The Economics of Health Reforms

Edited by Dr. John N. Yfantopoulos
The
ECONOMICS
of
HEALTH REFORMS

Edited by
Dr. John N. Yfantopoulos
Table of Contents

List of Contributors 10

1 The Economics of Health Reforms: An Introduction 15
   J.N. Yfantopoulos

Part 1: Health Economics and Politics

2 Freedom and Health: Democracy Is Good for Health 43
   J. Safaei

Part 2: Health Policy

3 Is There Hold-up of Health Care Reforms in Europe? 63
   R. Osterkamp  

4 Liabilities of the French State-as-an-Employer: Evaluation as of 1 January 2004 Following the 2003 Pension Reform 85
   E. Picket

5 Long Term Care Reform in Estonia: Plans and Reality – Financing, Management and Quality of Services 109
   J. Kõre and S. Kree

6 "Good Fences Make Good Neighbours": Healthcare in Ontario Enters the Age of Accountability 123
   F. Markel

7 The Efficiency of Public Primary Care Providers and the Need to Reform the Health Care System in Slovenia 129
   M. Tajičnikar and P. Došenović

8 Health Sector Reforms in Bangladesh: How does it Work? 151
   S.A. Rahman and M.H.Md. Iftekhar

9 Decentralization of Health Care in the Republic of Croatia – A Critical View 175
   A. Dzakula, L. Vonicina and O. Brborovic

10 The Effects of WTO on the Health Sector in Developing Countries 189
    M. Ener and E. Demircan

11 The Polish Results of a Health Economics Study Performed in Accordance with the Requirements of one of the American Schools of Public Health 199
    M. Bryla, W. Stelmach and I. Maniecka-Bryla
12 Standardized Mortality Ratios and Allocation of Health Care Resources: Turkey Case
   Y. Akbulut, M. Tatar and A. Demir

13 Users' Perceptions of Health Care Reforms: Quality of Care, Patients' Rights and Satisfaction with Health Insurance System in Four Regions in the Russian Federation
   M. Fotaki

Part 3: Health Inequalities

14 Economic and Health Impacts of Narrower Health Inequalities in Australia
   A. Walker

Part 4: Demand for Health and Health Services

15 The Demand for Health: Differences Between the Native Dutch and Immigrants in the Netherlands
   J.R. Cornelisse-Vernaat and H.M. van den Brink

16 Analysis of the Demand for Private Health Insurance in Spain
   J.A. Ordaz Sanz, F.M. Guerrero Casas and C. Murillo Fort

17 Further Inquiry into the Effect of Managed Care on the Utilization and Cost of Medical among Patients Diagnosed with Asthma and Diabetes
   M. Samnaliev and S. Brandt

18 An Overview of Generic Entry and Price Competition in the Prescription Drug Market
   T.L. Regan

19 Pre and Postnatal Determinants of Child Health
   T. Hindman Persson

Part 5: Supply for Health Services

20 Comparison of the European Physicians’ Market Power
   J. Akremi and J. Lievaut

Part 6: Hospital Economics

21 Economies of Scale and Scope in Turkish Hospitals
   Z. Caliskan

6
22 Child Survival in China: Convergence versus Government Subsidies in General Hospitals
   C. Ma
23 Nonurgent Use of Emergency Department: A Case Study in Turkey
   S. Tekin, unduz und E. Esatoglou
24 Prioritisation Scoring Systems for Surgical Waiting Lists
   A. Testi and E. Tantani
25 Inefficiency in Health Care: A Measurement by Potentially Avoidable Readmission
   C. Milcent
26 The Impact of DRG Payment System on Italian Hospitals
   G.P. Barbetta, G. Turati and A.M. Zago
27 Relationship between Funding Mechanism and Service Effectiveness of Hospital
   J. Rój
28 Relative Efficiency of Hospitals in Ukraine: A Malmquist-Index Approach
   A. Piyavsky and M. Staat

Part 7: Values in Health and Health Care
29 Pregnant Mother’s Valuation of Own and of Child Care
   S.A. Noesis and T.D. Croker
30 Values in Healthcare: Is a Values-Based Approach Practical?
   N. Ragbir-Day

Part 8: Economic Evaluation
31 The Biggest Bang for the Buck or Bigger Bucks for the Bang: The Fallacy of the Cost-Effectiveness Threshold
   S. Birch and A. Gafni
32 An Efficient Alternative Care Scenario for Long Term Care Based on the Principles of Social Sustainability and Quality of Life in Spain
   J. Garcés, F. Ródenas, V. San José and S. Carretero
33 The Cost-Effectiveness of Individual Remediation against the Effects of Radon Gas in Domestic Properties
   T. Coskeran, A. Denman, P. Phillips and R. Tornberg
34 A Cost Analysis of Telemedicine: Empirical Evidence from 8 Arizona sites
A. de la Torre, C. Hernandez-Rodriguez and L. Garcia

35 The Cost of Waiting
Lucy M. Kok and Peter J. Hop

36 Determining Benefit Packages in Health Care:
A Comparative Perspective
H. Rothgang, S. Gress, D. Niebuhr and J. Wasem

37 Economic Implications of Learning Disabilities in Great Britain: Cost of Care and Cost Effectiveness of Treatment
R. Romeo

