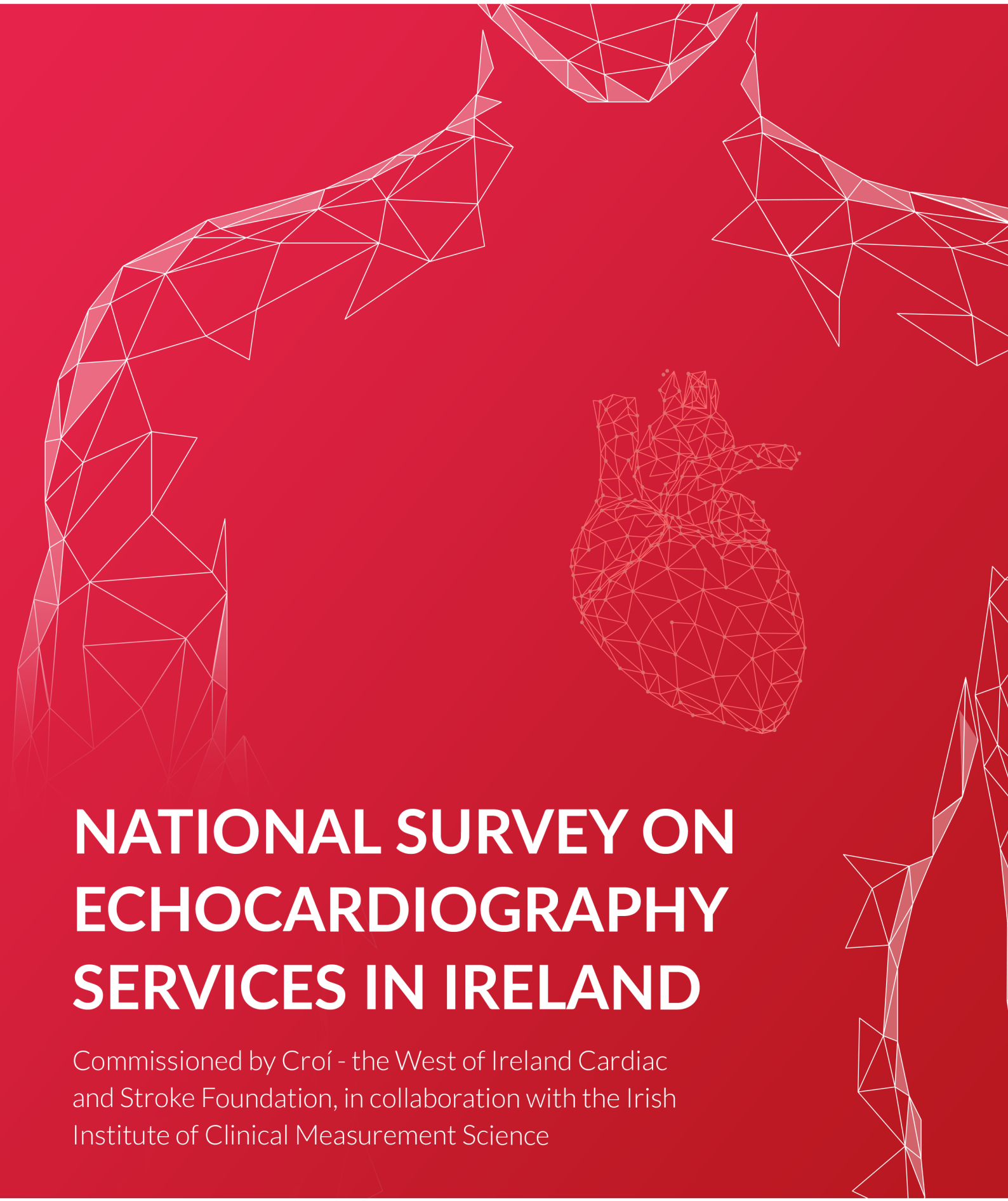
CROÍ
Fighting Heart Disease & Stroke

IICMS



NATIONAL SURVEY ON ECHOCARDIOGRAPHY SERVICES IN IRELAND

Commissioned by Croí - the West of Ireland Cardiac and Stroke Foundation, in collaboration with the Irish Institute of Clinical Measurement Science

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This report was commissioned by Croí, the West of Ireland Cardiac & Stroke Foundation and written by Bassline Strategy, in collaboration with the Irish Institute for Clinical Measurement Science. The initiative was supported by Edwards Lifesciences and Medtronic.

Foreword

In December 2021, the Global Heart Hub – the first international alliance of heart patient organisations, of which Croí, the West of Ireland Cardiac & Stroke Foundation, is a founding affiliate – launched a report on the patient journey for heart valve disease in Europe. Heart valve disease is a serious heart condition which can be fatal if left undetected and untreated. It is largely (but not exclusively) a condition of ageing and as the global population is steadily getting older, heart valve disease is on the rise. Up to 13% of people over the age of 75 are thought to be living with heart valve disease, and the number of people affected is expected to double by 2040 and triple by 2060. The rate of mortality in untreated, severe, symptomatic aortic stenosis (the most common type of heart valve disease) is between 25% and 50% per year.

While common and serious, the good news is that this condition is treatable. However, a key barrier to treatment is access to a timely diagnosis. A critical test for diagnosis is a cardiac ultrasound or echocardiogram. As a heart and stroke charity, Croí is to the forefront in putting a spotlight on issues affecting people living with or affected by heart disease. We are delighted to partner with the Irish Institute for Clinical Measurement Science in presenting the results of a national survey of echocardiography services in Ireland across both the public and private sectors.

An echocardiogram is a critical diagnostic test for the majority of cardiac conditions and is in fact one of the most used and needed cardiac diagnostic tests. However, the results of this survey highlight significant inequities between public and private patients in terms of timely access to cardiac diagnostics. For those dependent on our public health service there are multiple delays to appointments and diagnosis with obvious consequences for patients' health. This negatively impacts the care and treatment of those with heart valve disease and indeed many other heart conditions.

Many of the delays across the public system relate to a national shortage of cardiac physiologists, something that is also seen in the UK and further afield. Also, a significant percentage of our current workforce are not yet trained in echocardiography. Both of these issues can be addressed by a robust workforce plan with clear time limited goals and accountable implementation. Whilst cardiac physiologists perform and report these tests, consultant cardiologists provide clinical governance and overall care to the patient. The previously documented significant number of vacant consultant posts is also impacting on overall wait times to treatment.

Healthcare policymakers and practitioners across the world know well that cardiovascular ill-health is the single leading cause of death and disability. This knowledge has been continually shared for

decades so it is no secret. It is a fact constantly repeated in publications, peer reviewed articles, scientific papers and discussion documents on cardiovascular health, and yet we are still working to deliver this message to legislators.

We have sufficient knowledge and technology to detect, diagnose and treat most cardiovascular conditions. What is missing is the political will and healthcare policies and strategies to seriously address this unacceptable level of disease and economic burden with its associated impact on society, families and individuals.

To this end, the survey below comes with several calls to action. These include:

- The Department of Health urgently needs to commission a new National Cardiovascular Health Strategy which specifically includes heart valve disease.
- Government to allocate sufficient funding for echo services as part of Budget 2023.
- The HSE to provide GPs with greater access to hospital and community cardiac diagnostics to reduce delays and avoid unnecessary hospital presentations.

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- Members of the Cardiology Faculty of the Irish Institute of Clinical Measurement Science
- The Heart Valve Disease Multidisciplinary Group for Ireland

1. Introduction

"Echocardiography" (echo) describes a test which uses sound waves (ultrasound) to take a moving picture of the heart. It is routinely used in the diagnosis and management of a range of heart conditions, in particular valve diseases, but also conditions such as heart failure and in non-cardiac disciplines, such as oncology. A doctor may refer a patient for an echocardiogram if they suspect problems with the heart valves or symptoms of shortness of breath or chest pain. Echocardiography accounts for around 50% of the tests carried out in most Non-Invasive Cardiology Departments. Internationally, there is a variety of approaches to the provision of echocardiography, with echocardiograms mostly provided directly by doctors in many European health systems, for example Italy. In Ireland, the service is led by cardiac physiologists, a specific role within cardiac diagnostics. They are the staff who carry out all non-invasive cardiac investigations, reporting the vast majority, and work as part of the multidisciplinary team in the cardiac catheterisation suite. They are educated to degree level and many also have a range of internationally recognised accreditations. Cardiac physiologists are one of the five Clinical Measurement Science professions and are part of the wider Health and Social Care Professions (HSCP) grouping. They are represented by their professional body, the Irish Institute of Clinical Measurement Science (IICMS). They represent the key workforce in the delivery of echocardiography. While cardiac physiologists perform and provide the report in many cases, they operate under the clinical governance of consultant cardiologists. In many public hospitals, studies meeting certain clinical criteria are overread by a cardiologist, which is similar to the UK, and in private hospitals all are reviewed and receive cardiologist sign-off.

In setting out to complete this survey, Croí, with the support of the IICMS and their Cardiology Faculty, approached every Model 2, Model 3, Model 4 and private hospital in the state. The aim is to provide an effective heatmap of echocardiography services in Ireland, to reduce wait times and improve patient outcomes. The data gathered herein will form part of an evidence-base to advocate for greater access to echocardiography equipment and improved workforce planning as part of a renewed, cohesive national cardiac strategy. In compiling this report, we have consulted widely with a multidisciplinary team of cardiologists, GPs, nurses, cardiac physiologists and patient representatives to ensure a robust dataset.

The response rate to our questionnaire was high, with thirty-seven respondents out of a potential sample of forty. All of those who responded are tasked with overseeing the provision of echocardiography services and the sample is distinguished by the profile of respondent, formed of lead or deputy-lead cardiac physiologists responding on behalf of their departments.

What is your position within your department?

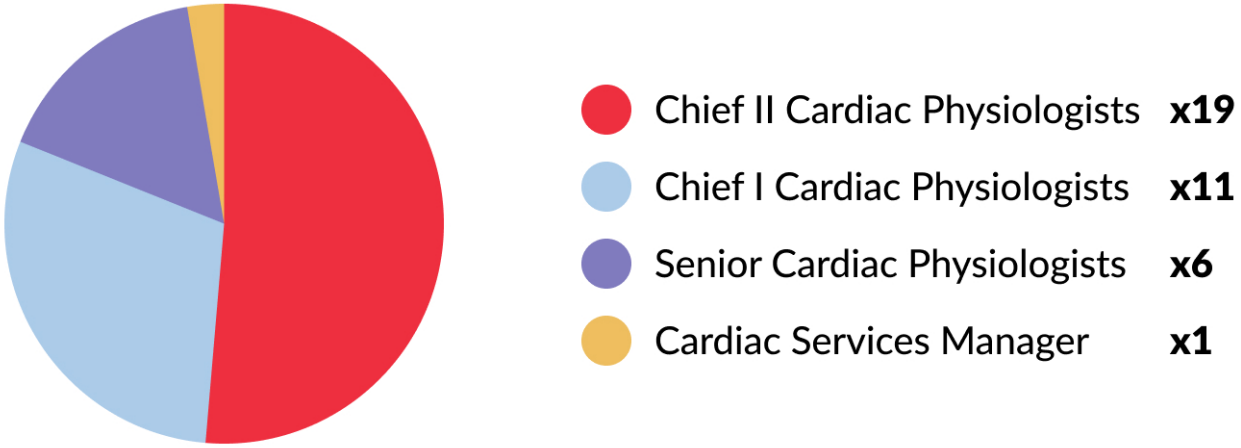

Figure 1

As we will see, the vast majority of echocardiograms are performed by cardiac physiologists. They are the key workforce and provide the most robust and compelling picture of the context in which such a vital diagnostic tool is provided. The performance of echocardiography is a highly technical skill which is coupled with an in-depth knowledge of anatomy and function in both normal and disease states. The complexity of performing and reporting this test is sometimes poorly understood by the wider healthcare community. Compared across Europe, the model for the provision of echocardiography services is unusual in Ireland, Portugal and the UK (and the Netherlands and Italy to a lesser degree). These countries retain specific roles for cardiac physiologists, while the norm across most of Europe is to have a physician-led model, making comparisons more challenging. As such, the data provided herein reflects a comprehensive picture of Ireland's specificities and will hopefully help discern a means to address the main deficits.

