



Challenges facing the Welsh NHS in tackling cancer, heart disease, and healthcare associated infections

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Introduction

NHS Wales faces major challenges in tackling the biggest disease killers in cancer, heart disease and healthcare associated infections. This was made clear by new research into differences in policy and practice between the devolved nations that was unveiled at an Academy Health Wales conference in Cardiff on 7 May 2009. The research, carried out for the pharmaceutical company Pfizer by the international consultancy IMS, compared treatment outcomes in Wales, Scotland, Northern Ireland and England. To our knowledge, no one else has attempted to do such a comparison, particularly one grounded in clinical areas. The researchers were asked to lay out the scale of the health challenge in each country, the policy and practice responses and the associated health outcomes to give real rather than theoretical lessons. Their findings have been summarised into four reports entitled *Access to Innovation in Healthcare: Lessons from Devolution*. The message for Wales was that its healthcare system generally fared worse, despite major increases in spending. The IMS report, *Access to Innovation in Healthcare: Lessons from Devolution for Wales*, found:

- Wales has the lowest five year survival rate for two of the most prevalent cancers, colorectal and lung, and among the lowest for breast and prostate. “Given the magnitude of the problem, it has invested comparatively less in both oncology medicines and technology – two areas which are commonly considered to be crucial for gold standard care.”
- Wales has the highest mortality rate for both coronary heart disease and stroke in the UK, despite higher prescribing rates for these diseases. In general Wales prescribes more, and older medicines than elsewhere.
- There are declining rates of some healthcare-associated infections, in particular MRSA. However, there has been a sharp increase in the incidence of *C. difficile* in the past four years.

At the Academy Health Wales conference NHS Wales leaders in each of these fields responded to the report. They were Malcolm Mason, Cancer Research Wales Professor of Clinical Oncology at Cardiff University; Dr Phil Thomas, Director of Cardiac Services Wales; and Dr Eleri Davies, Director of the Welsh Healthcare Associated Infection Programme; with an overview provided by Gwyn Bevan, Professor of Management Science at the London School of Economics. Their assessments form the main body of this short report. A concluding statement on the wider policy implications arising from the IMS study is provided by the Chair of Academy Health Wales, John Wyn Owen.

Cancer Treatment

Malcolm Mason, Cancer Research Wales Professor of Clinical Oncology at Cardiff University

1. Spending on Oncology Medicines

Wales has a relatively low expenditure on oncology medicines compared with the other nations of the UK, particularly in terms of spending per patient (Table 1). Wales and Scotland's spend per head is similar to that of England. However, because cancer prevalence is higher, this results in a lower spend per patient. Conversely, spending in Wales on new medicines was actually higher than the national average, as measured by eight new medicines introduced after 2003 – although this remains a very small proportion of the total cancer medicines spend.

Table 1: Spending on oncology medicines across the UK

	England	Scotland	Northern Ireland	Wales
Spending per head	£7.42	£7.23	£9.33	£7.5
Spending per patient	£1,526	£1,321	£2,162	£1,246

Northern Ireland's expenditure trumps the other nations. For instance, its consumption of oncology medicines such as Herceptin for treating breast cancer, Mabthera for treating lymphomas, and Taxotere for treating breast, lung, prostate and gastric cancers, is significantly higher, while Wales is the bottom of the league. It is not clear why this is the case. Apart from a smaller budget to begin with, there are two possibilities:

- We simply do not have the capacity to spend the money.
- Patients are still being seen by doctors with inadequately focused sub-speciality practices who may lack the experience or exposure to optimally select patients who are likely to benefit from these treatments.

2. Sub-specialisation and Teamworking

There is potential tension between national, regional and local service planning. The current system allows any hospital to appoint any specialist in any field. This reflects an ongoing tension between the advantages of concentrating critical mass in highly specialised treatment in one centre, and the aspirations of individual hospitals to sustain as wide a range of treatment potential as possible.

The overriding need is for complex, specialist treatments to be built around an adequately large multidisciplinary team. It doesn't make much sense to have a single-handed oncologist who is a sub-specialist in up to five areas. Sub-specialisation in isolation is useless. The exact location of specialist services should be defined at a

network or a supra-network level, and the aspirations of individual hospitals should be subservient to that ideal.

