

California Health Benefits Review Program

Analysis of California Senate Bill 562 Autism

A Report to the 2021–2022 California State Legislature

April 16, 2021



Key Findings

Analysis of California Senate Bill 562 Autism

Summary to the 2021–2022 California State Legislature, April 16, 2021



SUMMARY¹

The version of California Senate Bill 562 analyzed by CHBRP would alter the current law that requires coverage of behavioral health treatment (BHT) for autistic spectrum disorder (ASD). SB 562 would expand the definition of BHT to include treatment modalities based on developmental theory, would make technical changes to definitions related to network adequacy, and would prohibit denial of coverage based on either lack of parental/caregiver involvement or treatment setting time, or location. In 2022, of the 21.9 million Californians enrolled in state-regulated health insurance, 13.9 million of them would have insurance subject to SB 562.

Benefit Coverage: Postmandate, 74% of enrollees could no longer be denied BHT coverage due to lack of parental involvement and 56% could no longer be denied BHT coverage due to setting. In addition, 23% enrollees would gain coverage for BHT based on developmental theory.

Medical Effectiveness: There is evidence of effectiveness for BHT modalities based on behavioral theory, based on developmental theory, or based on both. There is evidence of effectiveness for BHT delivered in multiple settings. Although outcomes may improve with parent/caregiver involvement, there is evidence that BHT is effective when furnished only by providers.

Cost and Health Impacts²: In 2022, SB 562 would increase total net annual expenditures for commercial/CalPERS enrollees by \$4,112,000 (0.0031%). Among these enrollees, utilization would increase by an *average* of 1.8 hours per year for persons with ASD under 13 year of age already using BHT. For some of these enrollees, the increase may improve outcomes such as intelligence quotient (IQ), language skills, socialization, and adaptive behaviors.

¹ Refer to CHBRP's full report for citations and references.

² Similar cost and health impacts could be expected for the following year, though possible changes in medical science and other aspects of health make stability of impacts less certain as time goes by.

CONTEXT

Behavioral health treatment (BHT) for autistic spectrum disorder (ASD) is on a continuum — from modalities based on behavioral theory, such as applied behavioral analysis (ABA)³, to modalities based on developmental theory, such as developmental social pragmatic model (DSPM). In the middle are modalities based on both behavioral and developmental theories, such as naturalistic developmental behavioral interventions (NDBI).

A current California law⁴ places requirements on plans and policies regulated by the California Department of Managed Care (DMHC) and the California Department of Insurance (CDI). The law:

- Requires coverage for BHT for ASD and specifies that BHT is inclusive of behavioral modalities, specifying those based on a behavioral theory, (ABA).
- Requires provider networks to include qualified autism service (QAS) providers supervising/employing QAS professionals or QAS paraprofessionals and provides definitions for all three.

The law that SB 562 would alter exempts from compliance the benefit coverage of Medi-Cal beneficiaries enrolled in plans or policies regulated by DMHC (see Figure A).

BILL SUMMARY

SB 562 would alter the current law. SB 562 would:

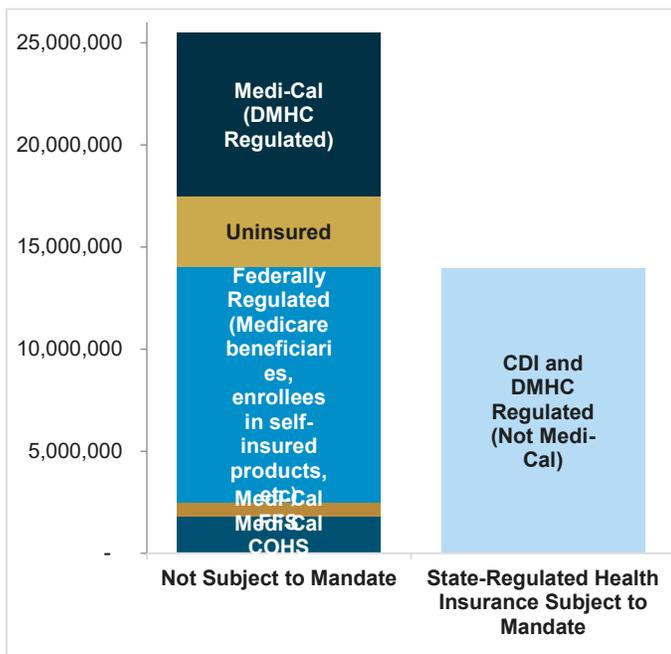
- Expand the definition of BHT to include modalities based on developmental theory, such as those based on developmental social pragmatic model (DSPM).
- Make technical changes to the definitions of QAS providers, professionals, and paraprofessionals.

³ BHT modalities based on ABA are often referred to as "ABA," but each has its own name.

⁴ Health & Safety Code 1374.73 and Insurance Code 10144.51.

- Prohibit denial of coverage for BHT based on:
 - Lack of parental involvement.
 - Setting, location, or time of treatment.

Figure A. Health Insurance in CA and SB 562



Source: California Health Benefits Review Program, 2021.

IMPACTS

Medical Effectiveness

Most studies of BHT are observational studies that compare a specific treatment modality to usual care. This makes it difficult to assess the relative effectiveness of modalities based on behavioral versus hybrid versus developmental theory.

More studies of BHT modalities based on behavioral theory have been published than studies of BHT based on developmental theory or hybrid theories. However,

⁵ *Preponderance of evidence* indicates that the majority of the studies reviewed are consistent in their findings that treatment is either effective or not effective.

⁶ *Inconclusive evidence* indicates that although some studies included in the medical effectiveness review find that a treatment is effective, a similar number of studies of equal quality suggest the treatment is not effective.

⁷ *Limited evidence* indicates that the studies have limited generalizability to the population of interest and/or the studies have a fatal flaw in research design or implementation.

regardless of the theoretical framework underpinning a BHT modality, most studies are observational studies which limits the ability to determine whether changes in outcomes experienced by people with ASD are due to receipt of the BHT modality the study assesses versus other factors that may affect outcomes.

For the modalities based on behavioral theory (ABA):

- There is a *preponderance*⁵ of evidence that Discrete Trials Training improves intelligence quotient and adaptive behavior. Evidence is *inconclusive*⁶ regarding effects on language and academic outcomes.
- There is *limited*⁷ evidence that Pivotal Response Training improves language and communication.

For modalities based on both behavioral and developmental theory (NDBI):

- There is a *preponderance* of evidence that Early Start Denver Model improves language. Evidence regarding effects on ASD severity and symptom outcomes is *inconclusive*.
- There is a *preponderance* of evidence that Social Skills Group therapy improves social behavior.
- Evidence is *inconclusive* regarding the effect of Project ImPACT on communication outcomes.

For modalities based on developmental theory (DSPM):

- There is a *preponderance* of evidence that DIR®/Floortime™ improves communication, engagement, and relationships.
- Evidence is insufficient⁸ regarding effects of Relationship Developmental Intervention on outcomes related to communication, social interaction, and academic placement.
- There is a *preponderance* of evidence that Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH) improves adaptive behavior and motor skills. Evidence is *inconclusive* regarding effects on language and communications outcomes.

⁸ *Insufficient evidence* indicates that there is not enough evidence available to know whether or not a treatment is effective, either because there are too few studies of the treatment or because the available studies are not of high quality. It does not indicate that a treatment is not effective.

Although parent and caregiver involvement in BHT may result in greater improvements, BHT improves outcomes regardless of whether parents or caregivers are involved.

There is a *preponderance* of evidence that BHT can be delivered effectively in multiple settings.

Benefit Coverage, Utilization, and Cost

Provider networks are compliant with the current mandate and although provider networks could change due to the alterations that SB 562 would make in qualified autism service (QAS) provider definitions, CHBRP does not anticipate measurable change within the first year of implementation.

Benefit Coverage

At baseline, 100% of commercial/CalPERS enrollees with health insurance that would be subject to SB 562 have coverage for modalities of BHT based on behavioral theory and hybrid modalities (behavioral and developmental). Postmandate, coverage for modalities based on developmental theory would rise among these enrollees from 77% to 100%.

At baseline, 26% of enrollees with health insurance that would be subject to SB 562 have coverage for BHT regardless of parental involvement, while 44% have coverage regardless of the setting, time, or location for the BHT. Postmandate, 100% of enrollees would have coverage for BHT compliant with SB 562.

Utilization

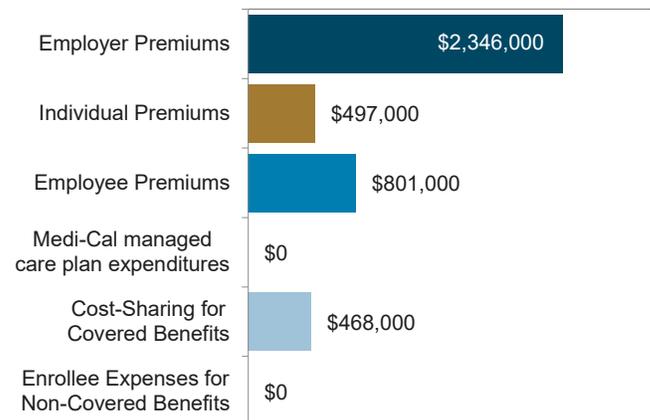
At baseline, the average annual hours of BHT per 1,000 enrollees with ASD is 166.3. The change in the definition of BHT (developmental theory as well as behavioral theory) may alter the mix of used modalities, but is not expected to alter the total number of hours used.

However, CHBRP projects an increase in BHT utilization due to SB 562's prohibition of denials related to parent/caregiver involvement and denials related to treatment setting, time, or location. Since BHT is most commonly used by children with ASD who are under 13 years old, CHBRP projects that the increase in average annual number of hours of BHT will derive from an increase in the moderate users of BHT (10 to 25 hours per week) in that age range. Each provision will separately increase the overall usage hours of BHT. Combined, they will raise the overall average annual hours of BHT per 1,000 enrollees with ASD to 168.2 hours.

Expenditures

As noted in Figure B, SB 562 would increase total net annual expenditures (premiums and enrollee expenses for covered and noncovered benefits) for commercial/CalPERS enrollees in DMHC-regulated plans and CDI-regulated policies by \$4,112,000 (0.0031%).

Figure B. Expenditure Impacts of SB 562



Source: California Health Benefits Review Program, 2021.

Medi-Cal

The law SB 562 would alter exempts from compliance the benefit coverage of Medi-Cal beneficiaries enrolled in DMHC-regulated plans. SB 562 would not alter that exemption and so would have no impact on Medi-Cal.

CalPERS

SB 562 would increase premiums for CalPERS by \$204,000 (0.0035%).

Number of Uninsured in California

Because the change in average premiums does not exceed 1% for any market segment, CHBRP would expect no measurable change in the number of uninsured persons due to the enactment of SB 562.

Public Health

Commercial/CalPERS enrollees with ASD under 13 years of age who already use BHT would increase their utilization by an *average* of 1.8 hours per year per BHT user in 2022. Based on the evidence, CHBRP finds that such an increase would not likely have a public health impact in the first year, postmandate. However, the

increase in BHT hours may improve BHT outcomes such as intelligence quotient (IQ), language skills, socialization, and adaptive behaviors on an individual basis for some persons with ASD.

Long-Term Impacts

After the small increase in utilization in the first 12 months, there is no indication in the research literature that the trends will change much over time. The overall number of commercial/CalPERS enrollees in DMHC-regulated plans or CDI-regulated policies with ASD who use BHT is expected to remain generally constant over time. CHBRP therefore does not estimate any change in long-term impacts in utilization, because the rate of BHT use will also remain generally consistent over time.

Over the long-term, the first-year cost increase findings would apply annually thereafter. However, the research literature has shown that BHT in children with autism improves their overall health and functioning over time,

including gains made for adolescents. Therefore, it is likely that the improvements in health outcomes that result from receipt of BHT among younger children with ASD will result in overall lower health care costs over their lifetimes, although this cannot be quantified.

Essential Health Benefits and the Affordable Care Act

For two reasons, SB 562 would not trigger financial costs to the state for exceeding EHBs. First, SB 562 alters the terms and conditions of an existing benefit mandate law, but does not require an additional benefit to be covered. Second, the current law that SB 562 would alter expressly indicates that it ceases to function if it exceeds EHBs and SB 562 does not eliminate this clause of the current law. Thus, neither the current law nor the version SB 562 would create would function if deemed to exceed EHBs.

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The California Health Benefits Review Program (CHBRP) was established in 2002. As per its authorizing statute, CHBRP provides the California Legislature with independent analysis of the medical, financial, and public health impacts of proposed health insurance benefit-related legislation. The state funds CHBRP through an annual assessment on health plans and insurers in California.

An analytic staff based at the University of California, Berkeley, supports a task force of faculty and research staff from multiple University of California campuses to complete each CHBRP analysis. A strict conflict-of-interest policy ensures that the analyses are undertaken without bias. A certified, independent actuary helps to estimate the financial impact. Content experts with comprehensive subject-matter expertise are consulted to provide essential background and input on the analytic approach for each report.

More detailed information on CHBRP's analysis methodology, authorizing statute, as well as all CHBRP reports and other publications, are available at www.chbrp.org.

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Table 1. SB 562 Impacts on Benefit Coverage, Utilization, and Cost, 2022

| | Baseline | Postmandate | Increase/ Decrease | Change Postmandate |
|---|--------------------------|--------------------------|-----------------------|-----------------------|
| Benefit Coverage | | | | |
| Total enrollees with health insurance subject to state-level benefit mandates (a) | 21,945,000 | 21,945,000 | 0 | 0.00% |
| Total enrollees with health insurance subject to SB 562 | 13,940,000 | 13,940,000 | 0 | 0.00% |
| Percentage of enrollees with coverage for BHT for ASD | 100% | 100% | 0% | 0.00% |
| Percentage of enrollees with coverage for | | | | |
| Behavioral modality, such as Pivotal Response Training | 100% | 100% | 0% | 0% |
| Hybrid modality, such as Early Start Denver Model | 100% | 100% | 0% | 0% |
| Developmental modality, such as DIR®/Floortime™ | 77% | 100% | 23% | 31% |
| BHT for ASD regardless of parental involvement | 26% | 100% | 74% | 285% |
| BHT for ASD regardless of setting/time/location | 44% | 100% | 56% | 127% |
| Utilization and Cost | | | | |
| Number of enrollees with ASD | 43,000 | 43,000 | — | 0% |
| Number of enrollees with ASD using BHT | 24,000 | 24,000 | — | 0% |
| Average annual hours of BHT per user | 166.3 | 168.2 | 1.8 | 1% |
| Average unit cost (per hour) | \$85.03 | \$85.03 | \$0.00 | 0% |
| Expenditures | | | | |
| <i>Premium (expenditures) by payer</i> | | | | |
| Private employers for group insurance | \$55,032,803,000 | \$55,034,945,000 | \$2,142,000 | 0.0039% |
| CalPERS HMO employer expenditures (b) (c) | \$5,765,017,000 | \$5,765,221,000 | \$204,000 | 0.0035% |
| Medi-Cal Managed Care Plan expenditures | \$24,150,529,000 | \$24,150,529,000 | \$0 | 0.0000% |
| <i>Enrollee premiums (expenditures)</i> | | | | |
| Enrollees for individually purchased insurance | \$15,847,507,000 | \$15,848,004,000 | \$497,000 | 0.0031% |
| Individually purchased – outside Exchange | \$4,890,852,000 | \$4,891,013,000 | \$161,000 | 0.0033% |
| Individually purchased – Covered California | \$10,956,655,000 | \$10,956,991,000 | \$336,000 | 0.0031% |
| Enrollees with group insurance, CalPERS HMOs, Covered California, and Medi-Cal Managed Care (c) | \$20,753,446,000 | \$20,754,247,000 | \$801,000 | 0.0039% |
| <i>Enrollee out-of-pocket expenses</i> | | | | |
| Cost-sharing for covered benefits (deductibles, copayments, etc.) | \$13,168,032,000 | \$13,168,500,000 | \$468,000 | 0.0036% |
| Expenses for noncovered benefits (d) (e) | — | — | — | — |
| Total Expenditures | \$134,717,334,000 | \$134,721,446,000 | \$4,112,000 | 0.0031% |

Source: California Health Benefits Review Program, 2021.

Notes: (a) Enrollees in plans and policies regulated by DMHC or CDI aged 0 to 64 years as well as enrollees 65 years or older in employer-sponsored health insurance. This group includes commercial enrollees (including those associated with Covered California or CalPERS).

(b) Of the increase in CalPERS employer expenditures, about 54.1% or \$110,000 would be state expenditures for CalPERS members who are state employees or their dependents.

(c) Enrollee premium expenditures include contributions by employees to employer-sponsored health insurance, health insurance purchased through Covered California, and contributions to Medi-Cal Managed Care.

(d) Includes only expenses paid directly by enrollees (or other sources) to providers for services related to the mandated benefit that are not covered by insurance at baseline. This only includes those expenses that will be newly covered postmandate. Other components of expenditures in this table include all health care services covered by insurance.

(e) Although enrollees with newly compliant benefit coverage may have paid for some before SB 562 that was denied due to setting/time/location or lack of parental involvement, CHBRP cannot estimate the frequency with which such situations may have occurred and therefore cannot estimate the related expense.

Key: ASD = autism spectrum disorder; BHT = behavioral health treatment; CalPERS HMOs = California Public Employees' Retirement System Health Maintenance Organizations; CDI = California Department of Insurance; DMHC = Department of Managed Health Care.

POLICY CONTEXT

The California Senate Committee on Health has requested that the California Health Benefits Review Program (CHBRP)⁹ conduct an evidence-based assessment of the medical, financial, and public health impacts of SB 562 Autism.

Bill-Specific Analysis of SB 562 Autism

SB 562 would alter a current benefit mandate law to include a more expansive definition of behavioral health therapy (BHT) for enrollees diagnosed with autism spectrum disorder (ASD).

Current law (H&S Code 1374.73 and Ins Code 10144.51):

- Requires coverage for behavioral health treatment (BHT) for autism spectrum disorder (ASD) and specifies that BHT is inclusive of evidence-based behavioral treatments like modalities based on applied behavioral analysis (ABA);
- Requires plan/policy networks to include qualified autism service (QAS) providers supervising/employing QAS professionals or QAS paraprofessionals;
- Offers definitions for QAS providers, QAS professionals, and QAS paraprofessionals; and
- Exempts from compliance the health insurance of:
 - Enrollees in specialized health plans/policies; and
 - Medi-Cal beneficiaries enrolled in plans or policies regulated by DMHC.

SB 562 would alter the existing law in the following ways:

- Expand the definition BHT to include any “program based on behavioral, developmental, relationship-based, or other evidence-based models” and would specify that coverage is required for ABA “and other behavior-based intervention programs,” thereby requiring coverage of additional forms of BHT. As applied behavioral analysis (ABA) is a behavioral theory, the expansion would require the coverage of treatments based on developmental theory. Further discussion of the varied forms of BHT for ASD is included in the *Medical Effectiveness* section.
- Make technical changes to the definitions of QAS providers, professionals, and paraprofessionals, including the elimination of reference to the Welfare and Institutions Code
- Prohibit denial of BHT coverage based on setting, location, time, or lack of parental or caregiver involvement.

The full text of SB 562 can be found in Appendix A.

Relevant Populations

If enacted, SB 562 would apply to the health insurance of approximately 13.9 million enrollees (35% of all Californians). This represents 64% of the 21.9 million Californians who will have health insurance regulated by the state that may be subject to any state health benefit mandate law, which includes health insurance regulated by the California Department of Managed Health Care (DMHC) or the California Department of Insurance (CDI). If enacted, the law would apply to the health insurance of commercial/CalPERS enrollees in DMHC-regulated plans and CDI-regulated policies, exempting the health insurance of Medi-Cal beneficiaries enrolled in DMHC-regulated plans.

⁹ CHBRP’s authorizing statute is available at www.chbrp.org/about_chbrp/faqs/index.php.

Analytic Approach and Key Assumptions

CHBRP previously analyzed similar bill language, SB 163 in 2019. Where applicable, this analysis builds from that previous analysis.

For the purposes of this analysis, CHBRP has assumed that the altered definition of BHT would require coverage of developmental-based modalities (such as DIR®/Floortime™) as well as behavior-based modalities (such as Pivotal Response Training) and hybrid modalities (such as Early Start Denver Model and Social Skills Group Therapy). All are further described in the *Medical Effectiveness* section.

Interaction With Existing State and Federal Requirements

Health benefit mandates may interact and align with the following state and federal mandates or provisions.

California Policy Landscape

California law and regulations

As noted, SB 562 would amend the current benefit mandate law¹⁰ that addresses BHT for ASD.

Similar requirements in other states

The District of Columbia and 47 states (ASHA, 2021) have implemented health insurance benefit mandates related to treatment for ASD. Some states identify treatments for which coverage is specifically required. Over half of the benefit mandates specifically require coverage for treatments based on applied behavioral analysis (ABA), and so require coverage for some modality of behavior-based treatment for ASD.

