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Chapter 8 The role and problems of economic evaluations in care

8.1 Introduction

Since 1976, the consequences of an ageing society for health care spending have become a major political concern (Blommestijn, 1991). The main instrument to reduce supply constraints in this area has long been substitution (Goudriaan, 1992, Gerritsen, 1993). Patterns of change were designed moving away from institutional care towards enhanced home care and the development of improved co-ordination at client level through case management.

While the provision and the development of such new care facilities has generated considerable political attention, economic efficiency of the drive for such downward substitution has received little systematic thought. Throughout this thesis, several factors have been mentioned that may explain this neglect for economic evaluation in the care sector.

- 1 Care facilities and care activities may attract less attention due to their target group: the elderly, chronically ill and disabled. This target group is not part of the labour force and has limited political power. Treatment of these people will in most cases lead to less cost-effective outcomes when a strictly utilitarian approach is followed (Nord, 1994).
- 2 Since medical technology is generally regarded to be the most important contributor to the rise in health care costs, policy makers tend to focus on containing higher spending through lashing out at technological innovations.
- 3 The results yielded by care activities are less spectacular. As in the medical world itself, where the latest medical technologies are important competitive instruments between hospitals and doctors, an economic study directed at major technological advance (like liver or lung transplantation), concerning treatments which involve life and death, is likely to attract more attention than a study of care facilities which deliver activities in a new fashion (Reisman, 1993).
- 4 There are several problems inherent to analysing the consequences of care policy alternatives, which make economic evaluations in the care sector more complicated.

Section 8.2 gives an overview of the difficulties faced in economic evaluations in the care sector. Next, in Section 8.3 the research reported in this thesis is used to identify different possibilities of how the results of economic evaluations may be used on different policy levels. On headlines, this does not differ much from the possible use of economic evaluations in general, but there are some minor deviations. In a final section 8.4, the main results of this thesis, its implications and suggestions for further research are discussed.

8.2 Economic evaluations in the care sector

This thesis reports results from economic studies in the care sector based on common rules for economic evaluation. When performing these studies some specific problems emerged, which complicated the interpretation of results. Traditional instruments for economic evaluation prove not always applicable in the care sector. For instance, there is no standardised outcome measurement scale, organising a randomised trial is complicated, and the relevance of non-medical costs is a special concern. So, conducting economic studies in the care sector reveals several problems in methodology and implementation. In this section these problems will be summarised and possible solutions will be discussed.

1- Research questions

Most policy research focuses on questions such as: what treatment should be provided; which intervention or what treatment option is most cost-effective for certain patient groups. Such questions are closely linked to questions like: To whom should treatment be provided: should dental implants be provided to anyone with a dental prosthesis; or: should a breast cancer screening programme be available to all women or only to specific categories of women?

There certainly is a case to be made for specifying individual patient characteristics that are associated with better health outcomes and/or lower costs. In the care sector this imposes an additional problem, because many of the manifest health problems are irreversible. An incontinent patient clearly requires more labour intensive treatment and therefore is a more expensive case compared to someone with the same functional abilities without being incontinent, while the outcome of care in terms of quality of

life or patient satisfaction is not very likely to differ. The care sector offers a safety net to all people who cannot care for themselves anymore, regardless of the reason. The question whom to treat is not appropriate here.

Other complexities exist, because the mode of treatment is mostly linked to locality, or: Where should treatment be provided? The high costs of inpatient services have stimulated searches for community-based care options. These extramural alternatives by definition take place in another setting. The questions what treatment should be provided and where treatment should be provided are difficult to separate out in the care sector.

Serious problems of research in the care sector arise because of the lack of specificity of the treatment (Krupnick, 1992). Problems include to define the what, how and where. In most research in the care sector, these questions are interrelated. It is important to keep this in mind, when formulating a sharp and detailed research question. Furthermore, the demand for care is determined by many complex factors. In many cases, it is not related to a particular disease. This has important repercussions for the gathering of data, especially those of indirect costs.

Perspective

Another choice that has to be made regards the perspective of the study. In general, three different perspectives can be discussed: (1) microeconomic (individual treatment programme participant), (2) mesoeconomic (health care suppliers, insurers, programme sponsors, local government agencies), and (3) societal. There is no fundamental difference between cure and care with respect to the perspective of the study. As in the cure sector, the societal perspective is considered the most comprehensive in the care sector. In practice, however, it is extremely difficult to apply, since a large part of the costs are typically indirect and do not have a market value. Special attention concerning identification, measurement and valuation of these indirect costs is called for (see point 4).

In Chapter 2, the conflict between distributional and allocational policy goals for government interventions was described. In the Netherlands, the system tends to give high priority to distributional issues. In this light, it

seems strange that this aspect gets so little attention in economic evaluations. This applies especially to the care sector, where many co-payment procedures exist. Paying more attention to the distribution of costs among actors, that is maintaining a multidimensional scope, is worthwhile.

3- Study design

In general, a randomised clinical trial (RCT) is regarded to be the best control over a study situation, although such a design generally says more about cost-efficacy than about cost-effectiveness. Nevertheless, a RCT is seen as the best way to isolate the investigated effect (Leaf, 1989; Mulder, 1996; Gold et al., 1996). There are, however, some serious problems that hamper the use of RCTs in the care sector.

