

EUROPE'S LOOMING RADIOLOGY CAPACITY CHALLENGE
A COMPARATIVE STUDY
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United Kingdom, France, Germany,
Sweden & Denmark

TMC



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“For me the main threat is the shortage of radiologists.”

Dr. Lluís Donoso, ESR President 2015/2016

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Executive Summary

Europe is currently experiencing a complex demographic transformation which is increasing pressure on healthcare resources across the continent. Specifically, in the field of radiology there is a widening capacity gap driven by a steady increase in demand for cross-sectional imaging (CT and MRI) and a stagnating number of trained radiologists available to report these images. This is resulting in a significantly increasing workload for consultant radiologists and is a manifestation of an unparalleled capacity challenge in radiology. European governments and institutions will have to address this as a matter of urgency. The challenge is significant and is manifested differently across European countries.

The key findings of the report are:

- **The UK has the most profound capacity challenge and the lowest number of practicing radiologists per capita. It will not be able to cope with predicted demand in the coming years.**
 - Currently there are only 4.7 radiologists per 100,000 population (by far the lowest number amongst all the countries analysed in the report).
 - Eight full-time equivalent (FTE) radiologists per 100,000 population would be required by 2022 to close the gap.
 - At current rates of growth, the UK will be unable to cope with predicted demand for CT and MRI examinations in the short, medium and long term.
- **France does more CT scans per capita than any other European country, and faces a double threat regarding its radiologist population**
 - The radiologist workforce is ageing: the average age of a consultant radiologist was 51 years in 2010.
 - An unequal geographical distribution of the radiologist workforce represents a major challenge to the country-wide provision of imaging services. The majority of consultants are concentrated around Paris and the Mediterranean coast.
- **Germany does twice as many CR and MRI scans per capita than most other countries**
 - However, this is only possible due to the common (but questionable) practice of non-radiology specialists interpreting CR themselves.

European Overview

- The UK has the most profound capacity challenge (and the lowest number of practicing radiologists per capita).
- France does more CT scans per capita than any other European country.
- Germany's CR and MRI scanning far exceeds the scanning activity in other European countries.

CT exams per 1,000 population

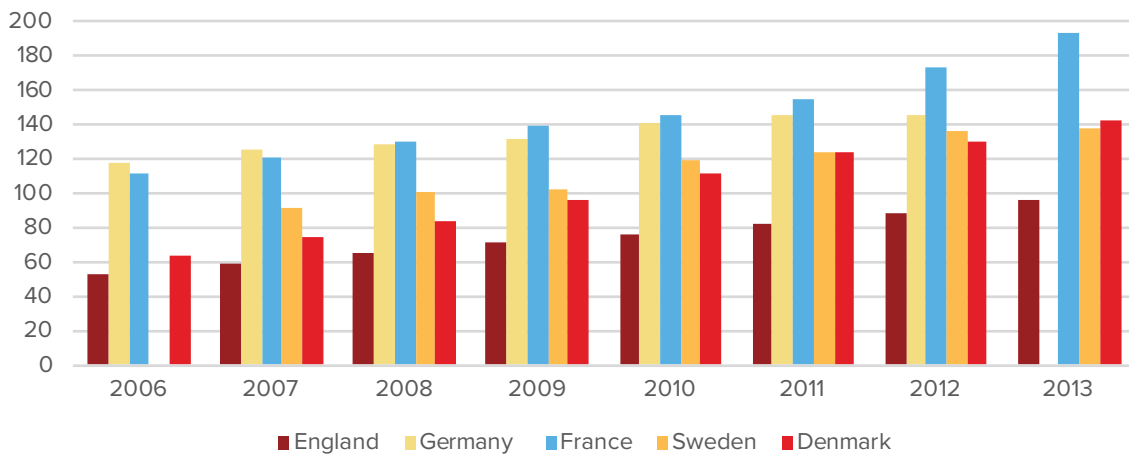


Figure 1: France carries out most CT exams per population, followed closely by Germany. While both Denmark and England came from a low level in 2006, only Denmark increased to levels comparable to the bigger countries in Europe. [England data based on period from April 1st of given year until March 31st of next year]