The sections that follow reflect several broad themes that emerged through the survey. In comparative terms, our findings are set against recommendations drawn from such sources as the Global Heart Hub's report "Heart Valve Disease: Working together to create a better patient journey", and from international best practice. In keeping with this model, the structure that follows reflects the journey a patient is likely to take between a visit to their GP and the attainment of an echocardiogram. It addresses the divergences that emerge in a patient's journey depending on whether they have access to private healthcare or rely on the public system. It also addresses disparities in the hospital experience based on model or group.

Multiple messages emerge from the data, which ought to have significant ramifications at a policy level and in terms of resources. We hope that this report can help highlight the shortfalls and provide coherent, actionable recommendations to improve access to such a key diagnostic test as echocardiography. Issues accessing services which will need to be addressed through, amongst other things, a comprehensive workforce plan to include sufficient recruitment of cardiac physiologists and timely access to echocardiography.

2. Primary Care Settings

2.1 Awareness among patients & General Practitioners

According to the Global Heart Hub's report "Heart Valve Disease: Working together to create a better patient journey", greater efforts are needed to improve public awareness of heart valve disease, particularly among people over the age of 65. At present, there is low public awareness of the symptoms of heart valve disease, which can lead to under-detection. Previous surveys have shown that most people do not know what heart valve disease is, and that they would not usually think to consult a physician when experiencing some of the typical symptoms of heart valve disease. This contrasts considerably with their reaction to the typical symptoms of a heart attack, such as chest pain, where they would definitely contact a physician.

Symptoms of heart valve disease may be difficult to recognise for patients, their loved ones and healthcare professionals, as they vary between individuals and often mimic general signs of ageing. As a result, people can live for a long time with symptoms without being aware that anything is wrong. Patient education needs to be embedded across all stages of the care pathway. This will help patients make informed decisions, understand why specific treatments are suggested to them, and prepare for and cope with different facets of their condition.

The role of the General Practitioner (GP) and Health and Social Care Professionals is crucial in the detection of heart valve disease, and it is in the GP's surgery that some of the first key disparities in the diagnosis and treatment of heart valve disease become apparent. Under-detection is a considerable challenge in heart valve disease, affecting prognosis and long-term survival. One of the reasons for this is limited awareness of heart valve disease and new treatments among GPs, who are often the first port of call for people who experience symptoms. It is compounded by a lack of resourced care for this patient group in General Practice. Increased awareness of heart valve disease and treatments among GPs should be encouraged through education initiatives. GPs should be encouraged to detect heart valve disease through assessing symptoms and auscultation in those most at risk, and heart valve disease should be part of a structured and resourced chronic disease management programme such as the HSE Chronic Disease Management (CDM) programme. A survey across 11 European countries found that more than half of people over the age of 60 were not regularly checked with a stethoscope by their GP. Rates of auscultation by GPs also vary considerably between countries.

Cardiac auscultation is an important tool in detecting heart valve disease but has limited accuracy for the detection of heart valve disease in asymptomatic patients. Raising awareness of symptoms of heart valve disease in the general public and healthcare professionals, encouraging auscultation when appropriate and ensuring easy access to echocardiography in patients with symptoms or signs suggesting heart valve disease is vital. Structured programmes would ensure patients receive regular checks. A vital part of a structured programme would be GP direct access to echocardiography, which as outlined below, raises several problems. The use of point of care ultrasound may prove a useful tool to identify people who may benefit most from formal echocardiography in the future, but further studies are needed.

2.2 GP direct access & community services

When a GP detects symptoms of heart valve disease, the next stage in the process is to refer the patient for an echocardiogram. This important step to diagnosis reflects the systemic disparities that have emerged as the key findings of our research. Put simply, the GP's decision-making process is to a certain degree determined by the economic position and insurance status of the patient. When faced with a patient with private health insurance, the GP can be certain of a wide array of options for direct referral for an echocardiogram to a team in a private clinic. For a public patient, the GP must refer to a cardiologist within a public hospital, who may see the patient in an outpatient clinic before referring to a cardiac physiologist for their echocardiogram. There are additional steps to attaining an echocardiogram, and each comparable step takes much longer than its private counterpart. Our survey sample was composed of chief cardiac physiologists and the section that follows highlights the disparities of access as seen from their perspective.

We asked respondents whether their department delivers GP direct access referral for echocardiography (defined as GP referral), without having to refer to Consultant or Outpatients Department. The picture that emerged showed an emphatic divergence between public and private healthcare provision. Of the sample surveyed, only 19% of public hospitals (5/26) indicated that they deliver GP direct access, while 81% do not. Within the private sector, this picture was inverted, with 80% providing direct access for GP patients.

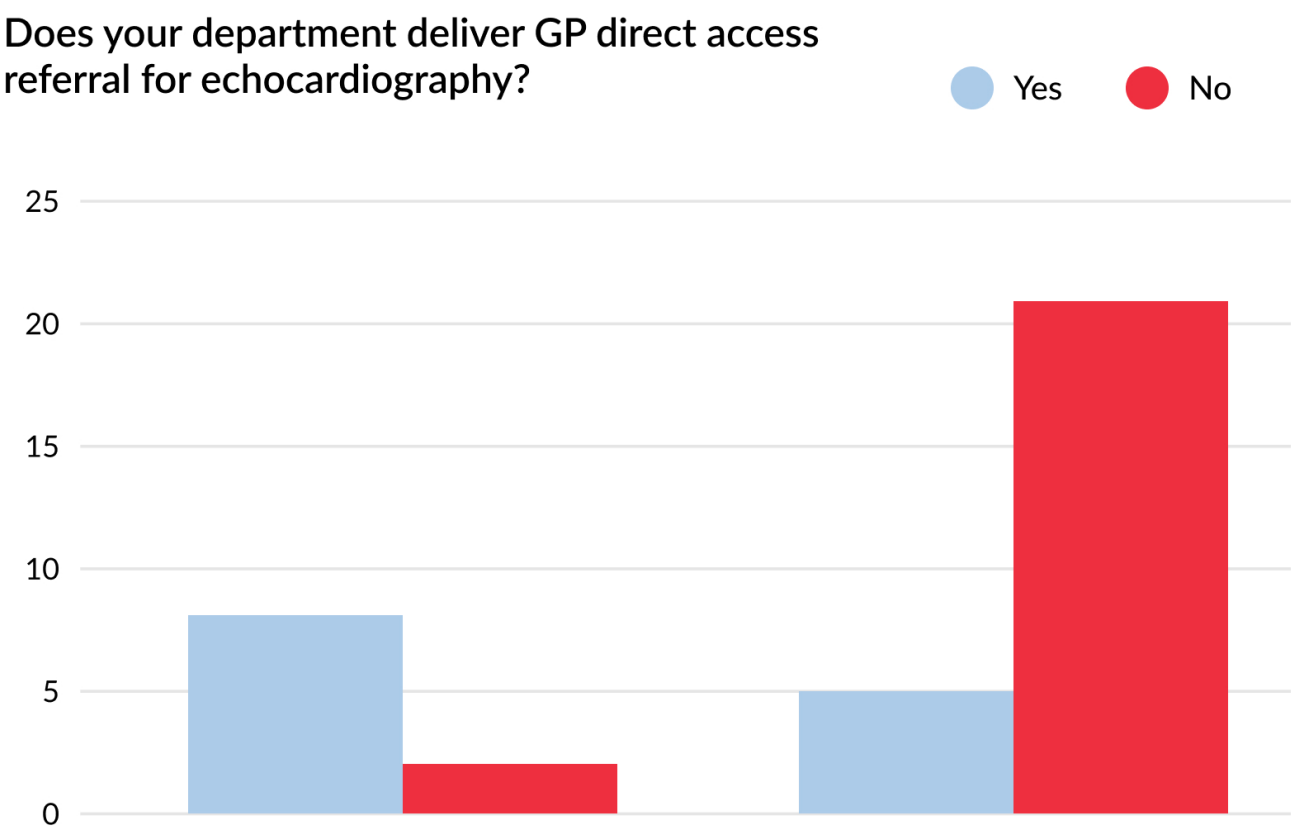

Figure 2

This divergence places GPs in an invidious position of offering different courses of action depending on their patients' ability to pay. They are hamstrung based on their patients' insurance status, rather than clinical need. Within the public system the process of accessing an echocardiogram is substantially delayed, less cost-effective and more resource-intensive, as the patient is required to go through a greater number of steps than their private counterpart. GP direct access makes a great deal of sense both for an individual patient's clinical need and from a systemic perspective. GPs are senior decision makers with the longest relationship with the patient, providing them with the advantage of qualitative insight as to patients' needs. Given the significant delays in the public system, it is known that GPs sometimes refer to acute services, such as an Emergency Department or Acute Medical Unit to access a diagnostic test.

In its 2013 report, Access to Diagnostics – A key enabler for a primary care led health service, the Irish College of General Practitioners referenced the Acute Hospital Bed Review, which supported improved GP access to hospital and community diagnostics to reduce delays and avoid unnecessary admissions. In an earlier report, two thirds of GP respondents indicated that their fee-paying patients had difficulty accessing diagnostic tests with this figure rising to 99% of GMS patients. While our survey shows some improvements for both private and public patients, there is still a stark disparity in terms of the capacity for GPs to access echocardiography through direct referral for their public patients.

Of the 19% of public departments that provide GP direct access referral, they are spread across all hospital models and the number of echocardiograms of this type per week is usually at the lower end of the scale. Just one Model 4 hospital performs more than 30 GP direct access echocardiograms per week, while one other performs fewer than ten per week. Within the private system, of the eight units that perform GP direct access, only three perform fewer than ten procedures per week, three others perform 11-20 per week and one surpasses 50. Examining the public hospitals at group level, one can see an uneven spread in units that provide GP direct access referral. As seen in Figure 3 below, the Saolta Group provides the highest proportion of GP direct access referral, with half of its hospitals making it available. This is likely a reflection of Saolta hospitals accessing Sláintecare funding to set up these services. Ireland East and the RCSI Group are the only others to offer this service, with one hospital in each case. None of the hospitals in the UL, South/Southwest or Dublin Midlands hospital groups provide GP direct access referral.