An important element of the infrastructure to support multi-disciplinary communication is to have more effective networking between hospitals across Wales, plus utilisation of the benefits of Information Technology. There are models around the world where this has been achieved to a high degree, for example in British Columbia, Canada. There is a strong case for seeking to emulate these good examples.

3. Cancer Treatment Trials

Recruitment of patients with cancer into publicly funded clinical trials are higher in Wales, at 10 per cent in 2005-06, than either Scotland (7 per cent) and Northern Ireland (4 per cent) and only marginally lower than England (see Table 4). Since then the overall Welsh percentage has rise to 12 per cent This reflects a significant increase in cancer research activity in Wales since the end of the 1990s. In 1997-98 369 Welsh patients were entered for drug trials, compared with 1,887 in 2007-08. Patients involved in trials have a higher recovery rate that those who are not because they have access to newer therapies.

Table 2: Patients involved in clinical trials as percentage of total patient population in 2005-06

	Breast cancer	Prostate cancer	Colorectal cancer	Lung cancer	Total cancers
Wales	34.3%	4.2%	21.4%	2.2%	10%
England	30.4%	6.2%	20.1%	3.8%	12%
Scotland	25.1%	2.1%	3.2%	1.2%	7%
N Ireland	6.2%	0.9%	6.7%	5.7%	4%

However, there is a wide variation in the participation rates in clinical trials across Wales. Further research is needed to establish the detailed statistics and to investigate why the variations occur.

4. Investment in High Technology Diagnosis and Treatment

There has been less investment in high value technology for the diagnosis and treatment of cancer in Wales than other parts of the UK. Tables 3 and 4 provide the latest comparative statistics for the provision of Linear Accelerators¹ and PET scanners² across the UK.

¹ A linear accelerator (LINAC) is the device most commonly used for external beam radiation treatments for patients with cancer. Linear accelerators pinpoint where cancer cells end and healthy cells begin, enabling the delivery of enough radiation to a moving tumor to eliminate it while minimizing the amount of healthy tissue that's exposed to the radiation.

² Positron emission tomography (PET) is a nuclear medicine imaging technique which produces a three-dimensional image or picture of functional processes in the body.

Table 3: Provision of Linear Accelerators across the UK

	England	Scotland	Northern Ireland	Wales
Number of Linear Accelerators	233	25	10	11
Number of Linear Accelerators per million population	4.6	4.9	5.7	3.7
Number of Linear Accelerators per thousand patients	0.98	0.91	1.39	0.64

Note that, since an acceptable number of accelerators per thousand patients is reckoned to be 5.5, only Northern Ireland has achieved (actually surpassed) this level. In Wales the objective is to reach a provision of 5.3 per thousand by 2015.

Table 4: Provision of PET Scanners across the UK

	England	Scotland	Northern Ireland	Wales
Number of PET Scanners as of 2005	12	1	1	0
Number of PET Scanners as of 2005 per million population	0.24	0.20	0.57	0
Number of PET Scanners as of 2005 per thousand patients	0.05	0.04	0.14	0

All parts of the UK are planning to expand the provision of PET Scanners. In Wales the Welsh Assembly Government is investing £16.5 million in a PET Research and Diagnostic Centre currently being constructed at the University Hospital of Wales in Cardiff.

5. Wales Cancer Strategy

The IMS report highlights the fact that “Wales does not currently have a dedicated cancer strategy such as those in England and Scotland”. However, the Cancer Services Co-ordinating Group did produce a Strategic Development Plan in the early 2,000s, which described in detail the requirements to put Wales’ cancer care on a par with the best in Europe. This never gained the status of being a Welsh Assembly Government strategy, probably because the financial implications were too great. This document is still available on the CSCG website.

The IMS report also notes that “a lack of new technology and treatment options has meant that some patients have to travel a considerable distance in order to receive appropriate access to services or specialist centres.”

