaging data management