Predicted economic damage from a quick, simple Alzheimer's disease cure

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ABSTRACT

The estimated 5.8 million Alzheimer’s disease patients in the U.S. require an enormous share of national healthcare expenditures. Other nations face similar economic burdens. There have been great efforts, thus far unsuccessful, to discover an effective therapeutic, with 1081 Alzheimer’s disease drug trials completed as of May 2019. The pessimism thus engendered has forestalled contingency planning for the potential major economic repercussions of a simple, quick cure. Yet, promising new research spotlighting the possible “trigger” role of infectious agents might allow some or all cases of Alzheimer’s disease to be halted, reversed, or prevented with an antibiotic or antiviral compound, possibly even one already approved by drug regulators for other uses. The sudden advent of such an unexpected therapy would theoretically have dramatic impacts, both detrimental and beneficial, on the American economy. The damages would include a $414 billion shrinkage of Medicaid, Medicare and other revenues to all six sectors comprising the healthcare provider category. Nursing homes and skilled nursing facilities are projected to suffer the greatest loss of annual revenue: $51 billion and $16 billion, respectively. This would cause the loss of an estimated 654,000 jobs. Facility mortgage and commercial loan repayments could stop. Other adverse consequences would include detrimental effects on reserves for Social Security and pensions, cutbacks in dementia research funding, and reduced donations to Alzheimer’s disease advocacy groups. Insurance company reserves for fixed payment annuities already sold could be jeopardized. However, an Alzheimer’s disease cure would also create economic beneficiaries. Medicare and Medicaid would save up to a projected $195 billion annually. Life insurance companies and unpaid caregivers would also benefit financially. By identifying the healthcare sectors likely to be detrimentally impacted by a simple, quick Alzheimer’s disease cure, contingency plans can be made in the U.S. and other countries to assist the foreseeable painful transitions for staff and facilities.

Introduction

An estimated 5.7 million Americans were living with Alzheimer’s disease (AD) as of 2018 [1]. It is the sixth-leading cause of death, with 121,528 people dying from this devastating illness in 2017 alone. AD also accounts for major healthcare expenditures, with medical and nursing outlays estimated at $290 billion [1]. This is greater than the annual budget of California ($261 billion), or New York and Texas combined ($268 billion) [2]. It comprises a formidable eight percent of the total U.S. healthcare expenditures of $3.5 trillion [3]. Worldwide, the estimated cost of AD and other dementias is $605 billion, or one percent of the global gross domestic product [4].

There has yet to be an effective curative therapy or preventive for AD, despite the urgent need for one and enormous efforts by researchers and pharmaceutical companies. Principal attention and significant monies have been invested in developing pharmaceuticals targeting brain amyloid-β [5]. Research funding has reached an all-time high; the 2019 fiscal year National Institutes of Health (NIH) budget for AD studies was estimated at $2.3 billion [6]. As of May 2019, 1081 AD trials of various therapeutics were marked as “completed”, but there have been no reports of breakthroughs [7]. Yet the search is still on; as of May 2019, another 405 clinical trials were recruiting volunteers [8].

However, the prevailing frustration, and even pessimism, that permeates the quest for an effective AD therapy or preventive has postponed consideration of a quite different possibility—the sudden discovery of a simple, quick cure for AD. Likely this would be regarded as a medical miracle, especially by patients, their families, and the millions aging into the decades of life in which AD prevalence escalates.

Despite previous failures, the potential for producing a curative for AD is not unwarranted. For example, increased attention is now being paid to infectious agents as possible triggers or promoters of AD. Suggestive evidence is accumulating, with both preclinical and clinical studies implicating viruses [9–12], bacteria [10,13–15], parasitic one-celled eukaryotes [16], fungi [17], and prions [18] in AD. If one or more microorganisms is proven to be directly causative or to play a necessary role in AD, the path opens to a simple blood test for diagnosis, and repurposing or developing a curative anti-infective drug or preventive vaccine. Or perhaps a different causation mechanism will be revealed, leading to a simple, quick cure tailored to it.

