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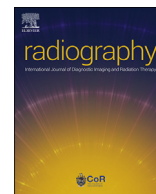
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# Radiographers in ultrasound: Motivation and role expansion. A survey of European Federation of Radiographer Societies (EFRS)

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## ABSTRACT

**Introduction:** Variability in non-medical ultrasound practice across Europe has been highlighted in studies. Meanwhile, advanced practice in radiography has undergone rapid development in the United Kingdom (UK). This survey aimed to review results relating to extended role and advanced practice skills, motivation and job satisfaction from a wider survey of radiographers undertaking ultrasound examinations across the European Federation of Radiographer Societies' (EFRS) community.

**Methods:** Following a pilot study, a SurveyMonkey™ on-line questionnaire was disseminated to EFRS member societies to share with their members, and via social media platforms. Quantitative questions for this article related to extended and advanced practice skills, communication of results, job satisfaction, motivation and career development. Theme analysis was used to assess qualitative feedback concerning priorities for future developments within the ultrasound role.

**Results:** There were 561 responses, mainly from the UK, Ireland and Spain (81%). The majority (83.4%) of UK sonographers communicate findings to patients, compared with 27.1% in other EFRS countries. More engage with teaching (UK = 90.1%, non-UK 72.9%) compared with activities in the other advanced practice domains. The lowest involvement was the research domain, with only 33% actively involved in research. Radiographers were motivated to undertake ultrasound to develop their knowledge and skills and assume more responsibility.

**Conclusion:** Wide variations in ultrasound practice were seen across respondent countries. Generally, radiographers are happy with their ultrasound roles, although priorities include legislation for the sonographer role, remuneration, respect or support from medical colleagues, high quality education and role progression opportunities.

**Implications for practice:** The findings provide a better understanding of radiographer views which can assist radiographer societies and local teams to develop strategies to enhance advanced practice skills development and career prospects in ultrasound.

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## Introduction

Variability in ultrasound practice across Europe has been documented in recent publications.<sup>1–4</sup> Limited opportunities are available in several European countries for radiographers aspiring to

extend their role into ultrasound.<sup>3</sup> Common reasons for this include lack of legislation/regulation enabling independent ultrasound practice and resistance from medical professionals particularly in countries with funding models whereby radiologists have to provide the final report before being recompensed.<sup>3</sup> Cowling (2008)

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highlights the disparity of radiographer role extension globally, but particularly the variation across Europe, although this was 13 years ago.<sup>5</sup> Some authors believe that sonography should be the domain of the radiologist or other medical professionals.<sup>6,7</sup> Evidence suggests that with appropriate education and training, on-going support, audit and continuing professional development (CPD) radiographers and other non-medical professionals can provide a safe, effective ultrasound service.<sup>2,3,8</sup>

Role development is defined as expanding practice with the same level of responsibility,<sup>9</sup> whereas role extension or extended scope of practice is the development of additional clinical skills and associated accountability after qualification.<sup>10</sup> Role extension has also been explained as undertaking roles that have been previously undertaken by others, thus increasing autonomy and responsibility.<sup>9</sup> This can include additional clinical competencies and possibly complex procedures such as biopsy, amniocentesis, therapeutic injections, contrast enhanced ultrasound and drainages.<sup>11–13</sup> Extended role differs from advanced practice or advanced clinical practice (ACP), which is defined in different ways worldwide.<sup>14</sup> Caulfield (2021) proposed 'expert clinical practice' with additional involvement in at least one other 'domain' of advanced practice.<sup>10</sup> Health Education England (HEE) define ACP as experienced autonomous practitioners involved in complex decisions and working within the "four pillars of clinical practice, leadership and management, education and research",<sup>15</sup> concurring with other publications.<sup>11,16</sup> Sevens (2018) suggests that report writing is no longer enough to justify the title 'advanced practitioner',<sup>16</sup> whilst Hardy et al. (2021) recognise that over time advanced practice elements of a role become embedded into normal practice.<sup>11</sup> Further work has recently been undertaken by HEE to develop a career framework for sonography to enable progression to advanced and consultant level practice.<sup>17</sup>

As part of a series of surveys, the European Federation of Radiographer Societies (EFRS) aimed to investigate radiographer practice within extended and advanced practice roles in ultrasound. This article reports one part of a wider study exploring current radiographer practice in ultrasound. The key aims of this article are to present results relating to motivation for developing ultrasound skills and perspectives on current practice and future role expansion.