In most cases the key of community care projects is participation of staff in selecting patients suitable for care arrangements outside the institutions (Wimo et al., 1995). A random design would therefore not adequately reflect the daily decisionmaking situation. Furthermore, a practical problem may arise in the care sector. In some circumstances, it may not be possible to randomly assign people to different care arrangements, because people simply may not want to move into a nursing home. In that case, the ethical problems are prohibitive (Holland, 1983).

A second aspect of design regards the blinding of carers and patients (double-blind). The best way to examine results and outcomes of intervention is thought to exist when the actors are kept in ignorance of which treatment they have given/undergone. This approach is rarely feasible in the care sector when the study is beyond the scope of simple drug or vaccination trials. A third aspect which should be mentioned as problematic is the time period of follow-up. One year is mostly seen as a minimal study period. This leads to a considerable amount of attrition, especially in the care for the elderly (nursing homes, where people on average live for about a year), and to financially expensive research programmes (due to extensive follow-up).

Last but not least, there are a thousand different ways to provide care. In the care sector, treatments are more and more following protocols. Every institution has its own view on care, its own organisation, co-operation with third parties, etc. Even when a RCT would be feasible, the results of such a study could not easily be generalised, due to all these differences in

the implementation of providing care, in each individual situation under review.

RCTs are not very often found in the care sector. It is not an useful instrument when evaluating projects which involve transition, because it is seen as unethical to change people's living environment against their will and because the success of a transition depends on certain patient characteristics. Although these research may particularly be considered to be only differences of degree, researchers should not underestimate the resistance of care providers and care suppliers to the implementation of randomised trials. Other study designs may be needed.

In Chapters 6 and 7, in which experiments are introduced into the natural environment of the research population, controls are difficult to find (Frank and Manning, 1992) or it has to be in another institution, which creates considerable bias (in the view on care, infrastructure, etc.).

With respects to costs, it is important to understand that, due to differences with regard to those aspects, type and level of disabilities vary systematically across facility alternatives. For instance, the population of elderly patients in an institution comprises those with severe problems in living independently. The outcome of economic evaluations will thus be questionable: to what extent can differences be attributed to the type of facility and to what extent to the type of clients served?

Generally, four options for research design can be found in the care sector:

- 1- Static group comparisons across multiple intact groups (Hill and Bruinincks, 1984; Hoeksema et al., 1991; Felce and Perry, 1997);
- 2- Static group comparisons with matched groups (Otten, 1991; Hatton, 1995). Groups can be matched by sex, level of retardation, years of institutionalisation, self-care skills, age and IQ. As described in Chapter 5, this method was used for the evaluation of care for the elderly. In that study only three matching criteria were identified: problems with (Instrumental) Activities in Daily Life, cognitive problems, and personal status (living alone or living together). Most probably there are other criteria that have an influence on intensity of the care required. Although this seems a good method to get around the problems concerning the influence of client characteristics on costs in a

- post-test only design, it is critical that all variables associated with costs be identified and employed. Case-control studies: individuals with and without the intervention under consideration are compared retrospectively with respect to their exposure to the study programme.
- 3- Case-control studies have the advantage that they avoid the prolonged follow-up, required in cohort-studies or RCTs. However, selection, observer and recall biases may seriously affect the validity of the results of these studies.
 - 4- Cohort studies: individuals exposed and not exposed to a given type of intervention are compared prospectively with respect to care consumption and level of outcome under consideration (Van der Giessen en Otten, 1992; Knobbe, 1995). However, in this type of study design, the factor that affects the choice of the intervention is a strong determinant of outcome. This pre-test/post-test comparison is especially valuable for studies that analyse transition of situations like the case study described in Chapter 7. In that study, however, there was no control group (as in Dockrell et al., 1995). With this method pre-tests are performed to account for selection bias. A comparison of costs before and after a transition gives an insight into the development for all individuals. The addition of preplacement assessments enhances plausibility of attributing observed variation to setting differences. However, because the population studied is not randomised, results cannot be generalised to all people with a mental handicap (which in care is called confounding by indication (Holland, 1983)). Developments in care intensity, costs or outcome can be related to patient characteristics. For instance, for the mentally retarded, costs of small-scale settings tend to be lower for people with a light mental handicap, while for people with a severe mental handicap costs tend to be much higher. Furthermore, it could be possible that on account of exogenous developments, results in the old facility would have changed too.

In this thesis, methods 2 and 4 were used, partly due to the fact that the real experiments had already started before the economic evaluation was set up. However, in all cases a randomised clinical trial was seen as not appropriate by care providers.

4- Cost accounting

Another question is: what costs must be included and how do we value them? Costing procedures have varied greatly between various studies in the literature. At one extreme, one could report state-wide averages of domiciliary costs per cost item, without specifying the composition of these cost averages. At the other extreme, a representation of exhaustive breakdowns of personnel, programme, professional support, and administrative costs is possible.

Cost accounting is a three-step process. First, the relevant resources used by clients have to be identified adequately (identification). Second, apart from the occurrence of an event, some measure of its duration and the amount of resources consumed must be obtained (measurement). Third, the cost-per-unit must be determined using a consistent method (valuation).