Part 9: Health Econometrics

38 A Panel Data Approach for Income-Health Causality
E. Erdil and H. Yetkiner

39 Public Policies and the Demand for Carbonated Soft Drinks
G.W. Gustavsen

40 The Role of the Extended Family in Coping with Cost of Illness in Rural China
Y. Jiang, J. von Braun and A. Astaw

A. Kara and S. Zaim

Part 10: Economics of Addiction

42 Estimating the Prevalence of Drug Abusers in Denmark
E. Hammerby

43 The Price of Beer and Lager and Violence-Related Injury in England and Wales: A Fixed Effects Model
K. Matthews, D. Peel, J. Shepherd and V. Sivarajasingham

Part 11: Health Care Management

44 Emerging Trends in Hospital Organizational Structure: An International Perspective
F. Lega
45 Revisiting the Theme of Winners and Losers: The Implications for Professional Roles and Occupational Identities in a Changing NHS
Y. Leverment

Part 12: Social Marketing and Quality of Life

46 The Use of Social Marketing Interventions for Improving Life Quality in Chronic Patients
M. Uydaci and A. Yildirim

47 Managed Care and Traditional Insurance: A Comparison of Care Quality
D. Simonet
An Efficient Alternative Care Scenario for Long Term Care Based on the Principles of Social Sustainability and Quality of Life in Spain

J. Garcés, F. Ródenas, V. San José and S. Carretero

Introduction

The substantial growth in expenditure earmarked for the health sector in European countries over recent decades (Saltman and Figueras, 1997) has brought with it the appearance of serious problems in both management (Dixon and Mossialos, 2002) and finance (Mossialos, Dixon, Figueras and Kutzin, 2002; Directorate-General for Economic and Financial Affairs, 2002a,b) among the health care systems of these countries, and especially among the Mediterranean nations. It is forecast that in a very short space of time the sustained increase in per capita health care spending will return a cost which the universal and free of charge system cannot support, producing a crisis related to a violation of the principles of universality and/or quality of life. This situation can be explained due to the concurrence of demographic, social and cultural changes which are occurring in Europe (Jackson and Howe, 2003), as well as a change in the axiological base guiding health care policy over the last 40 years.

Focusing now on the field of efficiency (Fenn, McGuire, Phillips, Jones and Backhouse, 1996; Drummond, O'Brien, Stoddart and Torrance, 2001; Kuntz and Weinstein, 2001), we must stress that applying economic methodology to welfare states implies considering the limits associated with its principles. Hence, two opposed principles exist regarding what should be the scope of the change and whom it should or must affect: At one extreme, the principle of non-existence of badly affected patients. At the other extreme, the principle of simple maximisation (it is enough to attend to optimisation of the change). A solution midway bet-
ween both extremes is the principle of "No-loser constraint with hypothetical compensation", or what is the same, that it is legitimate to carry through changes in health policy if the benefits outweigh the harmful effects -cost/benefits ratio-, as long as there is an offsetting subsequent redistribution of benefits among the population - an increase in equity.

The rise in costs is a continual menace to the principle of social sustainability (Garcés, 2000), a principle together with those of Social Co-responsibility and Quality of Life and Dignified Death must, according to our studies, conform the axiological basis of the new welfare systems in the Europe of the XXI century.

In this work we study the applicability of some care strategies on dependent people, that is to say, those who present reduced autonomy to develop daily life activities, due to the present relevance of problems of health management deriving from the growth of this collective among the developed countries. The objectives focus on defining what are the possible benefits for dependent persons, how to measure them and how to generate an increase in benefits without raising costs. Specifically, one way of approaching quantitatively the magnitude of the benefit when the opportunity to access care services is improved is the following: a) Awareness of the needs of dependent persons using health resources. This information has been recently obtained by means of an empirical study into the social and health care needs carried out in the Valencian Autonomous Region (Garcés, Ródenas, Sanjosé, Megía et al, 2003). These needs are grouped up into three basic factors: state of health, level of dependency on others, and social familial support available to the patient; b) Calculating the present cost of this care; c) Proposing changes in the ways care is performed; d) Recalculating the costs of the new proposal and the financial savings derived.

Finally, we should evaluate the global benefits of the proposal, and calculate the number of dependent persons that could benefit from it without incurring in an increase of the global expenditure.

The Care Factors of Dependent Persons

The study of the care profile of those who are dependent and the suitability of resources, have been objectives of other studies. For this study we select some hospital facilities such as the
Hospitals for chronically ill and long stay patient care (HCLS); the Short term stay medical units (STS), located in hospitals for the acutely ill, used to identify, evaluate and stabilise patients with a social and health care profile through the appropriate diagnostic and therapeutic instruments (frail elderly persons, the chronically ill, terminal patients, etc.), managing their assignment to the best therapy location; and the Units for psychiatric hospitalisation (UPH), directed to provide intensive treatment under a continuous care regime in hospitals for the acutely ill.

For dependent patients using these hospitals we evaluated the state of health, the functional dependence on other persons to carry out activities of daily life, and the existence or absence of a sufficient carer in the family sphere. These three aspects will be used afterwards to evaluate the possibility of assigning alternative care resources to patients currently being attended in hospital.

