
**THE BEST CONFIGURATION OF HOSPITAL SERVICES FOR WALES:
A REVIEW OF THE EVIDENCE**

SUMMARY

Professor Marcus Longley

Welsh Institute for Health and Social Care · University of Glamorgan

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The author

Professor Marcus Longley MA (Oxon), MScEcon, PhD, FFPH, AHSM is Director of the Welsh Institute for Health and Social Care and Professor of Applied Health Policy at the University of Glamorgan.
mlongley@glam.ac.uk <http://wihsc.glam.ac.uk/>

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SUMMARY

This paper reviews what the evidence suggests about the optimal number, size and distribution of hospital services in Wales. It is written for a non-specialist audience: Welsh citizens who want to make up their own minds about how their hospitals should be configured. Further information on three key parts of this debate – quality and safety, the workforce, and access – is contained in three accompanying papers.

This paper sets out to help the reader answer four questions:

Q: On Safety and Quality: **What's wrong with our current pattern of hospital services?**

A: There is an accumulating body of evidence which suggests that patients in Wales do not always get the best possible outcomes from their hospital care, and that in some key specialty areas – notably major trauma, general trauma and emergency care, stroke care, maternity and newborn care, and paediatrics – the way services are organised in Wales probably falls well short of what the evidence suggests is optimal.

Q: On the Workforce: **We've got more staff than ever before, so what's the problem?**

A: There are now acute pressures on medical staffing in paediatrics, emergency medicine, core surgical training and psychiatry, and more generally in some of the more remote parts of Wales. A 'perfect storm' has developed, with more doctors in our hospitals, but actually less availability in comparison with the demand for their services.

Q: On Access: **Is poorer access inevitable to ensure good safety and quality?**

A: Centralising services is almost bound to increase some people's travel times. However, there is a lot which can be done to mitigate the impact of the centralisation of some services. In particular, the risks associated with longer travel times could be substantially reduced, if pre-hospital emergency services were also re-configured.

Q: And putting the elements together: **What's the case for change?**

A: There is now a strong case for re-configuring some hospital services, in Wales as elsewhere in the UK. This has a positive aspect – patient outcomes could be improved – and a negative aspect – some services will collapse because of shortages of key staff, if changes are not made proactively. While these problems have been developing over time, the need for change is now urgent in some key specialties, as levels of medical staffing become acute.

It is in the nature of this evidence sometimes to be frustratingly vague, inconclusive, contradictory, or simply non-existent, and not always to point to a single answer. However, as this summary and the accompanying papers show, there is now convincing evidence that hospital services in Wales are not always configured optimally, and that patient care may suffer; and that some key staff groups, in some hospitals, are unsustainable, with the risk of imminent service collapse. Readers therefore have to weigh the evidence for themselves, taking into account the interpretations placed upon it, and applying their own common sense. Health policy decisions are usually like this - in part about value judgements - and striking an acceptable compromise between different objectives is something else that readers must do for themselves. Hence the need for a serious public debate about these issues. In some key respects, however, there is now a sufficient weight of evidence to give serious cause for concern about whether we really are getting the best possible care from the resources we currently invest.

‘Here now is the opportunity to build a hospital service equal to any in the world and matched, I would think, by very few... the intention of the Government and of the Hospital Service [is] to rise to that opportunity... This Plan is nothing less than a plan for the modernisation of our hospital system... to make clear the sort and size of hospitals which we ought to have if we are to make the best use of the specialist techniques of our time, together with the general practitioner services and the domiciliary services.’

Lord Newton, introducing *The Hospital Plan for England and Wales* to the House of Lords in 1962

1. INTRODUCTION

I. PURPOSE OF THIS PAPER

People across Wales are about to be asked for their views on how their health services should be changed. This paper is designed to help people make up their own minds. It reviews the evidence on what constitutes ‘the best’ in hospital provision, and assesses the strength and implications of the evidence. The focus is on **what the evidence suggests about the optimal number, size and distribution of hospital services in Wales**. It is impartial, based solely on the evidence reviewed, and any judgements made on the basis of the evidence are explicit. It is written primarily for a lay audience: people who care about the future of their health services, and want to make up their own minds between the sometimes conflicting views presented through the media and elsewhere.

It does not consider *local* plans: it merely reviews what the evidence says *in general* about changes to the pattern of hospital services. It focuses primarily on acute hospitals, but makes the point that these hospitals are only one part of a complex network of services that make up NHS Wales, and they depend on the services around them. It also works on the basis that the evidence can *help* make a decision, but it *doesn’t tell you what the answer is*. At the heart of these difficult issues lies a set of value judgements: people need to decide for themselves what matters most for them in healthcare, and what compromises they are prepared to accept.

This paper is based on three accompanying ‘technical’ documents which describe the evidence in more detail:

- I. Quality and Safety
- II. Workforce
- III. Access

If the reader wants more information on any particular issue, it can be found in these technical documents.

II. SOME STRAIGHT ANSWERS TO SOME SIMPLE QUESTIONS

Much of the controversy which dogs any proposed reconfiguration of health services, anywhere in the UK, stems from proposals to change what hospitals provide, and particularly to ‘take away’ services from local hospitals. All too often, it would appear, the discussion is not informed by the evidence, and people are left puzzled (and even suspicious) about what is going on. In reviewing the evidence, we have been guided

by some simple – but profound - questions which people repeatedly ask about the future of their hospitals, and to which they sometimes struggle to get a convincing answer:

- On Safety and Quality: **What’s wrong with our current pattern of hospital services?**
- On the Workforce: **We’ve got more staff than ever before, so what’s the problem?**
- On Access: **Is poorer access inevitable to ensure good safety and quality?**

And putting the elements together: **What’s the case for change?**

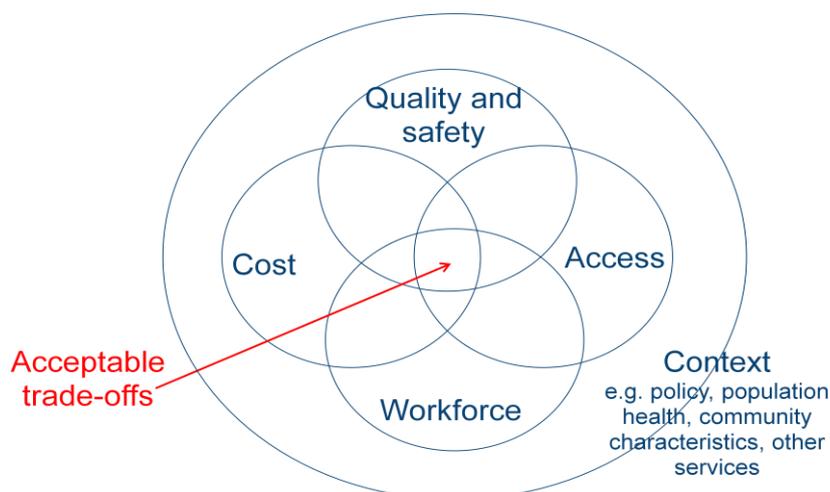
Another issue which frequently crops up in these discussions is about money: **Can we afford to improve the service?** The evidence on this is not reviewed here, but there is some discussion about what this question might mean.

2. THE CONTEXT

I. WORLD CLASS HOSPITALS DEPEND ON...

The Bevan Commission recommended to the Welsh Government that health care in Wales should be ‘*best suited to the needs of Wales and comparable with the best anywhere*’. In short: ‘world class’. Definitions of what constitutes ‘world class’ in hospital care vary from place to place and observer to observer, but there is a measure of consensus around four sets of issues in particular that will determine overall success: the quality and safety of the care provided in the hospital; how accessible it is; whether the workforce is sufficient in quality, quantity and distribution; and whether the system is affordable. Each of these must be sustainable into the future. No system in the world has ever managed to achieve perfection in all of these domains, or ever could: ‘world class’ is about finding a set of trade-offs which is acceptable to citizens and professionals (Figure 1):

Figure 1: The determinants of world class hospital care



This paper is about acute hospital services, and the evidence reviewed here takes that narrow focus. But the contextual factors are vital to the success of the hospitals. They translate into a series of objectives,

common to most healthcare systems in the developed world, including Wales, and are already subject to a variety of other initiatives:

- Helping people and communities look after themselves better – to prevent ill health and keep people well
- Controlling the growing burden of chronic disease – to minimise the impact of long-term conditions, which already account for most healthcare in Wales
- More NHS capacity and coordination outside hospital – to shift the balance of resources towards the community
- Preventing unnecessary hospital admissions – to make sure that people are only admitted to hospital when this is really their best option
- Better coordination between all service providers – to provide effective team working across the complex range of services which people require
- Adopting world class efficiency measures – to continue the endless task of making the system work as efficiently as possible
- Following best clinical practice – to make sure that all services follow accepted good practice
- Avoiding delayed discharges – to ensure that people leave hospital to the most appropriate destination for them, without any delay
- Services designed for different communities – to make sure that services are properly configured and attuned to where they work
- Partnership between services and patients – to ensure that all patients are fully engaged in their own care, making decisions and receiving care which suits them
- Adequate resources – to ensure that services work efficiently and get the money and other resources they need.

