Benchmarking Radiological Services in Europe

The EAR / UEMS embarked on a benchmarking process in 2002. The purpose of this exercise was to build up a profile of radiological services in each European country and to enable comparisons to be made between countries. This process has three main objectives:

1. To enable countries who are poorly provided with facilities to use the comparative information to put pressure on their national authorities to improve services and resources.
2. To enable the EAR / UEMS to put pressure on individual national authorities on behalf of individual national societies to improve services and also to provide information in discussions with the European Union commission on radiological issues.
3. To promote good radiological practice throughout Europe and enable countries to benefit from developments in other member states.

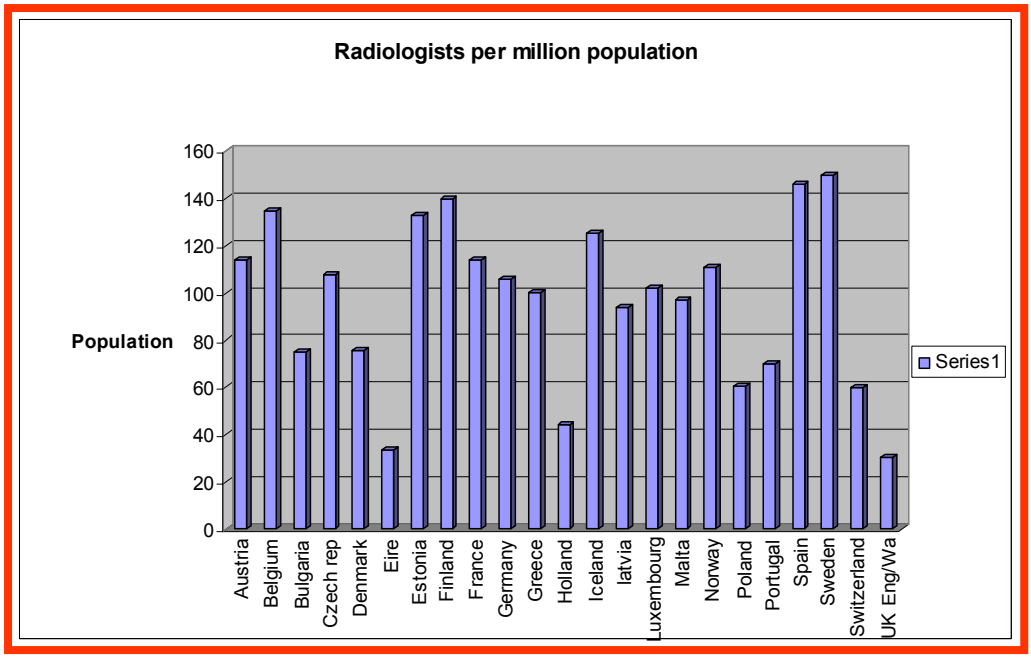
The questionnaires were devised to focus on radiological manpower, equipment, standards of service and funding of radiological services. Questionnaires were given to all UEMS national representatives and sent to the presidents of non-EU national radiological societies.

The response was only moderate and a number of respondents had difficulty in providing some of the information, which was not collected on a national basis. However, there were sufficient responses to provide an initial report.