4.1 Identification of costs

The identification process is particularly difficult because the spectrum of societal costs is so broad that identifying all resources consumed requires considerable knowledge of the actual working procedures. Information of care providers and patients will be necessary to identify all possible resources. Several cost components are normally included:

- Direct costs for care services (e.g. laboratory tests, physicians' time) should include all costs that are a direct consequence of the actions of individuals and/or institutions within the professional care sector, aimed at care providers (Luce and Elixhauser al., 1991).
- Direct costs outside the care sector include all resources invested by family and friends acting as informal care providers, and patients' travel time and out-of-pocket costs that are not based on official prescriptions.
- Indirect costs within the care sector are all medical costs originating in gained life-years and costs of diseases in the future (Busschbach et al., 1998). Weinstein et al. (1996) propose to only include intervention-related diseases for the years a patient would have been alive anyway, and to incorporate all medical costs during gained life-years. These guidelines are not applicable to the care for the elderly or people with a mental handicap. Nothing is known about added life-years as a result of living at home in stead of in a nursing home. Furthermore, almost every disease is related to age. In theory all have to be included in the

research design, because it is almost impossible to relate them causally to the living situation (at home or in a nursing home). In practice, only complications like hip fractures, broken arms, etc. due to living independently at home are included.

- Indirect non-medical costs are costs that occur as a result of production losses arising from illness or disablement. In the care for the elderly it is very unlikely that patients are still in paid employment. Thus these productivity costs (Koopmanschap et al., 1993) do not play a role in the care sector. However, the loss of unpaid work by elderly people may be of particular importance here. In the care for people with a mental handicap or psychiatric patients it might be possible that some persons get work after a transition, or lose their job. These costs and revenues should be included.

Solutions

A checklist for identifying all possible costs is given table 8.1 (Based on Van der Wijk, 1995; IOO, 1995; Chisholm, 1997).

Methods for measurement and valuation techniques for all these cost components are described in the next section. Different perspectives to uncover counterproductive incentives of budget proposals will be shown

4.3 Valuation of costs

Valuation of costs requires the assessment of identified and measured resources used for caring. It is the last process in cost accounting. In general, marginal cost is considered the appropriate cost valuation procedure for economic evaluation studies (Drummond, 1987; Sloan, 1995; Gold, 1996).

Problems with the valuation of direct costs in the health care sector

Direct costs in the care sector should be examined carefully in quantity of units and associated costs. The costs of a nursing home day, for instance, include various costs, such as the cost of the building and staff. These average costs cannot be used to compare different settings, unless the patient characteristics of all populations are the same. Basically, all units that are included in the nursing home day care should be included and valued separately by the opportunity cost. The extent to which the prices normally attached to the cost units are believed to adequately reflect real cost for society has to be further investigated.

Problems with the valuation of direct costs outside the care sector

Allocation of direct costs outside the care sector is complex due to problems with valuing unpriced time resources. How should time spent on informal care be assessed? Several methods can be used to value informal care time (Smith and Wright, 1995; Gold et al., 1996; Busschbach et al., 1998).

- First, opportunity costs can be established. Time spent on informal care should ideally be valued as being equal to the most normal alternative use of that time. When time spent on informal care would otherwise have been spent working in a paid job, that time should be valued as being equal to the average wage rate of the target population (Gold et al., 1996). In general, age- and gender-specific wage estimates will provide adequate specific estimates. If time spent on informal care would otherwise have been spent on leisure time, the value is more complicated to assess. Most informal care for the elderly is provided by other elderly people. They are primarily engaged in leisure time or voluntary work. No adequate method has been found yet to correct the wages of these individuals for the involvement in leisure time activities.
- Another method to value time spent on informal care would include the use of shadow prices for services delivered to the patient by the informal caregiver. The cost of informal care is valued according to the costs that would have been made if a professional care provider had provided the service (Rutten et al., 1993). A problem is that the amount of time spent by informal care providers may be much larger than the time it would have taken a professional to do the same job. This means that the activities should not be valued according to total time spent by informal care providers, but according to the time a professional carer would have spent on the same activity. This method explicitly requires a list of activities and a quantification of the time professionals have spent on them. This method was used in Chapters 5 and 6. The list of activities concerned is added in appendix B (in Dutch).

In this line of research the next step is to assign an hourly rate to each particular activity. This wage rate depends on the specific expertise needed to perform a given activity. Some activities (like cooking) are valued lower than others (e.g. nursing). This method is the most practical in mapping the costs of informal care. Nevertheless, Busschbach et al. (1998) recommend dividing time spent into time given up from paid work, from unpaid work, and from leisure time. This makes it possible to add more opportunity based cost valuations in the sensitivity analysis. For example, in the Netherlands Groenenboom and Huijsman (1995) report an

unweighted average of Dfl. 34 per hour for informal care. Boelema et al. (1995) use an average of Dfl. 32 in their report on normalisation for people with a mental handicap.

A problem of both approaches may be that informal care can have some effect on the quality of life of patients, and of volunteers (family and friends). This could lead to overrating costs. Most people provide help because they want to. This preference is part of their utility function and probably in their own QALY (positive or negative). The definition of benefits should be broadened to include all kinds of intangible benefits derived by individuals from the care process (Wiseman, 1997).

Problems with the valuation of indirect medical costs

Indirect medical costs in the care sector are very difficult to assess.

According to Weinstein et al. (1996) this would mean including costs of treatment-related diseases incurred during added life-years and the time the patient would have been alive anyway, and the costs of unrelated diseases in gained life-years. Non-health care costs in added years of life are not included. In this thesis, no specific diseases were taken into account. The demand for care, in general, is a result of several complex needs, possibly a consequence of various diseases. This means that all possible future costs should be included. However, since such figures would be based on average cost patterns among age groups, there would be no difference between treatment groups. It does not seem necessary nor feasible to include all these indirect future medical costs.

