Economic Burden of Childhood Autism Spectrum Disorders

WHAT’S KNOWN ON THIS SUBJECT: Previous analyses have documented increased health care costs for children with autism spectrum disorders but have not provided comprehensive estimates of the total economic burden.

WHAT THIS STUDY ADDS: There are substantial additional costs associated with caring for children with autism spectrum disorders, amounting to >$17 000 per child annually. Costs accrued outside of the health care system account for the majority of the financial burden.

abstract

OBJECTIVE: To estimate the associations between autism spectrum disorder (ASD) diagnoses and service use, caregiver time, and cost outcomes.

METHODS: We used national data from the Medical Expenditure Panel Survey linked to the National Health Interview Survey and a study-specific survey to estimate the annual utilization and costs for health care, school, ASD-related therapy, family-coordinated services, as well as caregiver time in children aged 3 to 17 years, with and without parent-reported ASD. Regression analyses estimated the association between ASD diagnosis and cost, controlling for child gender, age, race/ethnicity, insurance status, household income, country region and urban/rural classification, and non–ASD-related illnesses.

RESULTS: Children with parent-reported ASD had higher levels of health care office visits and prescription drug use compared with children without ASD (P < .05). A greater proportion of children in the ASD group used special educational services (76% vs 7% in the control group, P < .05). After adjusting for child demographic characteristics and non–ASD-associated illnesses, ASD was associated with $3020 (95% confidence interval [CI]: $1017–$4259) higher health care costs and $14 061 (95% CI: $4390–$24 302) higher aggregate non–health care costs, including $8610 (95% CI: $6595–$10 421) higher school costs. In adjusted analyses, parents who reported that their child had ASD did not have significantly higher out-of-pocket costs or spend more time on caregiving activities compared with control parents.

CONCLUSIONS: The economic burden associated with ASD is substantial and can be measured across multiple sectors of our society. Previous analyses that focused on health care underestimated this economic burden, particularly for school systems. Pediatrics 2014;133:e520–e529

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KEY WORDS: cost of illness, health economics, autism spectrum disorder

ABBREVIATIONS

ASD—autism spectrum disorder
CI—confidence interval
GLM—generalized linear model
MEPS—Medical Expenditure Panel Survey
NHIS—National Health Interview Survey
PDD-NOS—pervasive developmental disorder, not otherwise specified

Dr Lavelle contributed to the conceptualization and design of the study, coordinated data collection, carried out all data analyses, drafted the manuscript, had full access to all of the data in the study, and takes responsibility for the integrity of the data and the accuracy of the data analysis; Drs Weinstein, Newhouse, Munir, and Prosser contributed to the conceptualization and design of the study and reviewed and revised the manuscript; Dr Kuhlthau contributed to the conceptualization and design of the study and critically reviewed the manuscript; and all authors approved the final manuscript as submitted.

(Continued on last page)
Over the past decade, the prevalence of autism spectrum disorder (ASD) diagnoses has increased considerably. The most recent data released from the Autism and Developmental Disabilities Network reveal a 78% increase in ASD prevalence between 2002 and 2008,1 and data from the National Survey of Children’s Health reveal that the prevalence of parent-reported ASD among children aged 6 to 17 years increased from 1.2% in 2007 to 2.0% in 2011–2012.2 The increasing prevalence highlights a growing need for resources to provide care for this population of children. Studies have shown that families of children with ASD face high out-of-pocket costs.3–9 To date, however, there has not been a comprehensive pediatric cost analysis of ASD in the United States. Previous analyses have mainly focused on health care,9–13 despite evidence that costs incurred outside of the health care system may play a more important role in the total economic burden of ASD.3,14

In this study, we used data from 3 national sources to estimate the total economic costs associated with pediatric ASD and the out-of-pocket costs specifically borne by families. We compared the following sources of cost for children with and without parent-reported ASD: the annual utilization of health care, school, ASD-related therapy, family-coordinated services, and caregiver time.