Radiological Manpower

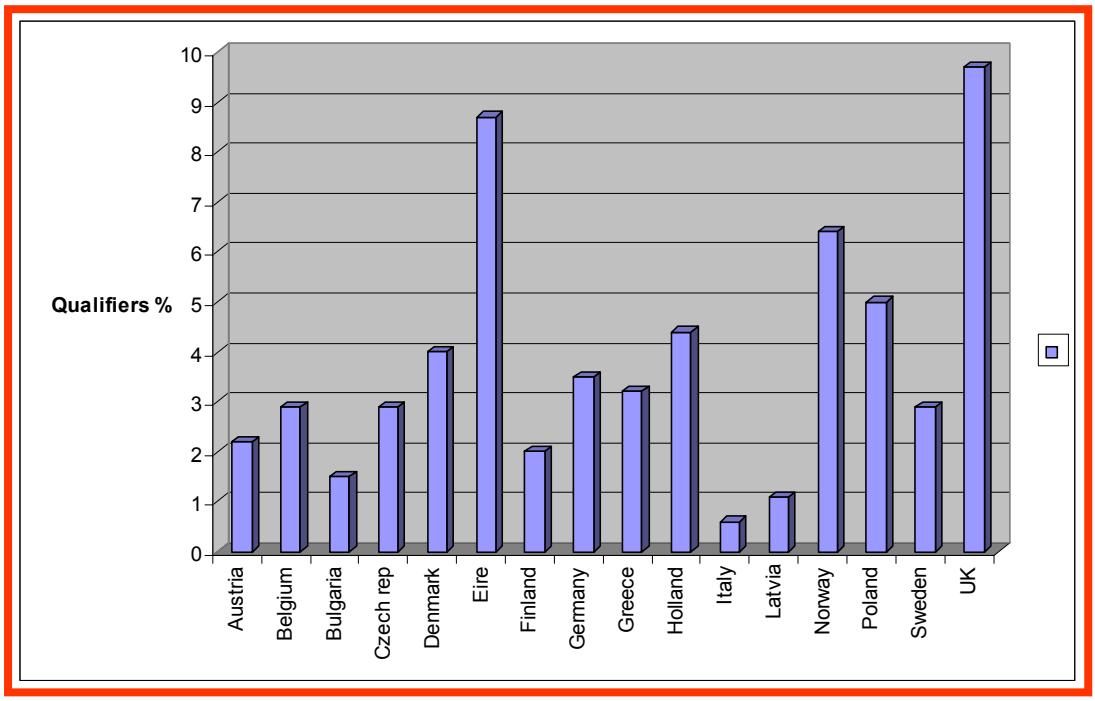
There is a wide disparity in the number of radiologists in many countries of Europe. This clearly affects the delivery of services in some countries and also may affect the financial rewards and turf battles in radiology and between other sections of the profession. It may have implications for pan-European radiology services with the development of teleradiology.

The questionnaire initially asked for the size of the national population and the number of qualified radiologists in each country.



The bar graph confirms the wide disparity in the numbers of radiologists in each country. This graph does not imply that those countries with a higher number have too many radiologists as the numbers also need to be related to the national radiological workload, the availability of equipment and the type and complexity of the work performed. Those countries with a high CT and MR provision and also where a significant amount of interventional radiology is undertaken will require a larger workforce.

The questionnaire also sought the number of trainees in radiology in each country. The number of responses here was reduced and so the figures are less robust. The number of trainees was related to the number of qualified radiologists and presented as a percentage per annum based on a 5-year training programme. This graph should be analysed in conjunction with the graph above.



The number of trainee radiologists required per annum to replace the specialist workforce depends on the retirement rate and on the basis of a 30 year working life of a specialist. The replacement requirement from the above bar graph would be 3.3%.

This does not take into account population expansion, whether the present national workforce level are adequate or for the requirement to deal with an increasing and more complex workload. It also does not take into account technological developments, which rarely replace other investigations but add to our ability to investigate patients in more depth.

It also does not take into account working time legislation, which has had a dramatic effect on the contribution played by trainees in some countries.

