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Age Discrimination in Mental Health Services

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José-Luis Fernández,
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Age Discrimination in Mental Health Services

**Jennifer Beecham, Martin Knapp, José-Luis Fernández, Peter Huxley,
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Executive summary

Aim

The UK government is considering the introduction of legislation to outlaw age discrimination in the provision of public services. The Department of Health commissioned a short piece of research to explore the extent of age discrimination in mental health services. Three broad issues are addressed in this report: inequalities between adult and older people's mental health services; inequalities between adults and older people with mental health problems in their use of health and social care services; and knowledge about the likely single equalities legislation in current services and the possible costs of implementation. The report does not examine differences in outcomes.

Methods

Available literature, both academic and policy-related, was reviewed in order to gauge the extent of age discrimination in mental health services in England, including previous UK studies of the relationship between age and costs (interpreted as a summary measure of service utilisation).

Insights and information were also obtained from interviews conducted with senior and middle managers in eight organisations, covering the perceived extent of age discrimination currently, knowledge about the possible new legislation, and expected costs and benefits of enactment of the Single Equality Bill.

New statistical analyses were conducted – in parallel with the other activities described here – using three relatively recent datasets: the nationally representative cross-sectional

Psychiatric Morbidity Survey 2000, longitudinal data from a randomised trial of treatments for people with depression and anxiety, and longitudinal data from an observational study of people with schizophrenia.

Findings from interviews with mental health organisations

There is very little knowledge within mental health organisations about the new legislation. There is, however, optimism that it will help improve services for older people with mental health problems by removing some of the barriers to services, and by providing services that are at least on par with adult services.

Interviewees generally acknowledged that age discrimination exists within current mental health services, although in some cases this is indirect rather than direct discrimination, and often due to the way organisations have developed historically. Each of the areas had a separate service for working age and older adults. There was some variation in the way transition between these services was managed but new users over 65 years would always be assessed within the older people's service.

Despite a stated belief that older people should be able to access the same services as those under 65 years, often older people's teams did not know about services, such as supported employment or assertive outreach, which were managed by the adult teams. Ageist attitudes on the part of staff and within organisations more generally also inhibited access to the level of support experienced by younger adults. There was also a generally held view among interviewees that there were fewer services for older people and that they tended to be less well-staffed. Low levels of resources for identification and early intervention work was highlighted as having led to high levels of unmet need, particularly for older people with anxiety and depression.

Opinions on the extent of and reason for discrimination varied and many interviewees were keen to emphasise that progress had been made. Some examples of good practice were cited. It was felt additional resources and guidance to accompany the legislation would help remove access barriers for older people. Additional resources would be needed to restructure the service, to improve identification and early intervention, to improve joint working, and to challenge negative and ageist attitudes within the organisation.

None of these organisations had estimated the costs of removing age discrimination, nor was there a consensus on whether these costs would be significant. However, these were generally seen as short-term costs and it was felt that the new legislation would bring forth changes that would benefit older people in the longer term.

Findings from review of previous cost studies

The assumption underpinning the review of previous research and the new statistical analyses was that cost provides an aggregate indicator of services used, and that variations in cost that are associated with age provide an indication of age discrimination,

but only so long as the age-cost associations are adjusted for other factors that could have an influence on service use patterns, particularly level of need or health status.

Studies of costs for people with mental health needs that are confined to older people have found support costs *rising* with age, an association that is most likely linked to increasing physical disability rather than increasing severity of mental health problems or age *per se*.

Studies that looked at only younger adults (up to age 65) generally do not find much of an age gradient: in other words, there is little apparent discrimination by age in the under-65 age group. Studies which are based on experimental designs – such as a randomised trial – were less likely to find an age gradient than naturalistic designs. Experimental designs might alter the way that services and professionals behave, encouraging them to pay more attention to needs assessment and response.

Studies that look at a wider age range – including people both above and below age 65 – tend to find more of an age gradient: support costs were generally found to be lower for older people.

Overall, we found relatively little previous research on age-cost associations, and very little that was based on data collected for people both under and over age 65. Some of the evidence was also quite old. For these reasons, we sought more recent data for a wide age range so that we could carry out new statistical examinations.

Note that the proportion of cost variance ‘explained’ statistically in these studies tended to be modest (often 20%), which leaves much of the observed difference in cost between sample members (and hence between people of different ages) unexplained by the measures included in the regression equations.

Findings from new statistical analyses

Three datasets were examined: a national epidemiological survey, a trial of treatment for depression and anxiety, and an observational study of people with schizophrenia.

Analyses of the Psychiatric Morbidity Survey (PMS) 2000 dataset made the distinction between mental health and other service use. There appeared to be reduced use of mental health services by older men compared to younger men (and no age difference for females), after adjusting for all other variables in the model, but the variance in the data means that this could be due to chance. When the analyses were confined to people aged under 65, the age effect disappeared – a result that is consistent with what we found in the previously completed literature.

The analyses also explored the age-cost association for other measures of service use. The impact of age was strongest on GP costs and social care costs, and it appears that it is the difference in these elements that is accounting for much of the age effect described in the previous paragraph. When total service use was examined (covering services for both

physical and mental health reasons), there was no evidence of an age-cost gradient. Possibly lower use of mental health services with age is accompanied by higher use of services for physical health reasons.

The second series of new analyses used data from a randomised trial of computerised cognitive behavioural therapy for adults with depression and/or anxiety. Age was found to have a nonlinear association with costs, with costs lowest at around age 42 years and increasing at greater ages. When the analyses were repeated for the subsample of people aged up to 65, this age-cost association disappeared.

In contrast to what was found in the analysis of the PMS data, older people with mental health problems in this trial were therefore *not* receiving fewer services. But some important differences between the two datasets might explain this discrepancy: cross-sectional versus longitudinal designs, experimental versus naturalistic settings, inclusion criteria, and availability of measures for potential covariates.

The third set of new analyses looked at a sample of people with schizophrenia and had a longitudinal element. A number of significant associations were found between costs and patient characteristics, including a nonlinear association with age. Costs appeared to be lowest within this sample at around age 57, and increased slightly thereafter, even after adjusting for symptoms, general health, functioning, medication adherence and socio-demographic dimensions such as education, marital status and gender. When the analyses were repeated after excluding people aged over 65, the age-cost association was slightly weaker, with less evidence of upward gradient with later age.

These analyses for the sample of people with schizophrenia used a cost measure that ranges over all services, but separating mental health services from others would not necessarily be appropriate (depending on the question being addressed) as it is well known that there are many physical health problems associated with schizophrenia, especially as people age. The dataset for this third statistical examination would not easily allow separation of mental health from other services to test this, as speciality was not noted when recording outpatient and inpatient service use.

The final set of new analyses used data from the PMS to explore the cost implications of increasing the supply of services to older people equalising expenditure to that for adults. The central estimate of the costs of levelling up expenditure for those aged over 55 and over to the levels of those aged 35 to 54 is £2.0 billion at 2006-07 prices.

Conclusions

The new statistical analyses generally support findings from the literature and the views of people interviewed in mental health organisations that use of mental health services is lower among older people, after adjusting for other covariates such as symptoms and need.

The gradient appears to be more marked for 'common mental disorders' such as depression and anxiety, whereas for people with psychosis there may be an increase in service use beyond about age 60, although whether this is in the use of mental health rather than general health services is not clear. Some but not all analyses suggest that the age gradient is more marked for men than for women.

When looking only at people aged under 65, there is little or no apparent age-cost association: generally, it is people aged over 65 who are receiving lower cost support packages compared to younger adults. Eliminating age discrimination in mental health services would require extra expenditure of around £2.0 billion.

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1. Introduction

In 2007, a consultation document was published, *A Framework for Fairness: Proposals for a Single Equality Bill for Great Britain*. The aim was to consider the arguments for a clearer and more streamlined legal framework for, inter alia, outlawing age discrimination in the provision of public services. The government is considering the introduction of legislation during this parliament.

To support this proposal, the Department of Health commissioned a short piece of research to explore the extent of age discrimination in mental health services. This had three linked strands. The first strand was a brief literature review of previous studies that explored the impact of age on mental health services and their associated costs. The second was to complete new analyses that would explore the relationship at the individual level between age and service use and costs. The results were used to assess the cost of eliminating age discrimination in mental health services. The third strand was to interview middle and senior managers working in eight organisations providing adult and older people's mental health services in order to assess attitudes to age discrimination in current services, knowledge about relevant legislation, and information about the costs of implementing new anti-discrimination legislation in England and Wales.

Drawing on these three strands of work, this report addresses three broad issues around discrimination: inequalities between adult and older people's mental health services; inequalities between adults and older people with mental health problems in their use of health and social care services; and knowledge about the likely single equalities legislation in current services and the possible costs of implementation. In the background were a number of interpretations of age discrimination (see Box 1).

The structure of this report is as follows. We first draw on a review of the available literature, both academic and policy-related, to gauge the extent of age discrimination in mental health services in England (Sections 2 and 3). We then turn to the insights and information obtained from interviews conducted with senior and middle managers in eight organisations (Section 4). The next section of the report summarises what we found from our careful examination of previous English or UK studies of the relationship between age and costs. Sections 6 to 8 then describe new evidence from the statistical analysis of three relatively recent datasets, one using the nationally representative cross-

sectional Psychiatric Morbidity Survey 2000, a second examining longitudinal data from a randomised trial of treatments for people with depression and anxiety, and the third employing data from a longitudinal observational study of people with schizophrenia. In Section 9 we look forward – at what is known locally about the proposed legislation and what the implications might be. A brief final section summarises the findings.

Box 1: Definitions

Age discrimination against older people may be defined as any 'action which adversely affects the older people because of their chronological age alone' (Age Concern, 2007, p34-5). This report from Age Concern identified three related concepts.

Direct discrimination: unequal treatment on grounds of age that cannot be justified. An example is an upper age limit on services that disadvantages people over 65.

Indirect discrimination: apparently neutral practices that disadvantage older people. An example is when it is assumed that older adults can be treated identically to younger adults, and mental health services are organised and designed around the needs of younger people without taking older people's needs and preferences into account.

Ageism: negative stereotypes and prejudice towards older people based on assumptions about them as a group. An example is the assumption that mental health problems are an inevitable part of ageing.

2. Availability and access to services for older people with mental health problems

Current service principles for an old age psychiatry service were defined some thirty years ago.

The most widely accepted model for old age psychiatry service delivery has requirements that include being multidisciplinary, comprehensive, integrated, accessible, available, responsive, able to liaise with other services and general practitioners, and having a defined catchment area (cited in Draper p.687).

A more recent review concluded that most studies suggest that old age psychiatry services are effective and generate positive treatment outcomes, particularly for depression (Draper, 2000). On the other hand, the evidence also suggested that services for older people with mental health problems are under-provided. The Age Concern Inquiry (2007) highlighted challenges in both primary and secondary care. Within community services, research has shown that only a third of older people with depression discuss their mental health with their GP and less than half of them are treated (p.27). GPs are key to accessing secondary or specialist care but only 6% of older people with depression receive specialist mental health care (pp.27-28). Most residential and nursing homes participating in a survey of residents' access to health care could access a psycho-geriatrician but again this was through the GP (1134/1233); just 12 % had direct contact with a psycho-geriatrician (Glendinning, et al., 2002).

A recent article summarising some of the issues raised by the Age Concern report argued that ‘at the heart of this discrimination is the fallacy that depression is an inevitable part of getting old’ which in turn bears its root in other areas of public policy (Lishman, 2007). An alternative view considers the importance of training. Around a third of GPs reported they had not received sufficient training to diagnose and manage depression in older people, with around two-thirds saying they had ready access to specialist advice (Audit Commission, 2002 p.19). Yet GPs who had received sufficient training were more likely to see the importance of early diagnosis, thus facilitating access to earlier intervention and treatment. The picture for people with dementia was even less encouraging. Fewer than half of GPs in the areas audited felt they had received sufficient training to help them diagnose and manage dementia, and less than two-thirds felt supported by specialist services (Audit Commission, 2002 p.18).

Specialist mental health services are also in short supply. The Age Concern report notes that most older people who take their own lives have diagnosable mental health problems but only a small minority are in contact with specialist mental health services (p.28; see also Cooper and Fearn, 1998; Kavanagh and Knapp, 1999). Home-based assessments may increase the proportion of patients and carers seen (Draper, 2000 p.697). In 2002, only 44% of the areas visited for an Audit Commission study had specialist multi-disciplinary teams for older people, although they partly existed in a third more; and only one in seven had home care staff trained in mental health issues who were consistently available (Audit Commission, 2002 pp.24-25).

Another barrier to specialist provision could be lack of training opportunities. Training in old age liaison psychiatry (that is, identification and treatment of psychiatric disorders in general health settings) is not recognised in the UK. Most old age consultants who received any training have done so with adults of working age, a specialty that tends to emphasise self-harm rather than dementia and delirium ‘which are the staples of old age liaison work’ (Holmes, et al., 2003). Indeed, the proportion of time devoted to old age psychiatry in the psychiatric residency programme of the 16 European countries having such a programme amounted to an average of only 10% (de Mendonca Lima, 2003 p.680).

When availability is low, access to support becomes limited. Three years after the publication of the National Service Framework for Older People Services (NSFOP; Department of Health, 2001), which included a standard related to older people’s mental health, a survey of consultant old age psychiatrists revealed the widespread view that there had been improvements in service availability for older people, but that significant gaps in provision remained (Tucker et al., 2007 p.216). Old age psychiatrists are also concerned about the future of their services:

...members of the Faculty were told of evidence that specialist services for older people with mental health problems, including dementia, are being cut purely to meet the financial pressures created elsewhere in the NHS, and to meet the demand of the Secretary of State that financial balance must be achieved (RCP, 2007).

3. Age inequality between adult and older people's mental health services

There is a small body of literature suggesting that there is inequality of mental health service provision between 'younger adults' and people over 65. Unfortunately, the current versions of the Adult and Older People's Mappings do not allow a national picture to be presented of the various services, so that levels of provision cannot be compared (www.mhcombinedmap.org). However, one survey found that less than a third of mental health trusts provide the same crisis resolution service to older and younger adults and only one in six areas frequently provided crisis services to older people (Cooper et al., 2007).

Some factors are again highlighted by the Age Concern report (2007), drawing on a range of research and other sources:

- One study found that those transferred to an older people's mental health service may experience a reduced service: 'Adult mental health teams have better access to occupational therapy, occupational therapy assistants, day centres in the community, psychotherapy services... A patient with chronic schizophrenia [was] transferred to us from the adult services [where he] was getting an occupational therapy assistant visiting once or twice a week, a community psychiatric nurse visiting weekly and a consultant visiting every two weeks. Once transferred, the consultant and community psychiatric nurse will visit [once a] month, if you are lucky (Age Concern, 2007 p.36; see also CPA, 2007 and Age Concern, 2006 for other user reports).
- Fewer than 10% of older people with clinical depression are referred to specialist mental health services compared with about 50% of younger adults with mental and emotional problems (p.74).
- Mental health wards for older patients are less clean, more noisy and more violent than average (p.74)
- There are fewer community mental health teams, crisis resolution teams and assertive outreach teams for older people than for younger adults (p.35).

Other studies also report differences between supports for adult and older users:

- Tucker and colleagues (2007) point to the limited provision of psychologists – and thus psychological therapies – for older people.
- Under-diagnosis of substance abuse is common as it is assumed to be a youth problem. Personality disorder is also often misdiagnosed alongside ageist assumptions that all older people are peculiar (Graham, 2003 p.675).

- Health and social services for people with learning disabilities are ill-equipped to deal with older people with learning disabilities, and they are often excluded from treatment and care if they develop mental health problems (Graham, 2003 p.675).
- The newer atypical antipsychotic medications are potentially more effective and have fewer undesirable side-effects than their predecessors, but older patients have been found to be less likely to be prescribed an atypical by a GP than a typical. For every five-year difference in age, the probability of being prescribed an atypical antipsychotic decreases by 15% (King and Knapp, 2006).

Graham and colleagues in their consensus statement on services for older people with mental health problems suggest the underlying issues of discrimination are those of stigma and attitudes to the 'double jeopardy' of mental illness and old age, both of which tend to have low social status in Western societies. Stigma leads to the development of negative attitudes such as negative professional attitudes towards older people, and towards the professionals and services that care for older people with mental health problems (p.673). This can lead to poor quality treatment and care (access, provision and outcome), marginalisation within the health system, warehousing outside the health system, and low status for professionals and services providing care (p.674).

Age Concern suggest that the dominance in previous years' mental health policy on services and supports for 'working age adults' has the turned focus away from older people's services and sent conflicting messages to commissioners and service providers (Age Concern, 2007 p.37). A further challenge may be the mixed understanding in Strategic Health Authorities, Trusts and services for older people about the meanings of the NSFOP anti-ageism standard; some concluded that the strategy discouraged services that were exclusively for older people, others that it encouraged dedicated provision for them.

A fundamental argument of the NSFOP was that older people should have access to appropriate services to meet their multiple needs, and that they should not be excluded from any service because of their age. In the same document, however the principle is put forward that services for older people should be developed because older people have specialist treatment and care needs, that is, they require different and dedicated services and clinical specialists (Reed et al., 2006 p.850).

Recent CSIP guidance aims to clarify the situation by reinforcing the NSFOP requirement for each area to have a fully resourced specialist service for older age mental health by 2011, but also recognises that the complexity of mental health problems requires the skills of specialist practitioner to be made available to 'up-skill those working in mainstream health and social care ... specialist mental health services for this group should be the bedrock on which other services can rely for clinical advice, support and practical help'. The guidance also re-iterates that services should not exclude people on the basis of age alone (CSIP, 2007)

Crome and Crome (2005) counter this confusion in their article discussing (the absence of) services to support older people with problems related to substance abuse:

There is no need for specialist provision for older people: but there is every reason to plan to deliver specialist treatment interventions tailored to the special needs of older [people] (p.344).

