# Kent Academic Repository

**Forder, Julien E. (2008)** *The Costs of Addressing Age Discrimination in Social Care (PSSRU Discussion Paper 2538).* **Personal Social Services Research Unit, University of Kent, 36 pp.**

# The Costs of Addressing Age Discrimination in Social Care

## Julien Forder

**The Costs of Addressing Age Discrimination in Social Care**
**Julien Forder**

# 1. Introduction

Historically PSS expenditure per head on older people using social care services has been lower than for other adult client groups. Along with a number of investigations (e.g. Age Concern England 2008), this difference is taken as a possible indicator of age discrimination in the deployment of services. The UK government is proceeding with the introduction of a Single Equality Bill during this Parliament. One of the proposals is to outlaw age discrimination in the provision of public services. This report seeks to gauge the extent of age discrimination in council-funded social care services for adults (people 18 or over). It draws on a quantitative analysis of the level of support provided to service users. Lower expenditure per head on services may indicate age discrimination, but there are also a range of 'legitimate' reasons for this pattern of spending. The analysis aims to determine whether people in different age groups are treated differently after these 'legitimate' differences are removed.

To make such an assessment requires us to be explicit about the equality principles being used to define age discrimination (Burchardt 2006). We consider a number of equality principles, of which an equality of opportunity principle appears most relevant. In any case, the lower support levels for older people may not be inconsistent with such a principle for a number of reasons. First, younger adults may have greater levels of impairment or need on average than older people. Caring for people with complex needs will be more difficult and require more resources. Achieving an equal level of outcome for an individual will require more input and support the greater their level of need. Second, the balance of everyday functioning and activities that people achieve that impact on their outcomes may be different for different age groups. This is not to condone different outcomes overall for different age groups, but rather different aspects will matter more or less for different groups. For example, employment opportunities will matter more to younger people than to older people, and this may be more costly. Third, the outcomes that people experience without services may differ

between age groups (after need adjustment), implying, in as far as this baseline difference is considered relevant, a lower level of support needed to achieve equal outcomes between different age groups. Fourth, there could be natural cost efficiencies in the provision of services to different groups. There may be economies of scale in services for older people; for example, the average size of care homes for older people is 34 places compared to nine places for younger adults (Commission for Social Care Inspection 2008, p43).

Because of these factors and others, we cannot make a judgement about age discrimination by looking at levels of public expenditure alone. We require data sources that have information on social care and other service use, outcomes and needs for different age groups. However, the routine data sets collected about social care correspond to service areas not individual service users. They do not, furthermore, have information on needs and outcomes. We therefore use two survey-based datasets: the British Household Panel Survey (BHPS) and the national evaluation of Individual Budgets (IBSEN) survey.

This report describes the analyses of existing data. We do not undertake a systematic review of the relevant literature, although some reference is made to previous work that might guide the analysis and its interpretation. In this report, the focus is only on publicly funded services for adults. It is structured as follows. First, we consider a framework for analysis and consider how to specify an empirical model to test hypotheses about age discrimination in the data. Second, we describe the data and the empirical modelling, using the BHPS and IBSEN data. Third, we describe and discuss the results. Fourth, we outline some conclusions about the likelihood of age discrimination in social care services for adults.

## 2. Relevant concepts regarding age discrimination

We are concerned with equality between age groups in relation to the use of public social care services. But how is equality in this sense measured? Three approaches can be distinguished:

- Equality of resources
- Equality of outcome
- Equality of opportunity

Burchardt (2006) adds equality of process to this list, but goes on to argue that the substantive aims of an equality of process principle can be better interpreted within a framework of equality of outcome or opportunity.

## Equality of resources

Equality of resources is essentially the idea of an equal share of public support. Within broad categories of eligibility, anyone who qualifies receives equal levels of support. Much depends in this case, on how the eligibility categories are defined, how broad they are and how the resources are provided. A relevant example might be that anyone who passes an eligibility hurdle based on their disability alone receives equal level of service. In this example, ability to draw on private resources such as informal caring or paid care, or the degree or type of impairment above the threshold is ignored. If support is provided as equal services, then this principle would also mean that people's individual preferences were not taken into account.

Limited account of people's preferences and values might be seen as a limitation with this principle, but the primary shortcoming is that people with high levels of need (which may be through no fault of their own) will have the same support as someone who just exceeds the eligibility threshold. In practice, this will often mean that people with high levels of need (or with less common preferences) will obtain lower outcomes – lower levels of well-being or functioning.

## Equality of outcome

Defining outcomes in terms of achieved levels of well-being or functioning, a principle of equality of outcome would require that more resources go to people with higher levels of need. For example, people who have difficulty performing activities of daily living (ADL) will need higher levels of support (Wanless, Forder et al. 2006).

In theory, having identified how to compensate for this need, people are given the level of service input necessary to achieve equal outcomes, given their needs. Difficulties arise, however, where choice is also valued. Where people can choose to some extent how they use any support being provided there is no reason to expect that people with different preferences, but the same needs, would achieve the same outcomes. For example, if we were interested in a policy that strived for equal personal dignity (i.e. being clean, dressed, etc.) then to achieve equal outcomes, personal care services would have to be provided equally after accounting for levels of need. But this would deny choice. People who had less of a preference for personal dignity and more for self-autonomy, more leisure, or whatever,

would do less well in overall terms. Their well-being, which concerns a much broader set of outcomes, would be lower.

The apparent answer would be for the policy to seek to ensure equality of outcome in broad well-being terms. This might work in theory, but in practice it would require anticipating every individual's choices and providing sufficient support on an individual basis so that everyone achieved the same well-being level, given their preferences and needs. Furthermore, as Burchardt (2006) notes, there is the additional problem of individual agency or responsibility. Suppose in some general sense that people's outcomes depend on the amount of personal effort they make; Burchardt gives the example of a person training for a marathon. Then equally of outcome would require support to be given in *inverse* proportion to that effort; otherwise people who put in more effort than others would end up with higher outcomes. This requirement to offset effort under a (strict) equality of outcome principle seems intrinsically unpalatable.

## Equality of opportunity

A solution to these problems is not to enforce equality of outcomes actually achieved, but rather *potential* outcomes, or more generally, the opportunity to achieve outcomes. In this case, we are content only to ensure that people have sufficient support to have the opportunity to achieve target outcomes, whether they choose to do so or not. How people actually choose to use support and what actual final outcomes they achieve are therefore irrelevant. People do not (in any meaningful sense) have any *choice* about their levels of need and so equality of opportunity *would* require support levels to take these factors into account.

In fact, the exact form of the equality of opportunity principle adopted really depends on what factors are deemed to be either under the control or outside the control of individuals. Many factors will impact on the outcomes a person could potentially achieve. In addition to their personal choices and effort, there are: the private resources they are endowed with, their needs and characteristics – e.g. natural talents, age, gender – the institutional context in which they live and so forth. Which of this latter list are legitimately beyond the control of individuals – and therefore grounds for compensation – needs to be determined.

The *capability* approach (Sen 1985; Sen 1993; Sen 1999), focuses on ensuring that people have the same *substantive freedoms*, that is, the capability to achieve the same outcomes should they choose to do so. In this way, equality of capability requires account and compensation for all factors on the above list, apart from preferences and effort. In side-

stepping many of the problems and issues with the equality principles summarised above, the capability approach has gained significant policy appeal (Burchardt, 2006).

## Age discrimination

Age effects in relation to social care can broadly take two forms. First, age may be seen as a direct need factor. Even after measuring impairment and disability (whose presence is correlated with age), it may be that older people need more help to achieve the same things in life as younger people. In other words, is there some sense in which 'frailty' exists that is more than impairment or disability? If the answer is yes, then under an equality of capability approach (and also an equality of outcome approach) as well as compensating for impairment and disability, support should also *positively* compensate for age, other things equal. If no, then after compensating for impairment, disability and other factors, support should be neutral with respect to age.

Here we are concerned with the role of public social care support. Capabilities will depend on the amount of that support, and so on, but also on other public services and the other wealth or endowments people possess. For example, the capability to have a good social life will depend on social care, but also on other services (e.g. transport and leisure), wealth (in accessing private entertainment), and on having an existing network of friends and family.

We need to consider the possibility that given other needs, older people have better capability and outcomes than younger people regardless of the social care services they use. Or alternatively, that older age makes it easier to achieve outcomes than being younger. As to the former, social care is but one form of support that older people experience. An example of the latter might be that through having gained greater experiences of life, older people are better able to cope with adversity like illness or disability. There is a fine line in this example, between a situation where an older person really is better able to cope, and where they think they should be because of societal expectations. But if the former were true, we need to accept that under a capabilities or outcomes equality principal, older people would need *less* support to achieve the same capability. There is evidence that the latter is true, at least with regard to health care services (see Dixon Woods, Kirk et al. 2005, for a review). In this case it becomes especially important to measure 'objective' well-being and capability (both as regards use of services and in other aspects of people's lives), rather than 'satisfaction' (Kahneman 2000). This work is being developed in social care (see Forder, Netten et al. 2007).