MRI exams per 1,000 population

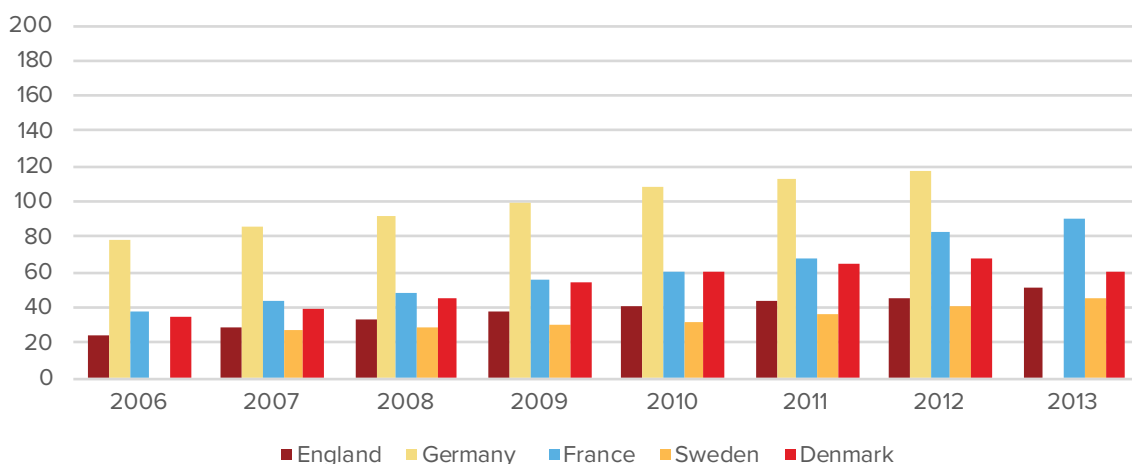


Figure 2: Germany leads in MRI exams performed per head of population. However other countries are catching up. In the period between 2011 and 2013, the number of MRI examinations performed in France has increased considerably. Denmark and especially England and Sweden are at lower levels of scanning. [England data based on period from April 1st of given year until March 31st of next year]

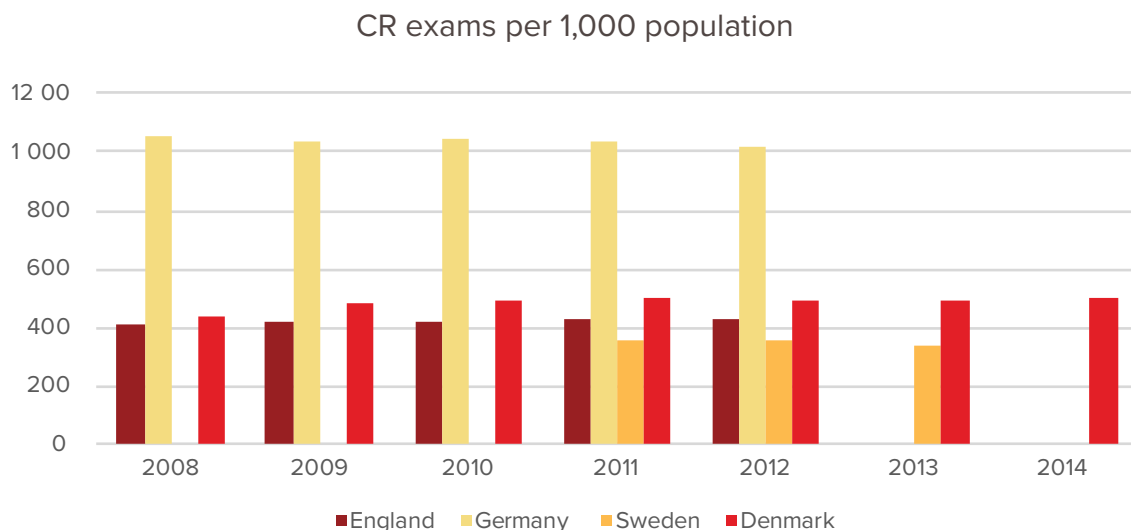


Figure 3: The overall level of CR exams per capita has stabilised with negligible growth rates in all four European countries for which data was available. Germany performs more than double the amount of CR exams compared with any of the other European countries analysed, with more than one CR examination per capita per year. [England data based on period from April 1 st of given year until March 31 st of next year]

