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**Actuarial Cost Estimate:  
Virginia House Bill 1588 -  
Coverage for the Diagnosis  
and Treatment of Autism  
Spectrum Disorder**

OLIVER WYMAN

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# 1

## **Background**

Oliver Wyman Actuarial Consulting, Inc. (Oliver Wyman or We) has been engaged by Autism Speaks to develop a cost model in order to analyze and estimate the impact of mandated insurance benefits for Autism Spectrum Disorders (ASD) on insurance premiums. As part of this work, Oliver Wyman has developed a range of independent estimates of the impact on insurance premiums for the benefits mandated by Virginia HB 1588 offered January 14, 2009 which provides coverage for the diagnosis and treatment of autism spectrum disorder in individuals under the age of 21.

Oliver Wyman is a part of the Marsh & McLennan (MMC) family of companies. With over 60 members of the American Academy of Actuaries, Oliver Wyman is one of the largest actuarial practices in North America. Oliver Wyman's health practice, which has twelve credentialed actuaries, advises insurers, regulators, governments, interest groups, and others.

This report, along with its supporting analysis, was developed by Marc Lambright, a Principal and consulting health actuary in Oliver Wyman's Philadelphia office. Marc is a Fellow of the Society of Actuaries and a member of the American Academy of Actuaries and is professionally qualified to analyze the cost impact of HB 1588 and provide the estimates shown in this report. As part of Oliver Wyman's quality assurance process, the underlying analysis and this report were independently peer reviewed by another credentialed Oliver Wyman actuary.

## 2

### **Scope and Limitations**

The intent of this analysis is to provide a reasonable range of estimates for the insured costs of the mandated ASD benefits provided for in HB 1588 and the associated premium impact on the markets affected by HB 1588. This analysis makes no attempt to quantify potential offsetting cost savings associated with successful ASD treatment, nor does it include the any estimate of the potential reduction in other government expenditures associated with providing ASD services that might overlap with the benefits provided by this mandate. Therefore, the reader is cautioned that this report should only be considered a cost analysis, and not be misconstrued as a cost-benefit analysis when assessing the merit of HB 1588.

We note that cost estimates for autism mandates have varied widely. The JLARC analysis of the impact of Virginia HB 83 showed a range of per member per month (PMPM) group standard premium impact estimates made by 20 Virginia insurers that varied by a factor of 154<sup>1</sup>. This variability of the cost estimates in the JLARC report is not entirely inconsistent with the variance in estimates for similar mandated autism benefits in other states. The reason for this variability is that the largest component of the increase in costs under the HB 1588 mandated ASD benefits is for Applied Behavior Analysis (“ABA”), which is almost universally excluded from health coverage, and therefore essentially no insured data exists for use in developing credible utilization and unit cost estimates for ABA.

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<sup>1</sup> JLARC: *Evaluation of House Bill 83: Mandated Coverage of Autism Spectrum Disorders*. September 2008, p. 8.

The reader is cautioned that the ultimate cost of covering ABA benefits is uncertain; however, this analysis attempts to reflect the likely behavior of consumers, providers and insurers of ABA services in developing the assumptions underlying the cost estimates. Likewise, the additional costs for mandated medical services other than ABA are difficult to quantify. Insurance policies often cover some services for children diagnosed with an ASD, although the mandate could cause the costs for certain services to increase because ASD exclusions are common, and certain services that may have been denied or terminated following utilization review might be covered due to the mandate.

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## **Description of Key HB 1588 Provisions and their Impact on Covered Benefits**

### Insurance Markets Covered by Mandate

Section F outlines which markets are excluded from the mandate, of particular note is F(iii) which notes the exclusion of *policies, contracts, or plans issued in the individual market or small group markets to employers with 25 or fewer employees*. In our modeling we are assuming that this means that the individual market would not be subject to this mandate, and that the statutory small group (2-50 employees) market would be covered by the mandate. Therefore, our analysis is based on the commercial insured market, which includes both the small group (2-50 employees) and large group (51+ employees) markets. We note that our estimates of the impact on premium are nearly identical for the large and small group markets.

