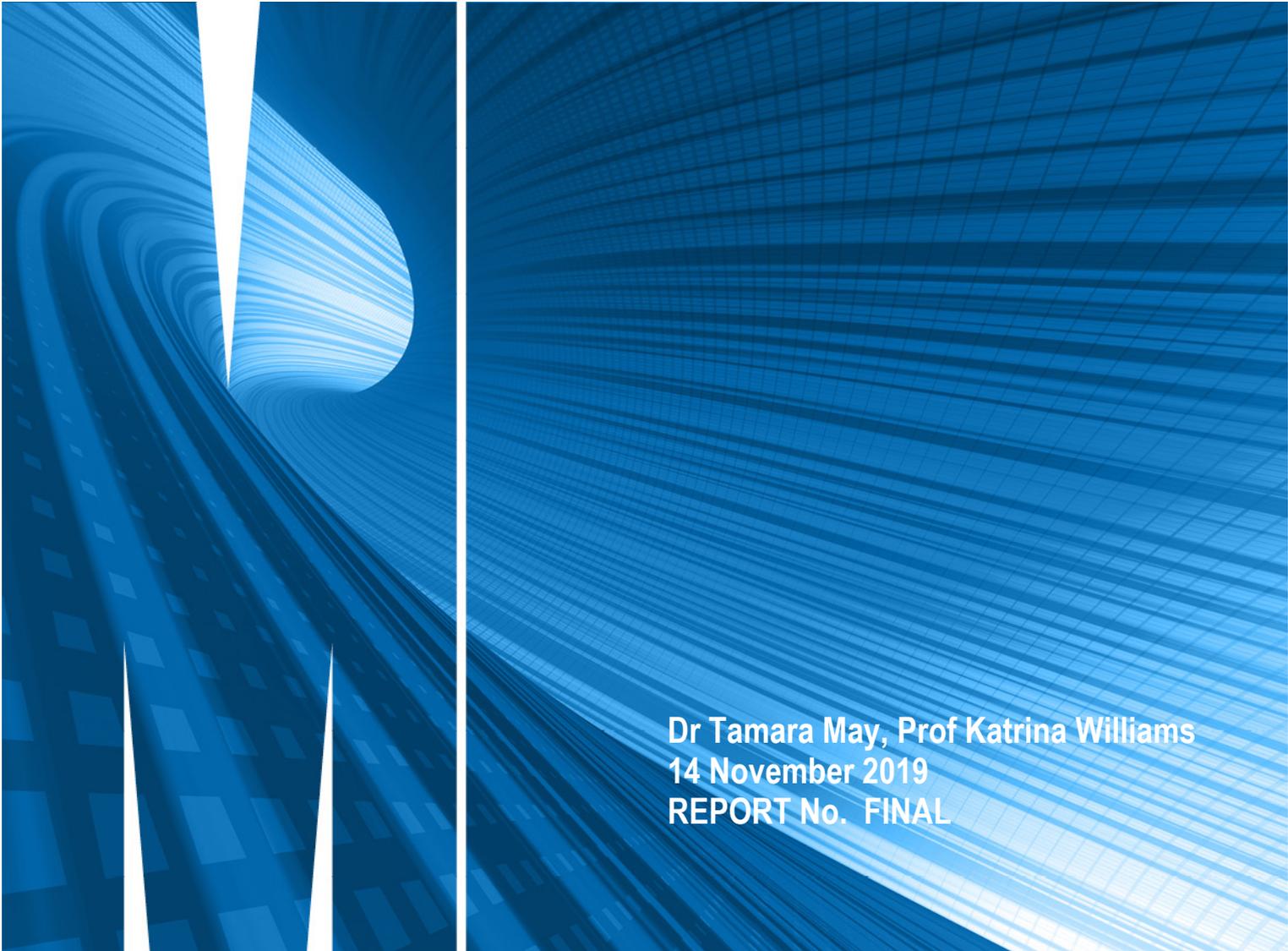


# Understanding increased enrolments of autism and mental health needs in NSW government schools



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## FOREWORD

The Department of Education NSW, commissioned researchers from the Department of Paediatrics, Monash University, to complete a report into the reasons for increased numbers of children with autism and mental health needs in NSW government schools over the period from 2013 to 2017. Internal factors under the influence of the Department of Education NSW were explored. These were derived from information provided by the Department of Education NSW through consultation with staff members and the provision of existing relevant reports and documentation. This report also provides an overview of autism and mental health prevalence in Australia and internationally to understand external factors outside of those influenced by the Department of Education NSW. This was performed via literature search and examination of other available relevant prevalence data. The report also includes the method and results of statistically modelling the influence of both internal and external factors, where possible, on the rise in autism and mental health needs prevalence in NSW government schools. The autism and mental health needs prevalence for 2018 is estimated. Autism and mental health needs in the next 5 to 10 years are forecast.

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## ACRONYMS

Acronym	Definition
AR	Access Request database
ASD	Autism Spectrum Disorder
DE	Distance Education
DoE	Department of Education
DSM	Diagnostic and Statistical Manual of Mental Disorders
ID	Intellectual Disability
IFS	Integration Funding Support
MH	Mental Health
SC	Support Class

## EXECUTIVE SUMMARY

This report was commissioned by the Department of Education (DoE) NSW to understand the reported annual increase in enrolments of students with autism spectrum disorder (ASD) (14.5%) and mental health (MH) needs (5.4%) in NSW public schools, during the period 2013-17 in the Disability Strategy. Key internal and external reasons for an increase, and their relative contribution, were explored. Prevalence figures for 2018 with a 10 year forecast were estimated. The dataset provided by DoE included students receiving Level 1 funding in NSW public schools. Of note the method for identifying students in the DoE dataset was different to the method used for the Disability Strategy.