METHODS

Study Samples

Study samples included children between the ages of 3 and 17 years with and without parent-reported ASD. To estimate annual health care utilization and costs, we linked observations from the cross-sectional Medical Expenditure Panel Survey (MEPS) to the Sample Child Core questionnaire in the National Health Interview Survey (NHIS).15,16 The NHIS is administered each year to a new sample of US households with noninstitutionalized adults and children. General health data are collected from all members of the sampled households, and more detailed health information is collected on 1 child in the household for the Sample Child Core questionnaire. In this study, children with a positive response to the NHIS Sample Child Core question “Has a doctor or health care provider ever told you that [child’s name] has autism?” were assigned to the ASD group. The control group was composed of children with a negative response. The MEPS collects more detailed health care utilization and expenditure data from a representative subset of households from the previous year’s NHIS sample, and follows this sample subset over a 2-year period. We used individual ID numbers to link 23 057 observations of children who had records in both the NHIS Sample Child Core from 2001 to 2007 and the MEPS from 2003 to 2008. These linkable observations were 19% of the total NHIS Child Core sample and 13% of the MEPS sample. Twelve children were eliminated from the linked sample for not having an indicator of ASD illness, and an additional 4161 children were eliminated for being outside of the 3- to 17-year age range when their MEPS data were collected, which left a final sample size of 18 884 (109 children with parent-reported ASD and 18 775 controls; Fig 1).

To estimate non–health care utilization and expenditures, a survey was administered to 2 groups of parents enrolled in a survey research panel managed by GfK Custom Research, LLC. This research panel is nationally representative; new panel members are currently recruited by mail using probability sampling from a published address–based sample frame that covers ~98% of US households.17 Of all households initially contacted to join the survey panel along with our study sample, 16% had at least 1 household member who was successfully recruited. Panel members are asked to complete online surveys 3 to 4 times per month. Those without previous Internet access are provided with a laptop computer and Internet service while on the panel; those with Internet access are given small monthly stipends in exchange for their participation.18 All panel members are asked to complete a series of profile questions to determine their eligibility for specific surveys.

A total of 201 potential respondents for our ASD group were randomly sampled from all survey panel members who had previously indicated on their GfK profile survey that they were the caregiver of a child under 18 years with autism or Asperger’s, and 204 potential respondents for our control group of parents of children without ASD were randomly selected from all parents on the panel who had a negative response to this profile question. A link to a screener questionnaire was e-mailed to the 405 survey panel members during October 2011. Screener questions asked parents whether they had a child between the ages of 3 and 17 years, and whether any of their children in this age range had been diagnosed with ASD, including autism, Asperger’s syndrome, or pervasive developmental disorder; not otherwise specified (PDD-NOS). Those in the ASD group who responded positively to both questions were then asked to complete a 25-minute online survey; those in the control group were asked to continue onto the survey if they had a child in this age range and no children in the range with ASD. We received responses from 72% (n = 145) of parents in the ASD group and 67% (n = 136) of controls after 2 e-mail reminders. Compared with nonrespondents, respondents were more likely to have previous Internet access (P < .01) and a bachelor’s degree or higher (P = .04), but other demographic characteristics were not statistically different.
Twenty-three respondents were excluded from the sample at the screening stage on the basis of age and diagnosis criteria, 8 from the ASD group and 15 from the control group, leaving a final sample size of 258 (137 ASD, 121 controls; Fig 1). This study was approved by the Harvard University Institutional Review Board. All data were deidentified, and no informed consent was required.

**Outcomes and Study Variables**

Our primary outcomes of interest were annual utilization and costs for health care, school services, ASD-related therapies, family-coordinated services, and caregiver time (full classification of each category available in Supplemental Table 5). We estimated total costs for each category and family out-of-pocket costs for all services.

We measured health care utilization for all categories reported in the MEPS data set including hospitalizations, office and emergency department visits, home health care, dental care visits, and prescription drug use. Total costs were assessed by using payments from all sources, including household and insurance payments; out-of-pocket costs were derived from household payments only.

School resource utilization was examined broadly by type of school (public, private day, residential, home, or other), classroom type (special, general education), and whether the child qualified for and used special education services through an Individualized Education Program. Children were categorized into 11 mutually exclusive school placements on the basis of their school type, special education use, and age. Previously published unit cost estimates for total annual education expenditures by school placement type were applied to these classifications to estimate the annual education costs at all public and residential schools, as well as private schools providing special education services (Supplemental Table 6).\(^19\)–\(^22\) Reported tuition expenditures from all sources were used to assess the total cost of educating children in private day schools without any special education services. Out-of-pocket costs for all school placements were based on the reported family tuition expenditures.