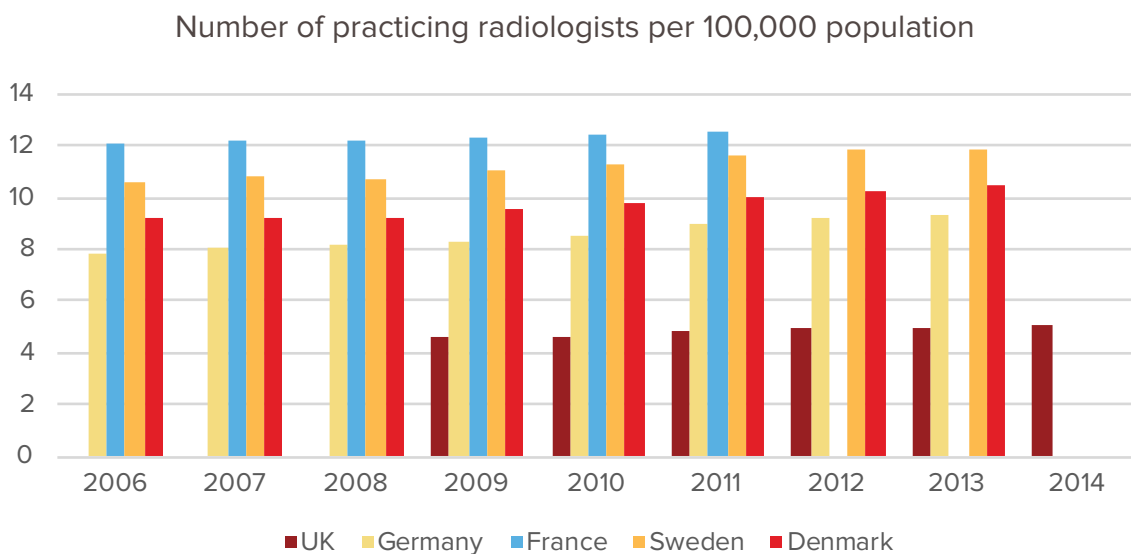


Figure 4: The UK is the country with by far the lowest number of consultant radiologists per head of population. While other countries in this analysis are in a more comfortable situation, for most of them the development of radiology capacity remains close to stagnant over the years.

United Kingdom

- The UK will not be able to cope with predicted demand for CT and MRI scans in the short, medium and long term.
- To meet this demand, eight FTE radiologists per 100,000 population would be required by 2022.
- Currently, there are only 4.7 per 100,000 population, by far the lowest number amongst all the countries analysed in this report.
- Radical **solutions are needed to support the current workforce** and to enable them to work efficiently to face this challenge.

This limited capacity is likely to contribute to limiting general cross-sectional imaging levels in England, see Figure 1 and Figure 2.

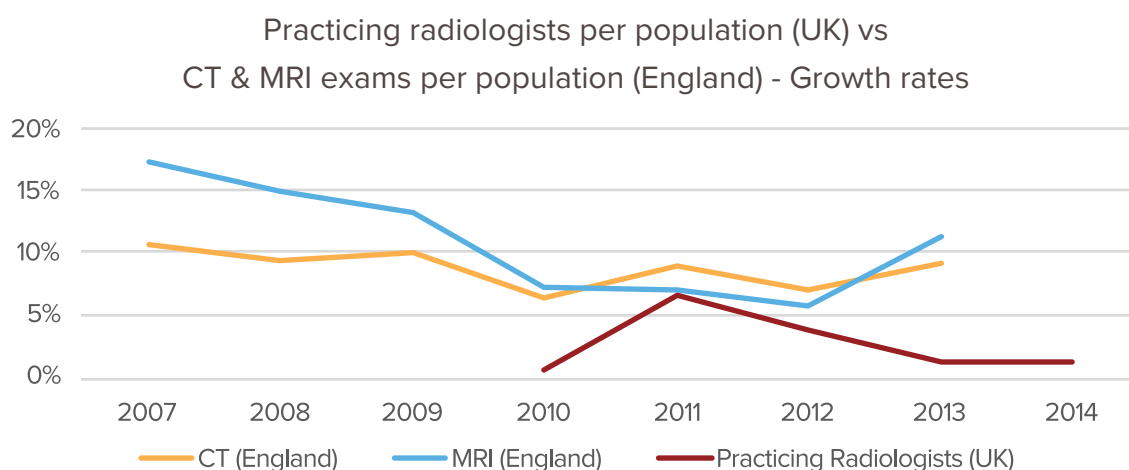


Figure 5: The growth rates of CT and MR exams, having decreased slightly, are still around the 10% mark while the radiologist workforce remains completely stagnant in recent years.

The challenge of continuously increasing cross-sectional imaging with limited and stagnant radiology capacity is exacerbated by the increasing complexity of exams and more comparisons to prior exams.

In order to satisfy this demand, the Royal College of Radiologists (RCR) has set a target of a minimum of eight FTE radiologists per 100,000 population. However, based on current projections, by the year 2022 the UK will only reach 5.7 FTE.