Health was evaluated through the medical diagnosis and the clinical complexity. Concretely, clinical complexity, defined here by the treatment procedures being used by individual patients can be a) high: the patient needs enteral or parenteral feeding, assisted breathing or respiratory therapy, thoracic -parecentesis or transfusion; b) Medium: the patient needs fluidotherapy, respiratory or functional physiotherapy, chemotherapy, radiotherapy, biopsy, complex cuts, ostomy or tracheotomy care, blood analysis, dialysis; or c) low when the patient does not need none of the previous treatment, but needs psychotherapy, oxygen treatment or medication.

HCLS and STS patient's dependency for daily life activities was measured using the Barthel test (Mahoney and Barthel, 1965). The Frenchay test (Bond, Harris, Smith and Clark, 1992) was used for UPH psychiatric patients, since mental patients present a dependency of a different nature, which is associated to instrumental activities of daily life (IADL) rather than basic activities.

Due to its usefulness for this study, we shall concentrate our attention on the existence or otherwise of a sufficient carer who attends the daily life needs of dependent persons. We call sufficient caregiver a person aged less than 75, present during the interview or mentioned by the dependent person, either belonging to the immediate family of the patient or someone independent and employed who can look after the patient all the time they need, or at least for 6 months at the patient's or their own home.
Now we can study the suitability of each of the different resources to their current users, and hence propose other care scenarios which improve the efficiency of the whole system by reducing unnecessary hospital stays and referring patients to other less costly resources which cover their needs offering equal or better quality of life.

Methods

The best option to improve the benefits among the dependent population in an immediate manner consists of looking at how to optimise the suitability of present resources in such a way that two objectives are achieved: a) Dependent persons must receive the necessary help with the maximum possible quality of life; b) More persons must be attended when they need to be, which implies a redistribution of care resources among potential users.

The first objective, referring to necessary, sufficient and high quality services, usually implies studying the way in which certain services can be supplied at home when this is possible. The second objective implies management of the time that care must last in each case, in such a way that resources which are not used when needed, are made available to persons who are in greater need. This is consistent with the “No-loser constraint with hypothetical compensation” principle.

With the aim of maximising the different results of proposing alternative care scenarios we shall concentrate our analysis on hospital facilities – the most expensive ones. Specifically, the hospital units involved in this empirical study are the STS, the HCLS and the UPH.

Our working hypothesis is that a careful study of the needs and possibilities of each patient can free up many hospital resources, through patient referral to other quality services which provide fair and necessary care to dependent persons in their own home and social and family environment. Concretely: Among the patients admitted to specific hospital units -STS, HCLS, UPH- we will find persons with a suitable profile for referral, given their clinical condition, and who would have a sufficient carer if the burden associated with care was lightened to a great extent.

The data sources available are: a) the Data Bases and official records of the different Hospitals, and b) the data that arose
from the field research were obtained through direct interviews from a sample of 1,263 dependent persons in the Valencian Autonomous Region (Garcés, Sanjose, Ródenas, Megía et al., 2003). The first sources provide annual economic, medical and statistical data on every patient: gender, age, clinical diagnosis, number of stays (nights spent in hospital) for every patient and clinical circumstance entered; and also the total annual cost for each service, as well as the total annual number of stays. However, information is normally not available concerning the level of functional dependence of each patient. As such, we shall make use of the results of the empirical study mentioned earlier in order to quantify the distribution of patients per type of hospital according to their dependence level. The second source enables us to assign alternative care resources for each patient with respect to their social-health profile.

From the principle of Quality of Life, the care scenario we propose is more efficient than the current one as it is based on the assumption that people in general, and dependent people in particular, enjoy the greatest quality of life possible when they can remain in their own social and family environment, with the guarantee that their health and social needs are being met.

The care scenario we are proposing as an alternative means using home and community resources when the patient profile makes this possible, and also assisted nursing homes (with medical and more or less intense clinical care) when necessary. Concretely, the resources that we shall consider are: Home Help Service (HHS), Nursing Homes, Day Hospital (DH), Unit of Home Hospitalization (UHH) - which from hospitals provide specialised health care in the home of the patient, alter the period of stabilisation in hospital- and Primary Care (PC), (doctors, nurses and social workers) at the surgery and at the home.

Criteria for Home and/or Community Patient Care

Four factors are taken into consideration to determine if dependent persons can or may not be attended in resources outside hospitals (or for referral of already admitted social and health care patients): a) clinical complexity; b) the degree of dependence in carrying out activities of daily life; c) availability of a sufficient home carer to attend their needs; d) age older or youn-
ger than 60 years (the legal age limit to gain access to certain resources such as nursing homes).

Clinical complexity has been defined earlier in a simple but objective way. The possibility or not of having these procedures available as well as the level of vigilance they imply determine the alternative health care resource that can cover the needs of the patient, as long as the latter is not currently suffering an acute stage of illness. So the alternative health care resources to hospitals in case of high, medium and low clinical complexity are UHH, DH and PC -with Day Centre (DC) or Units of Mental Health (UMH) when necessary-, respectively. The level of dependence for the activities of daily life determines the degree of daily social care required from others by the patient. Finally, the law currently in force in Spain places limits on the age of those who can benefit from certain resources such as elderly homes (60 years and over).