Problems with the valuation of indirect non-medical costs

Indirect non-medical costs or production losses are probably of limited size in the care sector, where clients are mostly elderly individuals, people with a mental handicap or psychiatric patients who did not have a job, or who have already retired. The best method to estimate these costs is the friction-cost method (Koopmanschap et al., 1995), which uses the average vacancy period of the lost job as a basis for cost calculations. However, how big is the chance that people with chronic mental illness had paid employment earlier, given the current high rates of unemployment? If this chance was not very big, should we include productivity losses for individuals with more acute conditions, who have short-term spells of absence? And how to proceed when in the near future excess labour demand is expected (Smith and Wright, 1996)? If lost productivity is included in the cost estimates for employed people, should we include lost productivity due to unwaged activities? Lost unpaid work may be especially important in the care sector. Brouwer et al. (1997) recommend to value these hours according to the wage rate of a professional housekeeper. Lost leisure time is expected to be fully captured in the outcome-measurement, the QALY-concept, and should therefore not be counted again (Gold et al., 1996). As will be shown in the next section, the QALY-concept does not suffice in the care sector, which means that costs of lost leisure time should be identified, measured and valued separately and taken into consideration at the cost side. If economic evaluations are used to decide on priority setting in resource allocation, care activities will not receive their proper weight.

Measurement of societal costs

A patient taken care of at home, does not go to a nursing home. For the individual himself the first option will be cheaper. However, for society as a whole that may be not the case. The bed in the nursing home is filled anyway, because there are waiting lists. When both people are helped, the costs for society as a whole are higher. When the first person is admitted into the nursing home, the other may have to wait for several months. Although this may have its impact on costs (a partner not being able to work, because he or she has to assist in caring), it is mostly not taken into consideration in economic evaluations. For inclusion of all costs of a care programme, the impact on waiting lists (and the costs to society of these waiting lists) should be included.

5- Outcomes

In general, outcome measurement instruments can be subdivided into technical and allocative efficiency measurement instruments. Measures of technical efficiency as a rule are intermediate variables like hospital occupancy rate, length of stay, number of clients treated, number of complications, and so on. However, many of these measures hardly show any causal relationship to the quality of care provided. These measures are important for (I) internal management information, for instance about production efficiency and utilisation review, and (II) external management information like market share or financial status (within budgets). They are, therefore, especially important on the micro- and mesoeconomic level.

As stated, such measures of production and efficiency do not show whether the health status of patients is improved. In a manner of speaking, they only give information on the amount of cars built and the way they were build (with which resources), and not about quality aspects or consumer satisfaction. For information on those aspects, other measures on allocative efficiency are needed. Measures of allocative efficiency can also be subdivided into internal measures like process and service quality, and external measures like customer satisfaction or effects on health status. Donabedian (1980) suggests three dimensions of quality: structure, production process and outcome. Structure refers to the physical and organisational setting. Process quality involves appropriate equipment, timely treatment, an adequate amount of services, following protocols, etc. The focus of a process approach is in fact on proper practising (Li and

Benton, 1996) and particularly important on the mesoeconomic level. Outcome for economic evaluations on the health sector level is defined as the change in a patients' health status following treatment, including physical, social, and psychological functions. Economists typically want to compare changes in quality of life among different health care programmes. Therefore, they have a strong preference for more general measures of quality of life. As an over-all measure, the QALY-concept was developed (Quality-Adjusted Life-Years). In this single index, mortality and morbidity are integrated. The result is a number between 0 and 1 (the utility factor) that corrects the number of life-years gained for quality of life. The potential use of cost-utility analysis lies in its ability to allow comparisons across health care programmes by referring to a league table of results (Gerard, 1992). A large disadvantage of this method is that by generalising the effects of health care programmes into one single index, sensitivity for small health change in certain dimensions is lost.

The use of a QALY appears to be difficult in the care sector for the following reasons:

- As considered above, the question of differentiating survival rates is a first complication. Actual changes in health status are very difficult to demonstrate in the care sector. Research on the influence on morbidity or mortality requires a huge database. Danermark et al. (1996) find no significant relationship between relocation and mortality in 22,579 elderly persons. Wimo et al. (1995) use a model based on average survival after the diagnosis of dementia. Differences in survival between certain care facilities were calculated using a Markov model of transition probabilities based on the development on the Global Deterioration Scale in the first year. They calculate that there is no significant difference in survival rate between the groups. However, progress of dementia symptoms seems to be slower for the group living under alternative programmes than for the individuals who live at home or in a geriatric psychiatric ward or a nursing home. In another study, no long-term difference was found in cognitive and physical functions for people who receive day care (as compared to people who live at home without day care) (Wimo et al., 1993).
- The product care has an intrinsic value which cannot be measured by output measurements. The goal of care is not so much to improve

health status, but to stop a deteriorating in health status. It is impossible to catch this in a QALY;

- The QALY is too insensitive on multiple health dimensions.
- In many cases, it is not easy to interview older people or mentally retarded people about their perceptions of the quality of their lives (Jenssen, 1995). Unless it can be ascertained that possible cognitive disturbances are small, the data must be obtained from a proxy. This proxy usually is a caregiver or a family member. There is considerable debate whether or not these proxies can be seen as accurate (Busschbach, 1998). An alternative would be using an indirect method of valuation of health status by the general public, as with EuroQOL (Brooks, 1996). However, this would aggravate the next problem;
- The QALY is discriminative (Gudex, 1996). A person aged 60 will in general have fewer years of benefit, than a twenty-year old. More in general, the question remains if a comparison of care for the elderly with other medical interventions is opportune. The nature of caring is to stop the functional decrease on several dimensions of the quality of life. Health gains hardly can be expected.