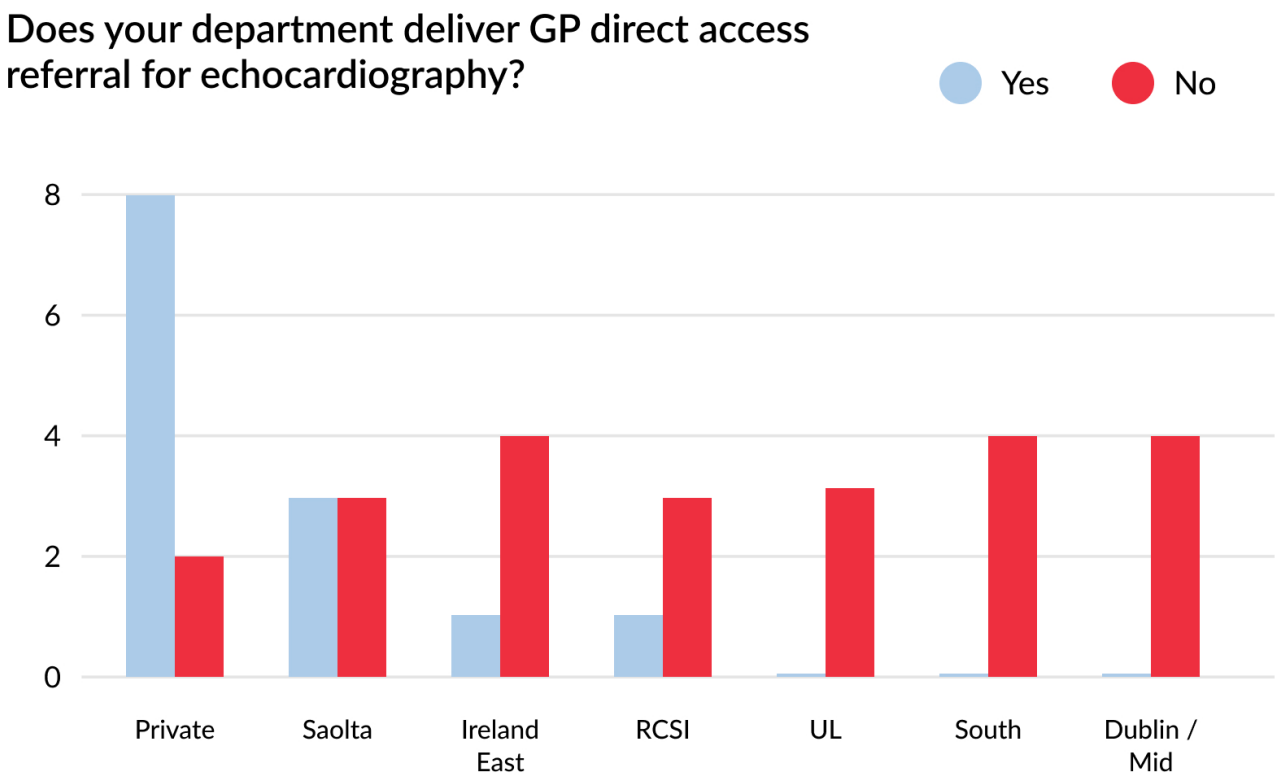

Figure 3

An additional issue emerged in open-ended questioning whereby a respondent from a public hospital indicated that GP echo referrals are currently being outsourced to a private hospital through the National Treatment Purchase Fund (NTPF). The rationale for this was that it helps cut waiting lists, which arose from COVID-19, for hospital echocardiograms requested by teams other than cardiology. However, the participant went on to point out that echocardiograms provided through NTPF in private hospitals cannot be viewed and stored on the hospital archive, which makes this type of outsourcing unsuitable for in-house referrals for other specialities. It also means that if the patient presents at a later date, the echocardiogram may be repeated unnecessarily as the reports and/or the images may not be available.

There is a low availability of community-based services across the country. Figure 4 shows us that, within the public system, the proportion of hospitals offering community-based echocardiography services (5/26) is equal to the number offering GP direct access. Among private hospitals, only one department provides community-based services. The significance of this metric derives from recommendations for community-based care as part of Sláintecare, and the model is supposed to make provision for diagnostic services at every community hub.

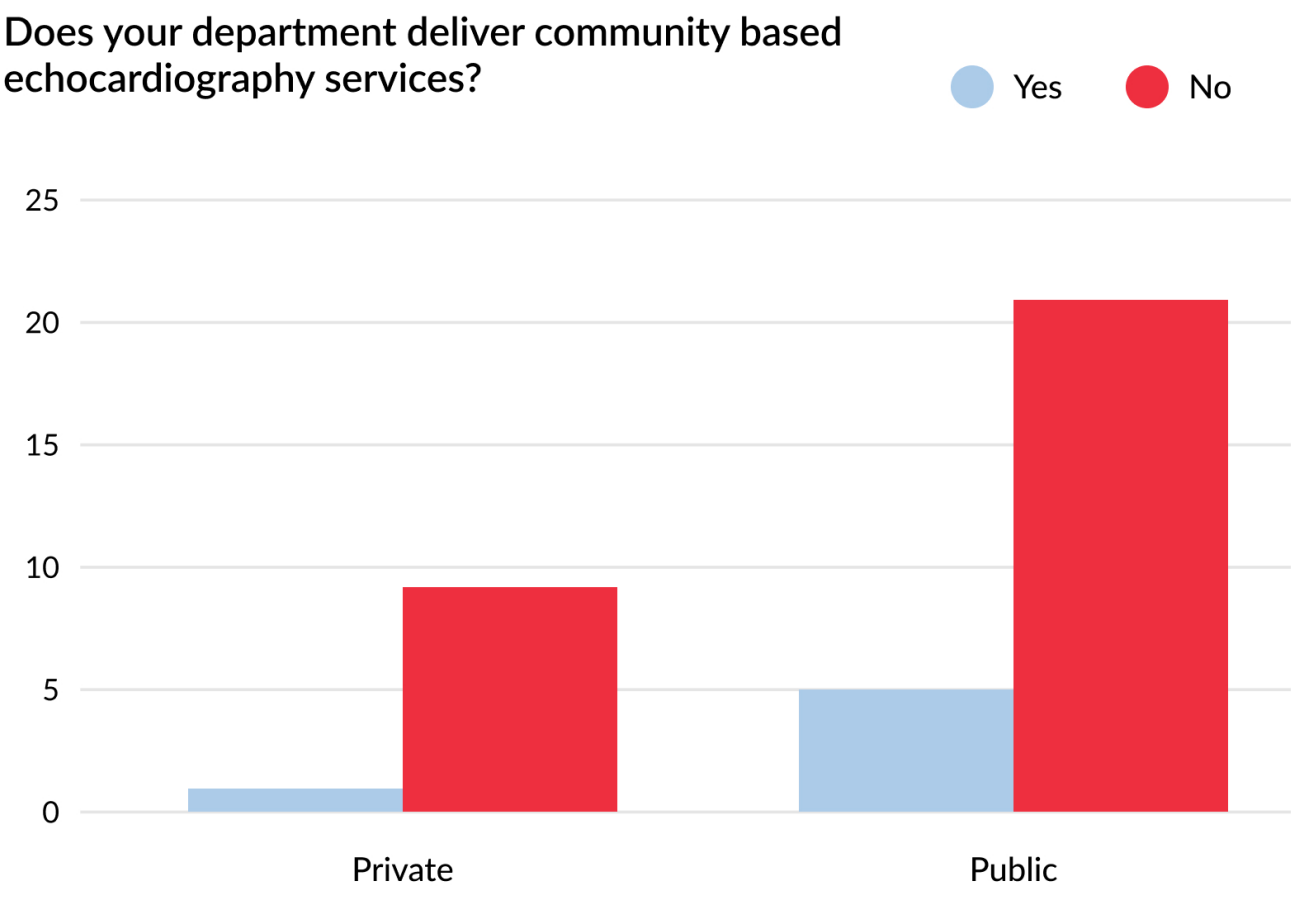

Figure 4

When addressing open-ended questions, our respondents volunteered additional insights as to the impediments to community-based cardiac diagnostics. One respondent cited the lack of clinical governance as a massive stumbling block for any kind of expansion into community services. A failure to prioritise patients in an appropriate manner and refuse requests that may not be of clinical benefit has meant that echocardiography services have become over-utilised, and some respondents feel that medical consultants have been unresponsive to the entreaties of cardiac physiologists to remedy this. In the absence of implementation of guidelines around the appropriate use of echocardiography, difficulties arise in questioning the request of another physician for an investigation.

Across the public system, we see repeated trade-offs wherein efforts to increase access can diminish quality, and vice versa, with the pressure inhibiting the effective expansion of GP direct access and community-based echocardiography services. Taking any additional pressures into account, ranging from staff shortages to the COVID-19 pandemic, presents often unworkable challenges for cardiac physiologists and their departments. COVID-19 has added time onto every echocardiogram with full disinfection required between each procedure, while several respondents documented numerous vacant posts in their hospitals. Demand for echocardiography services outstrips capacity, and staff must exercise clinical judgement as to whether a patient with heart valve disease requires an echocardiogram more urgently than, for example, an oncology patient.

There is significant ground to be made up in terms of supporting enhanced community care for cardiology. Our recommendation, based on data gathered on GP direct access and community-based echocardiography services, is for a system of direct access provided via community hubs. This would see 1-1.5 cardiac physiologists allocated to each community hub, with a clear hierarchical and supervisory link to the most appropriate Model 3 or 4 hospital in the catchment area. There should be clear referral pathway to specialist services if the result requires it. It can help ease the burden on acute hospitals while providing speedier access to diagnostic services for public patients, directly from their GP. This service needs to be provided under the clinical governance of the associated hospital with full integration to the hospitals cardiovascular IT infrastructure, so reports and images are available for future attendances.

3. Hospital Departments

3.1. Referral times

The data we have gathered shows wide disparities in routine referral times across hospital models, groups and depending on whether a department is public or private. Figure 5 outlines the average waiting times, broken down by model of hospital, to receive an echocardiogram for a routine referral. In each case, the percentages indicate the proportion of each model with specific waiting times, and private cardiology departments are defined as a distinct model and group. Six out of the ten private hospitals in our sample have routine waiting times of under one month, while only one of them has a waiting time in excess of three months. By contrast, 4-6 months is the starting point for routine referrals in all public hospitals. Worryingly, 67% of Model 3 hospitals and 38% of Model 4 hospitals have waiting times of over one year. Within the public sector, shorter waiting times are evident across higher volume units.