We used the parent survey to measure utilization and expenditures for ASD-related therapies that were not included in the MEPS data. These include treatments such as applied behavioral analysis, sensory integration, and communication therapies. All other resources used to care for children with parent-reported ASD are categorized as “family-coordinated services” for the purposes of this analysis. This is a broad category that includes items such as child care, legal services, and transportation. Costs for ASD-related therapies and family-coordinated services were based on reported expenditures by the family or other source excluding their school system (ie, insurance, Department of Developmental Services, charity, foundation, scholarship, fellowship).
Out-of-pocket costs reflect family expenditures only.

Caregiving time was measured as the amount of time all caregivers in the household had reportedly spent on activities such as coordinating their child’s therapies, homework help, and travel to appointments and activities during the previous 12 months. Time costs were converted to a dollar value by multiplying the number of hours spent on each caregiving activity by the 2011 mean wage rate for all US workers ($23/hour).23

Our study survey and MEPS provided data on child demographic characteristics, health insurance coverage, geographic region, household income, and health conditions. In our survey we asked parents of children with ASD to report their child’s specific diagnosis (autism, Asperger’s syndrome, or PDD-NOS) and the severity of the child’s social communication problems and restricted interests/repetitive behavior domains. A 3-level composite severity score (mild, moderate, severe) was derived on the basis of the reported severity levels on these 2 domains (Supplemental Fig 3).

Analyses
We compared demographic and clinical characteristics for the ASD and control groups by using χ² tests. We compared service utilization and caregiving hours for the ASD and control groups by using χ² tests for categorical measures and nonparametric Kolmogorov-Smirnov tests for continuous measures.24 To estimate the association between ASD diagnosis and cost outcomes, we used generalized linear models (GLMs) with a log link function.29 The GLM was used in combination with a logit model to create a 2-part model for cost categories with ≥50% zero-cost observations. For analyses of health care costs we used the generalized estimating equation extension of the GLM to account for the multiple observations per subject in the sample, and also evaluated a 2-part model in a sensitivity analysis.

In adjusted analyses we controlled for variables that had previously been identified as having an impact on costs, independent of health status.9,26–29 These included child gender, age, race/ethnicity, insurance status, household income, geographic region, and urban/rural classification. We also controlled for the presence of other illnesses that do not have an established association with ASD30,31 and that were available in all data. These included allergies, asthma, cerebral palsy, cystic fibrosis, diabetes, diarrhea/colitis, Down syndrome, hearing impairment, heart disease, muscular dystrophy, sickle cell anemia, and vision impairment. In sensitivity analyses we added an indicator variable for the presence of epilepsy or intellectual disability to our model, to evaluate the influence of controlling for these conditions with established associations with ASD.23,33 Confidence intervals (CIs) around all mean values and regression coefficients were estimated using nonparametric bootstrapping procedures.34 The goodness of fit of each GLM was measured by using a test of concordance between the observed and predicted costs.35 All cost data were updated to 2011 US dollars by using the Gross Domestic Product deflator.36 To reduce the influence of outliers, costs derived from MEPS and the study survey were truncated at the 99th and 90th percentiles, respectively.

RESULTS

Study Samples
In both study samples, children with parent-reported ASD were significantly more likely than controls to be male, over the age of 5 years, and non-Hispanic white. Children with parent-reported ASD were also significantly more likely to have certain comorbid conditions, including allergies, attention-deficit/hyperactivity disorder, and intellectual disability (P < .05 for all; Table 1).

Resource Utilization
Ninety-two percent of children in the ASD group had used some form of health care during the year compared with 82% in the control group (P = .01). On average, children with parent-reported ASD had significantly higher levels of physician and nonphysician office visits and prescription drug use compared with children in the control group (P < .05 for all). Other health care service use did not differ significantly between the 2 groups (Table 2). School placements differed significantly between the ASD and control groups. A greater proportion of children in the ASD group attended public school or were home schooled (85%) during the year compared with the control group (65%). Seventy-six percent of the children in the ASD group used special education services through an Individualized Education Program compared with 8% in the control group (P < .05 for all; Table 3). The use of special education services ranged from 73% for children with mild ASD to 91% for children with severe ASD, and was least likely among children with a specific diagnosis of Asperger’s syndrome, although differences between subgroups were not statistically significant (Supplemental Tables 7 and 8).