Other outcome measures are necessary. Economic evaluation could use utilisation reviews to answer questions like: what capacity level should each facility in the sector of the care for the elderly have; what is the optimal staff mix; what are the advantages of substitution, etc. The budget of nursing staff, for instance, mounts up to approximately 60-70% of total care costs (Groenenboom and Huijsman, 1995). For internal information, therefore, a detailed time registration procedure can find significant cost factors and thereby help in meeting the internal cost-containment policy. These are typically technical efficiency-motives. To allocate resources, a number of different output measurement instruments can be used.

I- Internal performance measures (technical efficiency measures)

Productive efficiency is used as a measure for performance. These measures include length of stay, case mix, patient cost per day, and total cost per case (Li and Benton, 1996). In most cases Data Envelopment Analysis is used to define these concepts (e.g. cost efficiency in nursing homes, Kooreman, 1994; Fazel and Nunnikhoven, 1992). In a more simple fashion, utilisation reviews measure the degree to which work force,

facilities, and equipment are employed. The average utilisation rate can be expressed as the average output rate divided by capacity, for instance occupancy ratio and nursing staff task assignments. Wimo et al. (1994) provide nine internal performance measures of psychogeriatric day care: the participation quotient, the registration quotient, capacity quotient, turnover quotient, average number of visits of patients per week, the degree of institutionalisation, mortality, a misjudgement quotient, and discharge analysis. However, the trouble with these measures is that, although occupancy rates, for instance, are a key variable in decisionmaking with regards to facility planning, real occupancy rates can easily be influenced by doctors and institutions.

II- External performance measures (technical efficiency measures)

Financial performance analysis is usually carried out by insurance companies. They are interested in the production parameters for financial reasons. In the Netherlands this is the case, because the budget for hospitals depends for a large part on the production parameters (together with availability and capacity). Availability counts for 25% of the budget, based on the adherence of the population. Capacity (35%) is based on the number of beds and specialist places (with a weighing factor for special functions). The budget for production (40%) is based on the number of admissions, the number of hospital days, the amount of day care services and the number of people that make a first visit to the outpatient department. Data on the utilisation of these parameters can be used to establish technical efficiency.

III- Internal quality measures (allocative efficiency measures)

Internal quality measures refer to process quality and service quality. Process measures, for example, may include prescription procedures for physicians or procedures for referring a patient to a specialist. These can objectively be recorded based on patient files. To establish the service quality remains a problem. The quality of the prescriptions in terms of their necessity and adequacy require explicit criteria. These could be provided by guidelines and protocols. In both cases the quality of health care is only measured using process qualifications. No judgement is given on the satisfaction of patients (subjective measures) or health status (objective measures). In the literature, however, these aspects are

generally seen as the most important outcome of medical intervention.

IV- External outcome measures (allocative efficiency measures)

Health status is most commonly measured by means of disease-specific (for instance the Older Americans Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire, the Groningen Activity Restriction Scale (GARS) (Suurmeijer et al., 1994), or the Nursing-Care Dependency Scale (NCD) (Dijkstra, 1998)) or generic (Sickness Impact Profile, Nottingham Health Profile or Rand 36) health outcome measures (Essink-Bot and Rutten-van Mólken, 1991; Van der Zee and Sanderman, 1994). In cost-effectiveness analyses, both instruments are very common. In each case a disease-specific instrument should be used to find out in which fields patients do better or worse. This can yield important information for improving the process of care. Recently, there is a trend to the usage of utility-based measures (time trade-off, standard gamble) which lead to an index for improvement of health status (for instance the QALY or the DALY (Murray, 1994)). As was mentioned at the beginning of this section, QALY's are difficult to use in the care sector (Chisholm, 1997). The QALY, as it is known now, cannot be used as an outcome measurement instrument for practical reasons (only use of proxies possible, it is too insensitive, and the product care cannot be evaluated by such outcome measurement instruments). Other instruments have to be used. The Dutch Advisory Council on Government Policy (Wetenschappelijke Raad voor de Regering (WRR)) suggests cost-quality analyses (WRR, 1997) in which a standardised concept of different dimensions of quality is used to evaluate care alternatives. This quality-concept could be based on the outcome measures mentioned above and can contribute to the use of economic evaluations on the mesoeconomic and the care sector level.

Solutions

In practice, a combination of several external measurement instruments seems best. In the CEA in dentistry (Chapter 4) several instruments were used:

- a- Clinical Implant Performance Scale (CIP-scale); in order to afford comparison of the clinical results of the different implant systems;
- b- Chewing ability; in order to be able to compare all treatment

- methods;
- c- Denture complaints; an assessment technique which uses a validated self-administered questionnaire, consisting of items focusing on problems with dentures, asking questions about functional complaints, physiognomy and aesthetics;
 - d- overall denture satisfaction; as an end point for cost-effectiveness analysis. A general measure of quality of life did not (significantly) differentiate between treatment groups.

In both studies in care for the elderly, quality was measured on a mix of qualitative and quantitative data, based on the judgement of clients and their informal care providers and professionals (Van Linschoten and Wolffensperger, 1994; Wolffensperger et al., 1994). Quality was defined with regard of the following aspects: availability, interpersonal manner (attitude), technical quality, efficiency, continuity, safety, and co-operation with informal carers and other professionals, for example physicians. This approach leads to a kind of process analysis. The results reflected bottlenecks in the implementation of the care delivery process (Van Linschoten and Wolffensperger, 1995). A comparison between different care options based on these concepts is difficult, a quantification of the outcomes even more so. Furthermore, data on external performance measures were used, number of clients treated, average number of visits per client, number of complications, etc. A patient satisfaction list was used to discover how different alternatives were valued.