## Methods

An on-line survey was developed by an ultrasound working group on behalf of the EFRS as part of a larger suite of surveys in 2019. SurveyMonkey™ was used to devise the survey, which was piloted in five EFRS countries ( $n = 12$ ). Minor changes to wording of some questions was made, to help with clarity. Convenience sampling was used, whereby Radiographer Societies who opted in at the initial survey disseminated the current survey to their members,<sup>3</sup> alongside using social media (Facebook, LinkedIn and Twitter).

The survey was sent on behalf of EFRS members as a membership survey in October 2019 and closed, after an extension in January 2020. Ethical principles and general data protection regulations were followed and were clearly articulated in the introduction to the survey. Participants were asked to consent to their anonymous information being disseminated to the EFRS executive committee, in publications and presentations, before beginning the survey. Questions covered a wide range of topics, this article will focus on issues relating to wider practice, motivation, current and future role expansion. Participants could leave out questions which were not applicable to them.

Results were collated in Excel. Descriptive statistics were used, along with a chi square test to compare Likert scale results for those

reporting sonographer practice within their country to those without. Thematic analysis was used for qualitative responses to the question relating to priorities for future developments<sup>18</sup> comparing the United Kingdom (UK), Ireland and the other respondents.

## Results

The survey resulted in 561 responses from 25 (58%) EFRS countries, some of which are reported elsewhere. Respondents from 10 countries (Austria, Cyprus, Denmark, Finland, France, Jersey, Malta, Netherlands, Sweden, UK) all reported that radiographers undertake ultrasound. Four countries had no radiographer input into ultrasound (Croatia, Czech Republic, Germany, Poland) and the remaining 11 had a mixture of responses, although for Ireland, only two of 113 respondents responded no to the question "do radiographers perform ultrasound scans in your country?". Of 349 respondents answering questions about their wider role, the majority ( $n = 291$ , 83.4%) were involved in teaching ultrasound to other staff. Far fewer sonographers reported being involved in research, audit and leadership with only 115 (33%) indicating any involvement in research (Fig. 1 and Table 1). Communicating ultrasound findings directly to patients was part of the role in 60.2% ( $n = 210$ ) of cases (Fig. 1). The results in Fig. 1 were separated to demonstrate the percentage responses for UK and non-UK countries due to differences in UK practice highlighted in previous studies<sup>3,4,7</sup> and the preponderance of UK respondents.

Respondents were asked for their perspectives on different aspects of the sonographer role (Fig. 2). Chi squared tests compared the responses from those reporting that radiographers did perform ultrasound scans in their country with those who did not. There was no statistical significance ( $P > .05$ ) in any statement other than "A radiographer specialised in ultrasound should provide a final report on ultrasound scans that they perform", which showed a significant difference between the two groups ( $P < 0.001$ ) in relation to positive responses.

Fig. 3 demonstrates the motivations for working in ultrasound, most commonly to increase knowledge and skills and for a new challenge. Fig. 4 reveals sonographers' views regarding their current work situation. Qualitative feedback on priorities for future developments was compared between Ireland, the UK and the remaining respondents, due to high numbers responding from the UK and Ireland and the disparity in practice across Europe (Fig. 5).

## Discussion

Based on responses to this survey, most radiographers independently perform ultrasound examinations, but outside the UK fewer independently report, despite the majority thinking the sonographer should report independently (Fig. 2). This leads to questions about what constitutes independently performing an ultrasound investigation. The provision of a final report was the only statement demonstrating a significant difference between those who are and are not aware that radiographers perform ultrasound in their country. It could be hypothesised that this is linked to limited awareness of the full extent of the sonographers' role. Report writing is an integral part of the examination in the UK.<sup>19,20</sup> Findings from this survey demonstrated a higher percentage of respondents (96.4%) agreed that a radiographer specialised in ultrasound should provide the final report compared with 82.8% of EFRS radiographer societies.<sup>3</sup> Again, this difference might be explained by the predominance of responses from the UK and Ireland.

