NATIONAL VARIATIONS IN THE PROVISION OF CARDIAC SERVICES IN THE UNITED KINGDOM

THIRD REPORT OF THE BRITISH CARDIOVASCULAR SOCIETY WORKING GROUP

Members of the working group

Nicholas Boon (chairman)
Michael Norell (secretary)
Jim Hall (England)
Kevin Jennings (Scotland)
Peter Groves (Wales)
Carol Wilson (Northern Ireland)
Judith Edwards (BACR - rehabilitation)
James Roxburgh (surgery)
Kirsten Bradbury (BCS)
EXECUTIVE SUMMARY

1. The British Cardiovascular Society has previously published two reports highlighting important differences in the provision, activity, and planning of cardiac services, that are clearly not related to differences in need, among the four home nations.

2. This report demonstrates that these differences remain and has identified some new inequalities. There is little or no evidence to suggest that these differences are diminishing.

3. Age adjusted CHD mortality has been falling across the UK for many years. The proportionate decline in mortality has been similar in all of the UK nations. Mortality, which is often used as a crude index of need, remains highest in the devolved nations and there is no sign of the gap closing.

4. There has been significant growth in the UK consultant cardiology workforce over the last 5 years and there is now a more equal distribution of cardiologists across the UK. However staffing levels remain well below those reported in comparable Western European countries.

5. There are important national variations in the use of complex therapies for heart disease including percutaneous coronary intervention and all forms of device therapy. The service in Wales appears to be significantly worse than the other UK countries but is improving.

6. There are important national differences in the provision of cardiac rehabilitation following myocardial infarction and bypass surgery. These differences are even more obvious when corrected for the burden of disease.

7. A bewildering and very different set of waiting time targets and guarantees are now operating in the four UK countries. These targets appear to be based on what is thought to be achievable but even so it looks as though some will be difficult to meet.
**Background**

This group was set up in response to concerns that the devolved nations had been disadvantaged by exclusion from the National Service Framework. The first report identified clear evidence of important variations in the provision, activity and planning of cardiac services between the four home nations, that were not related to differences in need.

The second report extended these findings by providing 5-year trend analyses and additional data on services, such as echocardiography, that were not included in the first report.

Council has requested an annual report from the National Variations Group because, at this stage, it is not clear if these anomalies will persist or even increase as health care diverges across the United Kingdom. Moreover, the work should help to inform planning and identify the most successful policies.

This report is intended to provide an update on core data including mortality, staffing and procedure rates and a review of current health care planning and target setting in each country. The working group intends to conduct a more detailed analysis of one aspect of cardiac services each year. Our last report concentrated on echocardiography and this paper contains a survey of cardiac rehabilitation services prepared with the help of Professor Bob Lewin and the British Association for Cardiac Rehabilitation (BACR).

Media interest in the first two papers was disappointing and the working party feels that there is little to be gained from seeking publication of this report; nevertheless council may wish to pace it on the BCS web site.

**Methodology**

Data for each country were collected from the same source using common definitions and have been corrected for the population served using denominators of 50 million for England, 5 million for Scotland, 3 million for Wales and 1.7 million for Northern Ireland. Some patients cross national borders to access specialist cardiac care; for example, approximately 700,000 people who live in North Wales rely on English centres for the provision of tertiary cardiac services. The working group have therefore, whenever possible analysed and presented activity data by place of residence.
Findings

Spending

Total spending on health care in the UK rose to an estimated £120 billion in 2006, representing 9.4% of GDP (up from 7.1% in 2001), and is now above the European average. Although the growth in the number of doctors per 1000 people is higher than in other European countries the UK still has substantially fewer doctors than Italy, France and Germany; in contrast the number of nurses in the UK is among the highest in Europe.\(^3\)

Mortality from CHD (Figs 1 & 2)

NB. new data for 2005 will be available in May

Age-adjusted CHD mortality has been falling across the UK for many years. The proportionate decline in mortality has been similar in all four devolved nations (figs 1 & 2). Mortality, which is often used as a crude index of need, remains highest in the devolved nations and the North of England and there is no sign of these gaps closing.

![Figure 1](https://www.heartstats.org)

Figure 1. Age-standardised death rates from CHD per 100,000 population for men aged 35-74. Source: BHF - www.heartstats.org
Cardiology Consultant Staffing

Analysis of the consultant cardiology workforce is difficult because the definition of a cardiologist is not straightforward. The data presented here are derived from the most recent workforce study conducted by the Royal College of Physicians of London and includes both adult and paediatric consultants. There has been significant growth in the UK cardiology workforce over the last five years (although not in Northern Ireland) and there is now a more equal distribution of cardiologists across the UK (Fig 3). Nevertheless, staffing levels remain well below those reported in comparable Western European countries and much lower than those recommended by the BCS workforce committee.

