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The Costs of What? Measuring Services and Quality of Care

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If we are to be able to reflect the cost implications of changes in the nature, quality and productivity of long-term care interventions in future projections, we need an approach to measurement that reflects the value and quality of care. This paper describes a theoretically based but pragmatic approach to identifying the welfare gain from government expenditure on social care and illustrates an application in projecting the costs of long-term care used in the Wanless review of future needs of social care for older people in England.

Introduction

Estimations of the future costs of long-term care inevitably focus on projected costs, assuming that services will be provided in the future very much as they have been in the past. Investigations into projections have tended to centre on trends in life expectancy and levels of impairment in the population, supply of informal care, unit costs of services, shifts from residential to home based care and changes in the funding system (Wittenberg *et al.*, 2001, 2006). Diverse as these are, there are other potential areas of change including the nature, quality and productivity of publicly funded interventions and inter-relationships planned for both the provision and responsibilities in long-term care in England (Department of Health, 2006). Usually projections assume that current provision is adequate for future purposes. In practice we know that needs go unmet, that standards need to improve and that there are better ways of delivering care (Wanless, 2006). With changing expectations, technology and improved commissioning, the mix and balance of the services available will also change.

Accepting that there are deficiencies in the current service model requires us to consider what changes would need to be made to improve services. Indeed, we can only speak about 'deficiencies' with a view in mind as to what the appropriate service model should be in the future. An approach to this problem taken by the Wanless Review (Wanless, 2006), and described in this paper, has been to start with the question of what people want from their services – e.g. improvements in their lives, or to their outcomes. Thereafter, the task is to establish how far services can achieve these improvements. Whilst straightforward in principle, this approach requires that the desired outcomes are measured in a systematic and comparable way that allows the effects of services on those outcomes to be quantified, just as the costs of those services are quantified.

Alternative approaches may draw on professional judgements about what services would be required to provide good quality care. These ideal service configurations can

then be compared with the current set of services. Others refer to people's willingness to pay for services, either as reflected in prices actually paid in markets for those services or by surveying people's preferences.

While the examples given above all reflect the English context, concerns about future costs and uncertainty around these are international (Comas-Herrera *et al.*, 2006). To explore the cost implications of shifts in policy and service provision for future expenditure, we need to be clear what falls within the scope of long-term care and to identify ways of describing and measuring the impact of services that go beyond current service descriptions.

This paper draws on work conducted as part of a wider review of how government output is measured for the purposes of National Accounts (Atkinson, 2005) to describe a theoretically based but pragmatic approach to identifying the welfare gain from government expenditure on social care. First, we describe the basis for measuring social care outputs, and how this could be applied to the measurement of outputs of home care and care homes in practice. We then illustrate an application in projecting the costs of long-term care by an account of the approach taken by the Wanless review of social care (Wanless, 2006).

Measuring government funded outputs for long-term care

We start by assuming that the objective of long-term care is to improve people's well being through services or interventions that help them. The number of people helped by an intervention is relatively straightforward to identify. *How much* they have been helped will depend on the nature of the intervention and their needs or characteristics.

We define three ways in which long-term social care interventions provide benefits

Increased productivity + Knowledge and information + Met needs

Individuals' increased productivity (in terms of their ability to look after themselves and do what they want to do) would result from improvements or prevention of deterioration in individuals' health and/or functional capacity. Such interventions are often characterised by relatively short-term, one-off expenditures with benefits that may extend beyond the year of expenditure. This would include equipment services and adaptations to property as well as recuperative services or intermediate care. Services that involve training carers both to cope personally and to care effectively may also be expected to increase productivity.

Increased knowledge and information will be the expected output from advice and information services, but may also be an important output of the assessment process. Benefit may be experienced through access to other mainstream facilities and services, knowledge of sources of support that could be drawn on in the future, or simply better understanding of entitlements and the care system.

While there is increasing policy emphasis on these first two types of output, the bulk of social care expenditure and benefit generated from this expenditure has been and is currently about meeting needs. Projecting the need for services forms the basis of all current models used for projecting long-term care expenditure. We focus here on turning from measuring these services in terms of activity to measuring their output.