Communication of findings to patients, in the era of person-centred care, can help to reduce anxiety<sup>21,22</sup> however over 15% of

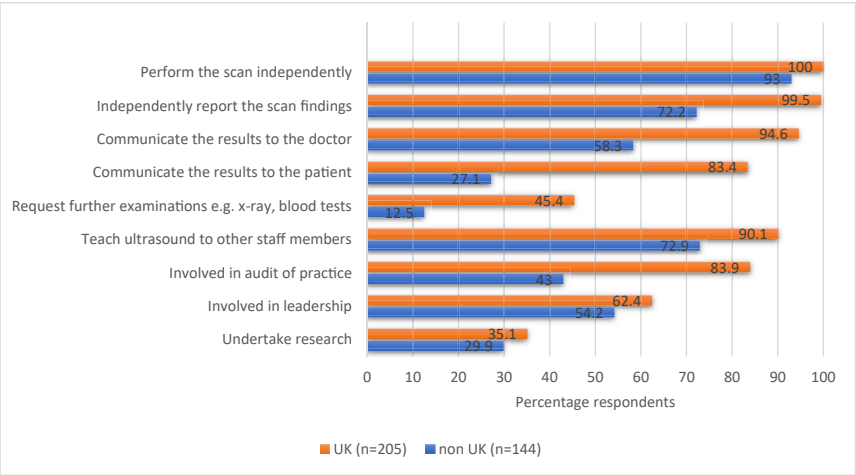


Figure 1. Involvement in the examination and wider areas of practice: UK compared with non-UK countries (percentage).

Table 1  
Involvement in the non-clinical advanced practice pillars (percentage).

Country (n=number responding to the question)	Audit	Teaching	Leadership	Research
Austria (n = 2)	0	50	0	50
Belgium (n = 2)	50	50	50	100
Bosnia and Herzegovina (n = 2)	0	0	100	100
Denmark (n = 10)	20	60	0	20
Estonia (n = 4)	25	25	50	25
Finland (n = 4)	25	25	0	0
France (1)	100	0	100	0
Ireland (n = 89)	55.1	83.1	70.1	29.2
Italy (n = 2)	0	50	100	0
Malta (n = 4)	0	50	50	0
Netherlands (n = 4)	25	50	0	25
Norway (n = 1)	100	100	0	0
Portugal (n = 2)	0	50	0	100
Spain (n = 14)	21.4	78.6	28.6	35.7
Sweden (n = 3)	66.7	100	66.7	66.7
United Kingdom (n = 205)	83.9	90.1	62.4	35.1

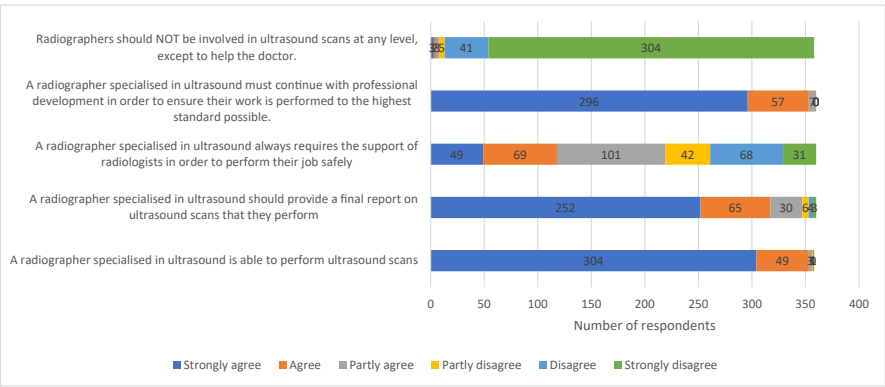


Figure 2. Response to questions about radiographers undertaking sonography.