Figure 2. Age-standardised death rates from CHD per 100,000 population for women aged 35-74. Source: BHF - www.heartstats.org

Figure 3. Cardiologists per million population by country. Data were derived from the Royal College of Physicians London census (there are no comparable data for Scotland in 1999).
Last year’s working party arranged a survey of the consultant workforce and was reassured to discover that the findings were very similar to the Royal College of Physicians data. This survey also demonstrated that the proportion of time cardiologists spend on specialist activity seems to vary considerably across the UK. Thus the vast majority (74%) of cardiologists in Northern Ireland are full time specialists whereas 65% of Welsh consultant cardiologists have important and apparently time-consuming general medical duties\(^2\). This may partly explain the regional differences in specialist activity (e.g. PCI and device implantation) described below.

**Percutaneous Coronary Intervention**

*Access rates for PCI*

Data for PCI access rates in the UK continue to be produced on an annual basis by the British Cardiovascular Intervention Society (BCIS, www.bcis.org.uk). The latest figures relate to calendar year 2005. These show a steady increase in PCI activity across the UK; approximately 70,000 procedures were undertaken that year, representing an increase of 11% over 2004.

The distribution of PCI activity across the devolved nations since 2000 is shown in Fig 4 as the number of procedures per million population. The rates of increase year upon year appear similar; Wales seems to have the lowest activity but a proportion of Welsh patients are treated in English PCI centres and may appear as PCI activity in that country.

![Figure 4. Percutaneous Coronary Intervention procedures per million population. Data provided by BCIS (British Cardiac Intervention Society).](image-url)
**Usage of Drug Eluting Stents (DES)**

During the last 5 years these devices have emerged as an important adjunct to routine PCI. Figure 5 shows that the extent to which they are utilised has not been uniform across the UK. Since this is a relatively new technology differences in uptake are likely to reflect the degree to which national health policies are responding to the changing clinical environment and planning for future population needs.

**Figure 5.** Percentage of PCI cases using a Drug Eluting Stent by country. Data provided by BCIS (British Cardiac Intervention Society)

The proportion of PCI cases using DES rose in 2005 in all devolved nations with the exception of Northern Ireland, where a fall was apparent. Our understanding is that this followed a decision by the Regional Medical Services Consortium, acting on behalf of the four Area Boards, to limit the use of DES to 40% of overall stent use.

**Primary PCI (PPCI) for AMI**

PCI is recognised as superior to thrombolytic therapy for patients with acute myocardial infarction (AMI). However the practicalities of delivering mechanical reperfusion in a timely fashion have limited the uptake of this therapy in the UK.

Peter Ludman (Audit officer for BCIS) has provided information on the number of centres in the UK that offer PPCI for AMI. As of September 2006, a comprehensive 24/7 service for PPCI was offered in 13 of the 54 NHS units in England and nowhere else in the UK. However, a larger number of centres were offering PPCI during working hours only; this included 1 of the 7 NHS units in Scotland, both PCI centres in Wales and a further 27 in England. There is no comprehensive primary PCI service in N Ireland.
**Cardiac Surgery**

Cardiac surgical activity (expressed as the number of operations per million population) for the calendar year 2006 is illustrated in figure 6. These data were provided by the Health Care Commission and will be available on the world wide web soon (http://heartsurgery.healthcarecommission.org.uk/index.aspx).

Our first report demonstrated that in 2002/3 surgical activity was greatest in Scotland followed by England, Wales and then Northern Ireland. This ranking has not changed. The low activity in Northern Ireland maybe partially offset by a higher than average PCI rate. In contrast, Wales has low rates of PCI and Cardiac surgery. These figures are worrying and suggest that the Welsh do not have adequate access to revascularisation; however, they may not take sufficient account of cross-border flow.

![Figure 6. Cardiac surgery (all heart operations per million population) during 2006 by country.](image)

**Device Therapy**

Bradycardia pacing, implantable cardioverter defibrillators (ICD) and Cardiac Resynchronisation Therapy (CRT) are among the wide range of evidence-based device therapies that are now in common use. Although implant rates are increasing, the UK as a whole implants far fewer devices than most Western European Countries. Moreover there are huge regional variations in implant rates across the UK that cannot be explained by differences in the prevalence of heart disease and must therefore reflect differences in clinical practice.