Achieving world class hospital services means achieving world class provision in all of these aspects, as well as the optimal configuration of hospital services themselves. In Wales, the achievement of the third objective – dramatically improving health and related services *outside* hospitals – is particularly important for the future of hospital services. It has been clear for some time that Wales has more hospital beds than England - 3.90 beds per 1,000 population in Wales compared with 2.64 beds per 1,000 population in England (December 2011). Progress in this area (set out in the Welsh Government's policy *Setting the Direction*) must proceed in lock-step with the development of hospital services if the latter are not to be left plugging gaps in community provision, and admitting people who should have been cared for in the community.

II. 50 YEARS OLD, BUT CONSTANTLY CHANGING

The current pattern of hospital services in England and Wales was established according to a blue print set out 50 years ago by the then Minister for Health, Enoch Powell MP in *The Hospital Plan for England and Wales*. Its aim seems remarkably modern: to create world class hospital care, by developing a coordinated system in and outside hospital, using the latest technology and the full range of staff skills and expertise. The words of Lord Newton, quoted at the start of this paper, could almost have been said by the Welsh Minister in the Senedd last week!

The Hospital Plan gave birth to a network of ‘District General Hospitals’ of 600-800 beds, designed to serve populations of 100,000 to 150,000. These key building blocks still exist in recognisable form across Wales 50 years later; but the care they provide has changed and adapted to meet changed circumstances:

<i>For example...</i>	<i>... which means</i>
Primary care identifies patients at risk and manages them proactively	Diabetic patients used to be admitted to hospital to start their insulin... now it’s done in the community
Length of hospital stay is much shorter	Many operations are done as day cases
Technology allows specialist care closer to home	Large parts of cancer care and most mental health services are now in the community
Staff have developed new roles	Many services are now led by non-medical staff

Change in these and other areas must continue in conjunction with any changes to the configuration of hospitals services.

3. WORLD CLASS HOSPITALS

I. SAFETY AND QUALITY

The safety and quality of hospital services can be defined and assessed in a variety of ways. The evidence relating to two of the most important is considered here. Clinical outcomes are those objective measures of success which matter most to patients, such as avoidable death and disability. Service models describe the way parts of the service – for example, types of surgery, stroke care, child birth - are provided. Looking at both helps us to answer the question: **What’s wrong with our current pattern of hospital services?**

Further information on the data summarised here can be found in the accompanying paper of Quality and Safety. The discussion here on safety and quality should also be read in conjunction with the next section, on Workforce, which explores whether shortage of particular groups of staff may in itself be a threat to quality and safety.

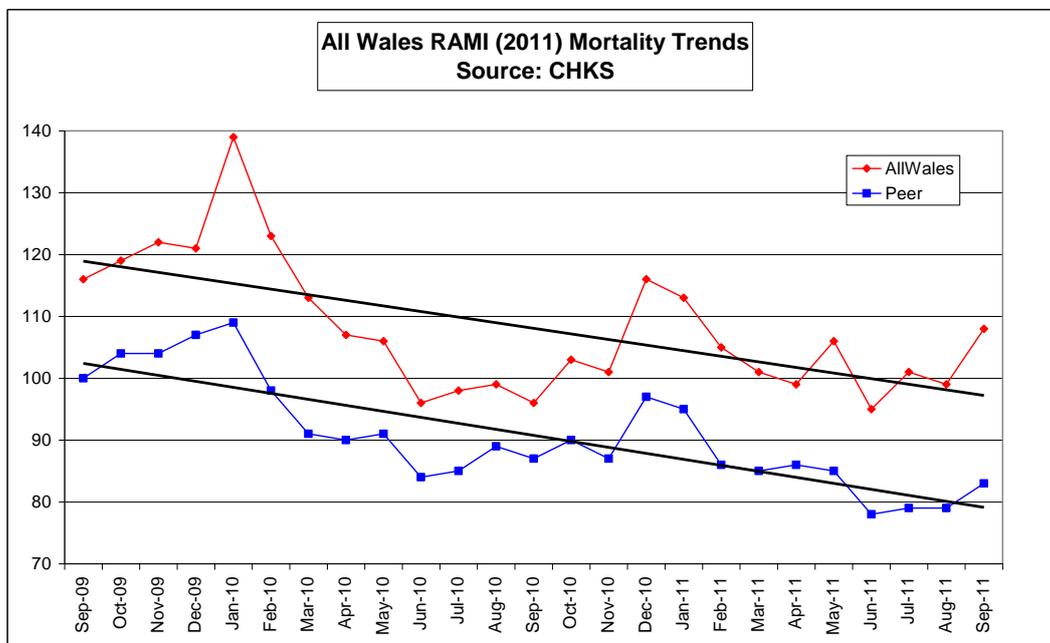
A. Clinical outcomes

Data on deaths in Welsh hospitals are used to construct a Risk Adjusted Mortality Index (RAMI). This attempts to adjust the ‘crude’ death rates for the differences between patients which are not the result of hospital care – for example, age, sex or severity of condition on admission. These are then compared with a broadly similar group of English hospitals, to see if there is any difference in the outcomes which might be the result of the hospital care itself. Like any statistical technique, the process of risk adjustment is not perfect, and it is possible that at least some of the difference observed is the result of extraneous factors such as differences in the types of hospital compared, or the local availability of hospice care. So the data

presented here should be used with caution. The data also mask variation between the different English regions.

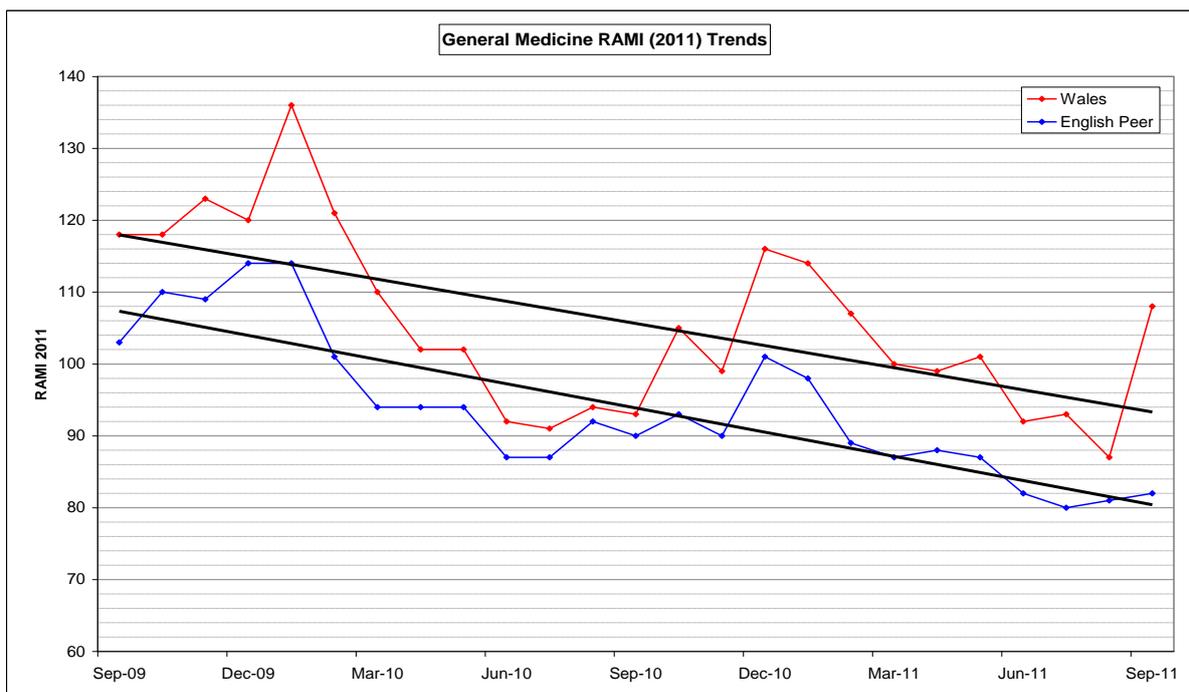
Figure 2 shows the overall comparison between Welsh and English hospitals, with a remarkably similar (improving) pattern between the two countries, but a consistently poorer performance from Wales:

Figure 2: Risk adjusted mortality trends 2009-11, Wales and England



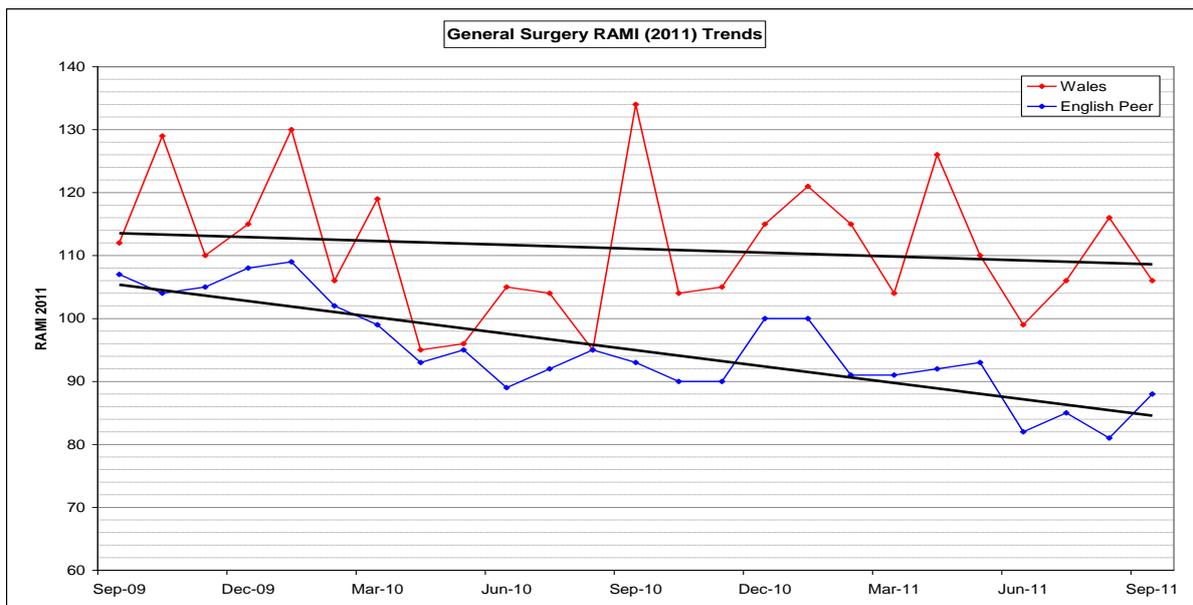
Looking more closely at some of the bigger specialties within this overall picture, general medicine appears to follow a similar pattern (Figure 3):

Figure 3: General Medicine risk adjusted mortality trends, 2009-11, Wales and England



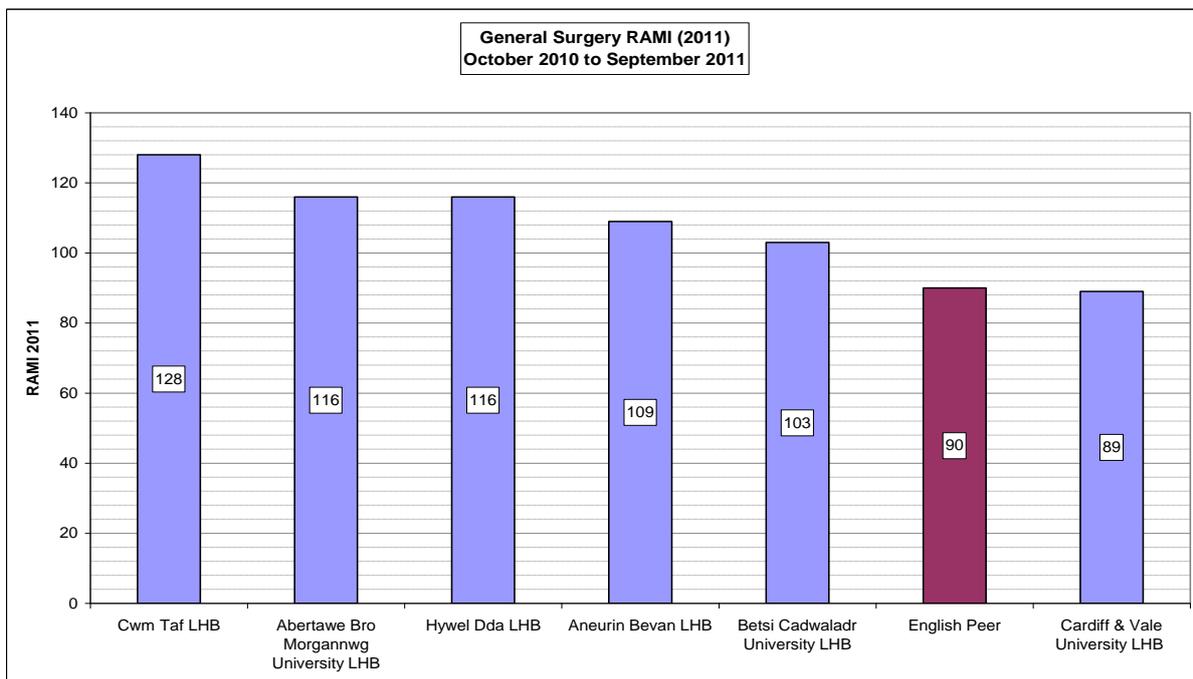
In general surgery, the difference between England and Wales appears to be widening (Figure 4):

Figure 4: General Surgery risk adjusted mortality trends, 2009-11, Wales and England



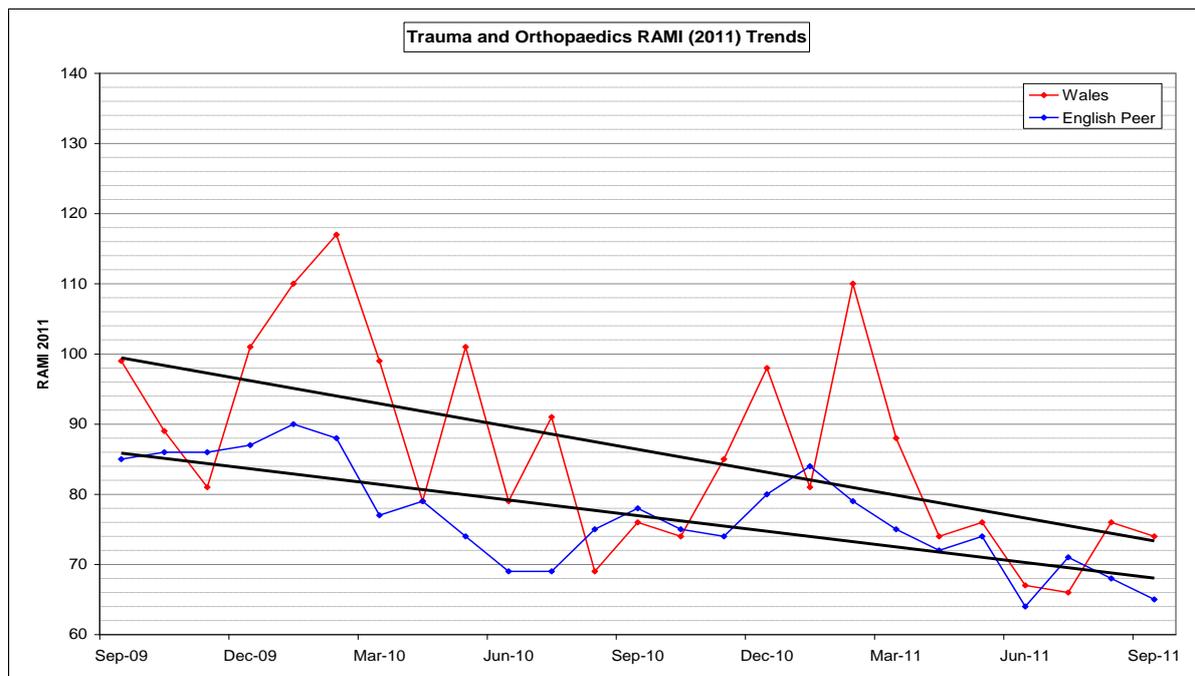
with substantial apparent variation between the different Welsh Health Boards (Figure 5):

Figure 5: Risk Adjusted Mortality, General Surgery, Welsh Health Boards and England, 2010/11



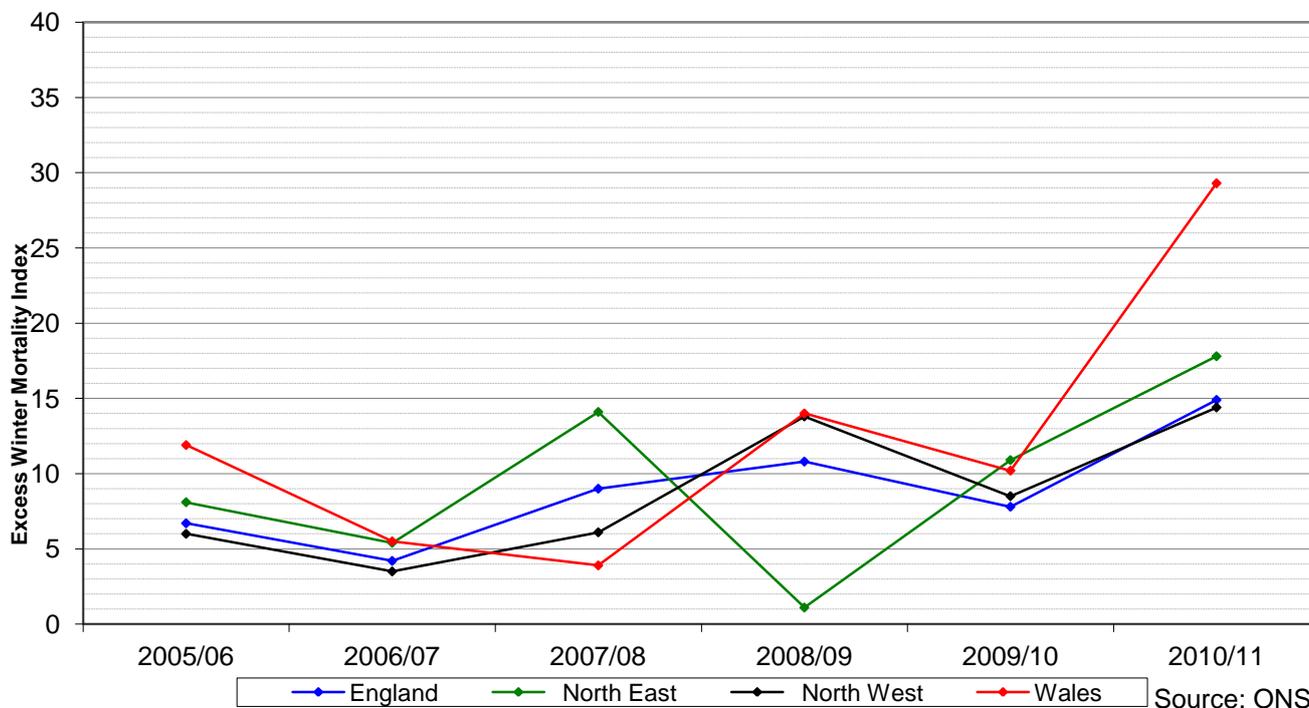
In trauma and orthopaedics, the gap between the two countries appears to be narrowing (Figure 6). However, Wales seems to have difficulty maintaining safe standards when there are seasonal peaks in demand:

Figure 6: Trauma and Orthopaedics risk adjusted mortality trends, 2009-11, Wales and England



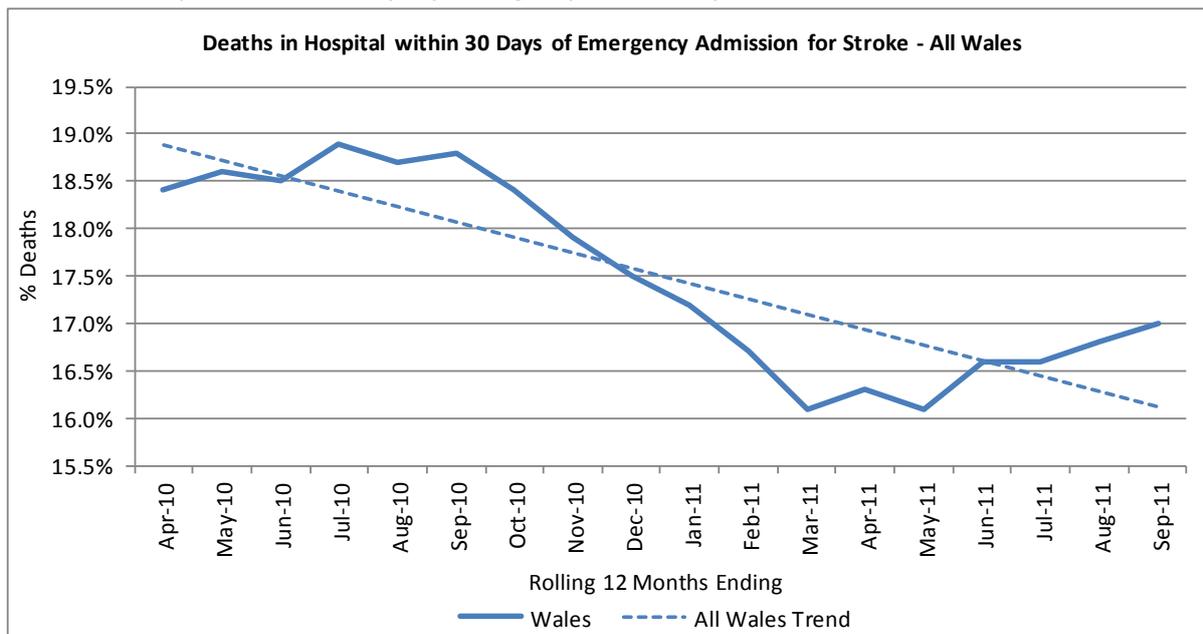
This is also reflected in the calculation of the 'excess winter mortality index', which shows Wales often performing less well than comparable regions in England (Figure 7):

Figure 7: Excess winter mortality index, ages 0-64, by region, 2005/6 to 2010/11



In stroke care, there has been a clear improvement in outcomes since a seminal audit by the Royal College of Physicians (Figure 8):

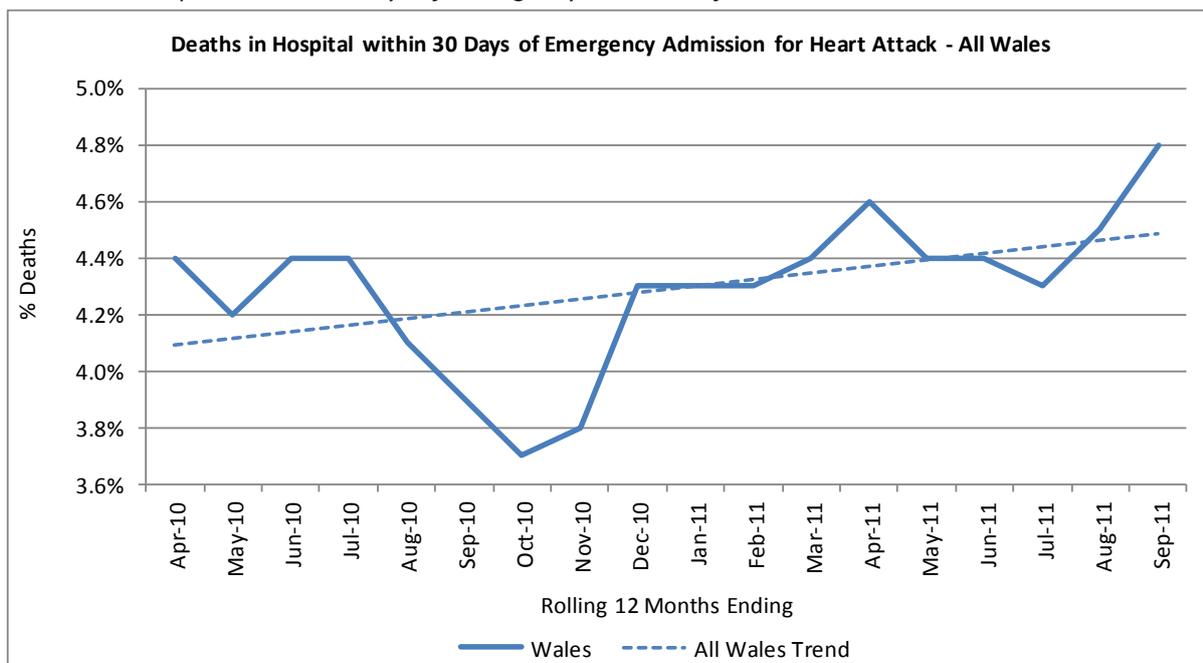
Figure 8: Deaths in hospital within 30 days of emergency admission for Stroke, Wales, 2010-11



However, the data for December 2011 show a wide variation in performance between hospitals in the compliance with agreed standards for the vital first day of post-stroke care. These range from over 95% compliance in four of the fifteen hospitals providing stroke care in Wales, to under 50% compliance in two hospitals.

Deaths after emergency admission for heart attack in Wales appear to be increasing (Figure 9):

Figure 9: Deaths in hospital within 30 days of emergency admission for heart attack, Wales, 2010-11



Another form of outcomes data is based on auditing individual departments, and comparing what they achieve with comparable units elsewhere. One of the biggest of these is the Trauma Audit Research

Network (TARN) database which provides detailed information on performance and outcomes for Accident and Emergency (A&E) departments. Unfortunately, only six of the 13 Accident and Emergency Departments in Wales have provided data to inform the TARN Database. Figure 10 provides a summary of the measure of unexpected survivors or deaths between 2008 and 2011, where 0 suggests average performance, and a positive number better than average. These data are generally good, but unfortunately no data are available for more than half the Welsh units:

Figure 10: Comparative outcomes of A&E Departments, Wales, 2008-11

Local Health Board	Hospital	Rate of survival
Cardiff and Vale	University Hospital of Wales	2.9 Additional survivors/100 patients
Betsi Cadwaladr	Glan Clwyd	0.2 additional survivors/100
	Wrexham Maelor	1.6 additional survivors/100
	Ysbyty Gwynedd	2.7 additional survivors/100
Abertawe Bro Morgannwg	Morrison	1.7 additional survivors/100
	Princess of Wales	0.7 more deaths/100
Aneurhan Bevan	Nevill Hall	No data
	Royal Gwent	
Cwm Taf	Royal Glamorgan	
	Prince Charles	
Hywel Dda	Bronglais	
	West Wales General	
	Withybush	

Another dimension which has received a lot of attention in both England and Wales recently is the impact of the day of the week on which patients are admitted. In both countries, there is now worrying evidence that patients admitted at the weekend – and especially on Sundays – are more likely to die than those admitted Monday to Friday (Figure 11):

Figure 11: Deaths in hospital by day of admission, Wales, 2010-11

Table 3: Mortality Rate Excluding Paediatrics, Obstetrics and Midwifery by Day of Admission and Hospital