UK and 72% of non-UK sonographers are not discussing the results with patients at the time of the examination. In Australia communication of results by sonographers is dependent on local working practices, with one study suggesting that limiting sonographers' ability to communicate findings can lead to increased stress and a reduction in professional identity.<sup>22</sup> Brasseur (2012) suggested that

sonographers were dissatisfied with their role, when unable to communicate findings to patients,<sup>23</sup> although the contrary view is that radiologists lack the training to communicate results to patients.<sup>24</sup> Outside the UK, differences are likely to be linked to the legalities and issues related to lack of independent report writing, as highlighted within this study and previous publications.<sup>1–3,22</sup> One

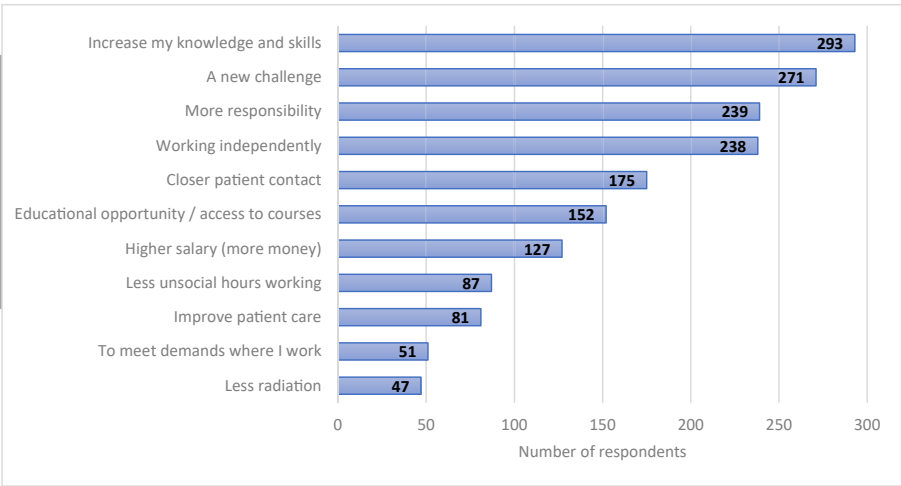


Figure 3. Motivation for undertaking ultrasound.

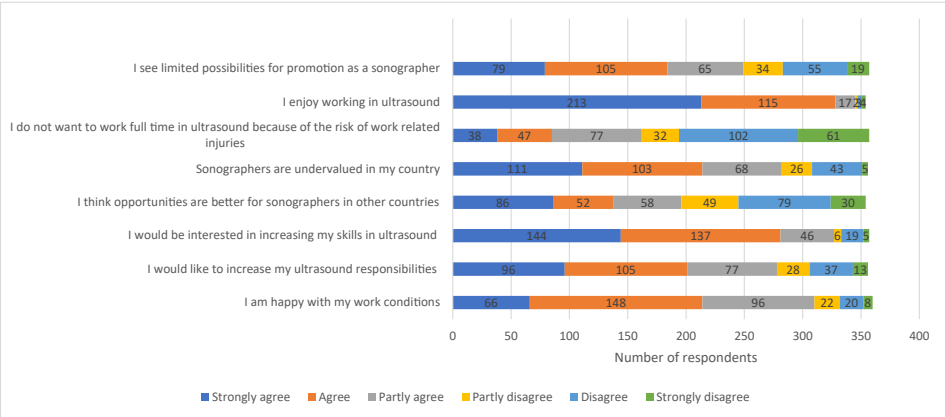


Figure 4. Radiographers' responses relating to their working situation.