Taking this into consideration, we assume the derivation criteria listed in Chart 1 for non-psychiatric and psychiatric patients respectively. In some cases we will demand that the domestic carer is not in a job outside the patient’s home owing to the permanent care the dependent person requires, whether it be due to their illness (psychiatric patients), their clinical complexity (patients attended by UHH), or their high dependence. Three standard levels of intensity are considered in HHS, whether domestic or personal: Low intensity (6hr/week); Medium intensity (10hr/week); High intensity (15hr/week).

**Chart 1 Derivation criteria**

<table>
<thead>
<tr>
<th>Sufficient Carer</th>
<th>Clinical Complexity: Low</th>
<th>Clinical Complexity: Medium</th>
<th>Clinical Complexity: High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independence</strong></td>
<td>Not needed/D-LU^1+PC</td>
<td>D-LI/MI^1+DH</td>
<td>P-HI+UHH</td>
</tr>
<tr>
<td><strong>Low Dependence</strong></td>
<td>D-LI/MI^1+PC</td>
<td>D-MI/HI^1+DH</td>
<td>P-HI+UHH</td>
</tr>
<tr>
<td><strong>High Dependence</strong></td>
<td>P-LI (+DC)+PC</td>
<td>P-MI+DH</td>
<td>P-HI+UHH</td>
</tr>
<tr>
<td>No Carer Dependence for BADL</td>
<td>Clinical Complexity: Low</td>
<td>Clinical Complexity: Medium</td>
<td>Clinical Complexity: High</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------</td>
<td>---------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Independence</td>
<td>D-LI/MI + PC</td>
<td>D-MI/MI + DH</td>
<td>Hospital (to 60y)/NH (over 60y)-HI</td>
</tr>
<tr>
<td>Low Dependence</td>
<td>P-LI/MI + PC</td>
<td>P-MI/MI + DH</td>
<td>Hospital (to 60y)/NH (over 60y)-HI</td>
</tr>
<tr>
<td>High Dependence</td>
<td>Hospital (to 60y)/NH (over 60y)-LI</td>
<td>Hospital (to 60y)/NH (over 60y)-MI</td>
<td>Hospital (to 60y)/NH (over 60y)-HI</td>
</tr>
</tbody>
</table>

2. Psychiatric patients (from UPH)

<table>
<thead>
<tr>
<th>Sufficient Carer Dependence for IADL</th>
<th>Clinical Complexity: Low</th>
<th>Clinical Complexity: Medium</th>
<th>Clinical Complexity: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independence</td>
<td>P-LI + MHU</td>
<td>P-MI + DH</td>
<td>UPH</td>
</tr>
<tr>
<td>Low Dependence</td>
<td>P-MI + MHU</td>
<td>P-MI + DH</td>
<td>UPH</td>
</tr>
<tr>
<td>High Dependence</td>
<td>P-HI + MHU</td>
<td>P-HI + DH</td>
<td>UPH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No Carer Dependence for IADL</th>
<th>Clinical Complexity: Low</th>
<th>Clinical Complexity: Medium</th>
<th>Clinical Complexity: High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independence</td>
<td>P-LI + MHU</td>
<td>UPH</td>
<td>UPH</td>
</tr>
<tr>
<td>Low/High Dependence</td>
<td>UPH</td>
<td>UPH</td>
<td>UPH</td>
</tr>
</tbody>
</table>

Notes. BADL: Basic activities of daily life. IADL: Instrumental activities of daily life. D: Domestic services; P: Personal and domestic services; LI=Low intensity (6h/week); MI=Medium intensity (10h/week); HI=High intensity (15h/week). PC: Primary Care; DH: Day Hospital; UHH: Unit for Home Hospitalization; MHU= Mental Health Unit; NH: Nursing Homes. In Nursing Homes: LI/MI/Hi= Degrees of medical care. The intensity depends on whether the caregiver works out of the home or not, and whether the level of the patient's autonomy is high or low for instrumental activities of daily life. Being a 'sufficient caregiver' for dependent mental patients implies that the caregiver does not work out of the patient's home. Independent patients presenting low clinical complexity do not need a family caregiver. Source: Own elaboration. "Poliwelfare" Research Unit, Universitat de València, 2003.
The referral itineraries proposed are those shown in diagram 1. Patients should be moved from hospital after they are duly stabilised unless they are in an acute phase of illness. In particular, our criterion contemplates that patients attended at an STS should be referred to a HCLS after being stabilised. In other cases, patients may be assigned directly to alternative resources, by a Primary Care team. The proposal modifies the average length of stay at hospitals, since a significant number of patients could be referred to other resources after their diagnosis, treatment and stabilisation (see Table 1).

Method for cost calculations of care services

The way of estimating the actual cost of dependence for each hospital is based on finding the relation between duration of stay and the degree of dependence of the individual patient. For that goal we have assumed the following methodological hypothesis: Persons with strong dependence statistically will generate a greater number of stays than persons with low dependence.

The hypothesis assumes that in each hospital unit, independent persons or those with slight dependence will produce a low number of stays, while people with strong dependence will, on average, produce a large number of stays (not necessarily in a direct proportional relationship).