But there has been little or no attention to the economic side effects of the unpredicted sudden arrival of an AD curative or preventive. U.S. data permit an instructive analysis. Much or all of the $290 billion currently received for AD-related matters in the U.S. would stop flowing to the behemoth medical infrastructure that supports the diagnosis and long-term care of this illness. The hypothesis presented here is that the
outright elimination of AD resulting from a simple, quick cure would be challenging, if not devastating, to certain now-comfortable sectors of healthcare which have become accustomed to providing care to millions of AD patients, in such settings as nursing homes, skilled nursing facilities, etc. These providers would suffer dramatic losses of revenue, which in turn would force drastic reductions in their staffs. The detrimental and beneficial ramifications to these and other economic sectors will be considered in this analysis.

Those sanguine about the proximity of a cure for AD will feel the type of economic calculations presented here are imperative, so that societal preparations can be made. Those more pessimistic about prospects for a therapeutic hopefully will view this theoretical analysis as at least a useful academic exercise in the applied economics of curing a chronic, ultimately fatal disease which is prevalent among millions of seniors.

Methodology used in evaluating hypothesis

For convenience in estimating the macroeconomic effects, two assumptions were made. The first is that the remedy is easy and convenient to administer, such as a bottle of pills or one injection in the doctor’s office. The other assumption is that it works quickly to halt or reverse AD, on an outpatient basis. Another consideration is that some current AD patients will have already suffered extensive loss of cognition and functionality and may not benefit significantly from the new medication, potentially requiring a lifetime of long-term care. But this cohort is assumed to be relatively small, with no new patients entering this stage, and thus it is not considered further in this study. Finally, “cure” includes preventives as well.

The statistics presented on AD cases are only estimates, and projections from estimates, as there are several factors that are intrinsically difficult to define. For example, published source data often combined AD and “other dementias” (OD) into a single compilation “AD/OD” (Alzheimer’s disease and other dementias). However, in this study, only a single, overall “AD” label was applied to all compilations and estimates, and it thus includes some unknown percentage of OD cases. These would likely not be helped by the new drug, which will lessen the cure’s economic effect to some extent. However, AD has been estimated to comprise a significant portion (50–70 percent) of all dementias [19]. The imprecision introduced by the foregoing simplifications and other decisions made for this analysis is believed to be relatively small in comparison to the very large economic effects foreseeable. Finally, only the United States economic and healthcare systems, and statistics applicable to them, were considered. However, the general trends and challenges revealed will likely apply in varying degrees to many other countries as well.

Predicted detrimental economic consequences

Revenues slashed at healthcare facilities

In the event of a novel, simple, and fast-acting AD curative entering the market, there would be an expected significant loss in revenues for healthcare facilities and other providers. All six categories of providers (nursing homes, hospitals, skilled nursing facilities, medical providers, home healthcare, and hospice) are projected to suffer a loss of Medicare revenue. (Table 1) Of course, there would still remain other disorders/diseases to be treated as seniors age, so no category would shrink to zero.

Annually, each AD/OD patient requires $35632 more in Medicare payments than a non-AD patient, $44,633 versus $9001 [1]. As there are estimated to be 5.8 million patients with Alzheimer’s and other dementias, in 2018 dollars the predicted total shrinkage of AD/OD-related payments via Medicare beneficiaries to the healthcare provider sector of the economy would be approximately $35,632 × 5.8 million, or an estimated $207 billion reduction [1]. (Table 1) Further, since Medicare is about 50% of total expenditures for AD/OD [1], we can double the Medicare number to estimate the total reduction from all revenue sources to healthcare providers and project an astounding $414 billion reduction.

Nursing home revenue will be hit hard

The potentially hardest hit of the long-term care (LTC) provider categories would be nursing homes. The Henry J. Kaiser Family Foundation estimates the number of residents in such facilities at about 1.35 million [2]. Centers for Disease Control and Prevention (CDC) statistics indicate about 50 percent of such patients carry the diagnosis of AD [20], and thus an AD cure would remove about 675,000 patients from nursing homes (we ignore those presently too far into cognitive decline to exit, but once they die they would not be replaced).