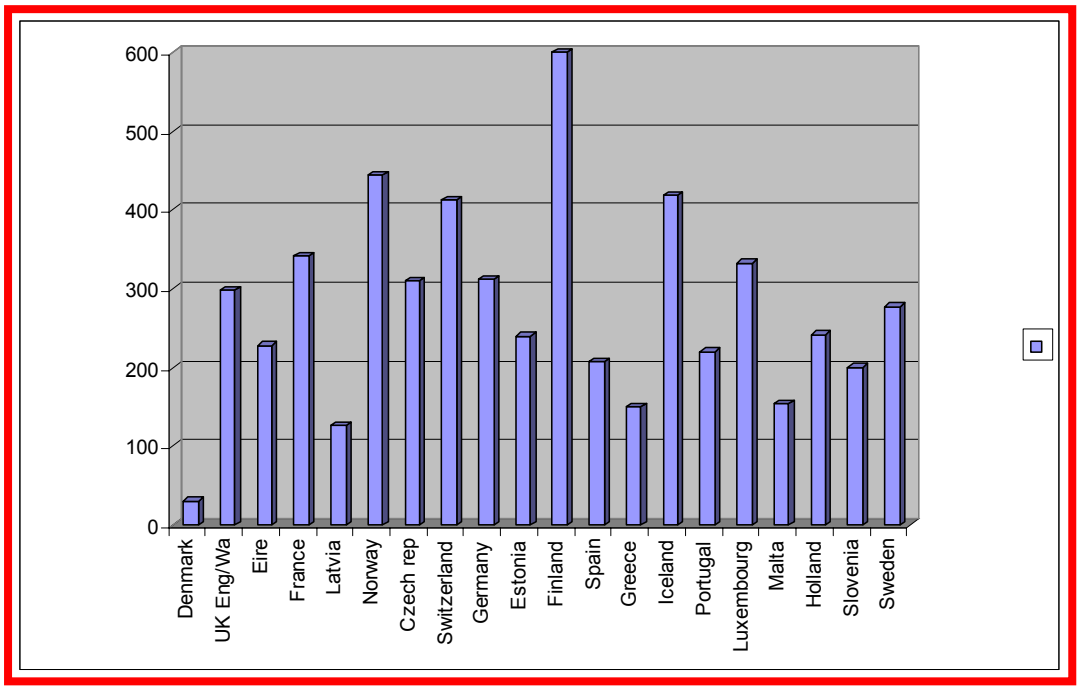
There are a significant number of countries that are not even replacing their present workforce. One country has a high percentage of qualifiers as a result of concerted and persistent pressure on the health funding authorities to redress the large deficit in

the workforce and the use of the European comparisons has been a great value in that campaign.

National Radiographic Workforce

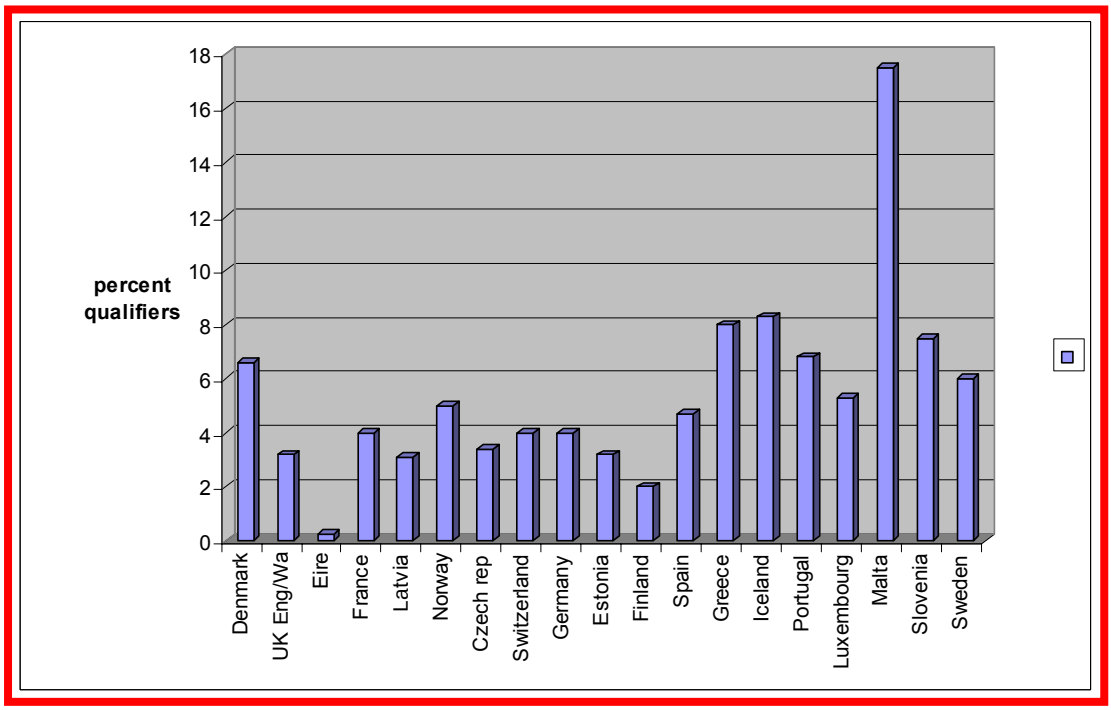
The EAR / UEMS questionnaire did not seek information on radiographers, but the information was collected by the European branch of the International Society of Radiographers and I am grateful to them for providing us with this data.