The procedure to follow is the one below: 1) Find the number of stays $N_k$ over the year of each person $k$; 2) Order from lesser to greater the total accumulated stays for each person to obtain an ordered series of pairs $(k,N_k)$, from greater to lesser $N_k$; 3) From all the persons with the greatest number of stays select the number corresponding to the percentage of severe dependants, $d_k$, given by the distribution of dependence, $P(d_k)$, from the previous field study; 4) Add up all the stays $N_k$ corresponding to these persons. Now we have the total stays corresponding to high dependence patients; 5) Repeat the exercise with the other dependence levels until the total of persons and stays is complete. Now we know $N(d_j)$ for each level of dependence, $d_j$; 6) Multiply by the cost per stay, $C_e$ -from hospital memories- to obtain $C(d_j)$. The cash unit used is the **cost per stay**. Generally, the cost per stay includes the night stay per patient in a hospital, catering costs, personal care and medication staff. The cost of the proposed alternative care resources will be calculated from quantities that have been officially agreed upon between the public administration and the entities that fulfil each of the services.
Table 1 Number of dependent social and health care patients in hospitals and proposed referral to other care resources

<table>
<thead>
<tr>
<th>Dependent social and health care patients in hospitals</th>
<th>Present hospital unit</th>
<th>% Referable patients admitted in each hospital unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STS(^3)</td>
<td>Hospital for CI(^4) &amp; LTS(^4)</td>
</tr>
<tr>
<td>% non referable (require hospitalisation full time, currently admitted)</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td>% referable to alternative resources</td>
<td>100%</td>
<td>92%</td>
</tr>
<tr>
<td>Total patients</td>
<td>5820</td>
<td>4357</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative resource assigned or referred</th>
<th>% Referable patients admitted in each hospital unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STS</td>
</tr>
<tr>
<td>UHH(^1)</td>
<td></td>
</tr>
<tr>
<td>HHS(^2)</td>
<td></td>
</tr>
<tr>
<td>Domestic 10hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Domestic 15hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Personal and domestic 10hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Personal and domestic 15hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Day hospital</td>
<td></td>
</tr>
<tr>
<td>HHS</td>
<td></td>
</tr>
<tr>
<td>Not needed</td>
<td>0</td>
</tr>
<tr>
<td>Domestic 6hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Domestic 10hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Personal and domestic 6hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Personal and domestic 10hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Personal and domestic 15hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Primary care or outpatients</td>
<td></td>
</tr>
<tr>
<td>HHS</td>
<td></td>
</tr>
<tr>
<td>Personal and domestic 6hr/week</td>
<td>0</td>
</tr>
<tr>
<td>Low care nursing home</td>
<td>0</td>
</tr>
<tr>
<td>Medium care nursing home</td>
<td>0</td>
</tr>
<tr>
<td>Intensive care nursing home</td>
<td>0</td>
</tr>
<tr>
<td>HCLS</td>
<td>100</td>
</tr>
</tbody>
</table>

\(^1\) Units for Home Hospitalisation. \(^2\) Home Help Service. \(^3\) Short Term Stay. \(^4\) Long Term Stay. \(^5\) Psychiatric Hospitalization. \(^6\) Chronically ILL

Source: Own elaboration, "Pollwelfare" Research Unit, Universitat de València.
Results

Costs of the hospital stays of dependent persons

Now we can use the hospital records of each unit to find out the number of persons attended in a year, the total number of stays over that year and the average cost per stay. Subsequently, the data of the statistics study described above allow us a clearer picture of the number of dependent persons attended in a year (2001) at each hospital resource. Finally, the methodological procedure described above and the costs per stay at each one of the hospital units enable us to determine the cost per stay of a dependent person and compare this with the cost per stay of an independent person (see table 2).

The high cost of dependence—between 72% and 96% of the total—makes it worthwhile examining other possible care alternatives. This would be a matter of optimising care at these costly resources and making possible referral to other resources of patients where possible, depending on their clinical state, social support, age and other circumstances. Finally, the objective is to estimate the benefits of the alternative in monetary terms (euros) and in terms of the opportunity of benefiting a greater number of people.

Costs and benefits of the proposed alternative care scenario

Employment of our alternative care scenario involves a cost resulting from adding: a) Costs of home health care (PC or UHH) or in DH or in hospital units (STS, HCLS, UPH); b) Costs of other resources such as HHS and DC if needed.

When calculating the benefits relative to the actual situation we must consider the qualitative dimension, defined by freeing up hospital beds for patients who need them, and the quantitative dimension, given by the monetary difference in euros between the two scenarios, or alternatively by the extra number of persons who can be cared for with the same budget. In this respect, we must say that the monetary costs of the alternative proposal must be calculated equalling the time presently consumed in care. This means that for comparison purposes, only the days in which the patients would have remained in hospital using other resources are computed, though these resources may have been used for a lot longer.
Table 2 Costs of the hospital stays of dependent persons (Year 2001) and saving in euros per patient referred and day, according to the care destination planned, in the alternative scenario to hospitalisation