4. Age discrimination in current services: attitudes and evidence

Interviews with senior and middle managers in eight organisations shed more light on the existence and extent of age discrimination in their mental health services, and the form that it takes. The topic guide for these interviews is given in Appendix 1. Here we arrange the findings around five central issues for mental health care providers: the structure of services, service delivery, identification and early intervention, joint working, and the culture of the organisations and services.

4.1 Service structure

At the broadest level, interviewees in seven of the eight organisations acknowledged that age discrimination existed. One interviewee felt strongly that ‘there is a clear inequality of service for older people with mental health problems.’ Several interviewees commented that while direct discrimination had been overcome, indirect discrimination still existed. One commented: ‘I do not believe that active age discrimination exists. However, the way in which the organisation is structured may result in indirect discrimination.’ This link between organisational structure and discrimination was mentioned by a number of interviewees. There was a general feeling that the way in which organisations have historically developed have indirectly resulted in age discrimination. As one interviewee said:

There are inherent difficulties in the way that the services have traditionally been set up, are organised and provided. The way in which the services have developed, been managed and funded have unintentionally created barriers... Age has been used as a factor for determining eligibility and there is an imbalance in the services available.

As Box 2 shows, even though these eight areas had separate adult and older people’s services, the form this separation takes varies. There is also little consistency in policies for moving from adult to older people’s services (transition). Interviewees in five organisations justified the services’ age-specific structure by highlighting the flexibility in the transition policy for existing service users. Emphasis was also placed on the importance of specialist services being offered to people and that while individuals may be assessed and care managed by separate teams they should be entitled to access the same service. One interviewee stated

While older people may be assessed by a separate team they should be able to access the same services as those under the age of 65.

Box 2: The service structure in the eight organisations where interviews were held

In all eight organisations, mental health services are structured separately for adults of working age (18-65 years) and older people (over 65 years). In seven of the organisations all dementia cases, regardless of age, are dealt with by the Older Adults Mental Health Team(s).

In five of the organisations, **existing service users** of the adult mental health team are *not* automatically transferred to the older persons team when they reach the age of 65. In two of the organisations they are automatically transferred on reaching the age of 70 while in the one remaining organisation the majority of existing service users are transferred at the age of 65, although exceptions can be made.

In the five organisations where there is no automatic transfer policy for existing service users who reach age 65, it is possible to continue being supported by the adult mental health team indefinitely. Users' needs are regularly assessed and the outcome of this assessment determines if and when they are transferred to the older people's team.

However in all eight organisations every **new service user** aged 65 or over who accessed the service for the first time would be initially assessed by the Older Persons Mental Health Team, regardless of need.

However, the Service Delivery section below reports findings that contradict this view. One interviewee stated that the structure of mental health services clearly created age discrimination, reporting that the adult mental health service had approximately 16 staff located in four specialist teams, while the older person's mental health teams had six members of staff located in two teams.

Some interviewees within the organisations did recognise inconsistencies and the resulting discrimination of the age specific structure. Interviewees in two organisations stated that they were currently looking at ways of restructuring the service to overcome this. An option being considered by one organisation was to have the existing adult community mental health teams dealing with all functional mental health cases, with the older person's teams focusing on people with dementia

In another organisation an interviewee stated, 'the age limits are themselves discriminatory, although ...the Trust is trying to deliver care based on need and not on age.' This interviewee explained that the Trust was developing an operational policy across all age ranges, which will mean that services will be offered on the basis of identified need and personalised care.

A manager in another organisation conceded that

Age discrimination occurs indirectly because of how the service is organised. ... The way in which the organisation is structured may result in indirect discrimination. ... The framework that exists now uses age to differentiate between services with the intention being to enable the individual to conveniently

access appropriate specialist services. However, this structure may indirectly result in discrimination.

4.2 Service delivery

Evidence of age discrimination in the delivery of services was provided by interviewees from almost all the organisations in the study and included:

- An Independent Living Team which until recently did not offer services to older people. This was described by the manager as an example of ‘blatant discrimination’ which has now been challenged.
- An Assertive Outreach Team which was not open to older people. While in theory older people should be able to access the team it does not happen. The manager emphasised that this discrimination occurred ‘by default rather than intentionally’.
- A Supported Employment Scheme which is overwhelmingly accessed by adult mental health because it is not advertised or promoted within the older person’s team.
- Until recently a rehabilitation service provided by the health service was only available to those receiving a service from the adult mental health team because the staff at the service could not see any benefit in offering this service to older people.

Health professionals within services can also discriminate against older people. An example was given of an acute ward in the hospital in which treatment had been refused to a person with functional mental health problems who was aged 70. Given the person’s age, staff felt it would be more beneficial for the individual to be assisted by the Older Persons’ Mental Health Team. This could mean the service user being channelled into residential care when other alternatives should have been explored, and would have been explored had they been under 65.

While interviewees from most of the organisations interviewed could provide some examples of age discrimination, interviewees in two organisations identified extensive age discrimination in the service delivery system (see Box 3 below).

4.3 Early intervention

Interviewees in five of the organisations involved in this study highlighted problems in undertaking early identification and intervention work with older people experiencing mental health problems, particularly people with problems such as anxiety and depression. Significant unmet need among older people who are suffering low level functional mental health problems was highlighted by some of the interviewees.

Box 3: Extensive age discrimination in two organisations

Organisation A

An interviewee reported that older people cannot access a wide range of services available to adults of working age including rehabilitation, intermediate support, crisis resolution and home treatment services. She explained that while adults of working age with early onset of dementia can access day care hospital provision for older people when needed the reverse is not true. She also reported that the drug and alcohol service, the criminal justice team and an advocacy service run by MIND will not assist people of 70 years and over. Finally the interviewee expressed frustration that the CPA policy only says that it 'may' be relevant to those over 65/70 but gives no further detail of the circumstances in which this might apply.

Organisation B

One interviewee explained that the adult mental health service has four well staffed specialist teams compared to two under resourced older person's teams. The older adults cannot access the services available to the younger adults, including Assertive Outreach, Home Treatment and First Access services. 'There is a very sparse service provision for older adults with mental health problems and they cannot access the services available to younger adults. The younger adult services are far better resourced and staffed.'

This interviewee expressed concern that as a result the services available to older people tend to be institution-based and it is very difficult to access services that enable the older person to remain in the community. Older people with functional mental health problems have very limited services and most have only a day hospital to access. The interviewee expressed concern that due to the absence of suitable community based services older people were entering residential and nursing care settings unnecessarily.

The difficulties in undertaking prevention and early intervention with older people were attributed to a range of factors including the structure of services, under-resourcing and increasing demand on services. This reflects recent concerns about local authorities' eligibility criteria that mean social care services are only available to service users with substantial or critical needs.

One interviewee commented that 'low level functional mental health problems among the over 65's is not being picked up.' The services were structured such that if a person has not been in receipt of a mental health service prior to the age of 65 for functional mental health problems they would be less likely to receive a service post-65 because their problems would be less likely to be identified.

Interviewees felt that the lack of resources and the increasing number of people with dementia meant the older person's teams had to focus on people with dementia, and that the service became reactive rather than proactive. As one interviewee stated,

Older people could be entering residential or nursing care unduly. It is very difficult to do preventative work or early intervention work with older people with mental health problems and often by the time they are assessed their health has deteriorated to a point where they may have to access residential/nursing care.

A linked concern was that care staff in most residential care settings had generic care skills but 'are not attuned to identifying low-level mental health problems' in their

residents. This is a significant issue of unmet need and raises questions about staff training and awareness.

4.4 Joint working

Problems with joint working, including information/knowledge sharing, were identified as contributory factors to age discrimination by several interviewees.

One interviewee felt that the social services and health organisations have different philosophies and approaches to mental health services, which in turn can result in different services being offered and problems with information sharing. This view was reflected in another's concern that while there was joint working there was insufficient integration between social services and health with different policy and management structures. For example 'social services and the NHS trust have different transition policies which cause difficulties and a disparity in the services provided.' There are discussions underway at a strategic level within the organisation to tackle this issue.

Tensions between older people and adult mental health services were also highlighted, particularly where access to services was a problem. One interviewee stated that in her organisation staff in the two services 'don't really understand the skills and abilities of the other group' which causes tension, and impacted upon the service provided. (See also section 4.2 above.)

Another problem related to information sharing. Neither staff nor service users of older people's mental health teams were aware of some adult services. For example, in one organisation the older people's mental health service was not aware about the services provided by an Assertive Outreach Team, which is located within the adult mental health service, and thus older service users were not able to access these supports.

4.5 Organisational culture

Interviewees also expressed concerns about the culture, ethos and attitude of organisations that implicitly accepts discriminatory practices. One interviewee identified the culture of the organization in which discriminatory views and practices were taking place (primarily indirectly and often inadvertently) as being a major barrier to overcoming age discrimination. An example was provided of an older person being patronised by well-meaning staff saying things like 'there there you poor thing' or 'I'd love you to be my mother, you dear thing'. Older people are often not treated with the respect and dignity they deserve.

Another interviewee gave the example of an Independent Living Team which until recently did not offer services to older people because an attitude prevailed among that team that there was little point offering the service to elderly people because they were old and very little could be done for them.

Particular concern about discrimination within health services was expressed by one interviewee who stated that health staff have the attitude towards older people presenting with depression and anxiety of ‘what do you expect ... they’re old’, as though it was inevitable that they will suffer with these problems and nothing can be done.

It is worth noting that interviewees’ opinions on the extent and reasons for discrimination varied. Some were keen to emphasise that progress had been made to overcome the problem; Box 4 describes briefly some examples of good practice reported in the study areas.

Box 4: Good practice examples from the eight organisations

Service structure: In one local authority area older people’s mental health service staff from both the local authority and the NHS Trust are managed by the social services department. The interviewee explained that having a single line management structure has overcome many common joint-working problems such as duplication of work, inconsistencies in service delivery, and problems sharing information and knowledge. Single line management ‘has resulted in a far better service with greater team and joint working’. Discussions are currently underway to extend single line management to other areas in the authority.

Intergenerational project: Schoolchildren and older people with dementia meet on a weekly basis at a day centre where they have the opportunity to talk and undertake activities together. The origins of the project lie in user and staff concerns about the misconceptions and stereotypes that young people hold about older people, especially where older people may have dementia. The aim was to challenge these views by providing young people with an opportunity to spend time with older people with dementia. Joint activities together include painting, drawing, reading and sewing. The sessions tend to have a theme, such as transport or entertainment over the years. Activities also meet the requirements of the national curriculum.

Home dementia scheme: As part of its aim to undertake more preventative as well as early intervention work with people suffering with dementia, one organisation has established a specialist home care service.

Assistive technology pilot: One organisation recently piloted a scheme where older people have been provided with a device that alerts relatives/carers when they begin to wander or leave the safety of their own home. The objective was to enable the older person to retain their independence and remain at home.

Extra care scheme: In one authority, there are three purpose-built blocks of flats where older people with dementia live. The older people have their own flats thus retain their independence but there is also an on-site care team providing specialist care and support 24 hours a day.

Floating support for older people: One organisation in Wales has submitted an application to establish a ‘floating support scheme’ to work with older people in their own homes. This would enable older people with mental health problems to remain at home and retain their independence.

5. Age inequalities for adults and older people using mental health services

As part of the review of the literature on UK older people's mental health services, we examined previous studies that have used multiple regression or other multivariate statistical techniques to identify the impact of age on costs. The rationale for this examination was that age discrimination, whether direct or indirect, and/or ageism would be hypothesised to lead to differential use of mental health and related services patterns. Statistical examination of patterns of service use for samples of adults, adjusting for needs and other relevant factors, would therefore test whether there were significant differences by age. Weighting each service by an appropriate unit cost measure and summation would allow aggregate service use patterns to be examined. Although it can be insightful to examine patterns of use for a single type of service (such as GP contacts or inpatient hospital admissions – and we do so later with one of the datasets that we analysed for the purposes of this report), the aggregated cost measure has the advantage of showing a more complete picture, particularly because some services are complements and some are substitutes. (To give a simple example, an individual spending an extended time as an inpatient will make less use of community-based services.)

Most of the previous research on patterns of service utilisation and cost was undertaken by researchers known to us – indeed much is our own work – but we also contacted all other UK researchers who might have undertaken these types of analyses in the recent past.

In Tables 1 and 2 we have summarised the seven papers – two for older people and five for adults – that have shown age-cost associations. In both tables, each paper is identified by authors and date, the second column gives a short description of the service context, and the third gives the age range and number of study participants. The final column gives a summary of the impact of age on service use and costs, commonly focussing on the total costs of all health and social care supports. The findings in these tables are always taken from regression equations which standardise for all other factors that have an influence on support costs; examples include diagnosis, severity, comorbidity, gender, ethnicity, and living arrangements. For full details it is necessary to go to the original paper, and citations are given in the reference list at the end of this report.

Table 1 contains just two studies, both exclusively for older people. Table 2 looks at studies of adults of all ages, although it will be clear from the second column that a number of them have age cut-offs at around age 65. In both tables, all listed studies found some significant relationship between age and cost.

In contrast, the studies summarised in Table 3 did not find significant age-cost associations. As can be seen, these are mainly studies of service responses for younger adults with mental health problems. Table 3 follows a similar format to the other two tables, reporting the key relevant aspects of the research.

We should note that statistical methods used in some of the earlier studies are not as robust as methods used in more recent research. In particular, it is common for the cost measure in mental health studies to be highly skewed, with a small number of people with very high costs and a large number of people with very low costs. In these circumstances it would be usual today to use bootstrap, logarithmic transformation or generalised linear modelling to address the problem. Some of the older studies in the tables used ordinary least squares estimation, and this may have generated incorrect results, although it is unlikely to have made a huge effect. It was certainly not possible for us to go back to the original datasets to re-estimate the relationships.

Table 1: Summary of papers exploring age-cost associations for older people

Authors	Service	Age & participants (n)	Impact
Nelson et al., 2004	A community-based survey of people aged 65 or older in one inner London borough	Age 65-102 years. 542 people interviewed, of whom 107 had dementia, 169 had depression and 269 had activity limitation	Greater age raised the probability of using community-based social care. The non-linear age effect on health care costs resulted in costs being highest at 77 years, when cost was about £10 more per week than at age 65 (Adj R ² = 0.20). Co-existence of dementia and depression was associated with lower use and costs of health care.
Kavanagh & Knapp 2002	Costs of support estimated from the national random sample in the mid/late 1980s OPCS disability survey	Age 64-99 living in domestic households. A range of cognitive, functional and physical disability measures were used (n=4531)	Age was positively associated with support costs when separate physical disability measures (eg locomotion, dexterity, hearing) were excluded (Adj R ² = 0.06). When these other disability dimensions were included in the regressions, there was no significant age-cost association (Adj R ² = 0.14).

With the exception of two papers, the findings in Tables 1 and 2 mainly come from analyses undertaken on data collected in the late 1980s or 1990s. The vintage of the studies should be borne in mind when interpreting the relevance of the results today.

What general points emerge from these studies?

- The two studies in Table 1 were confined to older people only (age 64 or 65 and above). Both looked at older people's supports using community surveys of people living in ordinary housing, thus reflecting the circumstances of the majority of older people with mental health problems. Both studies showed support costs *rising* with age, with one of the studies identifying age 77 as the point of greatest impact. However, this positive association is most likely to be linked to increasing physical disability rather than increasing severity of mental health problems or *age per se*.
- In Table 2, the age range of participants in only two of the studies extends above 65 years, and both of these studies were concerned with closure of long-stay psychiatric hospital and subsequent 'reprovision' of community-based services

and support. Generally, support costs were lower for older people and this is found also to be true for the national Care in the Community demonstration programme. Interestingly, lower costs for older people were *not* found in the study of early movers from long-stay psychiatric hospitals in Northern Ireland (n=133; Beecham, et al., 1996).

Table 2: Summary of papers exploring age-cost associations in adult services

Authors	Service	Age & participants (n)	Impact
Knapp et al., 1990 & 1995; Beecham et al., 1991	Community care for ex-long-stay patients from Friern and Claybury hospitals in north London	Age 23-85 years	Analyses over the 10-year closure programme showed that older people tended to receive less costly community care packages, but the impact on costs per week was small.
Knapp & Beecham 1990 Knapp et al., 1992 Beecham et al., 2004	National demonstration programme of community care for ex-long-stay patients	People who are younger than 65 and selected to move to the new community-based services (n=226)	Data on age were missing for half the sample. When hospital re-admissions were included, older people were found to tend to receive less costly packages, but the effect of age on costs per week is small (Adj R ² = 0.60). At 12 years they received slightly more costly care packages.
McCrone et al., 2006	Community care for ex-long-stay psychiatric hospital residents.	Age 19-77 years. Identified as 'difficult to place' using a Special Problems Rating Scale in hospital (n=84)	Higher costs were associated with better self-care skills, fewer domestic skills, and longer duration of hospital stay prior to moving. Each additional year of age was associated with lower costs of about £600 pa (Adj R ² = 0.28).
Chisholm et al., 1997	Adults living in residential facilities in eight English health districts.	Age 18-65, residents with functional mental illness. Systematic differences between London (n=888) and elsewhere (n=415) led to two separate analyses.	Age had a negative effect in non-London districts (older residents cost less) and a curvilinear relationship in London districts in which costs fell with age until around 45 years, then rose (Adj R ² = 0.19 & 0.18).
Almond et al., 2004	Patients with schizophrenia randomly selected from Leicester psychiatrists' active caseloads	Mean ages (range 18-64) of 38 years (sd 11) for relapse patients and 41 years (sd 11) for non-relapse patients (non-sig. difference) (n=145)	Controlling for all other factors, there was an increased risk of relapse associated with being older. Total costs were higher for those who relapsed (147%) but decreased by 3.6% for each year of age.