In measuring such an effect we would need to clearly delineate between capability produced by public social care services (at mean age) and 'residual' capability that exists in addition to any service effect. If residual capability was higher for older people for appropriate reasons, then equality of capability might require that social care support for older people was less than for younger people. In some sense we might think of residual capability as some (inverse) need factor, going beyond impairment and personal characteristics.

Much of this argument will depend on the exact equity principle being adopted. Social care services could compensate to some of extent for deficits of capability resulting from these other factors, but which ones and to what extent it? We might see a case for social care to compensate for differences in people's needs (perhaps including family support) and other factors that change their capability, but not for deficiencies caused by other public services.

A second age effect is as a result of discrimination, that is, a state of affairs whereby older people receive support which allows them to achieve lower levels of capability than younger people. Given need (and residual capability), support levels will be negatively correlated with age in this case.

## *Analysis strategy*

Ideally, we would measure inequality in terms of the measured differences in capabilities between age groups. We would need to be able to (a) measure capability, (b) determine that variation in capability which was relevant to the equity principle in question (i.e. allowing that capability could legitimately vary between age groups after provision of social care services, which was not seen as age discrimination) and (c) adjust for relevant needs factors.

In practice, neither of the first two requirements can be directly met. Rather we have data on need, support levels (i.e. service use by individual service users) and (some) outcome measures. All three are closely related to (relevant) capability. Other things equal, services and support (e.g. individual budgets) increase people's capability. Furthermore, although actual outcomes are not the same as potential outcomes, the two will be highly correlated especially for what Burchardt (2006) describes as *basic capabilities* – e.g. being fed, clean, safe etc. In these cases people's preferences are not likely to be systematically different. There are also some relevant *complex capabilities* where preferences would play a part (e.g. social participation). In this latter case, observed functioning is not a good proxy for capability. However, if a composite outcome tool includes a measure of a person's choice or freedom, then this will improve its correlation with capability (see Forder et al., 2007 QMF

paper). The Adult Social Care Outcomes Toolkit (ASCOT) (Forder et al., 2007) is such a tool, and a version is available in the IBSEN data.

The approach therefore that we adopt here is to estimate *utilisation functions*, either measured as the cost of service packages or the use of services – for more detail see Annex 1. The cost of service packages was calculated using service-specific unit costs. This is a way of being able to aggregate different types of services that a person is receiving in a 'package' of support i.e. each service component in the package – be it day care, home care, meals etc – is expressed in (common) cost terms using its unit cost and therefore each component can be added together. Unit costs therefore 'weight' the relative contribution of each service component in the whole package. Again, with reference to the above, we would ideally weight service inputs using a generic capability (or at least outcome) measure, but the data are not available. So we need to bear in mind that (a) cost-weighted service inputs are a proxy for the amount of 'support' a person receives in the sense of the combination of services that help a person and (b) getting support (or indeed services) cannot be directly read as an increase in capability (although it is a good proxy). In what follows, where the term 'support' is used, we actually mean the package cost (i.e. cost-weighted utilisation), notwithstanding the above points. At an individual person level, cost is synonymous with expenditure per person.

The utilisation functions are expressed as functions of need (*z*) and age (*w*). Where need factors account for the propensity of service users to gain capability from service inputs, then equal service use between age groups should imply equal capability. If differences by age group were found, then this would be suggestive of age discrimination. The function estimated from the data is:

(1) $\qquad x = \beta_0 + \beta_1 w + \beta_2 z + e$

where:
*x*  service use by the person
*w*  age of the person
*z*  needs factors (such as cognitive impairment, inability to carry out ADL tasks, etc.)
*e*  the 'error' or residual from the estimation, including unaccounted for factors
β's  the estimated coefficients (the degree to which the associated factor changes service use)

If we found that the coefficient on age was (significantly) negative (i.e. $\beta_1 < 0$), this would suggest age discrimination.

It is also possible that the care-related needs factors that we use are not sufficient to fully account for any residual capability effects as outlined above. We do not have a direct measure of capability, but we can instead use residual *outcomes* as a proxy. Two outcome measures are available in our datasets – ASCOT and the General Health Questionnaire (GHQ). We would expect services to improve outcomes. If we used actual outcomes directly in the estimation we would remove residual outcome effects but also differences in outcomes stemming from the use of services. If younger people were getting more support and with it achieving better outcomes than older people, then including outcome in the estimation would reduce the coefficient $\beta_1$ on age. We could measure the differences in outcomes directly and add them to the remaining effect shown on $\beta_1$, but making the right need adjustment is difficult. A way around this problem is to first estimate the impact of services on outcomes, given need, and then remove this effect. This first step gives a 'residual' outcome, which can then be used as a needs factor in the utilisation estimation. The first step is an estimation of:

$$(2) \qquad y = \alpha_0 + \alpha_1 x + \alpha_2 z^y + u$$

where:

$y$      outcome measure e.g. ASCOT or GHQ

$u$      error on outcomes equation

$\alpha$'s      coefficients in outcomes equation

$z^y$      needs factors that pertain to the outcome measure

Next we calculate residual outcomes: $y^R = y - \alpha_1 x$ and use this in equation (1):

$$(3) \qquad x = \theta_0 + \theta_1 w + \theta_2 z + \theta_3 y^R + e$$

where:

$\theta$'s      new coefficients in utilisation equation

In this case, age discrimination would be suggested if we (still) found a negative coefficient on the age variable (i.e. $\theta_1 < 0$).[1] If residual outcomes vary with age, then this coefficient ($\theta_1$) will be different from that estimated in the above equation ($\beta_1$).[2] This use of residual outcomes should also pick up any impact of services for different age groups having different unit costs due to cost efficiency. There is an argument that services for older people show economies of scale, and perhaps greater competition and so lower unit costs. Because we use the sample average relationship between outcomes and the (total) cost of the care package ($x$), any greater efficiency regarding services of older people will pass into the residual outcomes variable.

We should note that finding a negative coefficient on the age variable in the estimations outlined above is only suggestive of age discrimination because we cannot be completely sure that all relevant need (and residual outcome) effects are accounted for fully. Nonetheless, experimentation and testing of different specifications suggest that this problem has been minimised.

# 3. Data and empirical modelling

## *IBSEN dataset*

The Individual Budget evaluation is a randomised control trial in 13 local authorities covering the full range of client groups with interviews having been conducted in 12 areas six months after allocation to the IB or comparison group. Nearly 1000 interviews were completed with about half of the sample in the older age group – although, as we explain below, client group interviews are not equally distributed across the participating authorities.

Unusually the interviews have collected the same data for all client groups. This includes service receipt, needs both in traditional ADL terms and in the outcome domains of the Adult Social Care Outcomes Toolkit (ASCOT) measure, a measure of well-being (GHQ12), an indicator of overall quality of life and indicators of quality of care. Where people are not able to be interviewed a proxy interview was conducted with their carer. The dataset has the advantage that it reflects both current mainstream practice and the way that services are likely to develop in the future.

---

[1] We would also expect to find a negative coefficient on residual outcomes because if people have higher capability to start with or gain more from services, then they need less support.
[2] By using residual outcomes in the utilisation equation we are only accounting for this effect in as far as decision-markers actually do make adjustments. This is not to say that actual practice in making adjustments is to the 'right' level. But even if decision-makers make a partial adjustment, we should account for this effect.

## *British Household Panel Survey*

The BHPS can help us to look at whether access to public services in the general population shows any indications of age discrimination. The IBSEN analysis concerns people that are already service users and considers whether older people receive less intensive (or costly) support than younger people, other things considered. BHPS can help to see whether older people are less likely to get public supported care in the first place.

The BHPS is a nationally representative survey of households in Britain. In most recent wave, 13,600 people aged 18 and over were interviewed. By including non-service users (of all ages) as well as people that report service use, this dataset allows us to compare rates of uptake by age group. However, in investigating age effects, we need to account for confounded need and outcome effects as discussed above. In this task we are restricted to the variables in the survey, bearing in mind that the data are a nationally representative sample and not a purposive sample of potential service users. We are limited to what need and outcome variables are in the data set. Furthermore, we are limited in terms of what data the BHPS collects on service use. Of relevance, only information on use of home care and social worker services is collected. We can therefore only comment on potential age discrimination with regard to access to these two services, and not the range of services measured in the IBSEN data. Nonetheless, these service areas do serve as markers for other social care services.