<table>
<thead>
<tr>
<th>Hospital stays</th>
<th>STS</th>
<th>HCLSB</th>
<th>UPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients attended</td>
<td>9,739</td>
<td>6,428</td>
<td>2,814</td>
</tr>
<tr>
<td>Total stays</td>
<td>33,099</td>
<td>120,501</td>
<td>56,453</td>
</tr>
<tr>
<td>Total cost (euros)</td>
<td>7,314,598.95</td>
<td>16,904,444.62</td>
<td>10,073,852.28</td>
</tr>
<tr>
<td>Cost per stay (euros)</td>
<td>221.59</td>
<td>140.29</td>
<td>178.45</td>
</tr>
<tr>
<td>Dependent persons attended</td>
<td>5,820</td>
<td>4,357</td>
<td>956</td>
</tr>
<tr>
<td>Dependent persons as % of total persons</td>
<td>59.8</td>
<td>67.8</td>
<td>34.0</td>
</tr>
<tr>
<td>Total annual stays of dependent persons</td>
<td>27,394</td>
<td>116,288</td>
<td>40,428</td>
</tr>
<tr>
<td>Annual dependent persons stays as % of total stays</td>
<td>83.1</td>
<td>96.5</td>
<td>71.7</td>
</tr>
<tr>
<td>Average annual dependent persons stays</td>
<td>4.7</td>
<td>26.7</td>
<td>42.3</td>
</tr>
<tr>
<td>Average annual stays independent persons</td>
<td>1.4</td>
<td>2.0</td>
<td>8.6</td>
</tr>
<tr>
<td>Annual cost per dependent person (euros)</td>
<td>1,043.00</td>
<td>3,746.00</td>
<td>7,546.60</td>
</tr>
<tr>
<td>Annual cost per independent person (euros)</td>
<td>316.90</td>
<td>408.85</td>
<td>1,540.00</td>
</tr>
<tr>
<td>Ratio: annual cost per dependent person versus</td>
<td>3.3</td>
<td>9.2</td>
<td>4.9</td>
</tr>
<tr>
<td>independent person</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual cost of dependent persons (euros)</td>
<td>6,078,967.45</td>
<td>16,313,361.23</td>
<td>7,219,248.85</td>
</tr>
<tr>
<td>Percentage of total annual cost of dependent persons</td>
<td>83.1%</td>
<td>96.5%</td>
<td>71.6%</td>
</tr>
<tr>
<td>Alternative resource assigned or referred</td>
<td>Day hospital</td>
<td>Primary care</td>
<td>Day centre</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Home hospitalisation (UHH)</td>
<td>HHS</td>
<td>HHS</td>
<td>HHS</td>
</tr>
<tr>
<td>P and D 15hr/week</td>
<td>34.82€</td>
<td>36.15€</td>
<td>27.64€</td>
</tr>
<tr>
<td>D 10hr/week</td>
<td>41.82€</td>
<td>36.15€</td>
<td>27.64€</td>
</tr>
<tr>
<td>D 15hr/week</td>
<td>36.15€</td>
<td>36.15€</td>
<td>27.64€</td>
</tr>
<tr>
<td>P and D 10hr/week</td>
<td>36.15€</td>
<td>36.15€</td>
<td>27.64€</td>
</tr>
<tr>
<td>P and D 15hr/week</td>
<td>36.15€</td>
<td>36.15€</td>
<td>27.64€</td>
</tr>
<tr>
<td>Not needed</td>
<td>118.60€</td>
<td>111.80€</td>
<td>106.81€</td>
</tr>
<tr>
<td>D 6hr/week</td>
<td>111.80€</td>
<td>111.80€</td>
<td>106.81€</td>
</tr>
<tr>
<td>D 10hr/week</td>
<td>107.27€</td>
<td>108.40€</td>
<td>101.60€</td>
</tr>
<tr>
<td>P and D 6hr/week</td>
<td>108.40€</td>
<td>108.40€</td>
<td>101.60€</td>
</tr>
<tr>
<td>P and D 10hr/week</td>
<td>101.60€</td>
<td>101.60€</td>
<td>101.60€</td>
</tr>
<tr>
<td>P and D 15hr/week</td>
<td>93.10€</td>
<td>93.10€</td>
<td>93.10€</td>
</tr>
<tr>
<td>Low care nursing home</td>
<td>112.59€</td>
<td>112.59€</td>
<td>112.59€</td>
</tr>
<tr>
<td>Medium care nursing home</td>
<td>106.66€</td>
<td>106.66€</td>
<td>106.66€</td>
</tr>
<tr>
<td>Intensive care nursing home</td>
<td>99.77€</td>
<td>99.77€</td>
<td>99.77€</td>
</tr>
<tr>
<td>HCLS</td>
<td>81.62€</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regarding the qualitative benefit, our scenario contemplates cancellation or reduction of the average length of stay of patients in hospitals.

Optimisation of these costly hospital resources, which are highly necessary but saturated—in Spain there are long waiting lists—requires precise control of bed occupancy times. This control could be exercised by case management teams in Primary Care which have access to the clinical and social data of the patients in order to be able to take consensus and expert decisions on the appropriateness and timely nature of admission and/or referral to other resources (Walsh and Clark, 2002).

From the quantitative point of view, attention or referral home assigning resources such as HHS, DC, PC, DH and UHH, or referral to nursing homes with intensive, medium or low care represents a reduction of the cost per day versus hospital stays in HCLS, STS, and UPH. The costs per day are obtained totalling the services supplied during one year and dividing this by 365 days.