The report underlines the importance of screening to provide early diagnosis and observes that Wales has focused on breast and cervical cancer. It says, “The benefits of early detection seem to have been recognised in the country with the National Screening Committee currently looking at the clinical effectiveness of other screening programmes such as lung and prostate. Despite this endorsement, shortly following the completion of this study, Wales announced a delay in the planned rollout of its national bowel cancer screening programme to the 50-70 age group until 2015.”

In putting together a cancer strategy for Wales the following factors should be borne in mind:

- The underlying causes of the relatively high incidence of cancers in Wales, due to the impact of social deprivation, should be understood and tackled.
- There should be greater uniformity of high standards of provision at cancer treatment centres across Wales and the Welsh Cancer Standards should be rigorously enforced.
- A plan should be put in place to take full advantage of the significant investment that is being made in the Cardiff PET scanner and the increased roll out of Linear Accelerators across Wales.
- Wales’ input into cancer trials has been highly successful but we need to tackle the regional variations that exist.
- We should make full use of the advantages that can accrue from the All Wales Medicines Strategy Group. Normally Wales follows guidance from the UK National Institute for Health and Clinical Excellence (NICE). At the same time, for medicines that will never be on the NICE work programme the All Wales Medicines Strategy Group provides a potential mechanism to make them available. However, this is not being recognised to the extent that it could.

Heart Disease

Dr Phil Thomas, Director of Cardiac Services Wales

1. Wales' Problem

Wales faces significant problems in relation to the prevalence of coronary heart disease, stroke, and the associated condition of diabetes, compared with the other countries of the UK, as shown in Table 5. Wales has the second highest prevalence of coronary heart disease amongst the devolved nations, and 25 per cent higher than the equivalent rate for England. Wales also has the highest prevalence of stroke, along with Scotland, as well as the highest prevalence for diabetes.

Table 5: Prevalence coronary heart disease, stroke and diabetes across the UK in 2007

	Northern Ireland	Scotland	England	Wales
Coronary heart disease	4.2%	4.6%	3.5%	4.3%
Stroke	1.6%	2%	1.6%	2%
Diabetes	3.1%	3.5%	3.7%	4.2%

The meaningful comparisons here are with the other devolved nations. England is so relatively large, and with many different regions, that comparison with the North-East of England (which has a comparable socio-economic profile to Wales) would provide a better benchmark. Even so, Wales still underperforms. The high incidence of these diseases could be attributed to Wales's ageing population - approximately 18 per cent over 65 compared with the UK average of 16 per cent. However, comparison with Scotland, where the magnitude of the problems are similar but with a slightly younger population (16 per cent over 65) contradicts this.

Wales has a major issue with the provision of stroke facilities. Table 6 shows the percentage of hospitals with a stroke unit in England, Northern Ireland and Wales – revealing that Wales is under-performing by about 50 per cent. Figures for 2006 indicate that only 28 per cent of patients in Wales were treated in a stroke unit during their stay in hospital, compared with 64 per cent in England and 73 per cent in Northern Ireland.

Table 6: Percentage of hospitals with a stroke unit

	England	Northern Ireland	Wales
Percentage of hospitals with a stroke unit	98	95	42

However, the Assembly Government has acknowledged the shortfall and in June 2008 allocated an extra £2.5 million to enhance stroke services.

2. Tackling High Mortality Rates

Wales has the highest mortality rates for coronary heart disease in the UK, and high mortality rates for both stroke and diabetes. The Welsh Assembly Government has set the following targets:

- To reduce coronary heart disease mortality in 65-74-year-olds from 600 per 100,000 in 2002 to 400 per 100,000 by 2012. It looks as though Wales is on track to meet this goal.
- To reduce stroke mortality in 65-74-year-olds by 20 per cent by 2012. This also appears a realistic aim.
- To achieve a rapid improvement in coronary heart disease mortality in socially deprived groups of the population. Achieving this target seems more doubtful, mainly because there seems little prospect of narrowing the prosperity gap between the more well off and poorer parts of Wales. So, for example, in 2006 the least socially deprived county in Wales, Ceredigion, experienced just over 200 deaths per 100,000 of 65-74-year-olds; the most socially deprived county, Blaenau Gwent, experienced 650.