The implant data that follow were collected through CCAD and were checked and tabulated by David Cunningham. They take account of cross-border flow and are presented by place of residence.
Bradycardia Pacing

The implant rate for simple pacemakers has grown steadily over the last 10 years and the average for the UK as a whole is now just over 400 pacemakers per million population. This is well below the equivalent figure in most Western European countries and a long way below the English National Target of 700 per million. Moreover, there are striking regional differences; for example, implant rates in Dorset and Somerset now exceed 700 per million whilst the rates in Herefordshire and Worcestershire are less than 300 per million. The need for pacemaker therapy is heavily dependent on the age structure of the population, being greatest in communities with a high proportion of elderly people, but demographic differences are unlikely to account for such big variations in practice.

Figure 7. Implant rates (number per million population) for new pacemakers by country.

Implantable Cardioverter-Defibrillator (ICD) Therapy

ICD implant rates are growing in all areas of the UK but remain well below the rates reported in most other developed countries (Fig 8). Activity is particularly low in Wales and relatively high in N Ireland (where paradoxically bradycardia pacing rates are lower than the rest of the UK). These National variations do not reflect clinical need and are almost certainly due to differences in funding arrangements and health care policy. There are also huge regional variations in implant rates within the UK countries that cannot be explained by differences in the prevalence of heart disease and must therefore reflect differences in clinical practice.
Cardiac Resynchronisation Therapy

Cardiac Resynchronisation Therapy (CRT) is a complex form of pacemaker therapy that has been shown to improve the morbidity and mortality of selected patients with heart failure. The last working group found evidence of a very patchy uptake of this technology across the UK and concluded that this was due to a shortage of the relevant expertise and difficulties in funding. Figure 8 shows that there are still huge differences in implant rates between the four home nations. The recent Network Devices Survey has demonstrated that there also very large (up to ten fold) differences in implant rates between the English Networks.

Figure 9. Implant rates (number per million) for all forms of new CRT by country of residence.
CRT can be delivered using devices that provide only a pacing function (CRT-P), and those that also incorporate a defibrillator capacity (CRT-D). Interestingly, there are also substantial national and regional differences in the use of these subtypes of CRT (figures 10, 11 and 12).

**Figure 10.** Implant rates (number per million) for new CRT-P by country of residence.

**Figure 11.** Implant rates (number per million) for new CRT-D by country of residence.

**Figure 12.** Implant rates (number per million) for new CRT devices in 2006, subdivided into CRT-P and CRT-D, by country of residence.
Cardiac Rehabilitation

Cardiac rehabilitation has been shown to reduce morbidity and mortality after any major cardiac event, and is actively promoted by the health departments of England, Scotland, Wales and Northern Ireland. Patient groups have consistently identified investment and improvement of rehabilitation as one of their main priorities. In spite of these observations most local services remain patchy, inequitable and chronically under funded; many patients are not therefore offered rehabilitation services.

The activity data that follow are estimates derived from the results of a postal survey conducted by the British Association for Cardiac Rehabilitation and form part of a campaign, by a coalition of voluntary groups, to improve rehabilitation services. Questionnaires were sent to every known centre in the UK (287 in England, 31 in Scotland, 20 in Wales and 12 in Northern Ireland). Response rates were excellent (England 95%, Scotland 94%, Wales 100% and Northern Ireland 92%) but a significant minority of the responding centres could not provide the requisite data (England 21%, Scotland 42%, Wales 10% and Northern Ireland 25%).

There are clearly important regional differences in the provision of cardiac rehabilitation following myocardial infarction and by pass surgery (Fig 13). These differences are even more obvious when corrected for the burden of disease by expressing as the percentage of eligible patients treated (Fig 14). They confirm that a substantial number of patients who might benefit from rehabilitation do not receive it and highlight the need for more robust audit of this important therapy.

The service in Northern Ireland appears to be relatively poor but may have been underestimated because although the country has 18 rehabilitation centres they do not share a common database and only 12 of these are registered with the BHF. Six centres did not therefore take part in the BACR survey a similar situation exists in Scotland where a further 7 programmes have been discovered since the survey. Efforts to correct these shortcomings are underway.