The following prevalence figures were estimated for a primary diagnosis:

- There was an increase in primary diagnoses of ASD from 0.7% in 2013 to 1.5% in 2018. The average annual prevalence increase in ASD (adjusted for increase in total enrolments) was for 2013-2017, 15.8%, and 15.4% from 2013 to 2018.
- There was an increase in primary diagnoses of MH needs from 2013 to 2017 from 0.7% to 0.9%. The average annual prevalence increase in MH needs (adjusted for increase in total enrolments) was for 2013-2017, 3.3%, and 4.4% from 2013 to 2018.
- There was a decrease in primary diagnoses of Intellectual Disability (ID) from 1.9% in 2013 to 1.6% in 2018. The average annual prevalence decrease in ID (adjusted for increase in total enrolments) was for 2013-2017, 2.8%, and 2.8% from 2013 to 2018.

The 10 year prevalence predictions based on a primary diagnosis are:

- Primary diagnosis of ASD to increase from 1.6% in 2019 to 3.0% of students in 2028
- Primary diagnosis of MH needs to increase from 0.9% in 2019 to 1.2% of students in 2028

As many students will have more than one disorder (e.g. comorbid ASD and ID) the proportion of students with any of these diagnoses, regardless of their primary diagnosis, in NSW public schools was also calculated:

- The proportion of students in NSW schools with any ASD has increased from 1.1% in 2013 to 1.9% in 2018. The average annual prevalence increase in any ASD (adjusted for increase in total enrolments) was 12.2% from 2013 to 2018.
- The proportion of students in NSW schools with any MH needs has increased from 0.9% in 2013 to 1.3% in 2018. The average annual prevalence increase in any MH needs (adjusted for increase in total enrolments) was 6.4% from 2013 to 2018.
- The proportion of students in NSW schools with any ID has remained stable from 2011-2018 at around 2.4%. The average annual prevalence increase in any ID (adjusted for increase in total enrolments) was 0.4% from 2013 to 2018.