Our proposal implies that the primary care attention team can directly assign the home or community resources, as well as deciding the intensity of care. They can also decide on admission of patients to hospital. Inside the hospitals, other teams must perform monitoring of the status of patients admitted, to decide whether it is appropriate and opportune to refer patients to other resources. Thus we propose that from STS, stabilised patients can be referred to other convalescence, rehabilitation or long term stay HCLS units, without a loss in the quality of care. From HCLS and also from UPH some patients can also be referred, after a period of treatment at these centres either to their home or to residences, with adequate medical and social services.

The monetary benefits measured in euros savings per day and person for each alternative care to hospitalisation, or for each possible referral from STS, HCLS or UPH to other care destinations are shown in table 2.

For the dependent patients needing transport to DH or DC we must add a daily, adapted transport service at an approximate cost of 12 euros/day in Spain in year 2002.

An alternative care scenario must consider both the patients whose social and health care profile allows attention in other resources and the number of stays during which the alternative service could replace the hospital for each patient.

Table 1 shows the amount of dependent social and health care patients that could be attended by other resources or re-
ferred from hospital to other centres or services because they have the adequate profile of stability and clinical complexity and an available caregiver that meets their needs and age.

Costs of a Generic Alternative Scenario

The total cost of hospital attention at STS, HCLS and UPH is calculated in the following manner: $C = \sum_j (e_j \times p_j)$. Where $j$ represents each resource computed, $e_j$ is the number of stays at the resource $j$ of all the patients attended, and $p_j$ is the cost of each of the stays at this resource. Statistically, $e_j$ could be expressed as: $e_j = n_j \times a_j$, $n_j$ being the number of persons attended over a certain period of time (i.e. one year), and $a_j$ the average number of stays per person and year at the resource $j$.

Hence: $C = \sum_j (n_j \times a_j \times p_j)$.

As such, the difference between two care scenarios will be:

$\Delta C = \sum_{j \neq k} \sum_k e_{j\rightarrow k} \times (p_j - p_k)$. Where $j$ represents the present resource, $k$ the alternative resource, $e_{j\rightarrow k}$ represents the number of stays currently consumed at resource $j$ which would be consumed in resource $k$ in the alternative care scenario, depending on the number of persons who could be referred and the number of stays that could be transferred to the other resource on average.

From this departure point and in Table 3 the expressions for the different monetary savings depending on the present hospital resource are the following:

- From STS: $\Delta C_{STS} = a \times 5800 \times 4.71 \times 81.62$. Where “$a$” is a coefficient of values between 0 and 1 representing the proportion of annual stays which would be attended at HCLS; 5800 is the total number of patients who could be referred; 4.71 is the average days stay per year per patient attended and 81.62 is the difference in cost/person/stay between the two resources.
- From HCLS: $\Delta C_{HCLS} = \{a \times 396 \times 34.82 + b \times 183 \times 41.82 + c \times 670 \times 36.15 + ... + z \times 548 \times 99.77\} \times 26.69$. Where “$a, b, c, ... , z$” are the coefficients of values between 0 and 1 representing the proportion of patients in HCLS who could be referred to other resources, the other numbers representing the result of the number of patients and the average saving between the
two resources, and 26.69 is the annual average number of stays per dependent person at HCLS.

- From UPH: \( \Delta C_{UPH} = (a \times 159 \times 74.44 + b \times 637 \times 146.69 + c \times 40 \times 131.39) \times 42.29 \). Where, once again "a, b, and c" represent the proportion of persons who could be attended at DH and personal and domestic medium intensity HHS, PC with personal and domestic low intensity HHS, and PC with high intensity HHS respectively. The remaining figures are the number of patients and the saving per person and day and the average number of stays per person at UPH.

The maximum cash savings possible, under the—rather unrealistic—hypothesis that all the coefficients were 1 (i.e., all the patients who could have been attended at other resources had been attended there without being admitted to the hospital where they currently are found), are:

\[
\Delta C_{STS, \text{MAX}} = 2,229,695.16 \text{ Euros/year} \\
\Delta C_{HCLS, \text{MAX}} = 4,495,476.50 \text{ Euros/year} \\
\Delta C_{UPH, \text{MAX}} = 4,674,444.30 \text{ Euros/year}
\]

And hence the maximum theoretic cash saving in our study would be: \( \Delta C_{\text{Hospitals, MAX}} = 11,399,615.96 \) Euros/year. This represents 33.24% of the entire budget for the three hospital types considered in the Valencian Autonomous Region in year 2001. As we have said, this limit is merely theoretic, and unattainable in practice. These euro amounts can be converted in amounts of patients attended, simply considering the typical annual cost of a dependent person in each hospital.

A pedagogical example of an alternative care scenario

With the aim of estimating the largest possible benefit attainable as a maximum in an ideal scenario in which all the patients with suitable profiles were referred, our proposal contemplates the following average lengths of stay: a) At STS: average 3 days and referral to HCLS; b) At HCLS and in the case of referable patients: average 7 days and referrals home or to nursing home; c) In UPH and in the case of referable patients: average 15 days and referral home or to nursing home.

These averages are well in excess of independent patients (light, non-grave or more stable cases) so that the new referral
scenario would not affect them. As such, only the patients we have categorised as dependent in Basic Activities of Daily Life (BADL) are affected by this proposal in statistical terms.