![Graph showing differences in cardiac rehabilitation between England, Scotland, Wales, and Northern Ireland.](image)

**Figure 13.** Annual number of patients (per 100,000 population) reported to be receiving rehabilitation after myocardial infarction and after coronary artery bypass surgery. **NB** Estimates for missing data were derived from the median (and not the mean) value of the available data.
Figure 14. Percentage of eligible patients receiving rehabilitation after myocardial infarction and after coronary artery bypass surgery. NB The data reported are for discharges from care rather than episodes of care. English and Welsh data are derived from Hospital Episode Statistics. Scottish data are derived from Scottish Heart Disease Figures. The number of eligible patients in Northern Ireland could not be determined because NI does not currently contribute to the MINAP database.

A campaign, by a coalition of voluntary groups, to improve rehabilitation services will be launched later this year with the full support of the BCS.

Health Care Planning and National Waiting Time Targets

A bewildering and very different set of waiting-time targets and guarantees are now operating in the four UK countries. Cynics have observed that these targets were initially based on what was thought to be achievable; indeed, this is the only credible explanation for the huge difference in waiting-time guarantees between Wales and England. Nevertheless, the health departments in each country have introduced numerous changes and some of the new targets look as though they will be difficult to meet.

England

In England the targets for maximum waiting times for cardiac investigations and procedures became a political hot topic following the death of Ian Weir in 1999 on a waiting list for a CABG. Mr. Weir was a constituent of the then Health Secretary Alan Milburn. Shortly after this tragic event the NSF for CHD and the NHS Plan were published in March and July 2000. These forward plans for the NHS set out ‘aspirational targets’ for maximum waiting times for outpatient consultations and inpatient treatments. The goals set for cardiac care (particularly revascularisation) were more ambitious than for other procedures. The ultimate goal was to have a maximum of two weeks wait from referral by a GP to specialist assessment and a maximum of three months wait for CABG/PCI from the decision to operate.
Since that time the hard waiting time targets against which organizations were to be performance managed have progressively shortened and those for cardiac procedures have always been in advance of the more general targets.

In March 2001 the hard targets were for ‘waiting lists’ to have no waits longer than 18 months however for cardiac services these were to be shorter with no waits for ‘revascularisation’ to be greater than 12 months.

By March 2004 the term revascularization was widened to all adult cardiac surgery with explicit inclusion of PCI and the maximum wait was shortened to 6 months whilst other in-patient procedures had only to meet a 9 month target. At this stage the maximum wait for a rapid access chest pain clinic (RACPC) referral was 2 weeks whilst other outpatients had to be seen within 17 weeks.

By March 2005 the target for ‘revascularisation’ was reduced to 3 months whilst other inpatient procedures were to limit over 6 month waiters to less than 20% of the 2003 level. The maximum wait for an outpatient referral had to be less than 13 weeks from December 2006.

The next major step will be to bring all procedures to a maximum 3 month wait in line with ‘revascularisation’ and reduce all waits from GP referral to hospital treatment to 18 weeks by December 2008.

Scotland

A new SIGN guideline for the management of coronary heart disease was launched in February 2007. Many of the recommendations are cost-neutral but implementing the recommendations for primary prevention might cost as much as £90 million per year. Implementation has been left to local boards. Progress is likely to be slow partly because the current management structure effectively separates clinical advice (provided by the Managed Clinical Networks - which operate at Board level and have no budget), from planning (provided by the three regional planning groups that also have no budget and rarely meet), from the budget-holders (the chief executives of the Boards).

The latest Scottish Waiting Times Guarantees and Targets were confirmed by SEHD/Performance Management Division 5 on March 2007 and include 2 important guarantees and several relevant targets

Guarantees

- No patient with a guarantee will wait longer than 6 months for hospital inpatient or day case treatment. This will be reduced to 18 weeks from 31 December 2007.
- From 30 June 2004, the maximum wait for coronary artery bypass graft surgery or angioplasty, following angiography, will be 18 weeks.
If a patient's host NHS Board is unable to provide treatment within the guaranteed time, the patient will be offered treatment elsewhere in the NHS, in the private sector in Scotland or England or overseas.

**Targets**

- From 31 December 2004, the maximum wait for coronary angiography will be 8 weeks from seeing a specialist.
- From the end of 2007, no patient will wait more than 16 weeks from GP referral, through a rapid access chest pain clinic or equivalent, to cardiac intervention thereafter.
- From the end of 2007, no patient will wait more than 16 weeks for treatment after they have been seen as an outpatient by a heart specialist and the specialist has recommended treatment.
- From 31 December 2005, no patient will wait more than 26 weeks for a first outpatient appointment with a Consultant, following referral by a General Medical Practitioner/General Dental Practitioner. This will be reduced to 18 weeks from 31 December 2007.
- From 31 December 2007, the maximum waiting time for 8 key diagnostic tests will be 9 weeks. The key diagnostic tests are CT, MRI, Ultrasound and Barium Scans, Upper Endoscopy, Cystoscopy, Sigmoidoscopy and Colonoscopy.