Thirty-one percent of children with parent-reported ASD used some form of ASD-related therapy during the year, such as applied behavior analysis or sensory integration therapy. Compared with children in the control group, a significantly greater proportion of children in the ASD group used legal aid, private academic tutors, or private school observation services (P < .05 for all; results not shown). Total caregiving hours did not differ significantly between the groups.
Having ASD was significantly associated with $3020 (95% CI: $1017–$4259) higher health care costs after adjusting for demographic and non–ASD-associated illnesses in our primary analysis. Regression-adjusted school costs were $8610 (95% CI: $6595–$10 421) higher for children with ASD. Costs associated with ASD-related therapies and other family-coordinated services were not significantly higher in the ASD group, nor were caregiving time costs. When the 3 non–health care categories were examined in aggregate, however, their total cost was $14 061 (95% CI: $4390–$24 302) higher in the ASD group. Out-of-pocket costs were not significantly higher for the ASD group in any category (Table 4; full models for health care and aggregate non–health care costs are shown in Supplemental Tables 9 and 10). Concordance coefficients for all models ranged from 0.08 to 0.73 and were all significantly greater than zero, indicating a significant and positive correlation between observed and predicted costs.

In sensitivity analyses, the association between ASD and health care costs was estimated for each health care category. Costs associated with ASD-related therapies and other family-coordinated services were not significantly higher in the ASD group. Costs associated with ASD-related therapies and other family-coordinated services were not significantly higher in the ASD group. Costs associated with ASD-related therapies and other family-coordinated services were not significantly higher in the ASD group. Costs associated with ASD-related therapies and other family-coordinated services were not significantly higher in the ASD group.
TABLE 2 Health Care Utilization

<table>
<thead>
<tr>
<th>Health Care Resource Category</th>
<th>ASD</th>
<th>Control</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>95% CI</td>
<td>Median</td>
</tr>
<tr>
<td>Nights in inpatient hospital</td>
<td>0.3</td>
<td>0.0–0.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Outpatient visits (total)</td>
<td>10.7</td>
<td>5.8–16.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Outpatient hospital &lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.3</td>
<td>0.0–0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Physician office</td>
<td>5.2</td>
<td>2.8–7.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Nonphysician office &lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.1</td>
<td>1.9–5.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Emergency department</td>
<td>0.1</td>
<td>0.1–0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Home health care visits &lt;sup&gt;c&lt;/sup&gt;</td>
<td>11.6</td>
<td>0.3–19.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Dental care visits</td>
<td>1.2</td>
<td>0.9–1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Prescription medications with refills</td>
<td>11.4</td>
<td>7.4–16.3</td>
<td>3.0</td>
</tr>
</tbody>
</table>

95% CIs are bootstrap by using a clustered variance to account for multiple observations per person.

<sup>a</sup> Physician and nonphysician visits.

<sup>b</sup> Includes chiropractors, midwives, nurses and nurse practitioners, optometrists, physician assistants, physical therapists, occupational therapists, psychologists, social workers, technicians, and receptionists/clerks/secretaries.

<sup>c</sup> Includes agency and nonagency home health care.

decreased to $2373 (95% CI: $902–$3695) when modeled using a 2-part model. The association between ASD and out-of-pocket health care costs became significant in a 2-part model, with the ASD group having $154 (95% CI: $3–$344) higher costs compared with controls. Health care costs were no longer significantly higher in the ASD group when we controlled for the presence of epilepsy or intellectual disability. The association between ASD and aggregate non–health care costs decreased to $10 508 (95% CI: $725–$20 586) when we controlled for these comorbidities.

In subgroup analyses, regression-adjusted non–health care costs were significantly higher for mild, moderate, and severe ASD, compared with no ASD, and increased with each severity level (Supplemental Table 11). A specific diagnosis of autism was associated with higher aggregate non–health care costs, but specific diagnoses of Asperger’s syndrome and PDD-NOS were not (Supplemental Table 12). Each severity level and subtype of ASD significantly predicted higher school costs. The most severe level of ASD was significantly associated with $21 313 (95% CI: $6556–$39 473) higher caregiver time costs compared with a child without ASD (Fig 2). Similar to the overall group, this significant association did not persist among children with less severe levels of ASD, or among any of the 3 specific subtypes of ASD.

