

Alzheimer's Cost to U.S. Business

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prepared for the Alzheimer's Association by

Ross Koppel, Ph.D.

Social Research Corporation, Wyncote, PA

and Department of Sociology, University of Pennsylvania

Foreword - Alzheimer's Disease: The Costs to U.S. Business

An estimated 4 million Americans have Alzheimer's disease, which causes steady decline in memory and other major cognitive impairments. Eventually, people with Alzheimer's become unable to care for themselves. In 70% of the cases, it is family members (spouses and adult children) who provide most of the round-the-clock care that the person with Alzheimer's needs.

Just as medical research continues to bring forth significant discoveries related to Alzheimer's that bring us to a deeper understanding of the disease processes, social research can bring us closer to understanding more completely the human and economic costs of the disease.

This study, conducted by a leading sociologist who teaches at the University of Pennsylvania, was commissioned by the Alzheimer's Association so that we may gain insight into one particularly underreported, and therefore undervalued, area of cost analysis associated with Alzheimer's disease the cost to U.S. business.

As the report reveals, the business sector of the American economy contributes mightily to the nation's expenditures related to Alzheimer's. According to the report's author, Dr. Ross Koppel, the combined total cost to businesses of Alzheimer's disease is more than \$33 billion. And, as Dr. Koppel points out, many of the costs associated with the disease could not be measured within this study, so that the actual cost of the disease - both to society and to businesses - is far greater than projected.

An integral part of the mission of the Alzheimer's Association is to advance knowledge and understanding of the disease. We believe that this groundbreaking study on the business costs of Alzheimer's is consistent with our educational objectives. We hope that business leaders find this report as informative and compelling as we do.

Moreover, it is our fervent desire that decision-makers in Washington who must decide annually at what level to fund publicly-supported Alzheimer's research will take special notice of this dimension of the disease. With adequate funding, we can some day eradicate Alzheimer's disease so that it no longer represents such a tremendous burden on our nation's families and our businesses.

The Alzheimer's Association

Executive Summary

Alzheimer's disease costs American businesses \$33.16 billion a year.

The \$33.16 billion figure is probably a very low estimate. Many items cannot be measured with existing data. For example, we know almost nothing about the cost of those with the disease who are still in the labor force. Many of these costs have never been calculated before. If all the relevant factors could be measured, the actual cost might well be two to three times higher than \$33.16 billion.

Businesses are largely unaware of their annual cost from Alzheimer's disease, primarily because of the popular belief that the disease affects people after their work life. But that overlooks the employed caregivers among the 19 million Americans who have a family member with the disease.

Caregivers: Business costs associated with caregivers are estimated at \$26 billion a year, the lion's share of the overall \$33.16 billion. Caregivers' own absences cost \$7.89 billion, and lost productivity because of their absences, what has been called "the domino effect" of absenteeism, adds another \$13.22 billion.

Alzheimer's Cost to U.S. Business

I. Caregivers	<u>In billions</u>
• Caregivers absenteeism	\$7.89
• Productivity loss	13.22
• Replacement of caregivers who leave	3.59
• Continuing insurance for workers on leave and fees to temp agencies	1.32
• Cost of Employee Assistance Programs (EAPs)	0.0055
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Caregiving total	26.02
II. Medical Care and Medical Research	
• Business share of health care costs	7.09
• Business share of research on Alzheimer's	0.05
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Health total	7.14
TOTAL	33.168 billion

On average, a full time employed caregiver of an Alzheimer's patient is absent 12.66 days or partial days per year, is interrupted an average of 50 hours per year and is involved in other time losses totaling, in all, 23.82 days per year.

In addition, between one-tenth and one-fifth of caregivers leave the workforce entirely. For the employer, a worker's departure brings the costs of termination, the vacancy cost until the job is filled, hiring a replacement worker, training a replacement worker and productivity attenuation until the new hire is up to speed, a total annual cost of \$3.59 billion.

The cost of continuing health care coverage for workers on leave (\$719 million) and the fees to temporary agencies (\$598.7 million) add another \$1.32 billion to employer cost. Finally, increased caregiver usage of Employee Assistance Programs (EAPs) adds \$5.52 million, for a grand total of \$26 billion a year associated with caregivers.

Still, two-thirds to three-quarters of caregiving is provided without charge by family and friends, hinting at how much the Alzheimer's cost to the nation would increase if it were not for that so-called "free" caregiving.

Health Care and Other Costs to Employers: In addition to the \$26 billion a year cost associated with caregivers, business spends \$7.14 billion on health care, health insurance and the taxes to pay for Medicare, Medicaid and ongoing federal research on Alzheimer's.

Business contributes \$7.09 billion to the cost of health care of people with Alzheimer's. Businesses pay a noteworthy proportion of taxes and of insurance premiums. For example, 42% of new retirees are covered by company insurance, as are 34% of older retirees.

The total medical cost for Alzheimer's disease is between \$23 billion and \$24.5 billion. Medicare pays between \$6.4 billion and \$8.6 billion, and Medicaid pays between \$7.8 billion and \$10.2 billion. Families and patients pay a remarkably high percentage - equaling between \$3.7 billion and \$6.5 billion.

The federal government spends \$349.2 million on Alzheimer research at the National Institutes of Health. Based on combined business taxes of 15.5%, businesses contribute \$54.12 million.

Conclusion

From an economic perspective, Alzheimer's receives only a fraction of the attention it deserves. The costs to business and to society are extraordinary and will grow at a dramatic rate as aging baby boomers enter the age of highest risk. From a human perspective, the toll of Alzheimer's disease is incalculable and terrible. Investment in research on this disease appears not only humane but also prudent.

Ross Koppel, Ph.D.

In August 1998, while he was researching the cost of Alzheimer's disease to U.S. businesses, Ross Koppel received the William Whyte Distinguished Career Award for the practice of sociology from the American Sociological Association, Section on Sociological Practice.

That coveted award honored a career that embodies a combination of work in practice, scholarship and teaching.

Koppel is president of the Social Research Corporation (Wyncote, PA) and teaches research methodology in the Department of Sociology at the University of Pennsylvania. He has also taught at Temple University, LaSalle University and the Thomas Jefferson University's Occupational Medicine Residency Program.

He is the author or co-author of more than 80 academic studies. Socio Graphics, his sociology teaching software, was used in more than two-thirds of the nation's colleges. Oxford University Press has also published his works on values in software design.

He is a past chair of the American Sociological Association's Section on Sociological Practice. He currently serves on the board of the Sociological Practice Association and recently revised the SPA's code of ethics.

Before founding the Social Research Corporation in 1984, Koppel was director of social and demographic research at PNR & Associates, an econometric and research consulting firm. He has written or directed studies for the congressional Office of Technology Assessment, U.S. Department of Commerce, the National Science Foundation and U.S. Department of Labor in addition to serving on the White House Conference on the Future of Small Business and Entrepreneurship and on governors' and local commissions.

In his many published studies, he has written about labor force processes, the impact of technology on jobs and skills, research and evaluation policy, ethics of social research, education policy, community nutrition, workplace discrimination against women, social ecology, employment in the arts, wages and earnings, drug abuse and statistical analysis in social research.

In this analysis we seek to answer the seemingly simple question: How much does Alzheimer's disease cost U.S. business?

A Preview of the Findings

Caregivers - Estimates of Annual Cost to Business

- The absenteeism of workers who are caregivers for those with Alzheimer's disease costs U.S. businesses **\$7.89 billion.**
- Productivity losses to U.S. businesses associated with caregiver absenteeism costs **\$13.22 billion.**
- Replacement of caregiver workers leaving their employment costs U.S. businesses **\$3.59 billion.**
- The cost for continuing insurance for workers on leave is \$719 million and the cost of additional temporary worker replacement fees (premiums to temp agencies) is \$5.98.7 million. The combined total is **1.318 billion.**
- The cost to businesses of additional usage of Employee Assistance Programs (EARS) by employed caregivers is \$5.525 million.

Thus the business cost of Alzheimer's disease caregiving by employed workers is estimated at: \$26.024 billion.

Medical Care and Medical Research

Estimates of Annual Cost to Business

- Businesses pay \$7.09 billion of the health care costs of people with Alzheimer's disease. The approximately \$7 billion represents slightly less than two-fifths (39.44%) of the total of health care of people with Alzheimer's disease.
- Business taxes contribute \$54.126 million to research on Alzheimer's disease.

Thus businesses spend \$7.144 billion on health care, health care insurance and on research involving Alzheimer's disease.

Bottom Line

The combined total cost to business of employed caregivers and of health care is **\$33.168 billion.**

The Total Cost to the Nation

The best estimate of the total cost of Alzheimer's disease to our society is \$ 100 billion¹ - a figure that may not include many of the costs to business uncovered in this study. Many of the costs of Alzheimer's disease cannot be measured without additional research. For example, we know almost nothing about the cost of those with the disease who are still in the labor force. Throughout this short document we include sections entitled: "Not counted" to reflect the many unknowns about the costs of Alzheimer's. In addition, we have been very conservative in our projections where the data are available. Thus, this estimate is a minimum. In all probability, the actual cost of the disease both to society and to businesses - is far greater than what we present here.

