

March 1, 2010

Actuarial Cost Estimate:
North Carolina Draft Bill
2009-SQ-25 [v.1]

AN ACT TO REQUIRE HEALTH BENEFIT
PLANS, INCLUDING THE STATE HEALTH
PLAN FOR TEACHERS AND STATE
EMPLOYEES, TO PROVIDE COVERAGE
FOR TREATMENT OF AUTISM
SPECTRUM DISORDERS.

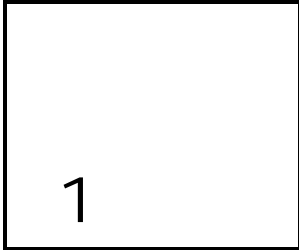
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Executive Summary

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 insurance benefits for autism spectrum disorders (ASD) mandated by North Carolina Draft Bill 2009-SQ-25 [v.1] (2009-SQ-25 [V.1]). The most significant treatment mandated by 2009-SQ-25 [V.1] is applied behavior analysis, or ABA which accounts for a large portion of the additional costs under 2009-SQ-25 [V.1]. The key provisions of 2009-SQ-25 [V.1] are explained further in Section 4 of this report.

Our analysis involved developing a robust model that reflects the likely behavior of consumers, providers and insurers of ABA services and includes North Carolina demographic and insurance market information. Key assumptions including the treated prevalence of ASD, the age of diagnosis, ABA program utilization by age, ABA annual costs by age, and additional other (i.e. not ABA) medical costs, as well as the modeling methodology are explained in detail in Sections 5 and 6 of this report and summarized through graphs in the Appendix.

Our analysis included scenario testing to develop cost estimates under a range of assumptions. Our “Middle” estimate is that, in the long-term, costs would increase by about 0.54% of premiums and premiums would increase about 0.63% should 2009-SQ-25 [V.1] be enacted. Our estimated range of long-term premium increases is 0.41% to 0.96% based on our “Low” and “High” estimates. We expect that premium increases would be lower in the years immediately following the passage of a law consistent with the provisions of 2009-SQ-25 [V.1], with first year cost increases in the range of 0.14% to 0.64% percent of premiums. Our expectation of lower first year costs is based on experiences in other states that have seen low initial costs when ASD benefits are mandated. These lower costs can be expected due to the lags typically seen in accessing new benefits and the limited supply of ABA providers.

The estimated cost increases for our “Middle” scenario along with some statistics for the individual, small, and large group markets are shown in the table below; we would expect that costs for any government plans would be similar to those estimated for large groups.

Long-Term Cost Estimates - “Middle” Cost Scenario

	Market			
	Individual	Small Group	Large Group	All
Covered Persons	432,000	653,000	881,000	1,966,000
Average Premium per Person	\$3,300	\$4,200	\$3,800	\$3,823
Annual Mandate Claim Cost per Covered Person	\$20.60	\$20.60	\$20.60	\$20.60
Claim Cost as a Percentage of Premium	0.62%	0.49%	0.54%	0.54%
Estimated Premium Increase with Admin @ 15%	\$24.20	\$24.20	\$24.20	\$24.20
Premium Increase as a Percentage of Premium	0.73%	0.58%	0.64%	0.63%

For our scenario testing we varied the assumptions that drive cost estimates. The assumptions under the “Low”, “Middle”, and “High” scenarios and premium increase estimates are summarized in the table below.

Scenario	% Diagnosed Under Age 6 Starting ABA	Avg. Annual ABA Program Cost	Avg. Annual non-ABA Cost (22 & under)	Annual Premium Increase per Covered Person	Premium Increase (% of Premium)
Low	40.0%	\$35,000	\$1,950	\$15.50	0.41%
Middle	50.0%	\$45,000	\$2,925	\$24.20	0.63%
High	66.7%	\$55,590	\$3,900	\$36.70	0.96%

While this analysis focused primarily on estimating the insured costs of mandated medical benefits, in Section 8 we summarize information related to the lifetime costs of ASD which include the costs associated with medical services, education, custodial care, and the lost productivity and wages of individuals affected by ASD, as well as their family caregivers. We also outline the potential savings to government financed education and medical programs associated with effective ASD treatments based on several studies.

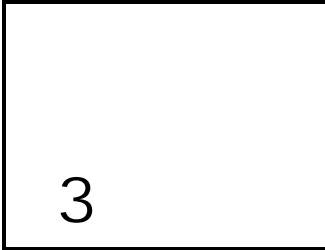
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Background

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 of the benefits mandated by North Carolina 2009-SQ-25 [V.1], which provides coverage for the diagnosis and treatment of autism spectrum disorders.

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 thirteen 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 2009-SQ-25 [V.1] 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.



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 2009-SQ-25 [V.1] and the associated premium impact on the individual, small group, and large group markets affected by 2009-SQ-25 [V.1]. This analysis also identifies and partially quantifies identified offsetting cost savings associated with successful ASD treatment.

We note that cost estimates for autism mandates have varied widely state to state based on differences in the state-specific mandates and the methods and assumptions used in estimating costs, though typically independent estimates show premium increases due to mandated autism benefits of less than 1%. A March 2009 report of The Council for Affordable Health Insurance (CAHI) states: “CAHI’s actuarial working team estimates that an autism mandate increases the cost of health insurance by about 1 percent.”¹ The reason for this variability is that the largest component of the increase in costs under 2009-SQ-25 [V.1] mandated ASD benefits is for behavioral therapy, including 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.

The reader is further 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 uncertain. Insurance policies often cover some services for children diagnosed with an ASD, although the mandate could cause the insured costs for certain services to increase because ASD exclusions or limitations are common, and certain services that may have been denied or terminated following utilization review might be covered due to the mandate.

¹ The Council for Affordable Health Insurance. “The Growing Trend Towards Autism Coverage.” March 2009.

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Description of Key 2009-SQ-25 [V.1] Provisions and their Impact on Covered Benefits

Insurance Markets Covered by Mandate

The Bill states “*Every health benefit plan, including the State Health Plan for Teachers and State Employees, shall provide coverage for the diagnosis and treatment of autism spectrum disorders in individuals.*” In our modeling we are assuming that this means that the mandate applies to the individual, small group (2-50 employees) and large group (51+ employees) markets, as well as the State Health Plan for Teachers and State Employees.