In order to identify the outputs resulting from meeting needs we use the concept of *Capacity for Benefit* (CfB). This is the level of output that an intervention could deliver for any given unit (e.g. per week) if it were implemented perfectly. In order then to reflect the outputs that are in fact delivered we incorporate an indicator of quality. Thus outputs of interventions that meet needs are the sum for each intervention of

$$\text{Capacity for Benefit} \times \text{Quality} \times \text{Weeks}$$

CfB reflects both *what* the intervention does and *how much*. *What* an intervention does depends on what outcomes it produces for people (i.e. the domains of outcome that are addressed – see below). *How much* it could do depends on how much service users rely on that intervention. *How much it does in practice* depends on the quality of the provision. In this context, ‘quality’ means both the degree to which needs are met and the quality of the process by which they are met. This immediately raises the question as to how can we quantify CfB and quality?

Measuring capacity for benefit and quality

First we specify what services are doing in terms of the domains of outcome or aspects of people’s lives they are intended to improve. Building on previous work (Netten *et al.*, 2002) and a series of consultations (Netten *et al.*, 2005) we identified eight domains of social care outcome. These are intended to address all interventions and all client groups and carers:

- *Personal cleanliness and comfort*
The individual is personally clean and comfortable, presentable in appearance and is in bed or up at appropriate times of the day.
- *Social participation and involvement*
The individual is content with their level of emotional support, general social contact and level of community participation.
- *Control over daily life*
The individual can choose what to do and when to do it, having control over their daily life and activities.
- *Meals and nutrition*
The individual has a nutritious, varied and culturally appropriate diet with meals at regular, timely intervals.
- *Safety*
The individual feels safe and secure.
- *Accommodation cleanliness, order and accessibility*
The environment is clean and comfortable and is easy to get around.
- *Employment and occupation*
The individual is sufficiently occupied in meaningful activities whether formal employment, unpaid work or leisure activities.
- *Role support (as a carer or parent)*
The individual is able to care for their dependant(s) as much as they wish without becoming overburdened.

In addition we need to allow for the fact that some care options result in people living in institutional settings, and that for the most part people prefer to live in their own

homes whenever possible. Since an important policy objective is to maintain people in their own homes, we need another domain that reflects whether or not this is the case. In practice, it is easier to identify when people are *not* living in their own homes, rather than that services have succeeded in keeping people at home.

Of course there will be other domains of outcome relevant to long-term care – health benefits resulting from nursing home care, for example. For the purposes of national accounts these have been excluded, as for the most part these are the outputs of health expenditure.

Within each domain we need to identify how reliant users are on the service. This is the difference between their expected level of needs in the absence of the service and the level of needs that they would have if the service was performing as well as it possibly could given its current configuration.

The measure of quality reflects what services are delivering in practice, ideally both the degree to which needs are met and the service process, as in social care the process is a critical influence on welfare. If somebody needs help getting dressed, their welfare will depend both on whether they are dressed appropriately for their desired activities and on factors such as the attitude and behaviour of the person helping them. Ideally the approach to measuring quality needs to reflect individual service user views, be reasonably robust in reflecting quality changes and practical, i.e. not too burdensome in terms of data collection.

Care interventions can and do address a range of different domains for individuals with varying levels of needs. Thus when estimating outputs we need as far as possible to use service user information on what services are doing for them and the quality of that provision. Moreover, ideally the measure of CfB should reflect the relative importance of the domains and welfare states reflected in different levels of unmet need. For this we need information about population and/or service user preferences for these welfare states. While it was not possible to fulfil all these requirements, the data and analyses described below serve to illustrate how this approach to quantifying the outputs of social care could be put into practice.

An illustration

In order to estimate CfB for older people receiving home care packages and resident in care homes a sample of older home care service users was drawn from 14 local authorities as part of another study feeding into the Relative Needs Formula for allocating central government funding to local authorities (Darton *et al.*, 2006). In total 387 people were interviewed, selected to over-represent those receiving more intensive packages of care. Table 1 shows the demographics of these and Table 2 the numbers receiving each type of service.

The sample was randomly selected by local authorities as in receipt of home care and aged 65 years or over. Table 2 shows that not all 384 respondents reported receiving home care in the past month. Of those that did, 367 knew the number of hours per week, with 35 per cent reporting 11 hours per week or more. About 60 per cent of those receiving home care only received that service. The majority of the remainder received day care with a tiny minority (4 per cent) receiving meals, day and home care.