What revenue would be lost by nursing home operators if these presently occupied beds become empty within a short period, possibly a year or two—which we will consider as “overnight”—and there are no more AD patients arriving to replace them? There is no single number to assign to this contemplated lost per bed revenue, as much depends on the payor, and there is some geographic variation.

Medicaid is the principal payor, supplying 62–66 percent of their revenue [21]. The remainder comes from Medicare, insurance, private pay, and other sources. The national average Medicaid reimbursement per nursing home patient is $210 per day, which amounts to $76,000 of revenue annually [21]. A non-Medicaid patient, paying an average of $263 per day, provides $96,000 annually [21]. A conservative estimate of the loss of nursing home revenue following an AD cure was calculated by assuming the average Medicaid rate of about $76,000 annually is being paid for each of the 675,000 patients that may be removed from revenues. Multiplying these two numbers yields about $51 billion of annual revenue which would potentially be removed from the nursing home industry. (This is likely understimating the monetary shrinkage, as about 45 percent of the estimated AD patients are paid from non-Medicaid sources, at a higher annual revenue each [21].)

This $51 billion decrease approximates the entire annual budget of Michigan ($56 billion) [22]. The total revenue estimated for all nursing homes in the U.S. in 2019 is projected to be $140 billion [23]. The projected disappearance of $51 billion is approximately 36 percent of that total. It is ten times the $5 billion 2018 revenue of the largest U.S. nursing home chain, Genesis Healthcare [24,25]. Thus, the predicted impact would be enormous.

Assisted living revenues will decrease

The expected disappearance of AD-affected residents would also have a sizable impact on residential care facilities, sometimes known as “assisted living.” According to the CDC, 2016 data indicate residential care communities house 811,500 individuals, 340,830 of whom (42 percent) have AD [26]. Genworth Financial estimates the average 2018 cost of residing at an assisted living facility at $48,000 [27]. Multiplying this per-resident cost by the number of AD residents—whose beds will become unused—yields a projected annual revenue loss to the assisted living industry of an alarming $16.3 billion. This is more than triple the annual revenues posted in 2018 by Brookdale Senior Living ($4.53 billion), which operates more than 1100 senior living facilities nationwide, and is the largest senior living facility operator in the U.S. [28].

Hospitals will potentially lose the extra increment of annual revenue ($7654) they collect from an AD patient as compared to a non-AD senior [1]. However, hospital admissions are usually short-stay, and for most of these facilities, AD patients are not a major part of the hospital inpatient mix. Therefore, hospitals were not further considered.
Deleterious impact on healthcare employment

An AD curative which empties LTC beds would also adversely impact the employees of those facilities. Assuming that present staff-to-patient ratios are maintained, a significant number of jobs would be lost. To estimate these, we first identified the number of individuals employed by such entities, using the most currently available CDC data [20]. As shown in Table 2, there are an estimated 1.45 million “patient care” jobs, distributed among the five types of providers which comprise the LTC healthcare sector. Nursing homes and residential care facilities together account for the vast majority (85 percent) of these, the former for 66 percent and the latter for 19 percent. The other categories (adult day care, home health agency, and hospice) provide the rest.

With a significant number of AD patients residing in LTC facilities (as high as 48.5% in nursing homes), an AD cure would significantly impact employment at these facilities. The percentage of patients/residents diagnosed with AD/OD in each provider category is shown (Table 2). Again assuming that the staff-to-patient ratio remains unchanged, an AD cure would reduce employment in each category by that percentage. Thus, the number of employee layoffs can be predicted. An estimated 654,000 jobs will be lost across all five LTC options. The largest employee shrinkages would likely occur in nursing homes (461,700 jobs eliminated) and residential care communities (110,300 jobs lost).