CHBRP is unaware of any state with a mandate that defines QAS providers, QAS professionals, and QAS paraprofessionals.

CHBRP is unaware of any state with a mandate that prohibits coverage denials related to parent/caregiver enrollment, setting, location, or time of treatment.

Federal Policy Landscape

Affordable Care Act

A number of Affordable Care Act (ACA) provisions have the potential to or do interact with state benefit mandates. Below is an analysis of how SB 562 may interact with requirements of the ACA as presently exist in federal law, including the requirement for certain health insurance to cover essential health benefits (EHBs).^{11,12}

Any changes at the federal level may impact the analysis or implementation of this bill, were it to pass into law. However, CHBRP analyzes bills in the current environment given current law and regulations.

¹⁰ Health & Safety Code 1374.73 and Insurance Code 10144.51.

¹¹ The ACA requires nongrandfathered small-group and individual market health insurance — including but not limited to QHPs sold in Covered California — to cover 10 specified categories of EHBs. Policy and issue briefs on EHBs and other ACA impacts are available on the CHBRP website: www.chbrp.org/other_publications/index.php.

¹² Although many provisions of the ACA have been codified in California law, the ACA was established by the federal government, and therefore, CHBRP generally discusses the ACA as a federal law.

Essential Health Benefits

Nongrandfathered plans and policies sold in the individual and small-group markets are required to meet a minimum standard of benefits as defined by the ACA as essential health benefits (EHBs). In California, EHBs are related to the benefit coverage available in the Kaiser Foundation Health Plan Small Group Health Maintenance Organization (HMO) 30 plan, the state's benchmark plan for federal EHBs.^{13,14} CHBRP estimates that approximately 4 million Californians (10%) have insurance coverage subject to EHBs in 2021.¹⁵

States may require plans and policies to offer benefits that exceed EHBs.¹⁶ However, a state that chooses to do so must make payments to defray the cost of those additionally mandated benefits, either by paying the purchaser directly or by paying the qualified health plan.^{17,18} Health plans and policies sold outside of the health insurance marketplaces are not subject to this requirement to defray the costs. State rules related to provider types, cost sharing, or reimbursement methods would not meet the definition of state benefit mandates that could exceed EHBs.¹⁹

As SB 562 would alter the terms and conditions of benefit coverage but would not require additional benefit coverage SB 562 appears not to exceed the definition of EHBs in California.

¹³ CCIIO, Information on Essential Health Benefits (EHB) Benchmark Plans. Available at: <https://www.cms.gov/ccio/resources/data-resources/ehb.html>.

¹⁴ H&SC Section 1367.005; IC Section 10112.27.

¹⁵ CHBRP, *Estimates of Sources of Health Insurance in California in 2021*. Available at: www.chbrp.org/other_publications/index.php.

¹⁶ ACA Section 1311(d)(3).

¹⁷ State benefit mandates enacted on or before December 31, 2011, may be included in a state's EHBs, according to the U.S. Department of Health and Human Services (HHS). Patient Protection and Affordable Care Act: Standards Related to Essential Health Benefits, Actuarial Value, and Accreditation. Final Rule. Federal Register, Vol. 78, No. 37. February 25, 2013. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2013-02-25/pdf/2013-04084.pdf>.

¹⁸ However, as laid out in the Final Rule on EHBs HHS released in February 2013, state benefit mandates enacted on or before December 31, 2011, would be included in the state's EHBs, and there would be no requirement that the state defray the costs of those state-mandated benefits. For state benefit mandates enacted after December 31, 2011, that are identified as exceeding EHBs, the state would be required to defray the cost.

¹⁹ Essential Health Benefits. Final Rule. A state's health insurance marketplace would be responsible for determining when a state benefit mandate exceeds EHBs, and QHP issuers would be responsible for calculating the cost that must be defrayed.

BACKGROUND ON AUTISM SPECTRUM DISORDER

Autism spectrum disorder (ASD)²⁰ is a developmental disability characterized by deficits in social interactions and communication, sensory processing, stereotypic (repetitive) behaviors or interests, and sometimes cognitive function (APA, 2021). As reflected by the phrase “autism spectrum disorder,” the symptoms of ASD fall along a continuum, ranging from mild impairment to profound disability.

ASD diagnoses are often made early in life, as individuals often demonstrate symptoms in early childhood. ASD can sometimes be detected by the age of 18 months, with reliable diagnoses by age 2 (CDC, 2021). The Centers for Disease Control and Prevention (CDC) supports the Autism and Developmental Disabilities Monitoring (ADDM) Network, an ongoing autism surveillance program of 11 sites across the United States. According to its 2016 findings, about 44% of U.S. children diagnosed with ASD who were 8 years old and born in the state of residence were evaluated for developmental concerns by age 3 years (Maenner et al., 2020). Among the children with a clinical ASD diagnosis, the median age at ASD diagnosis was 51 months, and black children had an older median age at diagnosis than white children (Maenner et al., 2020). The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) stated that persons with a diagnosis of autistic disorder, Asperger’s disorder, or pervasive developmental disorder not-otherwise-specified should be given the diagnosis of ASD (APA, 2013). Note that individuals whose symptoms do not manifest until later in life may receive a retroactive diagnosis but may not receive critical early interventions.

The cause (or causes) of ASD remain unknown, and research into genetic etiology, as well as environmental factors, continues to be explored. There is no cure for ASD; however, there is evidence that treatment, including behavioral health treatment (BHT), may improve some symptoms (see the *Medical Effectiveness* section).

Autism Spectrum Disorder Prevalence in California

Ascertaining the true prevalence of ASD in California is challenging without a registry system. Counts of persons diagnosed with ASD may be obtained from a variety of sources such as private insurance claims data, Medi-Cal (including Medi-Cal managed care plans) reports or claims and encounter data, the public school system, and Department of Developmental Services (DDS). Counts from these sources likely overlap, but it is unknown to what degree.

CHBRP’s following statewide estimate of ASD prevalence is based on data from the DDS and two California-specific studies. DDS frequently provides the initial ASD diagnosis and treatment referrals for those children meeting certain disability criteria (including ASD), regardless of income level. This estimate may be an undercount since families of children with ASD may access care through private insurance or payment out of pocket; thus, they may not have interacted with DDS.

As noted in the *Benefits Coverage, Utilization, and Cost* section, SB 562 is primarily expected to impact utilization among enrollees aged 12 years or less. CHBRP estimates that in 2016, the prevalence of ASD in California children (aged 0 to 9 years) was about 160 in 10,000. National data for 2016 show prevalence estimates of 185 in 10,000 children aged 8 years (Maenner et al., 2020).

²⁰ Previously referred to as “pervasive developmental disorder / autism (PDD/A),” CHBRP now uses “ASD” to align with the most current clinical diagnostic designation in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and ICD-10 classification systems.

Disparities²¹ and Social Determinants of Health²² in Autism Spectrum Disorders

Per statute, CHBRP includes discussion of disparities and social determinants of health (SDoH) as it relates to the ASD. Disparities are noticeable and preventable differences between groups of people.

Differences and Disparities in ASD Prevalence

Gender differences

In 2020, the CDC reported that the ASD prevalence rate among 8-year-old males in the 11 ADDM network sites was 4.3 times higher than in females (Maenner et al., 2020), similar to the 4.2 times shown in a California DDS report from the same year (DDS, 2021). DDS also reported that the male-dominated prevalence crossed all races and geographic regions in California (DDS, 2009).

Race/ethnicity differences

Although U.S. surveys previously reported a greater prevalence of ASD among white children than among black and Hispanic children (Baio et al., 2018; Hill et al., 2016), data from 2016 show no difference for white and black children (Maenner et al., 2020). While lower percentages of Hispanic children were identified with ASD in 2016, the differences were narrowing over time (Maenner et al., 2020). In California, among those with ASD served by DDS (the largest California-specific dataset for ASD), Hispanics outnumbered whites (DDS, 2021). Specifically, DDS reported that among those receiving DDS services for ASD, Hispanics accounted for 38% of recipients, followed by whites (28%), Asians (9%), and blacks (7%) (DDS, 2021). However, the proportion of individuals receiving DDS services who are enrollees in DMHC-regulated plans or CDI-regulated policies is unknown. The racial/ethnic distribution of children with ASD within the privately insured population is also unknown. One California study showed blacks having the highest ASD prevalence in birth year 2013, with 1.8%, compared to whites at 1.5% and Hispanics at 1.2% (Nevison and Parker, 2020); another study showed similar prevalence rates for whites and Hispanics at 1.2% for birth year 2013 (Nevison and Zahorodny, 2019).

Disparities in Access to Behavioral Health Treatment for ASD

Treatments for ASD include a number of modalities that are based on a variety of theoretical models (see the Medical Effectiveness section). Studies of children with ASD consistently show that children from low-income, less educated, and more rural families are less likely to receive BHT than their higher income, better educated, and urban counterparts. One study revealed that parents with a lower educational level accessed less intensive therapies compared to parents with higher educational levels who accessed higher intensity services. (Siller et al., 2014). A similar pattern was observed with geographic location with children in rural areas accessing less intensive services and individual treatment (Monz et al., 2019). Another study using data from the 2009/2010 National Survey of Children with Special Health Care Needs indicated that parents of Latino and black children with ASD were 45% less likely than whites to report that providers spent adequate time with their children, and were about 40% less likely to feel that their child's special needs provider was sensitive to their values and customs (Magana et al., 2015). Latino children in families whose primary language was not English also were less likely to utilize

²¹ Several competing definitions of "health disparities" exist. CHBRP relies on the following definition: Health disparity is defined as the differences, whether unjust or not, in health status or outcomes within a population. (Wyatt et al., 2016).

²² CHBRP defines social determinants of health as conditions in which people are born, grow, live, work, learn, and age. These social determinants of health (economic factors, social factors, education, physical environment) are shaped by the distribution of money, power, and resources and impacted by policy (adapted from: (CDC, 2014; Healthy People 2020, 2019). See CHBRP's SDoH white paper for further information: http://chbrp.com/analysis_methodology/public_health_impact_analysis.php.

individual treatment with 32.5% indicating they did not receive services compared to 24.3% who did (Nguyen et al., 2016).

Qualified autism service (QAS) provider shortages are less well documented, but literature suggests that provider shortages create unique barriers to BHT for low-income and rural families. For example, interviews with stakeholders in five states with autism insurance mandates, including California, reported that families were better able to access treatment services after the mandates were enacted, but that both consumer advocates and insurance companies reported shortages of licensed providers (Baller et al., 2016). To further complicate matters, stakeholders reported that low insurance reimbursement rates discourage QAS providers from accepting private insurance (Baller et al., 2016). A literature review found three of six studies on geographic variation in age of autism diagnosis (the start of autism treatment services) identified barriers for rural compared to urban families (Daniels and Mandell, 2014). Additionally, two qualitative studies (with sample sizes of 96 and 35 respondents, respectively) also found rural families had more difficulty than urban families in accessing ASD providers for timely diagnosis and treatment of ASD (Elder et al., 2016; Murphy and Ruble, 2012).

Social Determinants of Health (SDoH)

Although SDoH generally occur prior to or outside of the health care system and are highly correlated with downstream events such as avoidable illnesses and premature death, the relationship between SDoH and health status/outcomes is complex, and periodically, health insurance can influence SDoH.²³ In the case of SB 562, CHBRP found a dearth of literature discussing the effects of gender, race, and income on parental involvement in BHT.

Societal Impact of Autism Spectrum Disease in California

The presence of ASD in California has direct and indirect economic and societal costs. The *Benefit Coverage, Utilization, and Cost Impacts* estimates direct cost impacts on payers, including enrollees. Such figures represent a subset of the total societal impact related to ASD.

²³ For more about SDoH, see *Incorporating Relevant Social Determinants of Health into CHBRP Benefit Mandate Analyses*, available at www.chbrp.org/analysis_methodology/public_health_analysis.php.

MEDICAL EFFECTIVENESS

As discussed in the *Policy Context* section, SB 562 would mandate coverage of behavioral health treatment (BHT) based on applied behavior analysis, developmental and relationship-based models, and other evidence-based behavior intervention programs for autism spectrum disorder (ASD). Additional information on disease/condition is included in the *Background* section. The medical effectiveness review summarizes findings from evidence²⁴ on behavioral health therapy, impact of qualifications of BHT providers, impact of parent or caregiver involvement, effectiveness of BHT in different settings, and harms of BHT for ASD.

BHT aims to modify the behavior of individuals with ASD and improve their cognitive, language, and social functioning by assessing environmental stimuli and reinforcing appropriate responses. These services are generally delivered by QAS providers, professionals, and paraprofessionals. As illustrated in Figure 1. Continuum of Behavioral Theories and Treatment Modalities below, BHT treatment can also be described as a continuum from treatment modalities based primarily on behavioral theory (often referred to as applied behavioral analysis [ABA]) to treatments based primarily on developmental theory. Hybrid modalities, which draw from both behavioral theory and developmental theory fall at the middle of this continuum. Existing law explicitly requires coverage for BHT treatment modalities based on behavioral theory. SB 562 would amend existing law to explicitly require coverage for BHT treatment modalities based on developmental theory.

Figure 1. Continuum of Behavioral Theories and Treatment Modalities

| Examples of Modalities | Theoretical Model | | |
|------------------------|---|--|--|
| | Behavioral | Hybrid | Developmental |
| | Applied Behavioral Analysis (ABA) <ul style="list-style-type: none"> Discrete Trial Training (DTT), also known as Lovaas method Pivotal Response Therapy (PRT) | Naturalistic Developmental Behavioral interventions (NDBI) <ul style="list-style-type: none"> Early Start Denver Model (ESDM) Project ImPACT Social Skills Group | Developmental Social Pragmatic Model (DSPM) <ul style="list-style-type: none"> DIR®/Floortime™ Relationship Developmental Intervention® |

Source: California Health Benefits Review Program, 2019.

Treatments based on behavioral theory (ABA) fall at the behavioral end of the continuum. These treatments are grounded in B.F. Skinner’s research on the use of rewards or punishments to incentivize desirable behaviors. Treatments based on behavioral theory (ABA) use reinforcement to teach people with ASD basic social skills such as attention, compliance, and imitation (Howlin et al., 2009; Tchaconas and Adesman, 2013). During the 1970s and 1980s, Ivar Lovaas, a professor at the University of California, Los Angeles, drew upon behavioral theory (ABA) to develop discrete trial training (DTT), a treatment through which children with ASD are taught individual skills through drill-based, repetitive trials initiated by a therapist. Pivotal Response Treatment (PRT) is another treatment based on behavioral theory (ABA) that incorporates features that are associated with better response to treatment, including giving children a choice of activities, varying tasks, and interspersing training aimed at maintaining skills and training aimed at acquiring new skills (Mohammadzaheri et al., 2014).

²⁴ Much of the discussion in this section is focused on reviews of available literature. However, as noted in the section on Implementing the Hierarchy of Evidence on page 11 of the *Medical Effectiveness Analysis and Research Approach* document (posted at http://chbrp.com/analysis_methodology/medical_effectiveness_analysis.php), in the absence of fully applicable to the analysis peer-reviewed literature on well-designed randomized controlled trials (RCTs), CHBRP’s hierarchy of evidence allows for the inclusion of other evidence.

Other BHTs are based on the developmental social pragmatic model (DSPM), which is grounded in developmental theory. This theory holds that poor attachment to parents and caregivers is the primary cause of problematic behaviors associated with ASD. The goals of treatments based on this theory are to strengthen emotional bonds between people with ASD and their parents or caregivers and encourage children to learn through guided exploration (Thompson, 2013). Examples of BHTs based on developmental social pragmatic theory include the Developmental, Individual Differences, Relationship-Based model (DIR®/Floortime™), and Relationship Development Intervention (RDI™). Both of these treatments involve consultation with a therapist trained to provide the particular treatment who trains parents to provide therapy. Treatment and Education of Autistic and Communications-Handicapped Children (TEACCH) is another treatment modality based on developmental theory that emphasizes the use of visual cues to help children with ASD improve attention, executive function, and motivation for social communication (Thompson, 2013).

Other forms of BHT are characterized as naturalistic developmental behavioral interventions (NDBI). These interventions combine elements based on behavioral theory (ABA) with elements based on the DSPM. The Early Start Denver Model (ESDM), a comprehensive, play-based intervention, is the most widely studied hybrid model (Dawson et al., 2010; Tchaconas and Adesman, 2013). Therapists provide treatment to children and also train parents or caregivers to use ESDM strategies during everyday activities with children, such as feeding, bathing, and play. Social Skills Groups (SSGs) are an intervention that focuses on improving the social skills of people with ASD that is often used to treat people with less severe forms of ASD or to augment more intensive BHT treatments. The methods that therapists use to train children in SSGs are based on behavioral theory (ABA) but the specific social skills taught are tailored to the level of development of the children participating in a group. For example, an SSG that enrolls elementary school children would emphasize different social skills than an SSG that enrolls adolescents. Other examples of treatment modalities based on NDBI include Project IMPACT, which aims to improve the communication and social skills of children with ASD through daily activities and routines.

Research Approach and Methods

Studies of BHT were identified through searches of CINAHL Complete, Cochrane Library, Medline Complete, PsycInfo, PubMed, Scopus, and Web of Science Core Collection.

The search was limited to abstracts of studies published in English.

The search was limited to studies published from 2019 to present because CHBRP had previously conducted thorough literature searches on these topics in 2019 for SB 163.

Because the bill focuses on expanding the law's existing definition of evidence-based BHT, studies of screening and diagnosis of ASD and studies of treatment that are not related to BHT (e.g., drug therapies for ASD) were omitted.

Of the 263 articles found in the literature review, 61 articles were reviewed for potential inclusion in this report, as were a systematic review and an article about Pivotal Response Training that content experts recommended. Four articles cited in submissions from interested parties were included. One additional article was identified. A total of 37 articles were included in the medical effectiveness review of this report. The other articles were eliminated because they did not focus on autism spectrum disorder, did not focus on the effectiveness of BHT, or were of poor quality. A more thorough description of the methods used to conduct the medical effectiveness review and the process used to grade the evidence for each outcome measure is presented in Appendix B.

The medical effectiveness review also presents findings from the studies that were included in CHBRP's earlier reports on bills relevant to SB 562. A more thorough description of the methods used to conduct the medical effectiveness review and the process used to grade the evidence for each outcome measure is presented in Appendix B.

The conclusions below are based on the best available evidence from peer-reviewed literature.²⁵ Unpublished studies are not reviewed because the results of such studies, if they exist, cannot be obtained within the 60-day timeframe for CHBRP reports.

Key Questions

1. Does BHT improve behavior and cognitive, language, and social functioning among people with ASD?
2. What is the comparative effectiveness of BHT modalities based on behavioral theory (ABA), developmental/relationship theory, or a combination of these theories?
3. Do the qualifications of personnel who provide BHT affect the effectiveness of BHT?
4. Does involvement of parents or caregivers affect the effectiveness of BHT?
5. Does the setting in which BHT is provided affect the effectiveness of BHT?

Methodological Considerations

The amount of evidence regarding effectiveness varies across BHT based on behavioral theory (ABA), BHT based on developmental theory, and hybrid BHT modalities. Many more studies of BHT modalities based on behavioral theory (ABA) have been published than have studies of BHT modalities based on developmental theory and hybrid BHT modalities.

The strength of evidence regarding the effectiveness of BHT also varies across BHT modalities based on different theoretical models. Since the publication of the SB 163 report, researchers have published several new RCTs of BHT modalities based on behavioral theory (ABA), developmental theory, and hybrids of the two theories (e.g., ESDM). In contrast, CHBRP did not identify any controlled studies of RDI. CHBRP did not identify any new RCTs of interventions based on discrete trials training, DIR®/Floortime™, Treatment and Education of Autistic and Related Communication-handicapped Children (TEACCH), and Project ImPACT published since the SB 163 report. RCTs provide the strongest evidence of the efficacy of BHT because participants are randomly assigned to receive the BHT treatment the researchers are testing or to a control group. Random assignment increases the likelihood that any differences that are found between the treatment and control groups are due to the BHT treatment being tested and not to differences between the people with ASD in the treatment and control groups. However, many of the RCTs that CHBRP identified had small sample sizes, which may affect the external validity of their findings.

Most studies of BHT compare outcomes for people with ASD who receive a specific BHT treatment to people with ASD who receive “usual care,” which often consists of a mix of BHT treatments with different theoretical foundations (sometimes referred to as “eclectic treatment”). This research design is understandable because people with ASD often exhibit challenging behaviors and have limitations in cognitive, language, and social skills. These needs make it difficult to justify conducting studies in which no intervention is provided to people in the comparison group. Comparing people with ASD who receive a specific form of BHT to those who receive usual care ensures that all people participating in the study receive some form of BHT. A few studies use a “wait list” control design in which all persons receive both usual care and an additional form of BHT, but outcomes of the additional treatment are assessed only for people who are assigned to receive treatment first (i.e., people not on the waitlist). This research design enables everyone who participates in the study to receive the BHT modality that is being studied but

²⁵ Grey literature consists of material that is not published commercially or indexed systematically in bibliographic databases. For more information on CHBRP’s use of grey literature, visit http://chbrp.com/analysis_methodology/medical_effectiveness_analysis.php.

allows for assessment of the impact of adding this treatment to usual care. CHBRP identified one study that directly compared BHT treatments based on ABA to BHT treatments based on DSPM. CHBRP identified one study that compared treatment based on ABA to hybrid modalities.

