Long Term Problem or Long Term Opportunity?

Fifty years ago a man considered himself lucky if he saw his seventieth birthday. In those days working out how to fund healthcare was a relatively straight forward, back of the envelope, calculation. Starting work after leaving school and stopping work at 65 a person accumulated approximately 49 year's of National Insurance (NI) contributions. This paid for their healthcare up to the age of sixteen and a pension when they retired. It also covered any healthcare they required between the day they started work and the day they died. Anything left over provided a pension, and healthcare, for the person's wife – who, on average, lived five years longer than her husband.

The books balanced because people who suffered prolonged bouts of illness during their working lives – and claimed on the National Insurance scheme - usually died before well before their seventieth birthday.

Fit – but not for work

The world has changed significantly in fifty years. More people go on to further education and start work in their late teens or early twenties. Working lives are shorter with some people retiring as early as 55. Improved working conditions, diets, rising standards of living - and early retirement itself - have pushed men's life expectancy up to 75 and women's up to 85.

It should have been obvious that 35 years of NI contributions would not cover the cost of a lifetime's healthcare and provide a pension to cover 20 years of retirement. The ensuing crisis was masked by economic growth, increasing number of women joining the workforce and, more recently, a stock market boom that inflated pension funds. A slide in the value of stocks and shares during 2001 and 2002 has focussed attention on a problem that has been growing steadily more acute for two decades – namely who will pay for pensioner's long-term care?

At a Glance

The need for technology to eliminate bed blocking presents an opportunity for investors and IT vendors.

The market for ehealth systems to provide care for the elderly could be worth £1.5 billion per annum.

However, only if the government encourages NHS Trusts and local authorities to work together and if manufacturers can produce sophisticated low cost solutions.

It is unlikely that a person will have saved or contributed sufficient funds during 35 years of work to fund 20 years of retirement, a lifetime's healthcare and long-term care in their old age.

Are The Elderly Bringing NHS to its Knees?

The received wisdom is that, unless it is radically reformed, the NHS will be unable to deal with increasing numbers of elderly people seeking treatment and care. Most of the reforms centre on the increasing use of information technology. But before every one gets too excited and, on the assumption that the NHS will be forced to spend its way out of trouble, invests in any IT company with more then a toe in the healthcare market it is worth taking a closer look at the healthcare needs of the elderly.

Longevity may actually ease demands on the NHS by deferring expenditure

The Cost Of Living – And Dying

Firstly, longevity itself should not cause the NHS a problem in the short term, if at all. The reason people are living longer is because they are, in general, healthier. If people are fit and active for longer there is a clear case for raising the retirement age – which would provide some of the additional National Insurance contributions needed to fund the NHS.

Secondly, it is true that £3647 of the total £7792 spent on healthcare per head of population (at 1998 prices) is used up after a person reaches the age of 75. (Average expenditure on people between the age of 45 and 64 is only £410). However between birth and the age of 4 years is also an expensive period - £2,472 spent on healthcare per head - with a majority of this amount concentrated at the beginning of that 4-year period. In the same way, while the over 75s receive £3,647 worth of healthcare per head they tend to use a significant amount of this during the last year of their life.

During the first 4 years of life a person needs £2472 worth of healthcare – most of it during the first few hours.

Once over the age of 75 a person needs £3647 worth of healthcare – most of it during the last few weeks.

In the short term, and in a majority of cases, longevity is good news for the NHS as the relative high cost of treating and caring for patients during the last year of their life is deferred.

The Walking Wounded

One longevity related problem the NHS does face however is, ironically, attributable to advances in medical science. Today timely and efficient treatment means that heart attacks and strokes are rarely fatal. As well, many types of cancer are now treatable if detected in time. While advanced technology means the patient survives it creates a large number of 'walking wounded' who either require immediate care or are more likely to need long-term care when they are older.

There is also a greater awareness amongst the general public of medical conditions and – more importantly – there is the perception that doctors and surgeons can always treat these conditions. Where as, in the past, being elderly was almost synonymous with some form of suffering old people today are no longer prepared to suffer in silence.

GPs find themselves under pressure to either treat, or commit to a hospital, elderly patients who are keen to remain active for as long as possible.

Expectations of what the NHS can do for a patient are high. While it can treat diseases that were once fatal the patient is left needing months, if not years, of care.

The Internet has increased the public's awareness of medical conditions and their treatment.