### Covered Benefits

The mandate provides *coverage for the diagnosis and treatment of autism spectrum disorder in individuals under the age of 21*. Treatment includes: (i) *habilitative or rehabilitative care*; (ii) *pharmacy care*; (iii) *psychiatric care*; (iv) *psychological care*; and (v) *therapeutic care*.

The definition of *habilitative or rehabilitative care* is especially important since it includes applied behavioral analysis (ABA). The coverage of ABA has the most significant impact on cost of any mandated service. ABA programs are marked by intensive therapy that may include 30-40 hours of therapy a week under the most intensive programs, though many programs would not utilize that level of resources. Key assumptions underlying our ABA cost estimates are outlined in Section 5.

### Annual Maximum Benefit of \$36,000

The annual coverage maximum is important as it has the effect of capping costs for the heaviest users of ASD services. From a practical standpoint, this would generally apply to children whose therapy includes an intensive ABA program.

Medical Necessity and Treatment Review

The bill does allow for *undertaking of usual and customary procedures to determine the appropriateness of, and medical necessity for, treatment of autism spectrum disorder.*

This is important as insurers will develop protocols to review treatments and manage care which will limit unnecessary treatments if reviews are done appropriately.

# 4

## Modeling Methodology

The following outlines the general modeling methodology used to develop the cost estimates. Estimates were developed both on a PMPM basis, and as a percentage of average annual premiums as shown in Section 6. Details of key assumptions are discussed in Section 5 and illustrated graphically in the exhibits shown in Appendix 1.

## Modeling Perspective

In general, the model was developed to produce costs under the assumption that sufficient providers would be available to meet the demand for autism services, especially with regard to ABA services. It also assumes that there would be sufficient awareness of autism and motivation (primarily by parents) to seek treatment so that the diagnosis and treatment of ASDs would be more in line with the often cited CDC estimated prevalence of ASD of 1 in 150. We would expect that it would take at a minimum several years for both the supply of providers to meet the demand for mandated ASD services and for parents of autistic children to aggressively seek diagnosis and treatment of their children's disorders.

In spite of these real limitations that will likely limit short-term costs associated with mandated autism benefits, we feel that it is appropriate from a public policy perspective to look at the costs from a longer term perspective and assume that both awareness of ASDs will increase and that supply and demand for ASD services would eventually be in balance. We have developed our estimates with this in mind.

In the near term we would note that the supply of ABA service providers, specifically credentialed Board Certified Behavior Analysts (BCBAs) and Board Certified Associated Behavior Analysts (BCaBAs) would not be sufficient to meet the demand for ABA programs if ABA benefits are mandated. There are currently about 122<sup>2</sup> certified BCBAs and BCaBAs in Virginia, which translates to less than one therapist per 100 autistic

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<sup>2</sup> BACB Certificant Registry: [http://www.bacb.com/cues/frame\\_about.html](http://www.bacb.com/cues/frame_about.html), accessed January 2009.

children in Virginia assuming a 1 in 150 prevalence rate for autism. While it is true that not all autistic children will have an ABA program, it is also true that behavioral analysts provide services to individuals other than autistic children. It is reasonable to conclude that demand for ABA services, at least initially, would exceed supply should health care coverage similar to that mandated by HB 1588 become typical.

It is also instructive to look at some of the limited evidence available related to actual costs of ABA mandated benefits in other states. Aetna noted in December 2008 that it had tracked the cost of the autism mandate in Texas for its first year of existence and found that it increased costs for policyholders who filed autism-related claims by \$379 a month. A total of 235 policy holders had filed autism claims in the state as of the time the data was released. At that time, the company had not decided whether to pass those costs on to the policyholders because the cost of the mandate might change after the first year.<sup>3</sup> While this is only first year experience for a single insurer, it illustrates that initial mandate costs are likely low. Aetna's Texas block of business is quite large (approximately \$1.5 - 2.0 billion in premium<sup>4</sup>), so the statistics provided indicate a mandate cost of less than 0.1% of premium.