Table 1 Characteristics of home care service users 2005

	Number (n = 384)	%
<i>Age</i>		
65–74	76	20
75–79	65	17
80–84	115	30
85–89	68	18
90+	59	15
<i>Gender</i>		
Male	102	27
Female	282	73
<i>Household</i>		
Living alone	250	65
Living with others	134	35

Table 2 Packages of home care

	Number		%
	All cases responding (n = 384)	Receiving service	
Home care			
Any	384	367	96
Low intensity (<11 hrs pw)	367	240	65
High intensity (11+ hrs pw)	367	127	35
Privately organised home care	381	108	28
Meals service	384	63	16
Day care ¹	384	92	24
Home care and meals	382	62	16
Home and day care	382	89	23
Home and day care and meals	382	15	4

Note: ¹ Includes lunch clubs.

Additional questions were included to allow us to estimate the CfB from services. These asked in turn for each domain whether services helped the respondent in this area of life and if so which services and what their expected level of need would be in the absence of the service.

Home care. Table 3 shows the domains identified by home care service users as being addressed by their care package overall and the level of need they felt they would have in the absence of service interventions. The most commonly reported domain addressed by services packages was, as we might expect, personal comfort, closely followed by cleanliness and comfort of accommodation. The domains least frequently addressed were

Table 3 Domains of outcome and proportions reporting each level of need when that need was addressed by service package

Domain of outcome	Level of need in the absence of services ¹				
	Helped by services in domain (<i>n</i> = 384)		High needs (<i>n</i> = 354)	Low needs (<i>n</i> = 354)	No needs (<i>n</i> = 354)
	<i>N</i>	%	%	%	%
Personal comfort	260	68	33	20	20
Social participation	103	27	12	10	7
Control	174	45	26	20	3
Meals	166	43	26	14	6
Safety	165	43	20	19	7
Accommodation	239	62	34	26	7
Occupation	64	17	7	7	3
Any	354	92	–	–	–

Note: ¹Excludes those people who did not identify that services helped them in the domain.

occupation and social participation. Table 3 also shows the level of need expected in the absence of services. Of those that said that services helped them in any domain, 33 per cent reported that, in the absence of services, they would have high levels of need in terms of personal comfort and 34 per cent in terms of cleanliness.

Questions were raised by some unexpected findings, such as the relatively high proportion (20 per cent) that identified that although services helped them in terms of personal comfort they would not have needs in the absence of services. Follow-up interviews with 23 people suggested that for the most part respondents were consistent and such findings related to limited impacts of services. For example, one woman was helped to shower but reported that she would still use the shower without help but would not feel safe. Thus, while services clearly did help her in the domain of personal comfort, the outcome was experienced in terms of safety.

As we identified above, CfB is the difference between outcomes in the absence of PSS funded care (based on the expected need state) and the best possible outcomes state (given current practice) for any domain that the service package is addressing. To estimate the value of CfB for a home care package (CfB_{hc}), for each individual we take the maximum score for each domain where they specify the service helped them and deduct from this the score based on their expected level of need in the absence of the service.

We assume here that each of the domains and levels within the domains is of equal importance. The maximum score (all needs met) in each domain is 1, low level needs score 0.5, and high needs 0. Thus the maximum possible CfB_{hc} is 7 (high level needs to be met in all seven domains) and the minimum 0. For example, an individual who was helped by services in three domains and in their absence would have low level needs would score $(1 - 0.5) + (1 - 0.5) + (1 - 0.5) = 1.5$. Table 4 shows the estimated CfB_{hc} for home care packages based on the number of home care hours. The groupings reflect the way that home care packages are recorded in national statistics (Department of Health, 2005). As we would expect, CfB_{hc} increases with number of hours, with the most marked difference

Table 4 Mean estimated CfB_{hc} of home care packages

Home care hours per week	<i>N</i>	Mean CfB_{hc} (sd)
0–2	50	1.35 (1.30)
2–5	87	1.48 (1.16)
5–10	103	1.69 (1.32)
11+	127	2.83 (1.77)
All cases	367	1.99 (1.58)

occurring at the point where English home care is defined as intensive (Department of Health, 1998): people receiving more than ten hours.

To estimate quality of home care we drew on a home care service user experience survey (UES) that provided national level information on older home care users' overall satisfaction with social services received at home. In 2003, information was collected from 87,000 service users in all local authorities in England using detailed guidance on sampling procedures and conduct of the survey (Department of Health, 2003). A sample of 34 authorities used an extended questionnaire as part of this survey, including items on outcomes in terms of met needs, service quality and care worker attitudes (Netten *et al.*, 2004). An overall quality indicator was derived from these highly correlated items and showed good consistency (Cronbach's Alpha = 0.93). This indicator was used to weight the satisfaction measure to reflect the relative quality at each level of satisfaction where there was a statistically significant difference in reported quality. Weights ranged from 1 (extremely satisfied) through 0.668 and 0.426 (very and quite satisfied respectively) to 0.279 (neutral or dissatisfied). Combining the national proportions that reported each level of satisfaction with these weights resulted in an overall quality weight of 0.632 (Netten *et al.*, 2005). Although at the time of writing the data are not yet available, in 2006 the survey was repeated, allowing changes in service quality to be reflected over time.