3. Lifestyle Risk Factors

In tackling cardio-vascular diseases managing lifestyle risk factors is at a premium. The Welsh Health Survey for adults over 16, carried out in 2007, underlines the importance of this approach, as shown in Table 6.

Table 7: Welsh lifestyle indicators, 2007

Smoker	25%
Exposed to passive smoke	44%
Excess alcohol consumer	36%
Binge drinker	21%
Don't eat '5 a day'	54%
Not exercising enough	71%
Overweight or obese	57%
Obese	21%

However, with the exception of the smoking ban, the focus on risk factors has not been translated into concrete actions that truly motivate people to modify their behaviour. There is some indication that Welsh diet indicators are better than in Scotland or Northern Ireland. Nonetheless, a comprehensive patient management plan is required that covers both appropriate prescribing and, more fundamentally, addresses broader patient issues such as poor diet, physical activity and other risk factors.

Key objectives for Wales should be more effective management of blood pressure and cholesterol levels among high risk patients. However, the IMS report points to "a lack of appropriate screening to identify high risk patients and the need for clarification of

protocols and guidelines for both treatment and risk assessment to avoid confusion amongst clinicians.” In short, in Wales there are problems in the management of high risk patients because of:

- Poor screening.
- A lack of education about appropriate guidelines.
- The variety and complexity of risk assessment models and treatment algorithms³ which lead to confusion among physicians.

A vascular project group is currently addressing these issues. A new National Service Framework will update earlier cholesterol treatment targets.

4. Prescription Patterns

Wales prescribes more cardiovascular medicines than any other nation across the UK, as shown in Table 8.

Table 8: Cardiovascular prescription rates across the UK nations in 2006

	England	Northern Ireland	Scotland	Wales
Thousands of prescriptions per 100,000 people	462	391	438	562

These statistics show that Wales is prescribing 30 per cent more cardiovascular medicines than Northern Ireland. These high rates are leading to increased pressure in reducing spending on high-cost (and in some cases more intensive) medicines for some of the key medicine classes such as statins. Indeed, there is a dramatic switch underway to low-cost generic statins across the UK. However, the IMS report recommends that, “Ensuring that clinicians are free to decide on the most appropriate use of both branded and generic statins, particularly in high risk populations, could contribute to improved cardiovascular outcomes.”

³ A ‘treatment algorithm’ is a technique for standardizing diagnostic decision-making and improving technical quality of care. By providing a series of questions, it guides the caregiver to the correct diagnosis and treatment for the most commonly observed pathologies.

Healthcare Associated Infections

Dr Eleri Davies, Director of the Welsh Healthcare Associated Infection Programme

1. Healthcare Associated Infection Rates

The IMS report focuses on MRSA⁴ and *C. difficile*⁵. However, although serious, they are a relatively small proportion of healthcare associated infections, as can be seen from Table 9.

Table 9: Most common healthcare associated infections in Wales

'Chest infections'	24%
Surgical site infections	19%
Urinary tract infections	16%
Gastrointestinal infections	15%
Skin and soft tissue infections	12%
Blood stream infections	8%
<i>C. difficile</i>	1.1%
MRSA	- 1%

A problem with focusing on MRSA and *C. difficile* at the expense of giving attention to the other, more prevalent, infections is that it can result in a skewed response in the health service. For instance, a strong focus on MRSA can result in other infections becoming more prevalent.

This may explain the apparent paradox that although England and Scotland have developed targets and strategies for dealing specifically with MRSA and *C. difficile*, Wales – which introduced a strategy for dealing with all healthcare associated infections in 2004 - has the lowest incident rates of MRSA. Targets are controversial because concentrating on one problem can come at a cost elsewhere. Wales has a higher number of mandatory measures.

⁴ Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacterium responsible for difficult-to-treat infections in humans. It is by definition a strain of *Staphylococcus aureus* that is resistant to a large group of antibiotics called the beta-lactams, which include the penicillins and the cephalosporins.