Covered Benefits

The mandate provides for the diagnosis and treatment of autism spectrum disorders, where treatment includes “... *the following care prescribed, provided, or ordered for an individual diagnosed with one of the autism spectrum disorders by a licensed medical doctor or a licensed psychologist who determines the care to be medically necessary:*

- a. Habilitative or rehabilitative care.*
- b. Pharmacy care.*
- c. Psychiatric care.*
- d. Psychological care.*
- e. Therapeutic care.”*

The inclusion of behavioral therapies, including applied behavioral analysis (ABA) in the definition of “*habilitative or rehabilitative care*” is especially important. The coverage of behavioral therapies, including ABA has the most significant impact on cost of any mandated service. For the purpose of this report, when referring to ABA, assume that this encompasses all behavioral therapies since ABA is the most widely accepted, and we would expect other approved behavioral programs to have similar costs.

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 6.

Annual Maximum Behavioral Benefit of \$75,000

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

Maximum Age for Benefits

The Bill does not contain any language that limits the ages of insureds that may receive covered ASD services.

Medical Necessity and Treatment Review

The bill does allow for utilization review by specifically stating: “*a health benefit plan shall have the right to request a review of that treatment not more than once every 12 months unless the insurer and the individual's licensed medical doctor or licensed psychologist agrees that a more frequent review is necessary.*” This is important as insurers will develop protocols to review treatments and manage care which will limit unnecessary treatments if reviews are done appropriately.



Modeling Methodology

The following outlines the general modeling methodology used to develop our cost estimates. Estimates were developed both on a per covered person per year basis, and as a percentage of average annual premiums, as shown in Section 7. Details of key assumptions are discussed in Section 6 and illustrated graphically in the exhibits shown in Appendix 1.

Modeling Perspective

Our model was developed to produce costs under a range of assumptions, but generally assumes that a sufficient supply of 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 CDC diagnosed prevalence estimates.

We would expect that it would take a minimum of 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 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 over a longer term 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.

Acknowledging that short-term costs are also important to policymakers, in the sections outlining our cost estimates, we have included illustrative exhibits showing the possible progression of costs for mandated benefits by assuming that initial costs would be roughly one-half of the long-term estimates. We also assumed that it would take five years for costs to reach their ultimate levels, although these assumptions varied by cost scenario.

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 policyholders 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.² 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 premium³), 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:

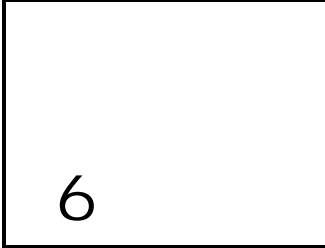
1. A treated prevalence estimate for North Carolina was developed based on the Center for Disease Control and Prevention's (CDC) Mortality and Morbidity Weekly Report (MMWR) on autism prevalence dated December 18, 2009.
2. Prevalence rates by diagnostic subtype (autistic disorder, PDD-NOS, Asperger's Syndrome) were estimated separately, since diagnosis patterns and service utilization could reasonably be expected to vary by how severely affected an individual with ASD is and by diagnostic subtype.
3. The percentage of children diagnosed by age for each diagnostic subtype was estimated so that the average ages of diagnosis implicit in the modeling are consistent with publicly available age at diagnosis statistics.⁴
4. The percentage of diagnosed children who could be expected to have an ABA program was estimated for each age based on assumptions regarding the percentage of children that would start a program and typical program continuance.
5. A distribution of the number of annual hours for ABA by age 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.
7. Non-ABA costs were estimated based upon studies of medical costs for children diagnosed with ASD 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.

² Associated Press. *Lawmaker: Oklahoma autism bill has momentum*. December 4, 2008. <http://newsok.com/article/3327594>. Accessed January 2009.

³ NAIC Annual Statements for 2007.

⁴ IAN database. <http://dashboard.ianexchange.org/StateStatsAdvanced.aspx?A1=VA&ADU=T>. Accessed January 2009.

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 North Carolina, and Kaiser Family Foundation coverage data. These assumptions are further documented in Section 6.
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 under a range of assumptions to develop “Low,” “Middle,” and “High” cost scenario estimates.



Summary of Key Assumptions

Key assumptions underlying the cost estimates for the proposed mandated benefits are summarized in this section. In order to better illustrate the sensitivity of costs to various assumptions, we developed assumptions for “Low,” “Middle,” and “High” cost scenarios. Appendix 1 further illustrates these assumptions for the “Middle” scenario.

Treated Prevalence and Age at Diagnosis

The December 18, 2009 CDC MMWR⁵ report included the following information related to the prevalence of ASD:

- 1. Children aged 8 years with a notation of an ASD or descriptions consistent with an ASD were identified through screening and abstraction of existing health and education records containing professional assessments of the child’s developmental progress at health-care or education facilities. Children aged 8 years whose parent(s) or legal guardian(s) resided in the respective areas in 2006 met the case definition for an ASD if their records documented behaviors consistent with the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision (DSM-IV-TR) criteria for autistic disorder, pervasive developmental disorder–not otherwise specified (PDD NOS), or Asperger disorder. Presence of an identified ASD was determined through a review of data abstracted from developmental evaluation records by trained clinician reviewers.⁶*
- 2. In 2006, the overall identified ASD prevalence per 1,000 children aged 8 years varied across ADDM sites ... The average across all 11 sites was 9.0 (CI = 8.6–9.3) per 1,000 children.⁷ A prevalence rate of 9 per 1,000 is approximately 1 in 110.*

⁵ Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report. December 18, 2009. <http://www.cdc.gov/mmwr/>. Accessed January 2010.

⁶ Ibid, p. 1

⁷ Ibid, p. 7

3. *In general, estimated ASD prevalence was lower in ADDM sites that relied solely on health sources to identify cases (mean: 7.5 per 1,000 population; CI = 7.0–7.9) compared with sites that also had access to education sources.*⁸
4. *Among all children meeting the ADDM ASD surveillance case definition, approximately 77% had a documented ASD classification in their records.*⁹
5. *All children initially identified for screening were first stratified by two factors highly associated with final case status: information source (education only, health only, or both types of sources) and the presence or absence of either an ASD ICD-9 code (299.0 or 299.8) or an autism special education eligibility. The potential number of cases missed because of missing records, and the impact on prevalence, was estimated on the assumption that within each of the strata, the proportion of children with missing records who ultimately would be confirmed as having ASD cases would have been similar to that of children for whom no records were missing.*¹⁰

In estimating treated prevalence, which drives medical services utilization and costs, we used the population prevalence as a starting point, and then made adjustments based on details in the MMWR study which would indicate that treated prevalence could be expected to be lower than population prevalence. Treated prevalence rates would be expected to be lower than population prevalence rates for several reasons:

1. As noted in 4. above, approximately 77% of children had documented ASD classification in their records. Without a documented ASD diagnosis, it is not likely that someone would receive treatments for ASD covered by insurance. Note 77% of the 9.0/1000 population prevalence means a documented diagnosis prevalence rate of approximately 1 in 144.
2. There is a reasonable expectation that covered medical ASD services would be supported by documentation in health records. Based on a review of health records, only, the population prevalence of ASD is approximately 7.5/1000, or 1 in 133.
3. The CDC methodology assumed that where records and information were missing, the proportion of children with missing records who ultimately would be confirmed as having ASD cases would have been similar to that of children for whom no records were missing. There is a reasonable likelihood that records would be less likely to be missing for children with documented ASD diagnoses who would seek treatment.
4. With ASD, as with any other disease or disorder, there will be some subset of the diagnosed population that will not seek treatment for any number of reasons.