Admitting Hospital	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Hazard Ratio
Bronglais General Hospital	4.99%	5.59%	4.41%	7.86%	6.53%	6.72%	4.15%	1.89
Ysbyty Glan Clwyd	6.13%	6.10%	6.26%	5.87%	5.30%	6.03%	6.39%	1.21
West Wales General Hospital	5.63%	5.15%	5.67%	4.92%	5.75%	6.94%	6.00%	1.41
Morrison Hospital	4.62%	5.13%	5.41%	4.93%	5.93%	5.23%	6.00%	1.30
Nevill Hall Hospital	4.76%	4.51%	4.32%	5.15%	5.73%	5.00%	6.86%	1.59
Prince Charles Hospital	5.50%	4.69%	4.97%	4.58%	5.36%	5.24%	6.48%	1.42
Princess of Wales Hospital	7.60%	7.06%	6.82%	8.06%	7.18%	8.41%	8.06%	1.23
The Royal Glamorgan Hospital	6.00%	6.32%	5.94%	6.75%	5.41%	7.21%	7.68%	1.42
Royal Gwent Hospital	3.97%	4.50%	4.82%	4.85%	4.36%	5.56%	5.65%	1.42
University Hospital of Wales	5.56%	5.56%	5.21%	5.55%	6.13%	5.02%	5.90%	1.22
Withybush General Hospital	5.63%	5.88%	5.19%	6.66%	5.56%	7.25%	6.63%	1.40
Wrexham Maelor Hospital	4.71%	5.28%	5.15%	5.53%	5.37%	5.86%	6.01%	1.28
Ysbyty Gwynedd	6.44%	5.59%	5.29%	4.79%	4.86%	4.97%	4.80%	1.34
Total	5.35%	5.36%	5.32%	5.54%	5.49%	5.90%	6.22%	1.17

Notes:- Data relates to discharges between September 2010 and August 2011 inclusive

Source: NWIS

Data is for emergency admissions only

Data relates to patients with all admitting treatment specialty excluding 'Paediatrics', 'Obstetrics' and 'Midwifery'

'The Royal Glamorgan Hospital' includes deaths for 'Mental Health Services at Royal Glamorgan Hospital'

'Ysbyty Gwynedd' includes deaths for 'Ysbyty Gwynedd (psychiatric)'

The day of the week with the highest mortality rate for each hospital is highlighted in dark grey and the day with the lowest rate in light blue

The Hazard Ratio is calculated as the ratio of the mortality rate on the day with the highest rate to the mortality rate on the day with the lowest rate

The pattern varies between specialties, but few ensure consistent care across the week. The variations in some specialties are even more pronounced than the overall picture – take, for example, the mortality associated with patients admitted with fractured neck of femur based on day of patient admissions (Figure 12):

Figure 12 Deaths associated with patients admitted with fractured neck of femur based on day of patient admission, Wales, September 2010-October 2011

Mortality Rate	Sun	Mon	Tue	Wed	Thu	Fri	Sat	All	Hazard Ratio*
Betsi Cadwaladr	6.0%	6.6%	5.9%	4.0%	7.9%	8.3%	4.9%	6.2%	2.1
Hywel Dda	2.4%	4.3%	4.4%	6.1%	5.9%	8.5%	5.7%	5.4%	3.6
Abertawe Bro Morgannwg	13.4%	4.0%	13.6%	6.2%	10.4%	10.9%	7.5%	9.2%	3.4
Cardiff & Vale	14.9%	15.1%	9.1%	6.4%	5.5%	13.5%	7.8%	10.3%	2.7
Cwm Taf	5.7%	8.0%	9.4%	4.1%	8.8%	3.2%	13.2%	7.7%	4.1
Aneurin Bevan	7.9%	9.0%	3.8%	10.1%	4.3%	6.7%	9.0%	7.2%	2.6
Powys	0.0%	20.0%	3.7%	3.6%	4.0%	0.0%	0.0%	4.5%	
All Wales	8.0%	7.7%	7.0%	6.0%	7.2%	8.6%	7.5%	7.4%	1.4

Note: Mortality rates should be viewed in conjunction with the number of deaths/admissions to understand the impact of the volumes

Denotes highest mortality rate day

Denotes lowest mortality rate day

* Hazard Ratio compares worst day mortality with best - eg patients in Cwm Taf are over 4 times as likely to die on a Saturday compared to a Friday

All of these data are beset by a variety of definitional and quality issues, and all should be treated with caution. However, they suggest grounds for concern about clinical outcomes in some key specialties, and according to the day of admission.

We turn now to the evidence which links service models to clinical outcomes.

B. Service models

While outcome data are valuable as a way of highlighting problems, they do not necessarily show the causes of those problems, and it is open to interpretation how far these figures are influenced by hospital configuration (as opposed to the other factors reviewed in Section 3.1.C below). An alternative approach is to look at how services are actually configured and delivered now, and ask the question: do the service models in Welsh hospitals follow the evidence about best practice?

The most obvious message from the evidence on service models is that it is impossible to generalise across all the different specialties of modern healthcare: the issues are often different, so each needs to be considered individually.

The second, and slightly more frustrating conclusion, is that we quite often do not have sufficient evidence to be sure about the optimal configuration. Carrying out research in this area – establishing a convincing link between the way services are provided and outcomes – is really difficult, mainly because there are so many elements that go into a service model, and so many other factors which may influence outcomes. There is a range of evidence, from multiple, large-scale randomised controlled trials (the strongest evidence), where researchers have tried to allow for all the variables, through to a consensus of expert

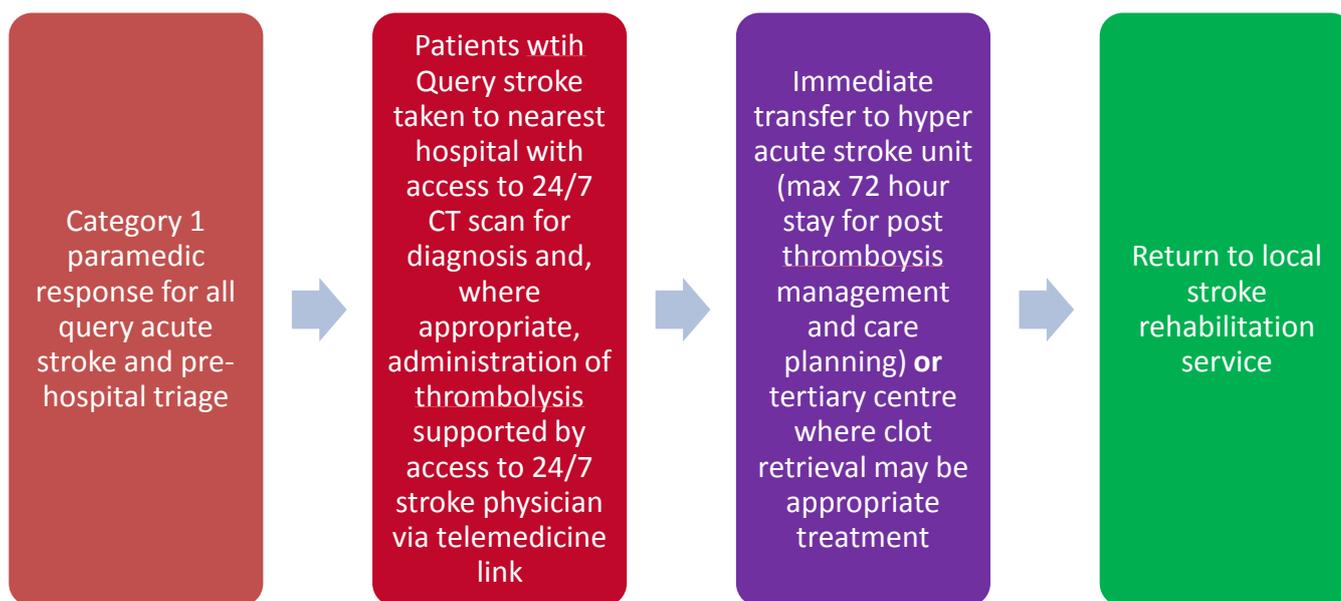
opinion based on evidence which in itself would be inconclusive. The former is as near to ‘proof’ as we are likely to get, but rare; the latter is much more common and certainly valuable, but experts are not always right, and their opinions should be treated with caution. In the middle there is a growing body of studies which look for statistical associations between models and outcomes, with some attempt to control for confounding variables.

There is another *caveat*: a lack of evidence of harm is not evidence of a lack of harm. In other words, because we cannot ‘prove’ that a model is harmful, that does not mean that we should assume it’s safe. More research is always needed!