Routine waiting times compared by hospital model (%)

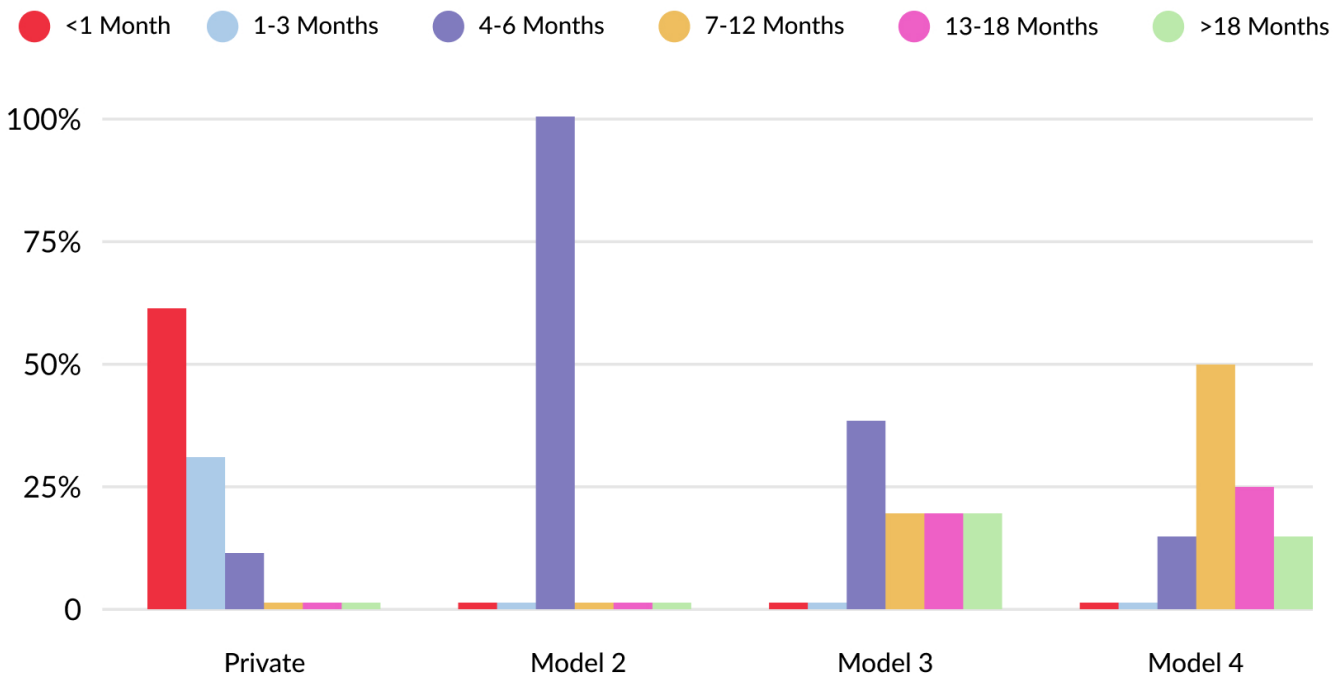

Figure 4

When compared to international guidance, we see that a majority of public hospitals have waiting times in excess of expert recommendations. The UK's National Institute for Health and Care Excellence (NICE) recommends a turnaround of six weeks for the provision of routine echocardiograms and that urgent referrals should be completed within two weeks. Quoting these figures, the British Heart Foundation provided a more lenient benchmark of six months for routine

referrals, when assessing the performance of NHS hospitals in Northern Ireland. Within the Irish public system, 62% of public hospitals exceed the six-month benchmark for routine referrals.

Looking at urgent procedures, the shortest referral time accounted for in the survey was less than one month. 100% of private hospitals and 68% of public hospitals reached this benchmark. Of the 32% of public hospitals with waiting times of greater than one month, one Model 3 hospital claimed to have delays in excess of three months, and there was one Model 3 drop-off for this question. Those units with routine referral times of under six months all manage to provide urgent procedures in under one month. Those with routine waiting times of over one year have much greater difficulty in meeting a one-month target for urgent referrals. As Figure 6 shows, when broken down by hospital model, all private and Model 2 units brought waiting times to under one month when procedures were categorised as urgent. 64% of Model 3 units and 63% of Model 4 units also reached the target of under one month. In Model 4 settings, the remainder of urgent procedures were processed in under three months.

Urgent waiting times compared by hospital model (%)

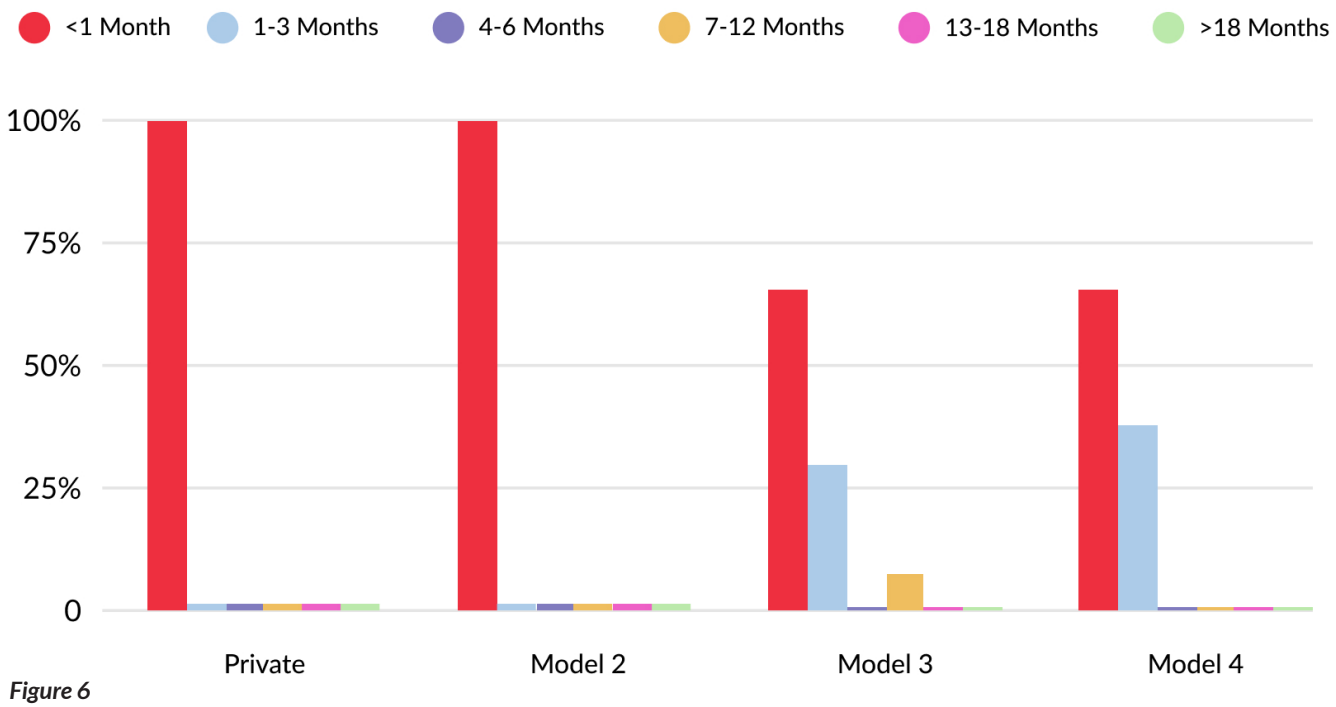

Figure 6

According to the NICE recommendations, echocardiograms and specialist assessment should be carried out within two weeks in patients with suspected heart valve disease and significant symptoms such as shortness at breath on minimal exertion. Allowing for some leniency given the ground to make up within some public hospital departments, this report recommends a turnaround of 18 weeks, as per current NHS standards, for all comers, regardless of location, hospital group or ability to pay. All urgent cases should be performed within two weeks. Figure 7 presents routine waiting times per hospital group, in absolute numbers rather than percentages.

Routine waiting times compared by hospital group

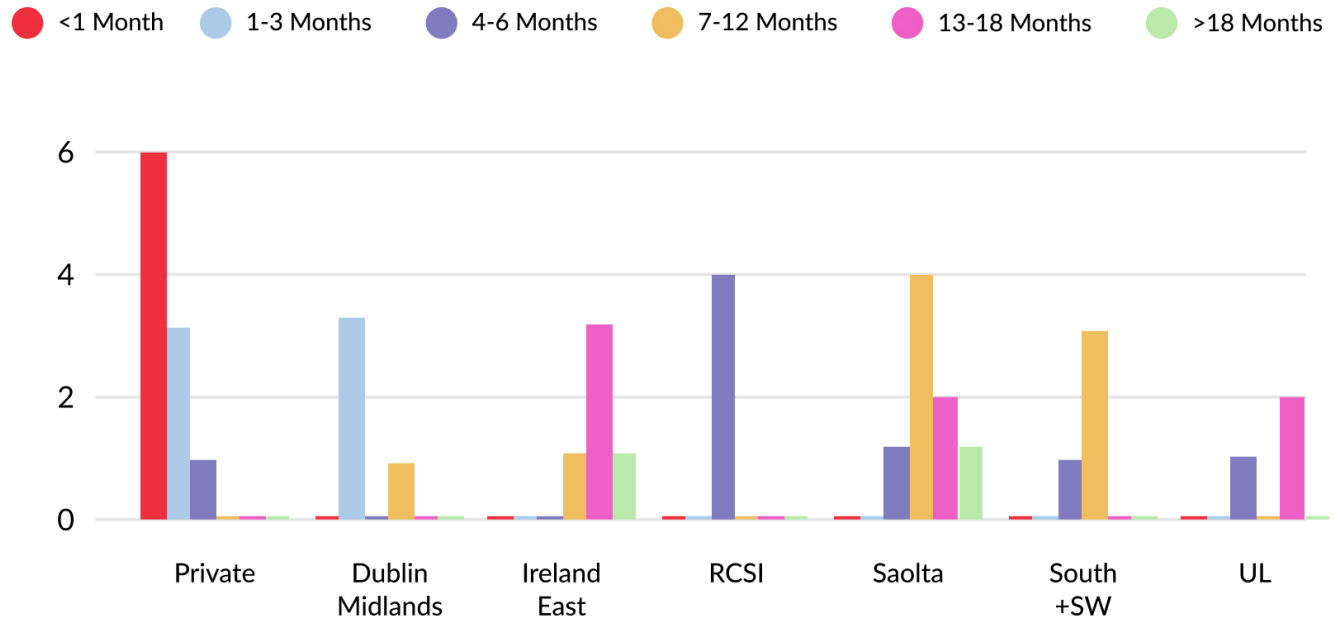

Figure 7

- Three quarters of hospitals in the Dublin Midlands group have routine waiting times of 4-6 months, with one surpassing eighteen months. All managed to reduce waiting times for urgent referrals to under one month.
- In Ireland East, all hospitals have routine waiting times of more than six months, with four of the five surpassing one year. When it comes to urgent referrals, only two of them managed a reduction to under one month, two registered at under three months, while one still has a delay of 7-12 months.
- In the RCSI Group, all hospitals have routine referral times of 4-6 months and urgent referral times of under one month.
- In Saolta, which covers the west and northwest, one hospital achieves a routine waiting time of under six months. Three hospitals come in at 7-12 months while, two have waiting times in excess of 18 months. There is also an internal disparity in waiting times within the region covered by the Saolta Group. When it comes to urgent care (and accounting for one drop-off for this question), four units meet the target waiting time of less than 1 month and one comes in at 1-3 months.

- In the South/Southwest Group, only one hospital has a routine referral time of under 6 months, with the remaining three hospitals have a waiting time of under a year. For urgent referrals, one hospital reaches the 1 month target, while the remainder take 1-3 months.
- The UL Hospital Group, one hospital has a routine waiting time of 4-6 months, while the

3.2. Resource management

The data included here also raises some pertinent issues regarding resource management and the provision of services within hospital groups. Looking at routine referrals alone, we can see disparities within some hospital groups when it comes to waiting times. Dublin Midlands, Saolta and the UL Hospital Group all have waiting times that range from 4-6 months to over 18 months while Ireland East has a range of 7 months to over 18 months. Only the RCSI Group is entirely uniform, with all four hospitals having a routine waiting time of 4-6 months, while the South/ Southwest Group has a less disparate range of 4-12 months.

Waiting times do not appear to correlate to variables such as the number of echocardiograms performed per week as the centres with the longest wait-times in each group range from the lowest to the highest volume units. Nor do they correspond to the model of hospital, as within each group the longest wait times are spread across Model 3 and Model 4 hospitals. There does, however, appear to be an interplay between hospital model and the ratio of machines to echocardiograms performed. The Model 4 hospital with waiting times of over 18 months performs 34-50 echocardiograms per week per machine (101-150 per week across three machines). Another Model 4 hospital takes 13-18 months but has 6 machines available, representing 17-25 echocardiograms per week per machine. The Model 2 and Model 3 hospitals with longer waiting times perform a lower number of echocardiograms per week ranging from 6 to 19 per machine on a weekly basis. The simple metric of machines per echocardiogram does not take into account other factors, such as whether machines are departmental or portable, and the availability of adequate space and staffing to utilise all machines to their maximum.