Some studies compare intensive BHT based on behavioral theory (ABA), often defined as BHT provided for 25 or more hours per week to less intensive BHT based on other theoretical frameworks. For example, treatments based on behavioral theory (ABA), particularly Discreet Trials Training (DTT), are often provided for more hours per week than treatments based on developmental theory. The difference in intensity makes it difficult to assess whether differences in outcomes between treatment and control groups are due to differences in the treatments provided or in the amount of treatment provided.

Outcomes Assessed

The outcomes assessed by studies included in this review include measures of cognitive functioning (such as IQ), development quotients, communication, language, social functioning, social skills, adaptive behavior, treatment fidelity, and changes in symptomatology.

Study Findings

This following section summarizes CHBRP's findings regarding the strength of evidence for the effectiveness of behavioral health therapy, impact of qualifications of BHT providers, impact of parent or caregiver involvement, effectiveness of BHT in different settings, and harms of BHT for ASD. Each section is accompanied by a corresponding figure. The title of the figure indicates the test, treatment, or service for which evidence is summarized. The statement in the box above the figure presents CHBRP's conclusion regarding the strength of evidence about the effect of a particular test, treatment, or service based on a specific relevant outcome and the number of studies on which CHBRP's conclusion is based. Definitions of CHBRP's grading scale terms is included in the box below, and more information is included in Appendix B.

The following terms are used to characterize the body of evidence regarding an outcome:

Clear and convincing evidence indicates that there are multiple studies of a treatment and that the large majority of studies are of high quality and consistently find that the treatment is either effective or not effective.

Preponderance of evidence indicates that the majority of the studies reviewed are consistent in their findings that treatment is either effective or not effective.

Limited evidence indicates that the studies have limited generalizability to the population of interest and/or the studies have a fatal flaw in research design or implementation.

Inconclusive evidence indicates that although some studies included in the medical effectiveness review find that a treatment is effective, a similar number of studies of equal quality suggest the treatment is not effective.

Insufficient evidence indicates that there is not enough evidence available to know whether or not a treatment is effective, either because there are too few studies of the treatment or because the available studies are not of high quality. It does not indicate that a treatment is not effective.

More information is available in Appendix B.

Effectiveness of BHT

Treatment modalities based on behavioral theory (ABA)

Discrete Trials Training (DTT)

For its reports on SB 126²⁶ and SB 163, CHBRP reviewed studies of early intensive behavioral interventions (EIBI) for ASD that utilize DTT as the primary treatment modality which were published prior to 2019 (CHBRP, 2013, 2019). These studies compared DTT to different treatments or usual care or compared more intensive to less intensive DTT treatments. CHBRP concluded that the preponderance of evidence from these studies indicates that receipt of EIBI that emphasizes DTT is associated with larger increase in intelligence quotient (IQ) and greater improvement in adaptive behavior than the treatment which it has been compared, which in most cases was treatment as usual. CHBRP also concluded that the impact of EIBI that emphasizes DTT on language outcomes and academic placement is inconclusive.

Since publishing the SB 163 report, CHBRP has not identified any additional studies on DTT.

Summary of findings regarding the effectiveness of EIBI that emphasizes DTT: There is a preponderance of evidence from over 50 RCTs and controlled observational studies that EIBI that emphasizes DTT improves IQ and adaptive behavior relative to the treatments to which it has been compared. The evidence regarding the impact of EIBI that emphasizes DTT on language outcomes and academic placement is inconclusive.

Figure 2. Impact of DTT on Intelligence Quotient and Adaptive Behavior

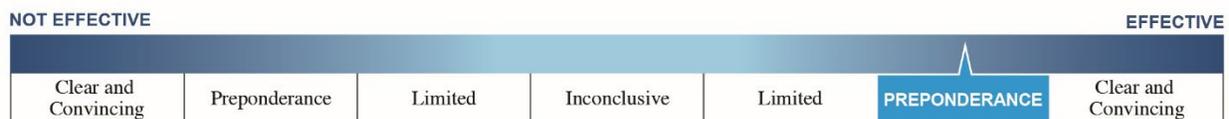


Figure 3. Impact of DTT on Language Outcomes and Academic Placement



Pivotal Response Treatment (PRT)

Multiple studies have evaluated PRT. A systematic review published in 2013 identified 25 studies of PRT as well as five studies of treatment modalities that were not expressly described as PRT which incorporated motivational techniques used to provide PRT (Verschuur et al., 2014). There was substantial variation in the PRT techniques assessed by each of the studies included in the systematic review. Most of these studies found that PRT improves language, communication, and play skills and reduces maladaptive behavior. However, most studies had small sample sizes and did not include a comparison

²⁶ CHBRP’s literature review for SB 126 encompassed nine meta-analyses and systematic reviews that included 42 RCTs and nonrandomized studies as well as findings from eight individual articles that presented findings from nonrandomized studies with comparison groups which were published after the studies included in the meta-analyses and systematic reviews.

group, which limits ability to determine whether the findings observed are due to PRT versus other factors.

For its report on SB 163, CHBRP identified two studies of PRT that were published after the studies included in the systematic review. One RCT that compared PRT to a structured intervention based on ABA that emphasized DTT found that children who received PRT had greater improvement in communication skills than children who received the treatment that emphasized DTT (Mohammadzaheri et al., 2014). An observational study that compared PRT to treatment as usual found that receipt of PRT was associated with greater reduction in autism symptoms than receipt of treatment as usual but that the size of the effect is small (Duifhuis et al., 2017).

Since publishing its report on SB 163, CHBRP has identified two additional studies on PRT. The first study was an RCT comparing children receiving a 24-week PRT package of services combining parent training and clinician-delivered in-home treatment (n=24) with a delayed treatment group receiving stable community-based interventions (n=24) (Gengoux et al., 2019). The authors found that children who received PRT demonstrated significant improvements in functional utterances, vocabulary, and social communication behaviors. The second study compared the effects of two different packages of services based on behavioral theory that were administered to Canadian preschool-age children (Stock et al., 2013). The first program was based on the verbal behavior approach to early intervention, and participants received 3 to 5 hours a week of DTT (out of a total of 15 to 25 hours of treatment per week). The second program was a PRT-based package. The researchers found that both groups demonstrated statistically significant improvements in cognitive scores, receptive and expressive language age equivalents, and problem behavior, and that neither group demonstrated significant results for adaptive behavior.

Summary of findings regarding the effectiveness of PRT: There is limited evidence from 29 studies, most of which are observational studies that do not have comparison groups, that PRT improves language, communication, and play skills among children with ASD.

Figure 4. Impact of PRT on Language, Communication, and Play Skills



Other interventions based on behavioral theory

CHBRP identified two meta-analyses and one systematic review of ABA (Rodgers et al., 2020; Rodgers et al., 2021; Yu et al., 2020)). The first meta-analysis contained a mixture of RCTs and non-randomized controlled studies, and analyzed data from 491 participants across 10 studies comparing preschool-age children with ASD receiving ABA interventions with those receiving treatment as usual/eclectic interventions (Rodgers et al., 2021). The authors found that relative to comparison group children, children receiving ABA interventions improved more on the Vineland adaptive behavior scale at two years. Evidence for other outcome measures of interest was inconclusive due to insufficient evidence. Other limitations included lack of data on longer-term effects, and all included studies were considered at risk of bias across several domains due to lack of randomization or blinding of outcome assessors. The second meta-analysis analyzed data from 555 participants across 14 RCT studies on child ABA interventions (Yu et al., 2020). The authors found that ABA interventions resulted in significant effects on socialization, communication, and expressive language. However, they did not find significant effects on ASD symptomology, receptive language, adaptive behavior, daily living skills, IQ, verbal and nonverbal IQ, restricted and repetitive behavior, motor skills, and cognition.

The systematic review included 20 RCTs and non-randomized studies and focused on evaluating the clinical effectiveness of early intensive ABA-based interventions for children with ASD; 15 studies contained sufficient data for meta-analysis (Rodgers et al., 2020). The authors concluded that compared to treatment as usual or eclectic interventions, ABA-based interventions performed better in improving adaptive behavior and cognitive ability (IQ). Results were inconclusive for motor skills, ASD severity, repetitive behavior, social skills, language, and academic placement. The authors also found no evidence that intervention effects varied with child characteristics. They could not determine the long-term impact of early intensive ABA-based interventions.

CHBRP identified two studies of interventions based on ABA that do not consist exclusively of DTT or PRT. These studies provide possible insights as to how dosage or intensity of ABA treatment affects outcomes for children with ASD. The first study used a retrospective design to compare clinical outcomes between children with ASD who received 8 to 14.5 weekly ABA intervention hours and children who received 1.4 to 8 weekly ABA intervention hours combined with other services; (Lotfizadeh et al., 2020). The researchers found that after two years of intervention, the group that received more hours of ABA per week made greater gains than the comparison group on language and social skills. However, no statistically significant differences were found between groups with regards to improvement in adaptive behavior. The second study compared children who received 25 to 40 hours per week of ABA treatment with no auxiliary treatments (such as sensory integration or speech therapy) with those who received eclectic treatment (Stanislaw et al., 2020). A subset of the eclectic treatment group received 10 hours of ABA therapy per week. Half of the eclectic treatment group also received speech therapy and one quarter received occupational therapy. At the baseline period, the children's scores for all outcome measure domains except motor skills were below normal. After the intervention period, 60% of children in the group that received ABA exclusively had normal cognitive scores, compared with only 25% of children who received eclectic treatment. Children in the group that received ABA exclusively were also significantly more likely to improve from subnormal to normal scores in receptive and expressive language skills, adaptive behavior (communication, self-help, and social skills).

CHBRP also identified two follow-up studies of adolescents who received ABA-based EIBI as young children. The first study followed up with 21 participants who were previously enrolled in a publicly funded EIBI intervention in Ontario, Canada between ages 2 and 9; the participants were studied between ages 13 and 20 and had stopped receiving the intervention for a mean of 10 years prior to participating in the study (Perry et al., 2019). There was heterogeneity across various outcomes (such as verbal and nonverbal IQ, academic performance, symptom severity), but overall, the general pattern of stability in this sample since the end of the intervention suggested that the gains made in EIBI were sustained over time. The second study examined 19 participants who had received two years of EIBI starting at a mean age of 35 months and followed up with them, on average, 12 years later (Smith et al., 2019). At follow-up, the significant increases in cognitive and adaptive standard scores that the participants made during their two years of EIBI were maintained, and their autism symptoms had reduced significantly. Additionally, none had received any additional psychiatric diagnoses and none were taking any psychotropic medications. However, a limitation of both follow-up studies of adolescents is that they do not control for other factors that may have affected the outcomes observed.

Summary of findings regarding the effectiveness of behavioral therapies besides DTT and PRT:

There is a preponderance of evidence that ABA-based therapies besides DTT and PRT improve adaptive behavior, social skills, communication skills, and cognition. There is inconclusive evidence that these therapies improve language skills, ASD symptomology and severity, and motor skills. There is limited evidence from two studies of adolescents that there are long-term benefits to EIBI.

Figure 5. Impact of Other ABA-Based Therapies on Adaptive Behavior, Social Skills, Communication Skills, and Cognition

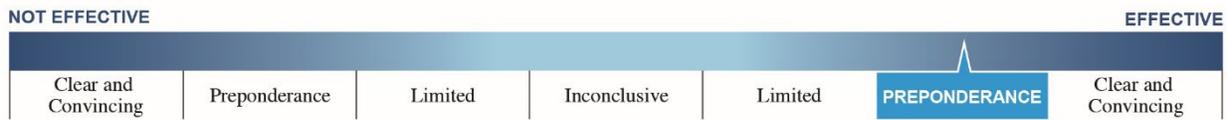


Figure 6. Impact of Other ABA-Based Therapies on Language Skills, ASD Symptomology and Severity, and Motor Skills



Figure 7. Long-Term Benefits of Other ABA-Based Therapies



Treatment modalities based on the developmental theory

Developmental, Individual Differences, Relationship-Based Model (DIR®)

For its report on SB 163, CHBRP identified four studies of treatment modalities based on DIR®. Two of these studies were pre-post studies of DIR®/Floortime™ that did not have comparison groups (Greenspan and Wieder, 1997; Reis et al., 2018). Findings from these studies suggest that children with ASD who receive DIR®/Floortime™ can develop creative thinking, empathy, reciprocate affection, and form healthy relationships with peers (Greenspan and Wieder, 1997) and that DIR®/Floortime™ improves social communication and sensory processing skills (Reis et al., 2018). However, the absence of a comparison group makes it difficult to determine whether the improvements that these children experiences were due to DIR®/Floortime™ or other circumstances that may have changed over time.

The other two studies included in the SB 163 report were of interventions based on DIR® (Pajareya and Nopmaneejumruslers, 2011; Solomon et al., 2014). The first RCT, which was conducted in Thailand, compared children who received DIR®/Floortime™ and usual care for ASD to children who only received usual care (Pajareya and Nopmaneejumruslers, 2011). The authors found that children who received DIR®/Floortime™ and usual care had better communication, better relationships, greater engagement with parents and caregivers, and greater gains in emotional development than children who only received usual care. For the primary outcome, a measure of emotional development, the scores of children who received DIR®/Floortime™ increased by 7.0 points versus an increase of 1.9 points among children in the control group. This study has some important limitations. The sample size was small (n = 28) and all children in the DIR®/Floortime™ group did not receive the same interventions at the same intensity.

The other RCT assessed the impact of Play and Language for Autistic Youngsters (PLAY), another intervention based on DIR®. PLAY is a parent-mediated treatment that encompasses coaching, modeling, and video feedback from occupational therapists, speech-language therapists, or special educators with expertise in PLAY. The RCT analyzed data on 122 children with autism or PDD-NOS who were age 2 to 6 years and lived in four different states. The authors found that children who received PLAY had greater

improvement in parent-child interaction, greater likelihood of experiencing a reduction in autism severity, and larger reductions in autism severity than children who received usual care (Solomon et al., 2014). However, there was no difference in language outcomes or developmental quotient between the two groups. An earlier, pre-post study that followed 68 children who received an 8-12 month PLAY intervention found that that 45.5% of the children made good to very good improvements in functional development measures on the Functional and Emotional Assessment Scale (self-regulation, interest in the world, forming relationships, attachment, engagement, two-way communication, behavioral organization, problem solving and internalization, representational capacity, and representational differentiation) (Solomon et al., 2007). They also found that 66% of children made good or very good progress in clinical functional developmental level measures; they found no statistical relationship between initial ASD severity and clinical scores. A limitation to this study is that it did not include a comparison group.

Since publishing its report on SB 163, CHBRP has identified one systematic review of DIR®/Floortime™ (Boshoff et al., 2020). This review included the two RCTs cited in the SB 163 report (Pajareya and Nopmaneejumruslers, 2011; Solomon et al., 2014) and seven other studies. The authors of the review found that positive outcomes were most concentrated in measures of socio-emotional development, such as social interaction, reciprocal communication, social engagement, and relating. They did not find improvements in other developmental areas such as motor development, fine motor and visual perception, and language.

CHBRP identified four additional studies of interventions based on DIR®. Two of these studies were included in the Boshoff systematic review. The first study was the aforementioned pre-post study of PLAY (Solomon et al., 2007). The second was an RCT that evaluated a 12-month, DIR®-based intervention for ASD (Casenhiser et al., 2013). Children aged 2 to 4 years were assigned to treatment at the Milton & Ethel Harris Research Initiative (MEHRIT) that was based on DIR® (n=25) or a comparison group receiving a variety of community-based treatments (n=26). Compared to the comparison group, children that received MEHRIT made significantly greater gains in social interaction skills. However, there were no between-group differences in gains for standard language measures.

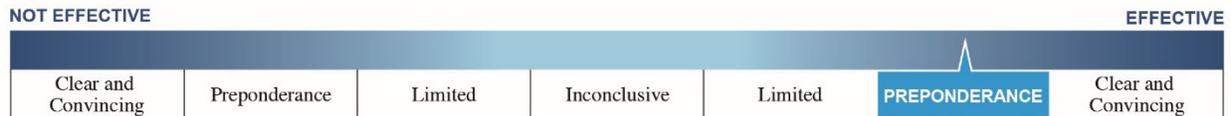
The third study followed young children with pervasive developmental disorders (PDD) (including autism) (n=20) or developmental disabilities (n=30) who received a 12-month, relationship-focused early intervention for (Mahoney and Peraldes, 2005). The intervention consisted of weekly individual parent-child sessions conducted by an early intervention specialist. Children with PDD experienced significant increases in pivotal behaviors, such as attention, persistence, interest, cooperation, initiation, joint attention, and affect. They also experienced significant increases in cognitive, communicative, and socioemotional function. However, this study did not include a comparison group.

The fourth study was an RCT that assessed the impact of Floortime™ on children in India with ASD. Children were randomly assigned to receive Floortime™ (n=13) or treatment as usual through early intervention sessions provided in their schools (n=13) (Lal and Chhabria, 2013). The evaluation instrument used was the Behavioral Scale for Social Skills (BSFS), which measured social behavior across four domains: turn-taking, two-way communication, understanding of cause and effect, and emotional thinking. The researchers found that average BSFS and individual domain scores in the treatment group experienced statistically significant increases from the baseline to post-intervention periods. At the post-intervention period, the treatment group had a significantly higher average BSFS score, as well as significantly higher scores for all domains except for emotional thinking. However, one cannot determine whether the treatment group experienced a larger increase in scores than the control group because the authors do not report the change over time in the scores among children in the control group.

Summary of findings regarding the effectiveness of DIR®: There is a preponderance of evidence from four uncontrolled studies, four RCTs with small sample sizes, and one systematic review that interventions based on DIR® improve the socioemotional development, communication, engagement, and

relationships of children with ASD. Findings also suggest that DIR® does not improve language skills for children with ASD.

Figure 8. Impact of DIR® on Communication, Engagement, and Relationships



Relationship Development Intervention (RDI)

For its report on SB 163, CHBRP identified one study of RDI (Gutstein et al., 2007). This study had a pre-post design and enrolled 16 children age 21 to 96 months who received RDI for 33 to 79 months and whose IQ score was at least 70. Five children were diagnosed with autism, four with PDD-NOS, and seven with Asperger’s syndrome. The children experienced statistically significant improvement in communication and social interaction as measured by scores on the Autism Diagnostic Observation Schedule (ADOS) and the Autism Diagnostic Interview – Revised (ADI-R). Following treatment, 10 of the 16 children were able to function in a mainstream classroom without an aide. The lack of a comparison group limits the strength of evidence this study provides. Without a comparison group, one cannot be certain that the changes observed were due to RDI or to other factors.

Since publishing its report on SB 163, CHBRP has not identified new studies of RDI.

Summary of findings regarding the effectiveness of RDI: There is insufficient evidence to assess the impact of RDI on communication, social interaction, and academic placement, or other outcomes. The only published study of RDI is an uncontrolled study with a small sample size. The lack of a comparison group limits ability to determine whether these improvements were due to RDI or other factors that changed over time.

Figure 9. Impact of RDI on Communication, Social Interaction, and Academic Placement



Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH)

For its report on SB 163, CHBRP summarized findings from a review of nine studies of TEACCH, including one RCT, three observational studies with comparison groups, and five uncontrolled studies (Mesibov and Shea, 2010). The observational studies with comparison groups found that compared to receipt of usual care, receipt of TEACCH was associated with greater improvement in adaptive behavior and cognitive, fine motor, gross motor, and imitation skills. The author of the RCT, which enrolled 20 children, concluded that TEACCH is associated with improvement in adaptive behavior, fine motor skills, visual receptive skills, and independence relative to usual care.

Since publishing its report on SB 163, CHBRP has identified two additional studies on TEACCH. The first was a quasi-experimental study conducted at day activity centers in Hong Kong (Siu et al., 2019). It

compared adults aged 21 to 40 diagnosed with ASD receiving TEACCH in addition to their regular training with those who received only regular training. The researchers found persons receiving TEACCH showed improvements in functional skills over the baseline, and mid-program, and post-program assessments. Compared to the group receiving only regular training, the group receiving TEACCH plus regular training also had significantly larger improvement in goal attainment scaling scores over time, specifically in the domains of vocational skills, independent functioning, and functional communication. However, no significant differences in improvement were observed for vocational behavior, leisure skills, and interpersonal behavior. There were also no significant changes between pre- and post-program TEACCH Transitional Assessment Profile scores between the two groups.