Number of Radiographers per million population.



This survey shows a wide discrepancy between different countries. The data may be affected by the varying tasks and levels of responsibility undertaken by radiographers throughout Europe.

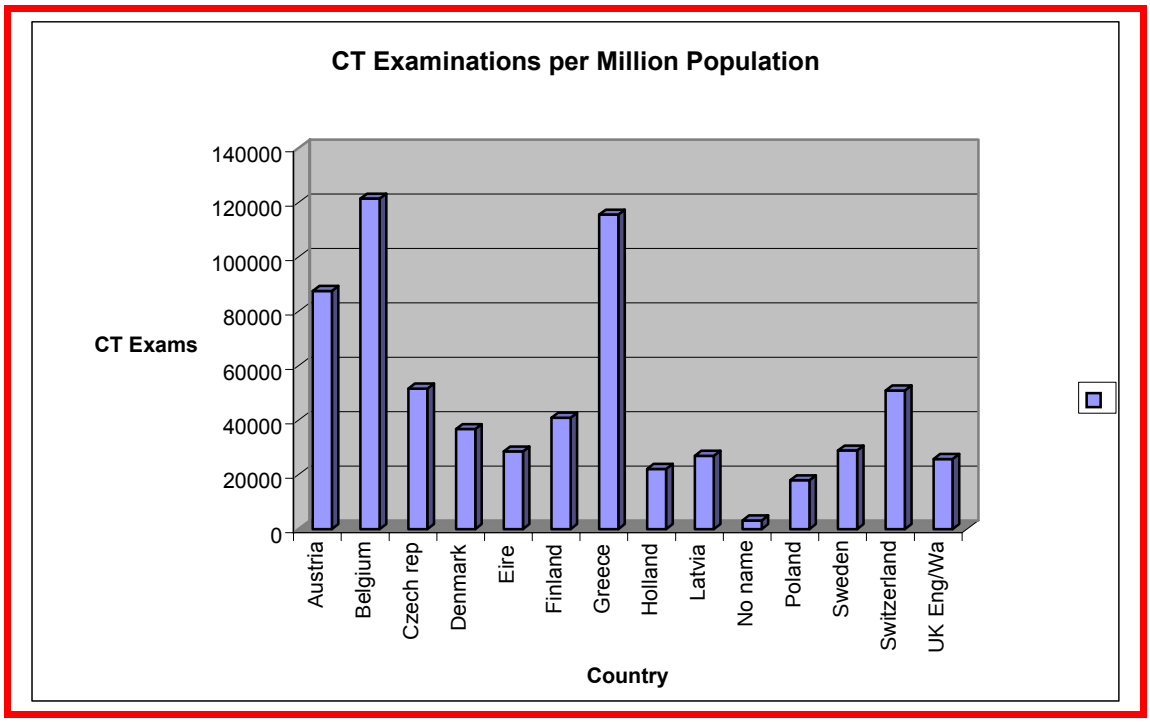
Radiographic qualifiers as a percentage of total numbers of radiographers.