To compare staffing allocations between hospitals with divergent waiting times, we looked first to compare the highest volume units with the two Model 4 hospitals which had the longest waiting times for routine referrals. In the Model 4 hospital with >18 months waiting times, each reporting cardiac physiologist performs an approximate average of 20-30 echocardiograms per week, while in the Model 4 hospitals performing echocardiograms within 13-18 months, each reporting

cardiac physiologist performs 13-20 echocardiograms per week. This compares favourably to their counterparts on other high-volume Model 4 hospitals, where a cardiac physiologist can expect to perform anywhere between 10 echocardiograms per week to the low 30s, depending on other duties. It is important to note that echocardiography is just one of potential nine investigations that a cardiac physiologist may work in on any given week. However, there is no reason to suspect a lower level of efficiency among the cardiac physiologists in these units. However, it is worth noting that in the cases with longer waiting times, respondents pointed to vacancies in their departments, or part-time arrangements which reduced the support available. The delays in these cases are evidently a function of workforce planning, and a need to resource these departments more fully.

There is also an interplay which emerges between the levels of staffing and equipment. The Model 4 hospital with the longest waiting times for routine procedures, at more than 18 months in the Dublin Midlands hospital Group, rates among the highest in the sample for the number of echocardiograms per machine per week (34-50), while at the same time ranking lower than its counterparts on the number of echocardiograms per cardiac physiologist. With only two departmental and one portable echo machine, this particular Model 4 department has fewer resources than comparably much quieter hospitals and would benefit greatly from a more comprehensive allocation. This hospital also has vacancies which will need to be filled. Others are more difficult to explain. The Model 3 Hospital with the longest waiting times performs 3-6 echocardiograms per cardiac physiologist per week; and only 6-13 echocardiograms per machine. It is seemingly well resourced in terms of equipment and has far from the lowest staff complement, and the source of delays must be sourced elsewhere.

Within the private system the average number of echocardiograms performed by a cardiac physiologist ranges from 7 to 25 per week, with an average of approximately 13, compared to 16 across the public hospitals. There is no specific correlation between the total volume of echocardiograms conducted and the number conducted per cardiac physiologist. The three departments with the lowest number of echocardiograms per cardiac physiologist all have routine waiting time of under one month. Of the two others that reach this threshold, one has a very favourable staff-to-machine ratio, while the other has no discernible pattern and may be a function of good planning.

No doubt there are myriad other factors at play which are not captured in quantitative data comparing the number of echocardiograms to the provision of staff and equipment. For example, this survey does not have a ranking for the level of complexity involved in each procedure and it

is more likely that the larger Model 4 hospitals will be called upon for more complex and urgent procedures. However, within the various hospital groups, a coordinated approach to planning and distribution of diagnostic procedures such as echocardiography would be very helpful. As such, where one hospital is overburdened, patients could, where appropriate, be sent to a neighbouring hospital for their echocardiograms. This would have substantial implications for the provision of other resources too, such as having integrated cardiovascular IT across each hospital group, so that data shared between hospitals is reliable and secure.

4. Quality of echocardiography services

4.1. Staffing and responsibilities

Determining the quality of echocardiography services is based on several factors, ranging from the model of service provision, the qualifications of professionals involved and overall workforce management. In this section, we aim to address these factors across a range of indicators, including the reporting model used in each hospital, as well as levels of experience and accreditation of its cardiac physiologists and consultant cardiologists overseeing the service. It raises several useful questions that relate to long-term resourcing and planning of echocardiography services.

It is worth noting that Ireland's model of service provision is distinct from its counterparts elsewhere in Europe in its use of cardiac physiologists as a specific role within cardiac diagnostics. Some other countries, such as Portugal and the United Kingdom (and the Netherlands and Italy to a lesser degree) also retain specific positions for cardiac physiologists but the European norm is to have a physician-led model. Ireland's specificities are borne out in this survey. The vast majority of echocardiograms are performed by cardiac physiologists – in 36 out of the 37 hospitals surveyed. The only outlier was due to a staff shortage whereby a registrar provides cover at times. Similarly, cardiac physiologists provide 68% of all reports, or 25 of the total sample of 37. As in Figure 8, we see a slight divergence between the public and private systems. In private hospitals, a much greater proportion of provisional reports are provided by a cardiologist (30%) than in the public sector (19%). It should be noted that in all private hospitals all studies receive consultant cardiologist overread and sign off as a requisite for billing. Of the six units categorised as "Other", a pattern emerges whereby cardiac physiologist will provide a report which will be signed off by a cardiologist.

Who performs the majority of echocardiography reports in your department?

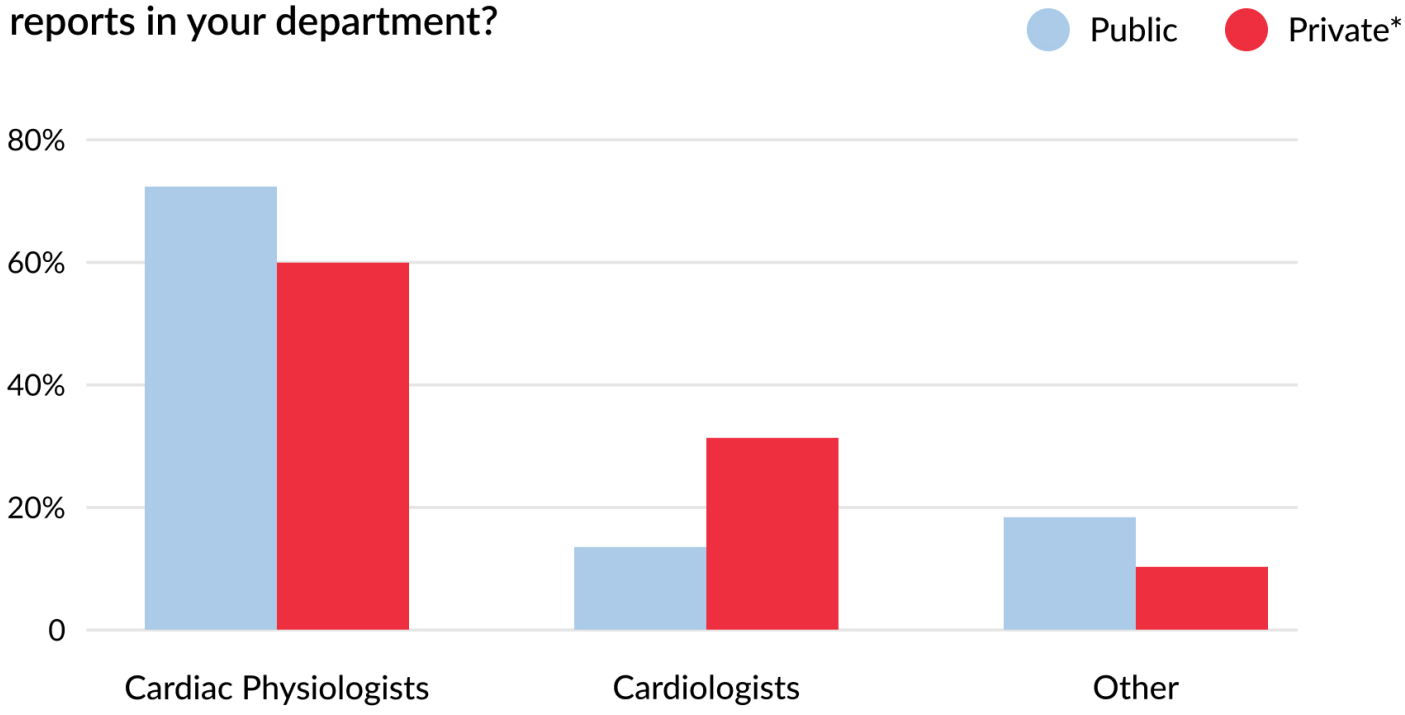

Figure 8

**In private hospitals, all reports are overread by a consultant*

There are some divergences based on hospital model when it comes to the provision of the majority of echocardiography reports. In two out of the three Model 2 hospitals surveyed, most reports are provided by cardiologists. This is most likely a function of lower levels of availability of cardiac physiologists than in other models. Cardiologists provide the majority of reports in only one Model 3 hospital and none of the Model 4 departments; and overall, in 11% of public centres, a cardiologist provides the majority of the reports. This rises to 30% for private hospitals. Further enquiry into the open-ended "Other" category also reveals further insights, with a private provider indicating that there is a process in place whereby cardiac physiologists provide a preliminary report and cardiologists provide the finalised report. For public hospitals, the five hospitals in the "Other" category include two with a sign-off procedure whereby a cardiologist approves the cardiac physiologist's report; two where cardiac registrars deliver reports and one where both cardiac physiologists and cardiologists write reports.

When asked how many cardiac physiologists in their departments provide at least a provisional report for echocardiograms (a surrogate for being trained in echocardiography), responses showed a degree of similarity across public and private systems. In public hospitals, on average, 74% of cardiac physiologists provide at least a provisional report. The figure for private hospitals is 73%. The range is also similar: the lowest percentage in public hospitals is 38% and in private units it is 40%, while in both settings there are hospitals where all cardiac physiologists provide reports. Within the public system, some differences emerged based on hospital model and group.

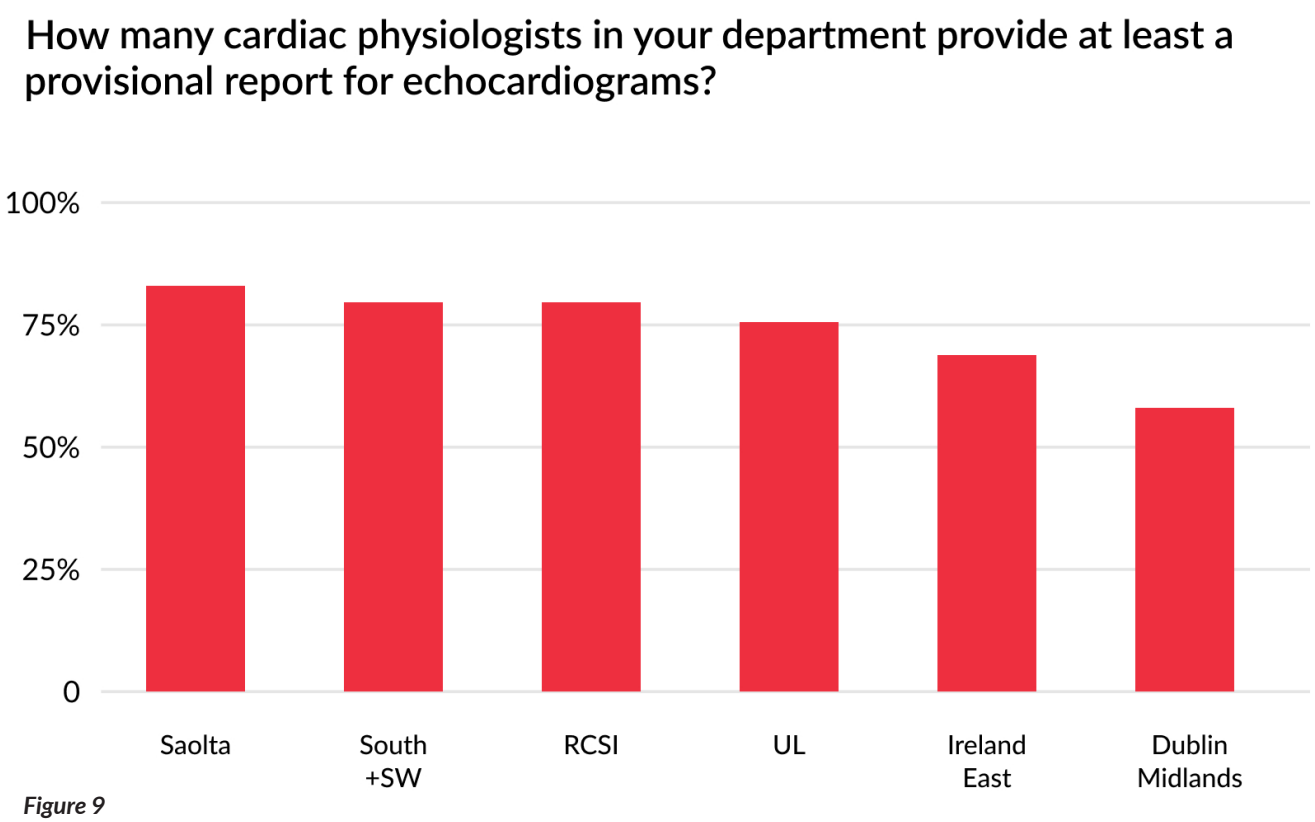

Figure 9

As Figure 9 demonstrates, the Saolta Group has the highest count of cardiac physiologists who provide reports at 81%, followed closely by the South/Southwest and RCSI groups on 79%. The only group not to surpass 70% for this metric was Dublin Midlands on 56%.