The second study was an RCT randomized children aged 3 and under to either receive six months of family-implemented TEACCH for Toddlers or six months of community services as usual (Turner-Brown et al., 2019). The researchers found no significant differences on global measures of early developmental skills. The researchers adapted portions of the Parent Interview for Autism (PIA) questionnaire to assess impact on participants’ social communication skills. While the treatment group’s overall PIA scores and PIA subdomain score for imitation increased modestly and significantly, there were no statistically significant differences for the PIA social communication subdomains of understanding, social reciprocity, and nonverbal communication. There was a statistically significant difference in the percentage of treatment group parents reporting that they perceived “a lot of progress” in their child’s social interaction skills, but no statistically significant difference in the percentage of parents reporting “a lot of progress” in their child’s cognitive and speech skills.

Summary of findings regarding the effectiveness of TEACCH: There is a preponderance of evidence from two RCTs, three observational studies with comparison groups, and five uncontrolled studies that TEACCH improves adaptive behavior and motor skills. Findings regarding effects on communication were inconclusive.

Figure 10. Impact of TEACCH on Adaptive Behavior and Motor Skills

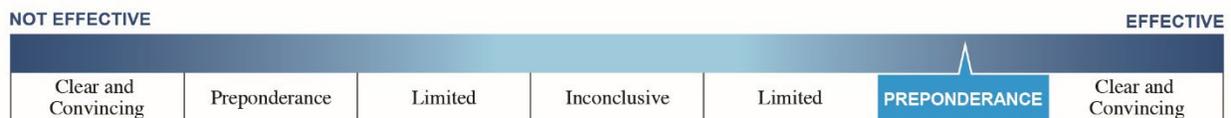


Figure 11. Impact of TEACCH on Communication



Play therapy

CHBRP identified one systematic review and two studies of play therapy. The systematic review included 1,149 participants aged 2 to 12 years across 19 RCT studies (published from 2001 to 2017) on the effects of play-based interventions on play and social skills for children with ASD (Kent et al., 2020). From this, 11 studies contained sufficient data for meta-analysis. The meta-analysis found a small but significant treatment effect of play therapy. Interventions delivered to individual children had a significant, small effect size, while interventions delivered in group settings had a negligible and insignificant effect size. Play interventions that focused on the child had a significant and large effect size, while interventions that focused on both the child and parent had a significant but small effect size. Play interventions focusing on child and peer had negligible and insignificant effect sizes. There were no statistically significant differences in findings across the clinic, home, or school settings.

Both of the individual studies had small sample sizes. The first study was an RCT that examined children aged 6 to 9 years with functioning high-functioning ASD enrolled in a private school system for children with learning differences (Doernberg et al., 2021). It compared children receiving an in-person pretend play intervention (n=18) with a waitlist control group (n=7). The intervention consisted of five weekly sessions, 15 to 20 minutes each, led by an interventionist who used prompts such as modeling, scaffolding, praising, reflecting emotions, and following the child’s lead. The researchers found that the intervention group significantly increased in imagination and cognitive play skills, which generalized to increases in emotional understanding. The second study was an RCT that investigated the effectiveness of a six-week intervention consisting of four weekly intensive child-centered play therapy (CCPT) sessions by comparing children receiving CCPT (n = 12) with a no-intervention control group (n = 11) (Schottelkorb et al., 2020). Compared to the control group, children who participated in 24 sessions of CCPT experienced statistically significant decreases in ASD core symptoms and behavioral symptoms.

Summary of findings regarding the effectiveness of play therapy: There is a preponderance of evidence from one systematic review/meta-analysis finding varying effect sizes across RCTs and two RCTs with small sample sizes that play therapy has positive effects on social skills, play skills, emotional understanding, and symptomology for children with ASD.

Figure 12. Impact of Play Therapy on Social Skills, Play Skills, Emotional Understanding, and ASD Symptomology



Other interventions based on developmental/relationship-based therapy

CHBRP identified two studies of other developmental/relationship-based therapies. The first study was an RCT of the parent-child interaction therapy (PCIT) intervention (Scudder et al., 2019). It compared children aged 2.5 to 6.1 years who received PCIT in addition to ongoing services (such as preschool,

speech therapy, or occupational therapy) with those assigned to a waitlist control group. The researchers found that among children receiving PCIT, intensity of disruptive behaviors decreased significantly. However, there no statistically significant group differences in child compliance rates or autism severity.

The second study was an RCT examining the efficacy of a preschool peer social intervention in facilitating social engagement of students with high-functioning ASD at Israeli special education preschools (Bauminger-Zviely et al., 2020). The 6-month intervention included three social construct learning and practice sessions per week, during which one to two children with ASD were in small mixed peer groups with two typically developing peers; the treatment group was randomized to one of three intervention domain groups: play, interaction, or conversation. All treatment groups showed improvement over time, primarily in their main intervention domains, but also showed generalization to untrained domains (suggesting improvements in adaptive skills). In contrast, the control group did not progress over time, and even deteriorated on some outcome measures.

Summary of findings regarding the effectiveness of developmental/relationship-based interventions besides DIR, RDI, TEACCH, and play therapy: There is limited evidence from two studies that developmental/relationship-based therapies focused on child-parent and child-peer interventions improve disruptive behaviors, play, interaction, and conversation.

Figure 13. Impact of Other Developmental/Relationship-Based Interventions on Disruptive Behaviors, Play, Interaction, and Conversation



Hybrid treatment modalities based on both behavioral and developmental theories

Early Start Denver Model (ESDM)

For its report on SB 163, CHBRP identified several RCTs assessing the impact of the Early Start Denver Model (ESDM) intervention, which combines treatments based on behavioral theory (ABA) and developmental theory. The original RCT on the effects of this intervention enrolled 48 children with ASD between 18 and 30 months old (Dawson et al., 2010). Children were randomized to participate in the ESDM intervention or were referred to providers in the community to obtain treatments commonly provided to children with ASD in the community. The children who received the ESDM intervention experienced a larger increase in IQ than children in the control group (17.6 points vs. 7.0 points) and greater improvement in receptive language (18.9 vs. 10.2 points) and expressive language (12.1 points vs. 4.0 points). The adaptive behavior of children who received the ESDM intervention improved whereas children in the control group showed greater delays in adaptive behavior.

A multi-site RCT of ESDM was published in early 2019 (Rogers et al., 2019). The study enrolled 118 children aged 14 to 24 months who lived in three different communities. The children were randomized to receive ESDM or referred to providers in the community who treat children with ASD. The authors found that receipt of ESDM was associated with greater improvement in language outcomes when site differences were considered but that there were no differences between the two groups of children with regard to developmental quotient (DQ), adaptive behavior, or autism severity.

Since publishing the report on SB 163, CHBRP has identified two meta-analyses, both of which only include studies with in which ESDM and was compared to non-ESDM treatment comparison groups. Both RCTs cited in the SB 163 report (Rogers et al., 2019, and Dawson et al., 2010) were included in both meta-analyses. The first meta-analysis reported results from 640 children with ASD, and found a moderate and statistically significant effect size for participants who received ESDM (Fuller et al., 2020).

This result was primarily driven by improvements in cognition and language, but no significant effects were observed for measures of autism symptomology, adaptive behavior, social communication, or restrictive and repetitive behaviors. The second meta-analysis consisted of 11 RCT studies and reported results for 624 children with ASD (Wang et al., 2021). The authors found that the ESDM intervention resulted in significant improvement with moderate effect sizes in cognition, autism symptomology, and language. However, no significant effects were observed for social communication.

CHBRP has also identified one additional study, which compared children in four Israeli community preschools for children with ASD that implemented the preschool-based ESDM intervention with children in four Israeli ASD community preschools that implemented a multidisciplinary developmental intervention that is commonly applied in Israeli ASD preschools (Sinai-Gavrilov et al., 2020). The researchers found that children in the ESDM preschools made greater improvements on measures of overall cognitive development, receptive and expressive language skills, and on parent and teacher-reported adaptive communication and socialization abilities. The subset of children in ESDM preschools with lower symptom severity, higher adaptive functioning, and receptive language abilities at the baseline period were shown to have greater improvement.

Summary of findings regarding the effectiveness of ESDM: There is a preponderance of evidence from two meta-analyses of studies that enrolled 640 and 624 children, respectively, that receipt of ESDM improves cognition language outcomes. Findings regarding effects of ESDM autism severity and symptomology are inconclusive. Findings also suggest that ESDM does not improve adaptive behavior or social communication.

Figure 14. Impact of ESDM on Language Outcomes



Figure 15. Impact of ESDM on ASD Severity and Symptomology



Project Improving Parents as Communication Teachers (ImPACT)

For its report on SB 163, CHBRP identified one observational study on Project ImPACT with a comparison group (Stadnick et al., 2015). The study enrolled 30 children with ASD aged 18 months to 8 years. Children who received Project ImPACT were compared to children who received usual care for ASD available in the community in which the study took place. The authors found that participation in Project ImPACT was associated with greater improvement in communication skills than receipt of usual care but that there was no difference in improvement in social skills between the two groups. Limitations of this study included reliance on parent report of outcomes, small sample size, and lack of randomization.

Since publishing the SB 163 report, CHBRP has identified one additional study assessing Project ImPACT’s impact on toddlers enrolled in publicly funded early intervention services in a large urban county (Stahmer et al., 2020). This quasi-experimental study compared toddlers who received Project ImPACT with toddlers receiving treatment as usual. Parents of children receiving Project ImPACT also

received training in Project ImpACT-based coaching and engagement strategies. For children who received Project ImpACT, the study found large effect sizes from the pre- to post-treatment period for social and communication skills and medium effect sizes for adaptive behavior skills; however, these differences were not statistically significant. The authors also noted that because the intervention was adapted with local providers and funders, implementation with fidelity was more likely. Therefore, it is possible that the even greater effect sizes observed for most outcome measures in the treatment group from the pre-treatment to follow-up periods resulted from parents' continued use of intervention strategies after completing the training, which could have increased intervention intensity and duration for the child.

Summary of findings regarding the effectiveness of Project ImpACT: There is inconclusive evidence from one observational study and one quasi-experimental study that Project ImpACT improves communication skills and adaptive behavior among children with ASD relative to usual care.

Figure 16. Impact of Project ImpACT on Communication Skills



Social Skills Groups (SSGs)

For its report on SB 126 in 2013, CHBRP identified a 2012 Cochrane review of five RCTs of Social Skills Group (SSG) interventions for people with ASD (Reichow et al., 2012). Most of the five RCTs enrolled children aged 7 to 12 years. The Cochrane review found participation in an SSG intervention increased social competency and improved the quality of friendships but did not improve emotional recognition or social communication.

For its report on SB 163 in 2019, CHBRP identified subsequent systematic review synthesizing findings from 19 RCTs published prior to January 2016 that enrolled persons aged 5 to 21 years (Gates et al., 2017). The authors concluded that participating in an SSG increased knowledge of social skills but did not improve enactment of these skills in social situations.

For the SB 163 report, CHBRP also identified two RCTs and one observational study with a comparison group that were published after the two systematic reviews. The observational study compared 26 preschool children who received one of two social skills interventions plus usual care to 26 preschool children who received usual care. The authors found that children who received the social skills intervention plus usual care developed better social skills than children who only received usual care (Szumski et al., 2019). One RCT of 15 children examined an SSG intervention implemented by teachers and found social behavior improved significantly among participants compared to children in the control group. The behavior was maintained up to 32 weeks after the intervention ended (Leaf et al., 2017). Another RCT that enrolled 122 verbally fluent pre-adolescent children with ASD compared three groups of children: (1) children who received SSG alone, (2) children who received SSG with parent or teacher involvement to enhance skills, and (3) children who received treatment as usual. The study found that children who received SSG alone or SSG with parent or teacher involvement had greater improvement in socialization than children who received usual care (Dekker et al., 2019).

Since publishing the SB 163 report, CHBRP has identified two additional studies on SSGs. The first study evaluated the effectiveness of an 8-week SSG intervention with a play component based at a university psychology clinic (Chester et al., 2019). It compared children across three assignment groups: (1) SSG with unstructured play, (2) SSG with semi-structured play, and (3) waitlist control. For children in both SSG intervention groups, teacher- and parent-reported measures of social skills experienced statistically

significant gains over time. No such changes were observed in the control group. The study also assessed the intervention’s impacts on social competence. Scores on measures of parent-, teacher-, and self-reported social competence increased for children in both intervention groups; in contrast, the control group’s scores decreased during this time. The researchers’ findings also suggest differences in impact between unstructured and semi-structured play. At both the post-test and follow-up periods, children in the semi-structured play group experienced significant gains in social skills. Although the unstructured play group made significant gains in social skills from the pre-test to follow-up period, their social skills did not differ significantly from the control group at either the post-test or follow-up periods.

The second study was an RCT conducted at two Swedish child and adolescent psychiatry outpatient units that examined children aged 8-17 diagnosed with ASD (Jonsson et al., 2019). It compared children receiving a 24-week SSG program with those receiving standard care. The researchers found large and statistically significant effects on parent-reported measures of social communication skills post-treatment. Changes in teacher-rated measures of social communication skills were not statistically significant. However, the researchers noted that there was a large amount of missing data from teachers, as well as the fact that teachers reported that they sometimes did not have sufficient insight to be qualified to assess students. It is also possible that the parents’ assessments were biased. While teachers were blinded to treatment conditions, parents were aware of treatment conditions. As secondary outcome measures, the researchers examined adaptive skills, symptom severity, general functioning, and participant stress. Except for general functioning, which improved in the treatment group, none of the secondary outcomes demonstrated statistically significant differences from baseline to posttreatment and follow-up periods between the two groups.

Summary of findings regarding the effectiveness of SSG: There is a preponderance of evidence from two systematic reviews of RCTs, three RCTs, and two observational studies with a comparison group that participation in SSGs improves knowledge of social skills and social behavior.

Figure 17. Impact of SSGs on Knowledge of Social Skills and Social Behavior



Other interventions based on both behavioral and developmental theories

CHBRP identified one meta-analysis and two studies evaluating the efficacy of naturalistic developmental behavioral interventions (NDBI). The meta-analysis analyzed 27 group-design studies of the effects of NDBI interventions compared to treatment-as-usual (Tiede and Walton, 2019). The authors found marginal effects for joint attention and receptive language; small, significant positive effects of NDBI for expressive language, reduction in ASD symptomology, and play skills; and large effects for social engagement and overall cognitive development.

The first study was an observational study that compared Swedish preschool-age children who received a two-year comprehensive Naturalistic Developmental Behavioral Intervention (NDBI) program with children receiving community treatment as usual (Haglund et al., 2020). The researchers found that children in the NDBI group made statistically significant improvements in their Autism Diagnostic Observation Schedule (ADOS-R) total scores, while no improvements were observed in the comparison group. The NDBI group also significantly improved their ADOS severity scores, but the scores were not significantly different from those of the comparison group. The second study was an RCT examining the efficacy of Early Achievements for Education Settings (EA-ES), a preschool teacher-implemented NDBI program (Engelstad et al., 2020). Classrooms in a public school district were randomized to EA-ES or business-as-usual. The researchers found that children receiving EA-ES demonstrated significantly greater

improvement in frequency of produced initiation, frequency of joint attention, and nonverbal cognitive functioning compared to the control group.

Summary of findings regarding the effectiveness of naturalistic developmental behavioral intervention: There is limited evidence across one meta-analysis and two studies that naturalistic developmental behavioral interventions (NDBI) have positive effects on joint attention, language skills, and play skills. There is inconclusive evidence that NDBI improves ASD severity.

Figure 18. Impact of NDBI on Joint Attention, Language Skills, and Play Skills

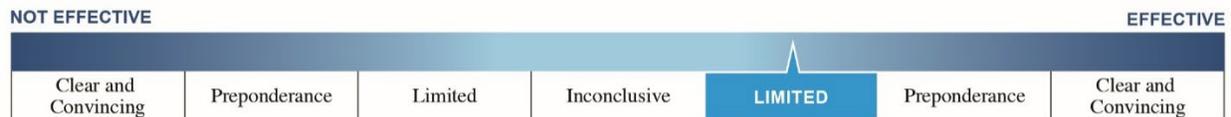


Figure 19. Impact of NDBI on ASD Severity



Comparison of BHT interventions based on different theoretical frameworks

CHBRP identified three meta-analyses on the effects of early intervention for children with ASD. The first meta-analysis included 1,442 children across 29 studies of different intervention types, and found that early intervention had a significant effect size on social communication outcomes (Fuller and Kaiser, 2020). The second meta-analysis analyzed summary effects across seven early intervention types (behavioral, developmental, naturalistic developmental behavioral intervention (NDBI), TEACCH, sensory-based, animal-assisted, and technology-based) for 15 outcome categories indexing core and related ASD symptoms (Sandbank et al., 2020a). The authors found that when study quality indicators were not considered, significant positive effects existed for behavioral, developmental, and NDBI interventions. However, when effect estimation was limited to RCT designs and to outcomes for which there was no risk of detection bias, no intervention types showed significant effects on any outcome. The third meta-analysis analyzed the effects of early intervention on language outcomes of children aged 0-8 (Sandbank et al., 2020b). The authors found that the summary effect of early intervention on language outcomes was small but significant. Effects were larger for expressive and composite language outcomes than for receptive language outcomes. Intervention type was not found to be a moderator of effects.

CHBRP also identified one systematic review on BHT, which sought to identify evidence-based, focused intervention practices for children and youth with ASD (Wong et al., 2015). The reviewers identified 27 intervention practices meeting the criteria for evidence-based practice, which included ABA techniques (e.g., DTT, pivotal response training), social skills training, structured play groups, parent-mediated interventions, and parent-implemented interventions.

CHBRP identified two studies demonstrating that ASD can be treated with different therapies based in different theories. The first study was an observational, quasi-experimental design that compared the effects on adolescents with ASD of three high-intensity interventions — applied behavior analysis (ABA) (based on behavioral theory), Treatment and Education of Autistic and Communication-Handicapped Children (TEACCH) (based on developmental theory), and Behavioral Educational Intervention (BEI) (partially based on behavioral theory with a primary focus on the rehabilitation community) (Mazza et al., 2020). The researchers found that all adolescents in the study sample reported an improvement of core ASD symptoms, regardless of type of treatment.

The second study was an RCT comparing children with ASD who were assigned to receive either the Early Start Denver Model (ESDM) intervention (a hybrid treatment based on both behavioral and developmental theories) or discrete trial training (based on behavioral theory) (Rogers et al., 2020). Participants were assigned to one of four treatment groups: (1) 15 hours of ESDM per week; (2) 25 hours of ESDM per week; (3) 15 hours of DTT per week; or (4) 25 hours of DTT per week. The researchers found that all four treatment groups made significant gains on all outcomes measured (autism severity, expressive language, receptive language, and nonverbal ability). There was no evidence that treatment style or treatment intensity (hours per week) had any effects on the trajectories of the outcome measures.

Summary of findings regarding the effectiveness of BHT: There is a preponderance of evidence from three meta-analyses, one systematic review, and two studies that a variety of BHT interventions based on different theories of treatment are effective at improving language, social communication, and ASD symptoms in children and adolescents with ASD.

Figure 20. Impact of BHT on Language, Social Communication, and ASD Symptoms



Impact of Qualifications of BHT Providers

As described in the *Policy Context* section, SB 562 would make technical changes to the definitions of qualified autism service (QAS) providers, QAS professionals, and QAS paraprofessionals. Studies of BHT for patients with ASD have evaluated treatments provided by a wide range of personnel, including: certified applied behavioral therapists, child care workers, counselors, early childhood educators, nurses, occupational therapists, psychologists, speech and language therapists, students, teachers, teachers’ aides/paraprofessionals, and parents.

CHBRP’s report on SB 399 summarized findings from two systematic reviews regarding the provision of BHT by “nonspecialized” personnel who are trained and supervised by persons with expertise in providing BHT based on ABA. One systematic review concluded that behavioral health treatments based on ABA that were delivered by “nonspecialized” personnel (e.g., nurse practitioner, teacher, teacher’s aide, parent) who were trained and supervised by persons with expertise in ABA improved IQ, language, daily living skills, and motor skills among lower functioning children with autism relative to usual care (Reichow et al., 2013).²⁷ Another systematic review summarized the evidence from studies of BHT interventions in which clinicians experienced in the interventions (e.g., clinic supervisor) train the personnel who deliver the services in the community (e.g., home interventionist). Overall, the authors report that treatments delivered by these trained community personnel result in positive outcomes in cognition, language, and symptoms of ASD, particularly among higher-functioning children (Shire and Kasari, 2014).²⁸

For its report on SB 163, CHBRP identified one RCT (N = 113) of the impact of supervising personnel who provide BHT that was published after the systematic reviews. Teacher assistants were supervised by on-site supervisors and remote consultants. The study concluded that supervised teacher assistants delivering a BHT treatment modality based on developmental theory to toddlers with ASD for 10 weeks were able to implement the intervention and that children made significant gains in outcomes including increased initiation of play and engagement in social communication (Shire et al., 2017).