Old people are no longer prepared to suffer in silence

Bed Blocking

The NHS is unlikely to be wrong footed by a sudden rush of elderly patients. The baby boom, which occurred after the Second World War, was not the first bulge in the UK's population. There was also a sharp rise in the birth rate following the First World War. During the 1990's the NHS was already dealing with a large number of elderly patients born during the first baby boom and is now relatively well prepared for the steady rise in the number of old people from the second baby boom.

While the NHS is now able to take in more elderly patients discharging them, after treatment, is proving more difficult. The term 'bed blocking' gained currency as the first wave of baby boomers were admitted to hospital, sometimes with relatively minor ailments, but could not be discharged. In many cases entry into hospital proved to be a turning point in an elderly person's life – up until this point they were either quite capable of looking after themselves or at least being cared for in their own home.

The NHS has already coped with the first wave of baby boomers – people born after the First World War who reached the age of 75 during the 1990's.

Getting old people into hospital is not as difficult as discharging them once they have been treated.

However when the time comes for the patient to be discharged from hospital they are deemed, either by social services or the hospital itself, in need of the type of long term care only available in a nursing home.

Opportunities and Challenges

A shortage of places in nursing homes with the necessary resources to provide either convalescence or long term care means the patient must remain on the hospital ward – eventually limiting the number of new patients the hospital can accept. There are also cost considerations here. Providing care within a hospital costs £805 per week (1996 prices*) - £468 more than it costs in a nursing home (£337 per week). Keeping an elderly person in a residential home costs £247 per week against £119 per week if they are cared for in their own home.

With differentials as wide as these it is surprising that more private companies are not rushing to provide technology and services which move elderly patients out of hospital beds into nursing homes, residential homes or even the patient's own home. And even more surprising that NHS trusts are not snapping up any technology on offer.

Most of the ehealth initiatives deployed so far attack the narrowest differential - between the cost of providing care in a person's own home and the cost of providing the same care in a residential home. One reason for this is that, at this end of the market, the technology required is relatively simple.

To achieve the level of care an elderly person would receive in a residential home merely requires monitoring equipment to detect intruders, ensure the patient has not fallen and collect data on the patient's vital signs. The £119 it costs to care for a person in their own home includes visits by community nurses and domestic help who can assist with health monitoring or are alerted if the patient falls. Typically remote monitoring services, run from a call centre, cost in the region of £120 per week which means keeping the elderly person in their home costs only £20 per week less than moving them to a residential home. However the savings for the local authorities are potentially be much larger.

> It costs £805 per week to care for an elderly person in hospital as opposed to £337 to care for them in a nursing home.

> The typical cost of monitoring a person in their own home is £120 per week - £20 less than transferring them to a residential home.

At present, of the £11 billion spent on long term care of the elderly - £4 billion is paid by the patients themselves. Remote healthcare, or monitoring, is offered to the patient as a means of maintaining their independence – something they may be willing to pay for themselves rather than relying on the local authorities to fund it.

Of the £11 billion spent on long term care of the elderly £4 billion is spent by the patients themselves.

Financial Challenges

At the other end of the market the technology required to provide an elderly person in a nursing home with same level of care they would have received in a hospital is complex. At the moment it is prohibitively expensive – even when set against potential savings of £468 per week. However £468 per week is probably enough to finance the technology needed to provide an elderly person in a residential home with the level of care they would have received in a nursing home. This would free up places in nursing homes which could then be taken by patients waiting to be discharged from hospital. However the way long term care of the elderly is funded may inhibit implementation of monitoring technology.

The way long term care of the elderly is funded could be a barrier to the introduction of ehealth services

The NHS funds the care received by an elderly person in hospital. But while the NHS also make a contribution to long term care of patients in nursing homes (7% on average) a large amount of the bill is picked up by local authorities (46% on average) – the remainder is paid by patients themselves.

The NHS contributes 7% of the cost of long-term care in nursing homes while local authorities contribute 46%

If the local authorities decided to fund ehealth projects which moved some of the 115,000 people it supports in nursing homes into residential care, then the NHS could discharge some of the 34,000 elderly people in hospitals into nursing homes. Saving the NHS £468 per patient per week.

However, at the most, local authorities would save just £90 per patient per week – the difference between the cost of a place in a residential home and a place in a nursing home. As well, the technology required would be more expensive than that required to relocate an elderly person from a residential care home to his or her own home (which yields larger savings for local authorities).

Local authorities would save only £90 per week by moving a patient from a nursing home into a residential home.

The NHS would save £468 per week by moving a patient from a hospital bed into a nursing home.

As for the patients themselves, having lost the independence they enjoyed in their own home, staying in hospital is little different to staying in a nursing home – except that patients make a contribution to their care in a nursing home whereas, in hospital, charges are negligible if they are levied at all.