The massive gap between demand and capacity also becomes apparent when looking at absolute numbers. According to the RCR, 4,370 FTE radiologists would have been required to handle the case volumes in the UK in 2015. Only 2,549 FTE were available, resulting in a shortfall of 1,821 FTE radiologists.

This challenging situation is directly affecting patients as it is causing delays in diagnosis and treatment.

Among the tactics used to meet the shortfall in radiologist capacity in 2014 were:¹

- Additional paid reporting by own radiologists outside contracted hours: used by 79% of radiology departments.
- Outsourcing of reporting to an independent sector company: used by 58% of radiology departments.
- Employing ad-hoc locums: used by 48% of radiology departments.

Among further possible solutions discussed at NHS Trusts were sequence reduction, radiographer reporting, demand management and collaborative regional radiology networks. Radiology networks in particular are receiving more and more attention, with several recent RCR publications stating the value they can provide by helping to make the best use of existing resources. Several UK trusts are already joining forces to tackle the capacity gap through collaboration. One example is the Working Together Programme in Yorkshire and Derbyshire, connecting seven NHS Trusts.

1 RCR census 2014

France

- France's **ageing radiology workforce poses the biggest threat to its radiology services**. In 2010, the average consultant radiologists was 51 years old.
- The unequal distribution of the radiologist workforce represents a big problem for the country-wide provision of imaging services.
- The overwhelming majority of consultants are concentrated around Paris and Mediterranean coast.

At first sight France seems to be in a comfortable situation regarding the radiologist workforce, with 12.5 radiologists per 100,000 citizens in 2011. However, looking at development of demand and capacity we can see that France's position is unsustainable. CT and MRI exams per population show annual growth rates between 6% and 16% while the number of radiologists per population remains flat.

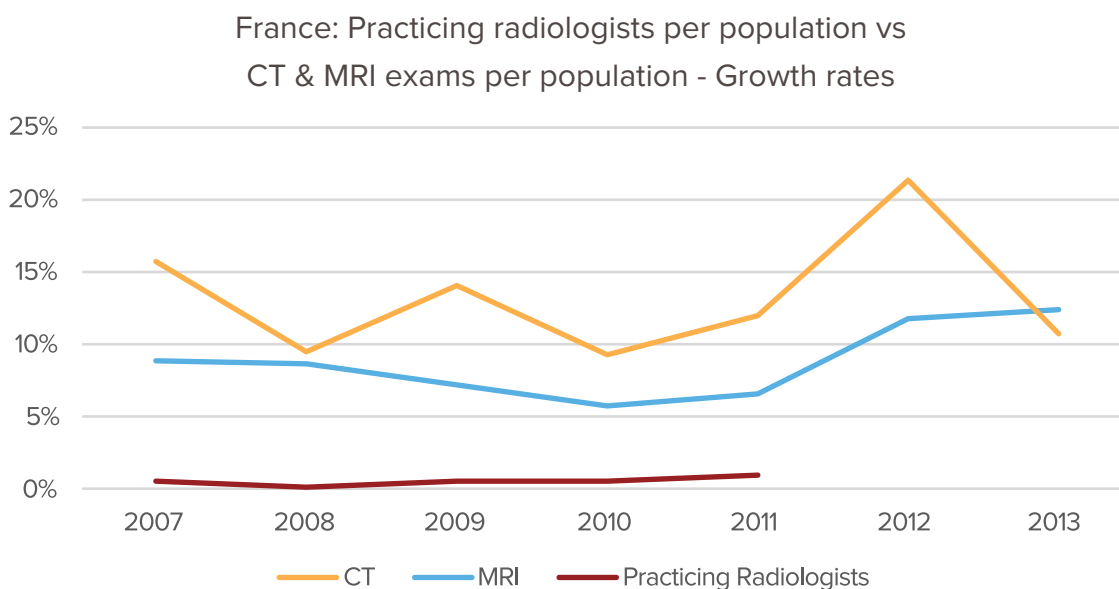


Figure 6: High growth rates of CT and MRI exams are not matched by any significant growth of the radiologist workforce.

However, the most alarming threat to the French radiology market is the ageing radiology workforce. In 2010, the average age of consultant radiologists in France was 51.3 years and 65% of the radiologists were 50 or older, meaning that only 35% of the current workforce will still work in 2025.