We know the total cost of Alzheimer's disease is staggering, but we are not exactly sure how staggering. Researchers estimate Alzheimer's disease costs the nation each year from between \$67.1 billion to \$719 billion in 1993 dollars (Wimo et al., 1997). This wide range is not as capricious as it may first appear. Differing but responsible methods of accounting explain much of the variation. Do we assign economic value to the efforts of the caregivers? Do we count only the "net additional" cost of dementia for nursing home patients, or do we count the regular nursing home bill? How is comorbidity treated? Do we consider the "lost" work time of caregivers and how do we value it? How do we treat costs paid by federal and state programs like Medicare and Medicaid? Do we add families' out-of-pocket expenses? Do we assess expenses as "willingness-to-pay" or as human capital measures?

Whatever the exact cost - and most cited estimates use the term "at least \$ 100 billion" we know that Alzheimer's is one of the most expensive diseases, exceeded only by heart disease and cancer. We also know that with the percentage of elderly among us increasing rapidly, the cost of Alzheimer's disease will increase almost four-fold in the next few decades - perhaps much more if we consider the decrease in "free" caregiving associated with the increase in women's labor force participation (Fox, 1997; Doty et al., 1998).

The Cost to Business

The cost of Alzheimer's disease associated with businesses has not been fully examined because so many of the people with Alzheimer's are retired or are otherwise out of the labor force and because two-thirds to three-quarters of caregiving is provided without charge by family and friends (Scharlach et al., 1991). Our research does not question the basic picture about retirees or unpaid caregiving, but we seek to consider systematically business-related expenses, taxes, and losses across several cost categories. As we shall demonstrate, several components of business-borne expenses for Alzheimer's disease have been ignored or insufficiently examined.

Note: In presenting these findings we separate two of the more laborious calculations into separate worksheets. Readers are urged to review these in addition to the text below

¹ Alzheimer's Association, 1998. One can also recalculate the data in Ernst and Hay's (1994) analysis or the data in Rice et al. (1993) to derive estimates on the cost per patient (adjusted to 1998 dollars) at \$41,400 and \$46,700 respectively. If we multiply that by the four million people with Alzheimer's disease, the cost is between \$165 billion and \$186 billion.

Part I : Caregivers of Alzheimer's Patients: Costs to U.S. Business

Four million Americans have Alzheimer's disease (Evans et al., 1990) and 90 percent of them have caregivers. Several studies have established the percentage of these caregivers in the work force (NACG/AARP, 1997; Doty et al., 1996; Rice et al., 1993; Scharlach et al., 1991). From four of these established studies, we use the middle and most recent estimate of 64% in the labor force. We use the U.S. Department of Labor finding that 81.25% of employed caregivers; are working full time and 18.75% part time.²

Part of the cost to business is the direct cost of absenteeism necessary for caregivers to meet their responsibilities. But a second cost occurs because of that absenteeism - the lost productivity when personnel are absent.

Caregiver Absenteeism

We estimate that it costs U.S. businesses \$7.89 billion for the time employees take off to meet their caregiver responsibilities.

Caregivers must take off work days and hours to help people with Alzheimer's disease for whom they care. Based on the MetLife analysis of a 1997 study and U.S. Department of Labor data, we estimate that each full time employed caregiver of an Alzheimer's disease patient is absent 12.66 days or partial days per year, is interrupted an average of 50 hours per year and is involved in other time losses (supervisor time, crises) totaling in all 23.82 days per year. (See *Worksheet on Caregiver Absenteeism* for detailed analysis.)

With adjustments for wages, full and part time benefits, and full vs. part time schedules (see worksheet), we estimate that this equals a loss of \$3,870-75 per full time worker caregiver; and \$1,521.22 per part time worker caregiver.

The cost of absenteeism for 1.869 million full time worker caregivers is \$7.234 billion.

The cost of absenteeism for 43 1,000 part time worker caregivers is \$656 million.

Thus, the combined cost of Alzheimer's disease caregiver absenteeism is **\$7.89 billion**.

² Recent analysis of U.S. caregiver data indicates that labor force participation rates for Alzheimer's caregivers are comparable to the figures used here.

We estimate the productivity losses to U.S. business associated with caregiver absenteeism at \$13.22 billion.

When a worker is absent, the loss to the business is far greater than that worker's salary and benefits costs. Productivity losses are estimated up to two times the worker's actual compensation package. The research literature on the relationship between absenteeism and productivity losses reveals that the ratio of productivity to compensation is between 167% to 197%. (Stoudemire et al., 1986; Greenberg et al., 1995; Hurley, 1996; Cohen et al., 1997). These ratios are supported by business surveys discussing the "inability to take needed training," rejection of opportunities and business travel, higher stress on other workers, and distractions (Scharlach et al., 1991). The relationship between absenteeism and productivity requires consideration of what Hurley (1996) calls "the domino effect of absenteeism on co-workers' productivi

We use a ratio of 167.52 - at the lower end of the published productivity loss ratios that we have located in the literature. (See especially the work of MIT-based economists Greenberg, Finkelstein and Berndt, "Economic Consequences of Illness in the Workplace," Sloan Management Review 36(4), 1995). Thus the absenteeism cost of \$7.89 billion is estimated to cost U.S. business \$13.22 billion in lost productivity.

Not Counted Here

1. *Secondary Caregivers.* We do not count the cost of absenteeism and productivity loss from secondary caregivers. Many if not most caregivers are assisted by others with their responsibilities. These secondary caregivers also generate costs for businesses, but data on those costs are not sufficient to estimate.
2. *Institutional Memory.* The research literature on absenteeism and productivity costs does not account for the detrimental effects of losses of institutional memory. For fear of double counting, we do not estimate additional costs. Nevertheless, the impact is real and is undoubtedly substantial.
3. *Family.* Caregiver burdens affect the rest of the family (e.g., caregiver's spouses, children). However, we do not include these additional costs because they are so difficult to estimate accurately and because they might be double counted. Similarly, we do not estimate the lost time and efforts of the Alzheimer's disease patient to the family - for example the loss of a beloved grandparent as a role model or as a child watcher.
4. *Lost Career Opportunities.* We also do not estimate the value of lost career opportunities to workers who are caregivers.
5. *Dependent day and night care.* Companies are increasingly offering day and night care for workers who must travel but who are caring for a dependent elderly relative (Lawlor, 1998). There is little systematic information on this benefit and we do not attempt to estimate its cost to business.

Replacement Costs for Caregivers Leaving Their Job

We estimate that replacing caregiver workers who leave their employment costs U.S. business \$3.59 billion.

Between one-tenth and one-fifth of caregivers; leave the workforce. The 1997 study by NACG/AARP (National Alliance for Caregiving with the American Association of Retired Persons) finds that "20% of caregivers gave up work entirely or temporarily." Among workers caring for those with the most debilitating diseases (like Alzheimer's disease), 30% gave up work entirely. The MetLife analysis of that NACG data indicates that 17% of those with moderate to severe caregiving burdens leave the workforce. Of particular interest to Alzheimer-related research is the consistent finding that those with the most profound caregiving burdens are more likely to leave work.

To-an employer, the burden of a worker's departure includes the costs of termination, the vacancy cost until the job is filled, hiring a replacement worker, training a replacement worker and productivity attenuation until the new hire is up to speed (Fitzenz, 1997). Thus, replacement costs to the firm are calculated to range between three-quarters of the worker's yearly salary plus benefits (MetLife Study, 1997) to two years of a worker's yearly salary plus benefits (Fitzenz, 1997). Fitzenz, indicates that the most appropriate replacement cost ratio is 1.33 of a year's salary plus benefits. We use that ratio. We use 17% as our estimate of the number of workers who leave the labor force.

Seventeen percent of the 1.869 million full time worker caregivers is 318,000 workers. Using the total compensation measure of each worker at \$38,928.49 (see first worksheet) and the ratio of 1.33, we estimate the replacement cost is \$12.379 billion if replacement costs occurred annually. Of course they don't; most caregivers; do not enter and leave the labor force that frequently. Rather, we divide that figure by 4.5 (years) to account for the average duration of caregiving (NACG/AARP, 1997).

This reduces the replacement cost to \$2.75 billion. The comparable figure for part time workers who are caregivers is of course reduced by the lower salary and much lower benefits rates. It is \$84 million. The total replacement cost for full time and part time workers who are caregivers leaving the workforce is \$3.59 billion.

Not Counted Here

1. Additional Caregiver Health Care Costs. Almost every study of caregivers finds they are far more likely than other workers to become mentally and physically ill, seek medical treatment, and use medication. The NACG/AARP 1997 study finds that 31% of caregivers with major caregiving burdens have experienced physical or mental health problems because of caregiving. However, it is not possible to estimate accurately the additional health care costs of the worker caregivers. In most cases, the impact of greater caregiving costs would be reflected in higher insurance premiums. Where an employer is self insured, the costs are directly borne by the employer. Thus even though the costs of additional health care expenses for caregivers are clearly significant, it would be irresponsible to include these costs without additional data.

2. Fulltime Workers Who Reduce Their Hours. Clearly, businesses suffer when important personnel are obliged to reduce their hours because of caregiver burdens.

Temporary Replacement Workers, Continuing Insurance:

We estimate the cost for continuing insurance for workers on leave is \$719 million and that the cost of additional temporary worker replacement fees (premiums to temp agencies) is \$598.7 million. The combined total is \$1.318 billion.