On the basis of the available evidence, however, there are several specialties where we can be reasonably sure that we know how services should be configured:

1. **Major Trauma Services** (i.e. multiple injuries involving different tissues and organs systems that are, or have the potential to be, life threatening). There is evidence of significant outcome benefits for patients with major trauma when treated in a dedicated major trauma centre. In a typical year around 1000 patients in Wales have major trauma:
 - Regionalisation of care to specialist trauma centres reduces mortality by 25% and length of stay by 4 days
 - High volume trauma centres reduce death from major injury by up to 50%
 - Time from injury to definitive surgery is the primary determinant of outcome in major trauma (not time to arrival in the nearest emergency department)
 - Major trauma patients managed initially in local hospitals are 1.5 to 5 times more likely to die than patients transported directly to trauma centres
 - One centre might typically serve a population of 3-4 million
2. **General Trauma and Emergency Care** – there is evidence for some patients (such as patients with ruptured abdominal aortic aneurysms) of outcomes improving as unit size increases, but it is not statistically significant. Services that meet clinical standards and consistently follow recommended pathways make the most difference, whatever the size of the unit. There is increasing evidence that outcomes are better when there are more senior doctors on site 24/7 and this is becoming increasingly difficult to achieve in smaller units:
 - Outcomes better where senior doctor cover is available 24/7
 - Some (weak) evidence that, for certain procedures (e.g. ruptured abdominal aortic aneurism), outcomes improve with unit size
 - Compliance with clinical standards and pathways more important than scale (smaller hospitals often show better compliance)
 - Time to treatment can be reduced through mobile provision in some cases
3. **Stroke Care** - The evidence suggests that patients who are admitted to a ‘hyper-acute stroke unit’ that is compliant with standards for acute stroke care are likely to have better outcomes. It is important to ensure prompt access to a neurosurgical centre for the very small number of patients assessed as being suitable for clot retrieval. The ideal configuration would ensure the following (Figure 13):

Figure 13 Stroke pathway



4. **Maternity and Newborn Care Services** – There is no evidence of a consistent relationship between outcomes and size of unit and as such no clear conclusions can be established from published research. For women who have been assessed as low risk, midwifery units appear to be safe for the baby and offer benefits for the mother, and for women having a second or subsequent child the same is true for homebirths. Professional advice in the form of Royal College of Obstetricians and Gynaecologists Guidelines suggests that units offering obstetric care should meet minimum numbers of dedicated hours of consultant presence on obstetric wards each week. Meeting this standard is likely to lead to fewer obstetric units in Wales, given the numbers of obstetricians practising in Wales.
5. **Paediatric Services**- There is no evidence of a consistent relationship between outcomes and size of unit, and as such no clear conclusions can be established from the published research. Professional guidance in the form of Royal College of Paediatrics and Child Health Standards recommends that small paediatric units admitting fewer than 1800 children each year should not continue to exist, unless they are geographically isolated. Meeting this standard is likely to lead to fewer inpatient paediatric units in Wales though it is less clear what it means for paediatric services in hospitals without an inpatient paediatric unit.

For other specialties, the link between size of unit/volume of patients and quality of care is less clear. For example, in the case of the surgical specialties, there is good evidence linking patient outcomes and *individual surgeon* volume, rather than *hospital* volume. The Royal College of Surgeons of England 2006 Reconfiguration Working Party concluded that for much of general surgery, these volumes could be achieved by clinical networking rather than concentration on single hospital sites.

In other cases, centralisation is associated with dramatic improvements in outcomes. In North Wales, for example, certain specialised stomach operations (oesophagectomy and gastrectomy) were previously

carried out in four District General Hospitals, but were centralised on one, five years ago, with substantial improvements for oesophagectomy:

- four-year survival figures now show in-hospital mortality at 3% compared with a UK average of 4.5%
- re-operation rates are now running at 6% compared with a UK average of 10%

and for gastrectomy:

- in-hospital mortality was 5% compared with a UK average of 6%
- re-operation rates are now 1% compared with a UK average of 7%.

Patients' families are offered hotel accommodation if they have travelled long distances, especially in the few days post-surgery.

The picture is further complicated, however, by the issue of inter-dependencies between some of the specialties. The original 1962 conception of the District General Hospital sought to achieve a cluster of mutually-dependent specialties in one place. In the subsequent 50 years, the detail of this has changed, but the principle remains. For example, in the case of emergency care, there is now a generally-accepted minimum set of acute services required on site to provide a safe emergency service department (Figure 14):

Figure 14 Services required to support an emergency department

Supported On-Site By 24 Hour Access to:

Acute Medicine

Level Two Critical Care

Non-Interventional Coronary Care Unit

Essential Services Laboratory (biochemistry, haematology, blood transfusion, microbiology, infection control and mortuary services)

Diagnostic Radiology (X-ray, ultrasound and CT Scan)

Supported by 24 Hour Local Multi-Hospital Network Access (not necessarily on-site) to:

Emergency Surgery

Trauma & Orthopaedics

Paediatrics

Obstetrics & Gynaecology

Mental Health

Supervised Surgery

Interventional Radiology

It may be the case, therefore, that some specialties have to change or re-locate, not because their own model of care is inadequate, but simply to follow other specialties which depend upon them.

C. Other determinants of quality and safety

The discussion so far has focused on the possible relationship between volume and quality/safety of care, because this has proved to be one of the most contentious elements in any health service reconfiguration across the UK. But there are many other determinants of quality and safety in hospital services which are at least as strongly evidence-based.

Within the hospitals themselves, we know for example that the following are important:

- Levels, qualification, training and utilisation of staff – a lot of work has been done on nurse staffing, for example
- Resources available for key elements of the system
- Adherence to guidelines and evidence-based care pathways
- Application of research evidence

and the quality and safety of care in hospitals is directly affected by what happens outside, for example:

- The quantity, quality and organisation of primary and community services
- The resources available to the local community to care for its own health and wellbeing.

Many of these factors are unrelated to hospital size; others can be correlated with hospital size, sometimes inversely. In short, hospital configuration may be a necessary element in ensuring quality and safety; it is never sufficient in itself.

D. Conclusions

Despite all the necessary *caveats* about the evidence, it is clear that:

- Patients in Welsh hospitals cannot yet be confident that their outcomes will always be ‘comparable with the best anywhere’, as the Bevan Commission suggested should be the case
- Some key parts of the hospital service are not configured as they should be

The NHS will need to consider how many hospitals of different sorts it can support if it is to ensure that outcomes for patients will be the best possible, in every hospital, at all times during the week.

II. THE WORKFORCE

This section reviews the current levels of staffing of key elements of the Welsh hospital service, both now and in the foreseeable future, to see whether they pose any threat to the quality and safety of services. In the process, the aim is to help answer the question: **We have more staff than ever before, so what’s the problem?** The focus is primarily on medical staff, because that is where it is claimed the biggest problems lie, but some of the key issues affecting other staff in the hospital sector are also briefly reviewed. Further information is contained in the accompanying paper on The Workforce.

A. Medical staffing: the perfect storm

When one considers the level of medical staffing in Welsh hospitals, there is an immediate paradox: we have more hospital doctors than ever before (in the last ten years, the numbers of hospital doctors in Wales have increased by 49% (+1,807 whole time equivalents), including an increase of 66% in consultants (+836)), and yet there is much talk about acute shortages in key areas. How can both be true?

The answer lies in the ‘perfect storm’ of reducing availability and increasing demand:

- Reduction in available medical input: while total numbers have increased, the amount of clinical time provided by each doctor has reduced as the impact of the following has taken effect:
 - the European Working Times Directive: between 2007 and 2011, the number of doctors in training in Wales increased from 2748 to 2810, but the number of hours worked per week fell from 134,206 to 126,651 ; and
 - changes to the consultant contract: in 2004, consultants typically worked a total of 11.5 sessions per week, of which 9.3 were clinical; in 2010 this had reduced to 10.4, of which 7.9 were clinical.

This is further compounded by the fact that

- doctors in training (especially women) are increasingly opting to work fewer hours to create a more acceptable work/life balance: currently 7.5% (203) of doctors in training are working less than full time.
- Increases in the minimum requirements for doctors:
 - As a result of the changes outlined above, there has been a revision of the number of consultants needed to staff rotas: in large specialties, such as trauma and orthopaedics and general surgery, 8 consultants are now required to provide a viable rota.
 - The evidence cited in the previous section about the harmful effect of inadequate senior staff cover 24/7 has further increased the need for senior staff.
- Recruitment problems in certain specialties, often on a UK-wide basis, compounded sometimes by unattractive training patterns (e.g. where junior doctors feel they don’t receive adequate supervision), and by a fluctuating supply of overseas doctors.
- A longer-term trend towards greater sub-specialisation - at one time, surgeons would be expected to carry out a variety of different operations on different parts of the body - to treat all sorts of conditions. Over time, however, a number of distinct specialties have evolved. For example, there are currently none surgical specialties: Cardiothoracic; Neurosurgery; Oral and Maxillofacial; Otolaryngology (ENT); Paediatric Surgery; Plastic Surgery; Trauma and Orthopaedics (T&O); Urology; General Surgery. In General Surgery, there are several ‘Areas of Special Interest’, including Upper Gastrointestinal; Colorectal; Vascular; Breast and Oncoplastic; Transplantation; Endocrine. This pattern is mirrored in medicine. This all tends to make smaller hospitals less attractive for many aspirant consultants, and to increase the overall demand for consultants.