DISCUSSION

This is the first study to our knowledge to provide comprehensive estimates of the total economic burden of childhood ASD. Using 3 national data sets, we found that the additional costs of caring for a child with parent-reported ASD, including health care, education, ASD-related therapy, family-coordinated services, and caregiver time, totaled $17 081 per year. Applying these estimates to the projected 673 000 children aged 3 to 17 years in the United States with ASD, the total societal costs of caring for this group of children were $11.5 billion in 2011.

Despite the literature’s emphasis on estimating health care costs for this population of children, we find that these costs are not the main contributor to the overall economic burden of this disorder. Of the estimated $17 000 additional costs we found to be associated with childhood ASD annually, only 18% were attributable to the increased use of health care services, specifically office visits and prescriptions. Our estimated health care costs are within the range of previously derived estimates, which show additional costs for children with ASD ranging from $2191 to $11 590 per year (2011 US dollars). Differences in data sources, comparison groups, and analytic methods contribute to the substantial variation in these results.

School services were the biggest contributor to costs associated with childhood ASD due to the increased use of special education services in this group. Although previous studies have estimated costs for children with ASD in special education, this is the first study to estimate educational costs for all children with parent-reported ASD. The results highlight the economic burden placed on this sector and the need for policies to ensure that resources are available to school systems to provide needed services in the future. Under federal law, students with disabilities are entitled to special education and related services through age
21. Previous research has suggested that after this time the cost burden may shift to sectors that provide adult-based services.3

Previous studies on this topic are limited, particularly in the United States. A study of children with ASD in a Swedish municipality reported the additional annual cost associated with this disorder to be €50 000 per child ($68 000 in 2011 US dollars),38 and a study of children with ASD in the United Kingdom reported an additional annual per capita cost of £25 000 ($44 063 in 2011 US dollars). 39,40 In the United States, Ganz3 estimated the additional lifetime costs associated with ASD to be $3.2 million per person ($3.8 million in 2011), including the costs for health care, special education, child and adult care, respite services, supported employment, and lost productivity. Although these estimates indicate a greater economic burden than one would infer from our study, direct comparisons between studies are not possible due to different country settings and different time horizons of the analyses.

Previous studies have also found that parents of children with ASD endure substantial financial burdens, in the form of high out-of-pocket costs, and decreased work force involvement.3–9 In our study we did not find that parents of children with ASD in the overall group had higher out-of-pocket costs or spent more time on caregiving activities compared with parents of children without ASD. We did find that parents in the ASD group reported more time than those in the control group on several specific caregiving activities, such as coordinating their child’s medical care and therapy and providing homework help, and reported less time on “general daily household caregiver activities.” This shift from general to specific caregiving activities for parents of children with ASD is important to note, because it could have important implications for the care of other children in the household. More studies are needed to provide a better understanding of the financial impact of ASD on families and how it may be evolving over time, particularly as states continue to enact legislative mandates requiring private insurance companies to cover additional ASD-related services.41 One study found that families of children with ASD living in states with ASD-specific parity laws were less likely to have health-related out-of-pocket expenditures compared with families living in states without mandates.42

We did find that having a child with the most severe level of ASD was associated with higher caregiving time costs. We accommodated social communication problems and restricted interest/repetitive behaviors domains in our composite assessment of severity, which is unique for this study. It is important to note that there is currently no universal tool used to assess the severity of children with ASD.43 In light of the recent

### TABLE 4

<table>
<thead>
<tr>
<th>Category</th>
<th>Total costs, $</th>
<th>95% CI</th>
<th>Out of pocket costs, $</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health care</td>
<td>1017 to 4259</td>
<td>182 to 289</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total aggregate non–health care</td>
<td>4300 to 24 302</td>
<td>−112 to −715</td>
<td>748</td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>5585 to 10 421</td>
<td>−482 to −436</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>ASD-related therapy and other</td>
<td>76 to 972</td>
<td>81 to 318</td>
<td>523</td>
<td></td>
</tr>
<tr>
<td>family-coordinated services</td>
<td>Time</td>
<td>1672 to 11 936</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Adjusted for child gender, age, race/ethnicity, insurance status, household income, geographic region, urban/rural classification, and the presence of a comorbidity not related to ASD.