Age distribution of radiologists in France

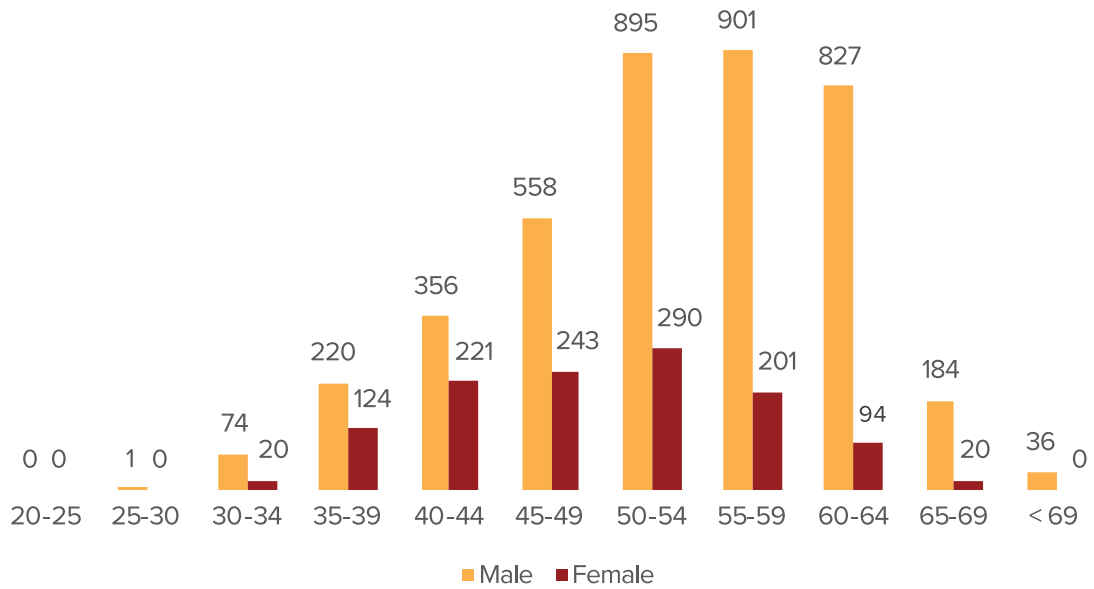


Figure 7: The population pyramid of radiologists in France could be seen as a ticking time bomb.

In addition, the distribution of radiologists around the country is highly unequal. The highest density of radiologist populations can be found in the metropolitan area of Paris and around the Côte d'Azur in the south while other regions continue to have alarmingly low levels of cover (see Figure 8).

Workforce density map of France

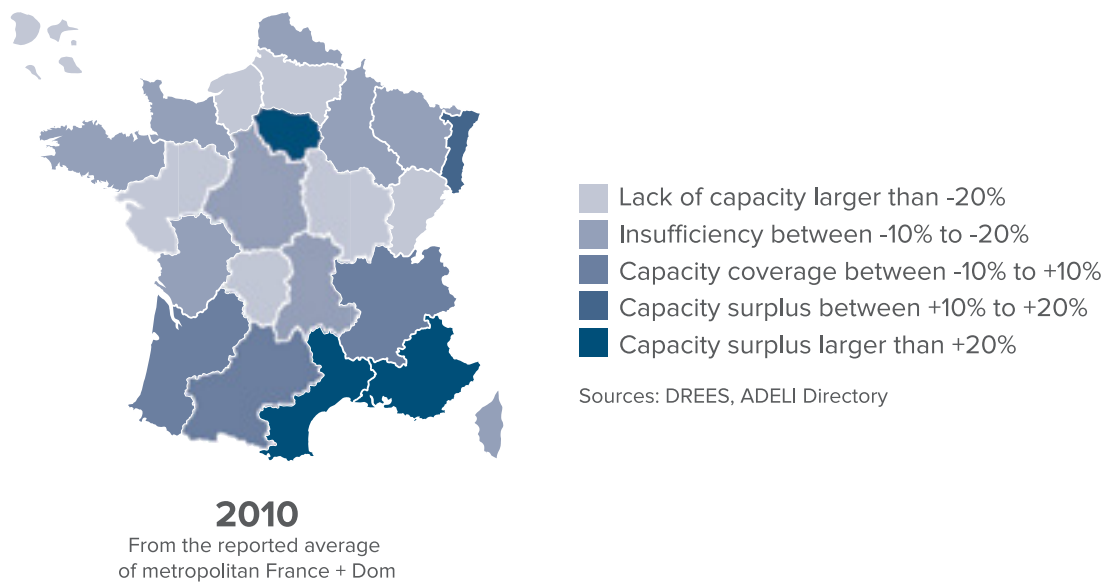


Figure 8: The radiologist population density map of France reveals vast differences among French regions.

