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Preventive Social Care

IS IT COST EFFECTIVE?



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Is it cost effective?

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King's **Fund**

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Executive summary

Background to this paper

This paper was commissioned as part of the Wanless Review of Social Care, which is examining the need for social care and its potential future funding streams. Prevention is considered to be an important part of future health and social care provision. The assumption is that preventive social care will ultimately lead to lower use of resources and, thus, prove to be cost effective in the long term. There is, however, debate over the level of impact it will have and this paper aims to pull together evidence to examine the kind of cost saving that could be expected from certain preventive interventions.

Policy background

Prevention and the concept of preventive services have become increasingly prominent in health and social care policy rhetoric in recent years. With the recognition that health and social care services, in their current configuration, are unsustainable, it is hoped that prevention could be the key to reducing demand for high-intensity, high-cost services. The ageing population and growing number of people with long-term conditions is placing enormous strain on health and social care services and the current focus of policy is to reduce this demand and shift services out of expensive acute hospitals and nursing homes and into the community. The 2005 Green Paper and subsequent White Paper highlight a commitment to shifting the system towards prevention. The White Paper states that integration of health and social care services can help prevent inappropriate use of specialist acute health care and that greater social inclusion can reduce the severity of mental illness. The government has committed to shift resources into preventive services, despite a slightly weak evidence base, on the assumption that preventive services can, in the long term, bring about cost effectiveness (Department of Health 2006).

Findings

Overall, there is a paucity of quantified information about the effectiveness of preventive services. This is consistent with the findings of many other studies that have called for further research. A small number of research papers have included quantified cost effectiveness information but this is often only for small scale studies and not comparable with other evaluations. This poses major obstacles to developing an evidence base and to drawing specific conclusions out of the literature. However, the review includes the following key findings.

- There is a strong financial case for reducing hospitalisation (particularly through falls) and for reducing the rate of institutionalisation by maintaining independence. However, the evidence as to what is effective in bringing about these reductions is rarely quantitative.

- There is a wealth of qualitative information to suggest that **low-level interventions** are highly valued by older people and that they can be effective in maintaining independence. However, there is a lack of robust evidence indicating that such low-level interventions are cost effective. Some evidence obtained through small-scale trials suggests that small interventions, such as issuing older people with slippers that fit properly, could save millions of pounds through preventing falls and reducing the rate of institutionalisation. However, establishing a direct causal relationship between such interventions and long-term financial savings has proved problematic.
- There is a lack of consensus over the cost effectiveness of **intermediate care**. Generic intermediate care has frequently been found to be not cost effective, although some studies have found that generic intermediate care is effective in reducing lengths of stay through facilitating timely discharge. There is stronger evidence for the cost effectiveness of intermediate care services that target specific groups/illnesses/events such as stroke and falls.
- Evidence for secondary **stroke prevention** services is perhaps the strongest, and most widely quantified, body of research. However, interventions vary widely as to their cost effectiveness. There is some evidence that primary prevention strategies (such as smoking cessation and reduced salt intake) have potential to reduce the incidence of stroke.
- Quantified evidence for **wider community services** has not been identified, although there is some effectiveness evidence around public health interventions, such as smoking cessation. Smoking cessation services tend to be relatively cost effective but it has seemingly proved too complex to measure the cost effectiveness of community services that are essential for an independent life and social inclusion (such as public transport and other amenities).
- It is evident that, in order to maximise the effectiveness of any intervention, it is important to target services carefully towards those who need them most.

Recommendations

This paper has sought to identify, and pull together, key pieces of evidence about the cost effectiveness of prevention in order to develop recommendations that will help to move the prevention debate forward. The lack of a quantified evidence base is raised frequently in research papers and appears to be an impediment to moving forward and proactively testing preventive interventions. Therefore, the following recommendations have been identified.

- The recent White Paper puts much emphasis on prevention, including the need to shift resources towards these services. It would be regrettable if this did not extend to low-level interventions, although this may also require enhanced public awareness around healthy lifestyles and how to prevent falls and a willingness to self-fund.
- Recognition should be given to the wealth of qualitative evidence about the value placed on lower level services by older people in helping them to maintain their independence.
- Given the difficulty of collecting robust evidence about the impact of low-level preventive services, a proactive approach should be encouraged whereby certain promising intervention could be implemented and formally evaluated during roll-out.
- Standard outcome measures of prevention need to be developed to facilitate the evaluation of various interventions, as this will allow future studies to be compared and a more robust evidence base to be collected.

- There is a need to target resources to those who require them and for whom an intervention will have greatest impact. To facilitate this, a method for accurately identifying individuals when they are most amenable to an intervention prior to deterioration is required.
- Integration between health and social care services is critical to bring about the desired shift in services towards the preventive end of the spectrum.

Introduction

Prevention and the concept of preventive services have become increasingly prominent in health and social care policy rhetoric in recent years. The recent White Paper – *Our Health, Our care, Our say* – shows a high level of commitment to prevention and pledges £60 million ring-fenced funding to run Partnerships for Older People Projects (POPPs) in order to build up an evidence base of what is effective (Department of Health 2006). The White Paper states that the economic case for primary and secondary disease prevention has been made and also that there is a growing body of evidence showing that social care and wider community services (for example, transport, housing and leisure) have a preventive function. There has, however, been much debate about the extent to which prevention is cost effective and whether the focus of service delivery should shift from reactive care to a more proactive, upstream model.

Aim

The aim of this paper is to review the UK and international evidence as to the cost effectiveness of preventive social care services in order to establish whether it is beneficial to shift resources from downstream intensive services to preventive upstream services.

Methods

A systematic review was not undertaken owing mainly to time and resource constraints. It was also expected that, owing to the nebulous nature of the area, strict and inflexible searching criteria would not yield results and would run a high risk of missing a large body of information (Ogilvie *et al* 2005). Although methods for evaluation other than randomised control trials are often not considered scientifically rigorous (Wanless 2004), it was decided not to limit searching to such studies because it was recognised that some of the interventions within the field of prevention could not be evaluated in this way. Therefore, an iterative approach was taken to searching literature databases.

In addition, it was expected that the richest information may not have been published and would therefore be missed in a strictly designed literature search. As such, grey literature was searched and contact was made with various local health and social services to obtain insight, reports and data. It is recognised that this is not a comprehensive review and that not all potential areas of prevention have been included. Efforts have been made not to duplicate material that appears in other sections of the published report of the Wanless Social Care Review. Instead, it aims to provide an insight into, and summary of, the evidence available about prevention and to identify any cost effectiveness information.

Structure of the paper

In addressing the above aim, this paper is structured around the following sections.

- 1 Background to prevention:** this section examines what preventive services are, what they are intended to achieve, how prevention has developed in policy and the rationale behind looking at the evidence base.
- 2 UK and international evidence base:** this section reviews the available evidence and is broken down into the following sub-sections.
 - a. Low-level interventions;
 - b. Formal social and health care services;
 - c. Wider community services.
- 3 Discussion and recommendations.**

Background to prevention

What is prevention?

Although prevention is a term that is used increasingly frequently within health and social care services and policy, there is no clear-cut definition and no consensus as to what constitutes 'preventive services'. Compounding this lack of clarity is a further haziness around the boundary between health and social care and between social care and wider community services such as housing and transport. Prevention is a concept that refers to upstream interventions which seek to help people maintain or improve health before it is compromised. This stands in contrast to the traditional role of the health care system that is to restore health once it has already come under threat (Health Canada 2002).

As Godfrey states in her 1999 study, prevention has different meanings in different contexts (Godfrey 1999). If a narrow perspective is taken, a preventive service may be said to be one that aims to prevent or delay a specific condition or outcome. An example could be a service that aims to prevent admission to hospital because of a fall. This type of service has a clear remit with a well-defined outcome. However, it is widely accepted that prevention as a concept is significantly more inclusive and that the concepts of quality of life, independence and control are central to the prevention agenda. Indeed, Wistow's influential conception of prevention encompassed the following three wide-ranging aims:

- to prevent or delay ill health or disability consequent upon ageing
- to promote/improve quality of life of older people, their independence and inclusion in social and community life
- to create healthy and supportive environments.

The latter two points underline the broad nature of preventive services and the role that they are seen to play in promoting social inclusion which, in itself, is seen to be key to maintaining good health and independence (Wistow *et al* 2003).

An alternative, but similar, definition has been put forward in recent work by the Social Exclusion Unit. This concept of prevention is more explicit in its intention to reduce current resource consumption and also carries forward the idea that prevention is a holistic concept that recognises the centrality of social inclusion and social engagement in good health. The implication is that if we can maintain good health, through the means of prevention, then the need for more costly services will be reduced or delayed or, in some cases, even prevented (Office of the Deputy Prime Minister 2006). As such, the Office of the Deputy Prime Minister (ODPM) uses the following two elements to describe preventive services:

- services that prevent/delay the need for more costly intensive services
- services that promote the quality of life of older people and their engagement with the community.

What are preventive services?

As is clear from the two example definitions included above, a whole array of services could come under the umbrella of prevention. Rather than being discrete and easily definable, preventive services represent a continuum of support services that range from relatively formal intermediate care services provided by health and social care professionals to so-called 'low-level' interventions that could include befriending schemes, the fitting of a hand rail or help with shopping; services not necessarily provided by a health or social care professional. When the element of social inclusion is included, prevention could extend to wider community services, such as public transport, leisure centres and housing (that is, all the ingredients that are essential for effective social inclusion).

In addition to encompassing a continuum of services, prevention can perform a number of different functions, targeting very different groups of people. For instance, health promotion (such as public information campaigns around smoking and healthy eating) primarily target those individuals who are relatively healthy at the present time and, as such, aim to prevent the onset of illness or disability. This is clearly different from such preventive services as intermediate care which tend to be executed after discharge from an acute setting in order to prevent deterioration of a current condition and, ultimately, readmission. In Canada, prevention is conceptualised on three broad levels (Hollander 2001):

- Primary prevention: this could include exercise programmes, smoking cessation, immunisation and so on and is targeted at individuals who are relatively healthy and active;
- Secondary prevention: this could involve screening and case finding to identify individuals at risk of specific conditions or events (such as falls or stroke);
- Tertiary prevention: at this level, prevention is aimed at minimising disability or deterioration from established diseases and, therefore, it targeted at relatively ill and frail people. The main function of this level of prevention is to delay (but not prevent) inevitable deterioration.

Clearly, this three-tiered framework does not map neatly onto a continuum of services, from low-level to more intensive provision. Two key areas remain where there is lack of clarity. The first is that there is no agreed definition of what constitutes a preventive service. The second is around the relative cost effectiveness of the three levels of prevention and, thus, a lack of clarity over where to focus financial investment.

Why promote preventive services?

