The Economic Cost of Senile Dementia in the United States, 1985

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Synopsis

Senile dementia is a progressive and irreversible decline of mental functions. The symptoms are mental confusion, memory loss, disorientation, cognitive decline, and inappropriate social behavior. It is one of the most common, costly, and distressful diseases among the elderly in the United States. Information on the economic costs of senile dementia is essential for determining research priorities and the allocation of resources to support aging and medical research. Economic consequences, such as direct medical and nonmedical expenditures by patients' families and the amount of time by third parties in caring for patients with senile dementia, are substantial. However, little systematic accounting to estimate these consequences has been undertaken. This paper attempts to estimate various costs associated with the care of senile dementia, based on available secondary data. We have used the direct cost and indirect cost approach and avoided double counting to identify the additional economic costs due to senile dementia.

The total, direct national cost of senile dementia is $13.26 billion, which includes $6.36 billion of medical care costs, $2.56 billion of nursing home care costs, and $4.34 billion of social agency service costs. The indirect cost for community home care alone is $31.46 billion, more than twice the total direct costs. The costs of premature death and loss of productivity due to senile dementia are about $43.17 billion. Although most of the indirect costs were imputed from the value of housekeeping or productivity loss, the magnitude of indirect costs reflects the serious consequences and burden on society's resources of this disease.

SENILE DEMENTIA is a progressive and irreversible decline of mental functions. The symptoms are mental confusion, memory loss, disorientation, cognitive decline, and inappropriate social behavior. The aging of the United States population implies a continued growth in the prevalence of this disease, whose only known risk factor is aging itself.

The large and significant economic impact of senile dementia is usually overlooked because its costs do not appear in usual accounting practice. Information on the economic costs of senile dementia, the most common cause of chronic intellectual decline in the United States, is essential for determining research priorities and the allocation of resources to support aging and medical research. Information on prevalence rates and costs is important for the development of new social, health, and economic policies for the affected patients and their families. The psychological stress on patients' families and immediate care-givers has been documented in numerous case studies and anecdotal reports (*1*).

Economic consequences, such as direct medical and nonmedical expenditures by patients and the amount of time spent by third parties in caring for patients with senile dementia, are thought to be substantial. However, little systematic accounting to estimate these consequences has been undertaken. Cost information would be useful for senile dementia case management and funding health care services for these patients.

The economic cost of senile dementia is defined as the value of resources forgone as the result of this type of illness (*2–4*). In this study, costs directly attributable to the disease were extracted

from the total costs of illness. The approach was to compare the demented elderly's costs in specific cost categories to average costs incurred by the elderly.

Prevalence of Senile Dementia

Estimates of the prevalence of senile dementia vary because of differences in the populations included in the studies (nursing home and community residence populations), the degree of dementia being assessed (mild, moderate, or severe), the types of dementia (Alzheimer's disease, multi-infarct dementia, or unspecified mixed cases), the age group (total population, or the 65 and older group), and differences in the methodologies applied to identify and diagnose dementia and derive the estimates (*5*).

This study was limited to the population 65 and older estimated to suffer irreversible dementia. Assuming that broader categories of dementia would provide more useful guidelines than narrower categories, the study group categorized dementias as Alzheimer's disease (SDAT), multi-infarct dementia (MID), and all other unspecified organic brain syndrome. Alzheimer's disease and multi-infarct dementia are believed to account for more than 85 percent of all dementia cases determined in autopsies (*6*).

The size of the population aged 65 and older was estimated at 28.53 million in 1985 by the U.S. Bureau of the Census (*7*). The total number of elderly in nursing homes was estimated to be 1.32 million, or 4.6 percent of the population 65 and older (*8*). The prevalence of senile dementia in nursing homes was estimated to be 47 percent, according to the 1985 Nursing Home Survey (*9*), which is equivalent to 618,000 elderly patients. Based on Wang's report (*10*) on prevalence rates, the total number of senile demented elderly patients in the community in 1985 was estimated to be 3.66 million. In sum, the total number of demented elderly patients was about 4.28 million 1985, which is about 15 percent of the total elderly.

Direct Costs of Senile Dementia

In a broad sense, economic costs of dementia can be defined as the value of the resources forgone as a result of one illness. Some resources are drawn directly from the economy to diagnose, treat, care for, and rehabilitate a patient. These resources are called the direct costs of illness and can be assessed directly from the market value of goods and services. Some resources are not fully used as a result of illness or premature death. These resources include the value of lost productivity and time by the patient or patient's relatives and are called indirect costs. Indirect costs are often assessed from opportunity costs or from the imputed value of resources. Because the estimates for indirect costs are based largely on various assumptions, the magnitude may not be precise.