![FIGURE 2](image-url)

**FIGURE 2**

Regression-adjusted differences in non–health care costs for children with ASD compared with children without ASD, by severity and diagnostic subgroups. *Statistically significant difference compared to children without ASD (P < .05).*

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revision of the Diagnostic and Statistical Manual of Mental Disorders (Di-
agnostic and Statistical Manual of Mental Disorders, Fifth Edition), which
collapses subtypes of ASD into 1 di-
agnosis, these results emphasize
the importance of a consistent
measure of severity that can provide
important categorizations of this
broad disorder. Diagnoses of ASD
under the Diagnostic and Statistical
Manual of Mental Disorders, Fifth
Edition, include level of severity
assessments for social commu-
nication and restricted, repetitive
behaviors. Such classifications could
help to quickly identify families who may
face increased caregiving demands.

Some limitations of the study must be
noted. Due to the observational nature
of our study we are not able to draw
causative conclusions. Relatively small
sample sizes may have limited our
ability to detect important cost differ-
ences. Although our study benefited
from national samples, these samples
were different for our health care and
non–health care analyses, and were
not necessarily representative of the
broader populations of families of
children with and without ASD. In par-
ticular, low recruitment rates for the
panel used for our survey of non–health
care utilization may have con-
tributed to selection bias. Controlling
for observed demographic variables in
adjusted cost analyses allowed us to
mitigate the impact of potential selec-
tion biases, but the impact of un-
measured confounding variables on
our estimates is not known. We also
controlled for comorbidities in our re-
gression analyses that do not have an
established association with ASD, but
if a causal association does exist
between any of these conditions and
ASD, then our adjusted results will un-
derestimate the total costs attribut-
able to ASD.

Linking MEPS data to the NHIS allowed
us to identify children with parent-
reported ASD who did not have any
health care use, but identification
through the NHIS has some limitations.
Specifically, parents are asked report
whether their child has ever been di-
agnosed with autism, not ASD, and
diagnoses of Asperger’s syndrome and
PDD-NOS may be underreported. In
addition, diagnoses of ASD do not nec-
essarily remain stable over time. If
there was any misclassiﬁcation be-
tween our ASD and control groups at
the time of resource utilization, then
our ﬁndings may be biased toward the
null.

All diagnoses were ascertained via
parent report; previous research has
revealed that parent report of ASD is
highly reliable when veriﬁed against
professional diagnostic documenta-
tion, but limited data are available
about the reliability of parent report of
speciﬁc diagnoses within the spectrum
and misclassiﬁcation may have oc-
curred. Parent report was also used to
document caregiver time and non–
health care service utilization and
expenditures over the previous 12
months. This time interval was chosen
to include both the school year and
summer time, 2 periods during which
the intensity of services and time
commitments may be different, but the
long recall period may have led to
underreporting.

The results of this study reveal the
current economic costs associated with
caring for children with ASD, but they do
not address how current investments
may lead to a change in the future
trajectory of services required. This
study also does not indicate whether
these costs reﬂect an optimal level of
resources, or whether resources are
being used efﬁciently, which highlights
the need for cost-effectiveness analyses
to provide guidance on how to improve
the allocation of resources devoted to
ASD. And ﬁnally, this study addresses
only the cost burden associated with
ASD, and not the impact that ASD has
on the health and well-being of family
members; previous research has
shown that children with ASD and their
families have diminished health-related
quality of life.

CONCLUSIONS
There is a large economic burden as-
associated with caring for a child with
ASD, a substantial portion of which is
borne by the educational system,
principally the cost of special education
services in public schools. These costs
have been underrecognized. Families of
children with the most severe level of
symptoms also face large caregiving
demands and severity measures may
help highlight those in greatest need for
support. Comprehensive policies are
needed to ensure that funds are allo-
cated to meet the needs of this pop-
ulation, and future cost-effectiveness
analyses should inform how these
funds are spent to ensure the best
possible outcomes for children with
ASD.

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Economic Burden of Childhood Autism Spectrum Disorders
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