The underlying rationale is that early and timely preventive services will not only promote individual well-being but will ultimately lead to a reduction in consumption of expensive intensive services in the future. Data indicates that around 5 per cent of patients account for 40 per cent of National Health Service (NHS) inpatient bed days (Department of Health 2004). Research has shown that the majority of this 5 per cent of patients are older with a high disease burden, often with a number of long-term conditions (Department of Health 2004). Indeed, Age Concern estimates that in 2000/1, the NHS spent 41 per cent of its entire budget on people over 65 (Age Concern 2005). Given the ageing population, there are significant resource implications for health and social care. It has been recognised that the situation is unsustainable and that alternatives to the prevailing model of acute health

care must be found. Attention has therefore turned towards better management of patients outside hospital.

Other key drivers behind the increasing prominence of prevention in policy include changing social attitudes and rising expectations from the population as to quality of life post-retirement. People are generally living longer in much better health than previously and, as a result, have higher expectations from life when they are over 65. Associated with this is the current government commitment to social inclusion and to giving people choice and to developing patient-centred services. As such, prevention is part of a wider commitment to maintaining people's independence so that they can make good choices about their lives and thus better manage their illness, disability or future disability (Wistow and Lewis 1997).

Development of policy on prevention

Two main parallel strands of policy which promote prevention have arisen during the past two decades. One is specifically around long-term conditions, which the World Health Organization (WHO) describe as 'the health care challenge of this century', with such conditions likely to be the leading causes of disability by 2020 (World Health Organization 2002). The other is a more general strand around the promotion of social inclusion and maintaining quality of life and independence for older people. Although the long-term conditions agenda is not specifically targeted at the elderly, its focus is on prevention of acute admission through proactive, timely, upstream care.

Care provision in the past decade or so has concentrated largely on people with intensive and complex needs at the expense of investment in promoting health, independence and well-being in the general population (Department of Health 2005). For a long time, statutory health and social services have generally been seen as separate entities geared towards provision of services at times of acute need and crisis. The White Paper recognises that UK spending on prevention and public health is relatively low in comparison to other advanced economies (Department of Health 2005). Current policy, however, has begun to emphasise the potential of proactive and integrated care whereby an individual's condition is not allowed to deteriorate to the extent that intensive acute services are required. As mentioned above, this has been driven largely by a realisation that current service models are unsustainable in terms of resource consumption, and concurrently by a growing desire amongst the population for choice, control and independence.

Though it has only come to the forefront of health policy in recent years, the concept of prevention has been developing for some time. The concept of 'prevention of illness' appeared in the Seebohm Report in 1968 (Seebohm 1968) and Griffiths' 'Community Care: Agenda for Action', 1988, is embedded within the concepts of prevention (Griffiths 1988). Prevention continued to feature on the policy landscape towards the end of the 1980s, culminating in the 1989 White Paper, *Caring for People*. This White Paper focused on enabling people to live as normal a life as possible in their own homes, providing the right amount of care to enable people to live independently, and giving individuals a greater say in how to live their lives (Department of Health 1989).

Although the 1989 White Paper addressed some of the concepts of prevention, it has been criticised by some commentators for its focus on those with the greatest needs. It was felt

that this focus on a small number of high need people was to the detriment of those individuals with low-level needs, such as individuals requiring weekly home help visits (Clark *et al* 1998). Social care providers were faced with cutting low-level services in order to transfer sufficient resources to people ‘who are affected by problems of ageing, mental illness, mental handicap or physical or sensory disability’ (Department of Health 1989). This focus on high need individuals continued throughout the 1990s with heightening media interest in waiting lists and acute services. It wasn’t until the late 1990s, with the realisation that health and social care services were unsustainable in their current configuration, that the potential of preventive services began to be recognised explicitly. The 1999 Audit Commission report – *With Respect to Old Age* – concluded that it was possible to break the cycle of unplanned admissions of older people to hospital and, subsequently, to long-term residential care through prevention and rehabilitation (Royal Commission on Long Term Care 1999).

Other key policy documents that tell the story of prevention and its climb up the political agenda include the 1997 paper, *Better Services for Vulnerable People*, which discusses the prevention of dependence through rehabilitation (Department of Health 1997). Modernising Health and Social Services (Department of Health 1998) explicitly focused on the idea of independence through rehabilitation and recuperation. This was quickly followed by Modernising Social Services (Secretary of State for Health 1998a), which widened the scope of the preventive agenda from a focus on secondary prevention to primary prevention by including individuals who were not necessarily on the boundary of hospitalisation or institutionalisation but who were at risk of losing their independence.

Of further relevance to the prevention agenda are the 1998 Green Paper, *Our Healthier Nation* (Secretary of State for Health 1998b) and the Cabinet Office’s Better Government for Older people programme. The former focuses on reducing inequalities through improving lifestyles, reducing chronic illness and improving living conditions. As such it makes the connection between wider social and economic factors and health and well-being. The latter set the stage for integrated interagency services that promote independence for older people and is indicative of changing social attitudes towards older people as a positive resource instead of a burden; a shift that has been quite central in the evolution of prevention.

Since 1999, a number of key health and social care documents have been published which have increased the pressure on health and social providers to reconfigure services towards a more sustainable model. Increasingly, prevention has been seen as having the potential to bring about such a reconfiguration. Publication of the National Beds Inquiry in 2000 drew attention to the extent of pressure on acute hospital beds. It highlighted the fact that significant numbers of older people stay in acute hospitals longer than is necessary or desirable (Department of Health 2000). In response to this, the concept of intermediate care was developed with the intention of breaking the spiral of admissions and speeding up discharge. Intermediate care was intended to include short-term preventive measures (such as rehabilitation and provision of equipment) and has the aims of preventing avoidable (re)admission to hospital, facilitating discharge, enhancing faster recovery from illness and promoting independence (Godfrey *et al* 2005). The NHS Plan (Department of Health 2000) also pledged an extra £900 million by 2003/4 for investment in intermediate care and related services to promote independence and improve quality of care for older people. The publication of the National Service Framework for Older People a year later set

out the expectations for intermediate care and called for the promotion of health and activity to be at the heart of service delivery (Department of Health 2001).

In order to bring about rapid change, Public Service Agreement (PSA) targets have been introduced to reduce emergency bed days by 5 per cent (from the level in 2004) by 2008 and to offer personalised care plans for vulnerable people most at risk. Although such targets are essentially health service-focused, preventive social care clearly has a major potential role to play. Effective integration of health and social care is critical and the recent White Paper recognises and promotes this. Furthermore, the White Paper states that Primary Care Trusts (PCTs) will be scrutinised against a number of preventive spending goals from 2008 onwards in order to increase overall spending on prevention (Department of Health 2006).

In addition, the long-term conditions agenda has come to dominate health policy in the past two years with the government looking to transfer resources away from intensive acute services to upstream preventive services, such as case management. The appointment of community matrons by March 2006 is intended to lead the way in case management. However, a recent evaluation of a case management pilot, Evercare, indicated that such an approach reduced hospital admissions by around just 1 per cent. It is thought that more accurate and timely targeting of the programme towards those most amenable to an intervention would bring about a more significant reduction (Roland *et al* 2005). Much of the focus of current health and social care policy concerns how best to identify and target individuals amenable to preventive interventions with the hope that upstream investment will ultimately reduce downstream consumption.

Evidence base on prevention

At present, health and social care providers are working to implement services that adhere to guidance within the relevant government policy, particularly the NSF for Older People. The 2006 White Paper gave further backing to the shift of resources to prevention (Department of Health 2006). However, there appears to be a paucity of robust quantified evidence around the long-term cost effectiveness of prevention. In some instances, there is evidence that certain interventions are reducing the consumption of intensive health and social services but this tends to be localised and it is unclear as to whether, over the long term, such interventions are cost effective. There is growing pressure to demonstrate the effectiveness and cost effectiveness of these services in order to justify the further reallocation of funding to upstream services, away from intensive acute services, and to identify which preventive interventions, if any, will yield the most impressive cost effectiveness.

Although there are numerous preventive schemes in place across the country and internationally, examining whether they are achieving the desired outcomes is beset by multiple difficulties. The vague nature of the concept of prevention, with its wide-ranging outcomes, which are difficult to measure, is at the heart of this complexity. Even when using a very narrow and specific definition of preventive services (for example, a service that reduces the number of falls in a locality), attributing cause and effect is not straight forward. For instance, although the number of falls in the locality may have reduced, how can it be proven that it was the specific service that brought this about and not one of numerous other factors at play (for example, other health and social care interventions,

the mental health of the population, access to transport and housing etc)? When taking the wider definition, encompassing social inclusion, into account, this problem is magnified; how can a change in subjective factors such as independence or quality of life be reliably measured? And can a link between high quality of living and reduced utilisation of services 10 years in the future be verified?

Measuring the cost effectiveness of a service adds a further layer of complexity. 'Cost effectiveness' (as opposed to 'cost minimisation') analysis attempts to relate costs to some measure of outcome (Ebrahim 2000). In order to achieve cost effectiveness, the outcomes of the service must justify the financial investment. However, by their very nature, preventive services are likely to have an impact over a long period of time. Therefore, although investment may be being made now, it may be that the economic benefits of this will not be felt for many years to come. There appears to be no consensus about the time period over which it is reasonable and appropriate to measure outcomes. In addition, because the 'outcomes' of prevention are so ill-defined and with no standard measurements to speak of, the data that has been collected is difficult to consolidate and compare (for example, while one evaluation may have considered number of falls as its primary outcome, another may have considered number of admissions, while another may have had well-being as its focal point). Also, when the intended outcome is not immediately tangible (for example, it could be to increase quality of life or independence), it is incredibly difficult to assess whether it justifies the financial investment. In order to fully assess cost effectiveness, it is necessary to know how much an intervention costs as well as how much money it may save. Few papers have attempted to tackle both elements on a large scale.

The next section of this paper examines the evidence that is available about prevention and reviews various preventive services and whether there is any cost effectiveness information available.

UK and International evidence

Introduction

Mindful of the issues highlighted in the background section, a literature review was undertaken in order to examine the evidence base underlying the assumption that investment in upstream, preventive social care is cost effective. This section presents the UK and international evidence that has been found and seeks to answer the following questions.

- What preventive interventions have been used around the world?
- What outcomes did they set out to achieve?
- What evidence is available around cost effectiveness?

Structure of the section

As explained in the background section above, preventive services span a continuum of interventions from very low-level to more intensive, formal services. Wider community services such as housing and transport can also be argued to fall under the umbrella of prevention. As such, for ease of summary, literature has been grouped and analysed within three broad categories. It is recognised, however, that many 'services' do not fit neatly into one discrete category, which have been identified as follows:

1. Low-level interventions
2. Formal social and health care services
 - a. General intermediate care
 - b. Event/condition-specific intermediate care
3. Wider community services.

In reviewing the evidence within each of these three categories, answers to the three questions listed above were sought.