- In these studies of adult services, and with the exception of those people who were described as 'difficult to place', the impact of age on support costs was small, commonly less than £1 per week for each additional year of age.
- The final two studies of adults (up to age 65 years) summarised in Table 2 show an interesting picture. The study of residential facilities found that costs rise after

age 45. This was only apparent in the two London districts and may be more a function of younger people showing more acute symptoms and the later stabilising of symptoms rather than age *per se*. The findings on relapse, however, ran counter to this argument: older people are more likely to relapse – and relapse is expensive – but this is alongside a small reduction in costs with age.

- In each set of analyses, the adjusted R^2 (a measure of the cost variation ‘explained’ statistically by the included variables) tends to be around 20%. Although this leaves more than three-quarters of the cost variance unexplained, these are not unusual figures for analyses of cross-sectional data.

The findings reported in Table 3 are, of course, as important as those which report age-cost associations, for they indicate *absence* of apparent discrimination in the micro-allocation of resources to older people with mental health problems relative to younger peers.

- Each of these papers considers services for adults with mental health problems with a cut-off point of 65 years or the local retirement age. As with drug trials, many service evaluations explicitly exclude older people, and the majority appear to be based in adult rather than older people’s services.
- The papers tend to use more recent data than those in Tables 1 and 2. Also, with one exception (Knapp et al., 2002), each paper focuses on a quite closely specified group of adults with mental health problems, usually evaluating a specific intervention for them.
- There appears to be little age discrimination between adults under 65 years.

In total, sixteen UK papers were found that explored age-cost associations having standardised for all other characteristics and needs that might influence costs. Most of this work has been undertaken by ourselves or our colleagues. Half of these analyses found no age-cost associations, but these studies were mainly concerned with adult services (only) and were based on experimental studies. One possibility is that inclusion in a trial – and most of the studies in Table 3 were experimental, with patients recruited purposively – alters the way that services and professionals behave, paying more attention to needs, and responding more carefully to them. In contrast, most of the studies in Tables 1 and 2 – which generally *did* find an age gradient – were naturalistic or non-intervention studies. Both studies in Table 1 were household surveys without any specific intervention being offered or evaluated, and all of the studies in Table 2 were similarly examining routine care arrangements. In contrast, five of the seven studies in Table 3 were trials.

Thus we found relatively little existing research that had explored age-cost associations, and even less that crossed the ‘age 65’ service-defining barrier. Some of what we found was based on data that were quite old. For these reasons, we carried out new statistical examination of reasonably up-to-date datasets that included both younger adults and older

people with mental health problems. As described in subsequent sections, three datasets were examined: a national epidemiological survey, a trial of treatment for depression and anxiety, and an observational study of people with schizophrenia.

Table 3: Studies showing no age-cost associations

Authors	Service/context	Age & participants (n)	Impact
Healey et al., 1998	Compliance/adherence therapy for people with psychosis	Most subjects below 40 years old, single, unemployed and living in public sector domestic housing (n=71)	Age had no influence on resource use or support costs.
Knapp et al., 1998	Intensive home-based care (n=70)	Aged 17-64 years, with no primary addition or organic brain syndrome (n=70)	Younger people were more likely to drop-out between the 20-month and 45-month interviews. No age impact on costs.
Knapp et al., 2002	People with schizophrenia in contact with London specialist services 3 months prior to study start. Part of a five-country European study	Mean age 44 years (sd 12) currently supported by a specialist mental health team. Excluded those with >1 year continuous residence in specialist facilities (n=84)	Age had no influence on support costs.
Knapp et al., 2004	Non-adherence to antipsychotic medication regimens	Mean age 44 years. Data from the 1994 OPCS Psychiatric Morbidity survey, self-report on non-adherence (n=658)	Age had no influence on resource use or support costs.
Patel et al., 2006	Cognitive deficits in people with schizophrenia	Mean age 36 years. Diagnosis of schizophrenia, >1 year since first contact with psychiatric services (n=84)	Age was not associated with support costs and excluded from reported regression equation.
Catty et al., 2008	Comparison of Individual Placement and Support (IPS) and usual vocational rehabilitation (VR). Part of an six-country European RCT	Age 18 years to local retirement age with serious mental illness for >2 years who had not been in employment in the previous year (n=312)	No association between age and good employment outcomes. Patients entering IPS or VR between 2 and 6 months after baseline were likely to work more hours than those not entering IPS or VR within the study period. It was not clear if entering IPS or VR within the study period was associated with age.
Knapp, Healey, Coid et al., (2008)	Medium secure psychiatric units (MSU, n=11) in seven of the 14 former NHS regional health authorities	Mean age on admission 32 years (sd 10). Mentally disordered offenders discharged between January 1989 and December 1994 (n=1582). Data collected for up to 10 years following discharge.	No significant association between length of stay and age on admission. A linked paper showed age of disorder onset/first psychiatric admission was negatively related to post-discharge costs for those subsequently case-managed by general adult psychiatry services but not for those case-managed by forensic services (Knapp, Healey, Raikou et al., 2008).

6. New findings from the 2000 Survey of Psychiatric Morbidity

6.1 Method

The 2000 Survey of Psychiatric Morbidity (PMS) collected data from adults aged 16 to 74 living in private households in England, Wales and Scotland (Singleton et al., 2001). Of the 8,580 respondents, 18% were diagnosed within the survey instrumentation as having a mental illness (Table 4).

Table 4: Diagnostic information from the PMS

No mental illness	7,053
Anxiety	478
Depression	228
Psychosis	18
Anxiety and Depression	761
Anxiety and Psychosis	15
Depression and Psychosis	19
Anxiety, Depression and Psychosis	8

A slightly lower proportion (16%; n=1,354) reported having used some form of mental health service in the previous 12 months. For the purposes of these analyses we excluded people who neither screened positive for mental illness nor reported having used mental health services; 6,406 individuals were excluded from analysis, plus one person who had very high support costs (an outlier)¹. Survey weights were used to adjust for the probability of selecting individuals in households of different sizes (the survey collected data from only one adult per household).

Annual total costs for mental health services, taken as an indicator of the intensity of service use, were estimated at 2001 prices (Netten et al., 2001). This total cost variable could be sub-divided into costs to the different parts of the mental health care system: GP visits for mental health problems, inpatient admissions, outpatient attendances, day activity services, and community-based services (see Appendix 2, where we give the fuller version of these findings). The survey questionnaire asks respondents to distinguish services used for reasons connected to their mental health and services used for other

¹ The selection of the sample was driven by the desire to focus on those people with a reasonable chance of using mental health services. Focusing on the entire sample would have meant that only a small proportion of the analysis sample would have been in receipt of services, resulting in limited variability in the dependent variable, and therefore increased difficulties for modelling the effect of age on the receipt of services.

It is important to note, however, that the inclusion in the sample of those individuals with no apparent mental health needs but receiving mental health services means that the effect of low mental health needs is biased downwards, as only those among the ‘no mental health needs’ group that used services were included in the model. The estimates in the model, therefore, should not be interpreted as indicating effects of mental health needs on the whole of the population, but rather on the sample used for the analysis (i.e. the high risk group). This should not affect the effect of age on receipt of services, and analyses carried out using the entire PMS sample confirmed the nature of the age effect identified using the ‘high-risk group’.

reasons. We cannot be certain that the distinction is consistently made by respondents, and so we carried out a number of streams of analysis, and report details of four in Appendix 2: mental health service use, mental health service use excluding GP visits, GP visits (only) and all health service use (for mental health as well as other reasons). In each case the dependent variable is annual cost, and in each case age-cost associations were estimated using a two-part statistical model. The first part aimed to estimate the probability of receiving any mental health services (say), while the second predicted the support cost incurred by those receiving services. The final results, most pertinent to the issues addressed in this report, are a combination of these two models. The regression equations explored a range of potential influences on costs, including demographic, socioeconomic and dependency-related factors (listed in Box 5). A variety of different specifications of age was tried in these analyses.

Box 5: Variables used in the analyses of the Psychiatric Morbidity Survey 2000

Service use/cost Secure/semi-secure unit stays, acute psychiatric ward stays, rehabilitation or long-stay ward stays, A&E or emergency ward stays, general medical ward stays, psychiatric outpatient dept visits, mental health related casualty department visits, other hospital outpatient department visits, other day patient service use, GP contacts (relating to anxiety, depression, mental, nervous or emotional problems), community psychiatrist, community psychologist, community psychiatric nurse, community learning disability nurse, other community nursing service, social worker, self-help and support group, home-help worker costs and outreach worker, community mental health centre, day activity centre, sheltered workshop.

Service use/cost All mental health (MH) and physical (PH) costs (continuous), any MH or PH cost (binary), all MH costs (continuous), any MH cost (binary), GP MH costs (continuous), any GP MH cost (binary), MH costs excluding GP (continuous), any MH cost excluding GP (binary), GP MH cost based on 2 week data (continuous).

Dependency Screens positive for mental illness based on questionnaire, ADL count, any longstanding illness, general health, total CISR score, number of neurotic symptoms in 3 groups, count of 4 disorders, screen positive for psychosis, dependent on drugs, has drink problem, estimated verbal IQ.

Socioeconomic Male, employed, ethnic group, lives alone, owns home, number of moves in past 2 years, score on NART, spent time in child institution before 16, taken into LA care before 16, age left school, age, age squared, age (5yr age groups), age (10yr age groups).

6.2 Findings

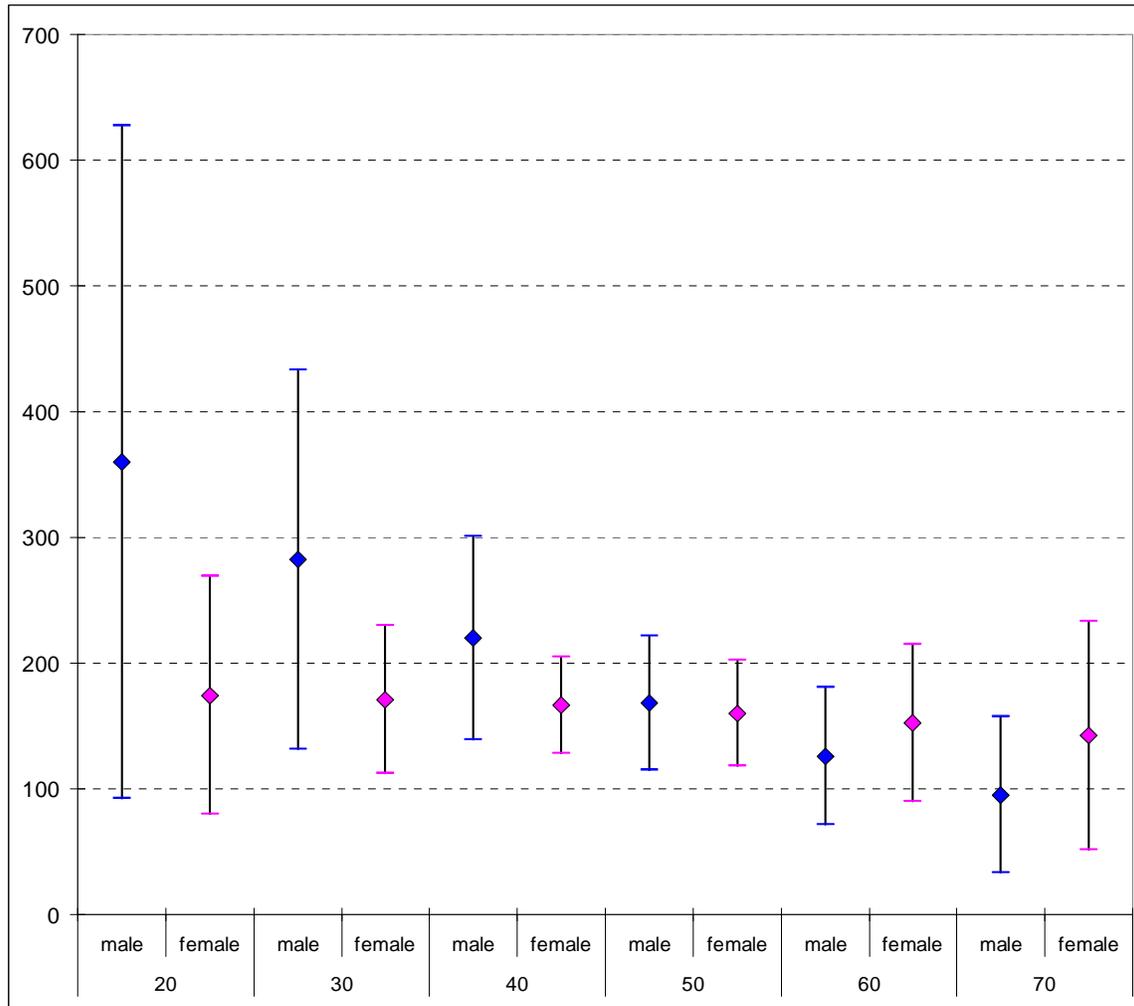
We focus here on the costs of all mental health services (model I in Appendix 2). The first part of the model, predicting service use, appeared to show a reduced likelihood of using any mental health service among older women. The second part of model (predicting level of service use through the cost measure, but only for those people with non-zero costs) showed that lower costs were associated with greater age for men, but not for women. Table 5 summarises the combined results from these two parts: the mean cost remains similar women at different ages, but decreases for older men. Figure 1 shows the results in diagrammatic form. Importantly, the length of the vertical line at each age point indicates the extent of the variation around the expected cost (95% confidence interval), and it can be seen that there is overlap between these intervals at the different ages

illustrated. In other words, although there appears to be reduced use of mental health services by older men compared to younger men, after adjusting for all other variables in the model, we cannot be certain that this is not due to chance. The gender difference does not arise because of higher use by males (in this sample at least) of secure provision.

Table 5: Mean costs by at age point from the PMS Survey, adjusting for all other characteristics

Age	Male		Female	
20	£	360	£	174
30	£	283	£	171
40	£	220	£	167
50	£	168	£	160
60	£	126	£	153
70	£	95	£	143

Figure 1: Impact of age on total mental health costs in the PMS Survey, holding all other factors constant



Further analyses were undertaken, and again the full details and results are given in Appendix 2.

- When we included only people younger than 65 years we found that the results change significantly, implying that age effects are largely driven by people over the age of 65. There does appear to be an ‘age barrier’ in receipt of mental health services at which point, costs decrease.
- Other models, also using the same two-step approach, explored the age-cost associations on total mental health support costs excluding the costs of visits to the GP for mental health reasons, and the age-cost impact for GP services alone. The impact of age is strongest on GP costs and social care costs, suggesting that it is the difference in these elements that is accounting for much of the reduction in the total costs of support over the age range.

- When total service use is examined (i.e. services used for both physical and mental health reasons), there does not appear to be evidence of an age gradient in costs. Possibly lower use of mental health services with age is accompanied (not surprisingly) by higher use of services for physical health reasons.

7. New findings from the Beating the Blues study: people with mild-moderate depression in primary care

7.1 Methods

Depression and anxiety are common problems and impose large economic and social burdens which can be substantially reduced by effective treatment. Many patients prefer psychological therapies to medication, but access to such therapies is still very limited. One treatment option, included for example in the NICE depression guidelines, is computerised therapy. ‘Beating the Blues’ (BtB) is one such computerised therapy, based on cognitive behavioural methods, and has been shown to be effective for treating anxiety and depression when compared to treatment as usual (Proudfoot et al., 2004). The randomised controlled trial by Proudfoot and colleagues included 261 patients recruited from general practices in South East England, aged 18-75, suffering from depression, mixed depression/anxiety, or anxiety disorder, and not currently receiving face-to-face psychological therapy. Data were collected in 2000-2001. A cost-effectiveness analysis of BtB has also previously been published (McCrone et al., 2004).

We re-examined the data from this BtB trial to see if there was any evidence of a systematic difference between patients of different ages. Comprehensive costs had previously been calculated (at 2000 prices), based on data collected from primary care notes and other sources, and included both primary and secondary (specialist and general) health care services (and some social care). These costs relate to an 8-month follow-up period. Full details are given in Appendix 3.

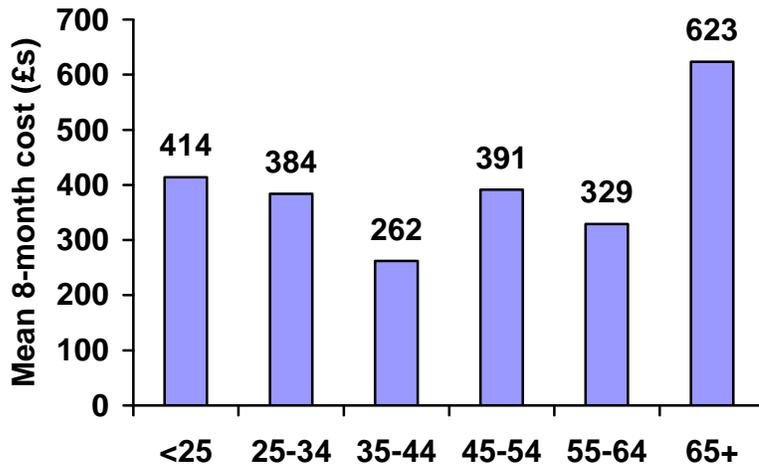
To assess age-cost associations, two types of regression model were used: ordinary least squares (OLS) and generalised linear models (GLMs), in each case linking total costs to a range of patient characteristics (age, gender, a depression score, an anxiety score, and a measure of functioning) and also including a variable which indicated whether or not an individual received computerised CBT. Note that there were fewer covariates to use in this study, compared to the richer set of data in the Psychiatric Morbidity Survey dataset, and we did not have time to explore different specifications of the cost variable.