⁵ *C. difficile* is the most serious cause of antibiotic-associated diarrhea and can lead to a severe infection of the colon, often resulting from eradication of the normal gut flora by antibiotics. The *C. difficile* bacteria, which naturally reside in the body, become overgrown. This is harmful because the bacterium releases toxins that can cause bloating, constipation, and diarrhea with abdominal pain, which may become severe.

2. *C. difficile*

Nonetheless, while the incidence of MRSA is relatively stable, *C. difficile* is increasing dramatically across the devolved nations of the UK. England saw a large increase during 2005-07. although not in England. Accordingly, targets for reduction have been in place since 2007 in England and they are now seeing a reduction in *C. difficile* rates. In 2008 Scotland set a 30 per cent reduction target to be achieved by 2011. Most Trusts in Wales have now nominated *C. difficile* as their Infection Reduction Target and are introducing packages of interventions to reduce the incidence of the disease in their patients.

3. Reducing Healthcare Associated Infections

Hand hygiene and high bed occupancy are commonly cited as the most critical factors related to the incidence of healthcare associated infections. However, addressing these, on the face of it, straightforward issues tend to be undermined by poor implementation:

- The failure to relate education to practice
- Infection control procedures are compromised in the face of high patient throughput, high levels of patient movement between wards, and low staff to patient ratios.
- Insufficient unit-based instruction and supervision.
- Inadequate quality control for cleaning services.
- Insufficient data to monitor outcome changes.

To tackle these issues NHS Wales is mid-way through its '1,000 Lives Campaign', between April 2008 and April 2010. One of the six areas that the campaign focuses on is Healthcare Associated Infection. Work in this area includes:

- Prevalence surveys of all health care associated infections.
- Hand hygiene improvements.
- Care Bundles for management of medical devices including central lines, urinary catheters and peripheral venous catheters.
- Surgical site infection reduction through peri-operative care bundles.
- Antimicrobial stewardship through checklists and compliance with protocols.

More front-line staff are being involved. The current NHS reorganisation with the reduction and merger of the trusts and Health Boards should enable more effective implementation of the Campaign across primary and secondary healthcare.

Improving Performance

Gwyn Bevan, Professor of Management Science, London School of Economics

The IMS study conclusions are sobering and reflect a cosy Welsh parochialism in which poor performance is tolerated. Research into systems of performance measurement and experience in the NHS in England and elsewhere in the world has demonstrated publishing performance ranking has had a major impact on raising standards. This had been shown by comparing performance in England and Wales on hospital waiting times and ambulance response times. Once star ratings began to be published significant improvements were observed in England, while in Wales some standards were revised down.

Wales should establish an independent NHS Analytical Unit whose role would be to benchmark progress on key service and clinical indicators in relation to achievements in the rest of the UK and overseas. These should be:

- Published and widely disseminated.
- Clearly presented and easily understood.

Publication could be linked with holding public local accountability meetings. The reason for publication is as much to put pressure on those inside the system as to inform the public.

Policy Implications

John Wyn Owen, Chair, Academy Health Wales

In 1998 the Nuffield Trust published *Devolution and Health* which explored the extent to which we would be able to talk about a **National** Health Service once it is run by three or four different governments within the United Kingdom.⁶ It also explored the extent to which health policy would diverge in Scotland and Wales. It asked which of the competing political forces would prevail, including health service reform, what would drive health services further apart, and the capacity of professionals to binding them together.

The report suggested there would be scope for considerable innovation and experimentation in the different countries and proposed that “it will be essential to ensure that learning from such experimentation is shared across the UK”

The experience with devolution within the UK, the plethora of policy making - measured in terms of new initiatives for health - has varied between countries.⁷ Each home country has produced its own NHS and public health policy. Scotland abolished the internal market and increased the role of health professionals. England introduced the ‘internal market’ and choice. Wales adopted localism and in 2008 signaled the end of the internal market and the re-introduction of health planning. Northern Ireland introduced policy reforms at the slowest rate but, according to the IMS report, has some of the best results in health outcomes in cancer and heart disease.⁸

Even in 2001 the Wanless report concluded that the outcomes across the four counties are increasingly uneven.⁹ And as recently as 2008, the NHS Confederation described the opportunity as “not to be missed” to learn what happens when policy approaches diverge.¹⁰

The IWA /Academy Health Wales conference provided an opportunity to consider a *new* comparative study commissioned by Pfizer from IMS Health Consulting on the impact in Wales of devolution in tackling cancer, heart disease and healthcare-associated infections. In this case the particular focus is on the use of innovation to improve health outcomes.