Based on our analysis of the CDC report, including the key items from the report noted above, a reasonable assumption for the treated prevalence of ASD is 1 in 150. While there is

⁸ Ibid, p. 7

⁹ Ibid, p. 9

¹⁰ Ibid, p.7

obvious rationale for modeling cost sensitivities to changes in prevalence, we did not do so since the range of likely costs based on the sensitivity testing outlined in the remainder of this report provides a fairly wide range and illustration of potential costs, and determining the impact on costs of different treated prevalence rates is a simple task.

Prevalence by diagnostic subtype was estimated based on an academic study published in the American Journal of Psychiatry.¹¹ 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 treated prevalence and age at diagnosis assumptions for North Carolina are shown below:

<u>North Carolina Treated Prevalence</u>		
<u>Diagnostic Subtype</u>	<u>Ultimate Prevalence</u>	<u>Average Age of Diagnosis</u>
Autistic Disorder	1 in 450	3
PDD-NOS	1 in 300	3
Asperger's	1 in 900	6
All ASD	1 in 150	

The average age of diagnosis stated in the 2009 CDC MMWR report is 53 months¹² which is higher than the average age used in our cost modeling of about 42 months, we believe that this difference is reasonable and explainable in that we are using parent reported data that is likely provided by the same parents who would most likely utilize insured benefits. Note a lower age of diagnosis results in higher cost estimates, all other things being equal.

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, and many others diagnosed with ASD, especially those in more rural areas, may have difficulty accessing a provider. For this reason, we have assumed that 40% to 66.7% (40% for “Low” scenario, 50% for “Middle” and 66.7% for “High”) of diagnosed children under age 6 will begin an ABA program. Based on discussions with ABA providers and researchers, actual utilization of ABA programs has been lower in many cases due to the lack of providers, the lack of coverage, and to some extent the limited understanding of ABA programs and their efficacy.

In Minnesota, a state that is widely regarded as having some of the most extensive ABA coverage and services in the nation, provider data indicates ABA utilization of approximately 20% of diagnosed three to six year olds¹³, which is considerably lower than assumed in each

¹¹ Fombonne, E. and S. Chakrabarti. American Journal of Psychiatry. June 2005.

¹² Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report. December 18, 2009. p. 9.

¹³ Discussion with Dr. Eric Larsson Executive Director, Clinical Services, The Lovaas Institute for Early Intervention

of the scenarios in our modeling. While our range of assumptions for ABA utilization may appear conservative, and likely is conservative in the near-term, we feel that the range is reasonable since insurers will likely have some conservatism in their cost estimates and premium rates. Private insurance utilization will also likely be higher than under the public/private programs in Minnesota, and utilization could increase over time due to increased awareness of ASD, and potentially, an increased supply of ABA providers.

In addition to the likelihood of starting a program, program continuance assumptions have a very significant impact on overall ABA utilization and cost estimates. ABA programs are generally geared towards addressing deficits in younger children and are 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 annually thereafter a large percentage of remaining programs would terminate until only a very small percentage of children have ABA programs by the time they reach their teenage years. Programs would be expected to terminate if a child has experienced sufficient progress whereby 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 by age for our “Middle” scenario is shown in the table below:

% of Diagnosed Children w/ ABA	
Under 6	50.0%
6	37.5%
7	25.0%
8	16.7%
9	11.1%
10	7.4%
11	4.9%
12	3.3%
13 to 21	2.5%

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 offer ABA benefits.¹⁴ We developed a distribution of expected hours that resulted in the annual averages shown in the table below:

Average ABA Program Hours	
Ages Under 8	1,500
Ages 8 to 12	671
Ages 13 to 21	401

Midwest Headquarters regarding ABA utilization research in Minnesota. February 2009.

¹⁴ Autism Therapy Reference- Microsoft Corporation (administered by Premera Blue Cross).

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 over 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. It would then again be reduced significantly 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 North Carolina, based on Bureau of Labor Statistics¹⁵ health care wage data. The resulting average cost per hour of ABA therapy in North Carolina is about \$45 for a program based on the assumption that staffing will be in line with what best practices might recommend. This is the cost underlying our “High” assumption, though we note that costs would vary based on the mix of professionals and technicians providing the services, and likely would be lower if less experienced ABA practitioners need to be employed to meet the increasing demands for services.

Range of Annual ABA Program Costs for Scenario Estimates

Given the actual cost of an ABA program could vary significantly for many reasons, we have assumed annual average program costs by scenario as follows:

“Low” cost scenario - assumes average ABA program cost is \$35,000 per year.

“Middle” cost scenario - assumes average ABA program cost is \$45,000 per year.

“High” cost scenario - based on the assumptions outlined in this section for the continuance of ABA programming, the number of annual hours for ABA programming, and an hourly rate of \$44.52, the calculated average annual cost for an ABA program for all ages is \$55,590.

Other (than ABA) Medical Costs

Based on several studies¹⁶, we estimated that children with ASDs had costs covered by insurers of approximately three times the average for non-inpatient medical services under current benefit programs. It is also clear that the mandate would mean that some services that an insurer could currently deny or exclude would now be covered. In our range of estimates, we assumed that the mandate would result in additional insured medical costs of 50% to 100% of the current level of estimated covered non-inpatient costs for services to children diagnosed with an ASD which we assumed are currently three times higher than the population costs in the absence of the benefit mandates under 2009-SQ-25 [V.1] for children/dependents under 23 diagnosed with an ASD.

We also included a provision for the potential costs associated with covered individuals ages 23 and over that could be impacted by 2009-SQ-25 [V.1]. This takes into account that many

¹⁵ BLS wage data. <http://www.bls.gov/guide/geography/wages.htm> accessed January 2009.

¹⁶ Mandell, Cao, Ittenbach, & Pinto-Martin, 2006. Croen, Najjar, Ray, Lotspeich, & Bernal, 2006. Liptak, Stuart, & Auinger, 2006.

dependent children with an ASD can become independent adults and would cease to be covered by their parents’ insurance policies, and that ASD related medical costs could be expected generally to decrease as an individual ages.