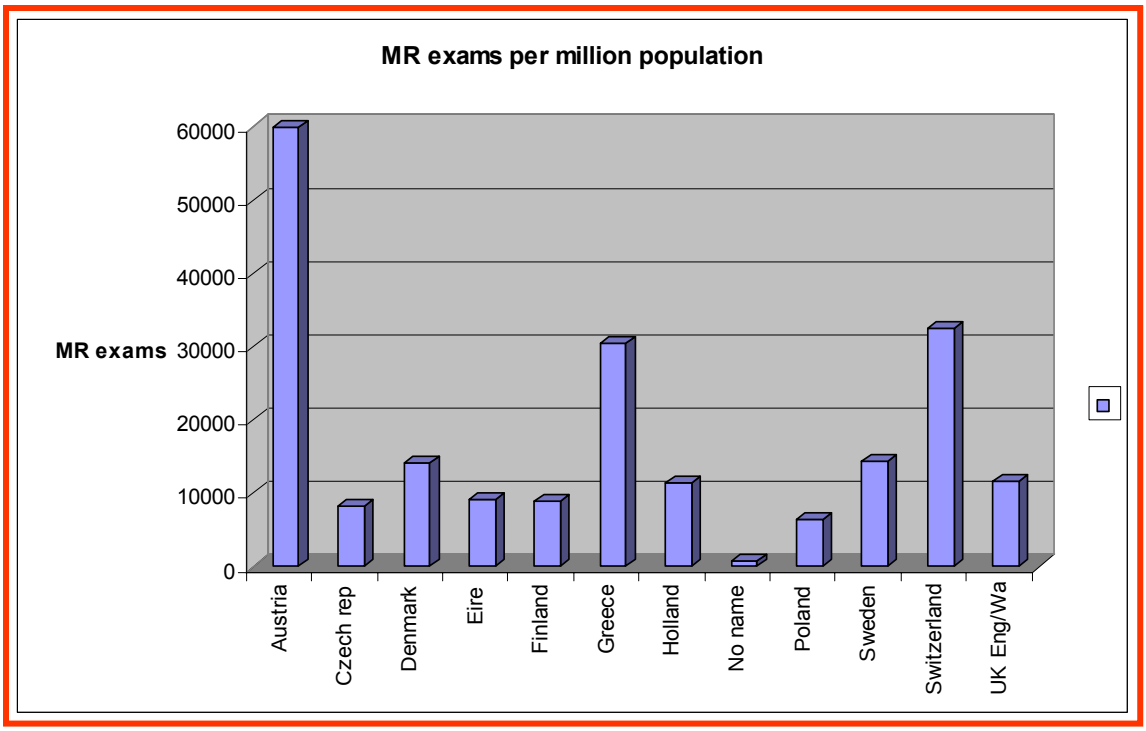
Based on a 25-year working career and accepting the present work practices without career development a replacement requirement would be approximately 4.5%. It is clear from the chart above that many countries are not training sufficient radiographic staff to even replace their present workforce without taking into account the continuing professional development of radiographers, the increased workload and the rise in population.

Workload

The questionnaire attempted to assess national workload in more complex investigations. This proved difficult for some countries where central statistical collection was not undertaken and this was especially the case in those countries with a large private sector. However, the figures below give some idea of the variation in CT and MR workload.