The study- the only one of its kind in terms of depth and breadth -provides an analysis and an assessment across multiple therapeutic areas and suggests where policy in Wales might evolve and improve. The findings and the conference discussion support themes that have emerged from earlier work of IWA and Academy Health Wales and would suggest the following recommendations for action.

⁶ Hazell, R. and Jervis, P., *Devolution and Health*, Nuffield Trust, 1998.

⁷ See Scott Greer, *‘Northern Ireland Permissive Managerialism’ Territorial Policies and Health Policy*, Manchester University Press, 2004.

⁸ *Access to Innovation in Healthcare: Lessons for Devolution*, IMS Commissioned by Pfizer UK, 2008.

⁹ Derek Wanless, *Securing our Future Health: Taking a long term view*, HM Treasury, 2001.

¹⁰ NHS Confederation, *Futures Debate – Globalisation – How will it affect the NHS*, London 2008.

Leadership for Health and Health Care

The issue of leadership was acknowledged in the Welsh Assembly Government's recent consultation paper on the NHS, "The number of bodies responsible for different aspects of health planning and provision has placed a heavy load upon a limited number of experienced clinical and managerial staff such that the capacity for talented leadership has been diluted".¹¹ The IMS report particularly highlights the importance of clinical leadership in improving health outcomes.

We now need the Assembly Government to explain how the new health and healthcare planning system will tackle the problems identified in the IMS report. In the absence of the dynamics of an internal market what will be the incentives to drive improvements? This will require benchmarking not just across Wales but the UK and Europe as well. We will need to create a transparent and accessible data base comparing service performance between health care providers as well as health outcomes. It also suggests the need for an altogether higher level of collaboration and learning across the UK and beyond.

If the intent in Wales is to implement the 'Citizen Model' in place of the internal market this will require more than a structural arrangement to effect the change. It will need a fresh approach to the values, cultures and attitudes that motivate the people involved in health services. The IWA/ Academy Health Wales suggested in the response to the NHS consultation that urgent consideration be given to upgrade the present system for leadership and management in NHS Wales and the wider public service. A start has been made with the Public Services Management Wales Initiative within the Government but the time has come for this to be developed substantially with the creation of a Public Service College for Wales connected to, but independent of Welsh Universities and with links to other sectors such as business and industry in Wales.

A Strengthened Health Policy Community

The IWA and Academy Health Wales in themselves embody a view that Wales would benefit from a strong health policy community – 'a policy village' as one of the Nuffield Trust recommendations put it in 1998 - to support analysis, policy development and options as well as a plurality of views outside government such as the King's Fund for London.

Amongst the matters to be considered, illustrated by the IMS report and the debate at the Cardiff conference, would be 'futures thinking'. The world of health care is about to experience greater complexity at both the individual and wider population level. For example, there will be new pharmaceuticals, medical devices, biologics and procedures as well as an increasing role for genetic variation in individual responses to treatment interventions. We are entering the age of personalised medicine. How this innovation is nurtured and introduced to the NHS will be critical to future health services.

Other matters that an independent 'policy village' in Wales could consider would be adaptive and sustainable systems thinking - 'systems for health', 'systems for

¹¹ Welsh Assembly Government, *Removing the Internal Market in Health in Wales*, 2008.

healthcare’ – which should be ‘people centred’ and ‘resource effective’. Studies could also support the intelligent translation from research and new knowledge to practice and promoting improvements in service quality and safe and acceptable levels of public accountability.

Effective Population-Wide Health Strategies

Avoiding premature death and improving the quality life years for the people of Wales requires tackling health inequalities as well as encouraging life style choices and changes. In addition, active management of long term health problems will be required to achieve healthy old age. The IMS report recognises that there is an absence of methods to measure the absolute impact of population-wide strategies. Until this is addressed complementary micro-level interventions of medicine use and patient screening remain important.