The estimated annual cost for additional non-ABA services (note many non-ABA medical services are already provided to individuals with ASD) that would be covered as a result of the mandate are shown for each scenario in the table below:

Scenario	Non-ABA Medical Costs	
	(22 & Under)	(23 & Over)
Low	\$1,950	\$975
Middle	\$2,925	\$1,463
High	\$3,900	\$1,950

(Amounts in 2010 dollars)

Administrative Costs

Typically, medical claim 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.

North Carolina 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 North Carolina was available for 2006¹⁷, so we trended this based on average recent employer premium increases provided from the Kaiser Family Foundation HRET¹⁸ survey to estimate the 2010 average annual premium per member necessary to compute the cost of mandated benefits as a percentage of annual premiums.

To estimate average premiums for the individual market, we reviewed survey results developed by America’s Health Insurance Plans¹⁹ that showed average premiums and members per policy by state.

As part of our development of premiums and membership estimates, we completed reasonableness tests by reviewing North Carolina insurer annual statement exhibits to ensure that the group premium estimate is not unreasonable.

¹⁷ MEPS state survey data. http://www.meps.ahrq.gov/mepsweb/data_stats/state_tables.jsp?regionid=-1&year=-1. Accessed January 2009.

¹⁸ Kaiser Family Foundation and Health Research Educational Trust. Employer Health Benefits- 2008 Annual Survey.

¹⁹ AHIP Individual Health Insurance 2006 - 2007: A Comprehensive Survey of Premiums, Availability, and Benefits. http://www.ahipresearch.org/pdfs/Individual_Market_Survey_December_2007.pdf. Accessed January 2009.



Cost Estimates

Long-Term Cost Estimates - “Middle” Cost Scenario

The table below summarizes our “Middle” scenario average annual cost estimates and premium increases on a per covered person basis, and as a percentage of the annual premiums. Our “Middle” estimate is that, in the long-term, the premium increase associated with the mandated benefits provided by 2009-SQ-25 [V.1] would be about 0.63% of insured premiums across all markets. However, we expect that costs would be lower in the years immediately following the passage of 2009-SQ-25 [V.1] based on experiences in other states that have mandated ASD benefits, lags typically seen in accessing new benefits, and the limited supply of ABA providers. We expect that government programs would have cost increases comparable to insured large groups.

The estimated cost increases for the large group market is shown in the table below. The annual claim cost per covered person estimate of \$20.60 and premium increase of \$24.20 are in 2010 dollars. We would expect the costs per covered person in the State Health Plan for Teachers and State Employees to be similar to those shown below for the Large Group market.

	Market			
	Individual	Small Group	Large Group	All
Covered Persons	432,000	653,000	881,000	1,966,000
Average Premium per Person	\$3,300	\$4,200	\$3,800	\$3,823
Annual Mandate Claim Cost per Covered Person	\$20.60	\$20.60	\$20.60	\$20.60
Claim Cost as a Percentage of Premium	0.62%	0.49%	0.54%	0.54%
Estimated Premium Increase with Admin @ 15%	\$24.20	\$24.20	\$24.20	\$24.20
Premium Increase as a Percentage of Premium	0.73%	0.58%	0.64%	0.63%

Scenario Estimates

As discussed in Section 3, very little insurance data exists that can be used to directly estimate the costs of ABA benefits mandated by 2009-SQ-25 [V.1]. This causes uncertainty in developing actuarial assumptions and cost estimates. Due to this uncertainty, it is useful to develop cost estimates for scenarios using optimistic and pessimistic assumptions.

Cost estimates are very sensitive to various assumptions, especially those related to ABA utilization and costs. Therefore, we varied our assumptions to develop estimated costs for ASD services under “Low,” “Middle,” and “High” cost scenarios, as shown in the table below:

Scenario	% Diagnosed Under Age 6 Starting ABA	Avg. Annual ABA Program Cost	Avg. Annual non-ABA Cost (22 & under)	Annual Premium Increase per Covered Person	Premium Increase (% of Premium)
Low	40.0%	\$35,000	\$1,950	\$15.50	0.41%
Middle	50.0%	\$45,000	\$2,925	\$24.20	0.63%
High	66.7%	\$55,590	\$3,900	\$36.70	0.96%

Short-Term Cost Estimates by Scenario

In addition to the uncertainty associated with long-term cost estimates, how quickly costs could reach their ultimate level due to the limited supply of ABA therapists is also uncertain. We have provided the table below to illustrate the potential short-term increases in premiums, and how they could grade into the long-term estimates over time.

Estimated Increase in Premiums due to 2009-SQ-25 [V.1]						
Scenario	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6 and Beyond
Low	0.14%	0.19%	0.24%	0.30%	0.35%	0.41%
Middle	0.32%	0.38%	0.44%	0.51%	0.57%	0.63%
High	0.64%	0.70%	0.77%	0.83%	0.90%	0.96%

Individual Market Comment

In developing the individual and small-group market cost estimates, we did not develop any assumptions regarding the impact of anti-selection which could lead to average cost and premium increases in excess of those shown in this report in the individual market. Completing an assessment of the potential for anti-selection to increase premium rates in the individual market under 2009-SQ-25 [V.1] is complicated for several reasons including the existence of Blue Cross and Blue Shield of North Carolina as the insurer of last resort, and beyond the scope of this review.

8

Cost – Benefit Analysis for ASD Treatments

There have been several studies related to the efficacy of ABA treatment programs, and the costs associated with ASD treatments, care, and supports. In this section, we summarize some of these studies.

Societal Costs of Autism- Ganz Report

One of the most often cited reports explaining the financial costs of ASD is *The Lifetime Distribution of the Incremental Societal Costs of Autism* by Michael Ganz, MS, PhD was published in 2007. This report summarized the modeled costs of a hypothetical cohort of children born in 2000 and diagnosed with autism in 2003. A study result is that the incremental societal cost of autism is \$3.2 million per capita in 2003 dollars.²⁰ The report is very helpful in identifying specific costs of ASD, and in providing a framework for quantifying these costs, as well as providing actual cost estimates.

Direct Medical

- Physician and Dental
- Drugs
- Complementary and Alternative Therapies
- Behavioral Therapies
- Emergency and Hospital
- Home Healthcare
- Travel

²⁰ Ganz, Michael L. *The Lifetime Distribution of the Incremental Societal Costs of Autism*. Archives of Pediatrics & Adolescent Medicine. April 2007. Volume 161.