7.2 Findings

Most individuals in the study were aged between 25 and 64 years old (83% of the sample), with 7% aged less than 25 years, and 9% older than 65 years.

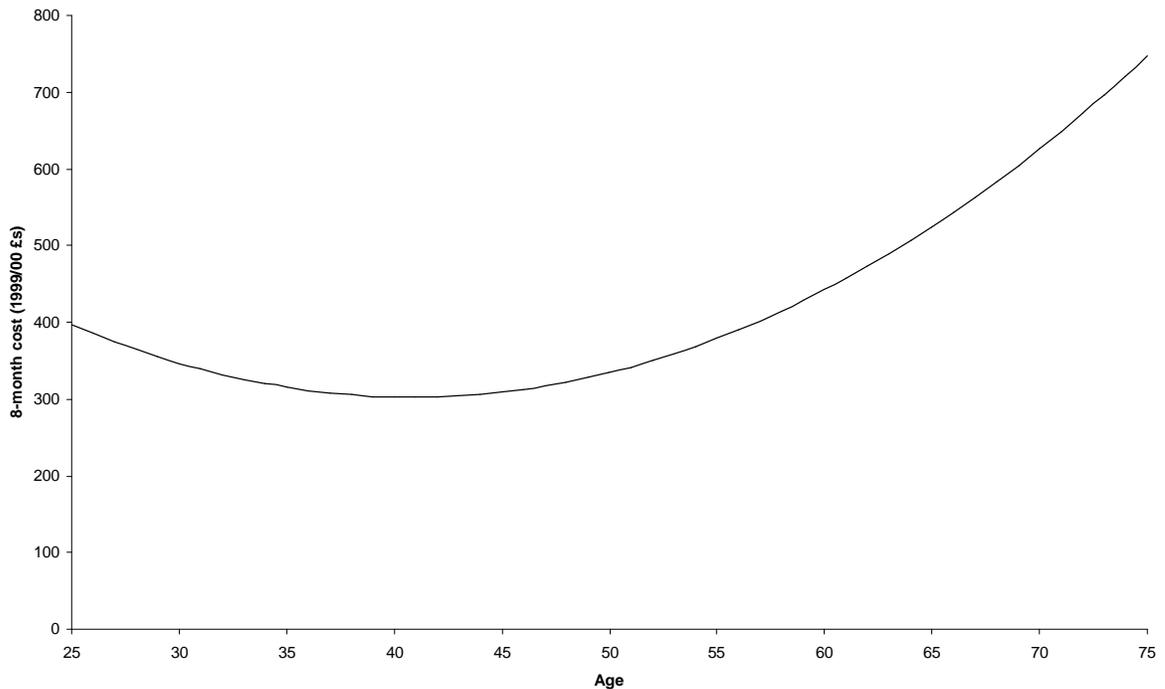
The unadjusted costs – that is, not taking into account any influences on costs of symptoms or level of functioning – appear to fall as age increases to 35-44 and then increase, with highest costs in the 65+ age group. These costs are illustrated in Figure 2.

Figure 2: Unadjusted costs by age group for the BtB study



The regression model using OLS estimation found no linear association between age and costs, but further exploration revealed that age had a non-linear impact on costs after adjustment for characteristics and severity of mental health problems. This is shown in Figure 3; costs fall until around age 42 years and then increase. Only one interaction effect was significant – older patients who used computerised CBT (BtB) had reduced costs. The GLM analyses supported these findings.

Figure 3: Impact of age on costs for the BtB study, controlling for patient demographic and clinical characteristics



When the analyses were repeated for the subsample of people aged up to 65, the age-cost association found previously disappeared. As was found in the analyses of the Psychiatric Morbidity Survey (PMS), the age gradient appears to be driven by the service use patterns of older people.

In contrast to what we found in the analysis of the PMS data, however, older people with mental health problems in the BtB trial sample are *not* receiving fewer services. But there are some important differences between the PMS and BtB datasets, and these mirror what we found from our examination of previous studies (in Section 5). The PMS is a nationally representative community sample and included some people who screened positive for a mental health problem (which could have been either a severe or a ‘common’ mental health disorder) but who were not in contact with mental health services. It also included some people who were in contact with these services but who did not have a diagnosable mental health condition. In contrast, those in the BtB study had a diagnosed mental health problems – and only anxiety and/or depression-related disorders – and were in contact with services. Another difference is that the BtB study measured total costs and not those that are attributable to mental health needs (in so far as the distinction can easily be made). Moreover, the BtB data come from a trial, while the PMS data come from a non-intervention-based household survey. (A further difference is that the PMS dataset includes some people with psychoses, whereas the BtB study only considered people with depression or anxiety.)

One further important difference between the two samples was the availability of a bigger set of ‘other characteristics’ in the PMS dataset with which to adjust the costs before drawing conclusions about an age-cost association. On the other hand, the PMS is a cross-sectional survey, which makes it hard to draw inferences about causality, whereas the BtB trial was longitudinal, and the data we examined were baseline symptoms (etc) and subsequent costs (over the 8-month follow-up period).

8. New findings from the SCAP study; people with schizophrenia

8.1 Methods

The SCAP (Schizophrenia Care and Assessment Program) is a longitudinal study conducted by the pharmaceutical company Eli Lilly². The sample comprised a representative group of 600 UK residents living in private households or institutions, who met the diagnostic criteria (DSM-IV) for schizophrenia. Participants were between 18 and 82 years old (mean ages of 42 for men and 44 for women), including 39 people over the age of 65. They were recruited from six sites (Bristol, Belfast, Dumfries, Liverpool, and two in London) during 1999/2000. As a group they had a long history of mental illness and considerable disability. They were a moderately ill group, as indicated by their symptom scores. Only 10% were in open employment, 11% in a marital or equivalent relationship, 35% were female, and 13% of non-white ethnicity. One person was

² We are grateful to Eli Lilly for permission to use these data for this purpose.

homeless, 31% lived alone, 38% lived with family/others, and 31% in supported accommodation. Almost all (90%) had seen a psychiatrist in the previous 6 months, and 24% had been admitted to an inpatient ward over the same period.

Sample members were interviewed at entry to the study and at 6-month intervals over three years (a total of five times). Measures completed at those interview points included indicators of symptoms, functioning (in terms of activities of daily living, social activities), general health status (physical and mental, using the SF-12), quality of life, health-related utility (QALY), alcohol use and misuse, substance misuse, mental health resource utilisation, medication use, side-effects of treatment, and medication adherence, together with a range of socio-demographic indicators including age, marital status, education, employment status, and living arrangements. Costs were estimated for usual accommodation, use of inpatient and outpatient care, community psychiatric nurses and other specialist mental health care, as well as other general health and social care services. Here we report only the results for the aggregated service cost measure.

Ordinary least squares multiple regression techniques, with bootstrap adjustment, were used to assess the age-cost associations in the context of other potential influencing factors. Costs were measured for the period between entry to study and the first 6-monthly interview. Individual characteristics and other measures used in the regressions were those assessed at entry to study. Full details of the variables and techniques used in these analyses are given in Appendix 4.

8.2 Findings

The regression analyses revealed a range of significant associations between costs and patient characteristics. In particular there was a significant nonlinear association between age and costs, with costs lowest within the sample at around age 57 and increasing slightly thereafter. This association holds after adjusting for differences in symptoms (positive, negative and depressive), general health (physical and mental), global level of functioning, specific functioning on particular activities of daily living, medication adherence and socio-demographic dimensions such as education level, marital status and gender. It was not possible to include the measures of alcohol or substance misuse in the equation reported because these variables had too many missing values and reduced the sample size considerably. The included variables ‘explain’ about one fifth of the observed variance in cost.

When the equation reported in full in Appendix 4 was re-run after excluding people over the age of 65, the sample size fell to 469, the overall proportion of cost variance ‘explained’ fell slightly and the age-cost association disappeared. This was despite the patterns of association for most of the other variables remaining unchanged between the analyses for the full sample and the ‘younger’ sample. The full details are not reported here, but the coefficient on age became -649.74 ($p=.038$) and that on the square of age became 5.5392 ($p=.123$).

These analyses of the SCAP dataset therefore usefully supplement the other two new analyses because neither of the datasets for those other analyses included many people with psychoses. In contrast, SCAP was entirely focused on a group of people with schizophrenia, recruited from sites across the UK, and was naturalistic in design. For people with schizophrenia there is an age-cost association consistent with costs being highest for the youngest members of the sample, lowest at around age 57, and then slightly higher again for older people.

9. Assessing the cost of eliminating age discrimination in mental health services

9.1 Introduction

Earlier analyses examining the extent of age discrimination in mental health services have found service use to be lower among older people after adjusting for need and other factors. The age-cost association has been found to be more marked for ‘common mental disorders’ such as depression and anxiety, but variation in service levels also appears to be present among those with psychoses.

This section examines the cost implications at national level of eliminating age discrimination from mental health services by increasing the supply of services to older age groups. The data do not allow us to examine differences in outcome and the modelling focuses on inequalities in expenditure as a measure of age discrimination. Furthermore, it assumes that age discrimination is addressed solely by increasing service provision where necessary, rather than redistributing existing services across the age spectrum.

9.2 Methods

Data

Annual mental health-related costs were estimated from data from the 2000 Psychiatric Morbidity Survey (PMS). The survey collected detailed information on service use among adults aged 16 to 74 living in private households in England. Of the 8,580 respondents, 18% were diagnosed as having a mental illness (see Table 4) and 16% (n=1,354) reported having used a mental health service in the previous 12 months. The analyses described below were undertaken on the same sample as described in Section 6, that is excluding people who neither screened positive for mental illness nor reported having used mental health services (n=6,406) plus one person who had unrealistically high support costs (an outlier). The nature and size of the sample used in the model was reflected subsequently in the methods used for grossing up the estimates of the cost of age discrimination. Again, survey weights were used to adjust for the probability of selecting individuals in households of different sizes.

Modelling the impact of age on mental health expenditure

Mental health expenditure for individuals in the PMS was estimated by multiplying levels of service receipt by estimates of unit costs from Netten et al. (2001). Social care expenditure was not included in these calculations to avoid overlaps with the PSSRU analysis of the costs of eliminating age discrimination in social care (Forder, 2008).

The impact of age on levels of expenditure, controlling for a number of other demographic, socioeconomic and dependency-related factors, was estimated in STATA 10.0 using a two-part model. The first part of the model (a logit model) estimated the probability of receiving any mental health service, while the second (a GLM model) estimated the total annual cost incurred by those receiving such a service. The GLM model was estimated with robust standard errors to account for the presence of heteroskedasticity, and applied a log-link function and assumed a Gamma distribution to minimise the effects of skewness in the cost data.

Estimates of total expenditure for different age-gender groups were derived by multiplying their expected probability of receipt of mental health services (the expected value from the first part of the model) by their expected level of expenditure assuming receipt of any service (the expected value from the second part of the model). A bootstrapping procedure with 2,000 replications was performed to provide 95% confidence intervals around the estimates of total costs.

The analysis produced estimates of levels of expenditure by gender and 10-year age group. The 35-54 age group, among whom service use was highest, was used as a benchmark expenditure level to estimate the cost of eliminating age discrimination. In other words, the extent of age discrimination was estimated as the shortfall in mental health expenditure for older people relative to the level of expenditure for the 35-54 age group, controlling for other explanatory factors. (The service, cost, dependency and socio-economic variables are listed in Section 6, Box 5.)

People aged 16 to 34 also showed lower levels of expenditure than those in the 35-54 age group. However, it was felt that these differences would be mainly associated with demand factors (related for instance to informal support), rather than with shortfalls in the levels of supply of services. They were therefore excluded from the calculations.

Grossing up costs

Given that previous analyses of PMS data found age discrimination to be less marked among individuals with psychoses, shortfalls in expenditure were calculated separately for patients diagnosed with a psychosis and those with any other mental health condition. Given the relatively small number of people diagnosed with a psychosis in the PMS sample, a second analysis was carried out on the entire sample, irrespective of diagnosis. The results of the 'whole sample' analysis confirmed the results presented here.

Based on the results of the models, the analysis estimated the proportional change in expenditure required to compensate for the age effect on the level of resources used by

older individuals. This estimate was then scaled up to national levels of expenditure by applying weights reflecting the appropriate national age and gender distributions, and then grossed-up to 2006/07 mental health NHS gross expenditure levels from the 2006/7 Programme Budget (Department of Health, 2008).

The PMS survey only collected data from adults aged 16 to 74. The analysis assumed the level of service use per individual among those aged 75 and above to be the same as for individuals aged between 65 and 74. Expenditure estimates for older people aged 75+ were therefore derived by multiplying the per capita expenditure estimates for the 65-74 group by the number of people with mental health problems aged 75+, estimated from a separate analysis of the 2005 Health Survey for England.

Analysis caveats

It is worth noting that the PMS does not cover people in long-stay hospital care or in care homes. Such groups are likely to comprise predominantly heavy service users: without further analysis focusing specifically on these groups it is not possible to ascertain whether similar patterns of age discrimination are present among them. The results described below assume the same level of age discrimination among people in institutions to that found among individuals living in the community.

The estimated costs reported below do not address other forms of discrimination. In particular, the estimated expenditure shortfalls do not reflect the cost of eliminating gender differences (within age groups). Moreover, the modelling described is based on an implicit assumption that in order to eliminate age discrimination, expenditure per person, after standardising for need, should be the same across all adult age groups. In practice, equality of service use does not necessarily represent equality of outcome, for example if equivalent outcomes can be achieved at lower cost for some age groups, or if some age groups experience different capacities to benefit from services³.

9.3 Results

Table 6 summarises the estimated increase in NHS expenditure necessary to eliminate age discrimination from mental health services. Figure 5 shows the distribution of the estimates, based on the results of the bootstrapped replications.

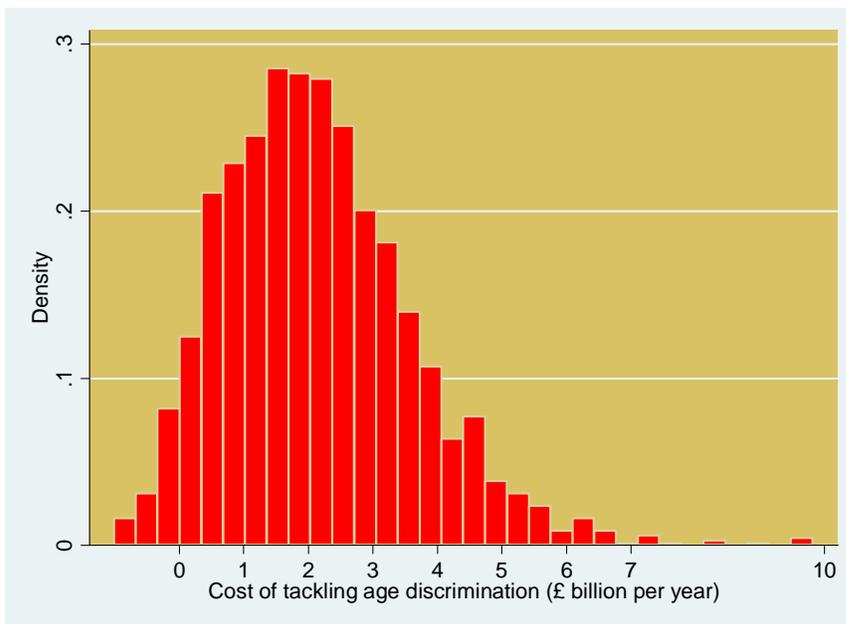
Table 6: Cost of eliminating age discrimination from mental health services in England

	Total expenditure (2006/07)	Increase in expenditure (%)	Increase in expenditure
Current levels	£ 8.4 billion		
Adjusted (point estimate)	£ 10.4 billion	24	£ 2.0 billion

³ The data did not allow consideration of other concepts of need such as capacity for benefit or capability. There are useful discussions of these issues and equality in Forder (2008) and Forder et al (2008).

- At the central (point) estimate, increasing service provision among adults aged over 55 to the level received by middle-aged individuals (35-54) with a mental health condition would cost an additional £2.0 billion per annum (2006/7 prices). This equates to an increase of almost 24% on current levels of expenditure.
- The proportional increase in total costs necessary to increase the supply of services to the benchmark level is significantly higher among adults with ‘common mental disorders’ such as anxiety and depression than among those with psychoses, due to the diversity in the extent of age discrimination between these groups.

Figure 5: Histogram of expected cost of tackling age discrimination in mental health services (annual)



9.4 Summary

The analysis presented in this report builds on the micro analyses presented in Section 6. It estimates the national cost to the NHS of eliminating age discrimination in mental health services. The central estimate is some £2.0 billion at 2006/7 prices (90% confidence intervals £0.4 billion to £4.0 billion). This is subject to a range of caveats relating to the use of PMS data. It is based on the assumption that to eliminate age discrimination, expenditure per person would be equalised across age bands (controlling for need) and that this would be achieved by levelling up expenditure for those aged 55 and over to the levels of those aged 35 to 54.