Low-level interventions

What are they

A broad range of services and initiatives may be considered 'low-level' although no standard definition appears to exist. In general, however, low-level or low-intensity interventions are those services or initiatives that require minimal resource input in terms of working hours and do not necessarily require the input of specialist professionals. Examples of services that might be classed as low-level include help with those tasks that people find difficult as they get older, such as gardening, laundry, cleaning and shopping (Clark 1998). Another stratum of 'low-level' interventions includes home adaptations, such as the installation of handrails and ramps.

What outcomes are they intended to bring about?

It is argued by a number of commentators that a low level of assistance in such areas of everyday life can enhance quality of life through enabling an older person to remain in their own home, maintain independence and reduce the risk of institutionalisation. Godfrey, for instance, argues that relatively minor alterations and help can be the difference between someone living independently in the community and being admitted to hospital or a care home and, as such, are critical to maintaining quality of life (Godfrey 1999). Although it is generally recognised that such low-level services, alone, cannot prevent ultimate deterioration in health, they may be able to delay this deterioration and thus delay admission to a care home (Audit Commission 2004).

The underlying rationale for low-level interventions is essentially the same as with all preventive care – that investment now will yield future cost savings. As set out in the policy background section, it has frequently been preventive services (particularly low-level interventions) that have been squeezed as resources have been moved to focus on acute, high need cases (Godfrey 1999). It is argued by some that this is a false economy as individuals who require just a low level of assistance to live independently would, without provision of this assistance, more quickly require high intensity, high cost, care. Intervening early, or in a timely manner, is intended to delay, and even reduce the intensity of this need. However, installing a hand rail in someone's home or providing them with help to go shopping twice a week costs money so it is necessary to prove that, ultimately, the long-term economics of shifting resources to this end of the care spectrum are robust. The challenge, clearly, is establishing the link between the implementation of a given intervention and the outcome achieved. This is hugely complex when the outcome is ill-defined, when there are a multiplicity of other factors to consider and when standard measures for outcomes have not been developed.

The evidence base

Relatively few papers were found on the subject of low-level interventions and their (cost) effectiveness. Even rarer are papers that quantify the impact of low-level interventions in terms of the outcomes they hope to achieve. Compounding this lack of evidence is the fact that, where measurements have been taken, each study used different outcomes and measuring units. This means that studies cannot easily be compared and results cannot easily be aggregated to form a consistent and meaningful evidence base. The majority of studies into low-level interventions focus on the impact on quality of life and independence rather than other, more tangible, outcomes.

Although very little quantified evidence was found around low-level interventions, there is a considerable bank of qualitative evidence, which generally comes out strongly in favour of low-level interventions. The most widely quoted paper on the topic of low-level interventions is Clark's *Little Bit of Help* which underlines the value of such services to older people. In this study, low-level services are seen as key to maintaining independence, avoiding institutionalisation and reducing isolation. Although Clark stresses the benefits to the well-being of older people, the paper does not attempt to quantify the impact of such services. Recent research by the Joseph Rowntree Foundation has also demonstrated the value of low-level interventions to older people who stress that it is such low-level help that enable them to live a relatively independent and high-quality life. It found that older people are finding it difficult to secure the help they need to

maintain ‘choice, control and dignity in their lives’ and argues that such services should be treated as core services (That Bit of Help Conference, 3 November 2005 and accompanying handouts).

In addition to low-level practical help, various pieces of research have stressed the importance of services and initiatives that enhance mental health and general well-being. The House of Lords Select Committee on Science and Technology found that ‘inactivity and isolation accelerate physical and psychological decline, creating a negative spiral towards premature, preventable ill health and dependency’ (House of Lords Select Committee on Science and Technology 2005). Clark’s *Little Bit of Help* and the recent JRF Conference both emphasise the importance of social inclusion and good mental health. Initiatives such as befriending schemes enable older people to maintain control, dignity and independence (Clark *et al* 1998) and, in doing so, reduce or delay the need for high intensity health and social care services. Work by Layard emphasises the importance of happiness in maintaining an effective economic, health and social care system (Layard 2005). Thus, it could be argued that services such as home help, befriending and gardening could be considered preventive.

The cost effectiveness of services that promote happiness, independence and general well-being is difficult to establish. Low-level interventions are discussed principally in terms of the impact they have upon quality of life in the present, and the extent to which they delay deterioration or reduce service utilisation is unclear in the evidence available. However, there has been some attempt to quantify isolated schemes. One intervention that has been widely implemented across the country is the Sloppy Slippers Campaign which aims to highlight the risks of ill-fitting slippers and encourages older people to exchange old, ill-fitting slippers for new ones that fit. The basis for this scheme is that, of the 300,000 older people who go to hospital with serious injuries from falling¹, around 9 per cent blame their slippers (Department of Health 2003). It is estimated that the Healthy Communities Collaborative, which has been responsible for the implementation of the sloppy slippers campaign amongst other falls prevention schemes, reduced falls by 32 per cent in the first year and 37 per cent in the second year. If this were rolled out across the country, it is estimated that some £500 million could be saved in terms of reduced falls and the resulting treatment required (ODPM 2006).

In addition, the ODPM has attempted to calculate the potential cost savings of reducing institutionalisation, based on work produced by the Personal Social Services Research Unit (PSSRU). PSSRU has estimated that if age-specific dependency prevalence rates fall by 1 per cent (not one percentage point) per year and the proportion of elderly people in institutional care also falls by 1 per cent per year, the projected number of elderly people in residential, nursing home or hospital care by 2031 would rise by just 14 per cent (on 1995 figures) compared with 64 per cent if there were no reductions (Wittenberg 1998). Further work by the ODPM states that a 1 per cent reduction in the rate of age-specific dependency could lead to public expenditure savings of £940 million per year by 2031. Furthermore, the ODPM estimates that reducing the rate of institutionalisation by 1 per cent per year could save £3.8 billion (ODPM 2006). The work has also concluded that 10 per cent of recipients of the Disability Facility Grant were kept out of residential care as a ‘direct result of adaptations’ and that of those people who had adaptations funded through the Disability Facilities Grant, 98.5 per cent reported improved quality of life with 89.1 per cent saying it had improved a lot (ODPM 2006). The work, however, does not examine the cost

TABLE 1: EVIDENCE OF THE EFFECTIVENESS OF LOW-LEVEL INTERVENTIONS

Intervention	Intended outcome	Result/effectiveness
Various low-level interventions, for example, Handy Help (house maintenance and repairs), Help at Home and Befriending ¹	<ul style="list-style-type: none"> To maintain independence in the home To prevent institutionalisation 	<ul style="list-style-type: none"> No information supplied on savings made Examples of costs: <ul style="list-style-type: none"> – Handy Help: £54.00 per visit – Help at Home: £10.70 per hour – Befriending: £5.35 per hour
Healthy Communities Collaborative, which comprised initiatives such as a Sloppy Slippers scheme and exercise classes ²	<ul style="list-style-type: none"> To reduce number of falls To reduce rate of institutionalisation 	<ul style="list-style-type: none"> Reduced falls by 32% in year one and 37% in year two Potential savings of £500m through reduced falls and consequent treatment Potential public expenditure savings of £940m through 1% reduction in the rate of age-specific dependency Potential savings of £3.8bn if rate of institutionalisation is reduced by 1%

¹ Joseph Rowntree Foundation 2005

² Office of the Deputy Prime Minister 2006

of setting up a large scale intervention to reduce institutionalisation nor does it consider the time period over which this cost saving could be expected. Thus, it is unclear whether these interventions are potentially cost effective or just potentially cost minimising.

A summary of quantitative information about low-level interventions is presented below. As can be seen from this summary, the amount of quantified information identified is minimal. Where there is some information, this tends to relate *either* to the cost of an intervention *or* savings from an outcome, but none have related the two and undertaken a cost effectiveness analysis.

Formal health and social care services

This section is divided into two broad areas: the first looks at general intermediate care and hospital at home schemes and the second looks at more condition/event-specific interventions, such as falls prevention programmes and stroke units (these being the two most documented and evaluated services). It is acknowledged that some falls prevention initiatives straddle boundaries of these categories and, hence, some falls schemes have been covered in the low-level interventions section above.

General formal interventions

The majority of ‘general formal interventions’ can be said to fall into the category of intermediate care services that are not targeted at a specific event or condition or group of people. Some of the literature reviewed looks at the different models for delivery of general intermediate care (for example, hospital at home, day hospital and so on). The definition of intermediate care is not clear cut, however, so there is debate over what does and does not constitute intermediate care.

When considering intermediate care, the lack of clarity over its definition poses a significant problem. Godfrey *et al.*, in a recently published evaluation, explores this issue in some depth (Godfrey *et al* 2005). Although intermediate care is talked about as a ‘service’, it is intended to achieve a wide range of outcomes that do not fit neatly into any single health or social care model, but rather represent a range of outcomes that lie at the cross-over of a number of service areas. The Older People’s National Service Framework talks about intermediate care as ‘an opportunity to maximise people’s physical functioning, build confidence, re-equip them with the skills they need to live safely and independently at home, and plan any on-going support needed’ (Department of Health 2001). Although this wide description has been welcomed, as it acknowledges the need for integration of services, it makes the measurement of outcomes extremely complex. Godfrey *et al*’s evaluation includes a lengthy chapter on what intermediate care actually is and explores the challenges around trying to define it and so this paper does not seek to repeat this in-depth discussion (Godfrey *et al* 2005). Key concepts that are central to the idea of intermediate care are that it is a series of integrated health and social care services which aim to promote independence, reduce and prevent (re)admission to an acute hospital and facilitate discharge. Intermediate care is usually also time bound. As such, intermediate care services could, by definition, fall into a continuum of low-level and high intensity services.

THE EVIDENCE

In recent years, intermediate care schemes have been rolled out across the country and evaluations are beginning to be set up. There is some local evidence being produced, although the majority seems to focus on event-specific interventions. Not all evidence has been published in a formal format.

Measuring cost effectiveness is particularly complex because intermediate care spans disciplines and professions and can comprise a wide range of different service components. One of the key difficulties in synthesising and comparing all the evidence from intermediate care schemes is the huge variation in what they are and what they have been set up to achieve (Godfrey *et al* 2005). Godfrey *et al*’s evaluation concludes that the evidence as to whether intermediate care is cost effective is not clear cut. Although on one level the service may bring about benefits for patients (for example, 64 per cent returned home after receiving intermediate care), it is often associated with longer lengths of stay overall. The report points out that intermediate care can be a very intensive service model but asserts that benefits (including financial gains) might be felt over the longer term (Godfrey *et al* 2005).

An evaluation of older people’s experiences of intermediate care by Help the Aged found that most older people were positive about the service although at the end of six weeks they felt they were left with no care and call for the voluntary sector to step in to fill this gap (Cornes and Manthorpe 2005). However, this study did not look at the financial implications of intermediate care. Other studies have produced mixed results as to the cost effectiveness of the service. However, when comparing findings, it should be remembered that they are not necessarily comparing like with like. One key difference (that is often not explicit in all papers) is the length of time over which costs are considered. As Godfrey *et al* states, cost effectiveness is very much dependent upon the length of time over which the impact is considered.