## **General Modeling Process**

The modeling process employed to develop our cost estimates was as follows:

1. Prevalence rates were developed so that overall ASD prevalence is equal to the CDC 1 in 150 ASD prevalence estimate for the United States.
2. Prevalence rates by diagnostic subtype (autistic disorder, PDD-NOS, Asperger's Syndrome) were estimated separately as diagnosis patterns and service utilization could reasonably be expected to vary by diagnostic subtype.
3. The percentage of children diagnosed by age for each diagnostic subtype was estimated so that the average age of diagnosis implicit in the modeling is consistent with publicly available age at diagnosis statistics<sup>5</sup>.
4. The percentage of diagnosed children who could be expected to have an ABA program was estimated for each age based on assumptions regarding how many children would start a program and typical program continuance.
5. A distribution of the number of annual hours for an ABA program was developed based on ABA provider input and an assumption that utilization review by insurers would impact utilization to some degree.
6. Based on the assumed treatment prevalence, likelihood of having an ABA program, assumed distribution of ABA program hours, and estimated ABA program cost per hour of therapy, ABA cost estimates by age were developed and adjusted to reflect the impact of the annual \$36,000 cap.

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<sup>3</sup> Lawmaker: Oklahoma autism bill has momentum. Associated Press. December 4, 2008. <http://newsok.com/article/3327594> accessed January 2009.

<sup>4</sup> NAIC Annual Statements for 2007.

<sup>5</sup> IAN database. <http://dashboard.ianexchange.org/StateStatsAdvanced.aspx?A1=VA&ADU=T>. Accessed January 2009.

7. Non-ABA costs were estimated based upon studies of medical costs for ASD children and judgment regarding the increase in costs that could be expected due to the mandated benefits.
8. Based on Census demographic data and the cost estimates for mandated ASD services by age as outlined in 1-7 above, an annual cost per covered individual was developed.
9. The cost of services was increased to reflect administrative and other insurer costs or profit charges.
10. The estimated size of the covered market was developed based on Census, Medical Expenditure Panel Survey (MEPS) enrollment and premium information for Virginia, and Kaiser Family Foundation coverage data. These assumptions are further documented in the following section.
11. The cost of the mandated services per covered person and as a percentage of premiums were calculated based on the model cost estimates and market data.

# 5

## Summary of Key Assumptions

Key assumptions underlying the cost estimates for the mandated benefits are summarized in this section. Appendix 1 further illustrates these assumptions.

### Treated Prevalence and Age at Diagnosis

Overall prevalence is based on a 2007 CDC<sup>6</sup> study, with prevalence by diagnostic subtype estimated based on an academic study published in the American Journal of Psychiatry<sup>7</sup>.

As noted in the previous section, the percentage of children diagnosed by age for each diagnostic subtype was estimated so that the average age of diagnosis implicit in the modeling is consistent with publicly available age at diagnosis statistics.

The base model assumptions for Virginia are shown below:

<u>Diagnostic Subtype</u>	<u>Prevalence</u>	<u>Average Age at Diagnosis</u>
Autistic Disorder	1 in 450	3
PDD-NOS	1 in 300	3
Asperger's Syndrome	1 in 900	6
<b>All ASD</b>	<b>1 in 150</b>	

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<sup>6</sup> Centers for Disease Control. Morbidity and Mortality Weekly Report. February 9, 2007.

<sup>7</sup> Fombonne, E. and S. Chakrabarti. American Journal of Psychiatry. June 2005.