10. Looking forward: knowledge of the proposed legislation and its implementation

As we have seen from the new statistical analyses as well as from most of the previous literature, there appears to be an age-cost gradient in the costs of mental health services. There is a weaker association (often not significant) when looking at the costs of *all* services, when using data from trials and other ‘intervention’ studies, and when looking at samples confined to people aged up to 65. The significant age-cost association is more noticeable when looking at services used to meet mental health needs, when using population surveys or other datasets that do not alter standard treatment or support arrangements, and when looking at (and hence comparing) people aged above and below 65.

In drawing these various findings together we return to the material obtained through the interviews conducted in the eight organisations, where – as we have seen – most respondents identified some age discrimination in the availability of and access to mental health services. We discuss knowledge of the proposed legislation, the possible impact of age discrimination legislation on mental health services, and the potential costs and benefits associated with the legislation.

10.1 Knowledge of the proposed legislation

Interviewees in only four of the eight organisations contacted had heard about the proposed Single Equality Bill. Even among those four, knowledge was minimal. As one interviewee commented, ‘my knowledge could be greater in terms of the Bill as well as other issues relating to older people with mental health problems.....the focus has tended to be on younger people and adults of working age.’ Comments were also made about managers’ needs to prioritise current pressures of work which meant that until legislation came into force they tended to pay little attention to the issues.

There was a general consensus among the participating organisations that they would benefit from further information and guidance on the proposed legislation.

10.2 The impact of age discrimination legislation on mental health services

Age Concern, the Mental Health Foundation and other organisations advocating equal rights and access for older people in mental health services have welcomed the proposed legislation. They argue that the long-term benefits will far outweigh any costs, many of which they believe to be short-term in order to level up mental health services.

Interviewees in seven of the organisations involved in this study also welcomed the legislation, stating that it could be a tool to tackle any existing discrimination and lead to improvements in the mental health services for older people. As one interviewee stated, it could create ‘equality of service for all people with mental health problems.’ Some interviewees highlighted the fact that age discrimination remains an issue despite the

existence of extensive guidance, such as the National Service Frameworks. The one organisation which did not accept that age discrimination existed stated that legislation will ‘not necessarily have an impact except confirm our status and working practices and ethos whereby services are provided on the basis of need.’

Many interviewees commented that improvements resulting from the legislation will be limited unless it is accompanied by significant additional resources to ensure that it is meaningful and enforceable. In the next two subsections we summarise interviewees’ comments on the expected costs and benefits of the proposed legislation. It should be noted that in some instances we found that the same issues appeared as costs and as benefits. This is particularly the case where there may be short-term costs – perhaps in restructuring or changing attitudes – but where these are expected to lead to long-term benefits.

10.3 Potential costs associated with the legislation

The Green Paper, *A Framework for Fairness*, estimates that there will only be minimal costs associated with introducing anti-age discrimination legislation in mental health services where it is deemed that ‘commitments to eliminate discriminatory policies and practices are already in place’ (Department for Communities and Local Government, 2007, p16). Age Concern have challenged this view, arguing that the government has underestimated the scale of the inequality in mental health services and thus also underestimated the costs of overcoming it. Age Concern calculated that if access to services for people with severe and enduring mental illness was equalised for older people and younger adults, the total cost would be around £800 million (Age Concern 2007, p26).

Whether this cost estimate is accurate, it is clear that:

Whatever policy is produced, and however it is supported, ultimately, better mental health for older people will only be secured by having sufficient resources and the close working of all organisations at a local level. This will require a coordinated strategy, for which it is the whole system’s responsibility to deliver (Philp and Appleby, 2005, p5).

Interviewees within seven of the organisations contacted for this research mentioned resource constraints as a cause of age discrimination. It was not surprising, therefore, that these interviewees also believed that legislation to outlaw age discrimination in mental health services would need to be accompanied by additional resources. Comments included:

- ‘Additional resources would be required both in time and money.’
- ‘No legislation is cost-neutral and we can only work within the boundaries and resources that we have.’

- ‘The older person’s service is, as ever, at its lowest ebb trying to cope with levels of demand that far outweigh available resources.’ This reflects a concern within organisations in the health and social care field about an existing lack of resources.

Unfortunately none of the participating organisations was able to provide any detailed cost estimates of the local consequences of the legislation, mainly because they had not had sufficient time to consider the issue, and because of their limited knowledge at the time of this study. As one interviewee stated, ‘I concede that I have not looked at the effect that this imbalance in services and discrimination has on the availability of access to services across the board’.

It is also important to note that there was some reluctance among interviewees to discuss any financial costs associated with the legislation; previously new legislation and guidance has not been accompanied by additional resources. The organisations have consistently had to work in an environment of scarce resources and reconfigure existing services within the same limited budget. Such cynicism or realism was common among the interviewees, and may have implications for the mental health system.

The descriptive information provided by interviewees regarding cost implications ranged over a number of areas: restructuring, unmet need and demographic pressures, new services, joint working, and challenging existing attitudes.

Restructuring the service was identified by interviewees as having cost implications, although there was no consensus as to whether the costs would be significant. One interviewee believed that there was an urgent need to restructure the service in order to tackle age discrimination. She estimated that for equality of service to be achieved it would be necessary to employ a number of additional staff within the older people’s team: ‘If the older people’s team was to mirror the younger adults’ team there would need to be a massive injection of resources.’ She also felt that achieving a good quality and equitable service could only be achieved by increasing resources. This reflects a view that equity should only be achieved by levelling up existing services and not levelling down. ‘In many areas this will require new investment in addition to modernisation of services’ (Philip and Appleby, 2005, p4).

In contrast, while service restructuring was regarded as one of the priorities by an interviewee in another organisation, she did not believe that this would necessarily have significant cost implications: ‘The resource implications might not be great if the services are reconsidered and needs met differently.’ This interviewee proceeded to evidence what she regarded as ‘an inequitable distribution of resources’ resulting from the existing structure of services. She explained that at present the older people’s team works with significantly higher caseloads than team for adults of working age. Since April 2007, the older persons’ team had assessed 300 cases and reviewed 900, in comparison to the team for adults of working age which had a total caseload of 150. The interviewee also expressed concern about the staff composition of the team for adults of working age stating that it was dominated by health care staff: ‘Given the extent of social care need

among older people, a service dominated by acute or chronic health care staff, is probably discriminatory in favour of health staff and health needs.’

While this interviewee was keen to emphasise the minimal costs associated with reconfiguring the service she did acknowledge that there would likely be significant training implications with associated costs.

The uncertainty about any costs associated with restructuring the service was reflected in the comments made by another interviewee who said that there is a need to develop a more responsive and appropriate service model but felt that further investigations, guidance and information would be beneficial in order to determine any additional costs.

Meeting *unmet need* among older people, in particular among people with low-level functional mental health problems such as depression and anxiety, was identified by some interviewees as having a significant financial cost implication. However, by the very fact that these needs are unmet, the interviewees found it difficult to estimate the resources required to meet them. Linked to this are the additional costs associated with demographic change identified by some interviewees. One interviewee stated that an ageing population will result in an ‘increasing demand for services provided both in the home and in residential care which will have massive resource implications.’

Providing sufficient and sustainable resources for new and innovative initiatives was identified as having cost implications. One example was an assistive technology pilot scheme that provided older people with devices to enable them to remain in their own homes. Despite its success, when the pilot came to an end no further funding was made available. The interviewee stated: ‘We need exit strategies so that schemes like this can be sustainable.’ Undertaking more preventative work was also felt to be important but as but one interviewee pointed out, while this may have ‘short-term costs in terms of promotion, developing services and training, in the long term it could be cost-effective.’

Improvements in *joint working* both between social care and health organisations and within them, and including between services (older and adult mental health services, mental health and community care services), were identified by some interviewees as having short-term costs in terms of staff time, but promised benefits, as we discuss below.

Interviewees from the organisations highlighted the importance of *challenging the negative and ageist attitude and culture* within organisations. This could have associated costs in terms of training. An example was provided of proposals to develop programmes to work with primary health care staff to change attitudes towards older people and to work in a preventative way with older people who are prone to depression. A recent report by Age Concern reflects this view: ‘Independent inspectors agree that there is insufficient training to counter ageist attitudes in health care’ (Age Concern, 2007, p23). The same can be said of training needs for front-line social care staff. One interviewee expressed concern that, while these staff have generic skills, they lack the necessary abilities to identify low-level mental health problems in older people living in residential care settings.

10.4 Potential benefits associated with the legislation

Age Concern (2007 p.26) has argued that while there may be initial costs, ‘in the long-term, there could be savings from preventing or postponing illness and disability. Money would also be saved by maintaining the wellbeing and independence of older people.’ Interviewees in seven of the eight organisations believed that the legislation would be beneficial in that it would enable discriminatory practice to be challenged in an enforceable way. Comments included:

- ‘Legislation can sharpen the mind and given that it is enforceable it does give you more powers to challenge any discriminatory practice.’
- ‘The legislation would empower users and carers and allow them to challenge decisions and staff could make use of it in a similar way.’
- ‘We feel this debate and prospect of legislation is timely as we are considering ways of restructuring our services to overcome any discrimination.’

The prospect of the possibility of receiving *additional resources* was regarded by interviewees as the most significant potential benefit of the legislation: ‘Providing the legislation is meaningful and reasonable and accompanied by sufficient resources it could have a positive impact on services.’

A number of interviewees commented that *restructuring the service* would be beneficial, in particular removing the age-based distinction between adult and older people’s services and ensuring equality of access to all services: ‘There is a need to develop a service model that is more responsive to the needs of older people with mental health problems.’ On the other hand, some interviewees expressed reservations about moving away from age-based structures and emphasised the benefits of having specialist (separate) services and professionals within them.

Many interviewees felt that services should be open to all individuals regardless of age, and that work was needed to tackle discrimination within service delivery. In light of this, they were hopeful that the legislation would be accompanied by additional guidance, information and good practice documents on how best to organise services in such a way that allows people access to services regardless of age. As one interviewee stated, ‘It will provide clarification and improvement around the boundaries and which service area is most appropriate to respond to an individual’s need.’

Improving service delivery and focusing resources on undertaking *preventative and early intervention work* was regarded by many interviewees as a benefit. One interviewee explained that within their local authority the numbers of older people needing crisis resolution and home treatment may not be that great, and some admissions might be prevented as a result of services being delivered differently. An interviewee from another organisation made the comment that ‘differently organised community services might be

able to deliver care to people with new disorders related to bereavement or other life events, and this might prevent more severe or chronic disorders.’ Being able to *tackle cultural negative attitudes, stereotypes and prejudices* was also seen as a benefit of the legislation. As one interviewee commented, ‘when you mention the law it can frighten staff and can force them to change their ways.’

Improvements in joint working practices were regarded as another benefit of the legislation. While one interviewee felt wide-ranging improvements were needed (see above), ‘by tackling joint working problems the aim is to ensure that the care package for the individual is based on assessed needs alone and is not influenced by any other matter.’ Another interviewee explained that there existed a different ethos between health and social services whereas if they were integrated and offered a unified multi-disciplinary service then the issues of protectionism and discrimination that had been encountered with the health service could be overcome.

Improving joint working could result in consistency in policies and procedures which could result in an improvement in information sharing and knowledge, all of which ought to be beneficial. However, it is only when this is linked to a consistent approach to provision of services based on need rather than age that the benefit in ending age discrimination would be seen.

11. Conclusion

The aim of this report was examine inequalities in the use of mental health services, particularly comparing utilisation by older people and younger adults. Numerous sources of evidence were sought: previous literature (academic and policy-related), previous economic studies, interviews with senior and middle managers in eight mental health organisations, and new statistical analyses of recent data collections. The focus was on service use, generally aggregated by attaching cost weights. We did not examine differences in outcomes.

The evidence tended to point in the same directions: use of mental health services is lower among older people, after adjusting for need and other factors. The age-cost association appears more marked for ‘common mental disorders’ such as depression and anxiety than for psychosis, although the physical health needs of people with schizophrenia, especially as they age, complicate the picture. Equalising expenditure across age bands while controlling for need would cost in around £2.0 billion

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Appendix 1

Topic Guide for interviews with senior and middle managers within older people's mental health services

The Impact of Age Discrimination on Social Care and Mental Health Services – A Consultation Exercise

Interview Questions

Section 1 - Current Services

1. How are mental health services organised within the Local Authority?
(assessment and service delivery)
2. Are the mental health services available to older people with mental health problems? If not, how are they organised for older people?
3. How do you gate keep mental health services? What are the criteria for being accepted by the mental health services?

Section 2 - Age Discrimination & Legislation

1. Do you believe that age discrimination exists within mental health services?
(please provide examples & evidence)
2. What would you change in order to overcome any discrimination?
3. (a) Have you heard about the proposal to introduce a Single Equality Bill?
(b) If yes, what is your knowledge of this?
4. Do you feel that age discrimination legislation is necessary?
5. What impact would age discrimination legislation have upon existing services?
6. Can you provide details of the *costs and benefits* that the introduction of age discrimination legislation would have on existing services? *(Where possible please provide estimates of the costs/savings of specific service changes that would take place)*

Appendix 2

Analyses of the Psychiatric Morbidity Survey, 2000

Method

The 2000 Survey of Psychiatric Morbidity (PMS) collected data from adults aged 16 to 74 living in private households in England, Wales and Scotland (Singleton et al., 2001). Of the 8,580 respondents, 18% were diagnosed within the Survey instrumentation as having a mental illness

Diagnostic information from the PMS

No mental illness	7,053
Anxiety	478
Depression	228
Psychosis	18
Anxiety and Depression	761
Anxiety and Psychosis	15
Depression and Psychosis	19
Anxiety, Depression and Psychosis	8

A slightly lower proportion (16%; n=1,354) reported having used some form of mental health service in the previous 12 months. For the purposes of these analyses however we excluded people who neither screened positive for mental illness nor reported having used mental health services; 6,406 individuals were excluded from analysis, plus one person who had very high support costs (an outlier). Survey weights were used to adjust for the probability of selecting individuals in households of different sizes (the survey collected data from only one adult per household).

Annual total costs for mental health services, taken as an indicator of the intensity of service use, were estimated at 2001 prices (Netten et al., 2001⁴). This total cost variable could be sub-divided into costs to the different parts of the mental health care system: GP visits for mental health problems, inpatient admissions, outpatient attendances, day activity services, and community-based services (see Box 1).

The models predicting costs relating to a mental illness were estimated using a two-part utilisation model. The first part (a logit model) predicted the probability of receiving any mental health services, while the second (a GLM model) predicted the level of cost incurred by those receiving such a service. The GLM model was estimated with robust standard errors to correct for the presence of heteroskedasticity, and a log-link function

⁴ Netten A, Rees T, Harrison G (2001) *Unit Costs of Health & Social Care – 2001*, Personal Social Services Research Unit, Canterbury.

was used to minimise the effects of skewness in the cost data. Expected levels of cost were subsequently estimated by combining the probability of service use with the expected intensity of receipt. Confidence intervals around these were estimated by bootstrapping the overall predictions (using 2000 repetitions). Both models were estimated in STATA 10.0 using the *logit* and *GLM* commands.

The analyses controlled for a number of demographic, socioeconomic and dependency-related factors likely to influence the use of mental health services (see Box A2.1 for the full list). Possible interactions between independent variables were also explored: consistently the most significant interaction was between age and gender. Where statistically significant this interaction has been included in all models.

Box A2.1: Variables used in the PMS analysis

Service use/cost Secure/semi-secure unit stays, Acute psychiatric ward stays, Rehab or long-stay ward stays, A&E or Emergency ward stays, General medical ward stays, Psychiatric outpatient dept visits, Mental health related casualty dept visits, Other hospital outpatient dept visits, Other day patient service use, GP costs (relating to anxiety, depression, mental, nervous or emotional problems), Community psychiatrist, Community psychologist, Community psychiatric nurse, Community learning disability nurse, Other community nursing service, Social worker, Self-help and support group, Home-help worker costs and outreach worker, Community mental health centre, Day activity centre, Sheltered workshop.