The people of Wales are not a particularly healthy lot and rank poorly in Europe on many health indicators. We have significant health inequalities while half of Welsh adults are classified as overweight and levels of obesity increase. Of even greater concern is that by international comparisons Welsh children and young people in their early teens have poorer health and are more likely to be involved in risky health behaviours. This is a worrying indication of the future health of adults in Wales. It will require the Welsh health policy community, Government and others including the business community to work in partnership to tackle the underlying determinants of health and deliver modernised public services to make an appreciable difference to the quality of people’s lives and life opportunities.

Notes on the Contributors

Dr Eleri Davies currently leads the Welsh Healthcare Associated Infection Programme team within the National Public Health Service for Wales (NPHS), which is responsible for delivering the National Healthcare Associated Infection (HCAI) Surveillance Programme in Wales and also supports the implementation of the Strategies for Reducing HCAI in Wales both in Hospital Practice and in the Community. She is also Infection Control Doctor for Cardiff and Vale NHS Trust and has a lead role within the 1000 Lives campaign in Wales focussing on reducing healthcare associated infections. Originally from Swansea, Dr. Davies trained in medicine in Cardiff then specialised in Medical Microbiology in Bristol. She was appointed as a Consultant in Medical Microbiology with a lead role for Infection Control in Bristol in 1999. Dr. Davies returned to Wales as a Consultant Microbiologist in 2003, taking on the Director role for the Healthcare Associated Infection Programme in Wales in 2006.

Gwyn Bevan is Professor of Management Science in the Department of Management at the London School of Economics and Political Science. His current research in health care includes performance measurement and developing approaches for disinvestment. He is a member of the Department of Health advisory groups on resource allocation and the Department of Health has recently published his report for the Secretary of State for Health on the developments of formula funding. He was seconded (2001 to 2003) to the Commission for Health Improvement (CHI), where he was Director of the Office for Information on Health Care Performance. This was responsible, for the NHS in England, for 'star ratings'; national surveys of staff and patients; developing national clinical audits; and undertaking analyses for CHI's reviews, investigations, and national studies. He has worked for the National Coal Board, HM Treasury, and an economic consultancy; and, as an academic, at Warwick Business School, and the Medical Schools of St Thomas's Hospital and Bristol University. His first degree was in mathematics from Oxford.

Professor Malcolm Mason is Professor of Clinical Oncology at Cardiff University. His main specialist interests lie in the field of urological cancers and he also has laboratory interests in cancer vaccines and cell adhesion. He has been involved with a number of MRC Urological Cancer Trials, as Chief Investigator (PRO4, PRO7, TE19 and TIP) or as a member of the Trial Management Group (STAMPEDE). For the MRC he also Chairs the GI/Gynae Cancer Trials Steering Committee, and is the Vice-Chair of the Cancer Research UK Clinical Trials Awards and Advisory Committee. For the UICC (International Union Against Cancer) he Chairs the UK TNM Committee, and sits on the Core Group and the Prognostic Factors Task Group. Since 2003 he has been the Director of the Wales Cancer Bank, the UK's first population-based tumour and blood sample collection, which to date has recruited 2,200 patients.

Dr Phil Thomas qualified in Cardiff in 1979 and trained in cardiology at the University Hospital, Cardiff and St Mary's Hospital, London. He is consultant cardiologist at Morriston Hospital, Swansea, specialising in coronary intervention. Dr Thomas was the lead cardiologist during the establishment of the Cardiac Centre in Swansea and its first clinical director until 2001. From 2002 he has been Lead Cardiac Clinician working with the cardiac networks in Wales and the Welsh Assembly Government in addition to his clinical work.

John Wyn Owen currently holds the post of Chairman of University of Wales Institute Cardiff (UWIC). Until his retirement he held the post of Secretary of the Nuffield Trust from 1st March 1997 to June 2005 having previously been Director-General of NSW Health in Australia and Chairman of the Australian Health Ministers Advisory Council and, until 1994, Director of NHS Wales. He is an Honorary Doctor of the University of Glamorgan and Honorary Doctor of Science of City University London.