²⁷ The systematic review included 34 articles describing 29 studies (15 randomized controlled trials and 14 prospective non-randomized controlled studies).

²⁸ Of the 12 articles included in the review, one was a randomized controlled trial, whereas the others had moderate-to-low-quality experimental designs, such as a pre-post design.

The literature described above has limitations with regards to some specific provisions of SB 562. Persons who did not have graduate degrees in behavior analysis or a related field were typically supervised by personnel with graduate degrees. Descriptions of the credentials of personnel providing BHT were inconsistent across studies, which limits the ability to determine which treatments utilized personnel similar to QAS professionals or QAS paraprofessionals. Additionally, CHBRP did not identify any studies of the impact of allowing QAS professionals and QAS paraprofessionals who are supervised by but not necessarily employed by QAS providers.

Since publishing its report on SB 163, CHBRP has not identified any additional articles on the impact of qualifications of BHT providers.

Summary of findings regarding BHT delivered by persons with training similar to QAS professionals and paraprofessionals: Based on two systematic reviews describing 41 studies of varying design quality with 2,169 participants and one RCT with 113 participants, there is a *preponderance of evidence* that BHT delivered by persons with training similar to QAS professionals and paraprofessionals, as well as a variety of other specialized and nonspecialized types of personnel, improve cognition, language, daily living skills, and motor skills and reduce symptoms of ASD when carried out under the training and supervision of a QAS provider.

Figure 21. Effectiveness of BHT Delivered by Persons With Training Similar to QAS Professionals and Paraprofessionals



Impact of Parent or Caregiver Involvement

SB 562 prohibits denial of health insurance coverage for BHT in the case of a lack of parental or caregiver involvement. Parental or caregiver involvement is an original and integral component of treatments based on both behavioral theory (ABA) and developmental theory. Degrees of involvement can vary greatly from transportation support, to presence during treatment by a qualified autism service (QAS) professional, to obtaining training and delivering treatment. The general purpose of parent or caregiver involvement is to increase continuity of treatment outside of treatment hours and to generalize skills (i.e., transfer behaviors learned in one social setting to multiple social settings). Parents, family members, and other caregivers are also able to provide important history and background on their child, and parental or caregiver involvement further provides contextual information that guides appropriate treatment to reflect the family dynamics (BACB, 2014). Recommendations for best practices in BHT for children with ASD call for parents/caregivers to be actively engaged in providing treatment, especially for young children (National Research Council, 2001; Volkmar et al., 2014; Zwaigenbaum et al., 2015).

To assess the impact of this provision, the medical effectiveness review searched for two types of literature: (1) literature comparing outcomes of BHT with parental or caregiver involvement to usual care; and (2) literature comparing outcomes of BHT with parental or caregiver involvement to outcomes of equivalent BHT without parental involvement. CHBRP identified some studies that addressed parental involvement in BHT, but these studies did not compare outcomes of involvement with equivalent BHT programs, which limits ability to isolate the impact of parent or caregiver involvement on outcomes. It should be noted that the sparseness of literature regarding lack of parent involvement is reasonable, given that the target population is children and thus there is inherent involvement of parents or caregivers in many aspects of the overall treatment plan.

For its report on SB 399, CHBRP identified a synthesis of six meta-analyses (including a total of 21 retrospective, prospective, and experimental studies, N = 894) of varying early intensive BHT based on

behavioral theory (ABA) that were published between 2009 and 2011 (Strauss et al., 2013). The authors concluded that early intensive BHT interventions that involved parents in providing treatment had larger positive effects on outcomes including intellectual functioning, language skills, and adaptive behaviors, than interventions that were provided solely by professionals and/or paraprofessionals but that early intensive BHT was effective regardless of variation in parent involvement or other variables, such as specific treatment characteristics, and child characteristics. However, these findings are a result of comparisons between nonequivalent BHT programs. It should be noted that most of the studies included in the synthesis were not RCTs, which limits the strength of their findings about the effects of treatment. In addition, few studies have directly assessed the impact of adding parent/caregiver treatment to a behavioral health treatment provided by professionals and/or paraprofessionals.

For its report on SB 163, CHBRP identified two RCTs that assessed the impact of parent/caregiver involvement. The first compared a BHT modality replicating the UCLA intensive behavioral treatment directed by professionals and paraprofessionals (Lovaas, 1987) to a treatment directed by parents in which professionals and paraprofessionals did not provide as many hours of treatment (Sallows et al., 2005). Parents were involved in both groups and instructed to practice treatment strategies at home with their child. The authors found that cognitive function, language use, and adaptive behavior improved for children with ASD in both groups. These findings of improved outcomes in both groups, with fixed treatment times, suggest that BHT modalities are effective in improving outcomes regardless of variations in the amount of parent involvement relative to the amount of professional or paraprofessional involvement.

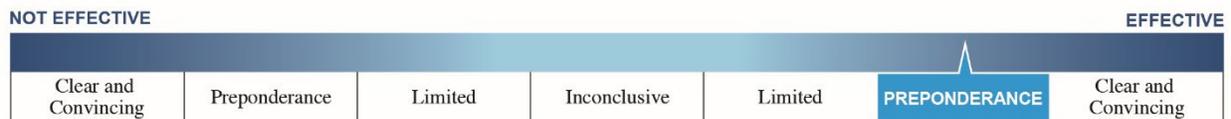
The second RCT compared groups of children receiving SSG alone to SSG with a parent or teacher involvement to enhance skills to treatment as usual (Dekker et al., 2019). Children in the SSG and the SSG with parent or teacher involvement improved significantly more on socialization scores than children in the control group, who experienced no significant improvement. For the primary outcome of socialization scores, there was no significant difference between the groups who participated in SSGs with and without parental and teacher involvement. However, there was a significant difference in the secondary outcome of teacher reported cooperation, assertion, and self-control. Thus, the study's findings suggest that SSGs improve socialization scores regardless of parent involvement, but also that parent involvement may improve other measures of socialization.

Since publishing the SB 163 report, CHBRP has identified two systematic reviews on parent and caregiver involvement in BHT. The first review was also a meta-analysis, and analyzed 33 RCT studies on the implementation and effectiveness of non-specialist mediated interventions; non-specialist delivery agents included parents, teachers, caregivers, and peers (Naveed et al., 2019). The authors found significant improvements in child distress, communication, expressive language, joint engagement, motor skills, repetitive behaviors, social skills, self-regulation, visual reception, and symptom severity. No significant improvements were found for adaptive behaviors, receptive language, and joint attention. Joint engagement was the only outcome in which parent-mediated interventions reported the greatest effect sizes. Subgroup analyses did not reveal any significant differences among interventions delivered by different agents on symptom severity and joint attention.

The second review sought to analyze the evidence regarding the effectiveness of ASD child intervention programs based on parent participation by analyzing 51 studies of varying designs, including meta-analyses, RCTs, quasi-experimental designs, and case studies (Rojas-Torres et al., 2020). Positive influence of parent participation on child outcomes was demonstrated in studies of comprehensive intervention programs, such as Parental Training, PRT, ESDM, and TEACCH. In studies of the parent-mediated interventions Joint Attention Symbolic Play, Engagement, and Regulation (JASPER) and Project ImPACT, the reviewers found positive effects on autism symptomology.

Summary of findings regarding parent/caregiver involvement in BHT: There is a preponderance of evidence that parent or caregiver involvement in BHT helps improve outcomes in children with ASD. Multiple studies, including RCTs, have found that parental or caregiver involvement improves outcomes of BHT for persons with ASD but that BHT improves outcomes relative to usual care regardless of the level of parent or caregiver involvement. Two systematic reviews demonstrate statistically significant effects of non-specialist mediated interventions and parent participation in intervention programs on outcomes for children with ASD. However, the strength of this evidence for assessing the impact of SB 562 is limited because most of these studies do not directly evaluate the impact of adding parent/caregiver treatment to BHT provided by professionals and/or paraprofessionals. In addition, no studies have examined the impact of prohibiting denial of coverage based on lack of parent or caregiver involvement on outcomes.

Figure 22. Effectiveness of Parent Involvement in BHT



Effectiveness of Behavioral Health Treatment Delivery in Different Settings

BHT can be delivered in a variety of settings such as in the home, hospitals, or other inpatient facilities, outpatient clinics (e.g., autism treatment centers, other provider offices), in schools of all levels, or in other community settings. The importance of generalizability in ASD therapies (i.e., the principle that learned behaviors are transferrable to multiple social settings) requires flexibility to treat in locations where behaviors are most likely to occur and to practice these skills in a variety of places. Additionally, once children enter school, the available hours during which to engage in BHT are limited unless some therapy is conducted in locations outside the home. The setting in which BHT is furnished will be driven in large part by treatment intensity, the combination of treatment goals, and accessibility.²⁹

For its report on SB 163, CHBRP did not identify any studies that compared the same treatment across different settings. However, as CHBRP noted in its report on SB 399, there is a preponderance of evidence from high-quality studies that intensive BHT is effective in improving outcomes for cognitive and social functioning across the various settings studied (Anagnostou et al., 2014). Not only does varying the setting promote generalization of treatment and help to maintain progress (BACB, 2014; Peters-Scheffer et al., 2013), it enables those who require more intensive treatment to receive the number of hours of BHT prescribed without being limited to one treatment location.

Additionally, it is recommended that treatment be delivered in a setting where there will be frequent interactions with typically developing children for purposes of modelling behavior and allowing the child to practice learned skills (Camargo et al., 2014; National Research Council, 2001). Finally, treatment setting may also benefit from variation due to co-occurring conditions such as anxiety. Desensitization to certain stimuli may be an appropriate treatment goal and require some sessions to occur in naturalistic environments outside of a typical treatment center. Therefore, CHBRP concludes that treatment is both effective and instructive across different settings, though the lack of research on relative effectiveness in different settings does not allow for determination of whether the same treatment would be more effective in one setting than another.

SB 562 would not require health care service plans to reimburse for services delivered by school personnel as part of an enrollee’s individualized educational program, despite the provision in the same bill to not restrict coverage of treatment regardless of setting. There is a preponderance of evidence that

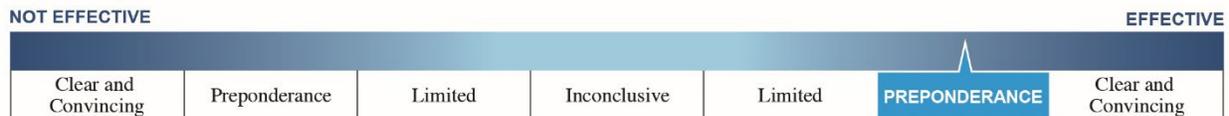
²⁹ Personal communication, D. Mandell, March 2017.

school-based interventions are effective for treatment of symptoms related ASD such as social communication and engagement, due in large part to the opportunity to engage with typically developing children (Chang and Locke, 2016; Kamps et al., 2015; Tanet et al., 2016).

Since publishing the SB 163 report, CHBRP has identified one systematic review of 16 studies published from 2002 to 2017 examining the effectiveness of early interventions to children with ASD implemented in inclusive preschool settings (Tupou et al., 2019). The study interventions included (but were not limited to) DTT, TEACCH, PRT, and play therapy. Outcome measures included adaptive behavior, functional skills, autism symptoms or severity, communication and/or language, social skills, cognition, and educational strengths and weaknesses. There was a preponderance of evidence that early intervention had positive impacts on adaptive behavior, functional skills, communication and/or language, and social skills. Findings about early intervention’s impacts on autism symptoms or severity and cognition were inconclusive.

Summary of findings regarding the settings in which treatment is provided: Based on the results of one systematic review and seven studies, there is a *preponderance of evidence* that BHT can be delivered effectively in multiple settings, including schools.

Figure 23. Lack of Impact of Setting on Effectiveness of BHT



Harms of BHT for ASD

CHBRP did not identify any studies that discussed harms associated with any BHT treatment modalities for ASD.

Summary of Findings

CHBRP’s review of literature pertinent to the provisions of SB 562 found evidence that BHT modalities based on behavioral theory (ABA), developmental theory, and hybrids of both theories improve outcomes for people with ASD. Prominent outcomes include improvements in communication, social skills, cognition, adaptive behavior, language, motor skills, play skills, and ASD symptom severity.

CHBRP’s literature review also found that BHT can be delivered effectively by people with similar training as QAS professionals when supervised by a QAS provider. Parent or caregiver involvement in BHT improves outcomes but treatment can be effective regardless of whether parents or caregivers are involved. In addition, CHBRP found that BHT can be delivered effectively in multiple settings.

Regardless of the theory on which BHT modalities are based, many studies of them are observational or quasi-experimental studies that do not randomly assign participants to the intervention or control condition. Some do not include any sort of comparison group. Lack of random assignment decreases confidence that any differences that are found between the treatment and control groups are due to the BHT treatment being tested and not to differences between the people with ASD in the treatment and control groups. Lack of a control group further decreases confidence in a study’s findings because one cannot rule out the possibility that any differences observed over time are due to factors other than the BHT modality. In cases where RCTs of BHT interventions were conducted, caution should be exercised when interpreting the findings of RCTs with small sample sizes. Moreover, most articles in CHBRP’s medical effectiveness literature review were about research on ASD in children; a few articles on adolescents with ASD were identified. This is reflective of general trends in ASD literature; therefore, the findings may be difficult to generalize to adults with ASD.

BENEFIT COVERAGE, UTILIZATION, AND COST IMPACTS

In addition to commercial enrollees, more than 50% of enrollees associated with the California Public Enrollees' Retirement System (CalPERS) and more than 70% of Medi-Cal beneficiaries are enrolled in DMHC-regulated plans.³⁰ As noted in the *Policy Context* section, SB 562 would impact these CalPERS enrollees' benefit coverage but would not (as the law SB 562 would amend does not) impact these Medi-Cal beneficiaries' benefit coverage.

This section reports the potential incremental impacts of SB 562 on estimated baseline benefit coverage, utilization, and overall cost. Please note that the results presented in this report are different from those in the 2019 report for SB 163³¹ due to the following reasons.

- SB 163 would have affected the benefit coverage of Medi-Cal beneficiaries enrolled in DMHC-regulated plans. Their absence is the reason for much of the difference in the figures reported in the analysis of SB 163 and this analysis for SB 562. For example, these beneficiaries' benefit coverage is less compliant with what SB 163 and SB 562 would require, so in this report, benefit coverage for developmental-based modalities of BHT for ASD, such as DIR®/ Floortime™ (see Table 1) is higher than what was reported for the analysis of SB 163, because such coverage is more common among commercial/CalPERS enrollees. Similarly, the average unit cost (see Table 1) is higher than what was reported for the analysis of SB 163 because payment rates are higher for commercial/CalPERS enrollees than they are for Medi-Cal beneficiaries.
- Although the general approach in this report is similar to the analysis for SB 163, CHBRP has made two changes to the methodology:
 - Since CHBRP's analysis of SB 163, the American Medical Association (AMA) revised procedure codes for applied behavioral analysis (ABA). These new codes are likely to capture more use of BHT for ASD and therefore increase utilization estimates for this analysis (in comparison to what was presented for the analysis of SB 163).
 - For this analysis, CHBRP expanded the age range for enrollees with expected utilization impacts from under 8 years old, which was used in the 2019 analysis of SB 163, to under 13 years old. A review of data available in 2019 and data available now, as well as content expert experience,³² indicate use has increased among enrollees with ASD who are 8 to 12 years old.

For this analysis, CHBRP has assumed that SB 562 would mandate coverage for BHT that includes not only behavioral therapy — often based on applied behavioral analysis (ABA) — such as Pivotal Response Training but also developmental therapy such as DIR®/Floortime.™ CHBRP has also assumed that coverage for hybrid therapy modalities (based on behavioral and developmental theory), such as Early Start Denver Model and Social Skills Groups therapy, would also be mandated by SB 562. These three categories of modalities of BHT treatment (behavioral, developmental, and hybrid) are consistent with the language of SB 562, and have been confirmed by both the research literature (see the *Medical Effectiveness* section) and content experts³³ as the relevant types of BHT that are considered evidence-based and so would be covered if SB 562 were enacted. Additionally, SB 562 would make technical changes to the definitions of qualified autism service (QAS) providers, prohibit denials of coverage for these evidence-based BHT modalities, if the denial was related to either setting/time/location of the BHT or lack of parent/guardian/caregiver involvement.

³⁰ For more detail, see CHBRP's *Estimates of Sources of Health Insurance in California for 2021*, a resource available at http://chbrp.org/other_publications/index.php.

³¹ For more detail, see CHBRP's Analysis of California Senate Bill 163 Autism, March 25, 2019 at <http://analyses.chbrp.com/document/view.php?id=1392>.

³² Personal communication, M. Candon, March 2021.

³³ Personal communication. M. Candon and C Lord, March 2021.

The percentage of enrollees with coverage of different BHT modalities (behavioral, hybrid, or developmental) was determined based on survey responses from the largest (by enrollment) plans and insurers regulated by DMHC and CDI (see Table 1). However, CHBRP was not able to disaggregate utilization of the different modalities, due to overlapping use (for all modalities) of the procedure codes used for billing purposes that informed CHBRP's estimates (for a full discussion of data sources, see Appendix C). The procedure codes do not specify the type of BHT for which the provider is billing. Therefore, CHBRP could not estimate the shifting in billing from one modality of BHT to another.

CHBRP was also able to determine, from the survey, the percentage of enrollees with coverage of BHT that could be denied due to setting/time/location or lack of parent/guardian/caregiver involvement (see Table 1).

For this analysis, CHBRP assumes that the potential increase in utilization would be among children with ASD under age 13 years, as this is the age range of the population that uses BHT more hours per week and for whom a treatment based on developmental theory is more likely to be considered medically necessary. CHBRP assumes that enrollees who use BHT are most often limited in their number of hours by coverage determinations based on medical necessity, and therefore neither the low-end users of BHT (less than 10 hours per week) nor the highest users of BHT (more than 25 hours per week) will increase their usage. The former would not do so because of lack of medical appropriateness. The latter would not do so because their medical needs already addressed. Any pent-up demand that would drive an increase in utilization due to altered benefit coverage would be concentrated among the moderate-users of BHT, under 13 years old, which would entail a 10% increase in utilization among those users³⁴. Therefore, CHBRP applied an overall combined 1.2% increase in utilization for all BHT users under age 13 years diagnosed with ASD, which translates to a 1.1% increase for all BHT users of all ages diagnosed with ASD (see Table 1).

CHBRP assumes that baseline utilization of health care services in 2022 will be roughly equivalent to utilization in 2019, with adjustments made to account for changes in enrollment and population. CHBRP does not make additional assumptions to adjust for changes in utilization due to COVID-19 because recent 2020 claims data indicates utilization, in aggregate, has mostly returned to pre-pandemic levels. However, CHBRP acknowledges utilization has not rebounded for some services and for some groups of enrollees (i.e. visits for younger children had not returned to pre-pandemic baseline as of October 2020) (Mehrotra et al., 2020). Additionally, there are additional unknown factors that may impact utilization as a result of COVID-19, such as the potential impacts of deferred care and long-term impacts from COVID-19 infections.

CHBRP estimates no measurable change in benefit coverage or utilization in regard to the changed definitions of qualified autism service (QAS) providers. Provider networks are compliant with the current mandate and although the bill's provisions could change provider networks due to the alterations in QAS definitions SB 562 would make, CHBRP does not anticipate measurable change within the first year of implementation.

For further details on the underlying data sources and methods used in this analysis, please see Appendix C.

Baseline and Postmandate Benefit Coverage

At baseline, 100% of enrollees with health insurance that would be subject to SB 562 have coverage that includes BHT based on behavioral models such as ABA (see Table 1), which is consistent with the current mandate. Similarly, 100% of enrollees have coverage for Hybrid modality BHT, such as Early Start Denver Model. In contrast, 77% of enrollees in DMHC-regulated plans or CDI-regulated policies subject to SB 562 have coverage for developmental modalities of BHT, such as DIR®/Floortime™.

³⁴ Personal communication, M. Candon, March 2021.

Postmandate, coverage for behavioral (including ABA) and hybrid modality BHT would remain at 100%, while coverage for developmental BHT would increase from 77% to 100% (see Table 1).

Currently, 26% of enrollees have coverage regardless of parental involvement, and 44% of enrollees have coverage regardless of setting or location of the treatment. Postmandate, 100% of enrollees would have coverage that prohibits denials based on setting/time/location or lack of parent/guardian/caregiver involvement.

Baseline and Postmandate Utilization

Using Milliman's proprietary 2019 Consolidated Health Cost Guidelines Sources Database (CHSD) data for prevalence of ASD in the insured population and utilization of BHT among enrollees with ASD, CHBRP estimates that 24,000 enrollees with ASD in DMHC-regulated plans and CDI-regulated policies have health insurance that would be subject to SB 562 and currently use BHT (see Table 1). Postmandate, CHBRP assumes the number of enrollees with ASD using BHT will not increase, because the use of this type of treatment overall is based on clinical diagnosis and determination that BHT is medically necessary.³⁵ However, the number of hours used by each enrollee with ASD could change.