The 10 year prevalence predictions based on any diagnosis is:

- ASD to increase from 2.0% in 2019 to 3.5% of students in 2028
- MH needs to increase from 1.3% in 2019 to 1.9% of students in 2028

The Nationally Consistent Collection of Data on school students with disability (NCCD) includes all students that required adjustments in schools and has collected data since 2015. In 2017, 19.2% of NSW students were

reported to receive adjustments. As per this report, in 2017, 3.75% of NSW public school enrolments received Level 1 funding for MH needs, ID and ASD. As the data collection procedures for the NCCD are being refined it is unclear if all students receiving Level 1 support at this time were captured in the NCCD figure from the same period. The four broad categories of disability from the NCCD cannot be compared to the narrow disorder defined categories captured by Level 1 funding. Further work to explore the overlap of NCCD and Level 1 funding is needed to understand the profile of students captured in the NCCD who are, and are not, receiving Level 1 funding.

For internal factors that may have contributed to the increase in Level 1 funding for ASD and MH needs:

- Many students have overlapping features of ASD, ID, MH needs (and other co-occurring disorders). While the proportion of students with intellectual disability (regardless of any other co-occurring disorders) remained stable from 2011 to 2018; the proportion of students with autism without intellectual disability increased over the period 2011 to 2018. Thus, the enrolment of intellectually-able students with ASD was the main contributor to the increase over the period.
- The proportion of comorbidity in students with ASD also decreased from 73% to 67% from 2013-2018 indicating that students with ASD with fewer other problems were increasingly identified over the period.
- In 2013 around 15,000 students were removed from level 1 funding with the introduction of Level 2 funding. Approximately 1,432 of these students returned to Level 1 funding from 2014 to 2018 accounting for 1.4% of ASD, 0.4% of ID and 1.3% of MH needs students over the five year period (3% of the total students receiving funding for ASD, ID & MH needs from 2014-2018). Thus, returning students contributed only 3% to the increase across these disorders.
- There was no indication that teachers completing online ASD professional development courses was associated with the increase in ASD prevalence.
- The change to DSM-5 in 2014 from the DSM-IV-TR for ASD could not be confirmed as a cause or correlate of the increase in students with ASD. This was due to the concurrent introduction of Level 2 funding resulting in a large group of students being removed in 2013 and insufficient prior data time points to compare.
- Diagnostic switching between any MH, ID or ASD diagnoses impacted only around 6% of students receiving Level 1 funding support. This indicates that students changing primary diagnosis from ID to ASD or MH needs did not make a substantial impact to the increase in ASD and MH needs.

For student characteristics:

- Proportionally more females with ASD and MH needs have been identified over time which has made a small contribution to the increase in the primary diagnosis levels of both categories.
- Aboriginal and Torres Strait Islander students were over-represented as having primary diagnoses of ASD, ID and MH needs relative to the NSW public school population prevalence of Aboriginal students. In 2018 Aboriginal students made up 8% of the NSW public school enrolments but 12% of students with ASD, 18% of students with ID and 29% of students with MH needs based on primary diagnosis. The proportion of Aboriginal and Torres Strait Islander students with MH needs has increased 6%, ASD 4% and ID 4% from 2011 to 2018. This has made a small contribution to the increase in MH and ASD prevalence.
- The average grade level that a student receives support has increased for ASD from grade 5 to 6, ID from Grade 6 to 8, and MH needs from Grade 6 to Grade 7 The grade a student first receives support

has also increased from 2011 to 2018, from Grade 2 to 3 for ASD, Grade 3 to 5 for ID, and MH needs has remained stable at Grade 5. This indicates that increasing numbers of older students are being identified as having ASD and ID, and similarly, increasing numbers of older students are receiving support.

#### For external factors

- There has been a significant and large international and national increase in ASD prevalence and an increase in other Australian states/territories over the period, as demonstrated by health, education and research data. Thus, the increase in ASD prevalence in NSW public schools reflects an international and national trend and one found in other states. The increase in ASD prevalence has been attributed in part to 'higher-functioning' individuals being identified who have lower levels of symptoms and fewer comorbidities such as ID, as reported in other national and international data. The NSW findings of the increase in ASD being mostly students without ID is consistent with these broader trends.
- There has similarly been an increase in MH needs prevalence in Australia and internationally and the increase in NSW public schools likely reflects this national trend.
- There has been a large increase in public awareness in ASD over the period which has likely contributed to the national increase in prevalence and to the increase in NSW public schools.
- The NDIS impact could not be confirmed because of the removal of students from Level 1 funding coinciding with the introduction of the NDIS in the Hunter region in 2013.