Service use All MH and PH costs (continuous), Any MH or PH cost (binary), All MH costs (continuous), Any MH cost (binary), GP MH costs (continuous), Any GP MH cost (binary), MH costs excluding GP (continuous), Any MH cost excluding GP (binary), GP MH cost based on 2 week data (continuous)

Dependency Screens positive for MI based on questionnaire, ADL count, any longstanding illness, general health, total CISR score, number of neurotic symptoms in 3 groups, count of 4 disorders, screen positive for psychosis, dependent on drugs, has drink problem, estimated verbal IQ

Socioeconomic Male, employed, ethnic group, lives alone, owns home, number of moves in past 2 years, score on NART, spent time in child institution before 16, taken into LA care before 16, age left school, age, age squared, age (5yr age groups), age (10yr age groups)

Results

Model I: The costs of all mental health services

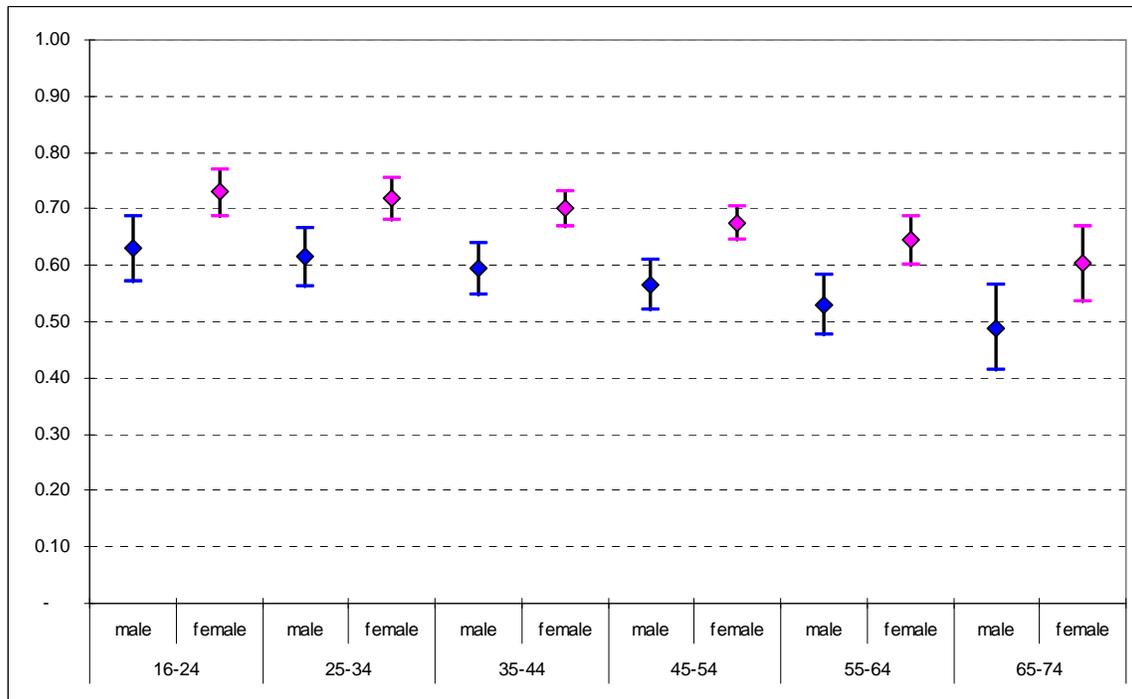
Model I considered the effect of age on the receipt of any mental health service (see Box 1). Results from the first part of the model, predicting whether or not individuals were likely to incur any mental health-related costs, appeared to show some negative age discrimination, although this was only statistically significant among females. Conversely, in the second part of the model an age effect was apparent only within the male population.

Model I, part i (logit): Whether any MH-related cost was incurred

	Coef.	Std. Err.	z	P>z	[95% conf	Interval]
General health very good	0.01	0.21	0.06	0.95	-0.40	0.42
General health good	0.32	0.21	1.51	0.13	-0.10	0.74
General health poor	0.53	0.23	2.27	0.02	0.07	0.98
General health fair	0.62	0.26	2.38	0.02	0.11	1.14
number of neurotic symptoms	-2.31	0.18	-12.54	0.00	-2.68	-1.95
Total CISR score	0.04	0.01	4.01	0.00	0.02	0.07
Screens positive for psychosis	2.63	0.68	3.85	0.00	1.29	3.96
In employment	-0.53	0.13	-3.93	0.00	-0.79	-0.27
Lives alone	0.36	0.12	3.07	0.00	0.13	0.59
Has a drink problem	-0.27	0.13	-2.08	0.04	-0.53	-0.02
Ethnicity black	-0.31	0.40	-0.76	0.45	-1.10	0.48
Ethnicity Indian, Pakistani or Bangladeshi	-1.06	0.44	-2.44	0.02	-1.92	-0.21
Ethnicity other	-1.00	0.32	-3.07	0.00	-1.63	-0.36
Male	-0.31	0.12	-2.6	0.01	-0.54	-0.08
Age squared	-1.3E-04	4.8E-05	-2.72	0.01	-2.3E-04	-3.7E-05
Constant	2.01	0.27	7.47	0.00	1.48	2.54

Number of observations = 2145

Model I, part i: Predicted likelihood of service use, holding all other factors constant (showing 95% confidence intervals)

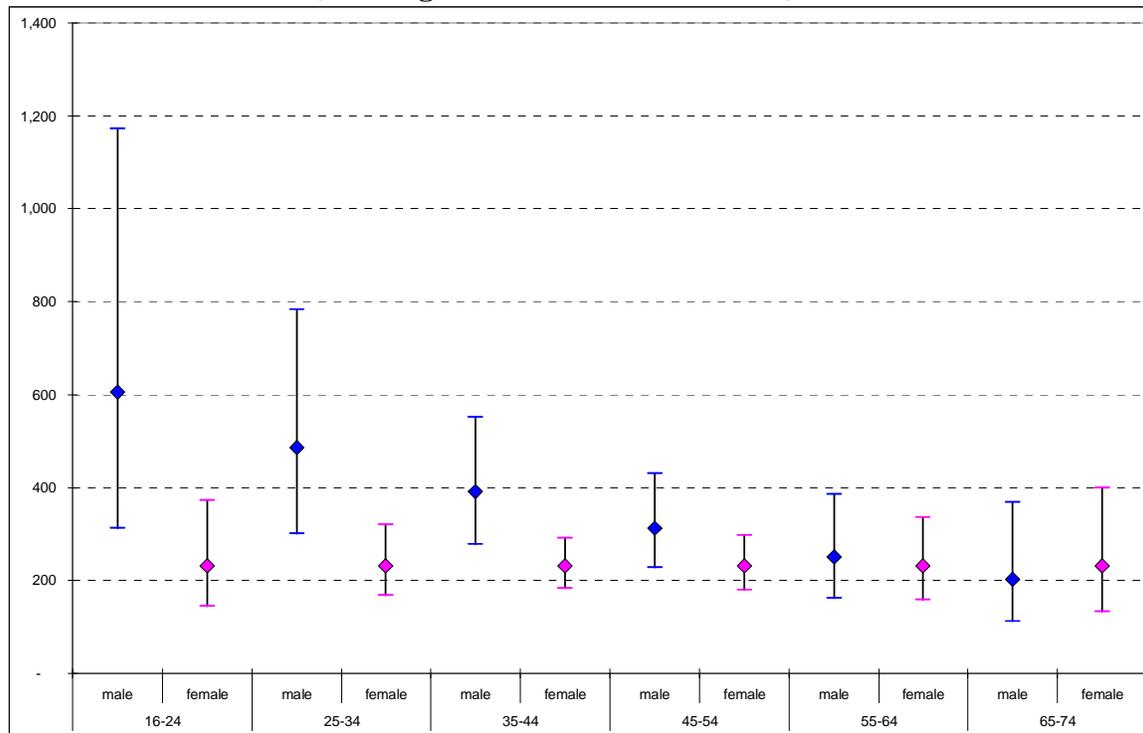


Model I, part ii (GLM): Total annual MH-related costs (if >£0)

	Robust		z	P>z	[95% conf	Interval]
	Coef.	Std. Err.				
Number of ADL difficulties	0.65	0.19	3.42	0.00	0.28	1.02
Number of ADL difficulties (squared)	-0.08	0.03	-2.30	0.02	-0.15	-0.01
Any longstanding illness	0.26	0.21	1.25	0.21	-0.15	0.68
Any trauma to self	0.75	0.21	3.57	0.00	0.34	1.16
Number of neurotic symptoms	-0.46	0.18	-2.62	0.01	-0.80	-0.12
In employment	-0.72	0.23	-3.19	0.00	-1.16	-0.28
Count of 4 disorders	0.54	0.18	3.04	0.00	0.19	0.89
Lives alone	0.43	0.19	2.25	0.03	0.06	0.81
Has a drink problem	-0.44	0.22	-2.00	0.05	-0.86	-0.01
Ethnicity black	-1.23	0.33	-3.74	0.00	-1.87	-0.58
Ethnicity Indian, Pakistani or Bangladeshi	-1.31	0.25	-5.28	0.00	-1.79	-0.82
Ethnicity other	-0.16	0.61	-0.26	0.79	-1.36	1.04
Male	1.26	0.66	1.91	0.06	-0.03	2.55
Age	-8.7E-05	0.01	-0.01	0.99	-0.02	0.02
Male*age	-0.02	0.01	-1.59	0.11	-0.05	0.01
Constant	4.79	0.49	9.73	0.00	3.83	5.76

Number of observations = 1330

Model I, part ii: Predicted total annual MH-related costs (£) (if > 0), holding all other factors constant (showing 95% confidence intervals)



Combining these results implies a significant age effect in the male population, although the size of the confidence intervals (demonstrated in the graph above) needs to be taken into account when considering the magnitude of this effect. Results change significantly when only people aged under 65 are included in the analysis, implying that age effects are largely driven by people over the age of 65.

Model I Parts i & ii combined effects with all other factors held constant

Age	Male	Female
20	£ 360	£ 174
30	£ 283	£ 171
40	£ 220	£ 167
50	£ 168	£ 160
60	£ 126	£ 153
70	£ 95	£ 143

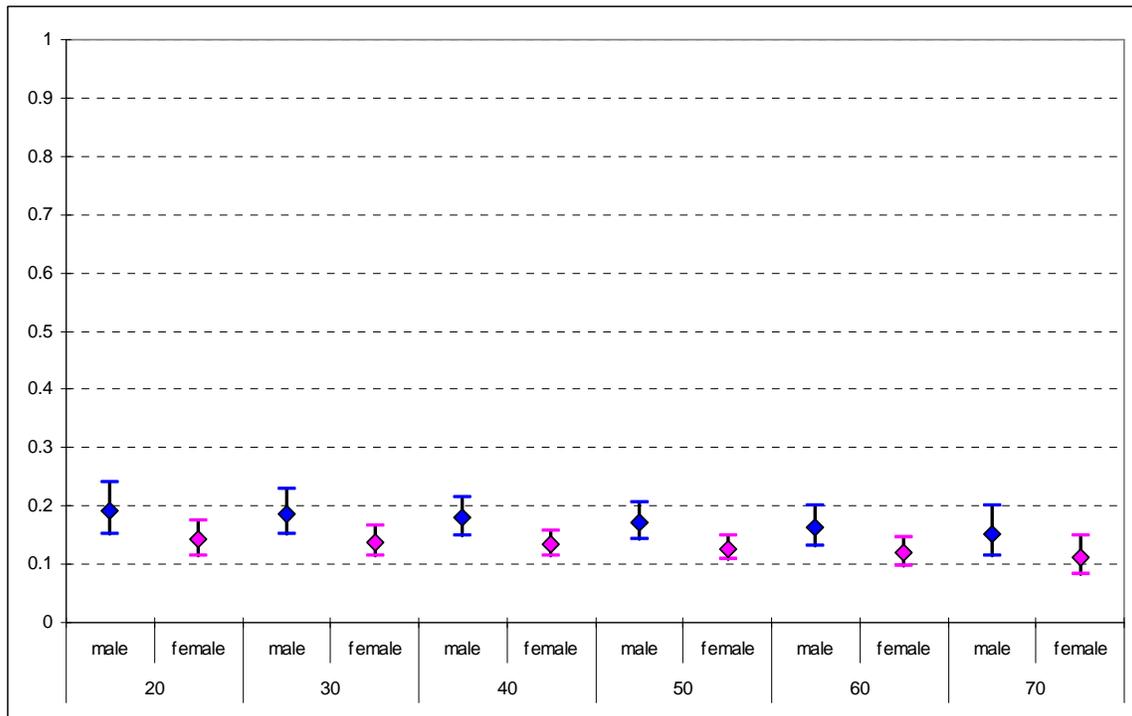
Model II: The costs of mental health services, excluding GP visits

Model II, part i (logit): Whether any MH (excluding GP cost) costs are incurred

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Any trauma to self	0.633	0.132	4.79	0.000	0.374	0.892
number of neurotic symptoms	-0.801	0.130	-6.15	0.000	-1.057	-0.546
Screen positive for psychosis	1.675	0.346	4.84	0.000	0.997	2.353
In employment	-0.811	0.145	-5.59	0.000	-1.095	-0.527
Lives alone	0.467	0.133	3.5	0.000	0.205	0.728
Ethnicity black	-0.150	0.401	-0.37	0.709	-0.937	0.637
Ethnicity Indian, Pakistani or Bangladeshi	-2.509	1.018	-2.46	0.014	-4.505	-0.513
Ethnicity other	-0.327	0.440	-0.74	0.457	-1.190	0.535
Male	0.359	0.140	2.57	0.010	0.085	0.634
Age squared	0.000	0.000	-1.27	0.205	0.000	0.000
Constant	-1.183	0.210	-5.64	0.000	-1.594	-0.772

Number of observations = 2154

Model II, part i: Predicted likelihood of use of non-GP MH services holding all other factors constant (showing 95% confidence intervals)

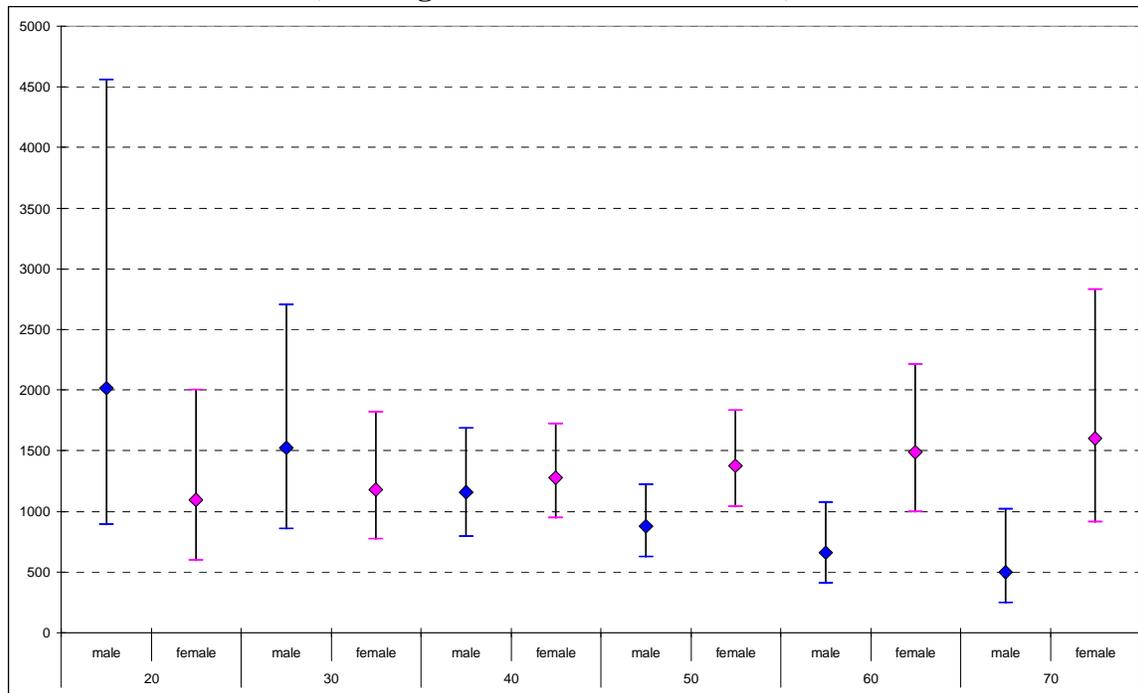


Model II, part ii (GLM) : Annual MH costs, excluding GP costs (if >£0)

	Coef.	Robust Std. Err.	Z	P>z	[95% Conf. Interval]
Any longstanding illness	0.760	0.247	3.08	0.002	0.276 1.244
Any trauma to self	0.628	0.222	2.83	0.005	0.193 1.063
Number of neurotic symptoms	-0.852	0.278	-3.07	0.002	-1.397 -0.308
Total CISR score	0.041	0.018	2.23	0.026	0.005 0.077
In employment	-0.802	0.264	-3.04	0.002	-1.318 -0.285
Count of 4 disorders	0.644	0.155	4.17	0.000	0.341 0.947
Male	1.319	0.794	1.66	0.097	-0.238 2.876
Age	0.008	0.011	0.72	0.47	-0.013 0.028
Male*age	-0.035	0.016	-2.15	0.031	-0.068 -0.003
Constant	5.792	0.622	9.31	0.000	4.572 7.011

Number of observations = 351

Model II, part ii: Predicted total annual MH non-GP costs (if > £0), holding all other factors constant (showing 95% confidence intervals)



Model II Parts i & ii combined effects, all other factors held constant

Age	male	female
20	£ 387	£ 156
30	£ 286	£ 164
40	£ 209	£ 170
50	£ 151	£ 175
60	£ 108	£ 178
70	£ 76	£ 179