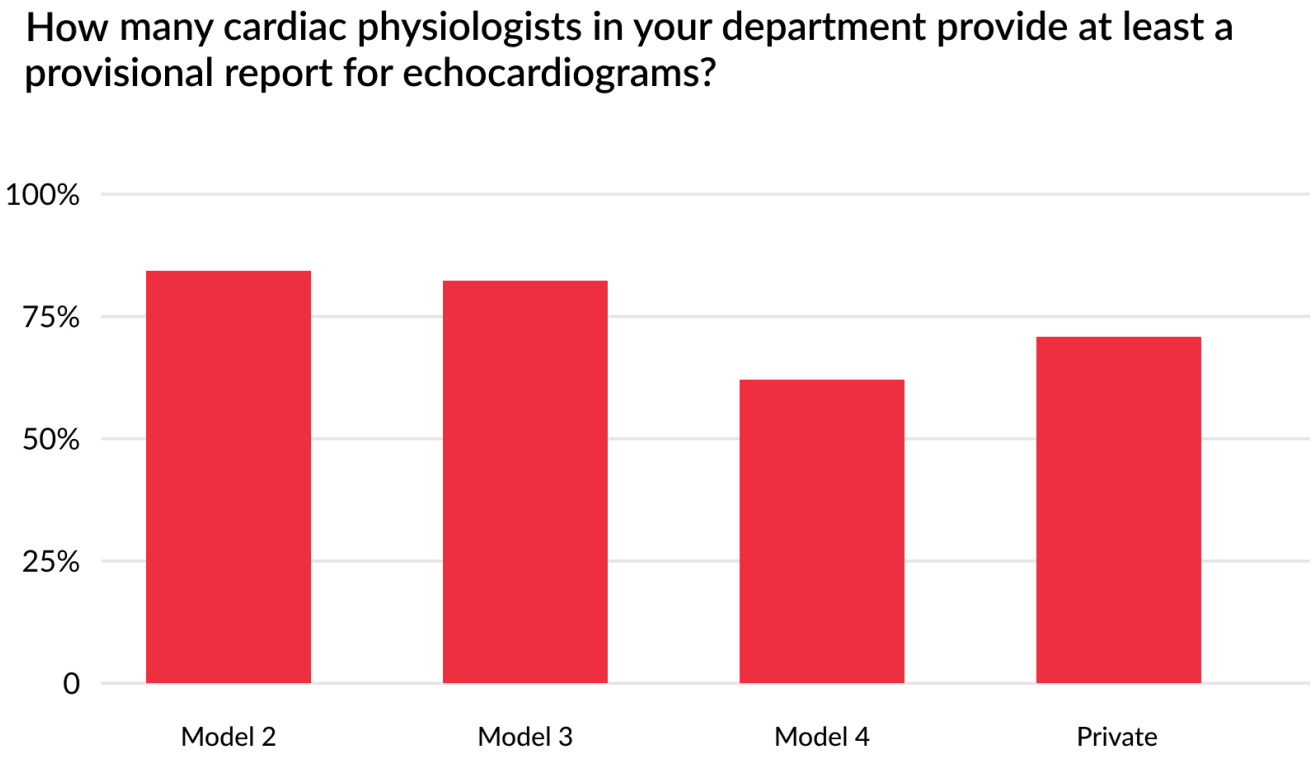

Figure 10

Figure 10 outlines the spread across hospital models. In Model 2 hospitals 82% of cardiac physiologists provide reports, compared to 80% for Model 3 and 62% for Model 4 hospitals. However, the considerable differences of size between these hospitals may skew this comparison somewhat, as Model 2 hospitals have much smaller teams of cardiac physiologists, thus increasing the necessity for more of them to provide reports. Across the whole sample, it is evident that there is enormous demand for echocardiography services, given the proportion of cardiac physiologists providing reports. Even though they work in multiple modalities in cardiac investigations, the demand for echocardiograms brings with it a push for them to provide the corresponding reports.

4.2. Volume and efficiency

Beyond looking at access and quality of echocardiography services in Ireland, we investigated whether there was a degree of uniformity in terms of their value when it comes to forward financial planning. To do so, we examined several metrics, including the quantity of echocardiograms performed in each department relative to their staff complement and availability of equipment, and the volume of echocardiograms varies considerably. While quantity is not the only indicator of efficiency or value for money, if we observe a situation where one hospital conducts eight echocardiograms per week per cardiac physiologist, while another conducts several times this number, it warrants further investigation. On one analysis it could indicate divergent levels of efficiency between hospitals or, alternatively, it may highlight that the staff in one department are conducting more complex procedures than the other or working in different areas such as the Cardiac Catheterisation Laboratory. In addition, when we look at the number of echocardiograms conducted by each echo machine, a disparity can highlight those hospitals where there are not enough staff employed to make the best use of the equipment available. Figure 11 below outlines the number of echocardiograms performed per week across the range of hospital models.

On average how many echocardiography scans are performed per week in your department?

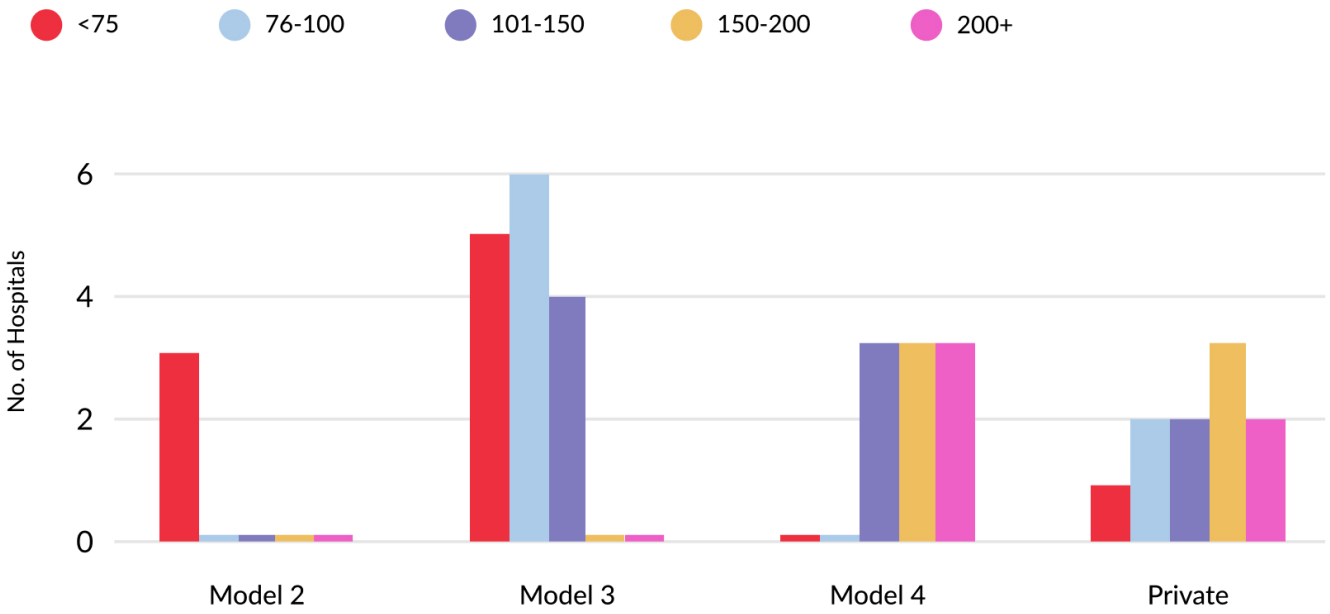

Figure 11

Looking at the overall quantity of echocardiograms per week, we found that the highest volume units, i.e., those conducting 150 or more echocardiograms per week, were all in Model 4 or private hospitals. Three Model 4 and two private hospitals surpassed 200 echocardiograms each week. Of the Model 3 hospitals, four conducted 101-150 per week, six performed 76-100 echocardiograms and four perform 75 echocardiograms or fewer. All the Model 2 hospitals perform between 25 and 50 echocardiograms per week.

To chart overall levels of efficiency and therefore value for investment we investigated the number of cardiac physiologists and echo machines within each department. Figure 12 shows a rather wide range across hospital models, which is largely to be expected in view of their respective sizes.

How many cardiac physiologists work in your department? (averages)

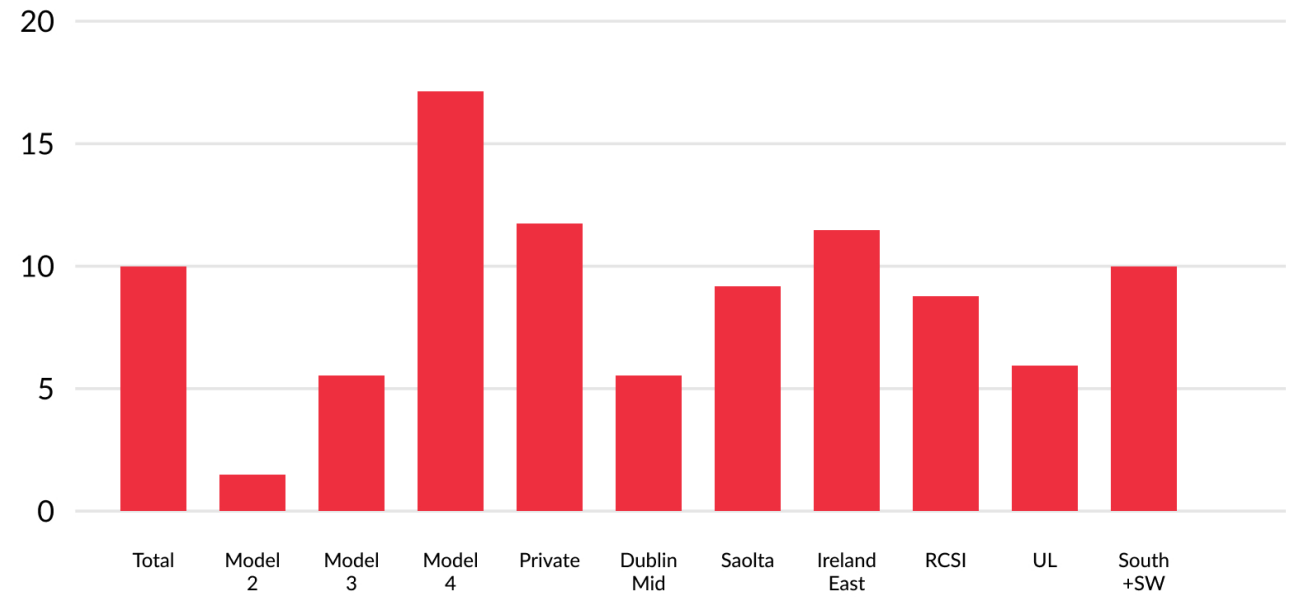

Figure 12

For access to echo machines, the following pattern emerges. Model 4 and private hospitals have the largest average complement of echo machines. Broken down by group, we see that the Ireland East Hospital Group is well provisioned, with the remainder falling at or below the national average.