#### Limitations

Missing disability information about primary and other diagnoses was derived by NSW DoE based on support class type and Factors of Need. Prediction and association statistics need to be interpreted with caution given the small number of data points used to make calculations. The MH Needs category includes all DSM-IV-TR psychiatric diagnoses. It does not provide the required granularity to explore potential specific diagnostic categories that might be contributing to the increase, such as a breakdown of internalising versus externalising disorders.

#### Summary

The increase in the prevalence of ASD from 2013 to 2018 is due to the identification of intellectually-able students with ASD. The prevalence of students with any intellectual disability (regardless of their primary diagnosis) remained stable over the last 8 years. The increase in mental health needs is likely due to increasing public awareness of MH needs. The MH needs category is too broad to understand specific causal factors for the increase. There is minimal contribution from the explored internal factors to the increase in ASD and MH needs. Three percent of the total students receiving funding for ASD, ID & MH needs from 2014-2018 were those who returned to Level 1 funding after being removed in 2013 with the introduction of Level 2 funding. Student characteristics have changed over the period, with slightly more girls with ASD and MH needs being identified and an increase in Aboriginal and Torres Strait Islander students receiving funding for ASD and MH needs. These changes each make a small contribution to the increase in prevalence of ASD. The impact of the NDIS and from changes to DSM-IV-TR to DSM-5 could not be confirmed due to too few prior data points and the co-occurring introduction of Level 2 funding in 2013. Increased ASD and MH needs prevalence likely reflects Australian and international trends of increased prevalence due to growing awareness, increased screening and identification of students with disabilities, and diagnosis of students with normal intelligence and less behavioural challenges.

## PART 1: BACKGROUND INFORMATION FROM NSW DOE

The NSW Department of Education (DoE) aspires to build an education system in which children with disability thrive academically, develop good physical, mental and emotional health, and gain the skills to live a fulfilling, independent life post-school.

The NSW Department of Education's Disability Strategy was released on 21 February 2019. The strategy has been informed by the recent Legislative Council's Inquiry into the education of students with disability or special needs in NSW and the release of the Committee's report in September 2017, as well as extensive consultation and collaboration with families, educators, community groups and disability advocates and experts.

The DoE's Disability Strategy provides a reform plan to provide children and young people with disability, their families and the broader community with an education system that meets their needs.

The focus of this Research Report is to better understand the prevalence of autism and mental health needs in NSW schools, which aligns with the thematic outcome 4.3 in the Strategy: *Invest in research to better understand the prevalence of autism and mental health in our schools.*

As reported in the NSW DoE's Disability Strategy, from 2013-17, enrolments of students with autism increased by ~14.5% per year while enrolments of students with mental health needs grew by 5.4%<sup>1</sup> per year. For this reason, the DoE commissioned this report to understand the underlying drivers. The DoE is keen to understand how much of the reported increase is attributable to 'external' population-level factors including, but not limited to, changes in diagnostic definitions, compared to 'internal' DoE factors, including but not limited to process changes, funding, communications and professional development.

### 1 RESEARCH QUESTION

What are the key reasons and their relative contribution to explain the observed increase in enrolments of students with autism (14.5%) and mental health needs (5.4%) in NSW public schools, during the period 2013-17? What is the prevalence of autism and mental health needs in 2018 and the 5 and 10 year predicted prevalence?

### 2 OBJECTIVES

- a) Provide the DoE with clarity on reasons for the increase, and their relative contribution:
  - that can be attributed to 'internal' activities or changes driven by the DoE including, but not limited to, process and form changes, funding, communications, professional development, etc. For this, the DoE will provide the researcher with specific data files to analyse and access to a targeted group of stakeholders.
  - that can be attributed to 'external' activities or changes including but not limited to population-level factors; criteria or classification changes etc. For this, we expect the researcher to draw on their professional expertise and/ or additional desktop research.
- b) Provide the DoE with an estimate of:
  - the population percentage increase of students with autism in NSW with a retrospective view 2013-18 and a future trend indication with estimates of prevalence over the next 5 to 10 years.