Which categories of workers would theoretically be hit the hardest? The LTC patient care job universe of 1.45 million full-time-equivalent nursing employees is sub-divided into four classifications: registered nurses (RN), licensed practical nurses (LPN), licensed vocational nurses (LVN), and nursing aides (NA). Across all five categories of providers of LTC, approximately 105,000 RN jobs are projected to be lost, as would approximately 130,000 LPN/LVN jobs, assuming these workers are not transferred to other positions. (Table 3) But the biggest impact would be on NA jobs, as about 419,000 positions would be eliminated.

Loss of spending power

With the predicted loss in jobs in the LTC sector due to an AD cure, there would be an accompanying loss in spending power, which may also impact the economy. The average annual pay for an RN in 2017 was $73,550 and for an LPN/LVN, $45,710 [29]. The median salary for a nursing aide was $27,520 [30]. Multiplying those wages by the projected loss of jobs in each AD care provider niche yields a potential reduction in spending power of $7.7 billion for RNs, $5.9 billion for LPNs/LVNs, and $11.5 billion for NAs, for a total of $25.1 billion. However, this theoretical shortfall in annual wages paid may not be fully realized as many workers will find new employment within a few months, and others will be eligible for unemployment compensation.

Other negative effects on the economy

Social security, pension, and annuity payouts extended

Although the beneficial health effects of an AD curative would be concentrated in the over-65 age group, overall the population would likely live longer. Therefore, actuarial tables of life expectancy would have to be extended. In financial terms, the per-person expected durations of Social Security payments and pension payments would have to be lengthened. This increased liability may add to recent concerns over underfunded pension funds and Social Security reserves.

There may also be problems for the companies which sold fixed payment annuities. Longer lives for seniors would extend the average number of payout years beyond those initially forecast. This could put pressure on the earnings and assets of such firms.

Research funding

Research activities would also be expected to undergo significant rearrangements. The 2019 NIH budget for AD is estimated at $2.3 billion [6]. Unless significant aspects of AD, such as the cause and mechanisms of damage, remain unsolved after the cure is found, these funds would be redirected to other illnesses or they would be otherwise available for medical research. It is likely that many scientists and facilities now working on AD would be able to refocus their talents, experience, techniques, and tools on alleviating other dementias and neurodegenerative diseases.

Advocacy groups

If AD is removed as a major threat, public interest, family activism,
and contributions for the disease would be expected to wane. The polio story is instructive. At one point in time, the National Foundation for Infantile Paralysis, and its “March of Dimes” fundraising had immense public recognition and played a crucial role in the research efforts to develop a polio vaccine. But after the vaccine essentially eliminated polio in the U.S., donations shrank, and the Foundation had to refocus for survival. Another example is the National Tuberculosis Association, so named in 1918. After the advent of antibiotics for the disease reduced U.S. cases, and eliminated the need for lengthy hospitalizations, public support dwindled. The group broadened its mission, and in 1973 changed its name to the American Lung Association. Similarly, perhaps, current AD advocacy groups could remain active by refocusing on other dementias and neurodegenerative diseases.

**Predicted economic beneficiaries**

### Healthcare outlays reduced, benefiting government and patients

While eradicating AD will theoretically give rise to economic hardship for certain healthcare providers and employees, its elimination should also offer economic benefits by potentially removing staggering AD patient care expenditures from budgets. Such outlays continue to soar: 2019 total costs for caring for patients afflicted with AD and other forms of dementia are estimated to be at a record $290 billion [1]. An AD cure could save the government the combined $195 billion paid out annually by Medicare ($146 billion) and Medicaid ($49 billion) for patients with AD or OD [1]. Out-of-pocket spending of $63 billion related to AD would also be eliminated, as would $32 billion spent by other sources including private insurance carriers, health maintenance organizations, and other managed care organizations [1].