## ABA Program Utilization and Cost

### ABA Program Utilization by Age

ABA programs require a significant commitment from affected children, as well as their families. It is likely that a significant number of ASD children will not have an ABA program regardless of the availability of a provider. For this reason, we have assumed that two-thirds of diagnosed children will begin an ABA program. ABA programs are generally geared towards addressing deficits in younger children and are generally not intended to be continued indefinitely. For this reason, we have assumed that no programs would terminate prior to school age, that a large percentage of ABA programs would terminate at ages six and seven when an autistic child could be expected to enter elementary school, and thereafter programs would terminate gradually until only a small percentage of children have ABA programs in their teenage years. Programs could be expected to terminate if a child has experienced sufficient progress so that a program is no longer necessary, or if the insurer or family sees no progress, as well as for other reasons.

The assumed percentage of children diagnosed with ASD that have an ABA program is shown in the table below:

<b>% of Diagnosed Children with an ABA Program by Age</b>	
6 and Under	66.7%
6	50.0%
7	33.3%
8	30.0%
9	26.7%
10	23.3%
11	20.0%
12	16.7%
13	13.3%
14	10.0%
15 and Over	6.7%

### ABA Program Annual Number of Hours

In developing the assumed annual ABA program hours, we discussed typical ABA programming with ABA providers, and reviewed some benefit materials from one of the few large self-insured employers who offers ABA benefits. For three age bands, we developed a distribution of expected hours that resulted in the annual averages shown in the table below.

<b>Average ABA Program Hours by Age</b>	
Ages Under 8	1,509
Ages 8 to 12	781
Ages 13 to 20	401

The general assumption is that pre-school aged children will have programs for 20 to 40 hours a week, averaging about 30 hours a week. This time will be reduced by roughly half by age eight when children would be expected to be in school and the school system would be required to provide services during the school day, and then would be cut in half again at age 13 as the child ages and ABA programs would be expected to be less time consuming and address a smaller number of behavioral deficits.

#### Cost per Hour of ABA Service

In developing the costs per hour, we reviewed ABA program staffing information and ABA provider wage and overhead cost assumptions. We developed an average cost for the entire United States and then adjusted this for Virginia, based on Bureau of Labor Statistics<sup>8</sup> health care wage data. The resulting average cost per hour of ABA therapy is \$45.45.

#### **Other (than ABA) Medical Costs**

Based on several studies<sup>9</sup>, we estimated that children with ASDs used approximately three times the non-inpatient medical services (other than ABA) under current benefit programs. It is also clear that the mandate would mean that services that an insurer could currently deny or exclude would now be covered. In our base estimate, we assumed that the mandate would result in additional insured medical costs equal to the current level of covered non-inpatient costs for services to children diagnosed with an ASD.

#### **Administrative Costs**

Typically, group medical claims costs could be expected to be 80 to 90% of premiums, meaning 10 to 20% of premiums are available for administration, profit, or other costs, often collectively referred to as “retention.” We have estimated the incremental retention charge to be 15% of premium under our base cost assumption.

#### **Virginia Market Data**

The MEPS survey provides average premiums, enrollees, offer rates, take-up rates, and self-insured percentages by employer size for healthcare coverage sponsored by privately insured employers. From this data we can estimate the size of the privately insured small group, insured large group, and self-insured markets. State specific premium data for Virginia was available for 2006<sup>10</sup>, so we trended this based on average recent employer premium increases provided from the Kaiser Family Foundation HRET<sup>11</sup> survey to estimate the 2009 average annual premium per member necessary to compute the cost of mandated benefits as a percentage of annual premiums.

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<sup>8</sup> BLS wage data. <http://www.bls.gov/guide/geography/wages.htm> accessed January 2009.

<sup>9</sup> Mandell, Cao, Ittenbach, & Pinto-Martin, 2006. Croen, Najjar, Ray, Lotspeich, & Bernal, 2006. Liptak, Stuart, & Auinger, 2006.