Godfrey *et al*'s evaluation considers a number of pieces of research that have attempted to cost or compare intermediate care services. Netten and Curtis's 2003 study costed a single intensive rapid response service and found that, although the cost varied widely by patient the average cost of an episode of this type of care might cost more than a hospital stay (Netten and Curtis 2003). Another study by Bernhaut and Mackay compared nurse-led intermediate care on a GP admissions unit with care on a medical ward. With an occupancy rate of 65 per cent, it calculated only a small difference in cost per occupied bed with one medical bed day costing £136 and one intermediate care bed day costing £131. No comparison between the quality, in terms of patient experience, were made (Bernhaut and Mackay 2002). Neither study, however, considered resource utilisation by patients over the longer term. In contrast, research by Richardson demonstrated that although nurse-led intermediate care patients had a longer length of stay and higher inpatient costs than patients receiving standard post-acute care, post-discharge costs were lower and, therefore, the service was found to be cost effective in the long term (Richardson *et al* 2001). In Richardson's work, average costs for patients receiving nurse-led intermediate care were £10,278, compared with £7,757 for those in standard care (1996/97 prices). One month after discharge, the average cost of services used by the nurse-led patients were higher but average post-discharge costs were found to be significantly lower (£990 compared with £1,259). This suggests that if long-term reductions in post-discharge use of resources were maintained, the use of intermediate care might not eventually add to costs. This is consistent with Godfrey's assertion that intermediate care benefits may be felt over a long period of time (Godfrey *et al* 2005).

Similarly, research by Griffiths found that nurse-led units were associated with longer lengths of stay than standard care but post-discharge use of resources was lower possibly because the cohort in nurse-led intermediate care were discharged with a greater level of functionality. It is surmised that a person with high physical functionality will require less help and fewer services and will, therefore, consume fewer health and social care resources in future. In addition, patients in nurse-led units had lower medical input, which is a key driver in cost (Griffiths *et al* 2005). A further finding in this study, which was consistent with Godfrey's findings, was that both discharge to institutional care and early readmission were considerably lower than for those who received standard post-acute care. However, the difference between the two cohorts reduced with time, until at the six-month follow-up there was no significant difference, contradicting the evidence presented by Richardson about long-term cost savings.

The most recent UK national evaluation of intermediate care examined the impact of such schemes on the service system as a whole. Patients admitted to the case study services were less dependent at admission compared to patients in earlier trials of hospitals at home. This suggests that intermediate care may be providing services for patients who would otherwise not require hospital care and that intermediate care was thus providing an additional services as well as a substitute service. In practice this meant that only about half of all intermediate care episodes in the case studies prevented or shortened a hospital admission. The evaluation included an examination of the costs of two types of intermediate care service (admission avoidance and supported discharge) up until discharge or transfer, but not including the longer term costs. The key finding from the cost analysis was that the service that sought to avoid hospital admission led to a cost saving of £285 per patient while the supported discharge service tended to lead to a cost increase of £189 per patient. Both costs were in comparison to a base case where intermediate care

was not available (Barton *et al* 2006). This raises a question about which patients should be included in intermediate care services and the intended purpose of the service. No other paper appeared to make such a clear distinction between the type of intermediate care so comparisons are not possible.

Although most papers review the general evidence for intermediate care and its effectiveness, one study examines the different models for its delivery and demonstrates that the service model can have an impact on outcomes, and therefore cost effectiveness. The models considered include hospital at home, day hospitals, nurse-led units, community hospitals and short-term care/nursing home placement (Young and Sykes 2005). It concludes that interventions geared towards a targeted group (for example, stroke patients) are more effective than general services. The evidence base for these specific services is considered in the next section of this paper.

Hospital at home is, according to Young, the model of intermediate care delivery with the most consistent evidence of effectiveness. However, the model comes out as cost neutral for generic service provision but is shown to yield savings for specialist services (see below). Young suggests that, given its cost neutral status, a hospital at home service may be a faster option to increasing capacity than increasing the bed base of a local hospital. The report also asserts that nursing home-based intermediate care may not be an effective model of delivery for short-term rehabilitation but may be more effective for slower track, step-down care. It recommends that nurse-led units should be avoided until new research has defined the role of the locality-based nurse-led units. The study found that nurse-led units meant patients were more independent at discharge but that they had considerably longer lengths of stay and a trend towards higher mortality than usual acute care. Short-term care or nursing home placements was found to reduce demand on District General Hospital beds but at the expense of a proportionately longer period in a care home which is unlikely to be cost-effective. It concludes that the district general hospital form of delivery does not offer any clinical advantage and is not cost effective (Young and Sykes 2005).

Non-published data being produced at PCT level as to the impact of intermediate care is available for a number of localities and provides an insight into the possible scale of impact. However, this information tends to be small scale and specific and it is not clear whether conclusions can be drawn and applied on a national scale. Of the PCTs with whom contact was made, Medway Teaching PCT was able to supply figures to illustrate the impact of its intermediate care rapid response team and, specifically, how it facilitates timely discharge. The scheme specifically targets individuals who have had a non-complicated elective orthopaedic operation and is intended to bring about early discharge. Data relates to 53 patients who received a total of 116 hours nursing care, 92 hours occupational therapy care and 54 hours of physiotherapy. The patients spent an average of 16 days in the care of the rapid response team following discharge. The impact was that their length of stay in hospital was reduced from an average of eight days to five. Over the five-month period of the study, this amounted to a total saving of 141 saved bed days. In terms of opportunity cost, this translates to an extra 18 orthopaedic patients being treated with an average length of stay of eight days or 28 extra patients being treated with a reduced length of stay of five days. No information was available as to the impact of the scheme on readmission rates. Although the PCT has not undertaken a costing study the initial findings do suggest that patients are receiving a higher quality standard of care with early discharge home (Medway Teaching PCT 2005).

A similar rapid response team in West Lothian has also been found to save bed days. In 2002, it was estimated that the scheme saved 1,700 bed days. A further report suggests that between 2003 and 2005, 3,200 bed days were saved. No cost benefit analysis has been undertaken, however, so it is not clear whether the savings made from these saved bed days outweighs the costs of the rapid response team².

International literature has also produced some evidence as to the effectiveness of this type of care. The term 'intermediate care' is not widely used abroad but schemes and initiatives that may be classified as intermediate care in a British context may include hospital at home and geriatric day hospitals. Canada has undertaken substantial work into the effectiveness of home care as a preventive service (for example, Franko 2001; Hollander 2001). Hollander's work questioned the findings of one Canadian study that found home care to increase death and the loss of independence, whereas most research in other countries had come to much more positive conclusions (Hollander 2001). What is apparent from the literature Hollander reviewed, is that the findings were incredibly varied, the majority finding there to be no financial benefit to such schemes, a few finding them to be cost neutral and only a small number coming out as cost effective. Again, a complexity in summarising these results stems from the fact that the initiatives were established with the intention of achieving different outcomes. In addition, some provide costings data, where others do not.

Of those papers that found preventive home care not to be cost effective include one that was intended to enhance functional status. This was found not to be cost effective because of the increased use of community services and increased number of referrals (Patterson and Chambers 1995). Another found that the cost of care was three times higher for patients receiving preventive home care and that 50 per cent of recipients died or lost their independence (Saskatchewan HSURC 2000). Others found home care to be cost neutral or inconclusive. The only study quoted that was found to be cost effective was a multi-factorial prevention programme intended to reduce falls; the cost of care was \$2,000 less for the intervention group than for the control (Rizzo *et al* 1996). This is discussed further in the falls section.

A further Canadian paper considered the costs of a community-based alternative for hospital treatment (Quick Response Program, QRP) for elderly patients who present at an emergency department with non-acute needs. The treatment included nursing home care, physical therapy, occupational therapy, social work and meals on wheels. The study found the QRP to be an appropriate and effective alternative level of care for non-acute individuals, compared with hospital care. The cost of providing such services in a hospital setting were \$3,927.00 for two admissions, totalling 12 days of non-acute hospital care. The average cost to provide community-based services, including QRP costs, to 1 individual for 30 days after an ED visit is \$358.05 (Franko 2001).

The table below provides a summary of the quantitative information presented above:

Condition/event-specific interventions

Another strand of the more formal interventions include those targeted at patients with certain conditions or towards those at risk of a specific events. Examples include falls prevention services which are relatively widespread in the UK and stroke, COPD and CHD

TABLE 2: EVIDENCE OF THE EFFECTIVENESS OF INTERMEDIATE CARE SCHEMES

Intervention	Intended outcome	Result/effectiveness
Generic intermediate care ¹	<ul style="list-style-type: none"> To reduce admissions To speed up discharge To enhance independence 	<ul style="list-style-type: none"> 64% returned home after receiving care Longer lengths of stay Possible savings over the long term
Generic intermediate care ²	<ul style="list-style-type: none"> To promote independence 	<ul style="list-style-type: none"> No figures provided Qualitative evidence suggested that older people were very positive about the intervention although the time limitation of 6 weeks left a care gap
Generic intermediate care ³	<ul style="list-style-type: none"> To prevent admissions 	<ul style="list-style-type: none"> Intermediate care was ‘more costly’ than a hospital stay
Generic intermediate care ⁴	<ul style="list-style-type: none"> To compare costs and resource use of medical beds and nurse-led beds 	<ul style="list-style-type: none"> No savings or cost-effectiveness information available for the medium to long term Comparative costs: <ul style="list-style-type: none"> – £136 for one medical bed day – £131 for one intermediate care bed day
Nurse-led intermediate care ⁵	<ul style="list-style-type: none"> To facilitate discharge 	<ul style="list-style-type: none"> Length of stay longer than standard care Post-discharge resource use lower because people discharged with high physical functionality Medical input lower Lower early readmission rate and lower rate of discharge to institutional care than those in standard care but this difference reduces over time
Hospital at home (generic) ⁶	<ul style="list-style-type: none"> To facilitate discharge To reduce length of stay 	<ul style="list-style-type: none"> Cost neutral when compared with standard care
Hospital at home (specialised focus) ⁶	<ul style="list-style-type: none"> To facilitate discharge To reduce length of stay 	<ul style="list-style-type: none"> Yields savings when compared with standard care
Nursing home-based intermediate care (generic) ⁶	<ul style="list-style-type: none"> To facilitate discharge To reduce length of stay 	<ul style="list-style-type: none"> Not effective for short-term rehabilitation More effective for slower track, step-down care Unlikely to be cost effective
Nurse-led unit ⁶	<ul style="list-style-type: none"> To facilitate discharge To reduce length of stay 	<ul style="list-style-type: none"> Longer length of stay than standard care but older people more independent at discharge Higher mortality than usual acute care