Direct Nonmedical

- Child Care
- Adult Care
- Respite Care
- Home Improvements
- Special Education
- Supported Work
- Other

Indirect

- Own Indirect- lost productivity and lower wages
- Not Own Indirect - lost productivity and lower wages of others (typically family)

Cost Savings to State and Local Governments

The Ganz study is probably the most comprehensive in terms of assessing the breadth of the financial costs associated with caring for individuals with ASD. Several other studies have attempted more limited quantifications of costs and savings to governments associated with providing early intensive behavioral interventions (EIBI) or ABA programs for young children. In summary, the studies quantify the costs of EIBI, assume success rates associated with EIBI based on efficacy studies, and then assume cost savings to educational and other government financed programs like Medicaid associated with these treatments.

Virginia's independent Joint Legislative Audit and Review Commission (JLARC) issued a report in August 2009: *Report of the Joint Legislative Audit and Review Commission To the Governor and The General Assembly of Virginia - Assessment of Services For Virginians With Autism Spectrum Disorders*. As part of this report, JLARC reviewed several studies related to the efficacy of EIBI, and potential cost savings to State and Local governments associated with effective EIBI treatments. The JLARC report outlines their assessment of the cost savings associated with EIBI as follows²¹:

“A study published in a national journal found that Pennsylvania could save an average of \$187,000 to \$203,000 on each child who received three years of EIBI relative to one who received special education services until age 22. The Pennsylvania study also suggested that cost savings would likely continue to accrue after children exit the school system. The study found that the state could save from \$656,000 to \$1.1 million per child if expenditures up to age 55 are included. Another study published in a national journal found that Texas could save an average of \$208,500 in education costs for each student who received three years of EIBI relative to a student who received 18 years of special education from ages four to 22. Applied to the estimated 10,000 children with ASDs in Texas, it was estimated that the state could save almost \$2.1 billion by implementing intensive treatment programs.

By applying the methodology used in the Pennsylvania and Texas studies to Virginia-related data, JLARC staff estimate that the Commonwealth could save approximately \$137,400 in special education costs per student with an ASD if EIBI was consistently provided. In fact, the analysis

²¹ *Report of the Joint Legislative Audit and Review Commission To the Governor and The General Assembly of Virginia - Assessment of Services For Virginians With Autism Spectrum Disorders*, p. 15. <http://jlarc.virginia.gov/reports/Rpt388.pdf>. Accessed December 2009.

indicates that Virginia could realize savings as long as at least 42 percent of students with ASDs who received EIBI make moderate improvements (require less intensive services and fewer supports), which is a substantially more conservative outcome than the outcomes reported in the research literature.”

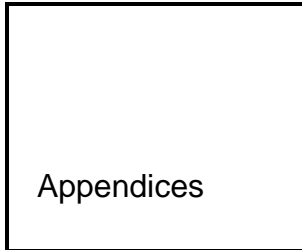
The actual success rates of EIBI treatments will drive the benefits derived from these treatments. Also, as noted in the JLARC report, moderate improvements in functioning could also lead to significant financial savings. The JLARC report also discusses various studies of the efficacy of EIBI and Table 3 on page 15 of the report summarizes the findings on the efficacy of EIBI of three research studies. This table is reproduced below:

Table 3: Multiple Studies Demonstrate Children Who Receive Intensive Treatment Fare Better Than Those Who Receive Less Intensive Services

Group	Outcomes	
	Average Change in IQ Points	Educational Placement
<i>EIBI compared to less intensive public school special education (2006 study)</i>		
Treatment	+25	<ul style="list-style-type: none"> ▪ 29% in general class without supports ▪ 52% in general class with supports
Comparison	+14	<ul style="list-style-type: none"> ▪ 5% in general class
<i>EIBI compared to less intensive parent-training model (2000 study)</i>		
Treatment	+16	<ul style="list-style-type: none"> ▪ 27% in general class without supports
Comparison	-1	<ul style="list-style-type: none"> ▪ No children in general class without supports
<i>EIBI compared to less intensive treatment (1987 study)</i>		
Treatment	<ul style="list-style-type: none"> ▪ 47% achieved IQ in normal range (94-120) 	<ul style="list-style-type: none"> ▪ 47% in general class without supports ▪ 42% in less intensive special education class for language delayed ▪ 11% in intensive special education class for children with autism or intellectual disability (ID)
Comparison	<ul style="list-style-type: none"> ▪ 2% achieved IQ in normal range 	<ul style="list-style-type: none"> ▪ 2% in general class without supports ▪ 45% in less intensive special education class for language delayed ▪ 53% in intensive special education class for children with autism or ID

Note: A more detailed table on the results of these studies can be found in Appendix C.

We currently do not have North Carolina specific data that would allow us to provide estimates of the potential educational and medical savings that could be achieved through EIBI. Under the assumption that the costs of ASD services and efficacy of EIBI are in line with those indicated in the studies noted, we would expect that the costs of ABA treatments covered under 2009-SQ-25 [V.1] could be recovered through reductions in educational and medical expenditures, alone. We would also expect that benefits associated with successful treatments would be realized in the areas noted in the beginning of this section through reducing other costs of care and improving the productivity of individuals with ASD and their caregivers, in addition to non-economic or quality of life benefits.



Cost Assumptions - Illustrative Exhibits,
and 2009-SQ-25 [V.1] Text

EXHIBIT I - SUMMARY OF NC 2009-SQ-25 [v.1] "MIDDLE" SCENARIO ASSUMPTIONS AND COSTS

State: North Carolina

Key Assumptions:

United States Treated Prevalence		
Diagnostic Subtype	Ultimate Prevalence	Average Age of Diagnosis
Autistic Disorder	1 in 450	3
PDD-NOS	1 in 300	3
Asperger's	1 in 900	6
All ASD	1 in 150	

% of Diagnosed Children w/ ABA	
Under 6	50.0%
6	37.5%
7	25.0%
8	16.7%
9	11.1%
10	7.4%
11	4.9%
12	3.3%
13 to 21	2.5%

Age Limits for Autism Benefits

Minimum: None
Maximum: None

Additional Annual Medical Costs for Non ABA Services

All Ages \$ 2,925
Ages 23 and over \$ 1,463

North Carolina Treated Prevalence

Diagnostic Subtype	Ultimate Prevalence	Average Age of Diagnosis
Autistic Disorder	1 in 450	3
PDD-NOS	1 in 300	3
Asperger's	1 in 900	6
All ASD	1 in 150	