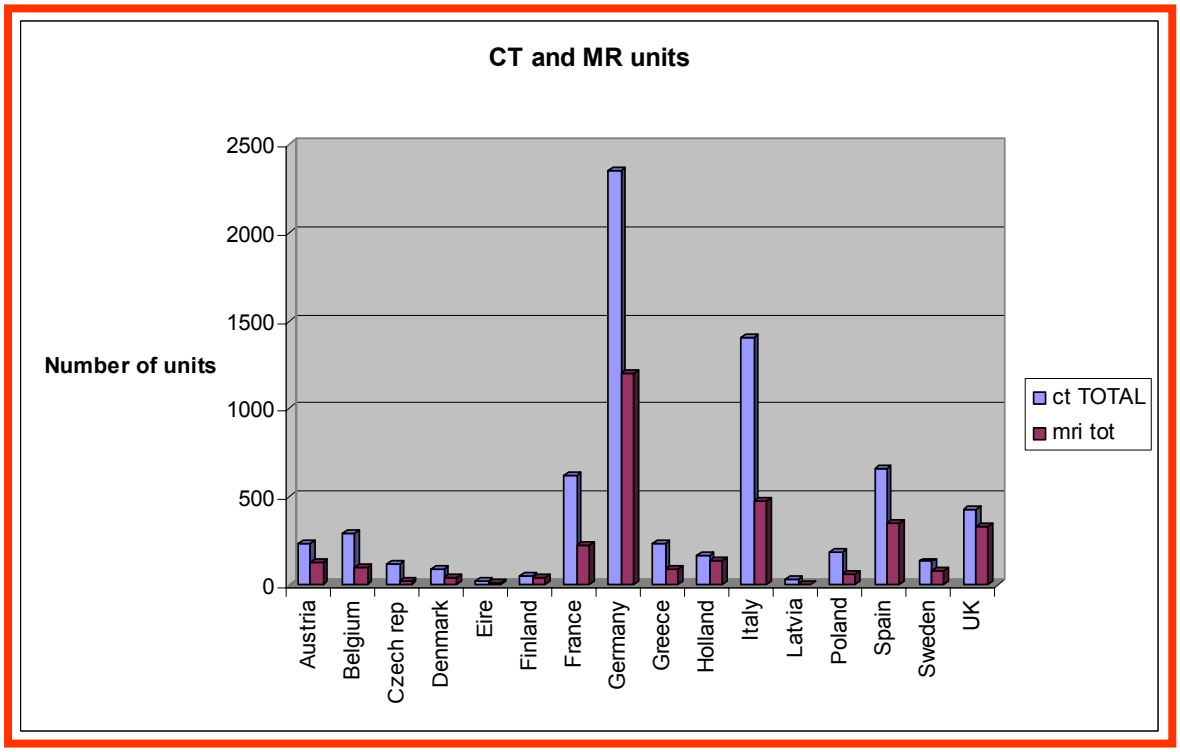


One country provided their information twice without identifying their name. Their population was 5 million and it is hoped that they will recognise themselves.

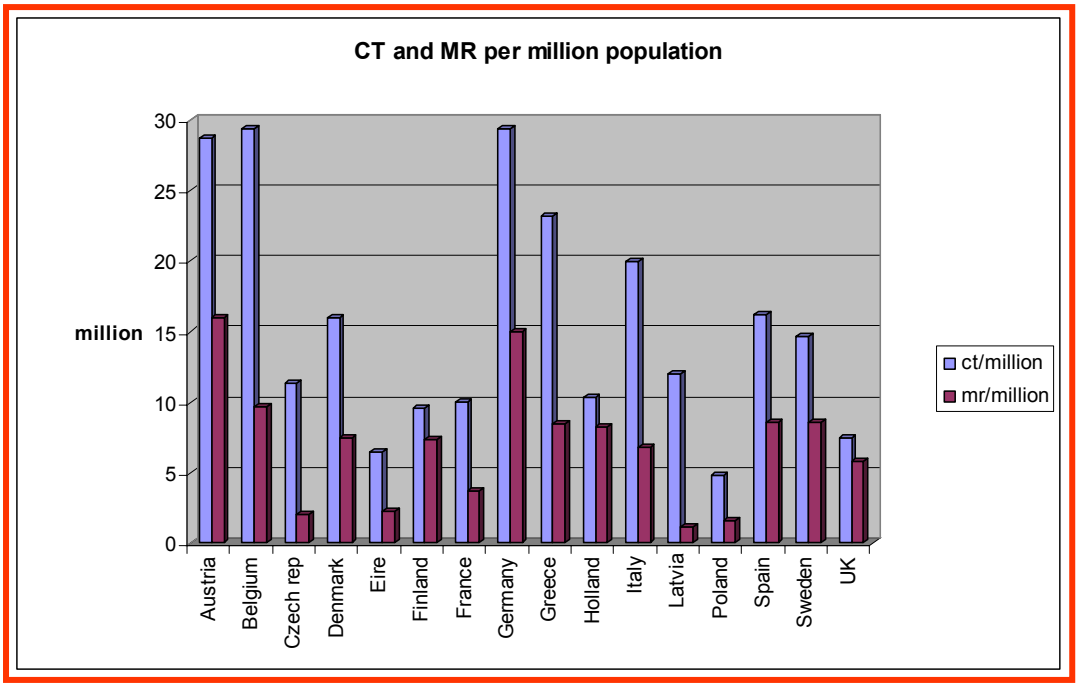


Major Equipment

The following chart identifies the number of CT and MR systems in the countries surveyed. This is a combination of information provided in the questionnaires supplemented by information obtained from the COCIR website from their recent report on equipment.



The charts show a wide disparity of availability of these systems throughout Europe with variations also in the proportions of CT to MR. Some countries have invested more heavily in CT while the ratio is closer in other countries which have put more emphasis on MR in recent times.



The relationship of CT and MR to the population shows a wide disparity. Some countries with a high gross national product still show relatively low investment levels in large computer-based imaging equipment. Some countries have a very low access level to MR, which clearly is detrimental to the clinical management of patients and their quality of care in those countries.