continued overleaf

TABLE 2 *continued*

Intervention	Intended outcome	Result/effectiveness
Intermediate care for post-acute orthopaedics (rapid response team) ⁷	<ul style="list-style-type: none"> • To facilitate discharge • To reduce length of stay 	<ul style="list-style-type: none"> • Length of hospital stay reduced from 8 days to 5 days • Post-discharge, each individual spent an average of 16 days in the care of the rapid response team • 141 bed days saved over the study period for 53 patients, with the result that an extra 28 patients with an average length of stay of 28 days could also be treated
Rapid response team, West Lothian ⁸	<ul style="list-style-type: none"> • To reduce length of hospital stay 	<ul style="list-style-type: none"> • 1,700 bed days saved in 2002 • 3,200 bed days saved in 2003–5
Home care ⁹	<ul style="list-style-type: none"> • To maintain independence 	<ul style="list-style-type: none"> • Cost of care three times higher than standard care • 50% lost lives/independence
Home care ¹⁰	<ul style="list-style-type: none"> • To enhance functional status 	<ul style="list-style-type: none"> • Not cost effective because of increased use of community services and number of referrals
Quick response programme ¹¹	<ul style="list-style-type: none"> • To divert older people from hospital 	<ul style="list-style-type: none"> • Comparative costs: <ul style="list-style-type: none"> – US\$358.05 for 30 days of intermediate care – US\$3,927.00 for 2 admissions to an acute setting
Intermediate care service ¹²	<ul style="list-style-type: none"> • To avoid admissions 	<ul style="list-style-type: none"> • Comparative costs: <ul style="list-style-type: none"> – £3,614 per patient where intermediate care was not available – £3,329 per patient with admission avoidance intermediate care (savings of £285 per patient)
Intermediate care service ¹²	<ul style="list-style-type: none"> • To provide supported discharge 	<ul style="list-style-type: none"> • Comparative costs: <ul style="list-style-type: none"> – £3,806 per patient where intermediate care was not available – £3,995 per patient with supported discharge intermediate care (increase of £189 per patient)

¹ Godfrey 2005

² Comes and Manthorpe 2005

³ Netten and Curtis 2003

⁴ Bernhaut and Mackay 2003

⁵ Griffiths 2005

⁶ Young 2005

⁷ Medway Teaching PCT 2005

⁸ West Lothian Local Government 2005

⁹ HUSRC 2000

¹⁰ Patterson and Chambers 1995

¹¹ Franko 2001

¹² Barton *et al* 2006

prevention schemes. Some of these initiatives are part of intermediate care services. These tend to be, but are not exclusively, 'secondary prevention' in that they target individuals who have had one episode and are therefore at risk of further fall or stroke. Where they are secondary prevention-focused, identifying appropriate individuals for inclusion in the programme is central.

FALLS PREVENTION

One area that is relatively well documented is that of falls prevention. Consistent with recommendations in the NSF for older people, PCTs have been working with partners in social care and the voluntary sector to establish interventions targeted at people who are frequent fallers or those who are at risk of becoming frequent fallers. Falls prevention has become a high priority for health and social care services since the extent of costs as a result of accidental falls has become apparent. Estimates as to the actual cost of falls to health and social care services vary according to the source but they are unarguably significant. Scuffham estimates that in 1999, accidental falls cost health and social care services around £1 billion, approximately 41 per cent of which was paid for by social services (Scuffham *et al* 2003). The ODPM estimates that the average faller consequently has a length of stay in acute care of 26 days (ODPM 2006) which would cost on average £8,000.

With such high costs of care, it is logical to want to reduce the number of falls that occur. Based on one bed day costing around £320, 196,000 bed days and the associated £63 million per year could be saved if 15 per cent of falls could be prevented (ODPM 2006). In addition to the costs incurred as a direct result of a fall by an acute trust, research shows that people who have fallen are more likely to fall again and show an increase in morbidity, mortality and health care utilisation which ultimately leads to increased health care costs (Hendricks *et al* 2005). The ODPM have added the costs of GP visits and ambulance journeys as well as post-acute care (estimated at £1,687 for a hip fracture patient) into the equation and shown that the savings from reducing falls by 15 per cent could be as much as £110 million. Preventing someone from falling would also reduce the risk of them being open to the frequent post-fall consequences of dependency and institutionalisation. Further work by the ODPM, based on research by PSSRU, states that a 1 per cent reduction in the rate of age-specific dependency could lead to public expenditure savings of £940 million per year by 2031 (Wittenberg 1998). Furthermore, the ODPM estimates that reducing the rate of institutionalisation by 1 per cent per year could save £3.8 billion (ODPM 2006). These estimates consider the costs saved, but do not consider how the reduction in falls might be brought about and how much these interventions might cost, in comparison to the long-term economic benefits yielded.

The evidence for prevention

As with other areas of the prevention spectrum, quantified evidence which examines both the cost saving potential and the actual costs of falls interventions is limited. Falls intervention programmes are also extremely varied in content, so comparison is difficult. However, there is considerably more evidence about falls prevention than many other interventions, partly because of the policy focus and partly, perhaps, because of the relative ease with which the outcomes of a falls prevention programme can be measured. Of course, any intervention will be affected by a number of factors, making cause and effect difficult to attribute. This, in turn, makes cost effectiveness difficult to assess. Some outcome measures are straightforward to measure (for example, the change in the number

of falls in a given period) but establishing how much of that change can be attributed to a specific intervention is problematic. One further obstacle that is presenting itself to falls prevention evaluators is that data is not always recorded in a way that means the information can be used in an evaluation. For instance, conversations with staff on the Isle of Wight revealed that falls prevention services have been established and evaluation is beginning but is hampered by the fact that many attendances at A&E are not recorded as 'falls' where they are in fact injuries resulting from falls (verbal information from Isle of Wight PCT). Many localities face a similar situation and are working on the assumption, rather than empirical evidence, that interventions to reduce falls are in fact achieving the desired outcome.

Most falls prevention programmes can be categorised as one of two types; single interventions and multi-factorial interventions. Tolley describes multi-factorial interventions as those that may include balancing activities, low impact aerobics, muscle-strengthening exercises as well as home modifications (Tolley and Atwal 2003). Where the two have been compared, evidence is varied with some suggesting that multi-factorial interventions are relatively more effective in reducing falls (for example, Chang *et al* 2004) and others finding single interventions to be relatively more effective (for example, Tolley and Atwal 2003). A few have looked at the various components of falls programmes in order to assess which are the most effective. As with other areas, comparing the papers poses numerous difficulties; they do not all measure the same indicators, they look at different outcomes (for example, some look purely at number of falls, others look at the wider picture of enabling independence and enhancing physical functioning, others look at impact on acute hospital services and so on) and very few look at cost effectiveness. Papers that include quantifications are presented in the table below.

As demonstrated by the table above, papers do not provide detailed or directly comparable quantified data. It is impossible from this information to make generalisations about the cost effectiveness of falls prevention services. Other papers have emphasised the benefit of other interventions to prevent falls but have not quantified the impact. For instance, Weeks concludes that falls programmes need to include behavioural change components in order to educate older people into not falling (Weeks and Roberto 2003). Tolley also brings up the psychological aspect of falling and claims that occupational therapy falls prevention programmes can reduce the impact of falls on older people by enhancing confidence to enable them to perform activities that can increase quality of life (Tolley and Atwal 2003). In terms of exercise programmes, the evidence is mixed. Chang found exercise to be effective (Chang *et al* 2004). However, Parmeshwar's paper states that exercise appears to improve fall incidence but has no impact on health status (Parmeshwar 2004). This comes back to the fact the intended outcome of the intervention differs between studies.

Although there is evidence that falls prevention services have the potential to reduce length of stay and, in some instances, enhance health status, there is relatively little evidence on the cost effectiveness of schemes. Some of the work undertaken in Canada and New Zealand is an exception. Robertson's study in New Zealand, where falls account for around 27 per cent of all hospital costs, looked at the effectiveness of a home-based muscle-strengthening and balance programme in reducing falls compared to usual care plus social visits for women over the age of 80 (Robertson *et al* 2001). Evaluation of the programme found that in year one, each fall prevented cost NZ\$314 and NZ\$265 in year

TABLE 3: EVIDENCE OF THE EFFECTIVENESS OF FALLS-PREVENTION PROGRAMMES

Intervention	Intended outcome	Result/effectiveness
Multi-factorial programme (included management programme, exercise, environmental modifications and education) ¹	<ul style="list-style-type: none"> To compare multi-factorial programme with individual components in reducing falls 	<ul style="list-style-type: none"> Multi-factorial programme most effective with 11.8 fewer falls per 100 people than the control Exercise as individual component effective in reducing falls
Multi-factorial programme (included exercise, medication adjustment and behavioural assessment) ²	<ul style="list-style-type: none"> To compare health care costs of group in multi-factorial programme with control group 	<ul style="list-style-type: none"> Intervention group health care costs US\$2,000 lower than control Found to be cost effective
Home-safety assessment and an exercise programme with vitamin D supplements	<ul style="list-style-type: none"> To reduce number of falls and cost of falls To compare outcomes and costs of control group with group undergoing home-safety assessment and group in exercise and vitamin D programme 	<ul style="list-style-type: none"> Home-safety assessment had most impact, resulting in 41% fewer falls at a cost of NZ\$650 per fall prevented or NZ\$325 per person (2004 prices). Exercise and vitamin D programme reduced falls by 15% – the closer people adhered to the regime, the greater the effect (no cost information available)
Calcitonin supplements ⁴	<ul style="list-style-type: none"> To reduce cost of fracture 	<ul style="list-style-type: none"> Reduced costs of fracture from US\$200,000–US\$70,000 (taking into account costs of calcitonin) – intervention is therefore still high cost but may be cost effective if correctly targeted
Hip protectors ⁴	<ul style="list-style-type: none"> To reduce hip fractures 	<ul style="list-style-type: none"> Not cost effective because of high cost of hip protectors
Calcium and vitamin D supplements ⁴	<ul style="list-style-type: none"> To reduce hip fractures 	<ul style="list-style-type: none"> Shown to be cost effective (no figures provided)
12-month exercise programme ⁵	<ul style="list-style-type: none"> To reduce number of falls To compare intervention group with a control group 	<ul style="list-style-type: none"> 22% fewer falls in the intervention group At 6 months, the intervention group was better at stepping and walking than the control, but not better in terms of muscle-strength and balance
Home assessment and modification ⁶	<ul style="list-style-type: none"> To reduce number of falls 	<ul style="list-style-type: none"> 36% reduction in falls Intervention group used an extra AUS\$1,807 in mean health care costs than the control, although the difference in median costs was not significant