Germany

- Germany has achieved a good balance between demand and capacity growth rates.
- On MRI and CR volumes, Germany far exceeds its European counterparts, doubling the numbers found in some other countries.
- However, this very high number of CR cases is only possible due to the common (but questionable) practice of non-radiology specialists interpreting CR themselves.

At first glance Germany seems to be in a comparable position to France, with a relatively healthy level of 9.3 radiologists per 100,000 population in 2013 (Figure 3). However, the case volumes are a cause for concern. German media has termed Germany the 'world champions' of MR exams². Our overview in Figure 2 confirms that Germany performs more MR exams than any other country analysed. While Germany trails behind France in CT, it does twice as many CR exams as the other European countries, with more than one exam per person per year. These extraordinarily high levels can only be handled because of the questionable common practice in Germany of non-radiology specialists (e.g. in orthopaedics) interpreting CR cases themselves without the support of a qualified radiologist. This issue has been picked up by the media,³ which advise patients to question whether a CR is really necessary. They claim that often the reasons for carrying out a scan are driven by financial return, with decisions to carry out imaging being made because of the need to amortise expensive equipment. Reports also warn about CT scans being carried out purely as a preventive measure in Germany, instead of for actual diagnosis, thus exposing patients to unnecessary radiation.

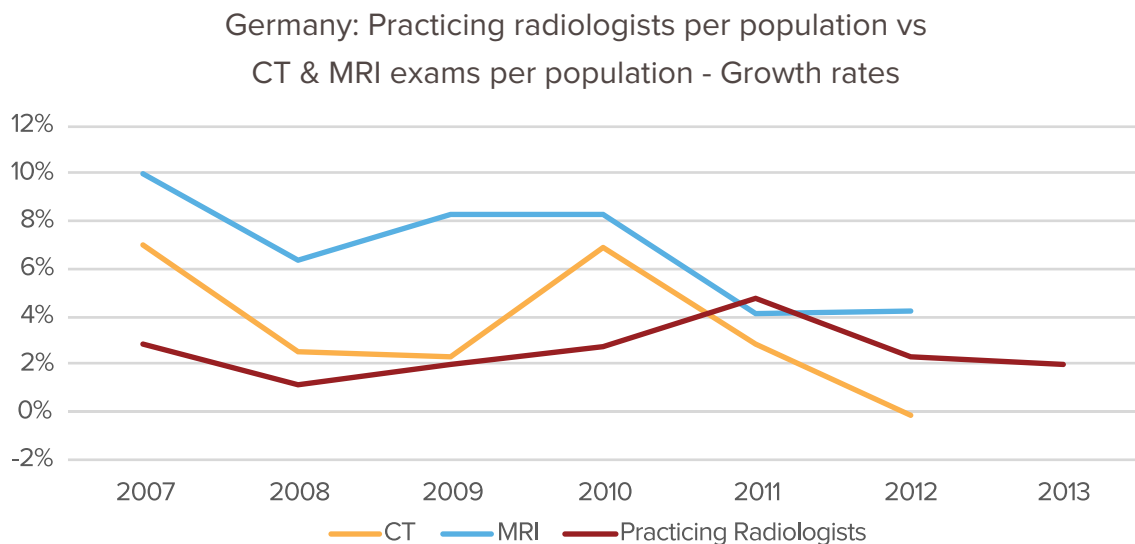


Figure 9: The growth rates of cross-sectional exams have decreased over recent years and reached better alignment with radiologist growth rates.

2 http://www.aerztezeitung.de/politik_gesellschaft/krankenkassen/article/639169/deutschland-weltmeister-mrt-untersuchungen.html

3 <http://www.fr-online.de/gesundheit/schaedliche-strahlen-fuers-roentgen-braucht-man-einen-guten-grund,3242120,14998076.html>

Sweden

- Sweden is in a relatively balanced situation, however trends point towards future increase of the currently small capacity gap.
- The government has plans to stabilise the increasing demand for radiology services.
- The shortage of specialist radiologist will reach 500 within five years.
- The imbalance is expected to be solved by 2025.

Radiology in Sweden is in a more comfortable position than in many bigger countries in Europe. The number of MRI exams per 100,000 population remains relatively low (Figure 2), while CT exams per 100,000 population are moderately high, but still below the values of Germany and France.

Sweden shows a solid capacity situation, with 11.8 radiologist per 100,000 population in 2014 (Figure 3).