Average ABA Program Hours	
Ages Under 8	1,500
Ages 8 to 12	671
Ages 13 to 21	401

Annual Limits by Covered Service

Hours Limit	Max Hours	Dollar Limit	Max \$s
ABA: No	-	Yes	\$75,000

Average cost of ABA Program: \$45,000

Market
Individual
Small Group
Large Group
Total

Coverage Estimates		
Number of Persons Covered	Premium (Per Person)	Total Premium
432,000	\$ 3,300	\$ 1,425,600,000
653,000	4,200	2,742,600,000
881,000	\$ 3,800	\$ 3,347,800,000
1,966,000	\$ 3,823	\$ 7,516,075,000

Costs Excluding Administrative Expense			Premium Increase including Admin @ 15%		
Costs	Costs (% of Premium)	Cost (Per Covered Person)	Incremental Premium	Premium Increase %	Annual Increase per Covered Person
\$ 8,899,200	0.62%	\$ 20.60	\$ 10,470,000	0.73%	\$ 24.20
13,451,800	0.49%	20.60	15,826,000	0.58%	24.20
\$ 18,148,600	0.54%	\$ 20.60	\$ 21,351,000	0.64%	\$ 24.20
\$ 40,499,600	0.54%	\$ 20.60	\$ 47,647,000	0.63%	\$ 24.20

Exhibit II - Treated Prevalence by Age

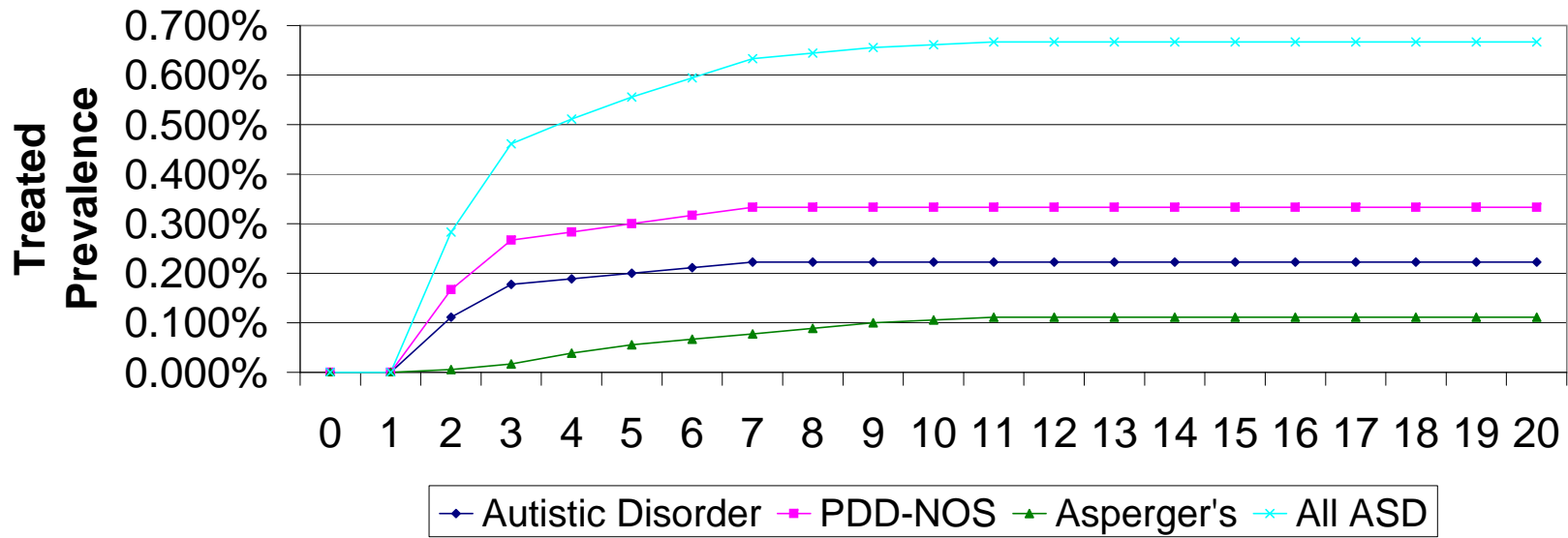


Exhibit III - Annual Cost Per Diagnosed/Treated Child

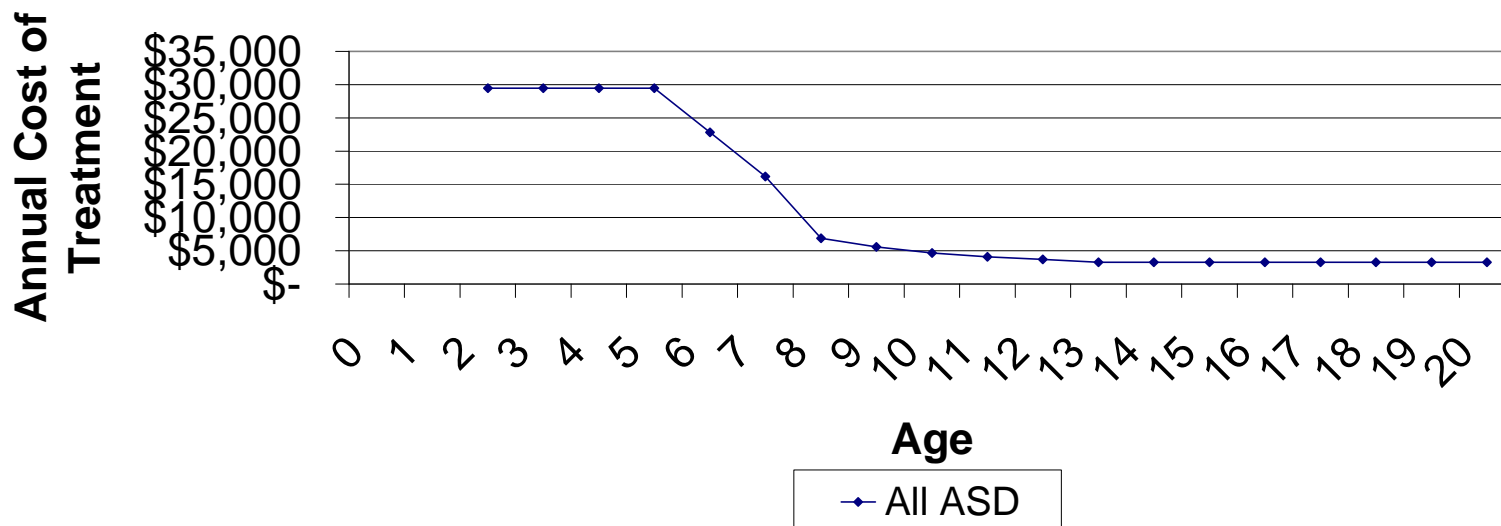


Exhibit IV - Annual Cost Per Autistic Child

(Includes both Diagnosed and Undiagnosed Children)