In the care for the mentally retarded, other aspects are considered to be important in the measurement of quality of care. Vreeke et al. (1993) proposed four aspects: (a) objective quality of life, (b) physical and social functioning, (c) integration, and (d) satisfaction of clients and parents. Gardner et al. (1997) use concepts of personal goals, choice, social inclusion, relationships, rights, dignity and respect, health, environment, security and satisfaction. Van der Wijk et al. (1996) summarise possible instruments that can be used in this area. However, even within the field, there is no general agreement on methods to measure these concepts.

Since the QALY in its current form is not useful in the care sector, other methods for outcome measurement have to be chosen. An indirect method

for valuation of health status, like EuroQOL, would help to assess the position of, for instance, a demented elder person on the health status continuum. However, the ethical consequences remain problematic. Care activities are not aimed at health gains, but more at stopping the decline of health status. This hardly can be measured as an output. Cost-quality analyses, as proposed by the WRR seem a good alternative. In a study like that, a combination of output measures, like the ones described above, can be used to evaluate performance, quality and the development in health status.

8.3 Concluding remarks

This section offers some concluding remarks on the usefulness of economic evaluation of health care options in general, specifically applied to studies included in this thesis. Furthermore, special attention will be drawn to the things we learned during the implementation of studies in the care sector. Finally, some recommendations are presented for the nature and direction of future research possibilities,

8.3.1 Possibilities to support public policy

Knapp (1997) mentions several developments that trigger the demand for economic information in the health care sector: the growing prevalence of diseases very expensive to treat such as anxiety disorders, wider economic pressures and government cut-backs, other socio-economic changes which trigger equity considerations (an ageing population, increased tax burdens or higher insurance premiums for the working population), family expectations (higher standards of care and treatment expected), market forces (competition between insurers on health insurance premiums and budgeting of insurance companies that want to cut providers' reimbursement rates). In general, an expanding role for economic evaluation is to be expected in the health care sector. In the following a short review is given of possible uses; more specifically the use of results of this thesis will be demonstrated. After that, an overview of specific problems for economic evaluation in the care sector is given and a checklist to get around them. Finally, some recommendations for further research are presented.

This paragraph starts with a survey of the possible options to support policy makers that may follow from the studies in Chapter 3-7 in this thesis. In general, the possibilities for economic evaluations on different policy levels can be described using the framework of Frenk (1994), in which the main objectives and their most important issues are worked out (see figure 1).

Figure 1: Policy levels, objectives and issues in economic evaluations in health care

Policy level	Main objective	Issues
1 Societal	Availability Equity	Choices between for example: education, defence, infrastructure; Other sectors with effects on health
2 Health care sector	Equity Allocational efficiency Appropriateness Availability	Choices in health care and institutional arrangements: - Public agencies involved in health care; - Levels of government; - Public/private mix; - Resource generators;
3 Meso-economic	Allocational efficiency Technical efficiency Quality/effectiveness Acceptability	- Priority setting; - Cost-effectiveness issues; - Productivity; - Quality of care;
4 Instrumental	Performance enhancement on the institutional level	- Individual decisions; - Man Power Planning; - Human resource development;

Source: Based on Frenk, 1994;

Societal level

The studies in this thesis have no effect on decision-making on the societal level. On this level, choices have to be made between for instance education, the defence budget, environmental policy and health care. Although it is not common practice yet, economic evaluations could play an important role here (Drummond and Stoddart, 1995). Graham and Vaupel (1987) conducted a study in which they compared the consequences on health status, measured by the number of life-years saved, from policies in different sectors in the economy. The health care sector is not necessarily the most efficient field to produce an improvement in health status of the general population (for example, safety belts or crash helmets, or food programmes may be much more efficient for specific purposes). However, decision-support for these questions seems to be light-years ahead of us.

Health care sector level

At the health sector level, the monitoring of the health status of the total population, together with total costs and accessibility of health care, is important. Based on this information, health targets can be established. Furthermore, the health care sector level addresses the organisation and the management in the health care sector. For instance by posing questions like: who provides the resources for the health care sector, how are those resources collected and distributed over providers? Rutten (1996) describes the planning of specialist facilities as another possibility, for instance as an assessment for licensing of specialist facilities. He concludes that surprisingly little work has been done to support this kind of decisionmaking.

As Van den Heuvel et al. (1997) and Terpstra (1996) have shown, in the Netherlands the use of economic evaluation in important decision-making processes in health care is still at a very low profile. The most ambitious use of economic information has been the attempt in Oregon (Blumstein, 1997), USA. A state commission considered cost-effectiveness data and public valuations of health status. It proposed a priority list of services the state should cover. It estimated the total costs to provide each service until it reached the point at which the budget ran out. Services with a cost-effectiveness ratio beneath that point were not funded at all. The results showed a kind of 'Rule of Rescue', a high preference for life prolonging

treatments (Hadorn, 1991). Therefore, care services in particular were moved up and down the list, and cost-effectiveness ratios only became important in an ad hoc way. The procedure showed that it is very difficult to use costs and effectiveness data for prioritising cure and care.