Direct Costs of Medical Care

The medical care costs included short-term hospitalization, physicians' services, drug consumption, and other medical supplies and expenditures. We relied on a study by Deacon (*11*) for the use of medical services by types for the elderly in institutions and in the community, and the pilot study by Hu and coworkers (*2*) for the evaluation of the costs of caring for the senile demented elderly. Deacon's study seems to provide a good data base for our cost estimation. From his study, we have estimated average medical care cost of the elderly at $2,881 per person per year, compared with Fisher's (*12*) estimation of $2,437, and Kovar of $2,892 (*13*) in 1983 prices. Fisher did not include nursing home residents in his estimation, and had slightly lower results (*14*).

The average short-term hospital stay per patient with a diagnosis of senile dementia was estimated at 5.06 days a year for those in nursing homes, and 4.75 days a year for those in community homes. The weighted average was 4.81 days of short-term hospital stay per demented patient. Deacon found that the average short-term hospital stay for the normal elderly was 3.47 days. Thus, the increase in short-stay hospital utilization due to senile dementia was 1.34 days a year, which is equivalent to $572 per patient. The hospital room charge per day in 1985 has been estimated to be $427 (*15*).

Based on the data provided by the National Institute of Mental Health (NIMH) and the Veterans Administration (VA), the average stay per demented elderly patient in State and county long-term mental hospitals and VA hospitals was 1.07 days. These patients were in the hospital exclusively for the disease of organic brain syndrome (or senile dementia) before they were transferred to nursing homes or back to the community. The extra cost for this type of hospital was $367 per demented patient. The hospital room charge per day for mental hospitals

is lower than that for other short-term community hospitals. Allen and coworkers (*16*) reported $180 per day in 1979, which is $343 if the hospital charge is adjusted to 1985 prices.

The estimation of the costs of added physicians' services owing to dementia is more complicated than the other cost items. One reason is that the average physician's fee per service is substantially different for patients in nursing homes than for those in community homes. We estimated the numbers and the cost of physicians' services for the demented elderly in nursing homes and in community homes separately, and for the nondemented elderly in these two different home settings. The extra cost of physicians' services due to dementia was the difference in the overall average physician's cost between the demented and the nondemented. The average number of physicians' services was 19.20. The average cost was $689 per demented elderly patient. For the nondemented elderly, the number of physicians' services was 11.39 at an average cost of $425 (*11*). As a result of dementia, the net increase in the number of physicians' services was 7.81, with a $264 per person increase in 1985.

The demented elderly generally are believed to consume substantially more drugs than the nondemented elderly. Our earlier study (*2*) showed that the average drug consumption per senile demented elderly in nursing homes was $540 in urban areas and $408 in rural areas. Because 70 percent of the elderly population is urban and 30 percent rural, the national average drug consumption cost was $500 per nursing home demented elderly patient in 1983, which is $597 in 1985 drug prices. The average drug consumption for the senile demented elderly in community homes is estimated to be $270 in 1983, which adjusted to 1985 drug prices is $322. The overall average drug consumption per demented elderly patient in 1985 was $370. The average drug consumption per normal elderly person was $160, based on Deacon's study with prices adjusted to 1985. The additional cost of drug consumption because of dementia is $210 per person.

The demented elderly averaged $269 per patient in 1985 in the use of other medical supplies and expenditures, while the nondemented elderly spent an average of $197 for these items. The difference of $72 is the added cost owing to dementia. All values were estimated from Deacon's report and adjusted to correspond with 1985 prices.

These calculations provide an estimate of additional medical care cost of dementia of $1,485 per patient. With 4.28 million demented patients, the national estimate of the additional medical care cost from dementia was $6.36 billion in 1985.

Care Costs Compared

The major difference in nursing home care costs between demented and nondemented elderly patients is the amount of time spent by nursing personnel. Our earlier study (*2*) showed that the demented elderly patient needed an average of 36 percent more nursing personnel care time than the nondemented elderly nursing home patient. Personnel costs in nursing homes averaged $9,008 per demented elderly patient and $6,624 per nondemented elderly patient in 1983. The net increase in nursing personnel time costs owing to dementia was $2,384 per patient in 1983, which is $2,550 when adjusted to 1985. The estimate of additional nursing personnel costs nationwide owing to dementia was $1.58 billion in 1985.

Another nursing home care cost was that resulting from additional nursing home admissions for senile dementia. Although 47 percent of the elderly in nursing homes are demented, not all of them are admitted for dementia. The normal nursing home care cost of those admitted for reasons other than dementia cannot be included in our direct cost calculation. No accurate estimate can be made of the number of elderly persons admitted to nursing homes as a result of senile dementia. According to the 1977 National Nursing Home Survey (*17*), it was estimated that about 3.5 percent of the elderly in nuring homes were admitted because of senile dementia. Based on this ratio, the total number was approximately 45,400 persons in 1985. With the adjustment for 1985 prices, the regular nursing home care cost per person was $21,674, which provides an estimated $0.98 billion for regular nursing home care costs for those admitted with dementia. The total added nursing home care cost of dementia was $2.56 billion, the sum of the added nursing personnel costs, $1.58 billion, and the regular nursing home costs for those admitted because of senile dementia.