The market for ehealth services could worth £1.5 billion per annum assuming that: -

1. Remote care is offered to the 34,000 patients now cared for in hospital and to the 157,000 patients in nursing homes.

2. Remote monitoring is offered to the 530,000 elderly people receiving community nursing in the home and to the 288,750 elderly people in residential homes.

While not all elderly people will elect to use, or need, ehealth services some will require monitoring and care more sophisticated than the basic services assumed (£120 per week for care and £7 per week for monitoring). These figures are based on the number of elderly people in care today – a number set to grow consistently over the next five decades. During the next two decades the number of people aged 65 and over will rise by 40% - this could increase spending on long-term care by £4.4 billion to £15.4 billion.

Technological Challenges

It falls to the NHS to find ways of easing bed blocking – either by building more nursing homes or working with manufacturers to develop ehealth technology to monitor patients in residential homes. This goes far beyond upgrading basic ehealth solutions used to monitor people in their own homes. At present even these are cumbersome; requiring data to be keyed in, having to be re-configured for different medical conditions and dependent on the patient 'docking' the equipment to transfer data.

Monitoring systems will have to adhere to 'always on' models - perhaps being based on mobile technology such as GPRS or 3G. The components, which make up an ehealth system, must interoperate - adhering to one, or both, of the key wireless standards (Bluetooth or 802.11). Data collected must interface efficiently with electronic patient record systems.

> The market for ehealth systems to provide long term care for the elderly could be worth £1.5 billion per year - a figure that would rise annually until 2050.

> The technology required to support the relocation of a patient from a hospital bed to a nursing home is more complex than a monitoring system which supports the relocation of an elderly person from a residential home to his or her own home.

Ehealth systems must be easy to use. If highly trained staff are needed to use them cost savings will quickly evaporate.

The cost per patient per week of ehealth services must fall as, given the risk of failure (which government bodies now factor into IT projects), few government departments will invest in solutions which do not demonstrate dramatic cost savings from day one.

Government bodies are increasingly risk adverse when purchasing IT services

A number of manufacturers are making advances in some of these areas but few are near to having a complete solution.

Risks and Strategies

The last five decades have been littered with the wreckage of companies who tried to second-guess the attitudes and needs of baby boomers. In old age the second wave of baby boomers may prove just as unpredictable as they were during their teens.

It is assumed, based on the behaviour of old people today, that tomorrow's senior citizens will wish to maintain their independence and stay in their own homes – even when they need care. This may not always be the case especially if, through bereavement, they have been left on their own. The government, faced with spiralling costs of care, may use the media to promote the benefits of life in a residential home.

Tomorrow's elderly people may not want to, or be able to afford to, stay in their own homes.

Today's senior citizens, who are relatively well off, are capable of contributing to the cost of their own long-term care. This has enabled the private sector to step in and replace services, such as chiropody, which have slipped to the bottom of the list of services the NHS provides.

Reduced pension entitlements may mean that elderly people can no longer afford to contribute the £4 in every £11 spent on their long-term care.

In theory the private sector could become an important outlet for suppliers of ehealth equipment and services. Private chiropodists themselves, who already make home visits, may wish to provide ehealth services should they find their market becoming increasingly well served and competitive.

There are private sector health providers who could support ehealth and monitoring services.

However it appears the next generation of pensioners will have less disposable income than the present one. Pension funds can no longer support final salary based schemes or offer attractive annuities. House prices may fall during the next decade and people hoping to release the equity locked into their property may receive less than they hoped to.

A house price crash would reduce the disposable income of a large number of elderly people.

The very fact that, over relatively short period, so many elderly people will attempt to withdraw equity from their property may in itself drive down property prices.

Today manufacturers and service providers are currently targeting the low end of the ehealth market – in part because the technology is simpler and the patients themselves are willing to contribute towards their cost.

If the patient becomes poorer, and the £4 billion they contribute to their own healthcare is no longer available, then the demand for ehealth at the low end of the market could soften. On the other hand advances in technology and the emergence of a 'mass' market for devices may lower costs to the point where monitoring equipment is as affordable as any other consumer electronics device.

While the NHS is confident it can cope with increasing numbers of elderly patients it is possible that population estimates are wrong – they, were after all, revised during the last decade as life expectancies increased.

The number of people aged over 60 is set to increase by 40% during the next 30 years. The number of people over 85 is set to increase three fold (it is now 1.128 million) by 2050. An upward revision of these figures, combined with the inability of elderly people to contribute towards their own healthcare, may force more NHS trusts and local authorities to jointly sponsor ehealth systems.