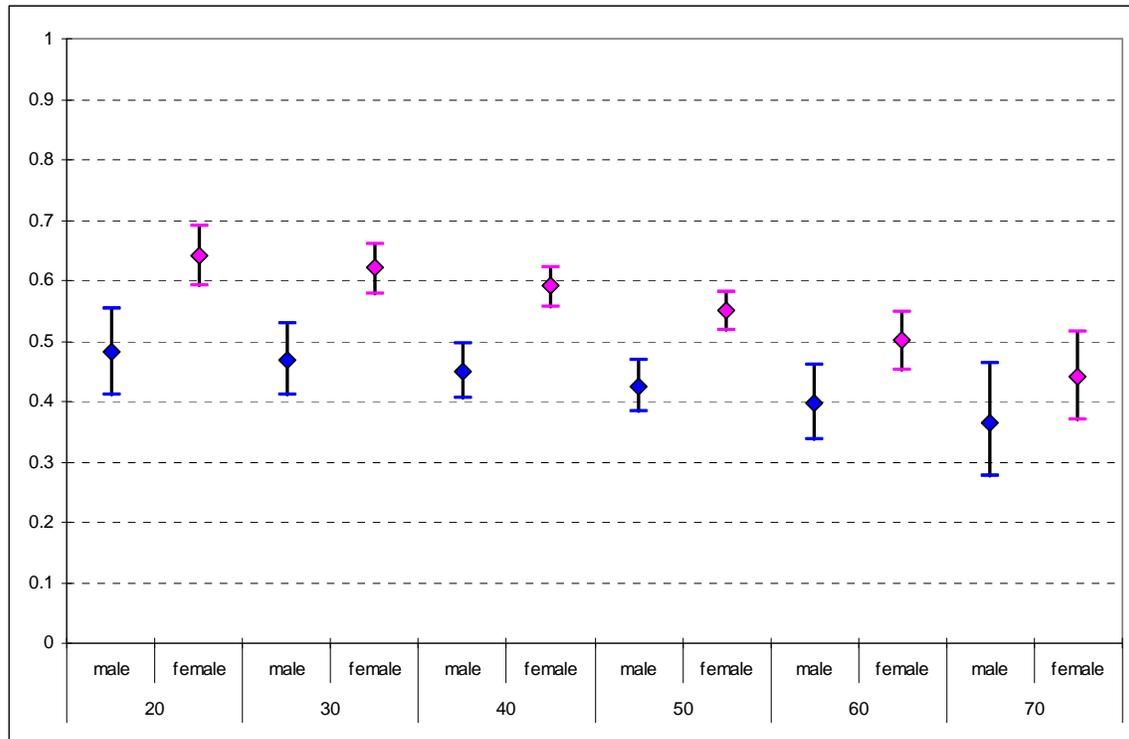
Model III Costs of visits to the GP for mental health reasons

Model III, part i (logit): Whether any MH GP cost incurred

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Gen health very good	0.232	0.216	1.07	0.283	-0.191	0.655
Gen health good	0.503	0.216	2.32	0.020	0.078	0.927
Gen health poor	0.675	0.230	2.94	0.003	0.225	1.126
Gen health fair	0.635	0.255	2.49	0.013	0.136	1.134
number of neurotic symptoms	-1.635	0.161	-10.14	0.000	-1.951	-1.319
Total CISR score	0.055	0.010	5.31	0.000	0.034	0.075
Screen positive for psychosis	1.956	0.462	4.24	0.000	1.051	2.861
In employment	-0.272	0.118	-2.3	0.022	-0.504	-0.040
Ethnicity black	-0.453	0.384	-1.18	0.238	-1.205	0.300
Ethnicity Indian, Pakistani or Bangladeshi	-0.785	0.415	-1.89	0.058	-1.599	0.028
Ethnicity other	-1.063	0.333	-3.19	0.001	-1.715	-0.410
Male	-0.689	0.200	-3.44	0.001	-1.081	-0.297
Age squared	0.000	0.000	-3.64	0.000	0.000	0.000
Male * Age squared	0.000	0.000	0.94	0.345	0.000	0.000
Constant	0.839	0.255	3.28	0.001	0.338	1.339

Number of observations = 2153

Model III, part i: Predicted likelihood of use of MH GP services holding all other factors constant (showing 95% confidence intervals)



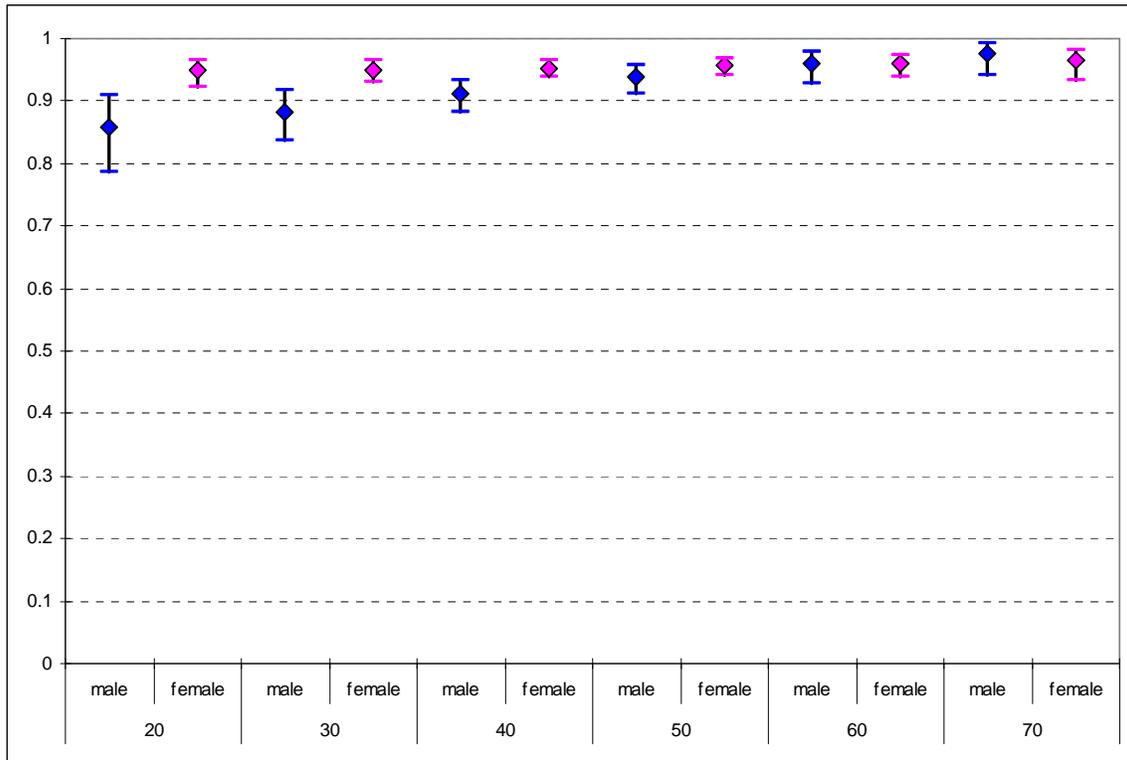
Model IV Costs of mental and physical health services

Model IV, part i (logit): Whether any MH or PH cost incurred

	Coef.	Std. Err.	Z	P>z	95%Conf	Interval]
General health very good	0.211	0.270	0.78	0.435	-0.319	0.741
General health good	0.685	0.281	2.43	0.015	0.133	1.236
General health poor	1.504	0.362	4.16	0.000	0.795	2.214
General health fair	2.596	0.640	4.06	0.000	1.342	3.850
Any trauma to self	0.552	0.204	2.7	0.007	0.151	0.952
number of neurotic symptoms	-1.801	0.206	-8.73	0.000	-2.205	-1.397
Total CISR score	0.045	0.017	2.68	0.007	0.012	0.077
Screen positive for psychosis	2.106	1.087	1.94	0.053	-0.025	4.237
In employment	-0.367	0.205	-1.79	0.074	-0.769	0.035
Ethnicity black	0.580	0.714	0.81	0.417	-0.820	1.979
Ethnicity Indian, Pakistani or Bangladeshi	-0.471	0.550	-0.85	0.393	-1.550	0.608
Ethnicity other	-0.787	0.416	-1.89	0.059	-1.602	0.029
Male	-1.233	0.339	-3.64	0.000	-1.897	-0.569
Age squared	0.000	0.000	0.86	0.390	0.000	0.000
Male * Age squared	0.000	0.000	1.92	0.054	0.000	0.001
Constant	2.541	0.373	6.81	0.000	1.810	3.273

Number of observations = 2152

Model IV, part i: Predicted likelihood of use of MH or PH services holding all other factors constant (showing 95% confidence intervals)

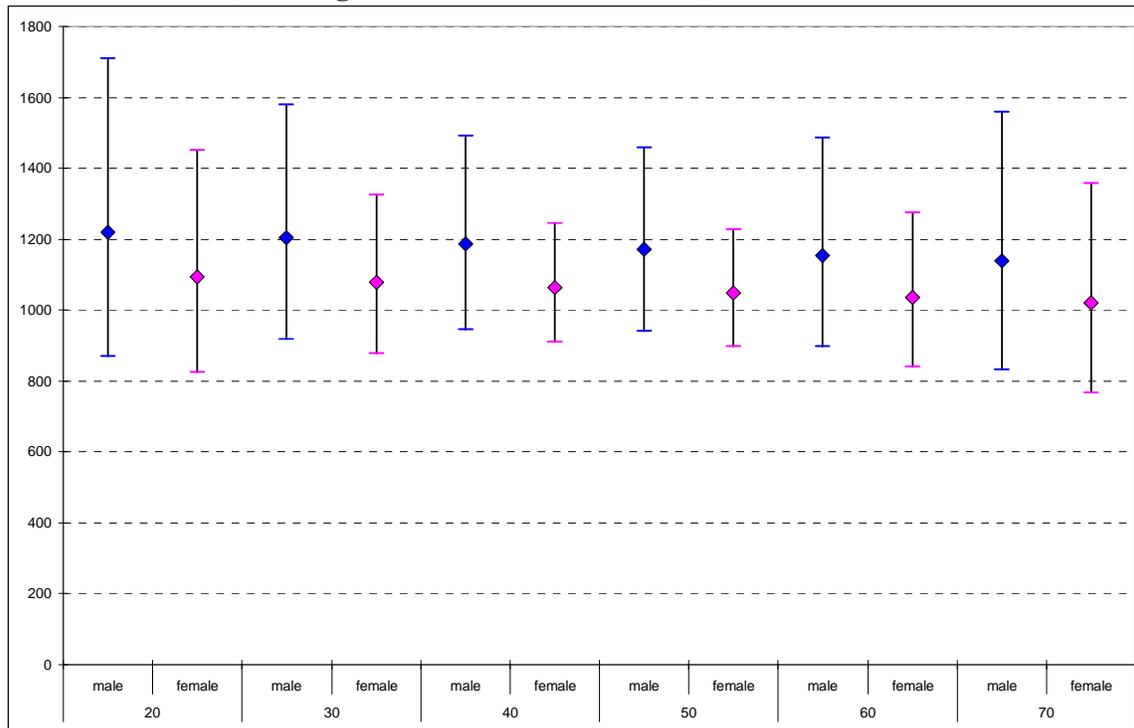


Model IV, part ii (GLM): Annual MH and PH costs (if > £0)

	Coef.	Robust Std. Err.	z	P>z	95%Conf	Interval]
Number of ADL difficulties	0.228	0.046	4.98	0.000	0.138	0.318
Any trauma to self	0.249	0.131	1.91	0.056	-0.007	0.505
Number of neurotic symptoms	-0.209	0.140	-1.5	0.134	-0.484	0.065
Screens positive for psychosis	0.576	0.124	4.66	0.000	0.333	0.818
In employment	-0.215	0.105	-2.05	0.041	-0.421	-0.009
Lives alone	0.746	0.218	3.42	0.001	0.318	1.174
Has a drink problem	-0.189	0.139	-1.36	0.174	-0.462	0.083
Ethnicity black	-0.212	0.257	-0.82	0.410	-0.715	0.292
Ethnicity indian, pakistani or bangladeshi	-0.498	0.220	-2.27	0.023	-0.928	-0.067
Ethnicity other	-0.345	0.265	-1.3	0.193	-0.863	0.174
Male	0.109	0.132	0.83	0.406	-0.149	0.368
Age	-0.001	0.005	-0.28	0.779	-0.011	0.008
Constant	6.582	0.302	21.79	0.000	5.990	7.174

Number of observations = 1072

Model IV, part ii: Predicted total annual MH or PH costs (if > £0), holding all other factors constant (showing 95% confidence intervals)



Model IV Parts i & ii combined effects, all other factors held constant

Age	male	female
20	£ 1,048	£ 1,037
30	£ 1,063	£ 1,025
40	£ 1,081	£ 1,014
50	£ 1,098	£ 1,004
60	£ 1,109	£ 994
70	£ 1,113	£ 985

Appendix 3

Analyses of the Beating the Blues study: people with mild-moderate depression in primary care

Background to study

Depression and anxiety are common problems and impose large economic and social burdens (Berto et al., 2000; Simon et al., 1995; Meltzer et al., 1995; Kessler et al., 1999; Spitzer et al., 1995). These costs can be substantially reduced by effective treatment (Simon et al., 2000). Patients generally prefer psychological therapies to medication (Angermeyer and Matschinger, 1996; Tylee, 2001) and the National Service Framework for Mental Health (Department of Health, 1999) has called for increased availability of such treatments for common mental health problems. A shortage of trained therapists (Goldberg and Gournay, 1997), has directed attention to alternative methods for delivering psychological therapies that offer rapid and acceptable care-pathways (Lovell and Richards, 2000). 'Beating the Blues' is an effective computerised therapy programme for anxiety and depression (Proudfoot et al., 2004). Patients were recruited in two phases from twelve general practices in South East England and included if they were between 18 and 75; were suffering from depression, mixed depression/anxiety, or anxiety disorder; and not currently receiving face-to-face psychological therapy (including counselling). Patients who consented were then randomised to 'Beating the Blues' (BtB, n=138) with usual care, or treatment as usual alone (TAU, n=123).

Service use data were collected from GP notes and other primary care sources by nurses for patients in each arm of the trial for two time periods: the six months prior to randomisation and the eight months following randomisation. These periods of time would be sufficiently long to capture the utilisation of rare (but often expensive) services as well as those more frequently used. Because data were collected from primary care sources it was not possible to measure use of social care services other than home helps (McCrone et al., 2004).

Services measured included actual contacts with mental health care staff (psychiatrists, psychologists, community mental health nurses, counsellors and other therapists); primary care staff (GPs, practice nurses, district nurses and health visitors); hospital services (in-patient care for psychiatric and physical health reasons, out-patient care, day surgery and accident and emergency attendances); home helps; medication (all medication was recorded but only data on anti-depressants, anxiolytics and sedatives were used in the analyses); and other services (chiropractors, physiotherapists, dieticians). The number of contacts with each service was recorded or, in the case of medication, the length of the course and the dosage.

Unit costs (which aim to reflect the long-run marginal costs) for most services were obtained from a recognised national source (Netten and Curtis, 2000) where staff costs were calculated by dividing the total cost (salary, on-costs, overheads, capital, land and training) of the service over one year by an appropriate unit of activity. Hospital costs

(accident and emergency, day surgery, generic in-patient, generic out-patient, psychiatric in-patient) were also obtained from the above source. Medication costs were taken from the British National Formulary (British Medical Association and the Royal Pharmaceutical Society of Great Britain, 2001). Unit costs were multiplied by the service utilisation data to generate service costs per patient. Mean total costs were £357 (sd 575) for the BtB group and £397 (sd 589) for the TAU group over the 8-month follow-up period.

Analyses

To assess the impact of age on service costs two types of regression model were used: (i) ordinary least squares (OLS) models and (ii) generalised linear models (GLMs). To address the problem of skewness in the distributions of regression residuals, bootstrapping was used to generate percentile confidence intervals around the coefficients in the OLS models. The GLM approach takes account of the skewness by using a log link and assuming a gamma distribution.

Models were built in a number of steps:

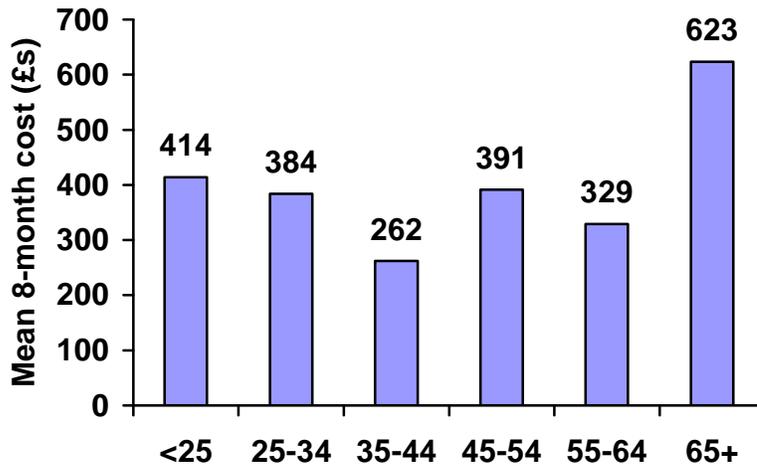
1. Age entered as a single independent variable
2. Gender entered as a covariate
3. Clinical ratings of depression (Beck Depression Inventory), anxiety (Beck Anxiety Inventory) and functioning (Work and Social Adjustment Scale) were entered as covariates and also use of antidepressants/anxiolytics/hypnotics
4. A variable was entered which indicated whether patients received computerised CBT
5. Age squared was entered to see if the relationship between age and cost was non-linear
6. Variables representing interactions between age and the other variables were entered

Patients were recruited from a number of general practices and to address the possible impact of this we used the 'cluster' option in Stata.

Results

The age distribution was as follows: <25 n=20 (7%), 25-34 n=68 (25%), 35-44 n=61 (22%), 45-54 n=54 (20%), 55-64 n=44 (16%) and 65+ n=25 (9%). The figure below shows that costs fall as age increases to 35-44. However, after that total costs increase with highest costs in the 65+ age group.

Figure A3.1: Unadjusted total costs by age group



OLS models

The following OLS models show that age does not have a significant linear impact on costs, either when entered as a single independent variable or with other patient characteristics. However, STEP 5 shows that age does have a significant non-linear impact on costs. The coefficients on the age and age-squared variables allow us to plot this relationship (Figure A3.2). Costs fall with age up to around 42 years, and then costs increase. Only one interaction effect was significant – older patients who used computerised CBT had reduced costs (coefficient -£9.3, 95% CI -£21.9 to -£0.2).