- the population percentage increase in students with mental health needs in NSW with a retrospective view 2013-18 and a future trend indication with estimates of prevalence over the next 5 to 10 years.

that can be reasonably attributed to solely 'external' factors, during the period 2013-2018.

- c) Provide the DoE with a current (2018) baseline for rates for autism and mental health within NSW public schools, ensuring Disability Strategy Implementation team engagement and sign off
- d) Provide the DoE with an analysis and insights to the methodology used to generate the statistics contained within the Strategy

### 3 SCOPE

**Research Period:** Children enrolled in NSW public schools from 2013 – 2018. Data files included students with disability receiving Level 1 funding from 2011-2018 in primary and secondary schools.

**Data Supplied:** The data files included all students receiving Level 1 funding that had a diagnosis of autism, intellectual disability, and mental health needs in the databases used to record disability information.

**Autism Diagnosis:** For this Research Report, diagnosis must be considered as defined by the NDIS; “a specialist multi-disciplinary team, paediatrician, psychiatrist or clinical psychologist experienced in the assessment of Pervasive Developmental Disorders, and assessed using the current Diagnostic and Statistical Manual of Mental Disorders (DSM-V)<sup>2</sup>

**Mental Health Diagnosis:** Diagnoses of mental illnesses conforming to either of the two classifications: the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IVR); or the International Classification of Diseases, Tenth Edition (ICD-10).[2011] The DSM-IVR covers mental illnesses and the ICD-10 covers mental and physical illnesses.

## PART 2: NSW DOE DISABILITY FUNDING INFORMATION AND THE PROVIDED DATA

In 2012/13 the DoE introduced a new disability approach to funding which was implemented in 2013. There are three levels of funding provided for students with disability as detailed in the figure below. Level 2 Equity loadings for schools were introduced from 2013 which resulted in around 15,000 students moving from Level 1 targeted specialist provisions funding to level 2 funding support from 2013 onwards. No diagnostic information about individual student's disability is recorded for Level 2 and 3 funding. As such, the disability prevalence relating to this project will be derived from information kept by the DoE relating to Level 1 targeted specialists provisions. Other students receiving non-Level 1 targeted specialist provisions will be discussed in relation to the Nationally Consistent Collection of Data (NDDC).

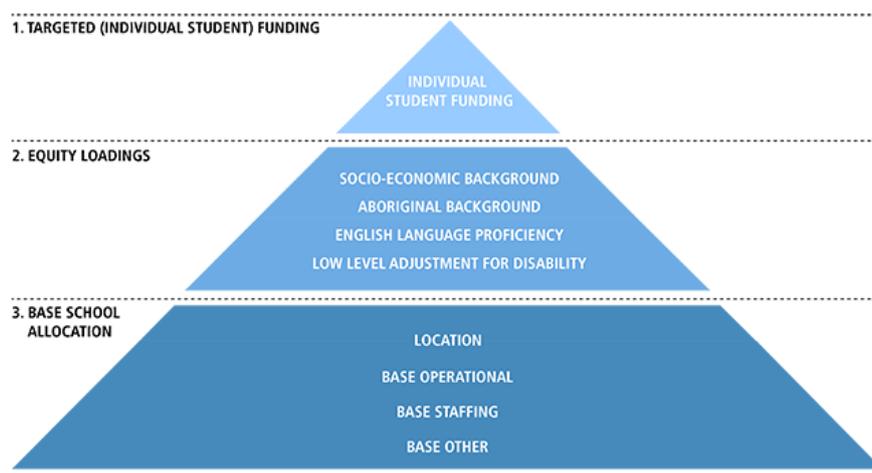


Figure 1 Disability funding levels provided by NSW DoE from 2013 onwards.