The growth rates of cross-sectional exams have mostly exceeded the growth rates of radiologist capacity (see Figure 10), which is an alarming trend.

At the moment, there are 100 radiologists in Sweden undergoing training to become specialists, which is exactly the shortage of specialists today according to the Swedish National Board of Health and Welfare (Social Styrelsen). Experts foresee this shortage will reach 500 within five years, confirming the negative trend.

However, the Swedish government has already started to take action and plans to introduce referral guidelines, so that no unnecessary exams are performed and the ones that are performed are the most appropriate for each case. This is one of the initiatives which should allow Sweden to reach a balance of demand and capacity by 2025.

Sweden: Practicing radiologists per population vs
CT & MRI exams per population - Growth rate

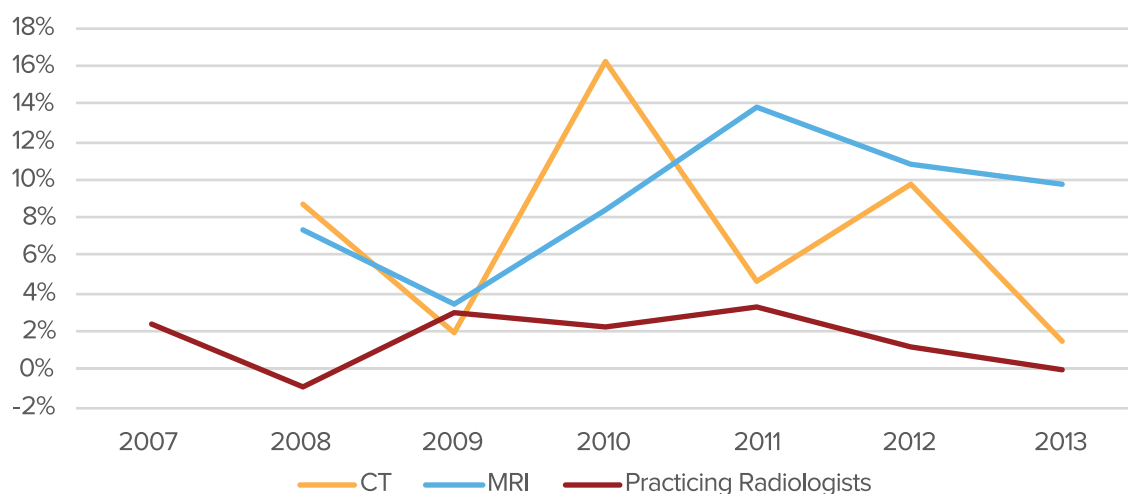


Figure 10: Growth rates of CT and MR have continuously exceeded growth rates of practicing radiologists.

Denmark

- Denmark has a balanced average demand and capacity situation compared to other EU countries.
- Alarming volume growth rates before 2010 have now stabilised.
- The Danish authorities' objective is to further control and avoid unnecessary scans in the future.

Denmark sits in the middle of the European pack both in MR and CT volumes per population as well as per capita radiologist capacity (Figure 1, Figure 2 and Figure 3).

Historically Denmark's cross-sectional volumes per population have been hitting a very high growth rate up until 2010 (see Figure 11). This becomes obvious when comparing number of CT exams per population with its neighbour Sweden. Denmark started at a significantly lower level but surpassed Sweden in 2013 (see Figure 1) This has not been met with a similar increase in the number of reporting radiologists. However, a stabilisation of volume growth was finally achieved in 2012.

A report from the Danish Health and Medicines Authority (Sundheds Styrelsen) confirms that Denmark is facing similar challenges to other European countries. There is a clear concern about allocation of scarce resources and the need to implement tight controls to avoid unnecessary scans in the future.