STEP 1

Variable	Coefficient	SE	95% CI
Age	2.24	2.98	-4.94 to 6.47
Constant	277		

STEP 2

Variable	Coefficient	SE	95% CI
Age	1.80	3.04	-5.68 to 6.24
Female	-204	108	-441 to -2
Constant	446		

STEP 3

Variable	Coefficient	SE	95% CI
Age	2.51	2.37	-3.04 to 6.39
Female	-223	140	-539 to 6
Baseline depression	13.52	8.15	0.53 to 31.66
Baseline anxiety	3.98	5.90	-7.18 to 16.00
Baseline functioning	-8.16	7.95	-26.55 to 3.56
Constant	160		

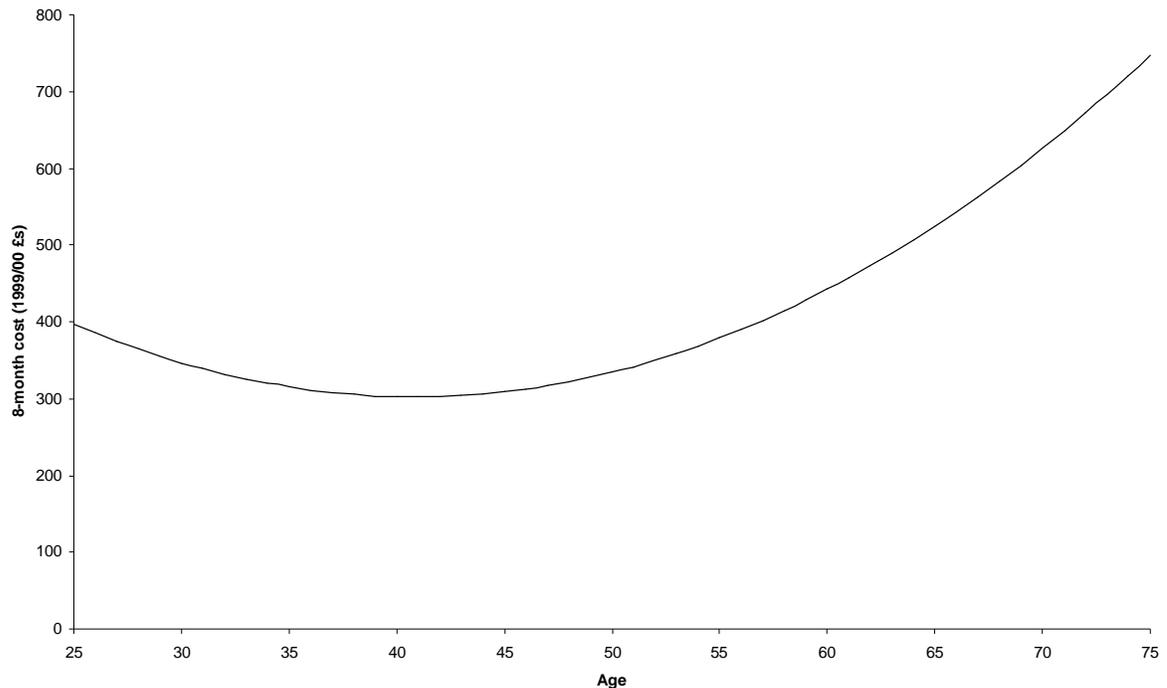
STEP 4

Variable	Coefficient	SE	95% CI
Age	2.46	2.26	-2.47 to 6.47
Female	-221	138	-558 to 8
Baseline depression	13.19	7.86	1.05 to 31.84
Baseline anxiety	4.10	5.87	-6.80 to 16.60
Baseline functioning	-7.84	8.16	-29.21 to 4.18
Use of cCBT	37.9	65.8	-94.2 to 170.8
Constant	141		

STEP 5

Variable	Coefficient	SE	95% CI
Age	-31.01	16.18	-66.53 to -2.74
Age squared	0.38	0.17	0.09 to 0.74
Female	-219	132	-516 to -7
Baseline depression	13.97	7.65	0.64 to 31.06
Baseline anxiety	3.32	5.91	-7.67 to 15.87
Baseline functioning	-6.82	7.27	-23.38 to 4.34
Use of cCBT	30.9	66.1	-95.0 to 164.7
Constant	790		

Figure 2: Impact of age on costs (controlling for patient demographic and clinical characteristics)



General linear models

The analyses using GLMs revealed that age had a positive impact on costs when gender and clinical characteristics were entered into the model. In STEP 5 the age-squared variable was significant, again indicating a non-linear effect of age.

STEP 1

Variable	Coefficient	SE	95% CI
Age	0.0052	0.0069	-0.0083 to 0.0186
Constant	5.7		

STEP 2

Variable	Coefficient	SE	95% CI
Age	0.0063	0.0057	-0.0048 to 0.0174
Female	-0.52	0.21	-0.93 to -1.10
Constant	6.0		

STEP 3

Variable	Coefficient	SE	95% CI
Age	0.0083	0.0039	<i>0.0006 to 0.0161</i>
Female	-0.43	0.21	-0.84 to -0.03
Baseline depression	0.029	0.011	0.006 to 0.051
Baseline anxiety	0.014	0.014	-0.014 to 0.042
Baseline functioning	-0.019	0.014	-0.046 to 0.009
Constant	5.2		

STEP 4

Variable	Coefficient	SE	95% CI
Age	0.0087	0.0038	<i>0.0013 to 0.0162</i>
Female	-0.41	0.21	-0.83 to -0.002
Baseline depression	0.027	0.011	0.004 to 0.049
Baseline anxiety	0.016	0.014	-0.011 to 0.042
Baseline functioning	-0.016	0.015	-0.046 to 0.013
Use of cCBT	0.141	0.139	-0.132 to 0.413
Constant	5.0		

STEP 5

Variable	Coefficient	SE	95% CI
Age	-0.0607	0.0351	-0.1295 to 0.0080
Age squared	0.00078	0.00038	<i>0.00003 to 0.00152</i>
Female	-0.39	0.22	-0.83 to 0.04
Baseline depression	0.026	0.011	0.004 to 0.048
Baseline anxiety	0.014	0.014	-0.014 to 0.041
Baseline functioning	-0.012	0.014	-0.040 to 0.015
Use of cCBT	0.142	0.123	-0.110 to 0.395
Constant	6.4		

Analyses for patients aged up to 65 only

The analyses were repeated for those sample members aged up to age 65. The table below summarises the final step of the analysis (using OLS with bootstrap). The significant age effect now disappears – within this ‘younger’ sub-sample there is no significant age-cost association. The non-linear association found with the earlier OLS analyses for the full sample has not been replicated.

Final regression equation for people aged up to 65 only

Variable	Coefficient	SE	95% CI
Age	-24.44	23.61	-74.44 to 14.60
Age squared	0.2819	0.2684	-0.1607 to 0.8456
Female	-237.77	148.69	-568.47 to 11.95
Baseline depression	11.623	8.867	-4.043 to 31.354
Baseline anxiety	3.502	6.135	-8.696 to 16.298
Baseline functioning	-5.097	7.803	-24.571 to 5.819
Use of cCBT	70.636	48.091	-3.865 to 190.101
Constant	703.75		

Conclusion

These analyses have shown weak evidence for a linear impact of age on costs (through the GLM but not the OLS model). There was stronger evidence for a non-linear effect with costs falling with age initially and then increasing. Other variables may be related to both age and costs and so these results should be treated with some caution.

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Appendix 4

Analyses of data from the Schizophrenia Care and Assessment Program

The SCAP (Schizophrenia Care and Assessment Program) is a longitudinal study conducted by the pharmaceutical company Eli Lilly. The prospective, non-randomised observational study sampled a representative group of 600 people with schizophrenia living in private households or institutions, each of whom met the diagnostic criteria for schizophrenia, schizophreniform or schizoaffective disorder (295.10, 295.20, 295.30, 295.40, 295.60, 295.70 or 295.90) according to DSM-IV (American Psychiatric Association, 1994).

The sample was drawn from across the UK in a multi-centre study with stratified sampling to ensure adequate representation of patients with different severity levels. The age range was from 18 to 82 (39 patients were age 65 or older). Patients were assessed at baseline and at 6-month intervals over three years by an assessor independent of the usual clinical care of the patient. Outcomes assessed for each patient include schizophrenia-specific symptoms, functioning, general health status, quality of life, health utility, mental health resource utilisation, and safety and welfare.

Inclusion criteria for the study were: male or female patients; 18 years of age or older; have a level of understanding sufficient to communicate with the investigator and also have the ability to read and communicate using simple English; be reliable and must agree to co-operate with all tests and examination required by the protocol; understand the nature of the study and must be competent to sign an informed consent document; fulfil the criteria of schizophrenia, schizoaffective disorder and schizophreniform disorder; be reachable by telephone or mail; be either (i) patients who received inpatient psychiatric care for schizophrenia within the year prior to the date of written informed consent, or (ii) patients who had not received inpatient psychiatric care for schizophrenia within the year prior to the date of written informed consent.

Patients were excluded if they were involved in controlled clinical drug trials within the 30 days prior to entry into the study or were people that the site believed would not be available for follow-up assessments.

The study collected a range socio-demographic variables (age, gender, ethnicity, education, marital status), mental health and general health indicators (PANSS, MADRS, AIMS, GAF, BARNES, QLS, SA, EQ5D, SF12), activity of daily living measures and service use, derived from face-to-face assisted self-administration questionnaires.

Variables used in the regression analyses

Dependent variable: Total costs at Time 2 which covers resources used from baseline to 6 months into the study. Unit costs for each service used were estimated at 2005 prices (Netten and Curtis, 2005) and are listed in Table A4.2 below.

Data on service use were collected for contacts with general practitioner (GP), psychiatrist, psychologist, social worker, health visitor, occupational therapist, community psychiatric nurse (CPN), other nurse, support worker, drug & alcohol worker, employment agency worker, crisis team, workshop, day hospital, acute and psychiatric hospitals, day centre, attendance at accident and emergency unit. The costs of residence in long stay hospitals, nursing homes and sheltered homes with mental health workers either present or visiting are also included in the estimation of total costs.

Resource use data were obtained mainly from patients' hospital notes (inpatient and outpatient) and CPN notes. GP notes were used if the details not otherwise available. Patient self-report data were also collected to complete the picture.

Potential cost predictors: Mental health indicators, general health indicators, activities of daily living, socio-demographic indicators, and medication adherence. Details of the schedules, variables and scoring are given below.

PANSS: The Positive and Negative Symptom Scale (PANSS) (Kay et al., 1987) is the most frequently employed rating scale for assessing positive symptoms, negative symptoms and general psychopathology, specifically for schizophrenia. It consists of 30 items each scored on a scale from 1 (absent) to 7 (extreme).

MADRS: The Montgomery-Asberg Depression Rating Scale (Montgomery, 1979) is a widely used instrument to assess depressive symptoms. It consists of 10 items each scored on a scale from 0 (absent) to 6 (extreme).

AIMS: The Abnormal Involuntary Movement Scale (Guy, 1976) is used to rate extrapyramidal symptoms. It consists of 12 items, 10 items scored on a scale of 0 (absent) to 4 (severe) and 2 items scored yes/no.

SA: The Simpson-Angus Scale (Simpson and Angus, 1970) assesses medication side-effects. It consists of 10 items scored on a scale of 0 (normal) to 4 (extreme).

Barnes Scale: The Barnes Akathisia Rating Scale (Barnes, 1989) assesses pseudoakathisia and akathisia. The scale consists of four major sections, with sections 1-3 containing 3 items and the last section containing 4 items. Items are scored on a scale of absence (0) to severe (4).

GAF: The Global Assessment of Functioning is used to assess patient functioning. It consists of a single rating of patient functioning (incorporating psychological, social and occupational functioning) on a hypothetical continuum of mental health illness. The single rating is on a scale of 0 (worst) to 100 (best).

EQVAS: Patients record their own assessment of their health status on this visual analogue scale from the EQ5D, with end-points of 100 (best imaginable health) at the top and 0 (worst imaginable health) at the bottom.

SF12: This is the 12-item version of the Short Form 36 used to assess mental and physical health.

Data from the **Heinrichs and Carpenter Quality of Life Scale**, the **EQ5D** and the **Drug & Alcohol Use** measure were not included in these analyses because the high level of missing values would have considerably reduced the sample size available for the regression analyses. In analyses using a smaller sample, these measures did not appear to add significantly to the model reported here.

Daily life activities: If the person was able to do these activities, scored yes/no.

Dahouse - household chores: 1=able to do; 0=no

Dalaund - own laundry: 1=able to do; 0=no

Daplan - plan meals and purchase food or household items: 1=able to do; 0=no

Daprep - prepare simple meals: 1=able to do; 0=no

Dashop - shop for personal necessities: 1=able to do; 0=no

Liesure activities: If the person engaged in the activity, scored yes/no.

Laprep - prepare food for self or others: 1=yes; 0=no

Larest - go to a restaurant or café: 1=yes; 0=no

Lashop - go shopping: 1=yes; 0=no

Lahoppby - do something fun like hobby, sport, crafts etc: 1=yes; 0=no

Social activities: The number of times person spent time with others doing things; 1= once a day, 2=once a week, 3=once a month, 4=less than a month 5=not at all.

Satime - spend time with someone more than friend, e.g. spouse.

Saplan - planned event with someone

Safriend - do things with friends

Age: continuous variable

Gender: 1=male; 0=female

Highest educational qualifications: 1=primary, 2=A-level, 3=tertiary

Marital status: 1=married, 2=never married, 3= widowed, 4=divorced, 5=separated

Medication Adherence: rated from 1= never missed taking medication, to 5= stopped taking medication

A number of regression equations were estimated, exploring the patterns of association between age (measured in various ways) and costs, while adjusting for other patient characteristics that might have an influence on costs. The final equation – which was felt to best represent the underlying associations – is summarised in the table below. The equation includes a number of variables that do not reach 95% significance but which need to be included in order to adjust for key factors (such as general physical health) and because of collinearities with other included variables. Significant variables are age (with a nonlinear association with costs), education, global functioning (measured by the GAF), negative symptoms (from the PANSS), some ADL indicators and medication adherence.

Table A4.1: OLS regression results with bootstrap adjustment

Variables	Coef	Std. err	Z	P>z	95%CI from the bootstrap analysis	
Constant	19185	8901.9	2.16	0.031	1737.7	36632
Age	-6663.44	234.73	-2.83	0.005	-1123.5	-203.37
Age squared	5.7987	2.5026	2.32	0.020	0.8937	10.704
Gender male	1660.7	1105.4	1.50	0.133	-505.82	3827.2
Marital	802.55	464.03	1.73	0.084	-106.95	1712.0
Education	11546.2	686.55	2.25	0.024	200.56	2891.8
GAF_T1	-128.32	52.867	-2.43	0.015	-231.94	-24.705
PANSneg_T1	268.80	121.99	2.20	0.028	29.708	507.89
PANSpos_T1	51.398	116.68	0.44	0.660	-177.30	280.09
MADRS_T1	-146.66	92.785	-1.58	0.114	-328.52	35.194
SA_T1	1722.3	1936.9	0.89	0.374	-2073.9	5518.6
DAhouse_T1	1316.4	511.52	2.57	0.010	313.85	2319.0
DAlaundry_T1	-2173.9	466.09	-4.66	0.000	-3087.4	-1260.3
DAplanmeals_T1	874.19	468.05	1.87	0.062	-43.176	1791.6
DAPreparemeal_T1	712.29	470.48	1.51	0.130	-209.84	1634.4
LArestarant_T1	1761.0	1167.3	1.51	0.131	-526.85	4048.9
LAsshop_T1	-2846.2	1937.3	-1.47	0.142	-6643.2	950.74
Medaherence_T1	-2642.8	575.09	-4.60	0.000	-3770.0	-1515.7
SF12mc_T1	104.04	68.398	1.52	0.128	-30.016	238.10
SF12pc_T1	-35.853	58.637	-0.61	0.541	-150.78	79.073

Notes: $R^2 = 0.2106$; Adj $R^2 = 0.1794$; $N = 501$

Table A4.2: Unit costs 2005 used in SCAP cost calculations

GP consultations	£25 / consultation. 12.6 minutes
Psychiatrist	£204 / hr of patient contact. 30 minutes average contact
Psychologist	£72 / hr of client contact. 30 minutes
Social worker	£106 / hr of face to face contact. One hr.
Health visitor	£67 / hr of client contact. 20 minutes.
Occupational therapist	£42 / hr of client contact. 30 minutes.
Community psychiatric nurse	£66 / hr of client contact. 20 minutes.
Other nurse	£44 / client contact. 20 minutes
Support worker- health funded	£19 / hr with patient. 20 minutes.
Drug/Alcohol workers	Alcohol health worker, A&E. £20 / clinic consultation
Workshop	£8.70 gross per hr. ½ a day.
Employment agency worker	£8.70 / hr. 1hr.
Crisis Team	£66 / hr of client contact. 20 minutes. (CPN costs used)

Acute, Psych & Special hospitals	£208 / bed day (MH acute care)
Day hospital	£29 / session (NHS Trust Day Care)
Day Centre	£19 / session (LA day care)
Accident & Emergency	£110 / attendance (National average, first attendance)
Medications (Mean costs from UK-SCAP)	Household sample: £1.72 per patient per day Institutional sample: £2.16 per patient per day
Long stay hospitals	£166 / day. NHS long-stay hospital for people with mental health problems.
Nursing homes	£269 / week. Private sector residential care for people with mental health problems.
Sheltered homes with mental health workers present	£437 / week. LA residential care (staffed hostel) for people with mental health problems.
Sheltered homes with mental health workers visiting	£83 / week. LA residential care (group home) for people with mental health problems.

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