The BHPS has a range of needs factors, including: health conditions, reported disability, problems with activities of daily living, and reported limitations due to poor health such as limited ability to work. There is also information on disability related benefit receipt, such as disability living allowance (DLA). On well-being or outcomes, BHPS collects the GHQ12 well-being measure and also asks questions about satisfaction with life in a number of dimensions. It also asks whether people are working, which is seen as an important outcome indicator for many people.

The outcome indicators in both the BHPS and IBSEN data are (for the most part) measures of either: satisfaction/happiness, well-being or functioning, or some combination.  Whilst all of these types of measures are likely to be strongly correlated with capability, they are not direct measures of capability.

# 4. Analysis and results

## *Access to services*

### England level

Total net expenditure by councils on social care for people with care needs is collected annually[3]. Totals for England in 2007 are given in Table 1. Almost all public spending on social care is routed through local councils.[4] Net expenditure (i.e. public spending – gross expenditure less charges from individuals) is higher in total for older people (£6.8bn) than for younger social care users. However, the numbers of people with disability in the older population is much higher. We can distinguish between numbers of people with disabilities in receipt of services at any given time, with the total respective population of people with disabilities, a proportion of which may not be accessing public services. There are no routine data concerning the latter and yet this category is most relevant for questions about access to services. Estimates of disabled populations are available from various National and other surveys.

In Table 1 we report estimates of the numbers of older people with disability as used in the Wanless Social Care Review (Wanless, 2006). These estimates draw on the General Household Survey (GHS) 2001 and the Cognitive Functioning and Aging Study (CFAS) conducted by the Medical Research Council. The central estimate is of just under 2.5m older people with some level of disability. The 'true' prevalence of learning disabilities is based on a study by Emerson and Hatton (2004), which suggests that as of 2007 over 700,000 adults 18-64 had some form of learning disability. Estimates of the population of people with physical disabilities are not available.

**Table 1. Access to services – Net expenditure, population and expenditure per head, England, 2007**

|  | Age group | |
|---|---|---|
|  | **18-64** | **65+** |
|  | **Learning disabilities** | **All with needs** |
| Net expenditure on social care £000s per annum | 2,914,814 | 6,803,738 |
| Estimated population with disability | 714784 | 2446204 |
| £ per week per head | **78** | **53** |

---

[3] PSSEX1 returns – See Information Centre for Health and Social Care
[4] The NHS might be regarded as providing some social care, but because it is very hard to untangle, this is generally considered as part of nursing support.

A simple average shows that expenditure per head in the respective population is higher among younger adults with learning disabilities. The problem with using the estimated population with disability is it gives no indication of the severity of need. We cannot tell the extent to which people in the respective populations simply choose not to approach public services because their need was modest or met in another way (e.g. through informal care), rather than having experienced barriers to accessing services.

**Individual level**

The BHPS analysis allows account to be made of severity of need and current outcomes as discussed above. Table 2 shows the (unadjusted) average take-up of social worker and home help services by age group. In both cases, but particularly home help, uptake is strongly skewed towards older people. In part, of course, this reflects the fact that service need stems from disability and that conditions which result in disability are highly correlated with age.

**Table 2. Access to services – averages in BHPS by age group, all people**

| Age group | Social worker | Home help |
|---|---|---|
| Aged 18 up to 50 | 1.8% | 0.3% |
| Aged 50 up to 65 | 1.6% | 0.6% |
| Aged 65 up to 85 | 2.9% | 4.0% |
| Aged 85 and over | 7.1% | 25.2% |
| Total | 2.0% | 1.4% |

Some 11.2% of people over 18 in the BHPS sample consider themselves to be "disabled" when asked. When we look only at this group uptake of services is much higher as we would expect. But also the age gradient is much less pronounced, especially for social work services – see Table 3. Furthermore, we are using a simple yes or no indicator for disability; a finer measure of severity of disability would further adjust the results.

**Table 3. Access to services – averages in BHPS by age group, people who self-report as disabled**

| Age group | Social worker | Home help |
|---|---|---|
| Aged 18 up to 50 | 12.2% | 3.4% |
| Aged 50 up to 65 | 7.8% | 3.1% |
| Aged 65 up to 85 | 8.9% | 10.9% |
| Aged 85 and over | 11.9% | 35.3% |
| Total | 9.6% | 8.1% |

Table 4 shows the results of further adjustment for outcomes. Reported use of social workers changes according to stated achievement of outcomes – in this case, overall satisfaction ratings with life. People reporting low levels of life satisfaction are much more likely to be using social worker services. But, again, the gradient with respect to age changes when account is made of achievement of outcomes. For the low life satisfaction, disabled group, there is some suggestion that uptake is higher among lower age groups, in stark contrast to the results in Table 2.

**Table 4. Access to social work services – averages in BHPS by age group and life satisfaction, people who self-report as disabled**

| Age group | Low life satisfaction | High life satisfaction |
|---|---|---|
| Aged 18 up to 50 | 17.2% | 6.6% |
| Aged 50 up to 65 | 9.6% | 5.1% |
| Aged 65 up to 85 | 12.5% | 6.9% |
| Aged 85 and over | 13.3% | 11.4% |

These results testify to the importance of adjusting for need and outcomes. In this case, we need to simultaneously account for a wide range of need, outcome and other factors. To this end, multivariate analysis is used as outlined above[5]. We estimate functions with and without residual outcomes included.

Table 5 gives the results of this analysis for social worker service use (without residual outcomes)[6]. The table lists the factors used to explain uptake of social worker services. The coefficients reported in the table are the estimated change in the percentage chance of uptake of the service for the change in the listed factor. At the mean, some 1.9% of the sample use social worker services. Each coefficient in the table is marginal effect of the listed service expressed in terms of a change in this mean level of service use (and is therefore small). Also reported is the relative contribution percentage; the relative importance of the listed factor in determining the use of social worker services. For example, males are 17.6% less likely to use social workers than females. People that say that health limits their ability to work are 48% more likely to use these services than people who do not think that their health limits their ability to work.

---

[5] A probit analysis is estimated using STATA 9. The dependent variable is a 0/1 variable according to whether a person used the service in question within the last year or not.
[6] This is an estimation of equation (1).

The probability reported in the table is the level of statistical significance. It is the probability that the reported coefficient is meaningful in the sense of being different from zero (i.e. no effect). Generally speaking estimates with a probability of less than 0.05 (i.e. 5%) are regarded as significant, and less than 0.1 as borderline significant.

With regard to age, the average age in the sample was 48 years. A person who is 1 year older than this is 0.66% *less* likely to access social worker services. A person who was 75 years old would be approximately 18% less likely than a person at the average age, all other things considered. This effect may be relatively modest in size, but it is strongly significant. Being an estimate, the actual value may be slightly higher or lower. We can say with 95% confidence, that the actual value lies within the range of -0.39% to -0.94% (where the point estimate is -0.66%).

Table 6 reports the equivalent analysis results for the home care services. In this case, the needs and outcomes factors show a similar pattern to the social worker estimation. However, for home care, age is not a significant factor *at the mean age*; being a year older or younger than the mean age of 48 has no meaningful effect on the chance of receipt. However, these marginal effects change by age group. The average age of people in the oldest age group (85 or over) is 88 years. For this group, those who are a year older (i.e. 89) are significantly *more* likely to be in receipt of home care, accounting for other factors. We cannot definitely rule out having missed some relevant need factor, but otherwise this finding suggests that for the oldest age group, some general age-specific frailty factor has a bearing on eligibility for home care. In some sense, this finding can be regarded as an indication of positive age discrimination in that the very old are more likely to be in receipt of support. However, a more negative view is that people are offered services just because they are old, and not necessarily because they have need. We discuss these implications below.