At baseline, the average annual number of hours of BHT per user with ASD is estimated as 166.3 hours (see Table 1). CHBRP projects no change in the number of hours due to increased coverage for developmental-based modalities or hybrid modalities, as utilization of all modalities is driven by medical necessity. However, CHBRP projects that the average annual number of hours of BHT will increase because of the prohibition of previously allowable denials of coverage. BHT is most commonly used by children with ASD who are under 13 years old, based on the review of historical claims and experience from content experts.³⁶ Therefore, CHBRP projects that the increase in average annual number of hours of BHT will result from an increase in the moderate users of BHT in that age range. Including developmental modalities in the mandate under SB 562 will increase the overall usage hours of BHT among enrollees with ASD under 13 years old by 1.2% (see Appendix C for further discussion). This will raise the overall average annual number of hours of BHT per user with ASD to 168.2 hours, due to the prohibition of previously allowable denials of coverage (see Table 1). As previously noted, CHBRP is unable to distinguish among utilization of different modalities of BHT and so cannot estimate how the increase might reflect varied use of the varied modalities (see Appendix C).

Baseline and Postmandate Per-Unit Cost

CHBRP estimates that the baseline average per hour cost of BHT ASD is \$85.03, a figure derived from the Milliman CHSD dataset, trended forward to 2022 dollars. Postmandate, CHBRP estimates that this per-unit cost will remain constant, because the projected increase in utilization is not enough to cause a change in unit cost prices.

Baseline and Postmandate Expenditures

Table 3 and Table 4 present baseline and postmandate expenditures by market segment for DMHC-regulated plans and CDI-regulated policies. The tables present per member per month (PMPM) premiums, enrollee expenses for both covered and noncovered benefits, and total expenditures (premiums as well as enrollee expenses).

SB 562 would increase total net annual expenditures by \$4,112,000 or 0.0031% for enrollees with DMHC-regulated plans and CDI-regulated policies. This is due to a \$3,644,000 increase in total health

³⁵ Personal communications, C. Lord and M. Candon, 2021.

³⁶ Personal communication, M. Candon, March 2021.

insurance premiums paid by employers and enrollees for newly covered benefits, adjusted by an increase of \$468,000 in enrollee out-of-pocket expenses for covered and/or noncovered benefits (see Table 1).

Premiums

Changes in premiums as a result of SB 562 would vary by market segment. Note that such changes are related to the number of enrollees (see Table 1, Table 3, and Table 4), with health insurance that would be subject to SB 562.

Increases in private insurance premiums range from a high of \$0.0227 PMPM among DMHC-regulated large-group plans to a low of \$0.0185 PMPM among CDI-regulated individual policies.

As SB 562 would not change the current law's Medi-Cal related exemption, CHBRP projects no change in premium expenditures for the 8.9 million Medi-Cal beneficiaries enrolled in DMHC-regulated plans.

Enrollee Expenses

SB 562-related changes in enrollee expenses for covered benefits (deductibles, copays, etc.) and enrollee expenses for noncovered benefits would vary by market segment. Note that such changes are related to the number of enrollees (see Table 3 and Table 4) with health insurance that would be subject to SB 562 expected to use BHT during the year after enactment. Enrollee expenses for covered benefits in private plans are expected to increase by a high of \$0.0251 PMPM among DMHC-regulated small group policies. At the low end, CHBRP estimates that enrollee expenses for covered benefits will increase by \$0.0240 PMPM among CDI-regulated large-group policies.

Among publicly funded DMHC-regulated health plans, there would be no impact on enrollee expenses in Medi-Cal plans (because the law the SB 562 would amend exempts their benefit coverage from compliance). CalPERS enrollees are estimated to see an increase in enrollee expenses of \$0.0244 PMPM.

Although enrollees with newly compliant benefit coverage may have paid for some treatments prior to enactment of SB 562, CHBRP cannot estimate the frequency with which such situations may have occurred and so cannot estimate the total expense such situations might have incurred. Postmandate, such expenses would be shifted to premiums, though enrollees with newly compliant benefit coverage might, postmandate, pay for some treatments for which coverage is denied. Again, CHBRP cannot estimate the frequency with which such situations might occur, and or the total expense such situations might incur.

Average enrollee expenses per user

As noted in Table 1, SB 562 would increase total enrollee out-of-pocket spending for covered benefits (cost sharing) by less than 0.01%. For enrollees with ASD who use BHT, SB 562's coverage requirements would create varied impacts. As noted in Table 2, cost-sharing impacts among enrollees using BHT for ASD would range from an average annual increase of \$11.49 among enrollees in CalPERS to \$54.50 among enrollees in the individual market.

Table 2. Impact of SB 562 (2022) on Average Annual Enrollee Out-of-Pocket Expenses Per User

| | Large Group | Small Group | Individual | CalPERS HMO | Medi-Cal HMO (b) |
|---|-------------|-------------|------------|-------------|------------------|
| % of enrollees with out-of-pocket expenses impact due to SB 562 (a) | 0.2% | 0.2% | 0.1% | 0.2% | 0.0% |
| Avg. annual out-of-pocket expenses impact for enrollees | \$11.73 | \$33.13 | \$54.50 | \$11.49 | \$0.00 |

Source: California Health Benefits Review Program, 2021.

Notes: (a) Includes expenses for both covered and noncovered benefits.

(b) Not including impacts on premiums; (b) Medi-Cal beneficiaries enrolled in DMHC-regulated plans generally have no cost sharing – and their benefit coverage would not be altered by SB 562.

It should be noted that Table 2 shows the per-user annual impact in the form of cost sharing change. These numbers reflect population averages and will vary significantly for individual members. Sources of variation include the BHT services utilized by the enrollee and the cost sharing and utilization management protocols applicable to their specific plan or policy. An enrollee may experience a mandate impact significantly higher or lower than those included in this Table 2. For example, there may be no change for enrollees with high BHT service utilization premandate, as these enrollees are already using the maximum amount of medically necessary services for which they have benefit coverage. due to lack of capacity for additional services, Moderate-users premandate, however may see their cost sharing increased by up to \$54 annually.

Potential Cost Offsets or Savings in the First 12 Months After Enactment

CHBRP does not project any cost offsets or savings in health care that would result because of the enactment of provisions in SB 562.

Postmandate Administrative Expenses and Other Expenses

CHBRP estimates that the increase in administrative costs of DMHC-regulated plans and/or CDI-regulated policies will remain proportional to the increase in premiums. CHBRP assumes that if health care costs increase as a result of increased utilization or changes in unit costs, there is a corresponding proportional increase in administrative costs. CHBRP assumes that the administrative cost portion of premiums is unchanged. All health plans and insurers include a component for administration and profit in their premiums.

Other Considerations for Policymakers

In addition to the impacts a bill may have on benefit coverage, utilization, and cost, related considerations for policymakers are discussed below.

Postmandate Changes in the Number of Uninsured Persons

Because the change in average premiums does not exceed 1% for any market segment (see Table 1, Table 3, and Table 4), CHBRP would expect no measurable change in the number of uninsured persons due to the enactment of SB 562.

Changes in Public Program Enrollment

CHBRP estimates that the mandate would produce no measurable impact on enrollment in publicly funded insurance programs due to the enactment of SB 562. Additionally, the research literature has shown that enrollees with ASD in publicly funded programs are significantly less likely to have out-of-pocket costs, and more likely to have benefit coverage that meets their child's needs (Zhang and Baranek, 2016). These factors will remain in place, and make any movement of children with ASD from public to private coverage unlikely.

How Lack of Benefit Coverage Results in Cost Shifts to Other Payers

CHBRP estimates that the current lack of these specific provisions of benefit coverage that would be altered by SB 562 under the existing BHT mandate for enrollees with ASD does not result in any measurable cost shifting to other payers.

Table 3. Baseline Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2022

| | DMHC-Regulated | | | | | | CDI-Regulated | | | TOTAL |
|---|----------------------------------|-----------------|-----------------|-----------------------|---------------------|-----------------|----------------------------------|-----------------|-----------------|--------------------------|
| | Commercial Plans (by Market) (a) | | | Publicly Funded Plans | | | Commercial Plans (by Market) (a) | | | |
| | Large Group | Small Group | Individual | CalPERS HMOs (b) | MCMC (Under 65) (c) | MCMC (65+) (c) | Large Group | Small Group | Individual | |
| Enrollee Counts | | | | | | | | | | |
| Total enrollees in plans/policies subject to state mandates (d) | 8,405,000 | 2,086,000 | 1,989,000 | 889,000 | 7,218,000 | 787,000 | 384,000 | 43,000 | 144,000 | 21,945,000 |
| Total enrollees in plans/policies subject to SB 562 | 8,405,000 | 2,086,000 | 1,989,000 | 889,000 | 0 | 0 | 384,000 | 43,000 | 144,000 | 13,940,000 |
| Premium Costs | | | | | | | | | | |
| Average portion of premium paid by employer | \$426.28 | \$374.49 | \$0.00 | \$540.40 | \$226.61 | \$478.87 | \$530.80 | \$421.81 | \$0.00 | \$84,948,349,000 |
| Average portion of premium paid by enrollee | \$141.02 | \$180.89 | \$624.47 | \$96.86 | \$0.00 | \$0.00 | \$186.55 | \$212.07 | \$545.57 | \$36,600,954,000 |
| Total Premium | \$567.30 | \$555.38 | \$624.47 | \$637.27 | \$226.61 | \$478.87 | \$717.35 | \$633.88 | \$545.57 | \$121,549,303,000 |
| Enrollee Expenses | | | | | | | | | | |
| Cost-sharing for covered benefits (deductibles, copays, etc.) | \$43.61 | \$121.70 | \$173.51 | \$50.75 | \$0.00 | \$0.00 | \$134.75 | \$197.13 | \$184.11 | \$13,168,032,000 |
| Expenses for noncovered benefits (e) | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0 |
| Total Expenditures | \$610.91 | \$677.07 | \$797.97 | \$688.02 | \$226.61 | \$478.87 | \$852.10 | \$831.01 | \$729.68 | \$134,717,335,000 |

Source: California Health Benefits Review Program, 2021.

Notes: (a) Includes enrollees with grandfathered and nongrandfathered health insurance acquired outside or through Covered California (the state's health insurance marketplace).

(b) Approximately 54.1% of CalPERS enrollees in DMHC-regulated plans are state retirees, state employees, or their dependents.

(c) Medi-Cal Managed Care Plan expenditures for members over 65 include those who are also Medicare beneficiaries. This population does not include enrollees in COHS.

(d) Enrollees in plans and policies regulated by DMHC or CDI aged 0 to 64 years as well as enrollees 65 years or older in employer-sponsored health insurance. This group includes commercial enrollees (including those associated with Covered California or CalPERS) and Medi-Cal beneficiaries enrolled in DMHC-regulated plans.

(e) Includes only those expenses that are paid directly by enrollees or other sources to providers for services related to the mandated benefit that are not covered by insurance at baseline. This only includes those expenses that will be newly covered, postmandate. Other components of expenditures in this table include all health care services covered by insurance.

Key: CalPERS HMOs = California Public Employees' Retirement System Health Maintenance Organizations; CDI = California Department of Insurance; COHS = County Organized Health Systems; DMHC = Department of Managed Health Care; MCMC = Medi-Cal Managed Care.

Table 4. Postmandate Per Member Per Month Premiums and Total Expenditures by Market Segment, California, 2022

| | DMHC-Regulated | | | | | | CDI-Regulated | | | TOTAL |
|---|----------------------------------|-----------------|-----------------|-----------------------|---------------------|-----------------|----------------------------------|-----------------|-----------------|--------------------|
| | Commercial Plans (by Market) (a) | | | Publicly Funded Plans | | | Commercial Plans (by Market) (a) | | | |
| | Large Group | Small Group | Individual | CalPERS HMOs (b) | MCMC (Under 65) (c) | MCMC (65+) (c) | Large Group | Small Group | Individual | |
| Enrollee Counts | | | | | | | | | | |
| Total enrollees in plans/policies subject to state mandates (d) | 8,405,000 | 2,086,000 | 1,989,000 | 889,000 | 7,218,000 | 787,000 | 384,000 | 43,000 | 144,000 | 21,945,000 |
| Total enrollees in plans/policies subject to SB 562 | 8,405,000 | 2,086,000 | 1,989,000 | 889,000 | 0 | 0 | 384,000 | 43,000 | 144,000 | 13,940,000 |
| Premium Costs | | | | | | | | | | |
| Average portion of premium paid by employer | \$0.0170 | \$0.0139 | \$0.0000 | \$0.0192 | \$0.0000 | \$0.0000 | \$0.0150 | \$0.0125 | \$0.0000 | \$2,347,000 |
| Average portion of premium paid by enrollee | \$0.0056 | \$0.0067 | \$0.0195 | \$0.0034 | \$0.0000 | \$0.0000 | \$0.0053 | \$0.0063 | \$0.0185 | \$1,298,000 |
| Total Premium | \$0.0227 | \$0.0207 | \$0.0195 | \$0.0226 | \$0.0000 | \$0.0000 | \$0.0202 | \$0.0188 | \$0.0185 | \$3,645,000 |
| Enrollee Expenses | | | | | | | | | | |
| Cost-sharing for covered benefits (deductibles, copays, etc.) | \$0.0017 | \$0.0045 | \$0.0054 | \$0.0018 | \$0.0000 | \$0.0000 | \$0.0038 | \$0.0060 | \$0.0062 | \$468,000 |
| Expenses for noncovered benefits (e) | \$0.0000 | \$0.0000 | \$0.0000 | \$0.0000 | \$0.0000 | \$0.0000 | \$0.0000 | \$0.0000 | \$0.0000 | \$0 |
| Total Expenditures | \$0.0244 | \$0.0251 | \$0.0249 | \$0.0244 | \$0.0000 | \$0.0000 | \$0.0240 | \$0.0248 | \$0.0247 | \$4,113,000 |
| Postmandate Percent Change | | | | | | | | | | |
| Percent change insured premiums | 0.0040% | 0.0037% | 0.0031% | 0.0035% | 0.0000% | 0.0000% | 0.0028% | 0.0030% | 0.0034% | 0.0030% |
| Percent Change Total Expenditures | 0.0040% | 0.0037% | 0.0031% | 0.0035% | 0.0000% | 0.0000% | 0.0028% | 0.0030% | 0.0034% | 0.0031% |

Source: California Health Benefits Review Program, 2021.

Notes: (a) Includes enrollees with grandfathered and nongrandfathered health insurance acquired outside or through Covered California (the state’s health insurance marketplace).

(b) Approximately 54.1% of CalPERS enrollees in DMHC-regulated plans are state retirees, state employees, or their dependents.

(c) Medi-Cal Managed Care Plan expenditures for members over 65 include those who are also Medicare beneficiaries. This population does not include enrollees in COHS.

(d) Enrollees in plans and policies regulated by DMHC or CDI aged 0 to 64 years as well as enrollees 65 years or older in employer-sponsored health insurance. This group includes commercial enrollees (including those associated with Covered California or CalPERS) and Medi-Cal beneficiaries enrolled in DMHC-regulated plans.

(e) Includes only those expenses that are paid directly by enrollees or other sources to providers for services related to the mandated benefit that are not covered by insurance at baseline. This only includes those expenses that will be newly covered, postmandate. Other components of expenditures in this table include all health care services covered by insurance.

Key: CalPERS HMOs = California Public Employees' Retirement System Health Maintenance Organizations; CDI = California Department of Insurance; COHS = County Organized Health Systems; DMHC = Department of Managed Health Care; MCMC = Medi-Cal Managed Care.

PUBLIC HEALTH IMPACTS

As discussed in the *Policy Context* section, SB 562 would alter an existing mandate related to the coverage of treatment for autism spectrum disorder (ASD). ASD is a developmental disability for which there is no known cure. Behavioral health treatments (BHT) for ASD focus on ameliorating a variety of symptoms common across the spectrum such as limited communication (verbal skills, eye contact, etc.), repetitive motions, and/or acute sensory sensitivity. This section estimates the impact SB 562 may have on related health outcomes as well as racial/ethnic disparities.

As discussed in the *Benefit Coverage, Utilization, and Cost Impacts* section, CHBRP projects utilization impacts are expected for persons with benefit coverage newly compliant to SB 562's requirements.

The public health impact analysis includes estimated impacts in the short term (within 12 months of implementation) and in the long term (beyond the first 12 months postmandate). This section estimates the short-term impact³⁷ of SB 562. See *Long-Term Impacts* for discussion of premature death, economic loss, social determinants of health, and other impacts.

Estimated Public Health Outcomes

As presented in the *Medical Effectiveness* section, there is a *preponderance* of evidence that multiple modalities of BHT improve cognitive functioning, language, social functioning, and adaptive behaviors. Regarding the effectiveness of parental involvement in delivering BHT, evidence shows that parental involvement is associated with greater improvements in functioning as compared with treatment provided solely by a professional. However, treatment provided solely by trained professionals is effective in producing favorable outcomes when compared with no treatment. Additionally, there is a preponderance of evidence from studies with moderately strong research designs that BHT can be delivered effectively in any setting or location.

As presented in the *Benefit Coverage, Utilization, and Cost Impacts* section, CHBRP projects no new users of BHT, but estimates that the 24,000 enrollees with ASD who already use BHT would increase their utilization by an *average* of 1.8 hours per year per user in 2018.

Despite a preponderance of evidence that BHT is medically effective, CHBRP projects no measurable public health impact at the population level due to the small estimated increase in utilization. However, SB 562 would likely yield improvements in outcomes such as intelligence quotient (IQ), language skills, socialization, and adaptive behaviors for some enrollees with ASD who would use additional BHT.

Impact on Disparities³⁸ in Children With ASD

Insurance benefit mandates may change an existing disparity. As described in the *Background* section, disparities in ASD and in use of BHT exist by race/ethnicity, gender, age, and income.

However, although individual children with ASD would receive more BHT hours due to the removal of restrictions on settings and parental involvement, CHBRP estimates that SB 562 would have no measurable impact on reducing *statewide* disparities with respect to access to BHT and ASD outcomes due to the marginal increase in new hours of BHT services for existing users.

³⁷ CHBRP defines short-term impacts as changes occurring within 12 months of bill implementation.

³⁸ For details about CHBRP's methodological approach to analyzing disparities, see the *Benefit Mandate Structure and Unequal Racial/Ethnic Health Impacts* document here: http://chbrp.com/analysis_methodology/public_health_impact_analysis.php.

LONG-TERM IMPACTS

In this section, CHBRP estimates the long-term impact of SB 562, which CHBRP defines as impacts occurring beyond the first 12 months after implementation. These estimates are qualitative and based on the existing evidence available in the literature. CHBRP does not provide quantitative estimates of long-term impacts because of unknown improvements in clinical care, changes in prices, implementation of other complementary or conflicting policies, and other unexpected factors.

Long-Term Utilization and Cost Impacts

Utilization Impacts

After the small increase in utilization in the first 12 months, there is no indication in the research literature that the trends will change over time. Therefore, CHBRP does not estimate any change in long-term impacts in utilization, because the rate of enrollees with ASD using BHT will also remain generally consistent over time.

Cost Impacts

Over the long term, the first-year cost increase findings would apply annually thereafter.

Long-Term Public Health Impacts

Because more BHT is generally associated with better outcomes, it stands to reason that long-term outcomes of cognitive functioning, language, social functioning, and adaptive behaviors may be improved, on an individual basis, for those enrollees who make use of additional BHT hours due to “the prohibition of restrictions on coverage due to the setting in which BHT is provided and lack of parental involvement.”; however, CHBRP projects no overall public health impact in the long term due to the limited increase in hours of BHT per user per year.

Impacts on Disparities and the Social Determinants of Health³⁹

Per statute, CHBRP includes a discussion of disparities and social determinants of health (SDoH), when relevant. In the case of SB 562, evidence shows that ASD occurs disproportionately among California males and whites and Hispanics. Additionally, children living in rural and low-income areas experience greater barriers in access to behavioral health treatment for autism. As utilization impacts are expected for enrollees already using BHT, CHBRP estimates no long-term impact on reducing statewide disparities or potential social determinants of health on access to BHT or ASD outcomes due to the limited increase in hours of BHT services per year spread across existing users.

³⁹ For more information about SDoH, see CHBRP's publication Incorporating Relevant Social Determinants of Health Into CHBRP Benefit Mandate Analyses at http://chbrp.com/analysis_methodology/public_health_impact_analysis.php.

APPENDIX A TEXT OF BILL ANALYZED

On February 8, 2021, the Senate Health Committee asked CHBRP to analyze the version of SB 110 that was introduced on January 6, 2021.

On March 11, 2021, the Senate Health Committee asked CHBRP to analyze the language with proposed amendments. The version below includes those amendments.