Conclusions

The government will find encouraging cooperation, rather than the imposing a combination of impossible targets and fines, is the only long-term fix for the problem of bed blocking. Starting a war between NHS trusts and local authorities will slow down development of technology based solutions, for example ehealth systems developed by Tunstall and Hanover Scotland relied on co-operation between West Lothian Healthcare NHS Trust and West Lothian Council.

Manufacturers and service providers need to ensure their product offerings meet the requirements of both the public and private sectors. Unfortunately, at present, there are few standards, no common platforms or even agreed guidelines for developers to work to.

In the event that the private healthcare sector softens manufacturers should ensure their products and services meet the needs of NHS trusts.

Figures for life expectancy are constantly being revised upwards and the market for ehealth for the elderly may have been similarly under estimated

The government should encourage cooperation between NHS Trusts and local authorities.

Manufacturers must drive down the cost of services, increase ease of use of devices and agree on a common ehealth development platform.

*Figures in this report have been taken from submissions made to the Royal Commission On Long Term Care of the Elderly.

Vendors and Case Studies

Docobo UK Ltd

Docobo came into existence as a result of collaboration between UK based Transpond Ltd, a developer and manufacturer of embedded control systems, and Estonian based Curonia Research. The two organisations formed a joint venture to market technology developed during their participation in DOC@HOME - an EU funded research project.

Docobo have 250 units being used in trials throughout Europe – 75 of these in the UK. Docobo believe that patients who monitor their blood pressure, and take action to lower it, can reduce their chances of having a heart attack by 60%. Docobo points out that it is the extra care a patient needs after an attack, rather than the attack itself, which places a burden on health providers. For this reason it could be ten years before enough data is available to assess the full benefit of the service.

Data, such as blood pressure, weight and temperature is keyed into a collection device by the patient or their helper. The device also measures the patient's heart rate. When docked in its cradle the device creates a dial up connection and transfers the patient's data to a remote server. Once on the remote server data can be accessed by a GP via the patient's electronic record. The device is also capable of downloading reminders to take medication.

There are two possible marketing models for the DOC@HOME service. The unit can either be purchased outright (for approximately £300) then supported with a monitoring service costing £0.25 per day or issued free of charge to the patient who then pays £0.90 per day for the service. With an eye to the NHS as potential customer for the service the device has been designed to keep costs to a minimum – Linux, running on a MIPS processor, is used as an operating system rather than Microsoft Windows. For the same reason the company intends to use Bluetooth rather than 802.11 when interfacing the device with wireless enabled sensors.

By storing the scripted application software on a flash memory card within the device Docobo hope to modify their service to suit different communications networks, such as GPRS, and alternative applications.

Docobo at a Glance

Formed in 2001 as a joint venture between Curionia Institute of Estonia and UK based Transpond Ltd

DOC@HOME funded by EU (935,513 Euro)

Manufacturer of healthcare computer hardware and software products

6 Employees

Funding from EU and joint venture with Curionia Institute.

Currently seeking £1.5 million to market its doctor at home service.

www.docobo.co.uk

While, today, units are configured for use by just one person the software can be modified so that they can be used by a number of patients in a residential home.

Analysis

With no healthcare provider or specific application in place, beyond the diabetes trial, Docobo have designed flexibility, with respect to cost and functionality, into the DOC@HOME service.

The company should be able to address the needs of some patients at the low end of the market (who are monitored in their own home as opposed to moving into a residential home). The company should also be able to take advantage of NHS trust initiated projects at the high end of the market (patients treated in a nursing or residential home as opposed to staying in hospital).

At the high end of the market Docobo will require the support of an NHS trust, or other health provider. If it can find this support the company should be in a position to establish its service as an accepted platform for ehealth applications.

Roke Manor Research

Roke Manor Research have collaborated with an undisclosed UK hospital in the development of technology which remotely monitors patients who are under going chemotherapy and are at risk of septic episodes.

A wireless device attached to the patient monitors skin temperatures and pulse rate. A PDA, linked to the device, communicates via Bluetooth with a GPRS terminal which in turn relays the patients data to an application server. The PDA used is a Palm but Roke Manor Research point out that pocket PCs from other manufacturer's can be used.