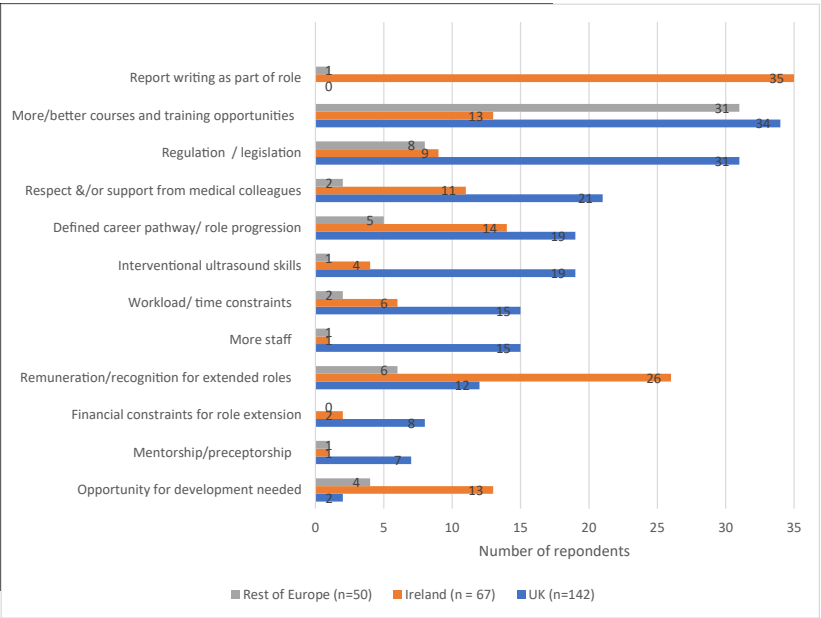


Figure 5. Key themes for future priorities for radiographers in ultrasound.

respondent said they verbally explain findings in obstetrics and paediatrics only [participant 25,UK]. Another reveals that:

*“communicating with patients is left to sonographer discretion - we have a free hand to share information if results are normal or benign. However, if complex pathology, high suspicion of malignancy or awaiting other results then this information may not be shared”* [23,UK].

This suggests that in some instances normal sonographic findings are communicated to the patient by the sonographer, but not always the abnormal or complex findings. Further exploration as to whether this is a common occurrence or alternatively why a proportion of UK sonographers are not communicating findings to patients is warranted.

### Advanced practice

This study demonstrated higher levels of engagement with teaching ultrasound to other staff (83.4%) than results found by Milner and Snaith (2017),<sup>25</sup> although the current study failed to determine the type of educational involvement, to map to the ACP framework.<sup>15</sup> Fewer radiographers are involved in the other domains of advanced practice (Fig. 1 and Table 1). Audit of clinical practice is essential to learning, quality improvement of the service and patient outcomes.<sup>26–28</sup> In this study 67% (n = 234) of sonographers are involved in audits of ultrasound practice, compared with 58% reported in a study by Milner and Snaith,<sup>25</sup> however almost a third are not auditing their practice, despite this being an expectation of the role.<sup>26–28</sup> One respondent commented:

*“Peer reviews should be mandatory. I find that some sonographers are resistant to peer review”* [171,Ireland].

In the UK there is a strategy to ‘transform’ diagnostic pathways, by developing community diagnostic hubs to provide more local diagnostic imaging centres external to the acute hospital environment.<sup>29</sup> Radiographers and sonographers will require strong leadership and associated advanced practice skills to enable successful introduction of these new pathways and audit of patient outcomes.<sup>29</sup> Sevens (2018)<sup>16</sup> highlighted that reporting without the other pillars of advanced practice no longer constitutes advanced practice, although a recent publication reveals respondents describing ultrasound as an ‘advanced practice’ role.<sup>11</sup> This confusion about the advanced practice title was highlighted within the current study, with one respondent commenting:

*“Advanced practitioner status should be awarded to reporting radiographers ... Salaries should reflect the additional responsibility of the role.”* [15,Ireland]

Leadership is a crucial element of health care practice<sup>29</sup> and advanced practice,<sup>15</sup> however the results in this study demonstrate that between 54.2% (non-UK) and 62.4% (UK) of sonographers are involved in leadership (Fig. 1), which compares with self-identified advanced practice radiographers in a 2017 study.<sup>25</sup> Only one respondent mentioned leadership in the qualitative feedback:

*“Increased responsibility and respect to allow me to work as a consultant sonographer (four tiers) ... Increase my use of CEUS elastography and 3D to benefit the patient pathway. Increase my role in the discharge of patients pathways ... Increase my role in governance. Increase my role in leadership and education for the above. This to grow the potential of radiographers doing ultrasound to benefit patients”* [410,UK]

Limited numbers of sonographers undertake research (33%), which corresponds to a recent Nordic study,<sup>30</sup> which was interesting given that 70% of EFRS societies reported actively supporting research in 2015<sup>31</sup> and 75% in 2017.<sup>32</sup> Milner and Snaith (2017) found that 72% of advanced practitioners engaged with research and service development, although only 19.7% specifically undertook “research activity”.<sup>25</sup> Research was not seen as a priority for clinical departments,<sup>33</sup> which correlates to Harris and Paterson’s (2016) suggestion that staff are more likely to engage with research if they are supported within the workplace, have sufficient skills, confidence and protected time.<sup>34</sup> This was supported by comments such as, *“I would like to be involved in research but there’s limited support for Radiographers”* [77,UK].