**Table 5. Access to a social worker – probit analysis**

| Variable | Coeff | Relative contribution | Prob |
|---|---|---|---|
| Age, +1 year | -0.01% | -0.66% | <0.001 |
| Male | -0.35% | -17.60% | <0.001 |
| No. ADL problems , +1 problem | 0.40% | 19.73% | <0.001 |
| Most recent year of data | 0.16% | 7.73% | 0.089 |
| Health limits ability to work | 0.97% | 48.01% | <0.001 |
| Disabled person | 1.03% | 50.89% | <0.001 |
| Anxiety, depression or psychiatric problems | 1.50% | 74.15% | <0.001 |
| Alcohol or drug related problems | 0.73% | 35.96% | 0.114 |
| Cancer | 0.47% | 23.41% | 0.152 |
| Stroke | 0.48% | 23.83% | 0.120 |
| Is working | -0.94% | -46.56% | <0.001 |
| Temp job | -0.40% | -19.86% | 0.247 |
| Person has deafness | 0.36% | 18.02% | 0.140 |
| Person has blindness | 0.78% | 38.44% | 0.015 |
| Owns home | -0.77% | -38.19% | <0.001 |
| Lives as couple | -0.57% | -28.20% | <0.001 |
| N | 25433 | | |
| Overall fit (chi sqrd) | 1137.57 | | |
| Prob > chi2 | <0.001 | | |
| Pseudo R2 | 0.2266 | | |

**Table 6. Access to a home care – probit analysis**

| Variable | Coeff | Relative contribution | Prob |
|---|---|---|---|
| Age (logged) | 0.11% | 11.78% | 0.021 |
| Age (logged) - 18-50s | -0.01% | -1.56% | 0.044 |
| Age (logged) - 50-65s | 0.00% | -0.19% | 0.839 |
| Age (logged) - 85s & over | 0.01% | 1.13% | 0.323 |
| *Age (at mean)* | *0.002%* | *0.24%* | *0.078* |
| Male | -0.04% | -4.11% | 0.004 |
| No. ADL problems , +1 problem | 0.07% | 7.39% | <0.001 |
| Most recent year of data | 0.02% | 1.66% | 0.192 |
| Health limits ability to work | 0.11% | 12.08% | <0.001 |
| Disabled person | 0.06% | 5.97% | 0.005 |
| Anxiety, depression or bad nerves, psychiatric problems | 0.02% | 1.86% | 0.311 |
| Alcohol or drug related problems | 0.10% | 10.77% | 0.197 |
| Cancer | 0.02% | 2.40% | 0.517 |
| Stroke | 0.05% | 5.20% | 0.141 |
| Is working | -0.24% | -25.31% | <0.001 |
| Temp job | 0.26% | 27.68% | 0.155 |
| Person has deafness | 0.03% | 2.66% | 0.286 |
| Person has blindness | 0.07% | 7.44% | 0.032 |
| Owns home | -0.07% | -7.32% | <0.001 |
| Lives as couple | -0.11% | -11.64% | <0.001 |
| N | 25433 | | |
| Overall fit (chi sqrd) | 950 | | |
| Prob > chi2 | <0.001 | | |
| Pseudo R2 | 0.349 | | |

Table 7 reports the estimation of use of social worker services where residual outcomes are included. Residual outcomes in this case concern the achievement of well-being outcomes as measured by the GHQ. Annex 2 reports the derivation of residual outcomes as based on estimation of outcome functions (which depend on needs and service use). The results in Table 7 show that the residual outcome variable is positively related to the use of social worker services. In other words, people with better residual outcomes (low GHQ scores) are less likely to receive social worker support than people with poorer residual outcomes (higher scores). Furthermore, as shown in the Annex, older people have *better* residual outcomes than younger people, other things equal. As a result, when residual outcomes are accounted for (i.e. in Table 7), the effects of age on access to social worker services is lower than when residual outcomes are not included (i.e. in Table 6).[7] Nonetheless, age remains negatively related to use of services – accounting for needs and residual outcomes, older people have less access to social worker services than younger people.

**Table 7. Access to a social worker – probit analysis, with residual outcome (GHQ)**

| Variable | Coeff | Relative contribution | Prob |
|---|---|---|---|
| Age, +1 year | -0.01% | -0.33% | 0.031 |
| Residual outcome | 0.10% | 4.86% | <0.001 |
| Male | -0.20% | -9.93% | 0.014 |
| No. ADL problems , +1 problem | 0.28% | 13.70% | 0.012 |
| Health limits ability to work | 0.56% | 27.74% | 0.002 |
| Disabled person | 1.18% | 58.68% | <0.001 |
| Anxiety, depression or psychiatric problems | 0.97% | 48.24% | <0.001 |
| Alcohol or drug related problems | 1.46% | 72.47% | 0.026 |
| Cancer | 0.08% | 3.73% | 0.809 |
| Stroke | 0.27% | 13.22% | 0.414 |
| Is working | -0.69% | -34.17% | <0.001 |
| Temp job | -0.38% | -18.86% | 0.290 |
| Person has deafness | 0.31% | 15.20% | 0.256 |
| Person has blindness | 0.54% | 26.92% | 0.135 |
| Owns home | -0.49% | -24.20% | <0.001 |
| Lives as couple | -0.30% | -14.63% | 0.007 |
| N | 11761 | | |
| Overall fit (chi sqrd) | 700.15 | | |
| Prob > chi2 | <0.001 | | |
| Pseudo R2 | 0.304 | | |

The average age of a younger person in the BHPS sample (i.e. between 18 and 64) was 41 years and for an older person (65 and over) was 74 years. Using a linear approximation of

---

[7] This suggests that the marginal effect of residual outcomes on costs differs little between age groups – see Annex 1.

the results in Table 7, this would mean that older people on average have around a 10% less chance of accessing social worker services as younger people with the same needs.

## *Intensity of support*

Differential access to services by age groups can be one form of age discrimination. Another possible form is where older people as service users receive less intensive support – lower packages of care – than younger people. Again in making this judgement we have to account for different needs and outcomes.

### Comparing unit costs

The unit costs of services – i.e. the total cost divided by the total number of service recipients – differ significantly between client groups, with younger people's services more expensive. Table 8 shows the unit costs by age group and client type of council social care services. The table also distinguishes between unit costs based on gross expenditure and those based on net expenditure, the latter being the public cost after service user charges and other income is removed. Although the pattern is not entirely clear, older people appear to receive less support than younger people. Younger people with mental health problems have the lowest unit costs in the table, but this is largely because a significant amount of support for people with mental health problems comes from NHS spending as well as council social care support. Total public care spending on these groups will be much higher than the figure in the table.

**Table 8. Unadjusted unit costs**

| | Age group | | | |
| | 18-64 | | | 65+ |
| | **Physical disabilities** | **Learning disabilities** | **Mental Health** | **All** |
| *Community-based services* | | | | |
| Recipient-weeks | 7,384,000 | 4,680,000 | 6,968,000 | 33,644,000 |
| Gross expenditure (£000s) | 782,264 | 1,159,871 | 280,066 | 2,844,553 |
| Unit cost per week (£/wk) | **106** | **248** | **40** | **85** |
| *Care home services* | | | | |
| Care home resident-weeks | 538494 | 2065147 | 646191 | 10901281 |
| Gross expenditure (£000s) | 382,728 | 2,004,658 | 386,989 | 4,865,661 |
| Unit cost per week (£/wk) | **711** | **971** | **599** | **446** |
| *All services* | | | | |
| All recipient weeks | 7922494 | 6745147 | 7614191 | 44545281 |
| Gross expenditure (£000s) | 1,406,733 | 3,121,100 | 987,338 | 8,521,287 |
| Unit cost (gross) per week (£/wk) | **178** | **463** | **130** | **191** |
| Net expenditure (£000s) | 1,322,146 | 2,914,814 | 934,411 | 6,803,738 |
| Net expd per recipient (£/wk) | **167** | **432** | **123** | **153** |

These unit costs are unadjusted figures – they tell us nothing about the different needs and outcomes of the people using services. Furthermore, these unit costs relate to service areas – they may not give us a good idea of the variation in total support between individual service users. For example, to a greater or lesser extent, community-based services can act as substitutes, and so a person regularly attending a day care centre may benefit less from a home care package.

## Individual level results

Judgements about possible discrimination are therefore more appropriately made using individual level (IBSEN) data. Data were collected about service use by people in the sample to which unit costs were applied to calculate a total weekly cost for each individual. The services included in this cost were: home care, meals, day care, personal assistance, social worker input, supported employment, lunch clubs, supporting people, equipment & adaptations, and independent living support. For the individual budget users, additional 'service' and support activities were also included, such as leisure, transport and so on.

Table 9 reports the costs for people under and over 65. At the mean, people under 65 have around a third higher level of support compared to older people (a difference of around £80 per week). By contrast, at the median older people attract around 9% more help.

**Table 9. Cost per week of care packages for service users in IBSEN sample**

| Age group | Mean | Median | 5th %tile | 95th %tile | Std Dev. |
|---|---|---|---|---|---|
| People under 65 | 312 | 154 | 15 | 948 | 363 |
| People over 65 | 234 | 168 | 22 | 553 | 216 |
| Total | 287 | 161 | 16 | 918 | 325 |

These are unadjusted costs. Multivariate regression can be used to control for differences in need, differences in residual outcomes (and differences in service option). Table 10 gives details of the characteristics of the 921 people in the sample. The mean age of people in the sample was just under 56 years old. Also listing in the table are the various relevant needs factors

Table 11 reports the main coefficients in the cost estimation.[8] Listed in the table is the respective factor along with the estimation coefficient, marginal effect and significance probability. Because costs are skewed, with a few people getting very large care packages,

---

[8] This model was estimated using GLM with a log link function and a gamma distribution

the analysis was done with natural logarithms of cost. To help with interpretation of these results, marginal effects are also provided and these can be read as the change in costs (per week) resulting from a change in listed factor. For example, people with principal carers living in the household have service packages that average some £66 per week less than people without such carers. People with evident cognitive impairment have packages that cost £75 more than people without such impairment.