Roke Manor Research at a Glance

A Seimens Company

507 Employees

www.roke.co.uk
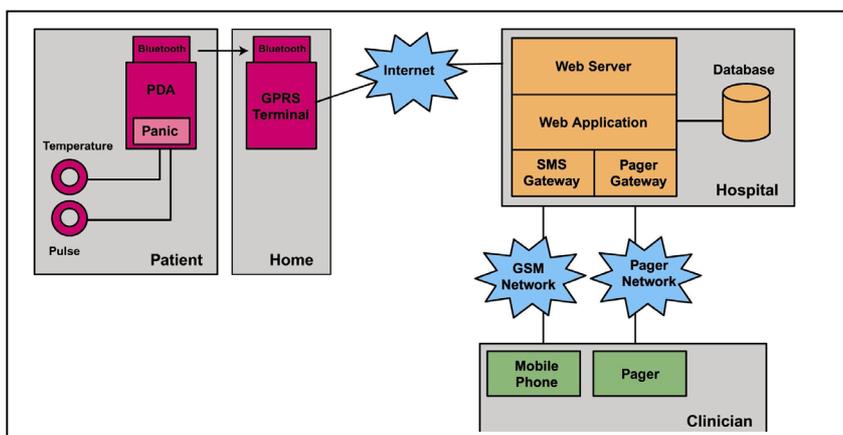
The patient can place the GPRS unit in their pocket should they wish to leave their house. The PDA can initiate an alarm signal if the data collected indicates an incipient infection. An alarm signal is also generated if data fails to reach the application server, or if the patient has pressed the panic button on the remote unit. An alarm signal will cause the application server to send either a SMS message or a pager alert to the patient's clinician.

Data is transmitted anonymously between the patient and the hospital and no personal data is transferred or stored on the server. A unique identifier is used to identify the equipment issued to a particular patient.

Analysis

Roke Manor Research have built a single application solution around an established IT product. By choosing a Palm device it has been able to get a truly wireless ehealth service up and running relatively quickly. The service should benefit from the falling price of PDAs and advances made by other companies who are adding wireless functionality to PDAs.

Having completed its first trial building additional applications around an existing platform should prove relatively straightforward – merely requiring the addition of new sensors and supporting software.

If the ehealth market is eventually dominated by custom built solutions Roke Manor Research could face strong competition from devices employing low cost communication technology and software which incur no license fee. However, while tailor made hardware and software may penetrate the UK health sector it is unlikely they will dominate the global ehealth market.

Tunstall and Hanover Scotland

Tunstall evolved from a provider of warden paging systems into a leading supplier of security, monitoring and ehealth systems for the elderly. In conjunction with Hanover Scotland, a housing association, Tunstall have carried out trials of a telecare system designed to remotely monitor a patient's vital signs.

As part of a project called 'Opening Doors For Older People' Hanover Scotland provided their residents with Tunstall's monitoring service. West Lothian Council and West Lothian Healthcare Trust also supported the project. The service aimed to keep people in their own homes as opposed to moving them into residential homes.

Tunstall at a Glance

Established in the UK in1957 and recapitalised in 1999 by HgCapital.

Produces emergency alarm and ehealth systems for use by elderly people.

800 employees worldwide.

www.tunstallgroup.com

A more ambitious project involved collaboration between Hanover Scotland Edinburgh Royal Infirmary's 'Hospital at Home Scheme' – a service addressing the top end of the market (caring for people in their own homes rather than in an NHS hospital bed). This service provided early supported discharge from hospital for patients with acute exacerbation of Chronic Obstructive Pulmonary Disease (COPD). The equipment used consisted of:-

- A telemedicine monitor which the patients use to take vital signs readings.
- A patient record database and monitoring system located at a 24 hour manned monitoring centre.
- A clinical workstation used by the patient's doctor or nurse to review the results of the monitoring.

Both projects were examples of an NHS Trust and a local authority working together to overcome bed blocking in hospitals. They also both enjoyed the support of David Hinchliffe MP – chair of the Health Select Committee.

Hanover Scotland at a Glance

Formed as a housing association in 1979.

Registered as charity.

Manages 4,715 houses throughout Scotland.

www.hanoverscotland.org.uk

Analysis

The Tunstall and Hanover initiatives are now moving beyond trial phase. Deployment of general-purpose alarm and monitoring systems – of which ehealth is one component – has begun. The progress made by the two organisations illustrates the advantage telecom operators and care home providers have over technology vendors when it comes to deployment of ehealth systems.

The two ehealth components so far not provided in house, by either Tunstall or Hanover, are the ehealth monitoring devices and the health service itself. However Hanover have been running a call centre on behalf of West Lothian Council and Tunstall already develop their own emergency communication technology.

There may be scope, if more NHS Trusts show an interest in ehealth for the elderly, to either develop or buy in the resources needed to provide a comprehensive turnkey solution. This may help bring down the cost, and increase the sophistication, of services to the point where they are applicable to the top end of the market.