From the studies in this thesis it becomes clear that at this level several possibilities exist to support decisions for policy purposes. Examples are:

- Excluding technologies from public reimbursement (for example the transmandibular implant mentioned in Chapter 4);
- Deciding about the suitability of new services for public funding (for example the permucosal implant in chapter 4 and the small-scale settings in Chapter 7, but also the encouragement of new modes of care in care for the elderly (Chapters 5 and 6);
- Setting the 'right' indication for medical technologies and treatment (Chapter 4);
- Reforming payment schemes for hospitals and other institutions (Chapters 5, 6, and 7);
- Changing payment schemes for health care professionals (as was suggested in Chapter 3);
- Changing reimbursement levels or coverage level (Chapters 3 and 7);
- The consequences of co-payment schemes and the shift in costs after the introduction of new facilities (chapter 5, 6, and 7);

In practice, however, the influence of results of these and other studies in the sector seems limited, or at least still far away. In dentistry, for instance, the dental prosthesis was removed from the insurance package, although it was seen as a rather cost-effective way of treating edentulous people. This rule has been abandoned recently. Nevertheless, the cumulation of studies that showed that payment schemes for hospitals and other institutions were counterproductive, led to some experiments with other means of financing (lump-sum, output-pricing). Furthermore, reimbursement levels are changed once in a while by the Central Council for Health Care Charges (Centraal Orgaan Tarieven Gezondheidszorg), although, according to professional critics, they are years behind.

Mesoeconomic level

On one hand the mesoeconomic level addresses allocational efficiency:

what do health care actors do; what types of technology do they provide; and how can priorities be set so that for any fixed budget in health care the allocation to different treatments and patients is such that we generate the greatest possible health for all? Economic research can support decisions on how to provide health care, concerning questions like the optimal staffing rate, the best mix of expertise, the provision of facilities, the use of equipment? On the other hand, the mesoeconomic level focuses on the technical efficiency (given program A, the costs of care should be minimised) of the production process in institutions and as such, forms an important input for internal management. Furthermore, this could be seen as a categorisation of medical efficiency, eliminating all unnecessary care. The mesoeconomic level is the level at which the traditional cost-effectiveness analyses take place, for instance as a piggyback to a randomised clinical trial in which three treatment options for edentulousness are compared (Chapters 3 and 4). On a programmatic level, possible subjects for studies are:

- resource allocation across programmes (based on utilitarian principles set out in Chapter 2);
- comparison of productivity between institutions (Van der Wijk et al., 1995, based on the data in Chapter 5);
- utilisation review;
- external budgeting;
- resource allocation in the region and investigating the possibilities for specialisation;
- disease management (protocols, guidelines);

On the mesoeconomic level (from the insurers' perspective) more information about care utilisation, costs and outcomes is used, for instance, in developing programmes for disease management. Information on cost-effectiveness of medical programmes can be helpful in determining standards and clinical guidelines for good medical practice or appropriate care (Elsinga and Rutten, 1997). The changes in the health care field described in Chapters 1 and 2 have led to the introduction of legislative changes like budgetary controls, separation of purchasing and providing, and a system of integrated care. This system improves the ability of different actors in the health care system to work together and to provide care in the neighbourhood. For instance, it promotes a more important role

for the general practitioner as a gatekeeper, a more important role for ambulatory care (transmuralisation) and better monitoring of individual patient treatment. These developments enhance the role of economic evaluation, because research is not only needed on the national policy level, but also on a more regional level and within institutions, insurance companies, etc. It can, for example, be used in the contracting process between insurers and providers (Gerard, 1993). The information can have potential in promoting a greater level of responsiveness of providers to new incentives and thereby encourage the market mechanisms which are proposed in many reforms. The decisionmaking on this echelon is likely to be sensitive to factors like local prevalence and incidence, local medical practice, and local capacity. The economic information provided should be made relevant to these local circumstances.

For insurers, the information will be needed to specify and monitor the delivery of health care within contracts. Here, the information gathered will focus on the costs and the process and service quality of care. At the provider level, information is needed to manage the use of resources and the delivery of quality services. The methods described in Chapters 3, 5 and 6 could be useful here. Standards for good medical or care practice and guidelines can be provided.

For providers, a Resource Management System which captures health activities and costs based on the case mix of services delivered, enabling care services to be managed within budgets or contracts, becomes increasingly necessary (managed care). Institutions (suppliers) and health care insurers are expected to become more and more responsible for their own exploitation within the budget.

Microeconomic level

The microeconomic level refers to the direction and administration of the process of cure and care, asking questions regarding management accounting. Other uses could be: the choice of patients that should receive access to a certain treatment, or the decision on the amount of money to be spent on individual patients (Ham, 1997).

At the microeconomic level, all kinds of organisational problems can be analysed. These take the form of management and financial accounting problems. In this category, questions about management information systems, cost consequences of client characteristics, the optimum staffing

ratio, the necessary expertise of staff, etc., can be answered. Within this level, economic evaluation focuses on technical efficiency questions.

- Developing medical audit and utilisation review schemes (Chapter 3);
- Establishing the optimal staff-level in quantity (number), and quality (what level of expertise) (Chapters 6 and 7);
- Internal budgeting;
- Human resource development;

At the institutional level, economic evaluations are only used in an ad hoc way. Management accounting, in principle, is an internal affair. At the patient level, economic evaluation can be used to make informed decisions. Application on this microeconomic level has several practical and ethical drawbacks (Williams, 1988; Hansson et al., 1994; Brock, 1993; Phelps, 1995; Lazaro, 1996), and it is therefore rarely put into practise.