Under the federal Family and Medical Leave Act (FMLA) employers are not obliged to pay the salaries of workers who take leaves. However, 85% of firms covered under the FMLA and 53.6% of non-covered firms continue to pay leave, sick or vacation pay. Slightly higher proportions (87.6% and 55.7%) continue to pay disability insurance contributions (Westat, Inc. Survey of Employers, 1995). Moreover, firms incur other "replacement" costs: 37.4% hire temporary replacement workers and 9.1% hire permanent replacement workers.

The NACG/AARP study finds that 11% of worker caregivers took leaves of absence. Based on only full time employees who are caregivers, this translates to 205,590 worker caregivers. The estimate for the proportion of benefits (41% or \$3,501) covered for those workers is \$719 million (see Table 19, Employer compensation costs per employee hours worked, all private industry, 1986-96, Report on the American Workforce, U.S. Department of Labor, 1997).

Adding the additional or premium costs of temporary replacement workers, we estimate additional temporary replacement fees (temp agency fees) of \$598.7 million.³ Using the 37.4% figure (i.e., those firms using temps), the total is 76,891 workers. The temp agency fee of 20% of compensation is \$598.7 million. Note that we do not include the additional salaries, just the additional charges from temporary agencies.

The combined cost for temporary replacement workers and insurance is **\$1.318 billion**.

³ The premium, or fee, paid to the temp agencies is estimated at 20%. The 11% of full time workers who are caregivers (1.869 million) is 202,950 workers. 37.4% of that figure (firms using temps) is 76,891 workers. 20% of their compensation is \$598.7 million.

Costs of Additional Use of Employee Assistance Programs (EAPs) by Caregivers

Not surprisingly, Alzheimer's disease caregivers are two to three times more likely than other employees to use the Employee Assistance Programs (EAPs) set up to assist employees with a variety of health and other problems. We estimate that the cost to business of additional EAP usage by full time employed caregivers with access to EAPs is **\$5.525 million**.

To estimate the additional cost of EAPs generated by Alzheimer's disease caregivers who are employed in firms with EAPs, we must be able to: 1. Estimate the number of employees covered by EAPs; 2. the cost per user; and 3. the marginal cost of assistance. Fortunately, we have reasonably good estimates for the first two of these figures, and indications of the ratios for the last one (see Worksheet on EAP Usage by Caregivers for a full analysis).

Based on Bray et al. (1996) and Cook (1997) we estimate EAP coverage at 26%; usage rates at 9.25%; and we estimate the average EAP cost per worker at \$28. Most of the costs are variable because EAPs are often subcontracted on a per case basis or because the company absorbs much of the cost as general operations or insurance. As the EAP worksheet indicates, we estimate the marginal cost of EAP usage by caregivers with EAP access at **\$5.525 million**.

Part II: Business Costs for Health Care Associated with Alzheimer's

We estimate that businesses pay \$7.090 billion of the cost of health care for people with Alzheimer's. The approximately \$7 billion represents slightly less than two-fifths (between 39.29% and 39.59%) of the total cost of health care for people with Alzheimer's. We emphasize that our estimates are very conservative. The actual costs - both health care and the business burden may well be two to three times these amounts.

We estimate that business taxes contribute \$54.126 million toward research on Alzheimer's.

The combined costs equal **\$7.144 billion**.

Medical Care of People with Alzheimers

The cost of medical and nursing home care associated with Alzheimer's disease has been studied by many scholars (e.g., Hay and Ernst, 1987; Rice et al., 1993; Ernst and Hay, 1994; White-Means and Chollet, 1996; Wimo et al., 1997; Fox, 1997; Eppig and Pisal, 1997; and Ernst and Hay, 1997.) The business costs of Alzheimer medical expenses, however, are far less studied because most Alzheimer patients are out of the labor force and thus assumed not directly relevant to businesses.

That assumption is faulty. Business pays a noteworthy proportion of taxes and of insurance premiums. Moreover, 42% of new retirees are covered by company insurance, a figure that drops to 34% among older retirees. Although the proportion covered by retiree insurance has declined steadily in the past several years, it still reflects a significant cost (Scanlon, 1998).

A serious difficulty in ascertaining the business costs of health care related to Alzheimer's disease is the lack of clear accounting and data. Alzheimer's disease is often difficult to diagnose and is frequently accompanied by other illnesses - many related to the patient's dementia. Medicare, moreover, does not pay for much of the care a person with Alzheimer's needs. Most Medicare costs are associated with other medical conditions even though they are the result of or are complicated by Alzheimer's disease. A patient may be hospitalized because she fell or is noncompliant with her medications, but these conditions were generated by Alzheimer's disease. The accounting for costs becomes more complex because many Alzheimer's disease patients are recipients of complex payment streams including Medicaid, Medicare, private insurance, family help, and whatever is left of their own savings. Most people with Alzheimer's disease are Medicare beneficiaries and 49% of Medicare beneficiaries with Alzheimer's disease also receive Medicaid benefits, usually because they have exhausted their savings paying for long term care. Of the total population "dually eligible" for Medicare and Medicaid, 22% are Alzheimer's disease patients.

To confront the cost of health care borne by business, we commissioned David Ford and Robert Brand of Solutions for Progress (Philadelphia).⁴ Ford is a senior policy analyst at the firm; Brand is the president of the firm and is the founder and former chairman of Pennsylvania's Health Care Cost Containment Council. Ford and Brand used several data sets from national surveys of nursing home use, of hospital use, and of home health care agencies. With the data in hand, they calculated payments, payers, and multiple diagnoses that included Alzheimer's disease and dementia. Then we added information on insurance costs and on state and federal business tax rates to determine business burdens for health care. Much of the following analysis is based on Ford and Brand's calculations. We only summarize the findings here. The tables and data set citations are found in B. Worksheets on Business Health Care Costs in Part III.

As can be seen in Table 1, Ford and Brand calculate that the total paid medical costs for Alzheimer's disease is between \$24.5 billion and \$23 billion. They find that Medicare pays between \$8.6 billion and \$6.4 billion; and that Medicaid pays between \$10.2 billion and \$7.8 billion. People with Alzheimer's disease and their families pay a remarkably high percentage equaling between \$3.7 billion and \$6.5 billion.

Many of Ford and Brand's numbers line up with the most recent published data. For example, Ford and Brand's estimates for the Medicaid contribution to nursing homes are \$9.95 billion to \$7.471 billion. Ernst and Hay (1997) report that the cost of nursing home for Medicaid was "just over \$8 billion in 1994."

Table I
Spending for Any Treatment of Those with Any Diagnosis of Alzheimer's Disease: by Payer and by Type of Provider (Major Categories)

In millions of dollars. In each column the first number is based on estimate 1, the second number is based on estimate 2. (See the worksheets for a discussion of the two estimation methods)

The bottom line from the two summary tables is that health care, health insurance and taxes

Major Payer Categories	Hospitals	Nursing Homes	Home Health Care Agencies	Total
Private Ins.	\$367-\$393	\$1,084-\$548	\$22-\$28	\$1,473-\$969
Own\$/Family	\$42-\$33	\$3,679-\$6,419	\$8-\$83	\$3,729-\$6,535
Medicare	\$6,889-\$4,750	\$1,243-\$1,378	\$561-\$307	\$8,693-\$6,435
Medicaid	\$229-\$229	\$9,951-\$7,471	\$74-\$96	\$10,253-\$7,796
Total	\$7,574-\$5,564	\$16,273-\$16,936	\$681-\$516	\$24,528-\$23,017

cost employers between \$8 billion and \$6 billion for the treatment of people with Alzheimer's disease. Using either estimate, this represents almost 40% of the medical treatment costs - the two estimates yield 39.29% and 39.59%, respectively. This ratio is considerably higher than is generally suspected.

⁴ The team also included Layrssa Mykyta, Policy Analyst.

Table II

Estimated Costs to Business for Alzheimer's Disease: by Payer and by Type of Provider

In millions of dollars. In columns two and three the first number is based on estimate 1, the second number is based on estimate 2.

Note: Mean of the business estimates = \$7.090 billion; the mean of 39.29% and 39.59% is 39.44%.

Payer Category	Total	Business Cost	Tax Rate or Insurance
Medicare	\$8,693 - \$6,435	\$4,346 - \$3,218	50.0
Medicaid Federal %	\$5,127 - \$3,898	\$1,666 - \$1,267	32.5
Medicaid State %	\$5,127 - \$3,898	\$1,767 - \$1,343	34.5
Private Insurance: - Hospital	\$367 - \$393	\$125 - \$134	34.0
Private Insurance: - Nursing Home	\$1,084 - \$548	\$129 - \$65	11.9
Private Insurance: - Home Health	\$22 - \$28	\$3 - \$3	11.9
All Private Insurance (3 above categories)	\$1,473 - \$969	\$256 - \$202	17.4 - 20.9
Other Gov't (Fed)	\$174 - \$176	\$57 - \$57	32.5
Total	\$20,594 - \$15,377	\$8,093 - \$6,087	

Why this is an underestimate:

Ford and Brand's exceptional research is based on diagnostic codes and survey data that systematically under-report Alzheimer's disease for the reasons discussed above. If one multiplies the average Alzheimer's disease costs found in the research literature based on individual patient analyses (e.g., Rice et al., 1993), it becomes clear that the true picture of Alzheimer's disease treatment costs is far greater than can be captured via institutional survey data. For example, in 1992 the Congressional Office of Technical Assistance (OTA) estimated that the government pays more than half of all nursing home care for dementia - a cost that must be reflected in taxes.