### 4 LEVEL 1 TARGETED SPECIALIST PROVISIONS

The following information has been ascertained from DoE staff. The following programs make up Level 1 targeted specialists provisions.

Table 1 Details of the databases used to derive disability information

Program	Details	Access	Administrative database
Integration Funding Support (IFS)	The Integration Funding Support program provides additional, targeted funding to NSW public schools for eligible students with disability to support personalised adjustments that enable their attendance	Application assessed by local school services offices;  Disability confirmation sheet used to ascertain if student still eligible over time e.g. usually annual review for mental health	IFS database

	and participation in regular classes.	needs but longer review period for other disorders.  Coding of primary diagnosis based on that considered to cause the most functional impact or that providing the highest level of support.	
Support Class (SC)	These are held in both regular and special schools. Places are limited.	Application assessed by placement panels.  Access is determined by considering numerous factors including child disability and other factors such as capacity and location and class fit with other students. All diagnoses are considered by the assessment panel, not just primary.	ERN & Access Request (AR)
Hearing & Vision classes	Hearing or vision teacher support.	Access Request	Sensory database
Distance Education and Support Classes DESU	For children with mild to severe Intellectual disability	Access Request	Access Request

Access Requests (AR) were reported to be completed online from 2010 with disability information recorded from 2013 onwards. Prior to this paper documentation was used, hence there are some students without Integration Funding Support (IFS) or AR information in the data analysed for this report. Generally, students cannot access IFS and SC at the same time, however, they may move between these programs and there may be periods of overlap.

Primary diagnosis and multiple secondary diagnoses are recorded in the IFS and AR databases. The most reliable data source for the purposes of this analysis was reported by DoE to be IFS which is most frequently updated, followed by Access Request and then Support Class (SC) information.

## 5 PROVIDED DOE DISABILITY DATASET

The dataset released by DoE for the purposes of this project uses information from multiple DoE databases used to hold information about disability. De-identified student level data was provided. The dataset includes the following information from 2011 to 2018:

- IFS and AR, DE-AR: primary and multiple other diagnoses in string format

- Intellectual Disability, Autism, Mental Health needs flags: from SC (based on Field of Need (FoN) for SCs extracted by DoE), IFS, AR, DE-AR
- SC, IFS, Statewide scholastic years, school code/name; SC enrolment type
- IFS, AR, DE AR latest update calendar year
- Sensory & hearing first year of support
- Student gender, Year of birth, Aboriginal and Torres Strait Islander status

In addition, two further data files were provided as follows:

- IFS history with year of calendar year, school code, name, scholastic year, primary disability, other disability, ID flag, Physical flag, for each disability certification for each student.
- AR history with creation and last update date, school code, name and primary and other disabilities for each access request made for each student

It was highlighted by DoE that access requests may be made and not progressed for various reasons. Hence, only where a school code for a particular year in the main dataset was flagged was a student identified as having funding that year for that diagnosis.

The three data files were merged by a de-identified student number.

There were 69268 students, however, only 66061 had a school code for a particular year and were within the range of 2011 to 2018. Thus the analyses that follow were based on these 66061 students.

## 6 PRIMARY DIAGNOSIS METHOD

Many education and health systems require, or only allow, one primary diagnosis to be recorded in an administrative database, and that primary diagnosis is used to provide access to resources and report on prevalence of different disorders. Comorbid disorders, or the co-occurrence of two or more disorders/ disabilities in one individual, is common in children with disabilities and in particular autism, mental health needs and intellectual disability. There are no definitive clinical rules or agreed methods of allocating a primary diagnosis when a child has multiple developmental/psychiatric disorders. Common clinical methods for determining a primary diagnosis are based on deciding which disorder causes the most functional impairment. However, this is often a subjective decision with few or no objective tools available to understand the contribution of each disorder to functional impairment. Decisions on a primary diagnosis may therefore be based on a combination of administrative and funding factors, such as level of difficulty or resources required to meet the administrative definition of the diagnosis, and funding/services available for each type of diagnosis or combination.