In our earlier study (*2*) in 1983, we found that social services agencies on the average provided $15 a day of services to 20 percent of demented elderly persons in the community. This is an adjusted equivalent of $1,186 a year per person, and a total of $4.34 billion for the total demented elderly in community homes in 1985.

The table summarizes total direct economic costs

Total direct economic costs due to senile dementia, 1985

Characteristics	Per capita cost	National cost (billions)
Medical care[1]:		
Short-term hospital care	$ 572	$2.45
Long-term hospital care	367	1.57
Physician services	264	1.13
Drug consumption	210	0.90
Other medical	72	0.31
Subtotal	$1,485	$6.36
Nursing home services (nursing)[2]:		
Labor costs	$2,550	$1.58
Additional admission	21,674	0.98
Subtotal		$2.56
Social agency services (community)[3]	$ 1,186	$4.34
Total		$13.26

[1]Based on an estimated 4.26 million demented elderly in 1985.
[2]Based on an estimated 618,000 demented elderly in nursing homes; 45,400 admissions were for senile dementia.
[3]Based on an estimated 3.66 million demented elderly in the community.

of senile dementia at about $13.26 billion. Of this, medical care costs are about 50 percent of the total.

Indirect Economic Costs

Indirect economic costs of dementia include the time costs imputed for community home care as well as the loss of the lifetime productive value of human capital and the subjective value of the loss of life as a result of dementia. Other indirect costs not included in the estimation are time spent in visiting nursing homes or accompanying the demented elderly in the community homes to receive additional physician services because of dementia. These are relatively small items.

The estimation of the total cost of the time spent by family members or relatives for the care of the demented elderly at home is based on our earlier study (*2*). In this case, the estimate is based upon the market value of the services performed, rather than on the more accurate value of forgone leisure of the caregiver. One would need an extensive survey to detail the various categories of care-givers and their market value of service. Our earlier survey showed that the severely demented elderly received an average of 8.06 hours a day of care; the mild and moderate cases received about 3.2 hours a day. With the exclusion of hospital days, this implies a labor cost of $14,308 a year for the severely demented, and $5,732 a year for those with mild or moderate cases in 1985. The average community home care cost for the demented elderly is $8,590 per person. The total national cost is $31.46 billion, which represents the additional care-giving burden of this disease. But, like housewives' services at home, the major portion is an imputed value of an intangible product.

The demented elderly have more problems of morbidity, disability, and increased mortality than other elderly patients. A standard approach to evaluating this cost is the human capital method. First, the age and sex distributions (five age groups and two sexes) of the demented elderly are established. We assumed that the prevalence rate doubles every 5 years, from 4 percent at age 67 to 57.5 percent for the elderly 85 and older (*18*). After adjusting standard human capital values reported by Landefeld and Seskin (*19*) to the 1985 wage level, the total human capital value of dementia for the elderly is estimated to be $86 billion after summing all values across age and sex groups. Sex differences are maintained because the human capital values vary according to lost lifetime earnings or lost housekeeping services. These differences are significant between sexes. The demented elderly on the average have lost 4 to 10 years of life expectancy (*5*), which is about 40 percent loss of the remaining life. Including the loss of productivity, the total human capital value is assumed to have diminished by a total of about 50 percent, which provides an estimate of $43 billion. Housekeeping value loss is the major component of this estimate. Using Landefeld's results (*20*), the loss of earnings through premature mortality and productivity is only $7.9 billion. The human capital approach is conservative, because it does not include the value of lost leisure time as a result of the disease. Using Landefeld and Seskin's adjusted willingness-to-pay/human-capital approach would have resulted in approximately twice the loss. Our estimate from the human capital approach is substantially higher than that by Rice and co-workers (*21*). Their estimate is only for those who are actually dead; our is for all those who have the disease. Although few elderly die of dementia in a year, the losses in lifetime earnings and housekeeping value as a result of dementia can be tremendous for the living demented elderly.

Conclusion

Little systematic accounting to estimate the economic consequences of senile dementia has been undertaken, although senile dementia is a

serious and distressing disease in our society. This paper attempts to estimate the added costs of senile dementia based on available secondary data. We have used the direct cost and indirect cost approach and avoided double counting to identify the extra costs of senile dementia.

The direct cost of senile dementia in the United States is $13.26 billion. However, the indirect costs are much higher. The indirect costs for community home care alone are $31.46 billion, more than twice the direct costs. The costs of premature death due to senile dementia are even higher, about $43.17 billion. Combining direct and indirect costs results in a total of $87.89 billion. Although indirect costs were imputed from the value of housekeeping services or productivity loss, the magnitude of the indirect costs reflects the serious consequences and burden of this disease on society's resources.

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