The preceding calculations do not include prescription medications. Presently, annual Medicare payments for prescription medicines are $498 higher for an Alzheimer’s patient, $3503, than for a non-Alzheimer’s patient, $3005 [1]. However, it is difficult to predict what the annual cost of an AD curative might be. It could be relatively high-priced, which would raise Medicare expenditures for this category. Yet, the pharmaceutical manufacturers might, with some justification, argue that the pill’s high cost is reasonable when viewed against its benefits, as it would eliminate present outlays of $197 billion for other Medicare services related to AD [1].

#### Unpaid caregivers would benefit

Caregiving and financial AD burdens would be lifted from families. Before AD patients enter nursing homes or memory care/assisted living, and sometimes until their final days or death, many are cared for at home for months or years by spouses and other family members. Though unpaid, these efforts take a toll on the caregivers’ time, strength, and possibly physical and mental health. The Alzheimer’s Association estimated this annual uncompensated care in 2019 at 18.5 billion hours, and its value at $234 billion [1]. Caregivers and patients would also benefit from the elimination of the out-of-pocket expenses and insurance co-pays incurred before admission to a residential care facility.

Conquest of AD would also allow a return to the workforce of any of the estimated 16 million uncompensated caregivers who need or desire to do so, thus increasing the number of Americans seeking employment. At the same time, those already employed may be able to work more productively, freed from the time, effort, and mental burdens of caregiving. Overall, family discretionary incomes may rise.

### Discussion

There have been so many expensive failures of clinical trials of putative treatments for AD that pessimism about finding a cure is becoming widespread. It is sometimes forgotten that rare events, “Black Swans”, can indeed occur, despite their low probability [31]. The history of medicine offers many instances of unlikely breakthroughs, and even lone investigators can unexpectedly discover causes and cures for diseases.

With the enormous ongoing effort by the pharmaceutical industry and other researchers in the AD space, it is possible that a quick, simple cure for AD could be found sooner than commonly supposed, through brilliant research insights or even serendipity. For example, the building scientific evidence for infectious agents playing a role in AD is very promising, and a rapid, simple cure effective against one of these microbes may be discovered. Other possibilities for a therapy are also being investigated.

The financial adjustments which follow a quick, simple cure for AD will likely be major. However, this possibility has received no prior consideration in AD circles, as far as could be determined. Yet, several important healthcare sectors have come to depend upon revenues from AD care for significant portions of their income. Their financial well-being would be threatened if the envisioned cure suddenly arrives.

Importantly, there are historical precedents for this economic impact theory. Medical history reveals that such remedies for major diseases can occasionally appear unexpectedly or with only brief advance notice. Within the last century we have experienced the unpredicted mass introduction of rapid cures for illnesses; all have dramatically impacted the healthcare system at their advent. Three notable ones involved infectious diseases that were widespread. For example, during the 18th and 19th centuries, tuberculosis “treatment” consisted of lengthy hospitalization or prolonged quasi-quarantine in sanatoria. Surgery to collapse infected lungs, to “rest” them, also became popular.

### Table 3

*Predicted U.S. nursing layoofs due to Alzheimer’s disease cure.*

<table>
<thead>
<tr>
<th>Provider Category</th>
<th>Predicted Total Nursing Layoffs (000)</th>
<th>No. of RNs (000) (Percent)</th>
<th>No. of LPNs/LVNs (000) (Percent)</th>
<th>No. of Nursing Aides (000) (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Home</td>
<td>461.7</td>
<td>54.0 (12)</td>
<td>105.7 (23)</td>
<td>301.2 (65)</td>
</tr>
<tr>
<td>Residential Care</td>
<td>110.3</td>
<td>8.4 (8)</td>
<td>11.3 (10)</td>
<td>90.6 (82)</td>
</tr>
<tr>
<td>Hospice</td>
<td>25.6</td>
<td>14.0 (55)</td>
<td>2.5 (10)</td>
<td>9.1 (36)</td>
</tr>
<tr>
<td>Home Health</td>
<td>49.8</td>
<td>27.1 (54)</td>
<td>9.5 (19)</td>
<td>13.2 (27)</td>
</tr>
<tr>
<td>Adult Day Care</td>
<td>6.6</td>
<td>1.3 (19)</td>
<td>0.7 (11)</td>
<td>4.6 (69)</td>
</tr>
<tr>
<td>Total</td>
<td>654.0</td>
<td>104.8</td>
<td>129.7</td>
<td>418.7</td>
</tr>
</tbody>
</table>

* Data adapted from CDC/NCHS, National Study of Long-Term Care Providers. Data from 2012 [20] (Appendix B).