COCIR indicates that in their view the age of equipment in each country should be based on: 60% less than five years old
30% between six and ten years
10% older than ten years

Older equipment is more liable to break down, has in general a poorer quality of examination, has an inferior range of examinations and has a reduced ability for upgrades. Very old equipment may have higher radiation burdens and spares may not be available.

It is therefore in the interest of the patient that equipment is kept up-to-date. According to the recent COCIR report 44% of CT scanners are older than five years and only 45% are spiral. The EAR / UEMS survey does have some data on the ratios of conventional, spiral and multi-slice CT systems, but it is not included in this present study as the accuracy of the data needs to be verified.

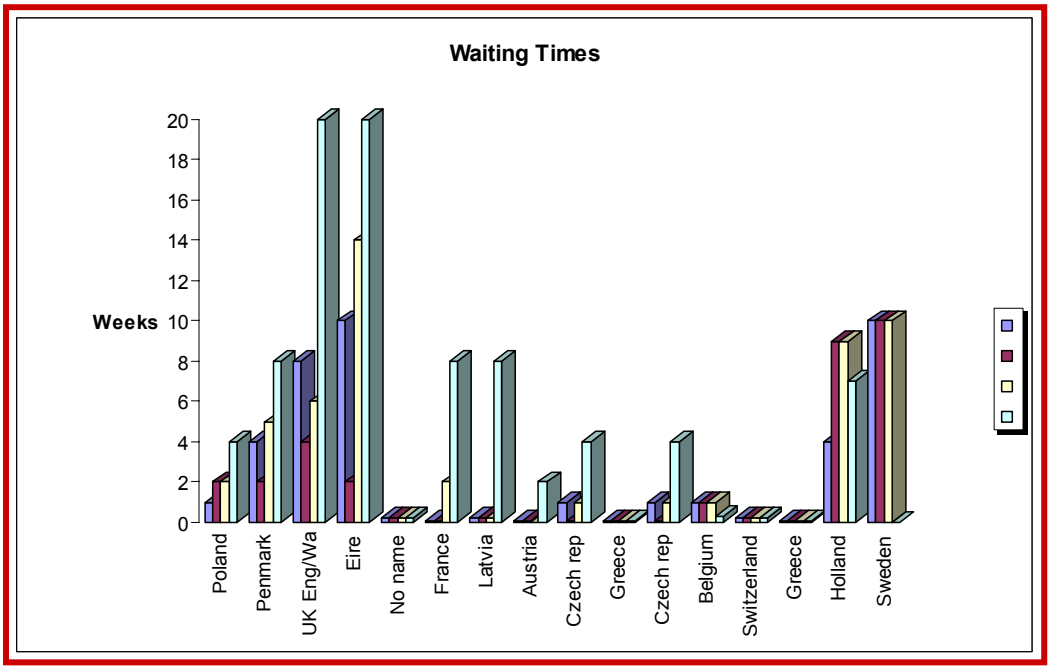
The COCIR study indicates that MR at present falls within the guidelines.

Waiting times for examinations

The length of time that patients have to wait for investigations can be an important issue in patient management in many cases. A long waiting time may affect the initiation of treatment and subsequently may lead to a poorer clinical outcome. It increases patient anxiety and may have economic implications to the patient and society. The questionnaire asked what the waiting times for a number of investigations was.

13 /14 countries indicated that there was immediate access to emergency imaging facilities for those requiring them. 11 had access to general radiology services within 48 hours, but 3 did not.

The chart below shows the waiting times for investigations in different countries. These are overall figures and within countries there may be wide variations between regions, individual hospitals and private practices.



Dark blue = US Mauve = fluoroscopy white = CT light blue =MR

In five countries there is immediate access to Ultrasound. In the remaining countries the average waiting time is 2.8 weeks with a range of 1 – 10 weeks.

In four countries there is immediate access to CT. In the remaining countries the average waiting time is 3.6 weeks with range of 1 – 14 weeks.

In four countries there is immediate access to MR. In the remaining countries the average waiting time is 6.6 weeks with a range of 1 – 20 weeks.