**Wales**

*Service planning and commissioning*

Targets for cardiac services are set by the Welsh Assembly Government (WAG) and are included in the annual Service and Financial Framework agreement (SaFF) between government and providers. Tertiary cardiac services are commissioned by Health Commission Wales and secondary cardiac services by Local Health Boards. Strategic service planning is overseen by three Cardiac Networks but the annual budget and spending priorities are overseen by the commissioning bodies.

*The evolution of cardiac targets in Wales*

The Coronary Heart Disease NSF for Wales (‘Tackling Coronary Heart Disease in Wales’) defined milestones for the development of cardiac services for the prevention and treatment of CHD from 2002/3 onward. For primary prevention, providers and networks were challenged to identify strategic priorities and to establish screening programmes for CHD risk factors. Maximum waiting targets for diagnostic and revascularization procedures were defined for the first time. Subsequent annual SaFF agreements have included a slow but stepped reduction in the maximum waiting time targets for diagnosis and treatment:

- **Coronary angiography** – The maximum waiting time in the NSF of 2002-3 was 6 months. This target remained unchanged through SaFF agreements for 2003/4 and 2004/5 but was reduced to 4 months for 2005/6 and 2006/7
- **Revascularization (PCI/CABG)** – The maximum waiting time in the NSF of 2002-3 was 12 months. This target was progressively reduced
in 2003/4 to 10 months, in 2004/5 to 8 months and in 2005/6 to 6 months but remained unchanged for 2006/7 at 6 months

- Compliance with a call-to-needle time for STEMI of less than 60 mins was set at 60% in 2005/6 and 70% in 2006/7

**Maximum waiting times**

In contrast to England and Scotland, the definition of a maximum waiting time target (from referral to completion of treatment) for patients with heart disease has appeared only recently in the SaFF agreement. In 2006/7, a maximum waiting time target of 16 months was defined with the intention that this be reduced progressively in future years to a maximum waiting time of 26 weeks by 2009.

**Northern Ireland**

In spite of some improvements, NI still has large numbers of patients waiting for cardiology outpatient assessment, cardiac investigations (particularly echocardiography and perfusion imaging), angiography, intervention, electrophysiological procedures, and cardiac surgery.

In 2005-2006 the inpatient waiting target of 6 months, was only achieved by sending significant numbers of both cardiac surgical and cardiology (invasive electrophysiology) patients to providers outside NI. Much of this has been achieved with non-recurrent funding.

For the current year (2007-2008) the target for outpatient assessment is 13 weeks from GP referral and the inpatient target is 21 weeks for all procedures. This is already proving challenging as units seek to balance the demand for acute angiography/EP services/cardiac surgical procedures against patients requiring to be done to meet the targets.

NI is now developing a Cardiac Network, but its work is not yet far enough developed to have had any real impact. The implications of devolution of powers to the local Assembly, and the major ongoing restructuring of Public Administration, are factors that will certainly affect health service priorities, commissioning and funding in a yet undetermined way.
Discussion

Most, if not all, of the national variations in the provision of cardiac services that were identified in our first two reports are still present. Moreover, there is little evidence to suggest that these differences are diminishing and some new inequalities have been identified.

The phenomenon of postcode prescribing, also known as the *postcode lottery*, has been well publicised and reflects many variables, particularly the availability and expertise of staff, that influence small health care units. The geographical variations in activity described in this report relate to much larger service blocks and could be construed as a *national lottery*. They are therefore more likely to reflect differences in health care policy and planning.

The whole purpose of devolution is to allow elected representatives to plan and implement services in accordance with local needs. Whilst, it seems inevitable that local planning will identify different priorities, and therefore create variations in service delivery, the core objectives of NHS in the four nations have not changed and the public rightly continues to expect common standards of care across the UK. There is therefore an obvious conflict between the desire to devolve decision-making and at the same time eliminate postcode prescribing.

The British Cardiovascular Society has a crucial role to play in setting and monitoring clinical standards and will continue to monitor regional and national anomalies in the provision and delivery of cardiovascular care closely.
References


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