8.3.2 Problems in care studies

The care sector is underrepresented in economic studies in health care. In most surveys of the subject, studies comparing care-interventions are not even mentioned (Elixhauser et al., 1993; Gerard, 1992). Most of the work concentrates on medical or educational prevention, diagnosis (for symptoms or screening procedures), and treatment (cure, rehabilitation, maintenance). Surprisingly, little research is being done in the care sector. The majority of studies focus on care for the mentally ill (Chisholm et al., 1997(a); Chisholm et al., 1997 (b); Knapp et al., 1994) and the mentally retarded (Beecham et al., 1997; Hatton et al., 1995). Non-acute care for the elderly is rarely evaluated. Several reasons were mentioned: first, the target group, which makes such an evaluation almost per definition less cost-effective; second, practical problems; and finally, the lack of prestige. Most studies in this field are assessed based on the standard toolkit for economic evaluations. For many reasons these tools do not fit automatically in the care sector. Many of the necessary adjustments are described in this thesis. The most important ones are surveyed below. Hopefully, they can serve in a more explicit discussion about the roles and methods of economic evaluation on different policy levels in the care sector. What have we learned so far?:

- Purely utilitarian principles cannot be used in the care sector. Care can

be seen as an ultimate safety net for all people who are no longer able to take care of themselves. The question whom to treat does not fit in this picture. Economic evaluations in this sector will always be more efficiency-driven;

- The research question should be formulated carefully. In most cases in the care sector locality and treatment modality are linked. Results should always be compared considering these possible differences;
- The perspective of the study could be more diverse. Not only the societal perspective should be used, but also the perspective of different other actors. Cost shifts from public agencies to individuals are fairly common and can lead to counterproductive incentives, which in turn may lead to less access for the least well-off;
- The study design in care evaluation is different from that in research of cure interventions. Randomised clinical trials are rarely done in the care sector, although they are fundamentally possible. Several options have been mentioned to get around this problem: static group comparisons, static group comparisons with matched groups, pretest-posttest without randomisation.
- Cost estimations should be made on an individual basis. This can be done, but it adds important restrictions to the gathering of data;
- Particularly the direct non-medical costs play an important role. A checklist was developed to include all possible related informal care costs. There will be less measurement problems if multiple data sets are used. The shadow price method is recommended for the current state of affairs;
- Indirect medical costs do not have to be included. In general, future care-related costs would have to be included in an economic evaluation. However, since it is extremely difficult in most cases to prove life-prolonging treatment, future costs can be excluded. Current costs should be included only when differences in all-comprehensive care packages exist;
- The effects of a certain programme on waiting lists and the costs that arise from these waiting lists should be included when a societal perspective on costs is taken;
- Outcome measurement in the care sector cannot be done with QALY's or DALY's yet. Outcome measurement will also be efficiency-driven, based on internal and external performance measures. For a description

of process qualifications, internal quality measures can be used.

- In the near future, cost-quality analyses are more opportune for the care sector;
- Economic evaluations are more useful on the mesoeconomic level (for organisational and programmatic purposes) than they are presently useful on the macroeconomic level. For the health care sector, several problems regarding the comparability of care activities remain.

8.3.3 Further research

- 1- Further research could focus on the use of cost functions in which service variables, resident characteristics, and other relevant variables are included to predict costs in a (linear) regression method. Such information could typically be relevant for individual organisations (SCP, 1989). In Alberta, Canada, a Resident Classification System was developed using resident characteristics to measure nursing care requirements and to provide case-mix information for a new funding system (Charles and Schalm, 1992). The information in Chapters 5,6 and 7 could be used to develop a system like that. More information about the factors that cause a demand for assistance is then necessary. From the literature Activities of Daily Living and Instrumental Activities of Daily Living seem to have an impact on the intensity of care. In Chapter 5, a regression analysis showed the influence of Cognitive Impairment. Many other factors have to be identified and their influence on care intensity has to be quantified.
- 2- When economic evaluations in the care sector tend to shift to cost-quality analyses, the next step involves production-function analysis. When the proposed quality measures can be quantified in a certain way, it becomes possible to relate inputs (costs) to outcomes in a mathematical equation. This procedure, however, will mainly be applicable for answering technical efficiency questions. But it will create a great forum for mirror information for institutions and a way to compare performances of hospitals and specialists;

- 3- Before this is possible, a standardised set of quality measures should be developed which measure the performance of service delivery in the care sector adequately. Such a set of quality measures should include measures for performance (technical efficiency), process outcomes (regarding quality of care activities), patient satisfaction scales, and an instrument to assess general health status.
- 4- More attention should be focused on the measurement and valuation of informal care time. Questions like the following should be answered: how do we count 24-hour surveillance, what time standard do we use for care activities delivered by informal care providers, and what are costs of time given up from unpaid work or leisure time. If the last question is answered, it will be possible to make an opportunity-based cost valuation procedure, which values input rather than output (as with the shadow price method)
- 5- Further efforts should be aimed at assessing productivity losses due to informal care activities of family and friends. How should lost productivity of unwaged activities be valued? And how can double-counting be prevented? For many informal care providers, helping their partners influences the quality of their life in a positive or negative sense. Maybe this effect should be included in outcome measurement rather than on the cost side;
- 6- Finally, the possibilities and consequences of usage of QALY-like instrument should be analysed. These issues have to be addressed before an adequate, health level wide comparison between cure and care activities is possible.

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