A UK study of consultant practitioners recognised that 61% of staff had no time in their work plan for research,<sup>33</sup> which concurred with 48% of consultant radiographers highlighting time as a barrier to undertaking research.<sup>34</sup> Mitchell’s editorial emphasises the need for sonographers to actively participate in research and engage with evidence-based practice and again identifies lack of knowledge and skills as a barrier, but recommends doctoral level study and joining inter-professional research groups to overcome this.<sup>35</sup> In the current study, three countries had 100% of respondents undertaking research, but caution is needed when interpreting due to low response rates (Table 1). Of UK sonographers, 35.1% reported undertaking research as part of their role, with similar figures for Spain. A 2009 study in the UK has comparable numbers involved in research (33.5%), despite almost 90% understanding the value of research.<sup>36</sup> Barriers included time, support, education, workload and staffing pressures.<sup>36</sup> Cancer research UK (2021) reports quality improvements within ‘research-active hospitals’ and recognise similar challenges.<sup>37</sup> Furthermore funding is predominantly biased towards medical professionals, with allied health professionals being under-represented in research, as clinical roles are often prioritised over research activities.<sup>37</sup> Benefits to staff and patients, including increased job satisfaction and expertise, along with associated improvements in health outcomes are reported.<sup>37</sup>

In this study one respondent who worked as a researcher elaborated *“I believe clinical research is an area that should be grown by our profession.”* [470,UK]. Another PhD academic researcher agreed that it was important to develop *“the role and opportunities for clinical advancement, research and education”* [542,UK].

Four UK respondents highlighted a desire to be involved with research, but identified barriers linked to availability, funding and support:

*“Would like to undertake research but not available in my locality”* [405,UK]

*“More funding/ support to part take in research”* [256,UK]

*“I would like to be involved in research but there’s limited support for Radiographers. Self- funding may be my only option”* [77,UK]

Literature suggests many benefits to advanced practice, particularly if accredited or regulated, including increased job satisfaction, staff retention, professional recognition, improvements to patient care and quality of imaging.<sup>10–12</sup> Further research and publication of the impact of advanced practice roles would assist progression within ultrasound and other fields of practice.<sup>9,11</sup> Barriers to advanced practice are similar to those for research, predominantly education to support the development of additional skills, financial constraints and priority for medical training. A cultural shift has been proposed to enable change, alongside support and respect from medical colleagues for the sonographer role,



as indicated by a respondent: *“In my country there is a need for a cultural change in recognizing radiology technicians as healthcare professionals capable of performing the ultrasound examination”* [550,Italy]. Protectionism has been proposed as a barrier to the development of advanced practice skills in radiography<sup>9,11,12</sup> and ultrasound.<sup>3</sup> This is corroborated by statements from the thematic analysis (Fig. 5), such as:

*“radiologists attitude to sonographer role extension”* [503,UK]

*“Often Radiologists don't give us the support we need. Maybe they don't have the time ... I also think they don't agree with what we do, and shouldn't be advancing our role. With their support we could be better sonographers carrying out more examinations”* [56,UK]

*“There is a variable [acceptance by] doctors over [the] possibility that radiographers perform ultrasound”* [165,Spain]

Financial recognition for advanced sonographic skills was a particular issue for respondents in Ireland (Fig. 5), although in total only 22.6% of respondents maintain salary was a motivator for undertaking ultrasound and 11.5% of those were from Ireland. It could be hypothesised that this is due to low expectations based on current circumstances within the country.

*“We should be paid more for the responsible nature of the job”* [437,Ireland]

*“Recognition for the role with grade and salary appropriate”* [490,Ireland].