To estimate the outputs of home care we put together the proportions receiving each level of home care with our estimated CfB (see table 4) and multiplied this by the quality weight and number of weeks of home care provided. On this basis 16,300,000 weeks of home care in 2002/03 nationally was estimated to deliver 18,400,000 units of output or welfare (Netten *et al.*, 2006). Changes in intensity of services between 2000/01 and 2000/05 were estimated to result in increased average capacity for benefit over the period of about 8 per cent but reductions in the number of weeks (as services were targeted on fewer people) meant that overall output (assuming quality constant) dropped by about 6 per cent.

Care homes. In order to estimate CfB for care homes (CfB_{ch}) we again need a maximum possible score and an expected score in the absence of the intervention. We assume that care homes can address all domains and have the capacity to meet all needs but we must allow for the welfare loss associated with people not being in their own home. For

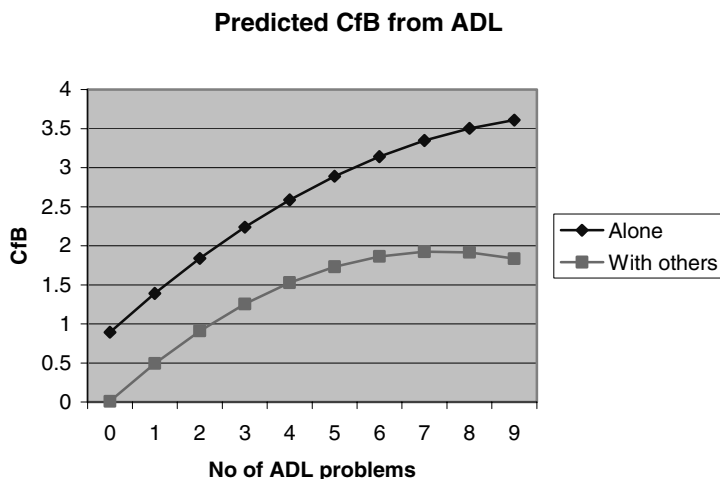


Figure 1. Predicted capacity for benefit from care homes.

the measure of CfB_{ch} , the maximum score is 6 based on seven domains of outcome and deducting 1 to reflect that they are not living in their own home.

There are no surveys that ask care home residents about their expected level of needs in the absence of services in our domains. However, people's needs without services measured in these domains correspond closely to their 'dependency characteristics' i.e. their abilities to perform activities of daily living (ADLs) and circumstances of admission, for which we do have information (Darton *et al.*, 2006). Using the home care sample data, a statistical model was used to estimate the relationship between CfB_{hc} and number of ADLs where help was needed and whether or not the individual lived with others. Figure 1 shows the estimated relationships, with the expected increase in CfB_{hc} with number of ADL problems and higher levels of CfB_{hc} at all levels of dependency for those living alone.

In order to estimate CfB for care homes we apply the predicted values from this model to the proportions of residents that fall into each dependency group (determined by number of ADL problems and whether they were living alone prior to admission). Ideally we would use data about current publicly funded residents, which are not available. However, we have data about 540 publicly funded admissions in 2005 (Darton *et al.*, 2006) and over 2000 admissions in 1995 (Bebbington *et al.*, 2001). Over the ten-year period both levels of impairment among people being admitted to a publicly funded care home place and the proportion of people living alone prior to moving into a care home have increased. In personal care homes the proportion of people with eight or nine ADL problems nearly doubled: 23 per cent in 2005 compared with 12 per cent in 1995. In nursing homes the change was more marked in terms of living arrangements: the proportion of people admitted living alone increased from 54 per cent in 1995 to 69 per cent in 2005.

Table 5 shows the estimated CfB values for care homes in 1995 and 2005. Changes in levels of impairment on admission result in a larger increase in CfB_{ch} for personal care homes than nursing homes: the increase in CfB_{ch} is about 14 per cent in personal care

Table 5 Capacity for benefit among admissions to care homes

	Personal care homes	Nursing homes	All care homes
1995	2.15	2.49	2.29
2005	2.45	2.74	2.55
% change	14%	10%	11%

only homes compared with 10 per cent in nursing homes. It is interesting to note that on this basis, CfB_{ch} for all homes in 2005 exceeds that of nursing homes in 1995.