**Table 10. Descriptive statistics – service user characteristics**

|  | Mean | SE | Min | Max |
|---|---|---|---|---|
| Age of service user, +1 year | 55.90 | 0.88 | 18 | 102 |
| Count of lack of ADL problems, -1 prob. | 24.89 | 0.29 | 13 | 39 |
| Lack of need for assistance using the toilet | 2.28 | 0.03 | 1 | 3 |
| Evidence of cognitive impairment | 0.39 | 0.02 | 0 | 1 |
| Principal carer living in the household | 0.39 | 0.02 | 0 | 1 |
| Service user is employed | 0.03 | 0.01 | 0 | 1 |
| Female service user | 0.58 | 0.02 | 0 | 1 |
| Mental health user group | 0.12 | 0.01 | 0 | 1 |

People who are older than the average 56 years receive around £2.10 less support for every year they are older. For example, a person who was 60 years old would on average have a care package that was around £8 less per week than someone who was 56 years old.

**Table 11. Cost per week – multivariate analysis**

|  | Model I | | | Model II | | |
|---|---|---|---|---|---|---|
|  | Coefficient | Marginal effect | Prob | Coefficient | Marginal effect | Prob |
| Age of service user, +1 year | -0.007 | -2.13 | <0.001 | -0.008 | -2.20 | <0.001 |
| Count of lack of ADL problems, -1 prob. | -0.022 | -6.26 | 0.025 | -0.019 | -5.49 | 0.048 |
| Lack of need for assistance using toilet | -0.180 | -52.34 | 0.017 | -0.199 | -58.06 | 0.008 |
| Evidence of cognitive impairment | 0.259 | 75.38 | 0.003 | 0.261 | 75.90 | 0.003 |
| Principal carer living in the household | -0.225 | -65.50 | 0.009 | -0.191 | -55.73 | 0.026 |
| Service user is employed | -0.563 | -163.84 | 0.019 | -0.486 | -141.41 | 0.041 |
| Female service user | -0.111 | -32.37 | 0.182 | -0.102 | -29.60 | 0.222 |
| Mental health user group | -0.474 | -138.04 | <0.001 | -0.516 | -150.23 | <0.001 |

Notes: a number of other factors were included in the estimation as control factors (not reported)

A linear age effect proved to be the best approximation of the relationship between age and (the log of) cost per week.  Table 12 gives the costs of packages for people of different ages who otherwise have identical needs. These costs are reported as differences from the costs of care for someone at the mean age. The linear approximation just applies the £2.13 per year of age for each year people are different from the mean. The non-linear values account for the skewed costs in the data, with the upshot being that the cost difference for the oldest people is less pronounced. Also shown in the table are costs differences at the upper and

lower (95%) confidence intervals. In the IBSEN sample, the mean age of older people (those over 65) is 82 years, whilst for younger people it is 43 years. To ensure that older people on average received the same support as younger people in the IBSEN sample, service packages for older people would have to increase by around £80 per week.

**Table 12. Difference in cost of service package by age,**
**compared with the cost at the mean age (56 years)**

| Age | Linear approx. | Non-linear approx. | | |
|---|---|---|---|---|
| | Central | Central | Lower CI | Upper CI |
| 20 | 76.5 | 86.9 | 142.7 | 38.4 |
| 30 | 55.2 | 60.4 | 97.0 | 27.3 |
| 40 | 33.9 | 35.7 | 56.1 | 16.5 |
| 50 | 12.6 | 12.8 | 19.5 | 6.2 |
| 60 | -8.7 | -8.6 | -13.2 | -3.9 |
| 70 | -30.0 | -28.4 | -42.4 | -13.6 |
| 80 | -51.3 | -46.8 | -68.5 | -22.9 |
| 90 | -72.6 | -63.9 | -91.9 | -32.0 |
| | | | | |
| 82 | -55.6 | -50.3 | -73.4 | -24.7 |
| 43 | 27.2 | 28.3 | 44.1 | 13.2 |

The size of age effects will differ according to which needs factors are included, especially if the size of those needs factors is significantly different by age group. One relevant factor in this regard is whether a person is employed, not only because it differs substantially by age but also because there are institutional reasons why it differs (i.e. older people retire). Removing this variable causes a small fall in estimated age effect (from £2.13 to £1.95).[9] We also estimated a model with dummy variables for each local authority in the IBSEN sample. In all but one case, these dummy variables were insignificant, but one authority did have much lower baseline costs than the others. Moreover, with a non-linear specification, the use of LA dummies did change the estimated age effect slightly (to £2.40).

These results would apply if we ignore residual outcomes. However, if our equity principle recognises that without social care services outcomes, and by inference capability, can differ between age groups, then some measure of difference in support between age groups is appropriate. Table 13 reports the (log) cost estimation[10] with the inclusion of the ASCOT

---

[9] Because being employed reduces the package cost and because younger people are more likely to be employed, we might have expected the coefficient on the age variable to become more negative, not less. Nonetheless, if the marginal effects of employment on costs differ significantly between age groups, then the observed result is entirely plausible.
[10] This model was estimated using GLM with a log link function and a gamma distribution

residual outcomes variable. For details of how residual outcomes were determined, see Annex 3. (For specific details of the ASCOT measure in IBSEN see Burge, Gallo et al. 2006)

**Table 13. Cost per week – multivariate analysis, with residual outcomes**

|  | Coefficient | Marginal effect | Prob |
|---|---|---|---|
| Age of service user, +1 year | -0.006 | -1.70 | 0.002 |
| Count of lack of ADL problems, -1 prob. | -0.017 | -4.91 | 0.065 |
| Lack of need for assistance using the toilet | -0.144 | -42.01 | 0.044 |
| Evidence of cognitive impairment | 0.217 | 63.20 | 0.009 |
| Principal carer living in the household | -0.192 | -55.84 | 0.020 |
| Service user is employed | -0.351 | -102.21 | 0.123 |
| Female service user | -0.108 | -31.54 | 0.175 |
| Mental health user group | -0.525 | -152.77 | <0.001 |
| Residual outcome, +1 ASCOT | -0.301 | -87.49 | <0.001 |

As with the BHPS analysis, accounting for residual outcomes appears to reduce the age effect. As outlined in the annex, with zero services and the same needs, older people have slightly better residual outcomes.[11] Table 14 shows, in this case, the size of age effects on weekly package costs for different ages compared to the mean age. To give older people in the IBSEN sample the same service packages as younger people, other things equal, would now cost just over £60 per week per older service user.

**Table 14. Difference in cost of service package by age,**
**compared with the cost at the mean age (56 years)  - with residual outcomes**

| Age | Linear approx. | Non-linear approx. | | |
|---|---|---|---|---|
|  | Central | Central | Lower CI | Upper CI |
| 20 | 61.0 | 67.6 | 118.9 | 22.8 |
| 30 | 44.0 | 47.3 | 81.5 | 16.3 |
| 40 | 27.0 | 28.2 | 47.6 | 9.9 |
| 50 | 10.0 | 10.2 | 16.8 | 3.6 |
| 60 | -7.0 | -6.9 | -11.2 | -2.5 |
| 70 | -23.9 | -22.9 | -36.6 | -8.5 |
| 80 | -40.9 | -38.1 | -59.8 | -14.4 |
| 90 | -57.9 | -52.4 | -80.8 | -20.1 |
|  |  |  |  |  |
| 43 | 21.7 | 22.4 | 37.6 | 7.9 |
| 82 | -44.3 | -41.0 | -64.1 | -15.5 |

---

[11] By including residual outcomes in the estimation, this source of difference between age groups is removed from the age variable, causing it to be less negative.

## *Cost implications*

The analysis above has shown that at an individual person level, after controlling for needs and outcomes, the support (i.e. cost-weighted service utilisation) received by older people is significantly less than the support received by younger people. We can begin to assess the national cost implications of a policy to increase the support of older people to that level enjoyed by younger people, that is, a 'levelling up' policy. The alternatives are to level down i.e. reduce the support levels for younger people or to level to the mean. In these latter two cases, pursuing such an equality policy will create significant losers among younger client groups. But it is clear that the overall cost of these policies will be less than a levelling up policy. The appropriateness of levelling-up or down are considered in the discussion below.