<sup>10</sup> MEPS state survey data. [http://www.meps.ahrq.gov/mepsweb/data\\_stats/state\\_tables.jsp?regionid=-1&year=-1](http://www.meps.ahrq.gov/mepsweb/data_stats/state_tables.jsp?regionid=-1&year=-1). Accessed January 2009.

<sup>11</sup> Kaiser Family Foundation and Health Research Educational Trust. Employer Health Benefits- 2008 Annual Survey.

# 6

## Cost Estimates

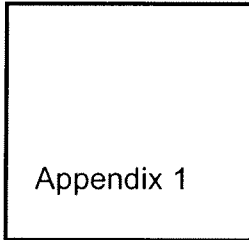
### Base Cost Estimate

The table below summarizes the mandate costs and impact on small and large group premiums under the base assumptions outlined in Section 5. The base estimate is that the long-term cost of the mandated benefits provided by HB 1588 would be about 0.60% of insured premiums, though this cost would likely initially be lower in the years immediately following the passage of the mandate.

	Market		
	Small Group	Large Group	All
Covered Persons	649,000	1,061,000	1,710,000
Average Premium per Person	\$3,900	\$3,800	\$3,838
Annual Mandate Claim Cost per Covered Person	\$19.50	\$19.50	\$19.50
Claim Cost as a Percentage of Premium	0.50%	0.51%	0.51%
Estimated Premium Increase with Admin @ 15%	22.90	22.90	\$ 22.90
Premium Increase as a Percentage of Premium	0.59%	0.60%	0.60%

### Scenario Estimates

As discussed in Section 1, very little insurance data exists that can be used to directly estimate the costs of ABA benefits mandated by HB 1588. This causes uncertainty in developing actuarial assumptions and cost estimates. Due to this uncertainty, it is useful to develop cost estimates for additional scenarios using more optimistic and pessimistic assumptions. A reasonable range of the long-term impact of the mandated HB 1588 benefits is that premiums would increase 0.45% to 0.75% with a \$36,000 annual benefit maximum, or cap. A reasonable estimate of the impact of mandated HB 1588 benefits assuming no annual cap is that premiums would increase 0.90%.