How many echo machines (departmental & portable) are available within your department? (averages)

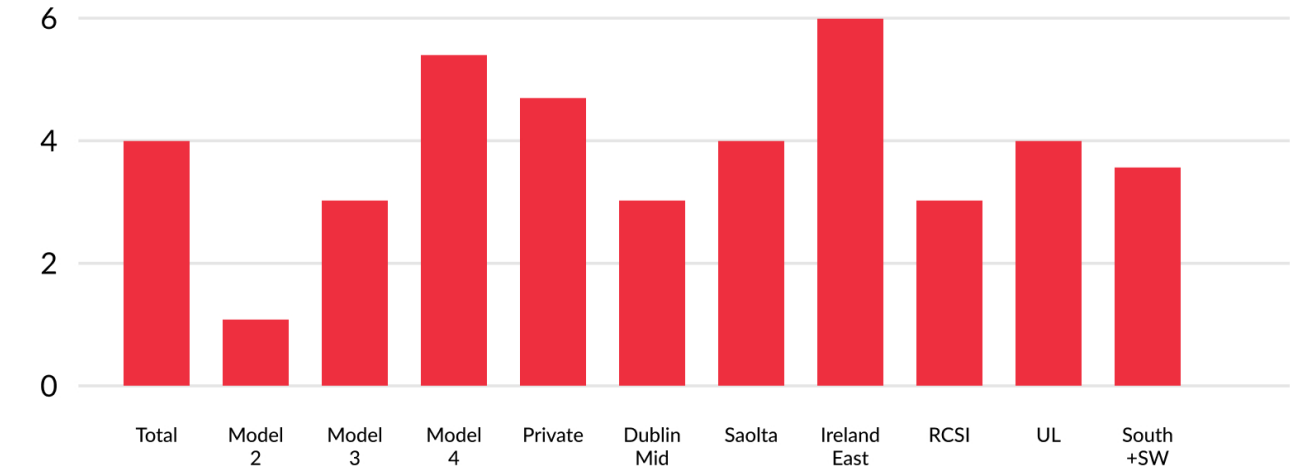

Figure 13

Behind the averages, three quarters of Model 4 and private hospitals have five or more machines at their disposal while most Model 3 hospitals have four machines or fewer. In general Model 2 hospitals have only one or two machines.

4.3. Workforce planning

Recognising the cardiac physiologist as the key workforce for the provision of echocardiography services, we assessed the demands placed upon them, as well as experience levels and qualifications. It becomes apparent that longer-term planning is crucial to the success and sustainability of these services. When vacancies arise, waiting times are exacerbated as hospitals struggle to find replacements in a timely manner. One respondent outlined the two-pronged nature of the problem, when they indicated that it is very difficult to backfill senior staff with echo experience, while it also takes a long time to train new graduates. As such, to highlight the challenge for workforce planning this brings, we have attempted to document the existing levels of experience as well as some of the challenges which may arise from cohorts of cardiac physiologists nearing retirement.

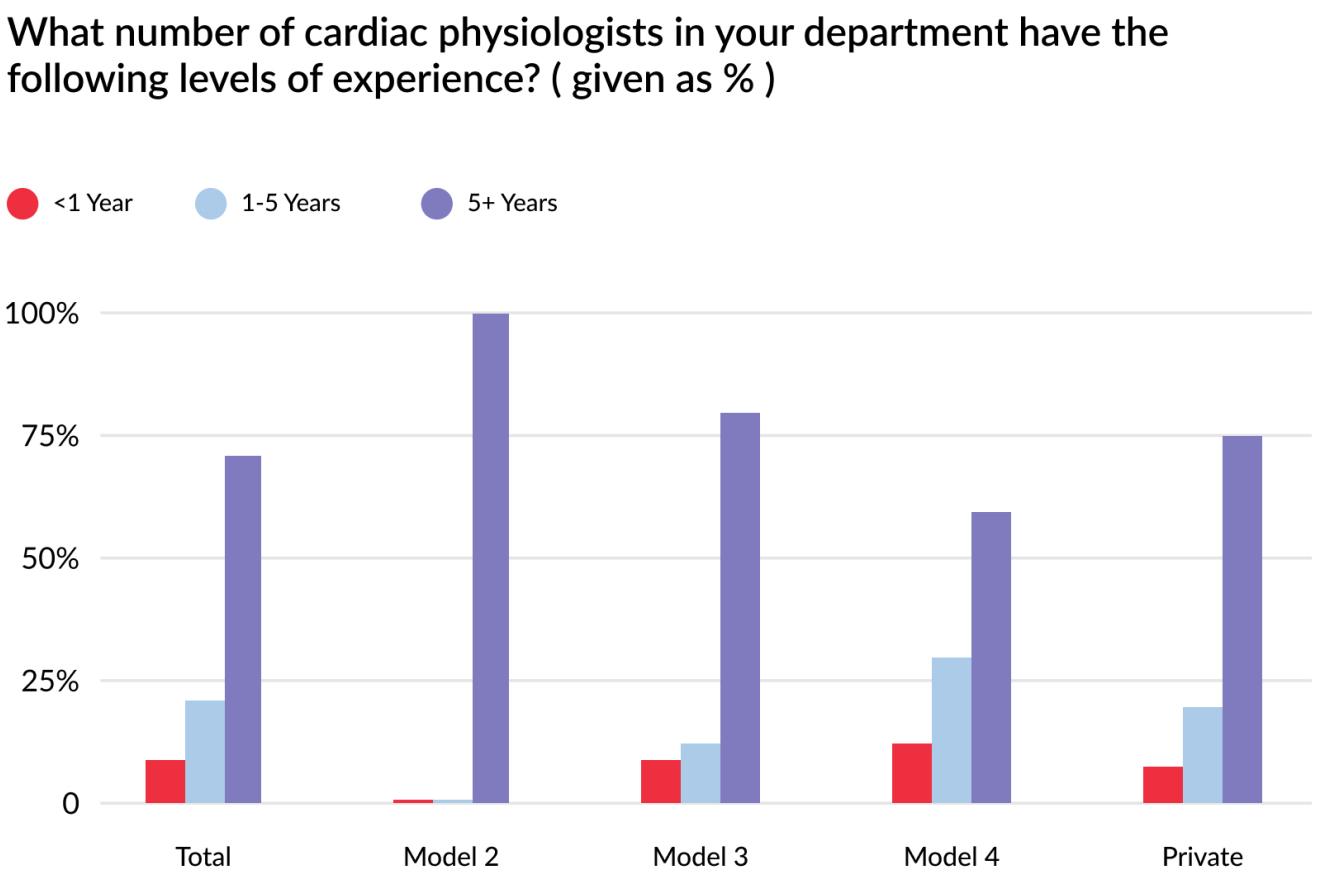

Figure 14

Based on our respondents' nearest estimates it has emerged that 8% of cardiac physiologists nationally have less than one year of experience. This compares with 19% at 1-5 years and 70% with over five years' experience. This workforce profile appears at first glance to be of significant benefit to the patient, showing highly experienced staff across the board. However, it demonstrates a broader systemic weakness which the health service must address. With a smaller than required number of new graduates entering the workforce, the provision of echocardiography services will become constrained in future. It raises questions as to whether Ireland is producing enough graduates to sustain echocardiography and other cardiology diagnostic services; whether enough is being done to attract newly qualified cardiac physiologists to work in Ireland, or to enter the profession in the first place.

Effective workforce planning will need to consider pay, conditions and career paths, including advanced practice and training to ensure the long-term viability of the service and maximising this highly trained workforce. Model 2 hospitals emerge as a particular cause for concern, as seen in Figure 14 above, where there are no cardiac physiologists with under five years' experience. If Model 2 hospitals are unattractive options for new entrants, the HSE and hospital group management will need to look at career development options from this position to maintain staffing levels into the future.

Following the same future-proofing orientation, we surveyed respondents to ascertain the proportion of cardiac physiologists on their teams who are fewer than five years from retirement. Figure 15 encapsulates this across both hospital models and groups. Again, it raises very significant planning and future-proofing questions for Model 2 hospitals, and in one case the sole cardiac physiologist is due to retire within five years, raising substantial questions about the ongoing viability of echocardiography services in this hospital. Yet it is not limited to smaller hospitals. In one Model 3 hospital, all five cardiac physiologists are nearing retirement age too, while in others between 38% and 50% fall within this category.

How many of the staff in your department are fewer than 5 years from retirement age?

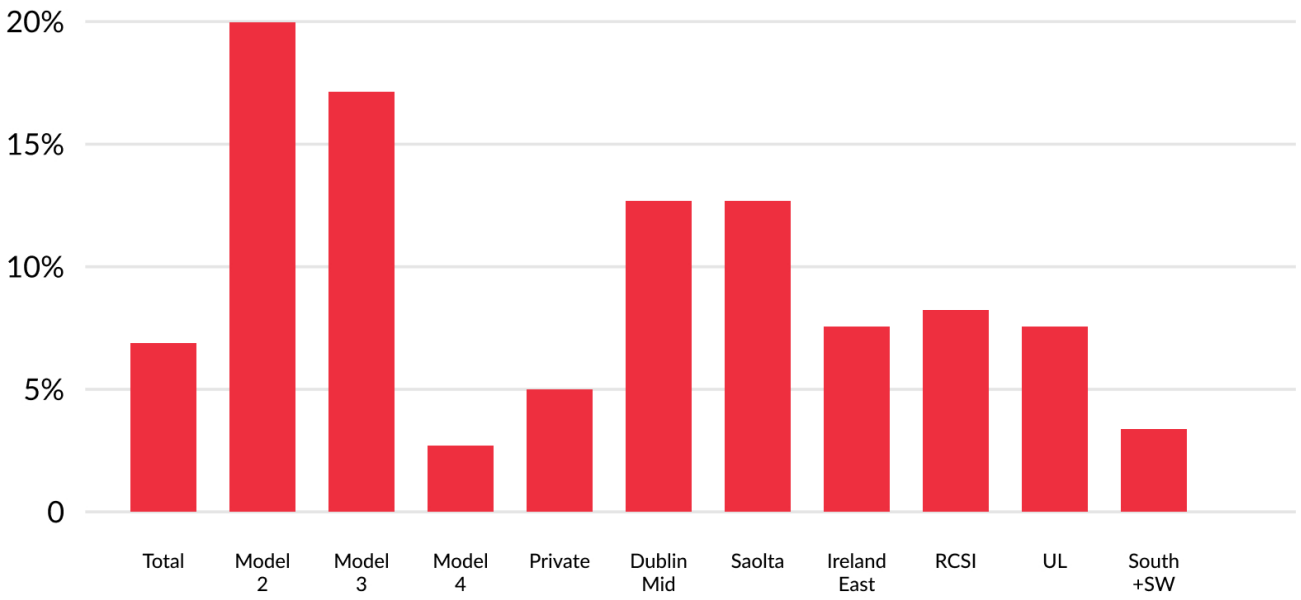

Figure 15

Looking at hospital groups, the Dublin Midlands and Saolta groups have the largest number of cardiac physiologists nearing retirement, while the remainder fall below 10%. The overall profile of the cardiac physiologist workforce emphasises the crucial importance of forward planning, to ensure that all practitioners are operating to a high standard. It also underlines the importance of peer supervision so that younger entrants are not performing echocardiograms on their own.