What else is not counted

1. *The elderly in the workforce.* Eighteen percent of males over 65 years of age are in the labor force. Eight percent of females over 65 years of age are in the labor force. While those with Alzheimer's disease are far more likely than most to stop working, the numbers and costs of Alzheimer's disease from labor force participants are undoubtedly substantial. Unfortunately, we have no accurate data on this population and do not offer estimates of the cost to business.

2. *People who are under 65, have Alzheimer's disease and are in the workforce.* Ernst and Hay (1994) estimate there are 245,000 people with Alzheimer's disease between 45 and 64 who were newly diagnosed in 1991. As with those older than 65, people with Alzheimer's disease are much more likely to withdraw from the labor force than are others. Nevertheless, the cost in health care, productivity loss, and emotional strain is undoubtedly many billions of dollars - much of that borne by business. Unfortunately, again, we have no accurate data on this question and do not estimate the costs.

3. *Cross subsidization:* The cost of Alzheimer's disease is sufficiently vast that it often puts pressure on medical services and institutions. The cost of Alzheimer's disease crosses over many budget categories, defying the accounting methods that seek to depict expenses accurately. Similarly, general charitable contributions to medical institutions are partially absorbed by the treatment of those with Alzheimer's disease.

Business Contribution to Federal Research on Alzheimer's Disease

The federal government spends \$349.2 million on Alzheimer research at the National Institutes of Health. Businesses pay an estimated \$54-126 million of that, based on combined business taxes of 15.5%.

Summary

We set out to determine how much Alzheimer's disease costs U.S. business. Although our numbers are laden with caveats, we have answered the question:

The combined total cost to businesses of worker/caregivers and of health care is \$33.168 billion.

We suggest that if we could measure all of the relevant factors, the actual cost of Alzheimer's disease to the nation might well be shown to be two to three times the cost estimated here. Because many of the costs cannot be calculated with precision, we base our estimates on the most conservative assumptions. Many of these costs are being calculated here for the first time and others cannot be measured with the existing published data - more reason to stick to the most conservative conclusions.

Consequently, the business share of the cost of Alzheimer's might be much higher than \$33.168 billion because most of the items we could not measure have profound implications for business.

Next Steps: From an economic perspective, Alzheimer's receives only a fraction of the attention it deserves. The cost to business and to society are extraordinary, and are growing in proportion to the aging baby boomers and other demographic shifts, including entry into the work force of increasing numbers of women - the foremost caregivers. From a human perspective, the toll of Alzheimer's disease is incalculable and terrible. Investment in research on this disease appears not only humane but also prudent.

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Part III: The Worksheets

A. Worksheets on Caregiver Costs

Number of employed caregivers and full time/part time status:

Joyce Berry, Commissioner, U.S. Administration on Aging, estimates that 70% of caregivers are employed (in Scharlach et al., 1991). Leschner and Sasaki (1995) indicate that between 50% and 61% of caregivers are working outside the home. But they do not give the ratio of full time to part time workers. The 1988 Travelers study (National Survey of Caregivers: Summary of Findings. AARP and The Travelers Companies Foundation, 1998) indicates that of those caregivers who are employed, 76% are employed full time. The NACG/AARP study (Family Caregiving in the US: Findings from a National Study. Washington, D.C., 1997) and the U.S. Department of Labor study (Facts on Working Women, Work and Elder Care No. 98-1, 1998) state that 64% of caregivers are working - and of these, 81.25% are working full time and 18.75% are working part time.

We use the middle and most recent estimate of 64% of caregivers; working, with 81.25% at full time and 18.75% at part time. We also base our calculations on 4 million Alzheimer's disease patients (Evans et al., 1990) of whom 90% have caregivers. Thus, we take 3.6 million caregivers (90% of 4 million) and multiply that times 64% (percent working), which equals 2.3 million caregivers. We perform separate analyses for the full time and the part time workers because we use lower salary and benefit estimates for part time workers. 81.25% of the 2.3 million caregivers equals 1,868,750 full time workers; and the number of part time workers who are caregivers is 431,250.

Wages:

Full Time: For full time workers who are also caregivers, we use the median wage/salary for workers age 35-44. In 1996 this was \$559. Adjusted to 1998, this is \$584.41. Annualized this equals \$30,389-14. (This figure is in line with the Met Life study that used weekly medians of \$701 for men and \$468 for women.) We use a benefit ratio of 28.1% for full time workers (Table 19, Employer compensation costs per employee hours worked, all private industry. Data for 1996. Report on the American Workforce. U.S. Department of Labor, 1997)

To figure the per day cost, we use the \$30,389.14 plus 28.1% = \$38,928-49 divided by 240 work days. This is \$162.20/day.

Part Time Workers: For part time workers who are also caregivers, we take two-thirds of the basic compensation ($\$30,389.14 \times .66 = \$20,056.83$) and we estimate the benefit ratio at 15.8%. (Table 19, Employer compensation costs per employee hours worked, all private industry. Data for 1996. Report on the American Workforce. U.S. Department of Labor, 1997 [This estimate removes: paid leave, supplemental pay, and retirement/savings.]) The lower salary of \$20,056.83 plus 15.8% = \$23,225-81. To figure the per day cost, we use the \$23,225.81 and the same 240 days = \$96.77/day. (Later, we shall also reduce the number of absent days for part time employees.)

Lost days:

The best estimate we have found of absenteeism associated with caregiving is from the MetLife Study of Employer Costs for Working Caregivers, June 1997.

This study breaks down the lost time as follows:

1. Lost days: 6 days (minimum) = 6 days/yr;
2. Partial lost days = 1 hr/wk 6.66 days at 7.5 hrs/day per year;
3. Supervisor time = 1 hr/mo 1.5 days/year;
4. Workday interruption: 50 hrs/yr = 6.66 (at 7.5 hrs/day);
5. Crises: 3 days/yr.

The total is 23.82 days per year.

Note that caregivers of Alzheimer's disease are probably more burdened than the MetLife data reflect. Nevertheless, to err on the conservative side, we use the 23.82 days per year figure. Moreover, we do not adjust the wage data to reflect higher supervisor earnings.

Estimates for full time and part time workers who are caregivers:

The lost days of full time worker who are caregivers; is $23.82 \times \$162.50 = \$3,870.75$

For part time workers, we use the lower compensation and benefit figure of \$96.77/day, and we estimate only two-thirds as many days are lost ($23.82 \times .66 = 15.72$ days). Thus, $\$96.77 \times 15.72$ days is \$1521.22

Costs:

Absenteeism costs of full time employed caregivers is $\$3,870.75 \times 1,868,750$ workers
=\$7.233 billion;

Absenteeism cost of part time employed caregivers is $\$1521.22 \times 431,250$ workers
=\$656 million.

Combined, the two costs total: \$7.885 billion

Worksheet on EAP Usage by Caregivers

Based on data in Bray et al. (1996), we estimate that 26% of employees are covered by EAPs. Cook (1997) indicates that the average cost per employee is \$28. Based on average utilization rates (9-.25% of workers use them - see Bray et al.) this translates to \$302.68 per user. Data on EAP marginal costs are less reliable. Most of the cost is variable (Bray et al.) because EAPs are often subcontracted on a per case basis or because the company absorbs much of the cost as general operations or insurance. We estimate the average usage cost conservatively at one-third the general cost: $.33$ of $\$302.68 = \99.88 . Based on 26% of employed caregivers with EAPs (598,000), and using only average utilization rates (9.25%) = 55,315 caregivers estimated to use EAPs. Absent any specific data on frequency, we shall assume only one visit at a marginal cost of \$99.88. This equals \$5.525 million - the marginal cost of EAP usage by caregivers with EAP access.

B. Worksheets on Business Health Care Costs

Developed by David Ford, Senior Policy Analyst, with assistance by Laryssa Mykyta, Policy Analyst.

Robert Brand, President

Solutions for Progress, 1800 JFK Blvd., Philadelphia, PA, 19103

(See attached pages)

Alzheimers Cost Analysis

Medicare Alzheimers Spending

Medicare Primary Diagnosis ICD-9 Code 290 and 331.0, Short Stay Hospital Care

Source: Health Care Financing Administration

This shows primary Alzheimers Disease diagnosis only.