Methods of Funding Radiological Services

There are a number of different methods of funding radiological services across Europe. Most countries use a combination of these methods, which are outlined below:

Direct government allocation to hospitals	3 countries
Government-funded insurance	1 country
Private Insurance	0 countries
Government allocation and insurance	1 country
Government allocation and private insurance	3 countries
Government and private insurance	5 countries
All the above methods	1 country

The most popular method is a combination of government and privately funded insurance-based system for individual patients, but some direct allocation to individual hospitals is also undertaken. Only three countries fund their radiological services by direct financial allocation to the hospital on a budgetary basis.

Comparison between the methods of funding and the waiting times indicates that two of the three countries with the longest waiting times for CT and MR are funded solely by direct government funding to the individual hospitals.

It is also of interest that no country funds their radiological services purely through private insurance indicating a state presence in the overall investigative pathway in some form.

Skill Mix

The questionnaire identified some tasks that might be performed by radiographers although there may be others that are undertaken.

Intravenous injections	11/14
Performing Barium Enemas	4/14
Performing US examinations	7/14
Reporting US examinations	1/14
Reporting radiographs	1/14

The results indicate that radiographers are now involved in undertaking Ultrasound examinations in a number of countries. This reflects the steady increase in the range of examinations available and the replacement of a number of radiological examinations by sonography. However, Ultrasound is a real time investigation and there will be continued pressure for radiographers undertaking the examination to issue a report. At present this is limited to one country and in carefully monitored conditions.

Radiographers undertaking IV injections is now commonplace primarily driven by the regular use of contrast in CT and MR and the impracticality of having a radiologist on hand all the time in many countries. Similarly performing barium enemas is a common task and is appropriate for skill-mix development.

Reporting peripheral trauma cases is a new venture in one country where there is a paucity of radiologists and where radiographers have been reviewing peripheral trauma radiographs on a monitored basis for some years.

Non-radiologist Reporting

In six countries, all radiological examinations are reported by radiologists including US. It is surprising that other clinical groups have not taken over some of the ultrasound work in these countries.

All reported by radiologists: 6

	Xray	US	CT	MR
Radiologist 100%	11	6	14	13
Radiographer	1	0	0	0
U/S technician	0	1	0	0
Clinician	2	8	0	1

These results are surprising as it reflects a more positive situation than expected. At present it does not appear that clinicians including cardiologists, orthopaedic surgeons and neurologists are purchasing and running their own MR and CT systems. However this is likely to change as CT replaces coronary angiography and dedicated MR systems are more widely marketed.

The figures do show that in most countries US is now used widely by a number of clinicians and this is unsurprising as it has been used extensively by obstetricians for many years and has never been the sole domain of the radiologist in most countries.

National Radiological Standards

Standards of service for radiological departments, which have been developed by national organisations or governments, appear to be the exception rather than the rule. A number of factors that would represent the quality of service delivery were included in the questionnaire to provide tangible information, but there are many others that may be developed.

National quality programme	6/14
Age of equipment	3/14
Storage of radiographs	7/14
RIS/HISS	4/14
Waiting time in department	2/14
Turn-around time	3/14
Patient satisfaction survey	4/14

The paucity of national standards may reflect the fact that in many countries the service is delivered through private practice or through an insurance-based system and

the purchasing power of the patient will drive the quality of the service. However, the lack of equipment and staff evident in most countries would suggest that the setting of agreed national standards might assist radiologists in the battle for resources at hospital and regional level. The United States has a primarily private system and yet the American College of Radiologists produces a wide range of standards which enable practices to use with insurance companies particularly in relation to risk management.

Conclusion

This is the first attempt by EAR / UEMS to undertake national benchmarking in Europe. The study is supplemented by data from the recent COCIR report and also from a benchmarking survey undertaken by the European section of the international society of radiographers to whom we are very grateful. There was considerable difficulty in collecting some of the data by the national representatives and the accuracy of the data cannot be guaranteed and has not be independently verified. Data on costs of examinations proved very difficult to provide especially with currency differences and has not been included in this report. It is, however, very important that we evaluate the financial input to radiology.

It is important that this initiative continues and therefore it is imperative that national societies develop systems for collecting data, especially where there is a large private sector.

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