There needs to be work-force planning into ensuring that we have an appropriate level of suitable trained Consultant Cardiologists to provide the required oversight and governance. In Model 4, and if developed Model 5 hospitals, the need for advanced echocardiography procedures, which are outside the scope of this report, for example transoesophageal and stress echocardiography will require Cardiologists with a special interest in cardiac imaging. There is an increasing need for these investigations and this, coupled with the increased need for echocardiography to support interventional heart disease procedures requires expertise that can only be provided by Cardiology Consultants with an interest and training in imaging.

4.4. Accreditation

We asked respondents for an indication of the number of cardiac physiologists in their departments who provide a provisional report, which is a useful measure of the number of cardiac physiologists deemed as trained in echocardiography. Further to this, we surveyed our respondents to ascertain the proportion of their teams who hold the relevant accreditations in echocardiography, such as those of the British Society of Echocardiography (BSE) or the European Association of Cardiovascular Imaging (EACVI), which is reflected in Figure 16 as a subset of the former category.

Proportion of cardiac physiologists providing a provisional report including the proportion of those with accreditation

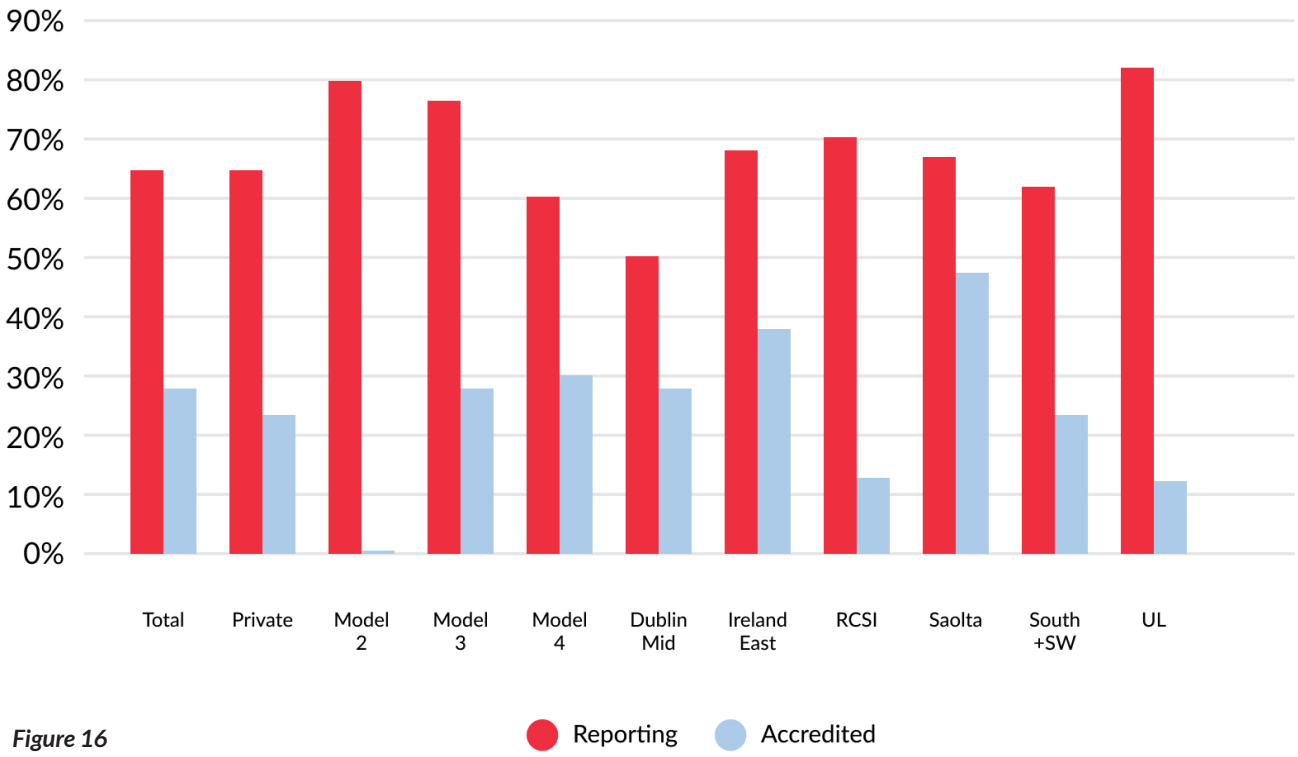

Figure 16

Across the system, there remains 35% of cardiac physiologists not currently trained in echocardiography, and there is a need to support structured fast track training. Model 4 and private hospitals have lower levels of reporting cardiac physiologists (67% and 62% respectively) when compared to their counterparts in Models 2 and 3. This reflects the larger teams available to Model 4 and private units, while there is a greater onus on cardiac physiologists in Model 2 and 3 units to provide reports.

Assessed based on hospital model, the levels of official accreditation are spread evenly across private, Model 3 and Model 4 hospitals, ranging from 28% to 33%. However, Model 2 units are a significant outlier, with none of the cardiac physiologists holding accreditation. Among the hospital groups, the spread of accreditation is uneven. The Saolta Group has the highest proportion of accredited cardiac physiologists at 49%. South/Southwest, Dublin Midlands and Ireland East range from 28% to 38% while the RCSI and UL Groups have the lowest levels of accreditation at 17% and 15% respectively. As part of the broader process of workforce planning, the health service will need to support and incentivise the internationally recognised accreditation processes of the British Society of Echocardiography and the European Association of Cardiovascular Imaging to sustain a high quality of service provision in echocardiography.

In order to ensure there is an adequate number of Consultant Cardiologists with an interest in imaging, Cardiologists in training should be also strongly encouraged and supported to undergo these individual certifications and accreditations. To ensure that the departmental processes and structures are at an appropriate level, Model 4 hospital, at a minimum, should also have departmental accreditation from the BSE or EACVI.

5. Recommendations

5.1. National Cardiovascular Health Policy

Fundamentally, the speedy diagnosis and effective treatment of heart conditions are hampered by the lack of an updated national strategy for cardiac care since the previous plan expired in 2019. Furthermore, heart valve disease was not mentioned in the previous strategy, and it remains a relatively overlooked condition – one which impacts an ever-greater proportion of our population and which is treatable. When it comes to the allocation of echocardiography services, other conditions with an up-to-date national strategy, such as oncology, receive greater priority than structural heart conditions. This theme emerged repeatedly during the qualitative components of our survey. Numerous respondents cited excessive referrals for echocardiograms across specialisations, often at the expense of heart valve disease patients.

Therefore, our key overarching recommendation is that the Department of Health and HSE publish an updated National Cardiovascular Health Policy. The policy should include specific provisions for the detection, diagnosis and treatment of heart valve disease based on the ideal patient pathway.

5.2. Allocation of funding

The new National Cardiovascular Health Policy should be linked to a multiannual budgetary framework to be reviewed against ambitious targets and regularly updated throughout its period of implementation. The most urgent starting point is to provide targeted funding in Budget 2023 to expand GP direct access and community-based echocardiography services. From this starting point, the multiannual budget should be directed towards the following imperatives in the short term:

5.2.1. Improved access

The most striking disparities identified here relate to challenges of accessing echocardiography services. The service requires a comprehensive overhaul to remedy challenges of access from several perspectives. First, the National Cardiovascular Health Policy should set a target of three months for the provision of routine echocardiograms and one month when it comes to urgent referrals.

Broadening GP direct access to hospital and community diagnostics for public patients will help to reduce delays and avoid unnecessary hospital admissions, thus diminishing the pressures felt within cardiology departments. Furthermore, resourcing every community hub with 1-2 cardiac physiologists, and building a clear supervisory relationship between community hubs and the appropriate Model 3 or 4 hospital, including IT integration, in their catchment area will do a great deal to improve waiting times for public patients.

5.2.2. Resources

All hospitals and community hubs should have access to echo machines to deliver services in a timely fashion. Furthermore, these should be provisioned with wraparound teams, including Consultant Cardiologists with a special interest in imaging, to ensure best possible use of equipment. This needs to be put into motion as part of the overall health expenditure in Budget 2023.

To ensure the best use of resources, the new National Cardiovascular Health Policy needs to ensure appropriate prioritisation of echocardiography services so that speed of provision reflects urgency of need. In open ended questions, several respondents raised this as a particular concern, citing inappropriate echocardiograms which had been referred to them. Therefore, in line with policies related to other conditions, the HSE should provide clear criteria for the prioritisation of echocardiograms within hospital and community settings. The American Society of Echocardiography has produced appropriate use criteria and the British Society of Echocardiography has developed a triage tool. Similar national guidance could help reduce echocardiograms which do not add value to patient care.

5.3. Workforce planning

Both the quantitative and qualitative components of our survey raised concerns around the capacity of the health system to deliver for heart valve patients, amid increasing demand and constrained resources. Many cardiac physiologists already feel over-worked and demand for echocardiography has increased exponentially during the past ten years. In addition, the ageing profile of this workforce brings concerns for the viability of echocardiography services in some units, particularly in Model 2 hospitals. Reflecting these concerns, Croí recommends the following:

5.3.1. Recruitment

There are not enough young cardiac physiologists entering the workforce, and there are significantly fewer new entrants than their counterparts nearing retirement. As a result, Croí calls on the Department of Further and Higher Education to launch a training/graduate scheme which would incentivise young people entering tertiary education to look towards a career as a cardiac physiologist.

5.3.2. Career development

Following initial recruitment, the HSE and the Department of Health needs to also examine the career path for a newly qualified cardiac physiologist. Currently, there are no cardiac physiologists with under five years' experience in any of the Model 2 hospitals surveyed. The supervisory and on-the-job training model will need to be reassessed to ensure the ongoing viability of these units, while pay, conditions and optimal career paths should be assessed to put it on a sustainable footing.

The fact that 35% of cardiac physiologists are not trained in echocardiography, reflects the difficulty of training in busy short-staffed departments, where the full range of investigations is being provided. A structured one-year post-graduate training programme in echocardiography would address this need and grow the number of Cardiac Physiologists trained in the area.

Workforce planning should also account for the training needs of cardiac physiologists in the form of targeting and tangibly supporting accreditation of Cardiac Physiologists through the British Society of Echocardiography and the European Association of Cardiovascular Imaging to sustain a high quality of service provision in echocardiography. Those seeking accreditation should be afforded the time and scope necessary to complete any additional work required. This initial certification, and further recertification at 5- and 10-year intervals needs to be factored into training and continuous professional development budgets

5.3.3. Consultant Cardiologists with a special interest in Imaging

Appointment of cardiologists with a special interest in imaging needs to be prioritised to ensure that we have an appropriate level of suitably trained Consultant Cardiologists to provide the required oversight and governance. This should be included as part of any cardiology workforce plan.

The need for advanced cardiac imaging, including exercise and stress echo and transoesophageal echo (TOE), and interventional TOE for adult congenital and structural heart disease interventions is expanding. Increasingly this requires an expertise that can only be provided by cardiologists with a special interest in cardiac imaging.

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