* Percentages are relative to three presented providers (RN, LPN/LVN, Nurse’s Aides). May not sum to 100 due to rounding.

#### Insurance industry

Life insurance companies would potentially benefit greatly if an AD cure is introduced. The life expectancies of seniors would increase, thus reducing government and patients predicted U.S. nursing layoofs due to Alzheimer’s disease cure. The preceding calculations do not include prescription medications. Presently, annual Medicare payments for prescription medicines are $498 higher for an Alzheimer’s patient, $3503, than for a non-Alzheimer’s patient, $3005 [1]. However, it is difficult to predict what the annual cost of an AD curative might be. It could be relatively high-priced, which would raise Medicare expenditures for this category. Yet, the pharmaceutical manufacturers might, with some justification, argue that the pill’s high cost is reasonable when viewed against its benefits, as it would eliminate present outlays of $197 billion for other Medicare services related to AD [1].
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surplus and paralysis rehabilitation facilities closed or switched focus to
problems other than polio.

Polio provides another example. Beginning in 1955, the widespread
use of the Salk vaccine to prevent the disease dried up the formerly-
significant and frightening seasonal flow of paralyzed patients into
hospitals and physical therapy centers [34]. Iron-lung machines became
surplus and paralysis rehabilitation facilities closed or switched focus to
problems other than polio.

Likewise, it is predicted here that an AD simple cure would detri-
mentally slash healthcare revenues to providers, while saving monies
for payors. All six major categories of healthcare providers would be
impacted, with an astounding $414 billion potential reduction of
Medicare and other payments. Nursing homes and skilled nursing fa-
cilities would likely face the greatest economic damage. In addition to
the financial impact on these businesses, employee jobs would be sliced,
with a projected 654,000 potential layoffs across all LTC constituents.
The expected loss of jobs would generate major national concerns,
especially as many of these jobs provide employment for groups on
lower rungs of the economic ladder. Detrimental ripples in other sectors
would include unanticipated extended payouts for reserves of Social
Security and pensions, shifts in research funding to other areas, and a
loss of jobs within advocacy groups.

There would, however, be economic beneficiaries from this transi-
 tion. Medicare and Medicaid would see huge reductions in outlays, saving
the government a combined $195 billion paid out annually by them. Patients would save $63 billion in out-of-pocket expenses. Along
with this, unpaid caregivers, who provided annual uncompensated care
in 2019 valued at $234 billion, would benefit from having an oppor-
tunity to increase their participation in the workforce or enjoy more
unstressed leisure time with loved ones. An estimated 16 million un-
compensated caregivers would potentially return to the workforce. An
additional $32 billion spent by other sources such as health main-
tenance organizations and private insurance carriers would be cut.
Payouts from LTC policies would be deferred or eliminated due to fewer
AD patients, benefiting the insurers.

The assumptions and calculations made in this presentation were
necessarily inexact. Available source data was predominantly AD/OD
rather than just AD. Another consideration is that there is a lack of
consensus by specialists on guidelines for detection and confirmation of
the earliest signs of AD, and therefore the number of relevant cases may
be inexact [35]. Also, in general, for many AD patients the accuracy of
office diagnosis is not aided by highly informative positron-emission
tomography (PET) imaging, but is based on cognitive loss and/or
memory testing. Even if a PET scan is done, interpretations may vary
among experts [36,37]. However, the big-picture trends and data pre-
 sented here are believed sufficiently useful to aid in constructive
planning for the advent of an AD cure.