### Working practice

Many sonographers were happy with their working conditions, enjoyed working in ultrasound and aspire to extend their skills further (Fig. 4). Despite this, 79.4% felt undervalued. Similarly, 69.9% responded negatively to the question about opportunities for promotion. Respondents referred to the limited opportunity to progress clinical roles:

*“promotion tends to be into management rather than clinical progression”* [323,UK] which *“stops you having time to scan”* [61,UK].

Other respondents are required to wait for a role to become vacant, rather than progress based on skills and competencies:

*“only if a senior post or clinical specialist post becomes available that a promotion is available”* [189,Ireland]

*“the promotion structure does not allow for junior and senior grades”* [232,UK]. This respondent also discussed the lack of opportunities to prepare for future managerial roles.

*“Promotion as a sonographer, I don't know where to find. It's rare”* [276,Netherlands]

Most respondents agreed or strongly agreed that CPD was important to ensure high quality practice, which is supported by findings that 70% of EFRS societies had a programme to support CPD<sup>31</sup> and 100% agreement from EFRS societies that radiographers must continuously update their skills.<sup>3</sup> Role development was promoted by 90% of EFRS members societies in the 2015 survey,<sup>31</sup> however qualitative feedback in this current survey included many comments about the need for more/better courses and training opportunities or development of career pathways for role

progression within ultrasound (Fig. 5). Respondents highlighted the need for a more consistent approach, within countries or Europe wide, to the development of ultrasound education and practice with comments including:

*“Standardising expectations across the continent/country”* [315,Ireland]

*“There's significant variation amongst different centres with regards to reporting responsibilities. I would love to see standardisation of processes, peer review and auditing to ensure diagnostic accuracy”* [478,Ireland]

*“In Finland sonographer's education is very variable, we should get standardised and official national guidelines! Which would preferably be in line with European/international programs, so that we would be in equal position in employment.”* [468,Finland]

*“There should be an [sic] regulation a certificate for working with it so we know they have same standard.”* [359,Sweden]

*“Copy the example of CASE that has the support of associations of radiographers, professional colleges of technicians and most importantly the support of medical societies (radiologists, obstetricians, cardiologists). When this is a reality, the next step will be that the training will be homogeneous for all professionals and uncontrolled in-hospital training will cease to exist.”* [170,Spain]

Legal changes to enable ultrasound practice was mentioned by a number of respondents (Fig. 5), whereas 21.8% (n = 31) UK respondents mentioned the need for sonographer regulation. Ultrasound in the UK is not a statutorily regulated profession and despite the efforts of professional bodies and other relevant organisations a report in 2019 did not recommend statutory regulation of sonographers.<sup>38</sup> There are limitations to practice for non-statutorily regulated sonographers, i.e. those who are not already regulated as for example a radiographer, nurse or midwife, in that they cannot act as a referrer for investigations requiring ionising radiation or administer medication under Patient Group Directions.<sup>38,39</sup>

Personal reasons relating to the development of knowledge, skills, independent working and additional responsibility are the key drivers for transitioning into ultrasound (Fig. 3).

### Limitations

Many respondents were non-native English speakers, which can lead to misinterpretation of questions, which were written in English. The data was skewed by the high proportion of UK respondents, where ultrasound practice is different to many other European countries. A self-selecting population potentially attracts responses from those with an interest in or experience of ultrasound, biasing the results towards the positive. Many questions were unanswered by some participants, several countries had very low response rates and 42% of EFRS countries were not represented, leading to difficulties making generalisations.

### Conclusion

Radiographers responding to the survey are independently performing ultrasound examinations, although few outside the UK independently report the findings or communicate results to the patient. Whilst many sonographers teach other staff, fewer are involved in the other aspects of advanced practice, namely audit, leadership and research. Findings are similar to other studies in that clinical practice skills are given priority over aspects of the role that can lead to improvements in patient care and outcomes.



The disparity of ultrasound practice across respondent European countries is consistent with previous research. Priorities for development of ultrasound practice across Europe are similar to those identified by EFRS national societies; specifically, regulation or legislation enabling ultrasound practice by radiographers, support from medical colleagues and appropriate training opportunities. Additional country specific priorities relate to report writing responsibilities, remuneration and the development of clearly defined career pathways.

### Conflict of interest statement

None.

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