AMENDED IN SENATE MARCH 15, 2021

CALIFORNIA LEGISLATURE— 2021–2022 REGULAR SESSION

SENATE BILL NO. 562

Introduced by Senator Portantino

February 18, 2021

An act to amend Section 1374.73 of the Health and Safety Code, and to amend Section 10144.51 of the Insurance Code, relating to health care coverage.

LEGISLATIVE COUNSEL'S DIGEST

SB 562, as amended, Portantino. Health care coverage: pervasive developmental disorders or autism.

Existing law, the Knox-Keene Health Care Service Plan Act of 1975 (Knox-Keene Act), provides for the licensure and regulation of health care service plans by the Department of Managed Health Care and makes a willful violation of the act a crime. Existing law also provides for the regulation of health insurers by the Department of Insurance. Existing law requires a health care service plan contract or a

health insurance policy to provide coverage for behavioral health treatment for pervasive developmental disorder or autism. Existing law defines “behavioral health treatment” for these purposes to mean professional services and treatment programs, including applied behavior analysis and evidence-based behavior intervention programs that meet specified criteria.

This bill would modify that definition to mean professional services and treatment programs based on behavioral, developmental, relationship-based, or other evidence-based models, including applied behavior analysis and other evidence-based behavior intervention programs that meet the specified criteria.

Existing law, the Lanterman Developmental Disabilities Services Act, requires the State Department of Developmental Services to contract with regional centers to provide services and supports to individuals with developmental disabilities and their families. Existing law defines developmental disability for these purposes to include, among other things, autism.

Existing law, the Knox-Keene Health Care Service Plan Act of 1975, provides for the licensure and regulation of health care service plans by the Department of Managed Health Care and makes a willful violation of the act a crime. Existing law also provides for the regulation of health insurers by the Department of Insurance. Existing law requires a health care service plan contract or a health insurance policy to provide coverage for behavioral health treatment for pervasive developmental disorder or autism, and defines “behavioral health treatment” to mean specified services and treatment programs, including treatment provided pursuant to a treatment plan that is prescribed by a qualified autism service provider and administered either by a qualified autism service provider or by a qualified autism service professional or qualified autism service paraprofessional who is supervised as specified. Existing law defines a “qualified autism service provider” to refer to a person who is certified or licensed and a “qualified autism service professional” to refer to a person who meets specified educational, training, and other requirements and is supervised and employed by a qualified autism service provider. Existing law defines a “qualified autism service paraprofessional” to mean an unlicensed and uncertified individual who meets specified educational, training, and other criteria, is supervised by a qualified autism service provider or a qualified autism service professional, and is employed by the qualified autism service provider. Existing law also requires a qualified autism service provider to design, in connection with the treatment plan, an intervention plan that describes, among other information, the parent participation needed to achieve the plan’s goals and objectives, as specified.

This bill would revise the definition of behavioral health treatment to require the services and treatment programs provided to be based on behavioral, developmental, relationship-based, or other evidence-based models. The bill also would expand the definition of a “qualified autism service professional” to include behavioral service providers who meet specified educational and professional or work experience qualifications. The bill would revise the definition of a “qualified autism service paraprofessional” by deleting the reference to an unlicensed and uncertified individual and by requiring the individual to comply with revised educational and training, or professional, requirements. The bill would also revise the definitions of both a qualified autism service professional and a qualified autism service paraprofessional to include the requirement that these individuals complete a background check.

This bill would require the intervention plan designed by the qualified autism service provider to include parent or caregiver participation, when clinically appropriate, that is individualized to the patient and takes into account the ability of the parent or caregiver to participate in therapy sessions and other

recommended activities, as specified. The bill would specify that the lack of parent or caregiver participation shall not be used to deny or reduce medically necessary services and that the setting, location, or time of treatment not be used as the only reason to deny medically necessary services.

Because a willful violation of the bill's provisions by a health care service plan would be a crime, it would impose a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

DIGEST KEY

Vote: majority Appropriation: no Fiscal Committee: yes Local Program: yes

BILL TEXT

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1.

Section 1374.73 of the Health and Safety Code is amended to read:

1374.73.

(a) (1) Every health care service plan contract that provides hospital, medical, or surgical coverage shall also provide coverage for behavioral health treatment for pervasive developmental disorder or autism no later than July 1, 2012. The coverage shall be provided in the same manner and shall be subject to the same requirements as provided in Section 1374.72.

(2) Notwithstanding paragraph (1), as of the date that proposed final rulemaking for essential health benefits is issued, this section does not require any benefits to be provided that exceed the essential health benefits that all health plans will be required by federal regulations to provide under Section 1302(b) of the federal Patient Protection and Affordable Care Act (Public Law 111-148), as amended by the federal Health Care and Education Reconciliation Act of 2010 (Public Law 111-152).

(3) This section shall not affect services for which an individual is eligible pursuant to Division 4.5 (commencing with Section 4500) of the Welfare and Institutions Code or Title 14 (commencing with Section 95000) of the Government Code.

(4) This section shall not affect or reduce any obligation to provide services under an individualized education program, as defined in Section 56032 of the Education Code, or an individual service plan, as described in Section 5600.4 of the Welfare and Institutions Code, or under the federal Individuals with Disabilities Education Act (20 U.S.C. Sec. 1400 et seq.) and its implementing regulations.

(b) Every health care service plan subject to this section shall maintain an adequate network that includes qualified autism service providers who supervise or employ qualified autism service

professionals or paraprofessionals who provide and administer behavioral health treatment. A health care service plan is not prevented from selectively contracting with providers within these requirements.

(c) For the purposes of this section, the following definitions shall apply:

(1) “Behavioral health treatment” means professional services and treatment programs based on behavioral, developmental, relationship-based, or other evidence-based models, including applied behavior analysis and other evidence-based behavior intervention programs, that develop or restore, to the maximum extent practicable, the functioning of an individual with pervasive developmental disorder or autism and that meet all of the following criteria:

(A) The treatment is prescribed by a physician and surgeon licensed pursuant to Chapter 5 (commencing with Section 2000) of, or is developed by a psychologist licensed pursuant to Chapter 6.6 (commencing with Section 2900) of, Division 2 of the Business and Professions Code.

(B) The treatment is provided under a treatment plan prescribed by a qualified autism service provider and is administered by one of the following:

(i) A qualified autism service provider.

(ii) A qualified autism service professional supervised by the qualified autism service provider.

(iii) A qualified autism service paraprofessional supervised by a qualified autism service provider or qualified autism service professional.

(C) The treatment plan has measurable goals over a specific timeline that is developed and approved by the qualified autism service provider for the specific patient being treated. The treatment plan shall be reviewed no less than once every six months by the qualified autism service provider and modified whenever appropriate, and shall be consistent with Section 4686.2 of the Welfare and Institutions Code pursuant to which the qualified autism service provider does all of the following:

(i) Describes the patient’s behavioral health impairments or developmental challenges that are to be treated.

(ii) Designs an intervention plan that includes the service type, number of hours, and parent participation *participation, when clinically appropriate*, needed to achieve the plan’s goal *goals* and objectives, and the frequency at which the patient’s progress is evaluated and reported. *When clinically appropriate, the plan shall include parent or caregiver participation that is individualized to the patient and that takes into account the ability of the parent or caregiver to participate in therapy sessions and other recommended activities. This clause does not limit the right of a parent or caregiver to participate in the patient’s therapy.*

(iii) Provides intervention plans that utilize evidence-based practices, with demonstrated clinical efficacy in treating pervasive developmental disorder or autism.

(iv) Discontinues intensive behavioral intervention services when the treatment goals and objectives are achieved or no longer appropriate.

(D) The treatment plan is not used for purposes of providing or for the reimbursement of respite, day care, *daycare*, or educational services and is not used to reimburse a parent for participating in the treatment program. The treatment plan shall be made available to the health care service plan upon request.

(2) “Pervasive developmental disorder or autism” shall have the same meaning and interpretation as used in Section 1374.72.

(3) “Qualified autism service provider” means either of the following:

(A) A person who is certified by a national entity, such as the Behavior Analyst Certification Board, with a certification that is accredited by the National Commission for Certifying Agencies, *Agencies or the American National Standards Institute*, and who designs, supervises, or provides treatment for pervasive developmental disorder or autism, provided the services are within the experience and competence of the person who is nationally certified.

(B) A person licensed as a physician and surgeon, physical therapist, occupational therapist, psychologist, marriage and family therapist, educational psychologist, clinical social worker, professional clinical counselor, speech-language pathologist, or audiologist pursuant to Division 2 (commencing with Section 500) of the Business and Professions Code, who designs, supervises, or provides treatment for pervasive developmental disorder or autism, provided the services are within the experience and competence of the licensee.

(4) “Qualified autism service professional” means an individual who meets all of the following criteria:

(A) Provides behavioral health treatment, which may include clinical case management and case supervision under the direction and supervision of a qualified autism service provider. *The services shall be consistent with the experience, training, or education of the professional.*

(B) Is supervised by a qualified autism service provider.

(C) Provides treatment pursuant to a treatment plan developed and approved by the qualified autism service provider.

(D) Is a behavioral service provider who meets the education and experience qualifications described in Section 54342 of Title 17 of the California Code of Regulations for an Associate Behavior Analyst, Behavior Analyst, Behavior Management Assistant, Behavior Management Consultant, or Behavior Management Program.

(E) Has training and experience in providing services for pervasive developmental disorder or autism pursuant to Division 4.5 (commencing with Section 4500) of the Welfare and Institutions Code or Title 14 (commencing with Section 95000) of the Government Code.

(D) Is a behavioral service provider who meets one of the following criteria:

(i) Meets the education and experience qualifications described in Section 54342 of Title 17 of the California Code of Regulations for an associate behavior analyst, behavior analyst, behavior management assistant, behavior management consultant, or behavior management program.

(ii) Possesses a bachelor of arts or science degree and meets one of the following qualifications:

(I) One year of experience in designing or implementing behavioral health treatment supervised by a qualified autism service provider and 12 semester units from an accredited institution of higher learning in either applied behavioral analysis or clinical coursework in behavioral health.

(II) Two years of experience in designing or implementing behavioral health treatment supervised by a qualified autism service provider.

(III) The person is a registered psychological assistant or registered psychologist pursuant to Chapter 6.6 (commencing with Section 2900) of Division 2 of the Business and Professions Code. A registered psychological assistant or registered psychologist may not supervise a qualified autism service paraprofessional until the registered psychological assistant or registered psychologist has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. A registered psychological assistant or registered psychologist in complying with this section shall conform to all of the requirements for their registration.

(IV) The person is an associate clinical social worker registered with the Board of Behavioral Sciences pursuant to Section 4996.18 of the Business and Professions Code. An associate clinical social worker may not supervise a qualified autism service paraprofessional until the associate clinical social worker has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. An associate clinical social worker in complying with this section shall conform to all of the requirements for their registration.

(V) The person is a registered associate marriage and family therapist with the Board of Behavioral Sciences pursuant to Section 4980.44 of the Business and Professions Code. A registered associate marriage and family therapist may not supervise a qualified autism service paraprofessional until the registered associate marriage and family therapist has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. A registered associate marriage and family therapist in complying with this section shall conform to all of the requirements for their registration.

(VI) The person is a registered associate professional clinical counselor with the Board of Behavioral Sciences pursuant to Section 4999.42 of the Business and Professions Code. A registered associate professional clinical counselor may not supervise a qualified autism service paraprofessional until the registered associate professional clinical counselor has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. A registered associate professional clinical counselor in complying with this section shall conform to all of the requirements for their registration.

(VII) The person is credentialed or certified by a national entity, including, but not limited to, the Behavior Analyst Certification Board, which is accredited by the National Commission for Certifying Agencies or the American National Standards Institute to provide applied behavior analysis or behavioral health treatment, which may include case management and case supervision under the direction and supervision of a qualified autism service provider.

(E) Has training and experience in providing services for pervasive developmental disorder or autism.

(F) Is employed by the qualified autism service provider or an entity or group that employs qualified autism service providers responsible for the autism treatment plan.

(G) Has completed a background check performed by an agency approved by the Department of Justice, with subsequent notification to the person's employer pursuant to Section 11105.2 of the Penal Code.

(5) "Qualified autism service paraprofessional" means an unlicensed and uncertified individual who meets all of the following criteria:

(A) Is supervised by a qualified autism service provider or qualified autism service professional at a level of clinical supervision that meets professionally recognized standards of practice.

(B) Provides treatment and implements services pursuant to a treatment plan developed and approved by the qualified autism service provider.

(C) Meets the *one of the following*:

(i) For applied behavioral analysis, the education and training qualifications described in Section 54342 of Title 17 of the California Code of Regulations.

(ii) For other evidence-based behavioral health treatments, all of the following qualifications:

(I) Possesses an associate's degree or has completed two years of study from an accredited college or university with coursework in a related field of study.

(II) Has 40 hours of training in the specific form of behavioral health treatment developed by a qualified autism service provider and administered by a qualified autism service provider or qualified autism service professional competent in the form of behavioral health treatment to be practiced by the paraprofessional.

(III) Has adequate education, training, and experience, as certified by a qualified autism service provider.

(iii) Is credentialed or certified in applied behavior analysis or behavioral health treatment for paraprofessionals or technicians by a national entity that is accredited by the National Commission for Certifying Agencies or the American National Standards Institute.

However, upon successful completion of the training and education necessary for certification or a credential described in this clause, if the applicant is otherwise qualified under this section, the applicant may provide treatment and implement services for up to 180 days while in the process of obtaining the certification or credential.

(D) Has adequate education, training, and experience, as certified by a qualified autism service provider or an entity or group that employs qualified autism service providers.

(E) Is employed by the qualified autism service provider or an entity or group that employs qualified autism service providers responsible for the autism treatment plan.

(F) Has completed a background check performed by an agency approved by the Department of Justice, with subsequent notification to the person's employer pursuant to Section 11105.2 of the Penal Code.

(d) This section shall not apply to the following:

(1) A specialized health care service plan that does not deliver mental health or behavioral health services to enrollees.

(2) A health care service plan contract in the Medi-Cal program (Chapter 7 (commencing with Section 14000) of Part 3 of Division 9 of the Welfare and Institutions Code).

(e) This section does not limit the obligation to provide services under Section 1374.72.

(f) As provided in Section 1374.72 and in paragraph (1) of subdivision (a), in the provision of benefits required by this section, a health care service plan may utilize case management, network providers, utilization review techniques, prior authorization, copayments, or other cost sharing.

(g) (1) The setting, location, or time of treatment recommended by the qualified autism service provider shall not be used as the only reason to deny or reduce coverage for medically necessary services. The setting shall be consistent with the standard of care for behavioral health treatment. This subdivision does not require a health care service plan to provide reimbursement for services delivered by school personnel pursuant to an enrollee's individualized educational program for the purpose of accessing educational services, unless otherwise required or permitted by federal and state law. This subdivision does not require a health care service plan to cover services rendered outside of the plan's service area unless the services are urgently needed services, as described in subdivision (h) of Section 1345, or emergency services, as defined in Section 1317.1, or unless the benefit plan expressly covers out-of-area services.

(2) Parent or caregiver participation may be associated with greater improvements in functioning and should be encouraged. However, the lack of parent or caregiver participation shall not be used as a basis for denying or reducing coverage of medically necessary services.

SEC. 2.

Section 10144.51 of the Insurance Code is amended to read:

10144.51.

(a) (1) Every health insurance policy shall also provide coverage for behavioral health treatment for pervasive developmental disorder or autism no later than July 1, 2012. The coverage shall be provided in the same manner and shall be subject to the same requirements as provided in Section 10144.5.

(2) Notwithstanding paragraph (1), as of the date that proposed final rulemaking for essential health benefits is issued, this section does not require any benefits to be provided that exceed the essential health benefits that all health insurers will be required by federal regulations to provide under Section 1302(b) of the federal Patient Protection and Affordable Care Act (Public Law 111-148), as amended by the federal Health Care and Education Reconciliation Act of 2010 (Public Law 111-152).

(3) This section shall not affect services for which an individual is eligible pursuant to Division 4.5 (commencing with Section 4500) of the Welfare and Institutions Code or Title 14 (commencing with Section 95000) of the Government Code.

(4) This section shall not affect or reduce any obligation to provide services under an individualized education program, as defined in Section 56032 of the Education Code, or an individual service plan, as described in Section 5600.4 of the Welfare and Institutions Code, or under the federal Individuals with Disabilities Education Act (20 U.S.C. Sec. 1400 et seq.) and its implementing regulations.

(b) Pursuant to Article 6 (commencing with Section 2240) of Subchapter 2 of Chapter 5 of Title 10 of the California Code of Regulations, every health insurer subject to this section shall maintain an adequate network that includes qualified autism service providers who supervise or employ qualified autism service professionals or paraprofessionals who provide and administer behavioral health treatment. A health insurer is not prevented from selectively contracting with providers within these requirements.

(c) For the purposes of this section, the following definitions shall apply:

(1) "Behavioral health treatment" means professional services and treatment programs based on behavioral, developmental, relationship-based, or other evidence-based models, including applied behavior analysis and other evidence-based behavior intervention programs, that develop or restore, to the maximum extent practicable, the functioning of an individual with pervasive developmental disorder or autism, and that meet all of the following criteria:

(A) The treatment is prescribed by a physician and surgeon licensed pursuant to Chapter 5 (commencing with Section 2000) of, or is developed by a psychologist licensed pursuant to Chapter 6.6 (commencing with Section 2900) of, Division 2 of the Business and Professions Code.

(B) The treatment is provided under a treatment plan prescribed by a qualified autism service provider and is administered by one of the following:

(i) A qualified autism service provider.

(ii) A qualified autism service professional supervised by the qualified autism service provider.

(iii) A qualified autism service paraprofessional supervised by a qualified autism service provider or qualified autism service professional.

(C) The treatment plan has measurable goals over a specific timeline that is developed and approved by the qualified autism service provider for the specific patient being treated. The treatment plan shall be reviewed no less than once every six months by the qualified autism service provider and modified whenever appropriate, and shall be consistent with Section 4686.2 of the Welfare and Institutions Code pursuant to which the qualified autism service provider does all of the following:

(i) Describes the patient's behavioral health impairments or developmental challenges that are to be treated.

(ii) Designs an intervention plan that includes the service type, number of hours, and parent participation *participation, when clinically appropriate*, needed to achieve the plan's goal *goals* and objectives, and the frequency at which the patient's progress is evaluated and reported. *When clinically appropriate, the plan shall include parent or caregiver participation that is individualized to the patient and that takes into account the ability of the parent or caregiver to participate in therapy sessions and other recommended activities. This clause does not limit the right of a parent or caregiver to participate in the patient's therapy.*

(iii) Provides intervention plans that utilize evidence-based practices, with demonstrated clinical efficacy in treating pervasive developmental disorder or autism.

(iv) Discontinues intensive behavioral intervention services when the treatment goals and objectives are achieved or no longer appropriate.

(D) The treatment plan is not used for purposes of providing or for the reimbursement of respite, day care, *daycare*, or educational services and is not used to reimburse a parent for participating in the treatment program. The treatment plan shall be made available to the insurer upon request.

(2) “Pervasive developmental disorder or autism” shall have the same meaning and interpretation as used in Section 10144.5.

(3) “Qualified autism service provider” means either of the following:

(A) A person who is certified by a national entity, such as the Behavior Analyst Certification Board, with a certification that is accredited by the National Commission for Certifying Agencies, *Agencies or the American National Standards Institute*, and who designs, supervises, or provides treatment for pervasive developmental disorder or autism, provided the services are within the experience and competence of the person who is nationally certified.

(B) A person licensed as a physician and surgeon, physical therapist, occupational therapist, psychologist, marriage and family therapist, educational psychologist, clinical social worker, professional clinical counselor, speech-language pathologist, or audiologist pursuant to Division 2 (commencing with Section 500) of the Business and Professions Code, who designs, supervises, or provides treatment for pervasive developmental disorder or autism, provided the services are within the experience and competence of the licensee.

(4) “Qualified autism service professional” means an individual who meets all of the following criteria:

(A) Provides behavioral health treatment, which may include clinical case management and case supervision under the direction and supervision of a qualified autism service provider. *The services shall be consistent with the experience, training, or education of the professional.*

(B) Is supervised by a qualified autism service provider.

(C) Provides treatment pursuant to a treatment plan developed and approved by the qualified autism service provider.

(D) Is a behavioral service provider who meets the education and experience qualifications described in Section 54342 of Title 17 of the California Code of Regulations for an Associate Behavior Analyst, Behavior Analyst, Behavior Management Assistant, Behavior Management Consultant, or Behavior Management Program.

(E) Has training and experience in providing services for pervasive developmental disorder or autism pursuant to Division 4.5 (commencing with Section 4500) of the Welfare and Institutions Code or Title 14 (commencing with Section 95000) of the Government Code.