continued overleaf

TABLE 3 *continued*

Intervention	Intended outcome	Result/effectiveness
Hospital-based dedicated falls prevention service ⁷	<ul style="list-style-type: none"> To reduce number of bed days To compare a hospital with a dedicated falls prevention service with a hospital with no facility 	<ul style="list-style-type: none"> Reduced average length of stay by 6,616 bed days compared to hospital with no falls service
Exercise pilot for the over 65s ⁸	<ul style="list-style-type: none"> To prevent death and reduce inpatient episodes 	<ul style="list-style-type: none"> Potentially prevented 76 deaths and avoided 230 inpatient episodes Cost £854,700, saving £601,000 or an average of £330 per life saved on the assumption that life expectancy after 65 is 10 years (although individual costs ranged between £100–£1,500)
Healthy Community Collaborative pilot in 3 PCTs, comprising various interventions such as improved lighting, installation of grab rails and stair rails, non-slip bath mats, better footwear and eye tests ⁹	<ul style="list-style-type: none"> To reduce number of falls 	<ul style="list-style-type: none"> Evaluation of first 6 months demonstrated a 32% reduction in falls among the elderly across the 3 PCTs
Estimate of potential cost savings from reduced falls ¹⁰	<ul style="list-style-type: none"> To calculate potential savings from reduced falls 	<ul style="list-style-type: none"> Potential savings of £63m or 196,000 bed days (given that each faller has a length of stay of 26 days) if falls are reduced by 15% Potential savings of £110m from a 15% reduction in falls if the costs of post-acute care and ambulance journeys (£1,687 per patient) are factored in Potential savings of £6.4m by 2031 if, by reducing falls, independence is enhanced and institutionalisation reduced by 1%
Home-based muscle-strengthening and balance training and usual care plus social visits for women over 80 years old ¹¹	<ul style="list-style-type: none"> To reduce falls To compare number of falls in the training group with number of falls in the group receiving usual care plus social visits 	<ul style="list-style-type: none"> Each fall prevented cost NZ\$314 in year one and NZ\$265 in year two Training did not reduce health care costs and was not found to be cost effective Participants in the training group had higher scores for physical functioning (SF36)

¹ Chang *et al* 2005

² Rizzo *et al* 1996

³ Campbell 2005

⁴ Vale (on behalf of Scottish Intercollegiate Guidelines Network) 2002

⁵ Lord *et al* 2003

⁶ Salkeld in Robertson 2001

⁷ Hampton 2002

⁸ Munro 1997

⁹ Wanless 2004

¹⁰ Office of the Deputy Prime Minister 2006

¹¹ Robertson *et al* 2001

two. When compared with the cost of falls, the programme was not found to be cost effective as it did not reduce health care costs considerably. However, those enrolled on the programme had higher scores for the physical functioning component of the SF-36. The impact of this better physical functioning has not been quantified but it does highlight the fact that such preventive interventions may yield benefits for an individual's independence which may not be represented in cost effectiveness calculations, or which may prove cost effective in the long term. Whatever the ultimate cost effectiveness, the programme was relatively low cost and was shown to improve physical functioning. Related to this is the issue of the importance of cost effectiveness versus cost savings or cost minimisation and just how appropriate and desirable it is to put a price on a person's independence or happiness.

Robertson compares these findings to those of similar studies in Australia and the US (Robertson *et al* 2001). One study, which looked at the cost effectiveness of a multi-factorial targeted prevention programme intended to reduce falls found the intervention to be cost effective (Rizzo *et al* 1996). This randomised controlled trial carried out in the US was one of the few studies to provide detailed cost information. The study found that the mean costs of the intervention group (that is, those who received a combination of medication adjustment, behavioural recommendations, and exercises) were \$2,000 less than the group receiving usual care; the intervention cost an average \$906 per person but hospital costs were \$7,509 compared with \$11,509 for those receiving usual care so the programme was found to be cost effective. Median costs, on the other hand, were found to be \$1,100 higher for the intervention group.

One UK paper was found that had fairly detailed cost information. This did not specifically address falls but could be seen to indirectly prevent falls as it studied an exercise pilot for the over 65s and found exercise classes to offer a low cost way of preventing death and reducing in-patient episodes. This particular evaluation found the scheme, with a cost of £854,700, to have the potential of preventing 76 deaths and avoiding 230 in-patient episodes, saving costs of around £601,000. Based on the assumption that life expectancy after 65 is ten years, the programme cost £330 per life saved (although the range was £100 – £1,500) (Munro *et al* 1997).

STROKE PREVENTION SERVICES

Stroke is another area where specific preventive services have been developed. Stroke prevention, like much of the falls prevention work tends to be secondary prevention; that is, it is aimed at preventing further incidences of fall/stroke as opposed to preventing the initial event. Sharon *et al* describe stroke as 'a major public health concern', and find that there is a body of evidence to support some primary and secondary prevention strategies (Sharon *et al* 2002). Stroke is the third highest cause of death and the leading cause of severe disability in the UK (Rennison *et al* 2003) and costs the NHS between 4 per cent and 5 per cent of its total budget (Ebrahim 2000). An estimated 100,000 people have a first stroke in England and Wales every year and there is between 30 per cent and 50 per cent chance of recurrence over 5 years (Rennison *et al* 2003). The direct cost of an individual stroke patient is estimated to be between £4,600 in 1998 in Scotland (Isard and Forbes 1992) and £5,900 in 1983 prices in Sweden (Persson *et al* 1990). The cost of long-term care for stroke sufferers should also be considered. With such considerable implications for the NHS budget, it is logical that any reductions brought about by preventing stroke would be of value (Ebrahim 2000).

There is a substantial amount of information in the public domain, but little consensus, about stroke prevention and what works and what doesn't. Interventions appear to fall into three main categories:

1. lifestyle change/behavioural change programmes and monitoring of risk factors (for example, smoking, cholesterol, blood pressure); this can be primary and secondary prevention and some could be categorised as 'low-level' interventions
2. intermediate care/rehabilitation following first stroke to prevent a second
3. pharmacological interventions. This is purely clinical and so has not been covered in this paper.

What cost effectiveness evidence there is tends to have originated from small-scale trials of a very specific target group or intervention. For example, different stroke prevention drugs are often evaluated for effectiveness and cost effectiveness amongst a small number of subjects, but these are usually very clinically focused with little commentary on the wider social care requirements of stroke patients.

Lifestyle change/behavioural change

The findings from the literature search revealed limited quantified cost effectiveness evidence for the first group (lifestyle and behavioural change programmes), although many papers do claim that lifestyle factors do have an impact on stroke rates. Indeed, Ebrahim states that current evidence is dominated by pharmacological interventions and there is considerably less good evidence available for the impact of lifestyle changes, such as diet and exercise. Without providing cost data, Mirvis *et al* state that it is intuitive that investing a small amount of money on simple interventions such as blood pressure measuring should be able to reduce the costs of treating stroke, as well as heart failure or cancer in future because it should keep low risk individuals from becoming high risk expensive patients (Mirvis and Chang 2004). In addition, the Stroke Association states that there is 'strong evidence' that the risk of stroke recurrence can be reduced by lifestyle changes, such as reducing smoking rates (Rennison *et al* 2003).

The paper by the Stroke Association in Kingston Upon Hull (Rennison *et al* 2003) reported on a programme that aimed to prevent stroke and reduce the risk of further stroke by increasing stroke knowledge, changing attitudes and behaviour and patient satisfaction via an advisor who established and delivered an individualised lifestyle change programme for 43 patients. The report concludes that the programme had a positive effect in terms of an increase in knowledge of stroke, lifestyle and subjective risk factors as well as patient satisfaction. However, it yielded no effect for blood pressure or weight loss objectives. Two per cent of the sample went on to have a second stroke, but no conclusions can be drawn from this because of the small sample. Similarly, Sharon *et al* in JAMA found effective strategies for secondary prevention of stroke to include treatment of hypertension (Sharon *et al* 2002). However, neither study undertook cost effectiveness analysis.

The Framingham Study is an ongoing study into risk factors in health. A report published in 1988 focused on cigarette smoking as a risk factor for stroke. It found that cigarette smoking is an independent risk factor for all strokes in general, and thrombotic strokes in particular, and that the risk of stroke increased with the number of cigarettes smoked (Wolf 1988). After two years of quitting, the risk of stroke reduced. The study also found that hypertension doubled the risk of stroke, regardless of smoking status. The journal Stroke

TABLE 4: EVIDENCE OF THE EFFECTIVENESS OF STROKE-PREVENTION PROGRAMMES

Intervention	Intended outcome	Result/effectiveness
Smoking cessation advice from GP ¹	<ul style="list-style-type: none"> To reduce risk of stroke by lowering cholesterol levels and blood pressure 	<ul style="list-style-type: none"> Cost per Quality-Adjusted Life Year: £270
Anti-hypertensive treatment ¹	<ul style="list-style-type: none"> To reduce risk of stroke by lowering cholesterol levels and blood pressure 	<ul style="list-style-type: none"> Cost per Quality-Adjusted Life Year: £940
Aspirin with anti-coagulant ¹	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> Cost per stroke prevented: £17,500 (low risk); £42,300 (high risk)
Anti-coagulant or aspirin ¹	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> Cost per stroke prevented: £8,900 (low risk); £12,400 (high risk)
Aspirin only ¹	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> Cost per stroke prevented: £800 (low risk); £800 (high risk)
Statins ¹	<ul style="list-style-type: none"> To reduce risk of stroke by lowering blood cholesterol levels 	<ul style="list-style-type: none"> Cost per life year gained: £8,000 (although this varies widely according to a number of assumptions)
Smoking cessation advice following myocardial infarction ¹	<ul style="list-style-type: none"> To prevent further strokes 	<ul style="list-style-type: none"> Cost per life year gained: US\$220 (assuming intervention cost of US\$100)
Nicotine replacement patches together with advice from clinician ¹	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> Cost per man: US\$1,000–US\$1,600; cost per woman: US\$1,600–US\$2,300
Multiple risk-factor interventions ¹	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> No obvious cost effectiveness for multiple risk factors in the workplace or primary care
Blood pressure monitoring ²	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> None
Lifestyle changes such as reduction in smoking ³	<ul style="list-style-type: none"> To reduce risk of stroke recurrence 	<ul style="list-style-type: none"> None
Stroke education programme ³	<ul style="list-style-type: none"> To reduce risk of stroke recurrence 	<ul style="list-style-type: none"> 2% of 43 patients went on to have a stroke Positive impact on patient satisfaction as a result of their increased knowledge of stroke and its attendant risk factors No cost-effectiveness analysis carried out
Anti-hypertension treatment ⁴	<ul style="list-style-type: none"> To prevent stroke 	<ul style="list-style-type: none"> None

continued overleaf

TABLE 4 *continued*

Intervention	Intended outcome	Result/effectiveness
Reduction in smoking ⁵	<ul style="list-style-type: none"> To reduce risk of stroke by lowering blood pressure 	<ul style="list-style-type: none"> 11.46% of those in the control group had recurrent stroke compared with 8.86% of those in the intervention group No cost-effectiveness information available
Reduction in salt intake ⁶	<ul style="list-style-type: none"> To reduce incidence of stroke 	<ul style="list-style-type: none"> 22% reduction in stroke incidence and 8% reduction in chronic heart disease Prevention of 11,000 deaths from stroke and 8,000 deaths from chronic heart disease Savings of £50m for strokes and heart attacks and £16m for angina Additional savings from secondary and long-term care but these not quantified
Health promotion regarding issues such as diet, exercise and smoking ⁷	<ul style="list-style-type: none"> To reduce risk of stroke 	<ul style="list-style-type: none"> Not quantified

¹ Ebrahim 2000

² Mirvis and Chang 2004

³ Rennison 2003

⁴ Sharon *et al* 2002

⁵ Wolf 1988

⁶ Wanless 2004

⁷ Hankey 1999

reviewed controlled trials to assess in impact of lowering blood pressure on stroke incidence and found that recurrent stroke occurred in 11.46 per cent of the placebo group and 8.86 per cent of the treatment group, although samples were too small for results to be conclusive (Rashid *et al* 2003). Again, no cost effectiveness study has been undertaken.