The applicability of these projections to other countries will also
depend on how exactly their systems for dementia healthcare resemble
those in the U.S. But hopefully the calculations herein will provide
at least an alert to them that significant economic effects will likely follow
an AD cure.

The U.S. economy has been challenged before by major upheavals in
the economy due to job loss/gain and has coped well in some cases, and
not in others. For example, coal mining jobs were reported to drop
191,000 from September 2014 to May 2016 [38]. The domestic steel
industry likewise declined from 100,894 jobs in 2008 to 81,063 jobs in
2017, with displaced workers mostly being absorbed into the economy
[39].

Demobilization of World War II troops flooded the job market with
discharged soldiers, bringing 10.5 million adults back into the job
market and peacetime economy. Plans for demobilization were being
considered as early as 1942 — three years before the end of the
war—when nothing was certain [40]. Yet, there was an expectation, or
at least hope, for victory, and a plan for that future was deemed war-
ranted. The result, to at least some extent aided by that planning, was
the successful transition of millions of veterans into various civilian
sector jobs when the war ended.

Similarly, it would be prudent to begin contingency planning for the
possible, though far from certain, eventuality that a fast-acting, simple
cure for AD is found. It’s widespread introduction would have enormous
detrimental effects throughout the LTC economic complex, with whole
sectors and groups losing patients and revenues. Facilities, to lessen or
avoid economic damage, would need to fill the gaps with patients, re-
 sides, or services in other categories beyond AD/dementia.

Possibilities include creation or expansion of assisted living and senior
life communities.

The expected impending job loss may be cushioned, at least some-
what, with a successful transition to new employment for nurses, nur-
sing aides, and other staff who are currently devoted in whole or in part
to AD patients. The general increase in the aging population will bring a
concomitant rise in geriatric ills, which may provide alternative work
possibilities. Newer phenomena, such as the "aging in place" move-
ment, may raise demand for workers in home health services.

Finally, it appears to be time for a taskforce of government officials,
business executives, healthcare economists, and other stakeholders to
produce a plan, even if theoretical, to cope with predictable economic
effects of a quick and easy cure for AD. This medical miracle could
arrive sooner than anyone expects.

Declaration of Competing Interest

The authors declare that they have no known competing financial
interests or personal relationships that could have appeared to influ-
ence the work reported in this paper.

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References

state-indicator/total-state-spending/?currentTimeframe=0&sortModel=%7B%22sortId%22:%22Location%22,%22sort%22:%22asc%22%7D.
[3] Centers for Medicare and Medicaid Services, NHE Fact Sheet 2019 [updated April
26, 2019]. Available from: https://www.cms.gov/Research-Statistics-Data-and-
Systems/Statistics-Trends-And-Reports/NationalHealthExpendData/NHE-Fact-
Sheet.html.
alzheimers.net/resources/alzheimers-statistics/.
[6] NIH, Research Portfolio Online Reporting Tools: Estimates of Funding for Various
Research, Condition, and Disease Categories (RDC) [updated April 19, 2019]. Avail-
[7] ClinicalTrials.gov, Completed Studies: Alzheimer’s Disease 2019 [updated May 12,
= DiseasesSearch=ApplykSearch=ekage v = &rdng = &rye = &rhtml =.
[8] ClinicalTrials.gov, Recruiting Studies: Alzheimer’s Disease 2019 [updated May 12,
= DiseasesSearch=ApplykSearch=ekage v = &rdng = &rye = &rhtml =.
[9] Fulop T, Izbaike RF, Balin BJ, Miklosy J, Barron AE. Role of microbes in the de-
velopment of Alzheimer’s disease: state of the art – an international symposium
[10] Harris SA, Harris EA. Herpes simplex virus type 1 and other pathogens are key
causative factors in sporadic Alzheimer’s disease. J Alzheimers Dis
Singhrao SK, Harding A, Poole S, Kesavalu L, Crean S. Porphyromonas gingivalis.