The impact of these concurrent changes can be seen in recruitment difficulties across Wales. Figure 15 shows those specialties where several Local Health Boards are experiencing severe difficulties with recruitment. These are not the short delays which can often accompany bureaucratic appointment processes: they are persistent problems, where departments are left trying to cover gaps with temporary staff, and often experiencing acute, stressful – and sometimes risky – staff shortages:

Figure 15: Medical staff recruitment problems by Specialty, Wales

Specialty	No. HBs with recruitment difficulties	National shortage?
A&E	6	Yes
Paediatrics	6	Yes
Mental Health/CAMHS	6	Yes
Clinical Radiology	4	No
Medicine/Geriatrics*	4	?
Anaesthetics	3	Yes
Microbiology	3	Yes
Obs and Gynae	3	Yes

Source: LHB workforce plans 2010/11 *Sub-specialties unclear

There is also a financial impact of these shortages. Costs for agency medical staff, for example, are high and rising in Wales (Figure 16):

Figure 16 Agency analysis at Month 6 2011/12

	2010/11 Full Year	2011/12 to September
ABMU	£3.282 m	£2.023 m
Aneurin Bevan	£2.031 m	£1.027 m
Betsi Cadwaladr	£13.351 m	£7.083 m
Cardiff & Vale	£2.67 m	£1.296 m
Cwm Taf	£3.977 m	£2.085 m
Hywel Dda	£5.275 m	£3.357 m
Powys	£0.217 m	£0.062 m
Public Health	£0.017 m	£0 m
Velindre	£0.146 m	£0.003 m
Welsh Ambulance	£0 m	£0 m
Total	£30.966 million	£16.936 million
Projected to year end		£33.872 million

B. Specialities under pressure

Set against this general background of the 'perfect storm', some specialties and training areas are particularly hard hit, together with some of the more remote parts of Wales. Tensions can arise between the needs of the NHS for doctors in training to keep services viable, and the obligations of the Postgraduate Deanery, General Medical Council, Royal Colleges and others to ensure adequate levels of training and appropriate experience and career progression. In a UK-wide market for recruitment, trainees' own wishes can also be a powerful lever for change. The following four areas illustrate where the pressures are at their greatest in Wales:

- 1. Paediatrics** – Recruitment in Paediatrics has been low for the last 2-3 years, and there is no expectation either in Wales or the UK that this situation will be resolved in the short to medium term. As Figure 15 shows, all Welsh Health Boards are experiencing persistent recruitment difficulties in this specialty. This poses particular problems as there are too many paediatric inpatient units, and therefore too many medical staff rotas, for the numbers of available doctors. Several rotas cannot now be staffed in a compliant way and this is the immediate problem being faced in three of the health boards. In the latest recruitment round there were 11 acceptances for 20 vacancies. The GMC survey shows that the workload for Paediatric trainees in Wales is amongst the highest in the UK, and Wales has the lowest and second lowest examples in the UK of Working Time Directive compliance. All of this has led the Royal College of Paediatrics & Child Health in Wales to conclude that *‘the current paediatric inpatient service provision in Wales is unsustainable with the full implementation of the Working Time Directive in 2009. Wales has too many paediatric inpatient units with too many middle grade rotas. There is an urgent need to decrease the number of inpatient paediatric units and significantly increase the number of Consultants in Wales.’*
- 2. Emergency medicine** is a problem across the UK. The GMC are currently undertaking a review of the cover in Emergency Medicine in all departments across the UK. There are particular concerns around the supervision of Foundation Doctors overnight in A&E departments. The Deanery has sought to minimise this in Wales, but there is a need for an urgent review of where training is actually placed as it is spread too thinly across too many departments. All Welsh Health Boards are experiencing recruitment difficulties in this speciality (Figure 15). The GMC survey shows the workload in A&E in Wales to be the highest in the UK. This does not help recruitment. Wales is towards the bottom half in Working Time Directive compliance. This year there is half the number of middle-grade doctors in the appointments process and we have appointed to only 11 out of 20 vacancies.
- 3. Core surgical Training** in Wales has been a long-standing problem. In contrast to paediatrics, there is an oversupply of Core Surgical Trainees who have no hope of progressing through to higher training because there are not enough consultant posts for them. This has a knock-on effect to recruitment into these posts, but the service seems to be reliant on their presence. The examination results are poor in Core Surgical Training and competition ratios going forward into higher training are amongst the highest in the UK. The GMC survey shows Wales as the worst in the UK for overall satisfaction and one of the lowest for adequate experience. The Deanery are reducing the number of Core Surgical Trainees over the next two years with the aim of bringing down competition ratios, improving the quality of the applications and reducing the number of sites that the Core Trainees will be available to work at. However, the Deanery is not reducing the higher training numbers so Wales will be producing the same number of qualified surgeons.
- 4. Psychiatry** training is another UK wide issue with reduced numbers across the UK; this is particularly acute in Wales. Again, with this specialty there are too many sites with Junior Doctors unsupervised out of hours. The Deanery will be reviewing these in the coming months and removing Junior Doctors from out-of-hours cover. This will by definition affect service delivery, but is in line with the GMC requirements. The GMC survey of trainees showed low overall satisfaction, with some reporting inadequate experience and poor educational supervision.

Failure to resolve these problems will lead to gaps in staffing, which may in turn threaten the safety and quality of the service, and its sustainability.

Outside hospitals, the situation with GPs is also posing difficulties. Many GPs in Wales are likely to retire over the next few years, and recruitment for GP training posts is already proving problematic in some parts of Wales (an area where Wales has previously been strong). This will also pose a challenge for hospital services, where the aim is to transfer some services to the community.

C. Non-medical staff

The focus so far has been on medical staff, because this is where the pressures are most acute, in some cases threatening the continuity of care over the next few months. But safe and high quality care equally depends upon all the other staff – nurses, midwives, allied healthcare professionals, healthcare scientists, and others - and they too face a series of challenges and opportunities.

The NHS has been busy creating new roles for many of these staff groups. Some patients are now being prescribed medication by nurses and pharmacists, for example, and they are attending minor injuries departments where nurses provide all the care. There are advanced practitioners in most of the healthcare professions, working at very high levels of specialised care and taking responsibility for the whole service provided. As elements of services are increasingly transferred from hospitals to the community, hospital staff are acquiring new levels of skill and providing new models of care.

Local managers are also looking carefully at the most appropriate mix of skills in clinical teams. As a result, staff are taking on responsibilities which used to belong to others: nurses substituting for doctors, support staff for registered professionals of various disciplines, and staff providing a wider range of services for their patients to reduce the numbers of professionals with which each patient has to interact. Such changes have the potential not only to provide high quality care, highly valued by patients, but also to mitigate the shortage of doctors – for example in minor injuries units.

The healthcare workforce generally is ageing, and this will soon start to present challenges in particular areas. Some more specialised areas of provision are experiencing recruitment difficulties, and competition for staff is growing from overseas countries who themselves have recruitment difficulties.

Most of these changes have implications for the education and training of non-medical staff, and the commissioning of this educational input has to keep pace with the changes. The numbers recruited for pre-registration education have fluctuated significantly over the past decades, making consistent workforce planning difficult. A considerable proportion of all professional education is done after initial qualification, and delivering such continuing professional development requires close cooperation between the NHS and the Universities – to release staff for new roles while they are still under pressure in their current role, and to anticipate what new skills are going to be required.

The proposed changes to hospital re-configuration will depend upon this continuing process of adaptation and development in the non-medical workforce, and a coordinated approach to education, service provision and quality assurance.

D. Conclusions

Some parts of the Welsh hospital service now face an acute shortage of medical staff. This stems from longer-term changes in work patterns which are common across the UK, exacerbated in some specialties in Wales by the fact scarce medical resources are being stretched across many hospitals. This may also mean that staff are not available everywhere to ensure consistently high quality care for 24 hours a day, 7 days a week. Recruitment of additional staff may help in some areas, but given the fact that similar pressures are now facing hospitals across the UK, this is unlikely to resolve the issue. New staff roles and service models may also alleviate the issue, but the problem is now urgent, as doctors in training are likely to be removed from some hospital departments in 2012. Other challenges face the wider NHS workforce, including the dependence on staff likely to retire in the next decade, and the need to match training to the service's future requirements.

III. ACCESS

There has been a lot of talk about the need to centralise some of the more specialised aspects of hospital care to fewer - and therefore for many people more remote – hospitals. So far in this paper we have looked at the strength of the evidence for this, from both a safety/quality aspect, and from the point of view of workforce pressures. This section looks at what we mean by 'access', at the possible risks that come from services being further away, and at what can be done to reduce the impact on patients of more remote services. It helps to answer the third of our questions: **Is poorer access inevitable to ensure good safety and quality?** Further information is contained in the accompanying paper on Access.

A. What do we mean by 'access'?

At first sight, this might seem a pedantic question: surely we simply mean how *easy* and *quick* it is to get the *care we need*, when we need it? It does mean this, but as always, the devil lies in the detail. For example:

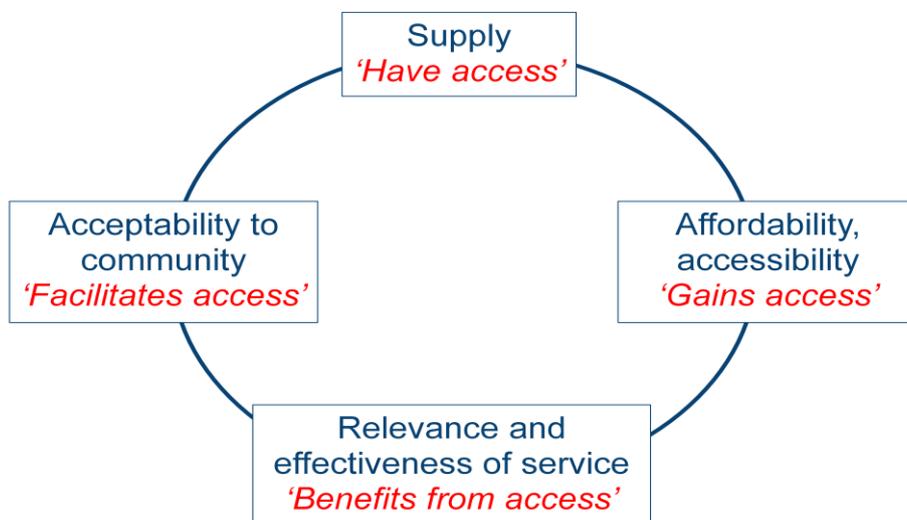
- **Ease** of access means different things in different circumstances: people might expect different access for a one-off visit to a hospital specialist, as opposed to repeated monthly visits over several years;
- **Quick** access also depends on circumstances: it is increasingly possible to take immediate emergency care to people, rather than having to take them to hospital.