In England since 2002 a national independent regulator (currently the Commission for Social Care Improvement (CSCI)) has had responsibility for inspecting homes and reporting annually on whether they are meeting National Minimum Standards (Department of Health, 2001). To reflect the quality of care homes, we drew on these care standards, a core subset of which proved to map well on to our domains of outcome and to reflect a key aspect of process (treating people with dignity). A measure was devised based on the degree to which homes were reported to meet these standards (Netten *et al.*, 2006), with a maximum score of 1 if all homes exceeded all these core standards and 0 if they failed to meet any. The overall average in 2002/03 (the first year that data were available) was 5.07 rising by nearly 8 per cent over the next two years.

As with home care we can combine information about number of weeks, CfB and quality to identify overall measures of output. In this instance in 2002/03 7,900,000 weeks of publicly funded care home places were estimated to provide 14,600,000 units of output. Using equivalent data for 2000/01 and 2004/05 output was estimated to have increased by 23 per cent over that period.

Projecting future costs

Historically, projections have been based on activity rather than outputs, usually with the implicit assumption that activity reflected adequate levels of met need and quality. The shift to outputs is helpful when attempting to predict how service patterns might, or indeed, should change in the future, reflecting the deficiencies that exist now. This latter approach combines the outputs information described above with information about the costs of services and also with a set of principles that guide resource allocation. One relevant principle concerns societal willingness to pay for social care outcomes, a *value-for-money* principle. Other principles include concerns with equity or access to services for different groups of people, distinguished by wealth, levels of need etc. Another relevant principle is fiscal sustainability, i.e. that the total implied cost to the public purse is affordable given the state of the wider economy. At times these principles can be in tension. For example, if wealthier people's outcomes improve at a greater rate than poorer people's, then value-for-money alone would direct more resources to wealthier people. In practice, in social care, poorer people tend to have greater needs, other things equal, so that value-for-money and relevant equity principles are complementary. Nonetheless, where multiple principles can apply, judgements are needed about their relative *weight*.

Once this is established, the next steps are to determine what types of services would be available were these principles applied. In theory, if the rules are sufficiently specific

and information on costs, outputs and other characteristics is sufficiently comprehensive, the appropriate pattern of services for the future can be built up from first principles. In practice, these conditions are unlikely to be met, but this approach can nevertheless be used to inform how service patterns might change in the future. The Wanless (2006) review of social care assesses the implications of applying a value-for-money principle in a way that mirrors the approach of the National Institute for Health and Clinical Excellence (NICE) for healthcare.

Value for money, outcomes and costs

An intervention or service can be rated according to the outputs it generates as described above, that is CfB multiplied by a quality factor. Outputs will vary with the intensity of the service (e.g. contact hours of care), the characteristics of the people receiving care and so on. For example, the first hour of home care for a highly dependent person will produce greater improvements in outcomes than the twentieth hour, or the first hour of care for a less dependent person. Generally speaking, every extra £1 spent to improve intensity, quality or broader access to the service will produce slightly less output than the previous £1. We could substantially increase spending on care services and still generate extra output. But the return on extra output for each additional £1 spent would be falling. At some stage any potential additional spending would best be used elsewhere to produce other more highly valued outputs.

The Wanless (2006) review focused on outcome gains in the personal care, nutrition and safety domains described above. Using the home care survey data described above, it defined a standard unit or measure of outcome gain as being equivalent to a person moving from having fully *unmet* needs in these three domains to having these needs completely met. In principle, any personal care intervention/service can be rated according to the proportion of this standard outcome gain it produces for various types of people. For example, the review estimated that ten hours of home care for people with two or more ADLs would have an average outcome improvement of 0.5 of the standard amount of outcome gain.¹ One more hour – i.e. 11 hours per week – would produce 0.544 of the standard amount of outcome gain, that is 0.044 more.

Any gain in outcomes for people needs to be set against the additional cost it entails. A decision can be made as to whether it is good value-for-money to pay for an increased care package, e.g. one more hour of home care. Is the money better spent in producing the extra outcome in this way rather than some other use for those resources? In the above example, the annual cost of the extra hour of home care is just under £600. From the tenth to the eleventh hour, the outcome gain is 0.044 in standard units, so the standard incremental cost is just under £14,000 ($£600 \times 1/0.044$); the lower the incremental cost, the better the value for money.