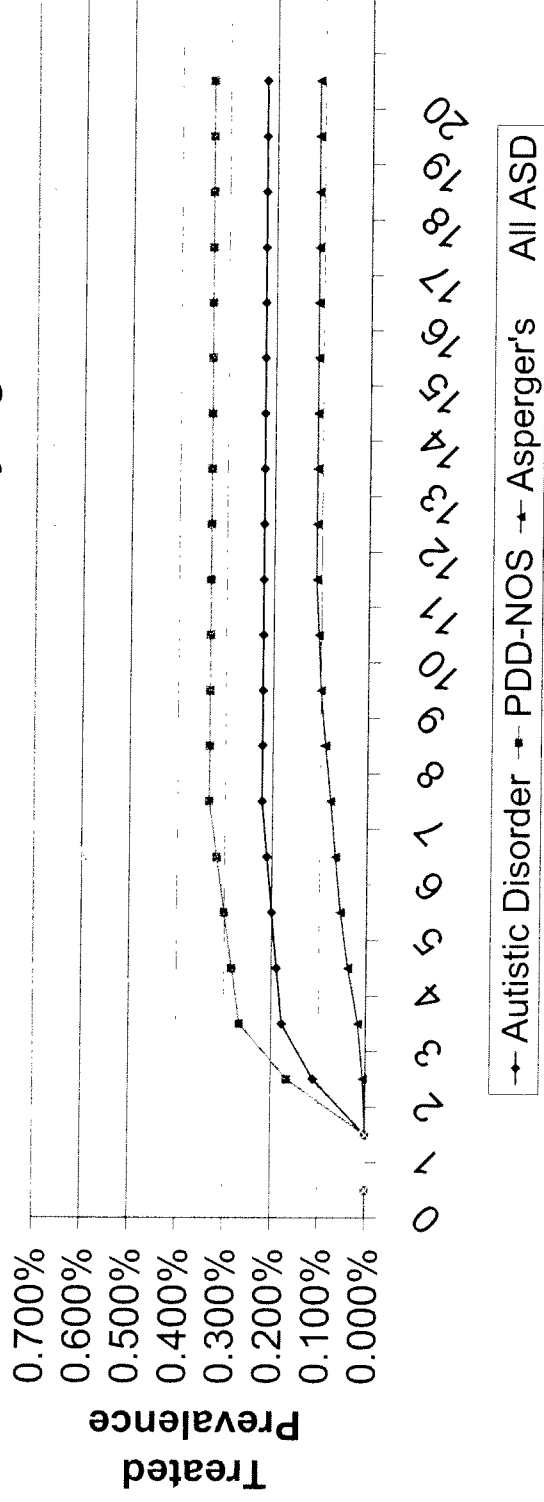


## **Cost Assumptions – Illustrative Exhibits**

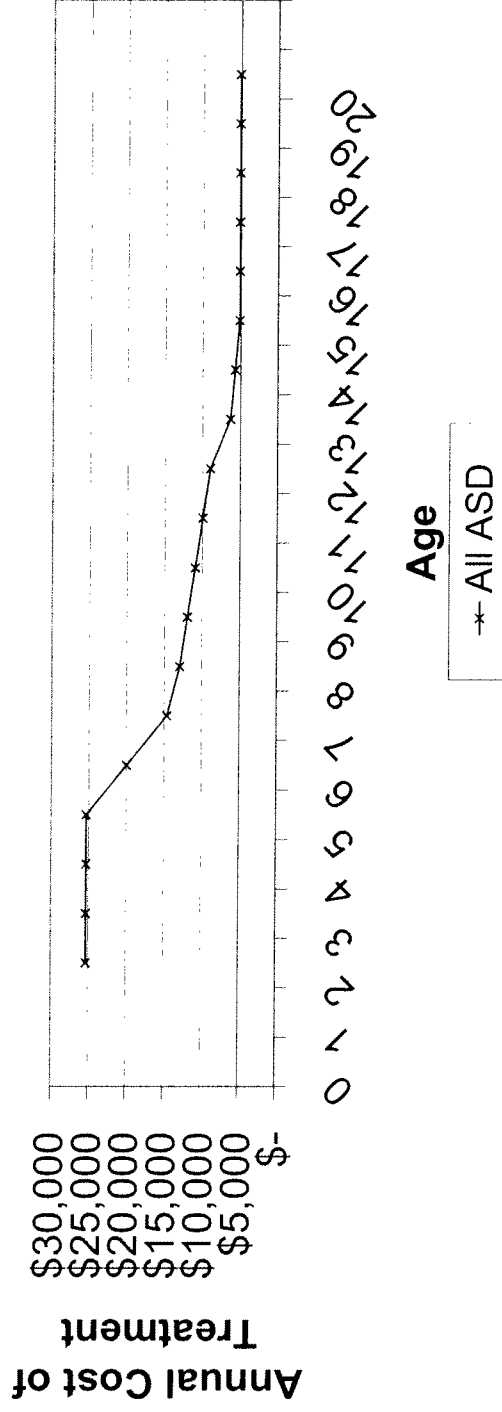
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Market	Coverage Estimates				Costs Excluding Administrative Expense				Premium Increase including Admin @ 15%		
	Number of Persons Covered	Premium (Per Person)	Total Premium		Costs	Costs (% of Premium)	Cost (Per Covered Person)	Incremental Premium	Premium Increase %	Annual Increase per Covered Person	
Individual											
Small Group	649,000	3,900	2,531,100,000		12,655,500	0.50%	19.50	14,889,000	0.59%	22.90	
Large Group	1,061,000	3,800	4,031,800,000		20,689,500	0.51%	19.50	24,341,000	0.60%	22.90	
Self-Insured (ERISA)											
State, Local and Federal											
Total	1,710,000	\$ 3,638	\$ 6,562,900,000		\$ 33,345,000	0.51%	\$ 19.50	\$ 39,229,000	0.60%	\$ 22.90	