Table 3 shows the cost of this scenario, as well as the cash saving it would represent compared with the present situation. The total saving of the proposal with respect to the current situation comes out as 9.18 million euros, which represents 31% of the annual budget dedicated to patients admitted to STS, HCLS and UPH. With this amount of money a certain number of patients could be attended with the correct profile at each of the hospital units, shown in table 3.

That is, almost 25% more dependent persons than the total present number could be attended in the specific hospital resources, remaining in them the average current period, without increasing the budget, just as we have proposed as one of the areas to study from the Principle of Social Sustainability (Garcés, Ródenas and Sanjósé, 2003). This, without doubt, represents a redistribution of benefits among the population.

Discussion

The benefits obtained by dependent persons from the care systems in European welfare states can be increased if the following parameters are optimised: a) Adapting resources and services to the specific needs of each dependent person. It is possible to define the care profile for each service and establish which of them should attend each particular case in order to maximise patients’ quality of life; b) increasing the opportunity to use resources for the population overall through adequate management of services in patient referral itineraries. This has important monetary implications when referrals are from hospital to outpatient and home services.

The study of the suitability of resources to social and health care patients’ needs has already been carried out in an earlier paper, and in this work we have focused on the way of generating more opportunities of use at the same time as restraining costs, implying a redistribution of benefits among dependent people.
Table 3 Cost of the alternative care proposal and saving. Number of extra dependent persons who could be attended in hospitals at the present cost and with the current length of stay

<table>
<thead>
<tr>
<th>Cost of the alternative care proposal and saving</th>
<th>Short Term Stay</th>
<th>Hospital for the Chronically ill and Long term Stay</th>
<th>Units for Psychiatric Hospitalisation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Of Non Referrals</td>
<td>Average stay</td>
<td>4.71</td>
<td>26.69</td>
<td>42.29</td>
</tr>
<tr>
<td></td>
<td>Euros/year</td>
<td>0€</td>
<td>1,368,907.69€</td>
<td>902,403.49€</td>
</tr>
<tr>
<td>Cost Of Referrals Pre Referral</td>
<td>Days stay</td>
<td>3.00</td>
<td>7.00</td>
<td>15.00</td>
</tr>
<tr>
<td></td>
<td>Euros/year</td>
<td>3,874,548.60€</td>
<td>3,919,373.17€</td>
<td>2,240,607.08€</td>
</tr>
<tr>
<td>Cost Of Referral</td>
<td>Days referred</td>
<td>1.71</td>
<td>19.69</td>
<td>27.29</td>
</tr>
<tr>
<td></td>
<td>Euros/year</td>
<td>1,396,094.62€</td>
<td>5,617,442.99€</td>
<td>1,110,739.30€</td>
</tr>
<tr>
<td>Total Cost Of Proposal</td>
<td>Euros/year</td>
<td>5,270,643.22€</td>
<td>10,905,723.85€</td>
<td>4,253,749.87€</td>
</tr>
<tr>
<td>Saving</td>
<td>Euros/year</td>
<td>808,324.23 €</td>
<td>5,407,637.38 €</td>
<td>2,965,498.98€</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of extra dependent persons</th>
<th>Short Term Stay</th>
<th>Hospital for the Chronically ill and Long term Stay</th>
<th>Units for Psychiatric Hospitalisation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of extra dependent persons who could be attended</td>
<td>774</td>
<td>1,444</td>
<td>393</td>
<td>2,611</td>
</tr>
<tr>
<td>% extra versus total dependent persons attended</td>
<td>13.30</td>
<td>33.15</td>
<td>41.08</td>
<td>23.45</td>
</tr>
</tbody>
</table>

Source: Own elaboration, “Poliwelfare” Research Unit, Universitat de València, 2003.
In order to carry out this study we have analysed the care profiles of dependent persons in a typically Mediterranean area, the Valencian Autonomous Region in Spain, and the specific link between the profiles with the care costs of one part of state resources, the hospitals, which turn out to be the most costly.

In order to be able to offer an alternative care scenario, it was necessary to construct criteria to determine in which social and health circumstances a person could be attended by other resources, without loss or with a gain in quality of life. Application of these principles to the Valencian Community shows that it is possible to amplify state care without raising overall costs by an average amount of around 25% extra dependent persons, attended per year at hospital. We believe that this significant figure requires attention from the state officials in charge of management.

It is clear that implementation of this scenario implies efforts in organising care, control and monitoring of social and health care patients (case management), as well as the availability of sufficient at-home and community resources to attend patients needs. On another plane, it is no less important to attend the need for a Dependence Act which regulates the rights and obligations of dependent persons and their caregivers and legal heirs, to protect both fragile citizens and also the financial sustainability of Mediterranean welfare systems. Welfare, in the short term future, depends on this.

References

Diagram 1 Proposed care itineraries for patient referrals from hospitals

From Emergencies, Primary Centre or Short Term Stay

- Short Term Stay
  - Hospitals Chronically Long Stay
  - Units Psychiatric Hospitalisation

- Nursing homes

- HOME AND OUTPATIENTS SERVICES AMBULATORIOS

Home Help Service

- Units for Home Hospitalisation
- Day Hospital
- Primary Care
- Day Centre

Source: Own elaboration, "Poliwelfare" Research Unit, Universitat de València.