Code	1996 Charges	Reimbursement	Total Days	Medicare Days	Discharges
290	\$142,488,015	\$81,369,655	150,940	143,530	14,400
29010	\$9,279,225	\$4,798,200	9,625	9,115	790
29011	\$3,497,115	\$1,874,360	3,630	3,495	390
29012	\$8,587,795	\$4,787,795	7,750	7,690	650
29013	\$3,770,230	\$2,631,455	3,980	3,945	240
29020	\$107,284,495	\$59,370,550	118,460	116,900	8,335
29021	\$66,080,990	\$37,216,405	70,275	69,425	4,740
2903	\$109,146,595	\$60,938,500	110,720	107,325	11,665
29040	\$69,275,315	\$35,778,800	66,385	64,500	6,440
29041	\$44,857,460	\$23,354,820	40,195	39,220	4,410
29042	\$28,282,565	\$15,932,945	31,135	30,615	2,200
3310	\$93,355,125	\$50,923,905	97,115	89,990	10,175
Total	\$685,904,925	\$378,977,390	710,210	685,750	64,435

Alzheimers Cost Analysis

**Medicare Short-stay Hospital Alzheimers Charges
Average Charge per Discharge, by Diagnosis**

Code	1996 Charges Reimbursement		Total Days	Medicare Days
290	\$9,895	\$5,651	10.5	10.0
29010	\$11,746	\$6,074	12.2	11.5
29011	\$8,967	\$4,806	9.3	9.0
29012	\$13,212	\$7,366	11.9	11.8
29013	\$15,709	\$10,964	16.6	16.4
29020	\$12,872	\$7,123	14.2	14.0
29021	\$13,941	\$7,852	14.8	14.6
2903	\$9,357	\$5,224	9.5	9.2
29040	\$10,757	\$5,556	10.3	10.0
29041	\$10,172	\$5,296	9.1	8.9
29042	\$12,856	\$7,242	14.2	13.9
3310	\$9,175	\$5,005	9.5	8.8
Total	\$10,645	\$5,882	11.0	10.6

Alzheimers Cost Analysis

Medicare Home Health Spending

Medicare Primary Diagnosis ICD-9 Code 290 and 331.0, for all Home Health Agencies

Source: Health Care Financing Administration

This shows primary Alzheimers Disease diagnosis only.

Code	1996 Charges	Reimbursement	Visits	Bills
290	\$1,189,545	\$823,880	15,885	830
2900	\$105,420,960	\$78,116,395	1,391,765	96,195
29000	\$180,205	\$144,490	3,340	250
2901	\$476,325	\$369,605	8,415	260
29010	\$21,427,875	\$16,514,425	292,050	20,675
29011	\$1,803,720	\$1,251,720	21,700	1,455
29012	\$2,302,870	\$1,579,840	26,570	2,035
29013	\$1,895,095	\$1,374,595	23,085	1,885
2902	\$143,165	\$119,275	2,110	175
29020	\$10,734,575	\$7,768,790	121,620	10,075
29021	\$10,010,100	\$7,190,775	116,445	9,395
2903	\$6,811,295	\$4,755,760	84,860	5,715
2904	\$286,345	\$222,890	4,740	385
29040	\$17,171,125	\$13,379,755	223,790	14,780
29041	\$3,076,160	\$2,217,575	39,965	2,850
29042	\$2,623,620	\$1,849,535	31,240	2,530
29043	\$2,184,385	\$1,627,300	26,905	2,135
2908	\$252,475	\$184,685	2,830	285
2909	\$2,457,690	\$1,813,125	31,440	2,605
3310	\$173,996,630	\$129,579,350	2,329,590	152,065
33100	\$958,480	\$763,140	16,530	1,015
Total	\$365,402,640	\$271,646,905	4,814,875	327,595

Alzheimers Cost Analysis

**Medicare Home Health Alzheimers Charges
Average Charge per Bill, by Diagnosis, 1996**

Code	Reimbursement		Total Days
	Charge/Bill	/Bill	
290	\$1,433	\$993	19.1
2900	\$1,096	\$812	14.5
29000	\$721	\$578	13.4
2901	\$1,832	\$1,422	32.4
29010	\$1,036	\$799	14.1
29011	\$1,240	\$860	14.9
29012	\$1,132	\$776	13.1
29013	\$1,005	\$729	12.2
2902	\$818	\$682	12.1
29020	\$1,065	\$771	12.1
29021	\$1,065	\$765	12.4
2903	\$1,192	\$832	14.8
2904	\$744	\$579	12.3
29040	\$1,162	\$905	15.1
29041	\$1,079	\$778	14.0
29042	\$1,037	\$731	12.3
29043	\$1,023	\$762	12.6
2908	\$886	\$648	9.9
2909	\$943	\$696	12.1
3310	\$1,144	\$852	15.3
33100	\$944	\$752	16.3
Total	\$1,115	\$829	14.7

Alzheimers Cost Analysis

Medicare Spending for Alzheimers Compared to Medicare Spending for All Diagnoses

	1991	1992	1993	1994	1995	1996
Total Medicare Spending (\$ millions)	123,017	138,280	150,927	167,602	187,024	\$207,685
Estimated primary diagnosis AD spending	\$385	\$433	\$473	\$525	\$586	\$651
Total Medicare growth over previous year		12.4%	9.1%	11.0%	11.6%	11.0%
1996 Hospital Total as % of Estimated 1996 Medicare Spending						0.31%
Total Medicare Hospital and Home Health Spending for Alzheimers						\$651

Alzheimers Cost Analysis

Statistics of Income

Source: Internal Revenue Service, Statistics of Income, Individual Income Tax returns 1995, Publication 1304 (Rev. 3-98)

Persons claiming exemptions for parents, 1995

Returns claiming exemptions for parents	1,869,055
Exemptions claimed for parents on those returns	2,193,480

Alzheimers Cost Analysis

Medicaid Alzheimers Spending

Medicaid does not track spending by diagnosis. HCFA had no information for AD spending by Medicaid.

Source: HCFA, National Health Accounts

	1991	1992	1993	1994	1995	1996
Total Medicaid Spending (\$ billions)	\$77.0	\$91.5	\$101.7	\$108.3	\$120.1	\$121.7

Alzheimers Cost Analysis

Hospital Discharge Database (1995)

Source: HCUP-3, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (NIS) Release 4, 1995.

We used two 10% samples from this database as well as conducting the analysis on the entire database, and looked at all cases where Alzheimers was diagnosed in the first through 15th diagnosis. Includes all ICD-9 codes for the 290 series, plus 331.0.

Total Hospital Discharges

Entire database (up to 15th diagnosis)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	24,701	\$234,121,144	\$9,478
Invalid	7,521	\$50,878,356	\$6,765
Medicare	2,344,988	\$31,758,651,358	\$13,543
Medicaid	1,218,655	\$10,117,023,527	\$8,302
Private Ins	2,391,921	\$20,506,548,902	\$8,573
Self-pay	337,152	\$2,807,068,326	\$8,326
No Charge	10,788	\$119,149,652	\$11,045
Other Govt	224,543	\$2,471,814,062	\$11,008
Total	6,560,269	\$68,065,255,327	\$10,375

Alzheimers Discharges (entire database)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	90	\$966,326	\$10,737
Invalid	28	\$238,796	\$8,528
Medicare	120,661	\$1,339,164,017	\$11,099
Medicaid	2,835	\$44,559,879	\$15,718
Private Ins	5,974	\$71,292,606	\$11,934
Self-pay	718	\$8,078,451	\$11,251
No Charge	11	\$122,417	\$11,129
Other Govt	688	\$7,934,491	\$11,533
Total	131,005	\$1,472,356,983	\$11,239

AD as Percent of Total Hospital Discharges

Alzheimers Cost Analysis

This table shows Alzheimers Disease Discharges and Charges by payer as percent of All Discharges or Charges

Payer Name	Total Discharges	Charges
Missing	0.0014%	0.0014%
Invalid	0.0004%	0.0004%
Medicare	1.8393%	1.9675%
Medicaid	0.0432%	0.0655%
Private Ins	0.0911%	0.1047%
Self-pay	0.0109%	0.0119%
No Charge	0.0002%	0.0002%
Other Govt	0.0105%	0.0117%
Total	1.9969%	2.1632%

AD as Percent of Total Payer Hospital Discharges

This table shows Alzheimers Disease Discharges and Charges by Payer as percent of All Discharges or Charges by Payer

Payer Name	Total Discharges	Charges
Missing	0.36%	0.41%
Invalid	0.37%	0.47%
Medicare	5.15%	4.22%
Medicaid	0.23%	0.44%
Private Ins	0.25%	0.35%
Self-pay	0.21%	0.29%
No Charge	0.10%	0.10%
Other Govt	0.31%	0.32%
Total	2.00%	2.16%

Estimates of total AD hospital spending in US, 1995 using entire database

Source: HCFA National Health Accounts, 1995

Estimate 1

Method: Total U.S. hospital spending is multiplied by survey AD spending as percent of total.

	Total (\$ Millions)
Total Hospital Spending, 1995	\$350,120

Projected AD Spending	Total (\$ Millions)
Medicare	\$6,889
Medicaid	\$229
Private Ins	\$367
Self-pay	\$42
No Charge	\$1
Other Govt	\$41
Other	\$7
Total	\$7,574

Estimate 2

Estimate Based on Payer categories using entire database

Method: Total payer category hospital spending is multiplied by survey AD spending as percent of payer category.

Figures in \$ millions	Total Spending (All Diagnoses)	Estimated AD Spending
Medicare	\$112,648	\$4,750
Medicaid	\$51,983	\$229
Private Ins	\$113,074	\$393
Self-pay	\$11,414	\$33
No Charge	\$11,329	\$12
Other Govt	\$49,672	\$159
Total	\$350,120	\$5,576

Total Govt (from HCFA) 214,303

Note: the sum of estimate 2 is some 2 billion less than the amount predicted by estimate 1.