Returning to a levelling up policy, the analysis suggests the need to increase support to older service users of around £60 per week on an average spend of around £240 per week, that is, a 25% increase. Can these results be applied nationally? We cannot say definitively whether the IBSEN sample is representative of the whole service user population, although analysis by the IBSEN project suggests that service use was mostly consistent with the national picture, except that slightly more direct payment users were included. There is no reason to suspect that this would bias the cost differences found in the above analysis.

The cost per week covers services which almost all fall within the council social care remit. There are some components such as independent living support that would fall on other budgets but these were very small. The sample does not cover care home users, so we cannot judge possible discrimination in that area. Nonetheless, since these services are provided on the same broad basis and within the same institutional and fiscal framework, it seems reasonable to assume that age group differences will be in the same proportion as with community-based users.

The above analysis has looked at the total costs of service packages between age groups of council supported service users. In many cases, services users might be required to pay a charge towards their care package. This charge is based on people's ability to pay and only very indirectly on the total cost of the care package. For community-based services some councils also cap charges. Consequently, the costs of an increase in the size of the care package received by older people are likely to fall almost entirely on the public purse.

Given the estimate that age effects run to some 25% of the costs of services for older people, and with these above assumptions, we can apply this percentage cost up-rating to

the current national gross expenditure on older people's services (including community-based and care home support). In 2006/7 the Government's PSSEX figures indicated that some £8.5bn per annum was spent on services for older people in England. A 25% cost up-rating would therefore come to £2.1bn. Here we have assumed that a 25% increase in the support received by individuals (in cost terms) when scaled-up to the national level implies the same increase in national expenditure. Strictly speaking, this is true if the individual person level mean service costs are uniformly distributed.

The BHPS data on access to services provided some mixed messages. For social worker services there were indications of discrimination. For home care, older people were more likely to receive help. However, because home care is only one option to address needs, it is entirely possible that younger people were accessing support for personal care in other forms e.g. personal assistants, day care, etc. The potential for substitution of social worker inputs would appear to be more limited and therefore we might tentatively conclude that access for older people more generally is more limited than for younger people, based on this result. If the access age effects for social worker services were a reasonable marker for access overall to social care, older people would on average have a 10% reduced chance of receiving services, other things equal, than younger people. On the 2006/7 spend of £8.5bn per annum, levelling up would require around £0.85bn per year.

# 5. Discussion

There are a range of significant conceptual and empirical challenges in assessing the extent of any age discrimination in publicly supported social care for adults. It was argued above that we should ideally assess any discrimination in the context of an equality of capability framework, being clear about which needs factors that affect capability should be compensated for and which should not. Impairment and disability are relatively self-evident needs factors for compensation and if younger people receive more support because they have greater needs than older people in this regard, then this is entirely consistent with an equality principle. But there are some needs factors that are less clear cut, such as the existence of informal care support. If age groups have differential informal care input and therefore receive different formal public support, are we as content that this difference does not indicate discrimination?

We do not have direct measures of capability differences between age groups and therefore have looked at differences in the key determinants of capability i.e. service use. Differences

in need-adjusted service use will imply differences by age in capability, but other factors that are beyond the control of social services will also matter. We have made some adjustments to reflect differences between age groups of baseline or pre-service capability (using residual outcomes). These adjustments seem appropriate but we can still ask if it is appropriate that older people, who have greater residual capability, should receive less social care support (which means that the *improvement* in capability, given needs, resulting from the use of social care services would be lower for older people). Moreover, the important point remains that service use, or indeed 'support' in the sense of a package of services, is not exactly the same as capability. Going further, the cost of an individual's package of care is a marker for the amount of support they receive, but these concepts are not exactly synonymous. Service inputs could be weighted differently (rather than using unit costs) and this would give different levels of support.

There is also the possibility that current support could have a long-term positive effect on need. In that the scope for this effect to apply to younger people is greater than for older people (given differences in life expectancy), this might be grounds to justify more support to younger people. But, we cannot explore this possibility without longitudinal data.

The empirical challenges are also significant. Both the BHPS and IBSEN datasets are not designed for our purpose and have a number of drawbacks. The principle drawback in the IBSEN data is that, although eight of the 13 LAs in the sample included older people, only one LA explicitly covers all client groups and four more will generate interview data about both older people and other younger client groups. We include all LAs in the sample to maintain sample size but this does introduce a further factor to control for in the analysis. In particular, as a result of having local autonomy, councils do vary in terms of the baseline support they provide for all users. Comparing younger service user support in a more generous council with older users in a less generous council, for example, would cloud the interpretation of the results. When using dummy variables for councils in the analysis only one had support levels that significantly departed from the others. Because council level dummy variables can pick up a range of effects, some potentially confounding the analysis, the main analysis dropped these variables.

Another drawback is that although the data have been collected in the same way for all client groups the proportion that need a proxy respondent are likely to be different in the different client groups and the way people respond to questions about need and outcome may vary with age. We have nonetheless, accounted for the effect of proxy respondents regarding analysis of reported outcomes.

Finally, and potentially most significantly, we are only able to control for needs and outcomes with the available measures in the data. We cannot rule out that some relevant needs factor might be missing which could justify some of the observed difference in support between age groups. Nonetheless, the needs and outcomes factors that were collected (particularly in the IBSEN sample) were synthesised from a significant body of previous research and also from experience within PSSRU and partners. Furthermore, although not definitive, specification testing did not suggest any problem of omitted variables.

These results are based on the actual practice of social care services sampled in a number of council areas. We have calculated the costs of a levelling up policy, but there is no particular reason to think that the level of support provided to younger people at present is the 'right' level, at least on economic grounds. Initial analyses in this respect have been undertaken for people over 65 receiving social care, with an approach whereby services are resourced to cost-effective levels, weighing extra outcome (or capability) benefits against the extra costs. Where this approach is applied it means a significant re-allocation of resources from how they are currently used and an average increase in the support received by older people (Wanless, Forder et al. 2006). Without a similar analysis of cost-effective support for younger people, we cannot comment, relatively speaking, on the allocation of resources. But the general point is that pursing a policy of equality of capability within a cost-effectiveness framework need not endorse a levelling up policy, or at least not a full levelling-up. As such the costs of improving equality could come from a re-distribution of resources from young to old rather than a requirement for extra spending (where younger service users were receiving support beyond that level society deems to be appropriate).

It is an essential conclusion that a consideration of equality issues cannot be fully made without an understanding of the principles on which public support is provided. At present social services authorities mostly operate with a budget constrained, need-based threshold approach, that is, people are supported if their assessed needs exceed the prevailing threshold. This approach tends to create unmet need for people just below the threshold (Forder 2007; Commission for Social Care Inspection 2008). If a cost-effectiveness principle based on the costs of achieving extra outcomes is adopted instead, the allocation of resources changes (Forder, Netten et al. 2007). Such an inquiry as to the how resources are deployed, covering issues of outcome improvement, socio-economic equity, targeting on needs, prevention etc., and also how resources *should be* deployed is beyond the scope of this work. These considerations do not, however, undermine the point that younger adults are experiencing higher levels of support (and therefore we infer capability) than older

people. The balance of resourcing should therefore change, whether it comes from a re-distribution or extra spending on older client groups.

# 6.  Conclusions

This aim of this work was to investigate the extent of any age discrimination in the provision of social care for adults. Defining and identifying age discrimination requires us to clearly delineate between appropriate and inappropriate differences in treatment of people in different age groups. A number of equality principles are considered, and on balance a principle of equality of capability is seen as the best approach. Without information on capability, the analysis focused on differences in support between age groups, controlling for appropriate needs factors, as a key influence on capability among people with care needs.

Analyses of two datasets, the British Household Panel Survey (BHPS) and the national evaluation of Individual Budgets (IBSEN), showed indications of differences in levels of support between age groups after accounting for differences required to compensate people with varying levels of need (e.g. disability and impairment). The IBSEN data suggests that older service users (65 and over) would require a 25% increase in support for these age differences compared to younger people (aged 18 to 64) to be removed. The BHPS data more tentatively suggest that older people's access to services is slightly more limited than younger people.