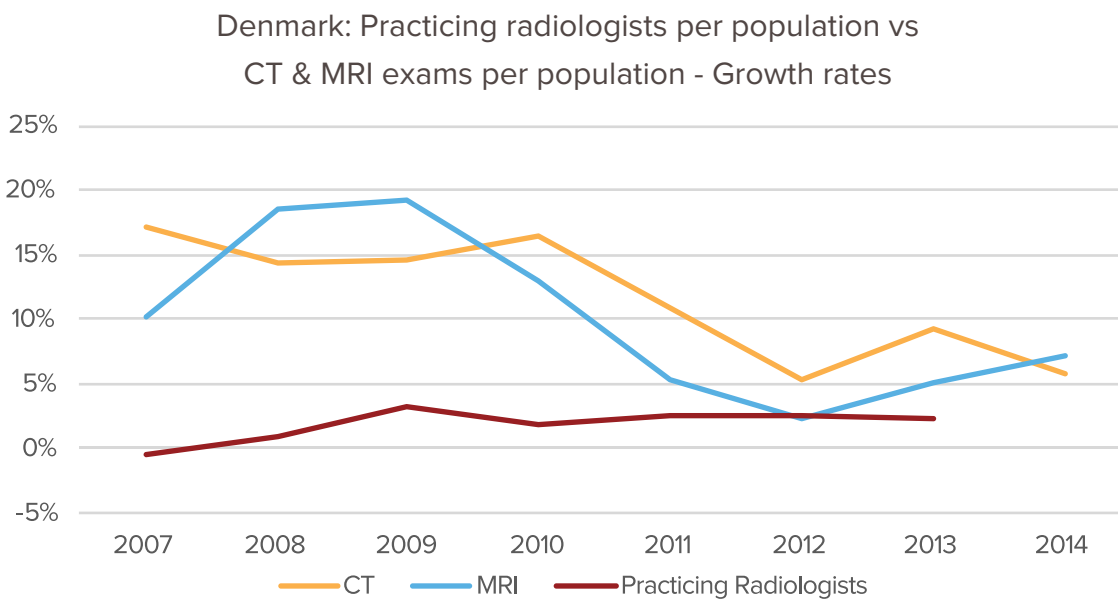


Figure 11: Very high historic growth rates of exam volumes per population decreased significantly as of 2010.

The Way Forward

We recommend the following measures to tackle the European capacity challenge:

In the short term: Strengthen subspecialty reporting services

Quality reporting services can provide capacity when and where it is needed. If the capacity situation in one country is stretched, cross-border services allow adding additional capacity from other countries in Europe to the national radiology workforce. Elective services should be provided by subspecialised radiologists and peer-review systems should be in place for quality assurance. For on-call services, reporting from a different time-zone (daytime reporting for European night-time cases) often provides the highest quality short term solution.

In the medium term: Establish collaborative radiology networks. Collaborative diagnostic networks allow the best possible use of existing resources by establishing true sub specialisation, which in turn improves patient outcomes and reporting efficiency. A flexible home reporting component would ensure that the radiologists' reporting time is protected from distractions. The centralisation of on-call reporting frees up much needed capacity during the day. In addition, the networked approach allows better load balancing, i.e. the flexibility to have cases reported wherever the right radiologist resources are available. The uneven regional distribution of reporters in France is a good example of where collaboration through radiology networks can help to solve this challenge.

In the long term: Increase training numbers and ensure high quality training of current workforce

According to the **Royal College of Radiology's** recent report: **Radiology Training 2016-2026 - a vision and a solution**, there is an urgent need for increasing radiology training across the UK. The RCR has announced its aim of building the UK radiologist network from 4.8 radiologists per 100,000 population in the UK to at least 8 whole time clinical radiologists per 100,000 population by 2026.

The challenge in the UK and other countries, is to not only increase the total number of radiology trainees in the profession and to ensure that there is a regular pipeline in the future, but also to ensure that the continuous education programmes that are available are of the highest standard. They must also be professionally robust, lead to internationally recognised qualifications and be convenient and affordable for radiology professionals.

These targets will only be met through a combination of public sector initiatives such as those proposed by the Royal College of Radiologists and private sector programmes which have the capacity to meet the continuous education needs of the radiology profession.

MR & CT exams

Country	Source
England	NHS
Germany	Bundesamt für Strahlenschutz
France	OECD
Sweden	Calculated from Nysamrapport Röntgen 2013 (exams per 1000 capita, median of 13 regions representing 31% of the population) and Statistiska centralbryån data.
Denmark	OECD

Population

Country	Source
UK	Office for National Statistics
England	Office for National Statistics
Germany	Statistisches Bundesamt. Note: As of 2011 new population census.
France	Insee
Sweden	Statistiska centralbryån
Denmark	StatBank Denmark

CR exams

Country	Source
England	NHS
Germany	Bundesamt für Strahlenschutz
Sweden	Nysamrapport Röntgen 2013
Denmark	Statens Serum Institut

Number of radiologists

Country	Source
UK	RCR Clinical Radiology UK Workforce Report 2015
Germany	Bundesärztekammer
France	Ministère du travail, de l'emploi et de la santé, ADELI. (Unsure about if these numbers only include practicing radiologists)
Sweden	Socialstyrelsen (National Board of Health and Welfare)
Denmark	Statens Serum Institut

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