Alzheimers Cost Analysis

Total Hospital Discharges

First Subsample, AD 1 (10%) (up to 15th diagnosis)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	2,494	\$24,211,436	\$9,708
Invalid	778	\$4,947,032	\$6,359
Medicare	234,242	\$3,171,929,469	\$13,541
Medicaid	121,835	\$1,019,188,278	\$8,365
Private Ins	239,401	\$2,053,749,090	\$8,579
Self-pay	33,657	\$279,070,654	\$8,292
No Charge	1,069	\$11,005,447	\$10,295
Other Govt	22,531	\$250,181,490	\$11,104
Total	656,007	\$6,814,282,896	10,388

Second Subsample, AD 2 (10%) (up to 15th diagnosis)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	2,459	\$23,228,998	\$9,447
Invalid	750	\$5,075,998	\$6,768
Medicare	234,233	\$3,171,159,862	\$13,538
Medicaid	122,539	\$1,005,088,081	\$8,202
Private Ins	238,761	\$2,035,674,463	\$8,526
Self-pay	33,668	\$281,455,852	\$8,360
No Charge	1,088	\$11,024,293	\$10,133
Other Govt	22,507	\$249,053,499	\$11,066
Total	656,005	\$6,781,761,046	\$10,338

Alzheimers Cost Analysis

Hospital Discharges with Alzheimer's Diagnoses

First Subsample, AD 1 (10%) (up to 15th diagnosis)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	11	\$130,356	\$11,851
Invalid	2	\$7,018	\$3,509
Medicare	11,955	\$132,980,541	\$11,123
Medicaid	256	\$4,472,392	\$17,470
Private Ins	616	\$7,086,279	\$11,504
Self-pay	73	\$652,287	\$8,935
No Charge	2	\$25,948	\$12,974
Other Govt	66	\$967,927	\$14,666
Total	12,981	\$146,322,748	\$11,272

Second Subsample, AD 2 (10%) (up to 15th diagnosis)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	6	\$78,842	\$13,140
Invalid	1	\$16,496	\$16,496
Medicare	12,044	\$132,937,830	\$11,038
Medicaid	298	\$5,562,931	\$18,668
Private Ins	576	\$6,470,063	\$11,233
Self-pay	71	\$752,498	\$10,599
No Charge	1	\$4,248	\$4,248
Other Govt	66	\$682,486	\$10,341
Total	13,063	\$146,505,394	\$11,215

Alzheimers Cost Analysis

Combined Samples (All Discharges)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	4,953	\$47,440,434	\$9,578
Invalid	1,528	\$10,023,030	\$6,560
Medicare	468,475	\$6,343,089,331	\$13,540
Medicaid	244,374	\$2,024,276,359	\$8,284
Private Ins	478,162	\$4,089,423,553	\$8,552
Self-pay	67,325	\$560,526,506	\$8,326
No Charge	2,157	\$22,029,740	\$10,213
Other Govt	45,038	\$499,234,989	\$11,085
Total	1,312,012	\$13,596,043,942	\$10,363

Combined Samples (AD Discharges)

Payer Name	Total Discharges	Total Charges	Average/Discharge
Missing	12	\$209,198	\$17,433
Invalid	2	\$23,514	\$11,757
Medicare	24,088	\$265,918,371	\$11,039
Medicaid	596	\$10,035,323	\$16,838
Private Ins	1,152	\$13,556,342	\$11,768
Self-pay	142	\$1,404,785	\$9,893
No Charge	2	\$30,196	\$15,098
Other Govt	132	\$1,650,413	\$12,503
Total	26,126	\$292,828,142	\$11,208

Alzheimers Cost Analysis

AD as Percent of Total Hospital Discharges

This table shows Alzheimers Disease Discharges and Charges by payer as percent of All Discharges or Charges

Payer Name	Total Discharges	Charges
Missing	0.0009%	0.0015%
Invalid	0.0002%	0.0002%
Medicare	1.8360%	1.9559%
Medicaid	0.0454%	0.0738%
Private Ins	0.0878%	0.0997%
Self-pay	0.0108%	0.0103%
No Charge	0.0002%	0.0002%
Other Govt	0.0101%	0.0121%
Total	1.9913%	2.1538%

AD as Percent of Total Payer Hospital Discharges

This table shows Alzheimers Disease Discharges and Charges by Payer as percent of All Discharges or Charges by Payer

Payer Name	Total Discharges	Charges
Missing	0.24%	0.44%
Invalid	0.13%	0.23%
Medicare	5.14%	4.19%
Medicaid	0.24%	0.50%
Private Ins	0.24%	0.33%
Self-pay	0.21%	0.25%
No Charge	0.09%	0.14%
Other Govt	0.29%	0.33%
Total	1.99%	2.15%

Alzheimers Cost Analysis

Estimates of total AD hospital spending in US, 1995 using combined samples

Source: HCFA National Health Accounts, 1995

Estimate 1 Based on combined samples

Method: Total U.S. hospital spending is multiplied by survey AD spending as percent of total.

	Total (\$ Millions)
Total Hospital Spending, 1995	\$350,120
Medicare	\$6,848
Medicaid	\$258
Private Ins	\$349
Self-pay	\$36
No Charge	\$1
Other Govt	\$43
Total	\$7,541

Alzheimers Cost Analysis

Estimate 2

Estimate Based on Payer categories using combined samples

Method: Total payer category hospital spending is multiplied by survey AD spending as percent of payer category.

Medicare	\$112,648	\$4,722
Medicaid	\$51,983	\$258
Private Ins	\$113,074	\$375
Self-pay	\$11,414	\$29
No Charge	\$11,329	\$16
Other Govt	\$49,672	\$164
Total	\$350,120	\$5,563
Total Govt (from HCFA)	\$214,303	

Note: the sum of estimate 2 is some 600 million less than the amount predicted by estimate 1.

Alzheimers Cost Analysis

Nursing Home Survey Data

Source: National Center for Health Statistics, 1995 National Nursing Home Survey
Survey of 8,056 current residents in 1409 nursing homes.

Method: We calculated length of stay using admission date and survey date. We estimated total charges by multiplying charge per period by number of billing periods for the entire length of stay. Where billing period information was indeterminate, we assigned billing periods assuming that under \$200 was a daily charge, \$200 to \$1000 was a weekly charge, and anything over \$1000 was a monthly charge, unless it appeared to be a charge for the entire length of stay.

Annual charges were calculated by taking the most recent year of total charges.

All NH residents in Survey

	Patients	Total Days	Total Charges	Annual Charges	Avg. Daily Charge	Per Person
All Patients	7,118	6,866,531	\$626,871,942	\$193,271,892	\$91.29	\$27,153
Private Insurance	438	278,547	\$28,622,854	\$12,431,249	\$102.76	\$28,382
Own Income, Family Support	1,549	1,203,834	\$107,991,104	\$40,684,034	\$89.71	\$26,265
SSI	9	11,105	\$443,045	\$183,210	\$39.90	\$20,357
Medicare	715	401,734	\$44,240,071	\$16,431,404	\$110.12	\$22,981
Medicaid	4,253	4,845,922	\$433,453,795	\$119,645,434	\$89.45	\$28,132
Other Govt Assistance	23	27,949	\$3,214,532	\$940,655	\$115.01	\$40,898
Religious Org	5	5,417	\$488,841	\$93,198	\$90.24	\$18,640
VA Contracts	38	25,938	\$2,425,212	\$770,663	\$93.50	\$20,281
Undetermined	5	1,240	\$114,340	\$74,299	\$92.21	\$14,860
Other	54	38,676	\$3,589,658	\$1,237,632	\$92.81	\$22,919
Blank	29	26,169	\$2,288,489	\$780,113	\$87.45	\$26,900
Total	7,118	6,866,531	\$626,871,942	\$193,271,892		\$27,153

Alzheimers Cost Analysis

Payers as Percent of All Nursing Home Charges

	Patients	Total Days	Total Charges	Annual Charges
Private Insurance	6.2%	4.1%	4.6%	6.4%
Own Income, Family Support	21.8%	17.5%	17.2%	21.1%
SSI	0.1%	0.2%	0.1%	0.1%
Medicare	10.0%	5.9%	7.1%	8.5%
Medicaid	59.7%	70.6%	69.1%	61.9%
Other Govt Assistance	0.3%	0.4%	0.5%	0.5%
Religious Org	0.1%	0.1%	0.1%	0.0%
VA Contracts	0.5%	0.4%	0.4%	0.4%
Undetermined	0.1%	0.0%	0.0%	0.0%
Other	0.8%	0.6%	0.6%	0.6%
Blank	0.4%	0.4%	0.4%	0.4%
Total	100.0%	100.0%	100.0%	100.0%

Alzheimers Cost Analysis

NH residents with AD Diagnosis

This table shows charges by payer for all nursing home residents in survey with any Alzheimers diagnosis. We looked at the first through sixth admitting diagnosis, as well as the first through sixth current diagnosis.