(D) Is a behavioral service provider who meets one of the following criteria:

(i) Meets the education and experience qualifications described in Section 54342 of Title 17 of the California Code of Regulations for an associate behavior analyst, behavior analyst, behavior management assistant, behavior management consultant, or behavior management program.

(ii) Possesses a bachelor of arts or science degree and meets one of the following qualifications:

(I) One year of experience in designing or implementing behavioral health treatment supervised by a qualified autism service provider and 12 semester units from an accredited institution of higher learning in either applied behavioral analysis or clinical coursework in behavioral health.

(II) Two years of experience in designing or implementing behavioral health treatment supervised by a qualified autism service provider.

(III) The person is a registered psychological assistant or registered psychologist pursuant to Chapter 6.6 (commencing with Section 2900) of Division 2 of the Business and Professions Code. A registered psychological assistant or registered psychologist may not supervise a qualified autism service paraprofessional until the registered psychological assistant or registered psychologist has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. A registered psychological assistant or registered psychologist in complying with this section shall conform to all of the requirements for their registration.

(IV) The person is an associate clinical social worker registered with the Board of Behavioral Sciences pursuant to Section 4996.18 of the Business and Professions Code. An associate clinical social worker may not supervise a qualified autism service paraprofessional until the associate clinical social worker has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. An associate clinical social worker in complying with this section shall conform to all of the requirements for their registration.

(V) The person is a registered associate marriage and family therapist with the Board of Behavioral Sciences pursuant to Section 4980.44 of the Business and Professions Code. A registered associate marriage and family therapist may not supervise a qualified autism service paraprofessional until the registered associate marriage and family therapist has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. A registered associate marriage and family therapist in complying with this section shall conform to all of the requirements for their registration.

(VI) The person is a registered associate professional clinical counselor with the Board of Behavioral Sciences pursuant to Section 4999.42 of the Business and Professions Code. A registered associate professional clinical counselor may not supervise a qualified autism service paraprofessional until the registered associate professional clinical counselor has obtained at least 500 hours of experience in designing or implementing behavioral health treatment. A registered associate professional clinical counselor in complying with this section shall conform to all of the requirements for their registration.

(VII) The person is credentialed or certified by a national entity, including, but not limited to, the Behavior Analyst Certification Board, which is accredited by the National Commission for Certifying Agencies or the American National Standards Institute to provide applied behavior analysis or behavioral health treatment, which may include case management and case supervision under the direction and supervision of a qualified autism service provider.

(E) Has training and experience in providing services for pervasive developmental disorder or autism.

(F) Is employed by the qualified autism service provider or an entity or group that employs qualified autism service providers responsible for the autism treatment plan.

(G) Has completed a background check performed by an agency approved by the Department of Justice, with subsequent notification to the person's employer pursuant to Section 11105.2 of the Penal Code.

(5) "Qualified autism service paraprofessional" means an unlicensed and uncertified individual who meets all of the following criteria:

(A) Is supervised by a qualified autism service provider or qualified autism service professional at a level of clinical supervision that meets professionally recognized standards of practice.

(B) Provides treatment and implements services pursuant to a treatment plan developed and approved by the qualified autism service provider.

(C) Meets the *one of the following*:

(i) For applied behavioral analysis, the education and training qualifications described in Section 54342 of Title 17 of the California Code of Regulations.

(ii) For other evidence-based behavioral health treatments, all of the following qualifications:

(I) Possesses an associate's degree or has completed two years of study from an accredited college or university with coursework in a related field of study.

(II) Has 40 hours of training in the specific form of behavioral health treatment developed by a qualified autism service provider and administered by a qualified autism service provider or qualified autism service professional competent in the form of behavioral health treatment to be practiced by the paraprofessional.

(III) Has adequate education, training, and experience, as certified by a qualified autism service provider.

(iii) Is credentialed or certified in applied behavior analysis or behavioral health treatment for paraprofessionals or technicians by a national entity that is accredited by the National Commission for Certifying Agencies or the American National Standards Institute.

However, upon successful completion of the training and education necessary for certification or a credential described in this clause, if the applicant is otherwise qualified under this section, the applicant may provide treatment and implement services for up to 180 days while in the process of obtaining the certification or credential.

(D) Has adequate education, training, and experience, as certified by a qualified autism service provider or an entity or group that employs qualified autism service providers.

(E) Is employed by the qualified autism service provider or an entity or group that employs qualified autism service providers responsible for the autism treatment plan.

(F) Has completed a background check performed by an agency approved by the Department of Justice with subsequent notification to the person's employer pursuant to Section 11105.2 of the Penal Code.

(d) This section shall not apply to the following:

(1) A specialized health insurance policy that does not cover mental health or behavioral health services or an accident only, specified disease, hospital indemnity, or Medicare supplement policy.

(2) A health insurance policy in the Medi-Cal program (Chapter 7 (commencing with Section 14000) of Part 3 of Division 9 of the Welfare and Institutions Code).

(e) This section does not limit the obligation to provide services under Section 10144.5.

(f) As provided in Section 10144.5 and in paragraph (1) of subdivision (a), in the provision of benefits required by this section, a health insurer may utilize case management, network providers, utilization review techniques, prior authorization, copayments, or other cost sharing.

(g) (1) The setting, location, or time of treatment recommended by the qualified autism service provider shall not be used as the only reason to deny or reduce coverage for medically necessary services. The setting shall be consistent with the standard of care for behavioral health treatment. This subdivision does not require a health insurer to provide reimbursement for services delivered by school personnel pursuant to an insured's individualized educational program for the purpose of accessing educational services, unless otherwise required or permitted by federal and state law. This subdivision does not require a health insurer to cover services rendered outside of the insurer's service area unless the services are urgently needed services, as described in subdivision (h) of Section 1345 of, or emergency services, as defined in Section 1317.1 of, the Health and Safety Code, or unless the benefit plan expressly covers out-of-area services.

(2) Parent or caregiver participation may be associated with greater improvements in functioning and should be encouraged. However, the lack of parent or caregiver participation shall not be used as a basis for denying or reducing coverage of medically necessary services.

SEC. 3.

No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

APPENDIX B LITERATURE REVIEW METHODS

This appendix describes methods used in the literature review conducted for this report. A discussion of CHBRP's system for medical effectiveness grading evidence, as well as lists of MeSH Terms, publication types, and keywords, follows.

Studies of the effects of behavioral health therapy (BHT), BHT provided by parents or caregivers, and BHT care setting were identified through searches of CINAHL Complete, Cochrane Library, Medline Complete, PsycInfo, PubMed, Scopus, and Web of Science Core Collection. The search was limited to abstracts of studies published in English. The search was limited to studies published from 2019 to present, because CHBRP had previously reviewed this literature using the same search terms in 2019 for the SB 163 analysis. Types of studies included systematic reviews, meta-analyses, randomized controlled trials, controlled clinical trials, and comparative studies.

Reviewers screened the title and abstract of each citation retrieved by the literature search to determine eligibility for inclusion. The reviewers acquired the full text of articles that were deemed eligible for inclusion in the review and reapplied the initial eligibility criteria.

Medical Effectiveness Review

The medical effectiveness literature review returned abstracts for 263 articles, of which 61 were reviewed for inclusion in this report. A systematic review and an article about Pivotal Response Training that content experts recommended were also included. Four articles cited in submissions from interested parties were included. One additional article was identified. A total of 37 articles, most of which were new studies published since 2019, were included in the medical effectiveness review for SB 562.

Medical Effectiveness Evidence Grading System

In making a "call" for each outcome measure, the medical effectiveness lead and the content expert consider the number of studies as well the strength of the evidence. Further information about the criteria CHBRP uses to evaluate evidence of medical effectiveness can be found in CHBRP's *Medical Effectiveness Analysis Research Approach*.⁴⁰ To grade the evidence for each outcome measured, the team uses a grading system that has the following categories:

- Research design;
- Statistical significance;
- Direction of effect;
- Size of effect; and
- Generalizability of findings.

The grading system also contains an overall conclusion that encompasses findings in these five domains. The conclusion is a statement that captures the strength and consistency of the evidence of an intervention's effect on an outcome. The following terms are used to characterize the body of evidence regarding an outcome:

- Clear and convincing evidence;
- Preponderance of evidence;
- Limited evidence;
- Inconclusive evidence; and
- Insufficient evidence.

⁴⁰ Available at: http://chbrp.com/analysis_methodology/medical_effectiveness_analysis.php.

A grade of *clear and convincing evidence* indicates that there are multiple studies of a treatment and that the large majority of studies are of high quality and consistently find that the treatment is either effective or not effective.

A grade of *preponderance of evidence* indicates that the majority of the studies reviewed are consistent in their findings that treatment is either effective or not effective.

A grade of *limited evidence* indicates that the studies had limited generalizability to the population of interest and/or the studies had a fatal flaw in research design or implementation.

A grade of *inconclusive evidence* indicates that although some studies included in the medical effectiveness review find that a treatment is effective, a similar number of studies of equal quality suggest the treatment is not effective.

A grade of *insufficient evidence* indicates that there is not enough evidence available to know whether or not a treatment is effective, either because there are too few studies of the treatment or because the available studies are not of high quality. It does not indicate that a treatment is not effective.

Search Terms (* indicates truncation of word stem)

NOTE: The terms below represent the major concepts used for the literature search. They were modified for each database and searched using Boolean and proximity operators, wildcards/truncation, subject headings, keywords, keyword phrases, and British spellings as appropriate. Search terms fell into the following broad category: Medical Effectiveness.

| | | |
|---|--|---|
| Applied Behavior Analysis | Caregiver Stressors | Early Intensive Behavioral Intervention |
| Applied Behavioral Therapy | Caregiver Support | Early Intervention |
| Asperger | Caregiver Support (Iowa Nic) | Early Intervention, Educational |
| Asperger Syndrome | Caregiver Well-Being (Iowa Noc) | Early Start Denver Model |
| Autism | Caregivers | EIBI |
| Autism Service Provider /Professional/Paraprofessional/Practitioner | Carers | ESDM |
| Autism Spectrum Disorders | Certification/Certificate/Certified/Certified/Licensed | Family Caregiver Status (Iowa Noc) |
| Autistic | Developmental Relationship-Based Theory/Model | Father-Child Relations |
| Autistic Disorder | Developmental Theory | Fathers |
| Behavioral Health Therapy | Discrete Trials Training | Floortime |
| Caregiver Attitudes | Early Childhood Development | Mother-Child Relations |
| Caregiver Burden | Early Childhood Intervention | Mothers |
| Caregiver Role Strain (Saba Ccc) | | Parent-Child Relations |

| | | |
|--|---|--|
| Parents | Pivotal Response Theory | Single Parent |
| Parents of Disabled Children | Play Therapy | Social Communication/Emotional Regulation/Transactional Support Model |
| Pervasive Child Development Disorders | Project Impact | Social Skills Group |
| Pervasive Development Disorders | Relationship Development Intervention | SSG |
| Pervasive Developmental Disorder-Not Otherwise Specified | Relationship-Based Individual Differences Development | Teacch |
| Picture Exchange Communication System | Risk for Caregiver Role Strain (Nanda) | Treatment and Education of Autistic and Related Communication-Handicapped Children |
| | Scerts | |

APPENDIX C COST IMPACT ANALYSIS: DATA SOURCES, CAVEATS, AND ASSUMPTIONS

With the assistance of CHBRP's contracted actuarial firm, Milliman, Inc, the cost analysis presented in this report was prepared by the faculty and researchers connected to CHBRP's Task Force with expertise in health economics.⁴¹ Information on the generally used data sources and estimation methods, as well as caveats and assumptions generally applicable to CHBRP's cost impacts analyses are available at CHBRP's website.⁴²

This appendix describes analysis-specific data sources, estimation methods, caveats, and assumptions used in preparing this cost impact analysis.

Analysis-Specific Data Sources

Current coverage of behavioral health treatment (BHT) for persons with autism spectrum disorder (ASD) for commercial enrollees was determined by a survey of the largest (by enrollment) providers of health insurance in California. Responses to this survey represent 100% of commercial enrollees with health insurance that can be subject to state benefit mandates. In addition, CalPERS, was queried regarding related benefit coverage.

Analysis-Specific Caveats and Assumptions

This subsection discusses the caveats and assumptions relevant to an analysis of SB 562.

CHBRP projects that SB 562:

Would not impact any forms of cost sharing, such as deductibles, copays, and coinsurance.

Would not affect plan/insurer methods of utilization management that may impact the coverage of medical treatments between baseline and postmandate periods, such as use of prior authorization requirements and medical review for medical treatments. Although, as discussed in this section, the bill may spur plans/insurers to update medical necessity criteria to consider the most current evidence base related to the behavioral health treatment (BHT) of autism spectrum disorder (ASD). There may also be an increase in awareness of other BHTs appropriate for ASD besides behavioral based modalities such as ABA.

The following is a description of methodology and assumptions used to develop the estimates of cost impacts:

Diagnosis codes, F84 (ICD-10, (ASD)) was used to identify claims relevant for analysis. CHBRP also used CPT/HCPCS procedure codes that were available in Milliman's proprietary 2019 Consolidated Health Cost Guidelines Sources Database (CHSD), which contains both Commercial and Medi-Cal managed care claims and encounters to identify BHT procedures relevant to those individuals with ASD. Methods for identifying relevant codes were vetted by content experts and by relevant carrier responses.

For the BHT procedure codes that were found in the 2019 CHSD, external research was performed to determine the number of minutes of service associated with each procedure code. If

⁴¹ CHBRP's authorizing statute, available at https://chbrp.org/about_chbrp/index.php, requires that CHBRP use a certified actuary or "other person with relevant knowledge and expertise" to determine financial impact.

⁴² See method documents posted at http://chbrp.com/analysis_methodology/cost_impact_analysis.php; in particular, see *2021 Cost Analyses: Data Sources, Caveats, and Assumptions*.

a procedure code did not have a time allocation in the description, CHBRP worked with content experts and a clinician to assign reasonable time allotments to each procedure code. Milliman also assigned a percentage rate of BHT associated with each procedure code. For example, a procedure code may be used by a billing provider for BHT but may also be used for other services. Rather than assume that 100% of the time a procedure code was used it was used for BHT, Milliman reviewed each procedure code and assigned a percentage share for BHT based on coding and clinical expertise. These definitions were used to produce a field that calculated total hours of BHT services in 2019.

Procedure codes do not map well to the unique modalities of BHT for ASD such as behavioral health, developmental, or hybrid categories. Certain CPT codes developed and adopted by the American Medical Association in 2021 were done so with the intent of capturing adaptive behavior assessment and treatment associated with applied behavioral analysis. Social Skills Group is associated with a specific CPT code (adaptive behavior treatment social skills group, administered by physician or other qualified health care professional face-to-face with multiple patients). However, given how recently these codes were introduced (CHBRP data is from 2019) and inconsistent billing practices or guidelines, it is not possible to map specific procedure codes with specific modalities of BHT, be it behavioral, developmental, or hybrid.

CHBRP used the ASD diagnosis codes to produce a list of ASD diagnosed individuals in the 2019 CHSD. With those unique individuals, CHBRP was able to identify all individuals with ASD using BHT services throughout the year. From the 2019 CHSD utilization, hours of service, and baseline utilization, hours of service and baseline cost information were developed for those individuals with an ASD diagnosis using BHT services. The data were split into several age categories to allow insight into patterns of prevalence by age band: 0 to 12 years; 13 and 17 and 18 and over. Through this breakout, CHBRP determined that there was a higher prevalence of claims for individuals with an ASD diagnosis for those 0 to 12 years of age and that the level of service was higher in those age bands. See below, for estimated ASD prevalence by age band.

Table 5. Prevalence of Autistic Spectrum Disorder Among Commercial/CalPERS Enrollees

| ASD Diagnoses per 10,000 Enrollees | Age Groups, Years | | | Total |
|--|-------------------|------------|----------|-------|
| | Ages 0–12 | Ages 13–17 | Ages 18+ | |
| With state-regulated (non–Medi-Cal) health insurance | 102.2 | 85.0 | 8.3 | 28.6 |

Source: California Health Benefits Review Program, 2021

Utilization is estimated to increase as a result from SB 562’s provisions related to removal of parental involvement restrictions; setting restrictions; and expanded coverage for BHT for ASD, especially those modalities considered developmental or hybrid. It is not possible to separate out the utilization impacts of these individual provisions; instead CHBRP estimates a combined utilization increase resulting from SB 562 provisions in total. CHBRP estimates a combined 1.2% increase in utilization for users aged 0 to 12 years. Unit costs of medical services were trended at an annual rate of 2.0% from 2019 to 2022.

Determining Public Demand for the Proposed Mandate

CHBRP reviews public demand for benefits relevant to a proposed mandate in two ways. CHBRP:

- Considers the bargaining history of organized labor; and

Compares the benefits provided by self-insured health plans or policies (which are not regulated by the DMHC or CDI and therefore not subject to state-level mandates) with the benefits that are provided by plans or policies that would be subject to the mandate.

On the basis of conversations with the largest collective bargaining agents in California, CHBRP concluded that in general, unions negotiate for broader contract provisions such as coverage for dependents, premiums, deductibles, and broad coinsurance levels.

Among publicly funded self-insured health insurance policies, the preferred provider organization (PPO) plans offered by CalPERS have the largest number of enrollees. The CalPERS PPOs currently provide benefit coverage similar to what is available through group health insurance plans and policies that would be subject to the mandate.

To further investigate public demand, CHBRP used the bill-specific coverage survey to ask carriers who act as third-party administrators for (non-CalPERS) self-insured group health insurance programs whether the relevant benefit coverage differed from what is offered in group market plans or policies that would be subject to the mandate. The responses indicated that there were no substantive differences.

Second Year Impacts on Benefit Coverage, Utilization, and Cost

CHBRP has considered whether continued implementation during the second year of the benefit coverage requirements of SB 562 would have a substantially different impact on utilization of BHT services for which coverage was directly addressed, the utilization of any indirectly affected utilization, or both. CHBRP reviewed the literature and consulted content experts about the possibility of varied second year impacts and determined the second year's impacts of SB 562 would be substantially the same as the impacts in the first year (see Table 1). Minor changes to utilization and expenditures are due to population changes between the first year postmandate and the second year postmandate.

APPENDIX D INFORMATION SUBMITTED BY OUTSIDE PARTIES

The following information was submitted by Melissa Cortez-Roth on behalf of Hanna Rue, Ph.D., BCBA-D.

Casenhiser, D.M., Shanker, S.G., & Stieben, J. (2011). Learning through interaction in children with autism: Preliminary data from a social-communication-based intervention. *Autism*, 17, 220-241.

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The following information was submitted by Melissa Cortez-Roth on behalf of the Center for Autism and Related Disorders.

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A group of faculty, researchers, and staff complete the analysis that informs California Health Benefits Review Program (CHBRP) reports. The CHBRP **Faculty Task Force** comprises rotating senior faculty from University of California (UC) campuses. In addition to these representatives, there are other ongoing researchers and analysts who are **Task Force Contributors** to CHBRP from UC that conduct much of the analysis. The **CHBRP staff** coordinates the efforts of the Faculty Task Force, works with Task Force members in preparing parts of the analysis, and manages all external communications, including those with the California Legislature. As required by CHBRP's authorizing legislation, UC contracts with a certified actuary, **Milliman**, to assist in assessing the financial impact of each legislative proposal mandating or repealing a health insurance benefit.

The **National Advisory Council** provides expert reviews of draft analyses and offers general guidance on the program to CHBRP staff and the Faculty Task Force. CHBRP is grateful for the valuable assistance of its National Advisory Council. CHBRP assumes full responsibility for the report and the accuracy of its contents.

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Janet Coffman, MA, MPP, PhD, and Connie Kwong, BA, both of the University of California, San Francisco, prepared the medical effectiveness analysis. Stephen L. Clancy, MLS, AHIP, of the University of California, Irvine, conducted the literature search. John Lewis, of CHBRP staff, and Karen Shore, PhD, CHBRP contractor, prepared the public health impact analysis. John Lewis, MPA, of CHBRP staff, and Annie Man, FSA, MAAA, PhD, of Milliman prepared the cost impact analysis. Annie Man, FSA, MAAA, PhD and Marina Zen, ASA, MAAA, of Milliman, provided actuarial analysis. Content experts Catherine Lord, PhD, of the University of California, Los Angeles, and Molly Candon, PhD, of the University of Pennsylvania, provided technical assistance with the literature search and expert input on the analytic approach. John Lewis, MPA, of CHBRP staff, prepared the Policy Context and synthesized the individual sections into a single report. A subcommittee of CHBRP's National Advisory Council (see previous page of this report) and a member of the CHBRP Faculty Task Force, Nadereh Pourat, PhD, of the University of California, Los Angeles, reviewed the analysis for its accuracy, completeness, clarity, and responsiveness to the Legislature's request.

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CHBRP assumes full responsibility for the report and the accuracy of its contents. All CHBRP bill analyses and other publications are available at www.chbrp.org.

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