The following figure (Figure 2) gives this (standard) incremental cost for an extra hour of home care, distinguishing intensity of the existing service (in hours per week) and dependency characteristics of users. These costs were derived from the home care survey data by estimating the impact of home care services on outputs and this analysis underpins the calculation of 'benchmark' services levels used in the Wanless review. Higher costs in the chart imply lower cost effectiveness of the service package. The cost effectiveness of more intensive packages of home care is smaller for bigger care packages, and smaller for less dependent people.

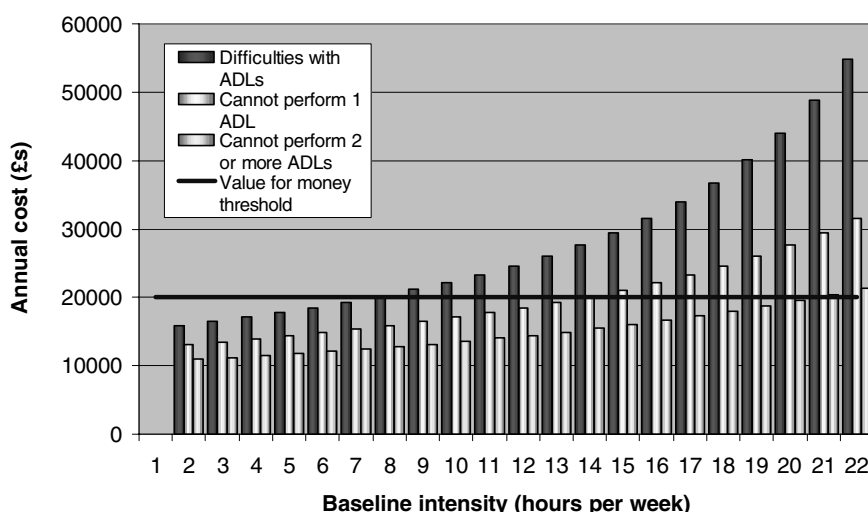


Figure 2. Incremental (annual) cost of an additional hour of home care to produce standard outcome gain.

The figure also shows a value-for-money ‘threshold’ of £20,000. This represents an assumed amount that society is willing to pay to achieve a standard outcome gain and is set to (conservatively) reflect the equivalent cost-effectiveness threshold that NICE uses in assessing health care interventions (Devlin and Parkin, 2003). Essentially, any service or care package that is expected to cost more than £20,000 to produce a standard unit of outcome is not regarded as worth resourcing. Accordingly, with reference to Figure 2, home care packages are good value for money at up to about 8 hours for people with difficulties performing ADLs or IADL problems, up to 14 hours for those people unable to perform without help one ADL and just over 20 hours for those with an inability to undertake two or more ADLs. These levels of home care are significantly higher than current levels – see Wanless (2006:193).

This example illustrates how output and outcome measurement can be used to guide how services could be commissioned in the future to secure the best value-for-money. Projections of future costs and outputs ought then to reflect these patterns of services. These could differ significantly from future projections based on current service models, where current activity rates are used. They would indicate the future resource implications of commissioning, reflecting certain principles about what desired outputs, that is the extent to which society would want to support people with care needs.

Conclusions

This paper seeks to demonstrate both that measuring outputs in social care is important and also how this measurement might be undertaken in a practical way. With growing expectations about what services ought to achieve but also real limits on the resources available, achieving good value for money in social care is increasingly important. This is not synonymous with cutting costs to achieve so-called efficiencies. Instead it is about reflecting on what outcomes and outputs are of value to people, and how deploying

services to produce these outputs needs to be balanced against the costs. Achieving this balance requires practical, but comprehensive ways to measure outputs on a routine basis, just as expenditure and cost information is collected.

Measuring outcomes and outputs is important therefore in assessing through time how well public money is being spent (e.g. the National Accounts example). But, going further, this information on outcome from services can be used *normatively* to suggest what types and levels of services should be provided given a set of guiding principles (the Wanless example).

While we have focused on the English context there is an urgent demand for more reflection on these issues in all countries. The approach presented and illustrated here provides us with the first steps in that process. Potentially we have the basis for describing interventions in a way that goes beyond activities and to the heart of what they are contributing to welfare – a new way of conceiving of ‘outputs’. A common understanding of such outputs could allow us to monitor and compare the changing contribution of social care interventions over time and between countries.

Note

- 1 See Figure 44, Wanless (2006: 186).

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