(Includes 290s and 3310)	Patients	Total Days	Total Charges	Annual Charges	Avg Daily Charge	Per Person
All AD Patients	1,422	1,325,500	\$123,930,498	\$40,386,325	\$93.50	\$28,401
Private Insurance	94	73,032	\$7,460,975	\$2,690,935	\$102.16	\$28,627
Own Income, Family Support	324	257,155	\$24,370,079	\$9,131,276	\$94.77	\$28,183
SSI	0	0	\$0	\$0	\$0.00	\$0
Medicare	112	62,015	\$7,372,777	\$3,084,218	\$118.89	\$27,538
Medicaid	862	910,579	\$82,729,614	\$24,694,873	\$90.85	\$28,648
Other Govt Assistance	4	2,337	\$298,172	\$121,972	\$127.59	\$30,493
Religious Org	2	2,131	\$154,760	\$44,579	\$72.62	\$22,290
VA Contracts	6	2,935	\$316,903	\$190,302	\$107.97	\$31,717
Undetermined	2	908	\$77,971	\$37,930	\$85.87	\$18,965
Other	7	6,574	\$417,390	\$107,195	\$63.49	\$15,314
Blank	9	7,834	\$731,857	\$283,044	\$93.42	\$31,449
Total	1,422	1,325,500	\$123,930,498	\$40,386,325		\$28,401

Alzheimers Cost Analysis

Payers Proportion of Alzheimer Diagnosis Nursing Home Charges

Percent of AD Total	Patients	Total Days	Total Charges	Annual Charges
All AD Patients	100.0%	100.0%	100.0%	100.0%
Private Insurance	6.6%	5.5%	6.0%	6.7%
Own Income, Family Support	22.8%	19.4%	19.7%	22.6%
SSI	0.0%	0.0%	0.0%	0.0%
Medicare	7.9%	4.7%	5.9%	7.6%
Medicaid	60.6%	68.7%	66.8%	61.1%
Other Govt Assistance	0.3%	0.2%	0.2%	0.3%
Religious Org	0.1%	0.2%	0.1%	0.1%
VA Contracts	0.4%	0.2%	0.3%	0.5%
Undetermined	0.1%	0.1%	0.1%	0.1%
Other	0.5%	0.5%	0.3%	0.3%
Blank	0.6%	0.6%	0.6%	0.7%
Total	100.0%	100.0%	100.0%	100.0%

Alzheimers Diagnoses as Percent of Payer Category

AD as Percent of Payer Category Total	Patients	Total Days	Total Charges	Annual Charges
All AD Patients	20.0%	19.3%	19.8%	20.9%
Private Insurance	21.5%	26.2%	26.1%	21.6%
Own Income, Family Support	20.9%	21.4%	22.6%	22.4%
SSI	0.0%	0.0%	0.0%	0.0%
Medicare	15.7%	15.4%	16.7%	18.8%
Medicaid	20.3%	18.8%	19.1%	20.6%
Other Govt Assistance	17.4%	8.4%	9.3%	13.0%
Religious Org	40.0%	39.3%	31.7%	47.8%
VA Contracts	15.8%	11.3%	13.1%	24.7%
Undetermined	40.0%	73.2%	68.2%	51.0%
Other	13.0%	17.0%	11.6%	8.7%
Blank	31.0%	29.9%	32.0%	36.3%

Alzheimers Cost Analysis

Alzheimers Diagnoses as percent of all nursing home spending, by payer

AD as Percent of All NH	Patients	Total Days	Total Charges	Annual Charges
All AD Patients	20.0%	19.3%	19.8%	20.9%
Private Insurance	1.3%	1.1%	1.2%	1.4%
Own Income, Family Support	4.6%	3.7%	3.9%	4.7%
SSI	0.0%	0.0%	0.0%	0.0%
Medicare	1.6%	0.9%	1.2%	1.6%
Medicaid	12.1%	13.3%	13.2%	12.8%
Other Govt Assistance	0.1%	0.0%	0.0%	0.1%
Religious Org	0.0%	0.0%	0.0%	0.0%
VA Contracts	0.1%	0.0%	0.1%	0.1%
Undetermined	0.0%	0.0%	0.0%	0.0%
Other	0.1%	0.1%	0.1%	0.1%
Blank	0.1%	0.1%	0.1%	0.1%

Alzheimers Cost Analysis

Nursing Home Spending, US, 1995 (\$ Millions)
Total \$77,877.0

Estimates for total Alzheimers Nursing Home Spending, 1995

Estimate 1:

Method: Multiplies total nursing home spending in US by survey payer AD percent of total nursing home spending.

Total	\$16,273.3
Private Insurance	\$1,084.3
Own Income, Family Support	\$3,679.4
SSI	\$0.0
Medicare	\$1,242.8
Medicaid	\$9,950.6
Other Govt Assistance	\$49.1
Religious Org	\$18.0
VA Contracts	\$76.7
Undetermined	\$15.3
Other	\$43.2
Blank	\$114.0

Alzheimers Cost Analysis

Estimates for total Alzheimers Nursing Home Spending, 1995

Estimate 2

Method: Multiplies payer total for US (From HCFA) by AD payer percent of payer nursing home total.

	(\$ Millions)	AD Spending
Total (from Estimate 1)	\$77,877.0	\$16,273.3
Private Insurance	\$2,532.0	\$548.1
Own Income, Family Support	\$28,599.0	\$6,418.9
SSI	\$0.0	\$0.0
Medicare	\$7,344.0	\$1,378.5
Medicaid	\$36,197.0	\$7,471.1
Other Govt Assistance	\$109.0	\$14.1
Religious Org	\$1,472.0	\$704.1
VA Contracts	\$1,624.0	\$401.0
Combined total (Estimate 2)	\$77,877	\$16,936

Alzheimers Cost Analysis

Home Health Care

Source: National Technical Information Service, "National Home and Hospice Care Survey 1994, U.S. Dept. of Commerce, 1994. Some 1500 agencies were surveyed, including hospices as well as home health agencies. We excluded the hospices, since they do not fit the HCFA definitions for Home Health Spending. We summed charges, patients and days of care for alzheimers diagnoses. These were then calculated as a proportion of total home health spending in the survey.

Discharge Database, All Records

All Diagnoses	Total Charges (\$_actual)	Total Patients Paying	Total Days of Care	Cost/Patient	Cost/Day
Private Insurance	\$313,627	502	7,553	\$624.75	\$41.52
Own Income, Family Support	\$46,468	94	1,698	\$494.34	\$27.37
SSI	\$1,683	6	110	\$280.50	\$15.30
Medicare	\$2,006,550	2,564	46,253	\$782.59	\$43.38
Medicaid	\$227,799	436	7,384	\$522.47	\$30.85
Other Govt Assistance	\$21,954	88	1,800	\$249.48	\$12.20
Religious Org	\$1,465	5	73	\$293.00	\$20.07
VA Contracts	\$5,632	15	237	\$375.47	\$23.76
Undetermined	\$2,813	3	53	\$937.67	\$53.08
Other	\$40,681	68	1,126	\$598.25	\$36.13
Don't know	\$5,527	13	198	\$425.15	\$27.91
Blank	\$4,765	9	196	\$529.44	\$24.31
Total	\$2,678,964	3,803	66,681	\$704.43	\$40.18

Alzheimers Cost Analysis

**Home Health Care
Current Patient Database, All Records**

All Diagnoses	Total Charges (\$_actual)	Total Patients Paying	Total Days of Care	Cost/Patient	Cost/Day
Private Insurance	\$287,801	272	5,313	\$1,058.09	\$54.17
Own Income, Family Support	\$83,990	131	2,955	\$641.15	\$28.42
SSI	\$500	3	45	\$166.67	\$11.11
Medicare	\$2,832,559	2,350	59,712	\$1,205.34	\$47.44
Medicaid	\$493,318	582	13,729	\$847.63	\$35.93
Other Govt Assistance	\$47,594	142	3,433	\$335.17	\$13.86
Religious Org	\$1,418	7	187	\$202.57	\$7.58
VA Contracts	\$5,959	11	265	\$541.73	\$22.49
Undetermined	\$3,589	1	30	\$3,589.00	\$119.63
Other	\$49,826	83	1,899	\$600.31	\$26.24
Don't know	\$12,913	18	391	\$717.39	\$33.03
Blank	\$21,888	13	286	\$1,683.69	\$76.53
Total	\$3,841,355	3,613	88,245	\$1,063.20	\$43.53

Alzheimers Cost Analysis

Home Health Care

Combined Current Patient and Discharge Database, All Records

All Diagnoses	Total Charges (\$_actual)	Total Patients Paying	Total Days of Care	Cost/Patient	Cost/Day
Private Insurance	\$601,428	774	12,866	\$777.04	\$46.75
Own Income, Family Support	\$130,458	225	4,653	\$579.81	\$28.04
SSI	\$2,183	9	155	\$242.56	\$14.08
Medicare	\$4,839,109	4,914	105,965	\$984.76	\$45.67
Medicaid	\$721,117	1,018	21,113	\$708.37	\$34.16
Other Govt Assistance	\$69,548	230	5,233	\$302.38	\$13.29
Religious Org	\$2,883	12	260	\$240.25	\$11.09
VA Contracts	\$11,591	26	502	\$445.81	\$23.09
Undetermined	\$6,402	4	83	\$1,600.50	\$77.13
Other	\$90,507	151	3,025	\$599.38	\$29.92
Don't know	\$18,440	31	589	\$594.84	\$31.31
Blank	\$26,653	22	482	\$1,211.50	\$55.30
Total	\$6,520,319	7,416	154,926	\$879.22	\$42.09