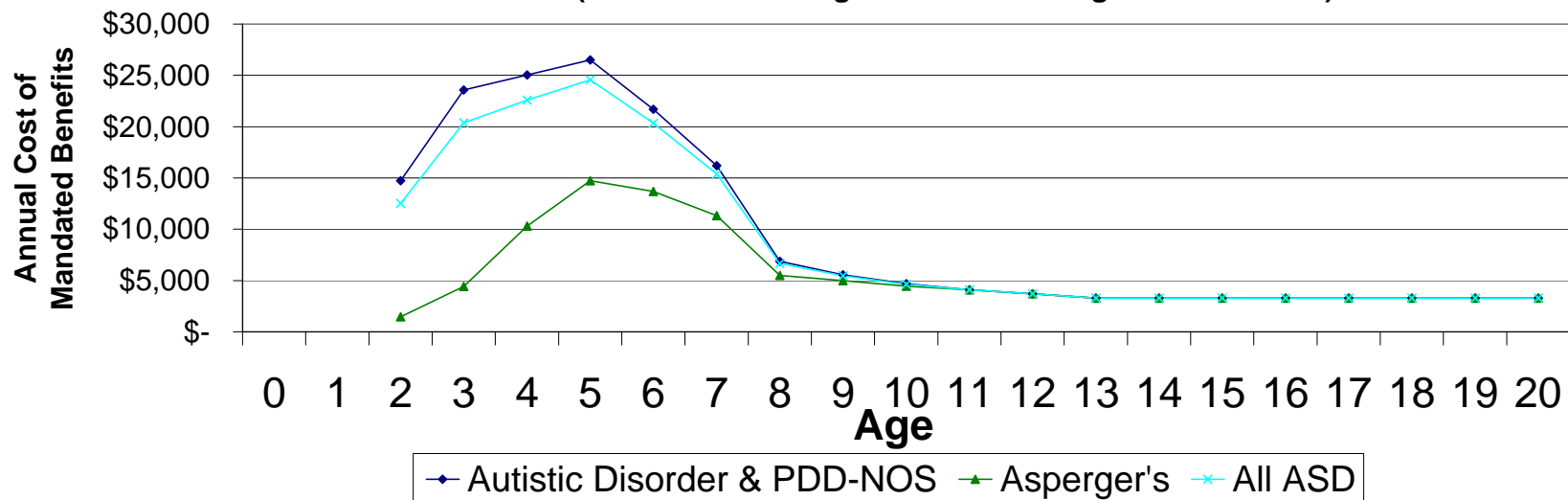


Exhibit V - ABA Utilization vs. Treated Prevalence

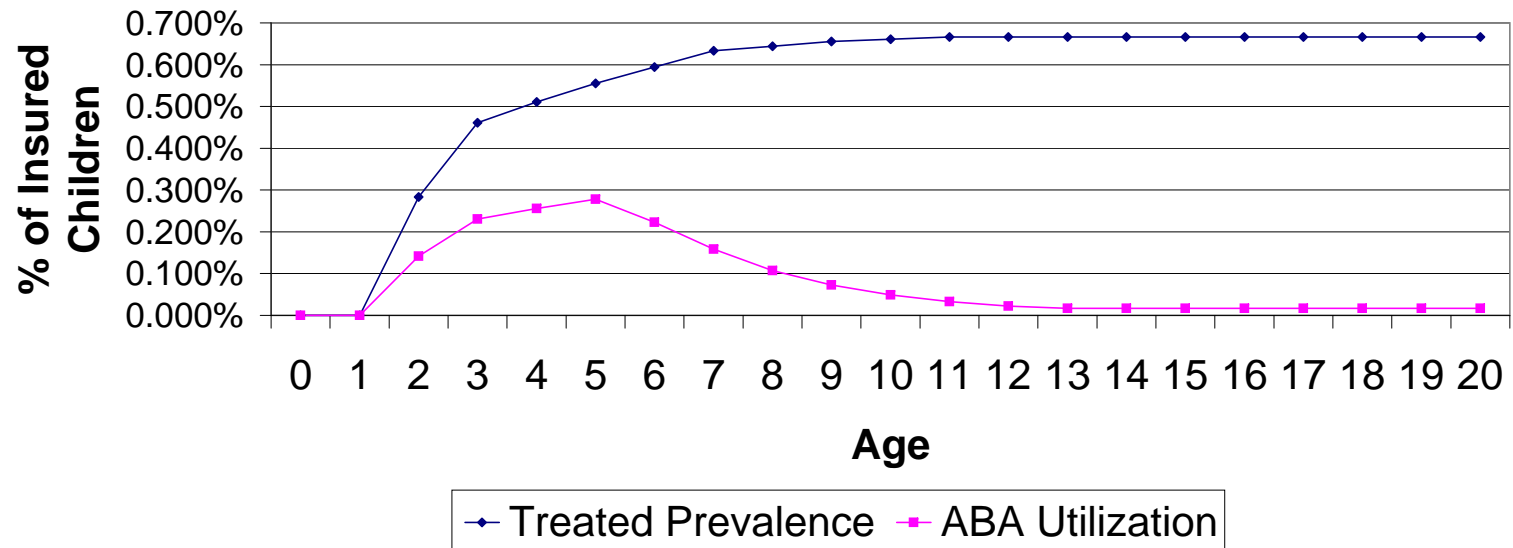
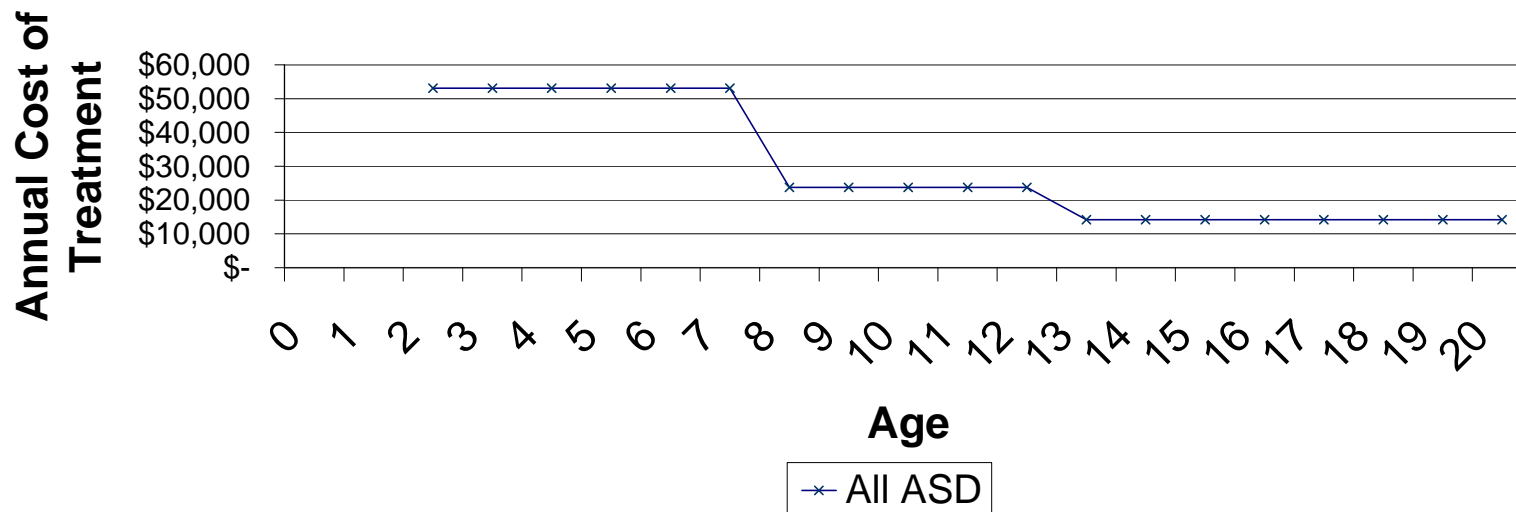