Similarly, one research paper in Australia concluded that, although it is not possible to prove that health promotion programmes, government legislation and the decline in risk factors have been responsible for the reduction in incidence of stroke in Australia, the data available does endorse a population approach to stroke prevention. Although not providing cost effectiveness information, in terms of primary prevention, the paper states that certain interventions for those at high risk of stroke can be effective. These include treatment of high blood pressure, healthy diet with reduced salt, fat and alcohol, reduced smoking, reduced obesity and controlling such conditions as diabetes (Hankey 1999).

The Treasury has attempted to quantify the cost of stroke and the potential of salt reduction to reduce this cost in its 2004 report *Securing Good Health*. The report states that cardiovascular disease costs the NHS around £10 billion per year and estimates that, if the target intake of salt were achieved, the incidence of stroke would reduce by 22 per cent and CHD by 8 per cent. This would translate to the prevention of approximately 11,000 stroke deaths and 8,000 CHD deaths and represent possible savings for inpatient costs of

£50 million for strokes and heart attacks and £16 million for angina. Additional savings could also be made from reduced need for secondary prevention and long-term care (Wanless 2004).

One paper that has attempted to calculate the cost effectiveness of stroke prevention is that by Ebrahim. The paper claims that modification of such factors as cholesterol, blood pressure and smoking can be 'very cost effective' if effectively targeted. This research has calculated that the cost of smoking cessation advice from GPs to reduce the risk of stroke is around £270 per QALY (Ebrahim 2000). The paper also considers the cost effectiveness of other interventions, most of the detail of which relates to the cost effectiveness of certain drugs.

The table below presents effectiveness information identified in papers. Many of the papers that provided cost effectiveness information focused on medical interventions so this table pulls out just those interventions that might be relevant to social care.

Stroke-specific intermediate care

In terms of the second category – stroke-specific intermediate care and rehabilitation – the older people's NSF stated that the evidence for intermediate care achieving its goals is 'strongest for specialist units for stroke rehabilitation and geriatric orthopaedic rehabilitation with evidence of faster improvement in physical function and fewer hospital re-admissions with no greater costs' (Department of Health 2001). Based on evidence published in the BMJ, the NSF states that there is strong evidence that people who have a stroke are more likely both to survive and to recover more function if admitted promptly to a hospital-based stroke unit with treatment and care provided by a specialist co-ordinated stroke team within an integrated stroke service. Critically, it claims that these benefits can be achieved at no overall additional cost to health and social care, although analysis of cost *effectiveness* is not supplied (Department of Health 2001).

Stroke units have been the subject of several reviews. A Cochrane review of stroke units concluded that 'stroke patients who receive organised inpatient care in a stroke unit are more likely to be alive, independent, and living at home one year after the stroke. The benefits were most apparent in units based in a discrete ward. No systematic increase was observed in the length of inpatient stay' (Stroke Unit Trialists' Collaboration 2001). An article in Bandolier states that stroke units deliver better outcomes in terms of mortality and return home with lower lengths of stay but that benefits weaken over time (Bandolier 2006). The review also found that inpatient rehabilitation generally reduces mortality when compared to usual care but that this might reduce over time. In terms of cost effectiveness, some evidence suggests that inpatient rehabilitation and day hospitals would lead to additional costs for the health service, although this is contradicted in other studies (Bandolier 2006). Young's review of intermediate care models concluded that specialist services generally have better outcomes than more general services. Compared to one group that stayed in hospital, the group that was discharged under the care of a specialist stroke team had a shorter average length of stay of 7.7 days which could lead to cost savings of 20 per cent (Young and Sykes 2005).

Wider community services and public health

What are they?

A further group of interventions that could be argued to come under the umbrella of prevention are those services that are key to maintaining an independent and high quality life and, ultimately, promoting social inclusion. Such ‘interventions’ (if they can be called that) may include public health programmes (some of which may also target specific conditions) and such services as housing, transport and policing. The argument for these services to be categorised as prevention is that social inclusion has been shown to be critical in good mental health and that good mental health is important in reducing the consumption of health and social care resources. The report by the House of Lords Select Committee on Science and Technology states that ‘inactivity and isolation accelerate physical and psychological decline, creating a negative spiral towards premature, preventable ill health and dependency’ (ODPM 2006). Work by Layard suggests that happiness can have beneficial social outcomes. If people are happy, they are better able to participate in society and therefore are likely to have lower needs (Layard 2003). The New Economics Foundation’s Well-being Manifesto even goes so far as claiming that ‘the scale of the effect of psychological well-being on health is of the same order as traditionally identified risks such as body mass, lack of exercise and smoking’ (New Economics Foundation 2004). The Foundation states that taking a holistic and preventive approach to health care would help achieve the World Health Organization’s definition of health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.’ Such a state of well-being would not only include having access to health and social services, but also leisure services, transport to get to such amenities and, in addition, it would be a state free from crime and the fear of crime.

What is the evidence of cost effectiveness?

Although the difficulties of examining the effectiveness and cost effectiveness of low-level services and intermediate care have been explored in depth above, these difficulties are further magnified when attempting to measure the cost effectiveness of wider social services and public health interventions. The key complexity underlying measuring cost effectiveness of such interventions is that the main outcome (social inclusion and engagement) is ill-defined making it almost impossible to attribute outcomes to specific services.

The Treasury’s 2004 report, *Securing Good Health*, explicitly states that there is a dearth of evidence around the cost-effectiveness of public health interventions due to the unclear objectives and little quantification of outcomes (Wanless 2004). Smoking is one public health issue that has received a great deal of public attention in recent years. According to the Treasury, smoking is the single greatest cause of preventable illness and premature mortality, killing an estimated 120,000 people per year in the UK (one fifth of all deaths) and causing one third of all cancer and one seventh of cardiovascular disease. Smoking-related illness costs the NHS up to £1.7 billion per year (this includes treating ill health as well as having wider costs such as productivity losses from ill health, absenteeism and accidents) (Wanless 2004). The Wanless report states that around £13 million was spent on anti-smoking education and media campaigns in 2002/3, based on evidence that smoking cessation programmes are a cost-effective means of reducing smoking prevalence. Indeed, the report estimates that smoking cessation programmes could lead

to 37,000 fewer people each year continuing to smoke (Wanless 2004). NICE has also done some research into prevention of CHD through reducing smoking, reducing cholesterol and bringing down blood pressure. It estimates that 50,000 deaths per year from CHD could be prevented (NICE).

Another public health issue that is high on the government agenda at present is that of obesity and the value of exercise in reducing the problem. One example cited in the Treasury's report is that of a walking scheme in Newcastle which brought about improvements in self-reported health status amongst a group of people with high blood pressure and diabetes (Wanless 2004). Although there are some costings available for these interventions and estimates of savings made, it is very difficult to attribute cause and effect and thus provide a definitive conclusion as to their cost effectiveness.

Although some evidence exists for the preventive value of some public health interventions, there is, unsurprisingly, minimal quantified evidence as to the cost effectiveness of wider community services in achieving the aims of prevention. Although there is qualitative evidence of a link between social engagement and happiness (Puttnam 2001), good self-esteem/happiness and good health ((Rizzo *et al* 1996) (Clark *et al* 1998)), no actual cost effectiveness study has been attempted. In order to measure this, the cost of the service provided (for example, transport) must be known as well as the costs saved as a direct result of that service, which is not straightforward when the potential beneficial outcomes are wide and non-quantifiable. In addition, work by the OPDM also considers the economic benefit of older people's contribution to society. The logic goes that, if older people are in good mental and physical health, they not only consume fewer health and social care resources but they also make an economic contribution to society (often through volunteering and unpaid care) (ODPM 2006). This is further discussed in the informal care section of the Wanless Review of Social Care.

Discussion

The shift of focus from reactive care towards proactive, preventive, upstream care has become increasingly prominent in health and social care planning during the past two decades. It is now a central priority to reduce intensive health and social care utilisation and there are specific targets to help bring this reduction about. The recent White Paper promotes care outside hospital in order to reduce high intensity health care utilisation and emphasises the potential of prevention in helping bring this about. It was within this context that this review of evidence was undertaken. Although not a systematic review, this paper aimed to pull together as much evidence as possible about the cost effectiveness of preventive social care within a short timeframe.

Summary of the literature

As would be expected of a review of something as wide-ranging and nebulous as prevention, the literature search identified articles that were very disparate in terms of content, outcomes and measurements. This poses a significant challenge when trying to pull together and summarise the findings in the papers. Many studies of preventive interventions have looked at the qualitative impact of schemes on people's lives. A few have attempted to quantify the impact (for example, such as the number of falls reduced) but very few have attempted a long-term economic evaluation, considering both the cost of the intervention and the money saved. Papers are so wide-ranging in their foci that few are comparable. One conclusion that can be made is that attributing cause and effect of a social care intervention is extremely complex. This complexity is compounded by the lack of clarity with regard to the definition of prevention and the hazy boundary between social care interventions, health care interventions and wider community services. There is also a lack of consensus as to whether the quest to quantify the impact of interventions is actually desirable in itself or whether it is a matter of trying to quantify the unquantifiable, running the risk of undermining the contribution of qualitative research.

The evidence base: how strong is it?

A recurring theme throughout all sections of this literature review has been the paucity of quantified evidence relating to the cost effectiveness of prevention. Many commentators call for further research in order to build up a robust evidence base. Although there is some cost effectiveness evidence for secondary interventions and some for specific conditions and events (particularly stroke and falls), there is much uncertainty around lower level interventions and wider community services. As Wanless observes in the Treasury's 2004 report, *Securing Health* (Wanless 2004), most privately funded research concentrates on secondary prevention and curative health care, mainly because of the potential for patenting and marketing the derived technology or drug (Wanless 2004). There is, therefore, less impetus to invest in research into primary prevention and low-level interventions.