And most importantly,

- The **care we need** is a critical dimension – immediate access to poor care is of little use to anyone.

We know that people expect different levels of access, depending on their level of need and the nature of their condition. So services need to ensure access in this graduated way, which is about much more than simply where services are located ('having access' in Figure 17):

Figure 17: Dimensions of access



B. Does longer travel time mean poorer outcomes?

The location of services – and therefore travel time - is nevertheless important, and for people with life-threatening conditions it can literally be a matter of life and death. Some studies have shown a link between travel times and impaired outcomes, for example in child birth, severe respiratory problems, and asthma; others have failed to find any link. In some cases the problem is the distance to GP services (leading to delayed diagnosis) rather than hospitals; in others it is the remoteness of hospital services themselves.

In all cases, however, the issue is the time taken to *access appropriate care*. In many cases, because of the way services are currently configured, this is the same as time to hospital. But this is often because pre-hospital care is not well developed, and the only option is to rush people to hospital. In other countries, services are in place to take care to people, rather than take them to care, often using an advanced network of mobile treatment facilities, by both road (advanced mobile clinical facilities) and air (helicopter and plane).

In Scotland, for example, in most of the country – including most of the remote areas - people with life-threatening emergencies can be reached within 45 minutes in all but the most extreme weather conditions, and provided with world class stabilisation and transfer to hospital as necessary. Relying solely on conventional ambulance services would produce much longer times, and poorer outcomes. Applying the same model to Wales might suggest maximum access times of no more than 20-30 minutes across the country.

In short, it is the **time to the start of appropriate treatment that matters**, rather than the time to hospital. Increasingly, these are not the same thing.

C. What can be done to reduce the impact of more remote services?

As we have seen, there is much more to accessibility than simply travel time. The NHS can reduce the impact of physically remote services in many ways.

First, technology can help. We are just beginning to see the potential of technology in four areas:

- Supporting self care – e.g. home telemonitoring for people with long term conditions, easier access to information on self care
- Supporting the delivery of safer care – e.g. electronic health records enabling the communication of patient data between professionals
- Enabling delivery of services more locally – e.g. virtual healthcare teams, consisting of healthcare professionals who collaborate and share patient information digitally
- Supporting efficiency – e.g. solutions for appointment scheduling, patient data management, mobile working

Second, there is a substantial body of evidence showing different ways of reducing the need for hospital services. These include ensuring continuity of primary care, providing hospital-at-home services, assertive case management in mental health, early senior review in A&E, multi-disciplinary interventions and telemonitoring in heart failure, better integration of primary and secondary care, structured discharge planning, and personalised health care programmes.

Third, the sort of development in pre-hospital emergency care described above reduces the need for admission in some cases.

Finally, the issue with the greatest impact for most patients is the adequacy of non-emergency transport to and from hospital, both for patients and (in the case of in-patients) their visitors. There is a variety of measures, including better communication, efficiency of provision and targeting of NHS-commissioned transport which can improve services, and which were recently highlighted in the Griffiths Review. Beyond this, there have been many efforts to improve public transport and car parking, sometimes with success. Offering relatives hotel accommodation when they have travelled far (as in the North Wales example cited earlier) can mitigate some of the effects of remoteness.

D. Conclusions

Easy and timely access to care is important, to save lives, and to minimise the inconvenience for patients and their visitors, especially for those without easy access to a car. New technologies and ways of working can reduce the impact of remote hospital services – by improved emergency and non-emergency transport, and by greater use of tele-care. In emergencies, the crucial issue is often the time to receiving care, which is increasingly not the same thing as time to hospital. For non-emergency care, much has been

done – and more could be done – to take care out of hospitals, but substantial numbers of people will still need to travel, and for them, access can be difficult.

IV. COST

The financial pressures facing the NHS have been well rehearsed. They come in two forms: the long-term impact of rising expectations and an ageing population, with serious chronic disease problems; and the short-term budgetary constraints of the next few years. On the former, the Office for Budget Responsibility estimates that, simply because of the consequences of an ageing population, the NHS will need to increase its share of gross domestic product from 8.0% in 2009/10 to 10.2% in 2039/40 to stand still. We have an increasingly obese population, and in Wales it was estimated that the cost to the NHS of obesity and alcohol was £140m in 2008/9. In addition to these demand factors, there are cost pressures on the supply side: the increasing cost of new medicines, and the cost of employing staff are two major examples. In the short term, the fiscal consequences of the banking crisis are now being felt by NHS Wales. The Wales Audit Office estimates that there will be a funding gap (i.e. the difference between what NHS Wales would need to stand still, and what it will actually receive) of between £252m and £445m by 2013/14.

The scale of both the short-and long-term funding pressures is probably unprecedented in the history of the NHS. Not only will the NHS have to improve its efficiency by making its current services work better, it will also have to substantially change those services if they are to be sustainable. Is hospital re-configuration, therefore, about saving money?

The evidence on the cost impact of hospital re-configuration is not conclusive: sometimes it saves money, sometimes it is cost neutral, and sometimes it increases cost. The picture is often confused by the unpredicted cost implications of change, and by other coincident service changes. Because of this complexity, this paper does not attempt to consider this issue in Wales. However, it is unlikely that any service re-configuration will lead to a net *increase* in costs – unlike earlier service changes – because of the financial pressures mentioned above.

In general, the demographic and fiscal pressures re-emphasise the importance of tackling the determinants of world class healthcare set out in section 2.1 above, including helping people to look after themselves better, and shifting care from hospitals and treatment, to community and prevention. In answer to our original question, **Can we afford to improve the service?** the answer is conditional: we can't afford it, if improvement means much more money. On the other hand, there are enough obvious inefficiencies in the current service to give some grounds for optimism. We await the detailed costings.

4. CONCLUSIONS

This paper set out to attempt some straight answers to some simple questions. On the basis of the evidence here – which is a summarised version of the evidence contained in the three accompanying papers – what can we conclude?

On Safety and Quality, the question was: **What's wrong with our current pattern of hospital services?** The answer is that in several respects key respects, our outcomes seem to be poorer than elsewhere. The reasons for this performance vary, and are not always clear. On the other hand, we can be reasonably sure that several of our service models (notably in major trauma, general emergency care, aspects of stroke care, some specialised surgery) are clearly well short of world class, and it would be reasonable to conclude that people are therefore suffering unnecessary disability and even death as a result.

On the Workforce, the question was: **We have more staff than ever before, so what is the problem?** The answer is that we have reached a precarious position with several key medical staff groups, and it is now possible to predict that services will have to be closed in an unplanned fashion in the near future if action is not taken immediately. We do not have sufficient senior staff where they are needed to ensure high quality care for all, and services which cannot recruit key staff are placed under considerable strain, and higher levels of risk. This situation has developed over time because we now demand more of our doctors, in particular, while their available clinical time is reducing and becoming increasingly specialised. Doctors in training are a key part of the service, but for some, their training is inadequate, and cannot continue. Many of these problems are common across the UK, and services everywhere have to respond in a similar fashion.

On Access, the question was: **Is poorer access inevitable to ensure good safety and quality?** The answer is that, in some cases, yes it is inevitable. But in most cases, there is a lot which can be done to reduce this problem – reducing the need for hospital care, using new technologies, improving non-emergency transport and access, and by improving the capacity of pre-hospital emergency care. The net effect of all these measures could be to improve access to the highest quality emergency care, and to confine the problems of remote hospitals to small numbers of people requiring highly specialised care, and to the most acute part of their 'pathway'.

And putting the elements together: **What's the case for change?** The case is really quite strong, in Wales as elsewhere in the UK, that some acute hospital services should now be reconfigured. There are both positive and negative aspects to this. On the positive side, Wales' hospitals could provide better care in some key respects, reducing the risk of unnecessary disability and even death. More negatively, the pressure on the availability of key medical staff in a small number of specialties is now so great that the collapse of some services is likely. The impact of re-configuration can often be mitigated, and there is also the potential of increasing access to emergency care for people across Wales, even in the most remote communities.

Through this review of the evidence, two themes recur. First, the evidence is seldom so unequivocal that the answer is immediately clear. It therefore requires interpretation and application to particular circumstances, and needs to be set in the context of the complex inter-dependencies which are typical of modern healthcare, both in hospital and outside. Second, health policy is usually about working out acceptable compromises between competing objectives – quality and safety, accessibility, cost.

Hence this paper – an attempt to present the non-specialist reader with a summary of what the evidence does support, so that he or she may make up their own mind.



Welsh Institute for Health & Social Care
University of Glamorgan
Lower Glyntaf Campus
Treforest
Pontypridd
CF37 1DL

Tel: 00 44 (0)1443 483070

Fax: 00 44 (0)1443 483079

<http://wihsc.glam.ac.uk/>