Exhibit VI - Annual Cost per Child With ABA Program



**GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2009**

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BILL DRAFT 2009-SQ-25 [v.1] (02/12)

(THIS IS A DRAFT AND IS NOT READY FOR INTRODUCTION)

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Short Title: Insurance Coverage Autism Spectrum Disorders.

(Public)

Sponsors: .

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO REQUIRE HEALTH BENEFIT PLANS, INCLUDING THE STATE HEALTH
3 PLAN FOR TEACHERS AND STATE EMPLOYEES, TO PROVIDE COVERAGE FOR
4 TREATMENT OF AUTISM SPECTRUM DISORDERS.

5 The General Assembly of North Carolina enacts:

6 SECTION 1. Article 3 of Chapter 58 of the General Statutes is amended by adding
7 a new section to read:

8 "**§ 58-3-192. Coverage for autism spectrum disorders.**

9 (a) Definitions. – As used in this section:

10 (1) "Autism services provider." – Any person, entity, or group that provides
11 treatment of autism spectrum disorders.

12 (2) "Autism spectrum disorders." – Any of the pervasive developmental
13 disorders as defined in the Diagnostic and Statistical Manual of Mental
14 Disorders (DSM-IV), or subsequent edition published by the American
15 Psychiatric Association, or the International Statistical Classification of
16 Diseases and Related Health Problems (ICD-10), or subsequent edition
17 published by the World Health Organization.

18 (3) "Behavioral therapy." – Interactive therapies derived from evidence-based
19 research, including, but not limited to, applied behavior analysis. Applied
20 behavior analysis means the design, implementation, and evaluation of
21 environmental modifications, using behavioral stimuli and consequences, to
22 produce socially significant improvement in human behavior, including, but
23 not limited to, the use of direct observation, measurement, and functional
24 analysis of the relationship between environment and behavior.

25 (4) "Habilitative or rehabilitative care." – Professional, counseling, and guidance
26 services and treatment programs, including behavioral therapy, that are
27 necessary to develop, maintain, and restore, to the maximum extent
28 practicable, the functioning of an individual.

29 (5) "Pharmacy care." – Medications prescribed by a licensed medical doctor and
30 any health-related services deemed medically necessary to determine the
31 need or effectiveness of the medications.

1 (6) "Health plan." – As defined in G.S. 58-3-167. For purposes of this section,
2 "health benefit plan" includes the State Health Plan for Teachers and State
3 Employees.

4 (7) "Therapeutic care." – Services provided by licensed or certified speech
5 therapists, occupational therapists, or physical therapists.

6 (8) "Treatment for autism spectrum disorders." – Includes the following care
7 prescribed, provided, or ordered for an individual diagnosed with one of the
8 autism spectrum disorders by a licensed medical doctor or a licensed
9 psychologist who determines the care to be medically necessary:

10 a. Habilitative or rehabilitative care.

11 b. Pharmacy care.

12 c. Psychiatric care.

13 d. Psychological care.

14 e. Therapeutic care.

15 (b) Every health benefit plan, including the State Health Plan for Teachers and State
16 Employees, shall provide coverage for the diagnosis and treatment of autism spectrum
17 disorders in individuals. No insurer shall terminate coverage or refuse to deliver, execute, issue,
18 amend, adjust, or renew coverage to an individual solely because the individual is diagnosed
19 with one of the autism spectrum disorders or has received treatment for autism spectrum
20 disorders.

21 (c) Coverage under this section shall not be subject to any limits on the number of visits
22 an individual may make to an autism services provider.

23 (d) Coverage under this section may be subject to co-payment, deductible, and
24 coinsurance provisions of a health benefit plan that are not less favorable than the co-payment,
25 deductible, and coinsurance provisions that apply to other medical services covered by the
26 health benefit plan.

27 (e) This section shall not be construed as limiting benefits that are otherwise available
28 to an individual under a health benefit plan.

29 (f) Coverage for behavioral therapy under this section will be subject to a maximum
30 benefit of seventy-five thousand dollars (\$75,000) per year. After December 31, 2011, the
31 Commissioner shall, on an annual basis, adjust the maximum benefit for inflation by using the
32 Medical Care Component of the United States Department of Labor Consumer Price Index for
33 all urban consumers (CPI-U). The Commissioner shall submit the adjusted maximum benefit
34 for publication no later than June of each calendar year; and the published adjusted maximum
35 benefit shall be applicable in the following calendar year to health benefit plans subject to this
36 section. Payments made by an insurer on behalf of a covered individual for any care, treatment,
37 intervention, service, or item unrelated to autism spectrum disorders shall not be applied
38 towards any maximum benefit established under this section.

39 (g) Except for inpatient services, if an individual is receiving treatment for autism
40 spectrum disorders, a health benefit plan shall have the right to request a review of that
41 treatment not more than once every 12 months unless the insurer and the individual's licensed
42 medical doctor or licensed psychologist agrees that a more frequent review is necessary. The
43 cost of obtaining any review shall be borne by the insurer."

44 **SECTION 2.** This act becomes effective January 1, 2011, and applies to all health
45 benefit plans that are delivered, issued for delivery, or renewed within this State, or outside this
46 State if insuring North Carolina residents, on and after that date.

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