Even where papers have quantified the impact of interventions, the majority are based on relatively small-scale, specific, studies and so their impact cannot be easily extrapolated to a national level. Because of the huge range of evaluation criteria used and outcomes sought, few papers are comparable making it impossible to extract assumptions for modelling the impact of prevention. Identifying the cost effectiveness of these interventions, even where outcomes are quantified, is a further complexity and few papers have attempted a full cost effectiveness analysis. It is also important to recognise the difference between a cost effectiveness analysis and a cost minimisation or cost saving analysis (Ebrahim 2000). When discussing cost effectiveness it is important to fully understand the intended outcomes of interventions, the full cost of implementing them and the full costs and benefits over time to health and social care services.

In addition to the huge potential range of intended outcomes, the issue is further complicated by the lack of a single definition for preventive social care services. Are preventive services only intended to prevent a defined outcome or is delaying the onset of a condition still a valid use of resources? Are such services as discharge planning and intermediate care indeed secondary prevention or simply post-acute care? It could be argued that some interventions and services that currently come under the umbrella of 'prevention' enhance current quality of life but have no proven long-term impact on health and functionality. Putting a financial cost and benefit around such an impact is problematic and there is an ethical and social debate to be had around whether enhancing quality of life is a reasonable and desirable use of scarce resources where the longer term impact on downstream intensive health and social care services is not yet proven.

LOW-LEVEL INTERVENTIONS

The strongest evidence for the effectiveness of low-level preventive services is qualitative, with numerous pieces of research emphasising the value to the individual of various low-level preventive services. Older people, those with disabilities and their carers generally stress that it is the small things that make the difference and keep them out of hospital, delay deterioration and delay institutionalisation. There is some evidence to suggest that low-level interventions have a role in promoting independence and physical functioning but the long-term financial impact of this is difficult to determine. The ODPM's work has calculated that small reductions in the rate of institutional care could lead to massive financial savings. What is difficult to determine is which interventions to invest in to bring about the maximum savings. Although it is recognised that financial investment must be made on the basis of reasonable evidence of effectiveness, it must also be recognised that obtaining such quantified cost information for certain services is at best difficult and at worst impossible.

Many papers call for further effectiveness and cost effectiveness research to be undertaken before any further low-level services are funded. However, almost all commentators have reported on the difficulties of doing this and it is likely that there is a limit to the value of doing so. In the Treasury's 2004 report, it is suggested that a more proactive approach should be taken whereby certain promising interventions should be implemented and formally evaluated (Wanless 2004). This should ensure that potentially effective interventions are implemented and are benefiting people while a robust evidence base is constructed. This is relevant for all preventive interventions, but particularly low-level ones where the financial evidence base is especially weak. In order for evaluations to usefully contribute to the evidence base, it is essential that standard outcomes and measures are adopted to ensure comparability.

FORMAL INTERVENTIONS

Compared to papers about low-level interventions, studies into the more formal end of the spectrum such as intermediate care, hospital at home, rehabilitation programmes and geriatric day hospitals, are relatively plentiful. As with low-level services, these initiatives have been established in order to achieve a range of outcomes. For instance, some intermediate care evaluations have focused on the impact of the service on delayed discharge, others on admissions and others on independence. This makes comparing different programmes and drawing general conclusions very difficult. There is also much room for disagreement as to whether a scheme to reduce delayed discharge comes under the umbrella of prevention or whether it is simply post-acute care. Similarly, can a scheme to divert patients away from A&E towards seemingly more cost effective care be classed as prevention? Moreover, what constitutes social care as opposed to health care?

Taking a very wide view of ‘prevention’ and including any scheme or intervention to reduce high intensity health service use, the literature reviewed in this paper indicates that there is effectiveness and, in some cases, cost effectiveness evidence available. Where the impact of generic intermediate care interventions has been considered quantitatively, there is no consensus between papers about cost effectiveness. Several papers point to intermediate care leading to longer lengths of stay (length of stay inclusive of both acute and post-acute care) but with the positive impact that patients are discharged with a high level of physical functionality. Several local health economies have found that intermediate care can be effective in saving bed days in acute hospitals but this is dependent upon intermediate care being available on discharge. The evidence available also suggests that the model of intermediate care delivery is critical to cost effectiveness.

Where comparisons between general and specific services have been made, UK and international literature appear to point towards services targeted at a particular event or condition being more (cost) effective than general formal services. It is possible that this is simply a function of the fact that the impact of services aimed at a specific condition/event are more easily measured because of the more well-defined nature of the outcome. Results of various falls interventions programmes indicate that such schemes have the potential to effectively reduce the number of falls. What is still lacking in this information is a full cost effectiveness analysis taking into account both the cost of the intervention and the long-term costs and benefits. A small number of falls prevention papers have undertaken such a study but with little consistency in outcome measures and time period. In contrast, there is relatively more information with regard to stroke interventions. The balance of such evaluations tends to be weighted towards the medical end of the spectrum, although there is some available data around smoking cessation and healthy eating. The majority has found that such low-level interventions have the potential to bring about major savings. Again, however, results are not consistent across papers.

WIDER COMMUNITY SERVICES

Although there is some quantified evidence as to the effectiveness of some health promotion and public health interventions, this area is generally weak. Quantitative evidence was found to suggest that smoking cessation can be cost effective as can preventing CHD through healthy diet. However, quantified evidence of the impact of wider community services – which, as key ingredients of an independent and fulfilling life, are seen to have the potential to prevent the onset of ill health – was not found. The qualitative value of such services has been reported in various papers which stress the importance of social inclusion to well-being.

Measuring the impact

One of the most significant barriers to establishing the cost effectiveness of interventions, and building an evidence base, is the lack of standard outcome measures. Although the pinning down of cause and effect is extremely complex, this is compounded by the fact that there is no consensus as to the best way to measure impact. Some papers have used extra life years gained, others have used Quality Adjusted Life Years and others have used a measure specific to the intended outcome (for example, number of falls prevented, cost per fall prevented or length of stay). Measuring the contribution of an intervention to an individual's quality of life is particularly problematic and subjective. Some researchers have used proxy measures of quality of life such as functional status as an indication of independence. However, there are many different instruments for taking this measurement and no consensus as to which one is most accurate/effective.

The benefit to developing standard outcomes measures for a range of intended outcomes would allow different research studies to be compared and a robust evidence base to be constructed. It would then be an easier task to establish which interventions are most cost effective.

Identifying beneficiaries

Given the lack of concrete evidence, a proactive approach would be to work with a number of 'reasonable' assumptions to develop services and evaluate them formally in order to build up that required evidence base. Learning that has to come out of the health sector recently is the importance of effectively identifying individuals who should be targeted with preventive interventions. The evaluation of Evercare in early 2005 indicated that this form of care package (which was a combination of health and social care intended to prevent emergency admission to hospital) actually had very little impact on the rate of emergency admissions. Rather than the package being ineffective, it was thought that the failure was due to inappropriate individuals being included in the programme. Therefore, the very small (1 per cent) reduction in admissions was due to resources being mis-targeted. It is hypothesised that, if the correct intensity of care had been targeted at the correct individual at the right time, then the impact on admissions would have been more substantial. The NHS has begun to address this issue and has invested in the development of a risk prediction system which uses various datasets to identify individuals at risk of future admission to hospital, thus enabling NHS resources to be targeted at those most amenable to intervention. This may involve identifying individuals who are not yet at high risk but likely to become so in future and thus break the spiral of deterioration that leads to regular admissions (Billings 2005).

There is potential to transfer this learning into the social care sphere in order to efficiently and effectively allocate resources to those who have not yet deteriorated to a point where emergency admission to hospital has occurred but who are likely, in the near future, to deteriorate. It is likely that it is these individuals who will be most amenable to an upstream intervention, rather than those who are already at high risk currently (Billings 2005). Taking this approach may shift the debate away from which interventions are most cost effective to who should be targeted with extra care. In this way, the needs of individual patients can be considered and a patient-centred care plan put in place. Evaluation of these, using standard outcome measures, would then provide robust cost effectiveness information to inform the decision about interventions should be rolled out on a larger scale.

Recommendations

This paper has sought to identify, and pull together, key pieces of evidence about the cost effectiveness of prevention in order to develop recommendations that will help to move the prevention debate forward. What was evident from many of the papers reviewed was that the lack of quantified evidence base is raised frequently and appears to be an impediment to moving the debate forward in a proactive way. Therefore, the following recommendations have been identified in light of the findings from the evidence review and within the context of current health and social care policy.

- The recent White Paper puts much emphasis on prevention including the need to shift resources towards these services. It would be regrettable if this did not extend to low-level interventions, although this may also require enhanced public awareness around healthy lifestyles and how to prevent falls and a willingness to self-fund (for example, self-funding of safe slippers and small home adaptations may be necessary).
- Recognition should be given to the wealth of qualitative evidence about the value placed on lower level services by older people in helping them to maintain their independence. Although several commentators have dismissed this evidence due to lack of quantified costing information, it is suggested that the focus is shifted away from an overriding concern with cost effectiveness towards a more holistic viewpoint which places value on qualitative information about quality of life and independence.
- To enable the formal evaluation of promising interventions, there is a need to develop standard outcome measures. These measures should include those which assess changes in quality of life as well as more tangible quantifiable results, such as number of falls. The use of standard measurements will allow for comparison between localities and will facilitate the construction of a robust evidence base.
- Given the difficulty of collecting robust evidence about the impact of low-level preventive services, it is recommended that a proactive approach should be encouraged whereby those interventions exhibiting potential are implemented and evaluated formally using standard agreed measures. The call for more, similar, research is unlikely to yield more useful information. There is enough evidence around which interventions show potential, particularly in the area of falls and strokes. National evaluations of such promising interventions using standard outcome measures would provide the opportunity to collect robust effectiveness (both quantitative and qualitative) and cost effectiveness information. A commitment to this approach has been made in the recent White Paper which has ring-fenced £60 million for 2006–08 to expand the prevention evidence base through POPPs.
- There is a need to recognise the importance of targeting resources to those who require them and for whom an intervention will have greatest impact. It is perhaps through this mechanism that cost effectiveness can be achieved. The development of a social care instrument that can accurately predict those individuals likely to become high risk in future, much like the recent developments in the health sector, will allow better allocation of resources. It will also enable social care staff to put in place bespoke interventions before the individual deteriorates and requires high intensity care. Timely interventions in the community could help reduce the rate of institutionalisation and bring about sizeable savings in the long run. It is likely that the more targeted the intervention, the more impact they are likely to have.
- Evidence appears to point to higher cost-effectiveness of intermediate care schemes that are targeted at specific conditions or groups of people and this is likely to shape the development of intermediate care services in future.

- Integration between health and social care services is critical if the shift of resources towards the preventive end of the spectrum is to bring about the desired outcomes. This is particularly key for intermediate care services which tend to include both health and social care components.

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Notes

¹ Other falls prevention initiatives are discussed later in this paper, under falls-specific formal care interventions.

² Information on the West Lothian Local Government website: http://www.westlothian.gov.uk/community_care/frail.htm