# Annexes

## Annex 1. Theory

Capability $Y$ (at post service time) is:

$$(4) \qquad Y = Y^f(x, z, w)$$

where $Y_x^f > 0$ and where $Y_{xx}^f < 0$ and $Y_{xz}^f \geq 0$. For convenience, assume that the function breaks down into capability that can be affected by services and capability that is not affected:

$$(5) \qquad Y = Y^x(x, z^x, w) + Y^n(z^n, w)$$

Suppose that decision-makers seek to maximise some function: $U(Y(x, z, w), m(w))$, where $m$ is spending on some non-care activity. If decision-makers are subject to a budget $B$, which is binding, then optimal (implicit) expenditure on care services is: $x = x^*(Y(x, z, w), B(z, w))$. Writing this function in explicit form gives:

$$(6) \qquad x = x(z^x, w, Y^n(z^n, w))$$

where $x_z > 0$. If the needs of different user groups i.e. users in different age groups – have a differential impact on $Y^x$ and $Y^n$ then it is possible that the relationship between services use and need will differ by user (age) group. For example, with the same needs, older people may have higher non-service capability than younger groups. In that case, with the same needs, older people need less service input to achieve the same overall level of capability compared with younger people.

The differential with respect to age is:

$$(7) \qquad \frac{\partial x}{\partial w} = x' \left( \left. \frac{\partial}{\partial w} \right|_{Y^n} + \frac{\partial}{\partial Y^n} \frac{\partial Y^n}{\partial w} \right)$$

where, in the above example, the second terms in brackets is negative (as $x_{Y^n} < 0$ and $Y^n_w > 0$).

The overall effect on capability of a change in age (group) is:

(8) $\quad \dfrac{\partial Y}{\partial w} = \dfrac{\partial Y^x}{\partial x}\dfrac{\partial x}{\partial w} + \dfrac{\partial Y^n}{\partial w}$

What are the implications regarding age discrimination? We have two scenarios. The first, most straightforward case is where age has no impact on non-care related capability, or decision-markers were only concerned with care-related capability $Y^x$. Then, in an estimation of $x = \tilde{x}(z^x, w)$, a finding of $\dfrac{\partial \tilde{x}}{\partial w} < 0$ would suggest discrimination (assuming that the vector $z^x$ is properly specified). In the second case, suppose that $Y^n_w > 0$, and that this mattered. In this case, equality of capability would not require $\dfrac{\partial \tilde{x}}{\partial w} = 0$. Decision-markers could provide less support to older people because older people have greater residual (non-service) capability. We could write service provision, using (6), as a combination of 'unadjusted' and service provision and an adjustment reflecting differences in residual capability (assuming reasonable additive separability):

(9) $\quad x = \tilde{x} - x^{-1}\big(Y^n(z^n, w)\big)$

Only after making this adjustment, if we found that $\dfrac{\partial x}{\partial w} = \dfrac{\partial \tilde{x}}{\partial w} - \dfrac{\partial x^{-1}}{\partial Y^n}\dfrac{\partial Y^n}{\partial w} < 0$, then this would suggest age discrimination. The second term: $-\dfrac{\partial x^{-1}}{\partial Y^n}\dfrac{\partial Y^n}{\partial w} > 0$ is positive if older people have better residual outcomes and where this reduces service need, $\dfrac{\partial x^{-1}}{\partial Y^n} < 0$. In other words, in an estimation which specifically included residual capability, still finding a difference between age groups would be suggestive of age discrimination, other things equal.

In practice, we do not have a direct measure of residual capability, $Y^n$. However, residual outcomes might be a reasonable proxy. In this case, residual outcomes are:

$$(10) \quad y^n = y - \hat{y}\left(\bar{x}, z^x, z^{n)}\right)$$

In other words, we determine what outcomes would be expected if all user groups received the same (mean) service levels and then assess differences in actual outcomes over and above this expected level. We are in effect removing the impact of services from outcomes in a way that is equivalent to (5). Otherwise, using outcomes directly in the estimation of (6) would create an endogeneity problem: services being a function of outcomes that depend in part on services. Residual outcomes only depend on need, so this problem is avoided. In that residual outcomes could vary by age group, using this variable in the estimation creates an age effect in the estimation of (6), which may (or may not) be compensated for in the provision of services. Age effects that are found in the estimation that go beyond this adjustment will suggest discrimination.

To give an example, suppose that there are two age groups, *old* and *young*, and that they have identical needs. Suppose also that residual outcomes were greater for the *old* group. Actual service provision given by the functions:

$$(11) \quad x^{old} = x_0^{old} - \beta^{old} y^{n,old}$$

and

$$(12) \quad x^{young} = x_0^{young} - \beta^{young} y^{n,young}$$

In this example, we observe that $x^{young} - x^{old} = \Delta x > 0$ i.e. that younger people get more support. Without controlling for residual outcomes, an age group variable would just equal $\Delta x$. But with residual outcomes included, the age group variable now picks up $\left(x_0^{young} - x_0^{old}\right)$. Assume also that $\beta^{young} = \beta^{old} = \beta$ where:

$$(13) \quad x^{young} - x^{old} = \left(x_0^{young} - x_0^{old}\right) - \beta\left(y^{n,young} - y^{n,old}\right) = \Delta x$$

or

$$(14) \quad \left(x_0^{young} - x_0^{old}\right) = \Delta x - \beta\left(y^{n,old} - y^{n,young}\right) < \Delta x$$

because $\left(y^{n,old} - y^{n,young}\right) > 0$ in this example. In as much as accounting for $\left(y^{n,old} - y^{n,young}\right)$ is legitimate, then any age discrimination is found if $\left(x_0^{young} - x_0^{old}\right) > 0.$

We should also note that if the marginal effects of residual outcomes (i.e. β) differ significantly between age group, then in an estimation with a shift effect alone (i.e. forcing the effect to be β), we would have:

$$(15) \quad \left(x_0^{young} - x_0^{old}\right) = \Delta x - \beta\left(y^{n,old} - y^{n,young}\right) + \left(\beta^{young} - \beta\right)y^{young} - \left(\beta^{old} - \beta\right)y^{old}$$

which is indeterminate.

## Annex 2. Outcome estimations - BHPS

Table 15 reports two models estimating the impact of services and needs factors on the change in GHQ score over the previous year in the BHPS sample. The (change in) the GHQ outcome depends on whether social worker services were used by people. Furthermore, however, use of social workers at the current time will be affected by how outcomes changed in the previous period. We address this possible circularity by either using the predicted value of social worker use as determined only from needs factors (an IV estimation), or alternatively use lagged values of social worker use at a time before outcome change was measured. Both models indicate that social work services have a strong significant negative effect on GHQ, which means that they improved outcomes (low scores on GHQ corresponding to high outcomes). The instruments used in the IV estimation were lagged values of social worker service.

**Table 15. BHPS GHQ difference (lagged 1 year) estimation**

| | Instrumental variables | | OLS model | |
|---|---|---|---|---|
| | Coefficient | Prob | Coefficient | Prob |
| Uses social worker | | | | |
| - predicted | -5.840 | <0.001 | | |
| - lagged | | | -1.757 | <0.001 |
| Male | 0.020 | 0.849 | 0.046 | 0.654 |
| No. of ADL problems (lagged) | 0.264 | 0.001 | 0.237 | 0.002 |
| Disabled (lagged) | 0.812 | <0.001 | 0.749 | <0.001 |
| Difficulty in seeing | -0.295 | 0.207 | -0.404 | 0.08 |
| Anxiety, depression or psychiatric probs | 0.489 | 0.017 | 0.265 | 0.179 |
| Alcohol or drug related problems | -0.158 | 0.832 | -0.662 | 0.366 |
| Cancer | 0.183 | 0.684 | 0.125 | 0.779 |
| Stroke | 1.047 | 0.036 | 0.833 | 0.091 |
| Is a couple | -0.147 | 0.203 | -0.093 | 0.413 |
| working (lag) | -0.964 | <0.001 | -0.967 | <0.001 |
| white | -0.889 | 0.009 | -0.812 | 0.016 |
| Household size | 0.086 | 0.029 | 0.085 | 0.029 |
| Health: good | 0.248 | 0.059 | 0.258 | 0.047 |
| Health: fair | 0.417 | 0.009 | 0.378 | 0.016 |
| Health: poor | 1.035 | <0.001 | 0.864 | <0.001 |
| Health: v. poor | 2.086 | <0.001 | 1.633 | <0.001 |
| Constant | 0.622 | 0.107 | 0.473 | 0.215 |
| | | | | |
| Model | IV reg | | OLS | |
| F | 9.260 | <0.001 | 8.470 | <0.001 |
| N | 11762 | | 11762 | |
| Anderson (underidentification test): | 1970.893 | <0.001 | | |
| Cragg-Donald F (weak ident. test): | 1071.088 | | | |
| Stock-Yogo weak ID test critical values: | | | | |
| 10% maximal IV size | 19.93 | | | |
| 15% maximal IV size | 11.59 | | | |
| 20% maximal IV size | 8.75 | | | |
| 25% maximal IV size | 7.25 | | | |
| Sargan statistic (overidentification test) | 0 | 0.9997 | | |
| Endogeneity test | 46.846 | <0.001 | | |
| Ramsey RESET spec test | | | 1.48 | 0.2188 |

Table 16 reports estimation of the total GHQ score, not the difference, but again using an instrumental variables approach. Instruments in this case were: lagged use of social worker services, whether people lived alone, and whether people owned their own home or privately rented. The results are very similar, although the impact of social work is lower in this case. As in the difference estimations, the first model results in Table 16 are where age as a factor is not used – in order that its effect is picked up in the residual. When age is included – the second model results in Table 16 – it enters negatively on GHQ i.e. older people have better

outcomes other things equal. In other words, with zero service use older people's outcomes would be *better* than those of younger people with the same needs.