**Exhibit II - Treated Prevalence by Age**

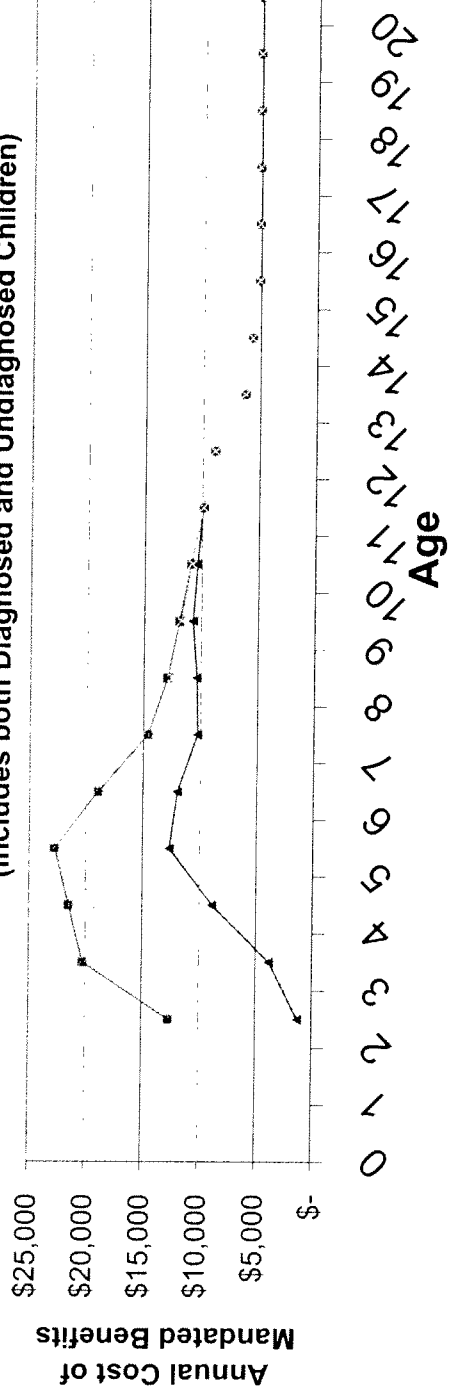


**Exhibit III - Annual Cost Per Diagnosed/Treated Child**



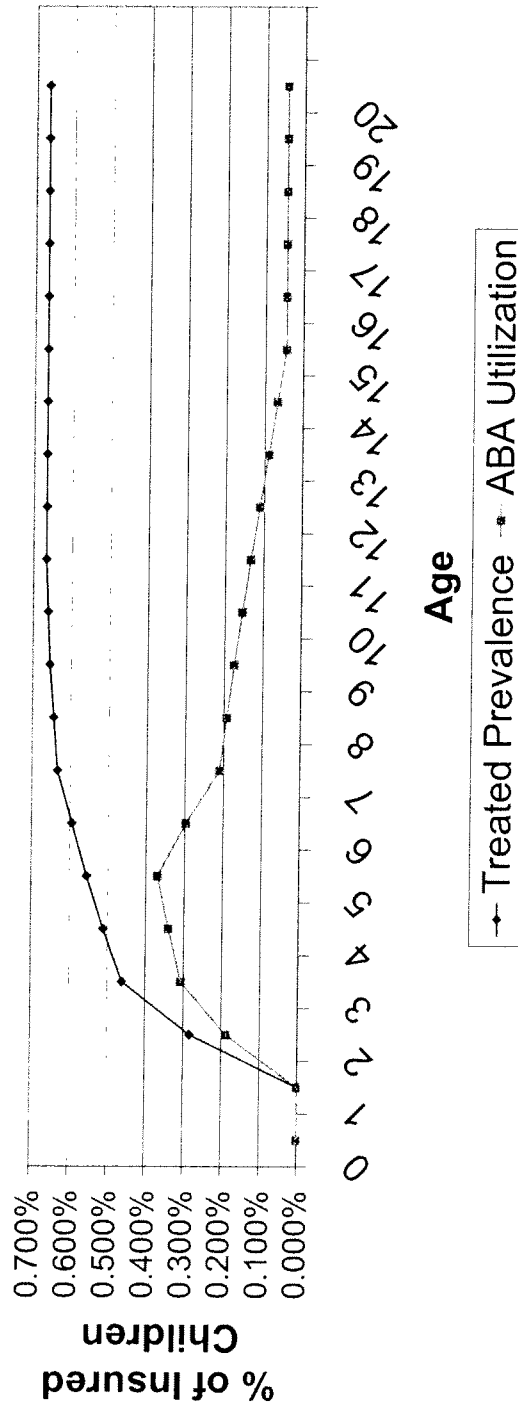
# Exhibit IV - Annual Cost Per Autistic Child

(Includes both Diagnosed and Undiagnosed Children)