Alzheimers Cost Analysis

Home Health Care

Combined Current Patient and Discharge Database, AD Diagnoses Only

AD Diagnoses	Total Charges (\$_actual)	Total Patients Paying	Total Days of Care	Cost/Patient	Cost/Day
Private Insurance	\$5,084	9	143	\$564.89	\$35.55
Own Income, Family Support	\$1,806	7	117	\$258.00	\$15.44
SSI	\$0	0	0	\$0.00	\$0.00
Medicare	\$128,128	144	3,260	\$889.78	\$39.30
Medicaid	\$16,818	20	503	\$840.90	\$33.44
Other Govt Assistance	\$1,769	6	164	\$0.00	\$0.00
Religious Org	\$0	0	0	\$0.00	\$0.00
VA Contracts	\$0	0	0	\$0.00	\$0.00
Undetermined	\$0	0	0	\$0.00	\$0.00
Other	\$1,275	2	52	\$637.50	\$24.52
Don't know	\$556	2	8	\$0.00	\$0.00
Blank	\$3,263	1	35	\$0.00	\$0.00
Total	\$158,699	191	4,282	\$830.88	\$37.06

Alzheimers Cost Analysis

Home Health Care

AD Diagnoses as Percent of ALL Home Care

	Total Charges	Total Patients Paying	Total Days of Care
Private Insurance	0.08%	0.12%	0.09%
Own Income, Family Support	0.03%	0.09%	0.08%
SSI	0.00%	0.00%	0.00%
Medicare	1.97%	1.94%	2.10%
Medicaid	0.26%	0.27%	0.32%
Other Govt Assistance	0.03%	0.08%	0.11%
Religious Org	0.00%	0.00%	0.00%
VA Contracts	0.00%	0.00%	0.00%
Undetermined	0.00%	0.00%	0.00%
Other	0.02%	0.03%	0.03%
Don't know	0.01%	0.03%	0.01%
Blank	0.05%	0.01%	0.02%
Total	2.43%	2.58%	2.76%

Alzheimers Cost Analysis

Home Health Care

AD Diagnoses as Percent of Payer Category

	Total Charges	Total Patients Paying	Total Days of Care
Private Insurance	0.85%	1.16%	1.11%
Own Income, Family Support	1.38%	3.11%	2.51%
SSI	0.00%	0.00%	0.00%
Medicare	2.65%	2.93%	3.08%
Medicaid	2.33%	1.96%	2.38%
Other Govt Assistance	2.54%	2.61%	3.13%
Religious Org	0.00%	0.00%	0.00%
VA Contracts	0.00%	0.00%	0.00%
Undetermined	0.00%	0.00%	0.00%
Other	1.41%	1.32%	1.72%
Don't know	3.02%	6.45%	1.36%
Blank	12.24%	4.55%	7.26%
Total	2.43%	2.58%	2.76%

Alzheimers Cost Analysis

Home Health Care

Home Health Spending, US, 1995

Total (\$ millions) \$28,573

Estimated Home Health spending for Alzheimers Diagnoses, 1995

Estimate 1:

Method: Multiplies total home health spending in US by survey payer AD percent of total home health spending.

(\$ millions)

All Payers	\$695.4
Private Insurance	\$22.3
Own Income, Family Support	\$7.9
SSI	\$0.0
Medicare	\$561.5
Medicaid	\$73.7
Other Govt Assistance	\$7.8
Religious Org	\$0.0
VA Contracts	\$0.0
Undetermined	\$0.0
Other	\$5.6
Don't know	\$2.4
Blank	\$14.3
Sum	\$695.4

Alzheimers Cost Analysis

Estimates for total Alzheimers Home Health Spending, 1995

Estimate 2

Method: Multiplies payer total for US (From HCFA) by AD payer percent of payer nursing home total.

	Health \$ Millions)	AD Spending
Total	\$28,573.0	\$695.4
Private Insurance	\$3,340.0	\$28.2
Own Income, Family Support	\$6,004.0	\$83.1
SSI	\$0.0	\$0.0
Medicare	\$11,594.0	\$307.0
Medicaid	\$4,095.0	\$95.5
Other Govt Assistance	\$103.0	\$2.6
Religious Org	\$3,437.0	\$0.0
VA Contracts		\$0.0
Sum of payers	\$28,573	\$516.5

Summary Tables

Estimate 1

Spending by payer and type of provider for treatment of those with any diagnosis of Alzheimers, 1995

Payer	Hospital (\$ millions)	Nursing Home (\$ millions)	Home Health Care* (\$ millions)	Total (\$ millions)
Private Insurance	\$367	\$1,084	\$22	\$1,473
Own Income, Family Support	\$42	\$3,679	\$8	\$3,729
SSI	\$0	\$0	\$0	\$0
Medicare	\$6,889	\$1,243	\$561	\$8,693
Medicaid	\$229	\$9,951	\$74	\$10,253
Other Govt Assistance	\$41	\$49	\$8	\$98
Religious Org	\$0	\$18	\$0	\$18
VA Contracts	\$0	\$77	\$0	\$77
Undetermined	\$0	\$15	\$0	\$15
Other	\$7	\$43	\$6	\$56
Blank	\$0	\$114	\$2	\$116
All Payers	\$7,574	\$16,273	\$681	\$24,528

* This represents costs for home health care only, and does not include personal care services or homemaker services or other assistance services that may be paid for by Medicaid or privately to care for persons with Alzherimers.

Alzheimers Cost Analysis

Estimate 1

Estimated Cost to Business

(Figures in \$ millions)

	Total	Portion	Business Cost Source of Business Portion
Medicare	\$8,693	50.0%	\$4,346 Assumes employer/employee 50% split.
Medicaid Federal Portion	\$5,127	32.5%	\$1,666 RK's calculation.
Medicaid State Portion	\$5,127	34.5%	\$1,767 Business portion calculation
Private Insurance -- Hospital	\$367	34.0%	\$125 RK's calculation.
Private Insurance -- Nursing Home*	\$1,084	11.9%	\$129 HIAA
Private Insurance -- Home Health*	\$22	11.9%	\$3 HIAA
All of Private Insurance	\$1,473	17.4%	\$256
Other Government (assumes all federal)	\$174	32.5%	\$57 RK's calculation.
Total	\$20,594		\$8,093

* Source: HIAA, "Long-Term Care: Knowing the Risk, Paying the Price," Table 4.1, Washington DC, 1997, p. 68.

Medicare spending for AD based on primary diagnosis only (for comparison purposes)

1995	
1996	\$379

Alzheimers Cost Analysis

Estimate 1 Proportion of Spending by payer and type of provider for treatment of those with any diagnosis of Alzheimers, 1995

Payer	Hospital	Nursing Home	Home Health Care	Total
Private Insurance	4.8%	6.7%	3.3%	6.0%
Own Income, Family Support	0.5%	22.6%	1.2%	15.2%
SSI	0.0%	0.0%	0.0%	0.0%
Medicare	91.0%	7.6%	82.4%	35.4%
Medicaid	3.0%	61.1%	10.8%	41.8%
Other Govt Assistance	0.5%	0.3%	1.1%	0.4%
Religious Org	0.0%	0.1%	0.0%	0.1%
VA Contracts	0.0%	0.5%	0.0%	0.3%
Undetermined	0.0%	0.1%	0.0%	0.1%
Other	0.1%	0.3%	0.8%	0.2%
Blank	0.0%	0.7%	0.4%	0.5%
All Payers	100.0%	100.0%	100.0%	100.0%

Summary Tables

Estimate 2

Spending by payer and type of provider for treatment of those with any diagnosis of Alzheimers, 1995

Payer	Hospital (\$ millions)	Nursing Home (\$ millions)	Home Health Care* (\$ millions)	Total (\$ millions)
Private Insurance	\$393	\$548	\$28	\$969
Own Income, Family Support	\$33	\$6,419	\$83	\$6,535
SSI	\$0	\$0	\$0	\$0
Medicare	\$4,750	\$1,378	\$307	\$6,435
Medicaid	\$229	\$7,471	\$96	\$7,796
Other Govt Assistance	\$159	\$14	\$3	\$176
Religious Org	\$0	\$704	\$0	\$704
VA Contracts	\$0	\$401	\$0	\$401
All Payers	\$5,564	\$16,936	\$516	\$23,017

* This represents costs for home health care only, and does not include personal care services or homemaker services or other assistance services that may be paid for by Medicaid or privately to care for persons with Alzherimers.

Alzheimers Cost Analysis

Estimated Cost to Business (Figures in \$ millions)	Total	business Portion	Business Cost Source of Business Portion
Medicare	\$6,435	50.0%	\$3,218 Assumes employer/employee 50% split.
Medicaid Federal Portion	\$3,898	32.5%	\$1,267 RK's calculation.
Medicaid State Portion	\$3,898	34.5%	\$1,343 Business portion calculation
Private Insurance -- Hospital	\$393	34.0%	\$134 RK's calculation.
Private Insurance -- Nursing Home*	\$548	11.9%	\$65 HIAA
Private Insurance -- Home Health*	\$28	11.9%	\$3 HIAA
All of Private Insurance	\$969	20.9%	\$202
Other Government (assumes all federal)	\$176	32.5%	\$57 RK's calculation.
Total	\$15,377		\$6,087

* Source: HIAA, "Long-Term Care: Knowing the Risk, Paying the Price," Table 4.1, Washington DC, 1997, p. 68.