**Table 16. BHPS GHQ total estimation**

| | IV Model | | IV model with age | |
|---|---|---|---|---|
| | **Coefficient** | **Prob** | **Coefficient** | **Prob** |
| Uses social worker (predicted) | -2.509 | 0.035 | -2.553 | 0.031 |
| Age, +1 years | | | -0.012 | <0.001 |
| Male | -1.156 | <0.001 | -1.162 | <0.001 |
| No. of ADL problems (log) | 0.709 | <0.001 | 0.766 | <0.001 |
| Health limits work | 0.365 | 0.021 | 0.443 | 0.005 |
| Heart/high blood pressure or blood circulation problems | -0.394 | 0.002 | -0.250 | 0.06 |
| Diabetes | -0.828 | <0.001 | -0.765 | 0.001 |
| Anxiety, depression or bad nerves, psychiatric problems | 4.987 | <0.001 | 4.967 | <0.001 |
| Alcohol or drug related problems | 1.630 | 0.016 | 1.499 | 0.027 |
| Epilepsy | 1.058 | 0.038 | 1.035 | 0.042 |
| Cancer | | | | |
| Is a couple | -0.304 | 0.005 | -0.185 | 0.103 |
| white | -0.818 | 0.008 | -0.793 | 0.01 |
| Household size | 0.945 | <0.001 | 0.660 | <0.001 |
| Health: good | 1.524 | <0.001 | 1.540 | <0.001 |
| Health: fair | 3.180 | <0.001 | 3.189 | <0.001 |
| Health: poor | 5.549 | <0.001 | 5.500 | <0.001 |
| Health: v. poor | 7.607 | <0.001 | 7.543 | <0.001 |
| Constant | 21.165 | <0.001 | 21.967 | <0.001 |
| | | | | |
| Model | IV reg | | IV reg | |
| F | 207.940 | <0.001 | 197.340 | <0.001 |
| N | 12262 | | 12262 | |
| Anderson (underidentification test): | 1023.832 | <0.001 | 1025.661 | <0.001 |
| Cragg-Donald F (weak ident. test): | 266.49 | | 266.965 | |
| Stock-Yogo weak ID test critical values: | | | | |
| 10% maximal IV size | 19.93 | | 19.93 | |
| 15% maximal IV size | 11.59 | | 11.59 | |
| 20% maximal IV size | 8.75 | | 8.75 | |
| 25% maximal IV size | 7.25 | | 7.25 | |
| Sargan statistic (overidentification test) | 3.313 | 0.3459 | 1.819 | 0.6109 |
| Endogeneity test | 12.192 | <0.001 | 12.643 | <0.001 |

## Annex 3. Outcome estimations – IBSEN

Table 17 reports estimates of the change in ASCOT outcomes associated with service use. The change is measured as the difference between people's reported current outcomes and the outcomes they expect in the absence of services. A GLM model with a log transformation of cost is used (costs show a strong skew over service users in the sample). Overall service intensity (cost per week) has a highly significant positive impact on outcome (change) (with a net coefficient of 0.0010).

We also modelled the relationship between current outcomes (not change in outcome) and costs. In that needs factors are highly correlated with pre-service outcomes, this estimation with current outcomes should produce similar results to that estimation above, although in practice this adjustment is unlikely to work perfectly. Furthermore, current outcomes showed some endogeneity with service intensity, perhaps stemming from service decisions that reflect both need and also the potential outcomes people could experience after they use those services. An instrumental variables model using current outcomes produced very similar net service effects (just slightly higher than the 0.0010 found above).

The outcomes change estimation is used to calculate residual ASCOT outcomes by removing the service intensity effects from the current outcome score. This effectively means that residual outcomes are the outcomes people would experience with zero service use. As with the BHPS analysis, age is not directly used in the estimation.

**Table 17. IBSEN Change in ASCOT estimation**

|  | Coefficient | Marginal effect | Prob |
| --- | --- | --- | --- |
| Cost per week | 8.51E-04 | 1.22E-03 | <0.001 |
| Cost per week (sqd) | -2.10E-07 | -3.01E-07 | 0.088 |
| Count of lack of ADL problems | 0.046 | 0.07 | 0.322 |
| Count of lack of ADL problems (sqrd) | -0.001 | 0.00 | 0.105 |
| Evidence of cognitive impairment | -0.062 | -0.09 | 0.457 |
| Lack of need for assistance using the toilet | 0.017 | 0.02 | 0.823 |
| Principal carer living in the household | -0.265 | -0.38 | 0.002 |
| Female service user | 0.111 | 0.16 | 0.162 |
| Mental health user group | -0.197 | -0.28 | 0.161 |
| Service user is employed | 0.184 | 0.26 | 0.412 |
| Service is white | -0.217 | -0.31 | 0.153 |

Note: GLM model with log dependent variable and gamma distribution. Some control factors not reported.

Table 18 reports an estimation of the impact of age and other need factors on residual outcomes. With a square root transformation of residual outcomes, age shows a positive

effect in this estimation. In other words, with zero service use, and the same needs, older people have slightly better outcomes than younger people. This effect is nonetheless very borderline, being significant only at the 10 per cent confidence level (p = 0.084). But in as far as service decisions account for residual outcomes, this result suggests that service intensity will be (and should be) lower for older age groups after accounting for need.

**Table 18. Estimation of residual (ASCOT) outcomes**

|  | Coefficient | Prob |
|---|---|---|
| Age (sqrd) | 7.40E-06 | 0.084 |
| Count of lack of ADL problems (sqrd) | 1.24E-04 | 0.010 |
| Lack of need for assistance using the toilet | -0.001 | 0.961 |
| Evidence of cognitive impairment | -0.042 | 0.069 |
| Principal carer living in the household | 0.044 | 0.043 |
| Service user is employed | 0.163 | 0.001 |
| Female service user | -0.010 | 0.657 |
| Constant | 1.704 | <0.001 |

Note: GLM model with log dependent variable and gamma distribution.

# References

Age Concern England (2008). The Age Agenda 2008. London, Age Concern England

Burchardt, T. (2006). Foundations for measuring equality: A discussion paper for the Equalities Review. London, Centre for Analysis of Social Exclusion. CASE/111,(

Burge, P., F. Gallo, et al. (2006). Valuing PSS outputs and quality changes. Canterbury, PSSRU University of Kent. Discussion Paper 2356/3,(

Commission for Social Care Inspection (2008). The State of social care in England 2006-07. London, Commission for Social Care Inspection

Dixon Woods, M., D. Kirk, et al. (2005). Vulnerable groups and access to health care: a critical interpretive review. Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R & D (NCCSDO),(

Forder, J. (2007). Self-funded social care for older people: an analysis of eligibility, variations and future projections, Commission for Social Care Inspection & PSSRU, University of Kent. PSSRU Discussion Paper 2505 (http://www.csci.org.uk/pdf/20080128_Self-funded_social_care_for_older_people.pdf)

Forder, J., A. Netten, et al. (2007). Measuring Outcomes in Social Care: Conceptual Development and Empirical Design, PSSRU, University of Kent. PSSRU Discussion Paper 2422, report for Office of National Statistics,(http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/output/qmf/downloads/PSSRU_QMF_Interim_Report_Oct_2007.pdf)

Kahneman, D. (2000). Experienced Utility and Objective Happiness: A Moment-Based Approach. Choices, values and frames. D. Kahneman and A. Tversky. Cambridge University Press, New York.

Sen, A. (1985). Commodities and capabilities. Amsterdam, North-Holland.

Sen, A. (1993). Capability and well-being. The Quality of Life. M. Nussbaum and A. Sen. Oxford, Clarenden Press.

Sen, A. (1999). "The Possibility of Social Choice." American Economic Review 89(3): 349-378.

Wanless, D., J. Forder, et al. (2006). Securing Good Care for Older People: Taking a long term view. London, King's Fund