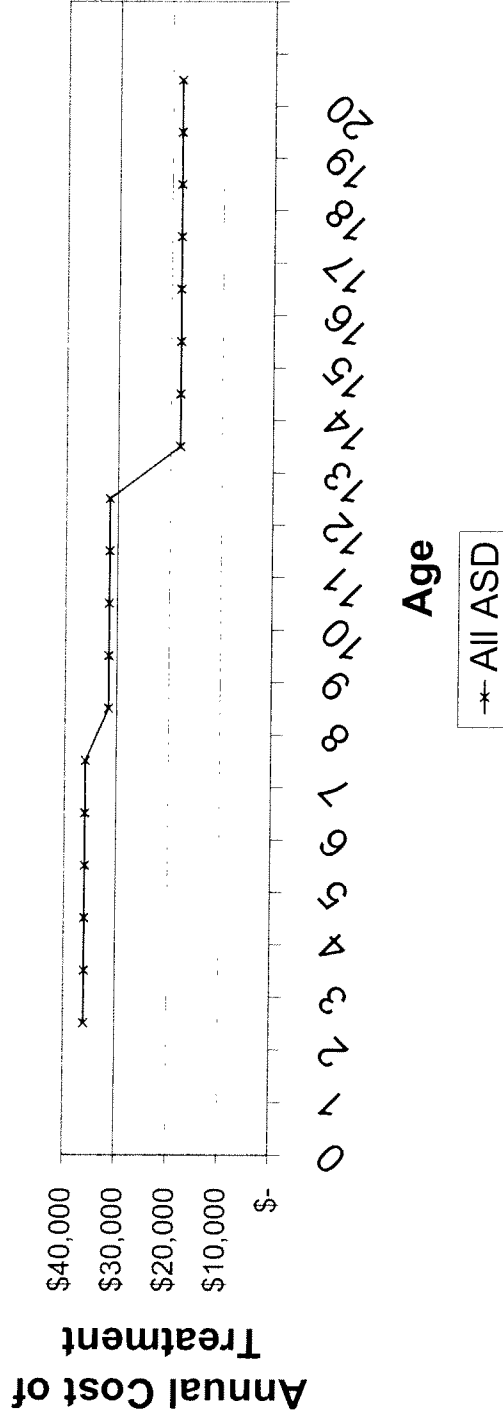


Autistic Disorder PDD-NOS Asperger's All ASD

**Exhibit V - ABA Utilization vs. Treated Prevalence**



# Exhibit VI - Annual Cost per Child With ABA Program



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