The dataset provided by DoE provides multiple flags in the dataset for diagnoses. There are therefore multiple ways to calculate prevalence of a primary diagnosis for each year from the DoE data. The following methods detailed below were explored.

### **Primary Diagnosis Method 1: ID precedence using most recent diagnosis**

1. For each IFS\_ScholasticYear[2011-2018] where the student received funding use IFS\_Primary\_Disability field to derive the new primary disability.
2. For students who do not have any data for IFS\_ScholasticYear, for each SCAS\_SubEnrolmentType[2018-2011] use the AR\_PrimaryDisability field to derive the new primary disability type.

3. For students who do not have an AR\_PrimaryDisability field, for each SCAS\_SubEnrolmentType[2018-2011] use the DE\_AR\_PrimaryDisability field to derive the new primary disability type.
4. For students who do not have a record in any of the above, use the Flags provided by DOE as follows:
  - a. Code as ID if any ID flags are indicated
  - b. If no ID flags, Code as ASD if ASD flags are indicated
  - c. If no ID or ASD flags, code as MH if MH flags are indicated.
5. For students who have a disability other than ID, Autism or Mental health needs flagged (e.g. physical, hearing, vision, language) replace with ID, Autism or Mental health if that was flagged as another diagnosis.
6. For students attending a statewide mental health class (e.g. a class in a hospital) their primary disability was recorded as mental health regardless of any flags, following discussion with DoE.
7. Any students who had a preschool flag indicated in their school year were excluded from analyses.

### Primary Diagnosis Method 2: ASD precedence using most recent diagnosis

Steps 1,2,3 and 5,6 identical to above.

4. For students who do not have a record in any of the above, use the Flags provided by DOE as follows:
  1. Code as ASD if any ASD flags are indicated
  2. If no ASD flags, Code as ID if ID flags are indicated
  3. If no ID or ASD flags, code as MH if MH flags are indicated.

### Primary Diagnosis Method 3: Explore all prior IFS and AR diagnoses, ID precedence

DoE provided two additional datasets – IFS history and AR history. These included each request/disability confirmation from 2011-2018 for students who had this information recorded (which is a subset of the original dataset). This information was coded so that for each year, the primary diagnosis from the IFS history or AR history for that corresponding year was used. As per above, IFS information was coded first, then AR information if no IFS information. As per Method 1, ID was given precedence over ASD. Any students who had a primary disability other than ID, ASD or MH coded was replaced with either ID, ASD or MH based on whether these flags were present with ID given precedence as per Method 1.

### Student Summary – for ID, ASD, MH

Data source	Number of students
IFS	29733
AR	30176
AR DE	0
<b>Total</b>	<b>59909</b>
Students allocated based on flags (from SC FoN to create flags)	9359
<b>Total students in dataset</b>	<b>69268</b>
<b>Total students with a school code</b>	<b>66061</b>

## PART 3: 2018 BASELINE LEVEL 1 AUTISM & MENTAL HEALTH NEEDS PREVALENCE IN NSW PUBLIC SCHOOLS

### 7 METHOD

We used the three primary diagnosis methods as defined above to calculate point prevalence by year as follows:

$$\text{Point prevalence} = \frac{\text{No. of cases in population of NSW public schools in 2018}}{\text{No. of children in NSW public schools in 2018}}$$

The annual adjusted percentage prevalence increase was calculated as follows. First the percentage increase in the disorder was calculated, with N=number of students with disorder:

$$\text{percentage increase} = \frac{N \text{ time } 2 - N \text{ time } 1}{N \text{ time } 1} * 100$$

The percentage increase in total NSW public school enrolments was calculated as above. The adjusted annual percentage increase in prevalence was the percentage increase in the disorder minus the prevalence increase in total NSW public school enrolments.

### 8 RESULTS: BASELINE POINT PREVALENCE ASD AND MENTAL HEALTH NEEDS 2011- 2018

The three methods had minimal difference (<0.02%) between them for each diagnosis (MH, ID, ASD). Hence, Method 3 was chosen as this used previous as well as the most recent report of diagnosis. See Appendix for the results for the other two methods.

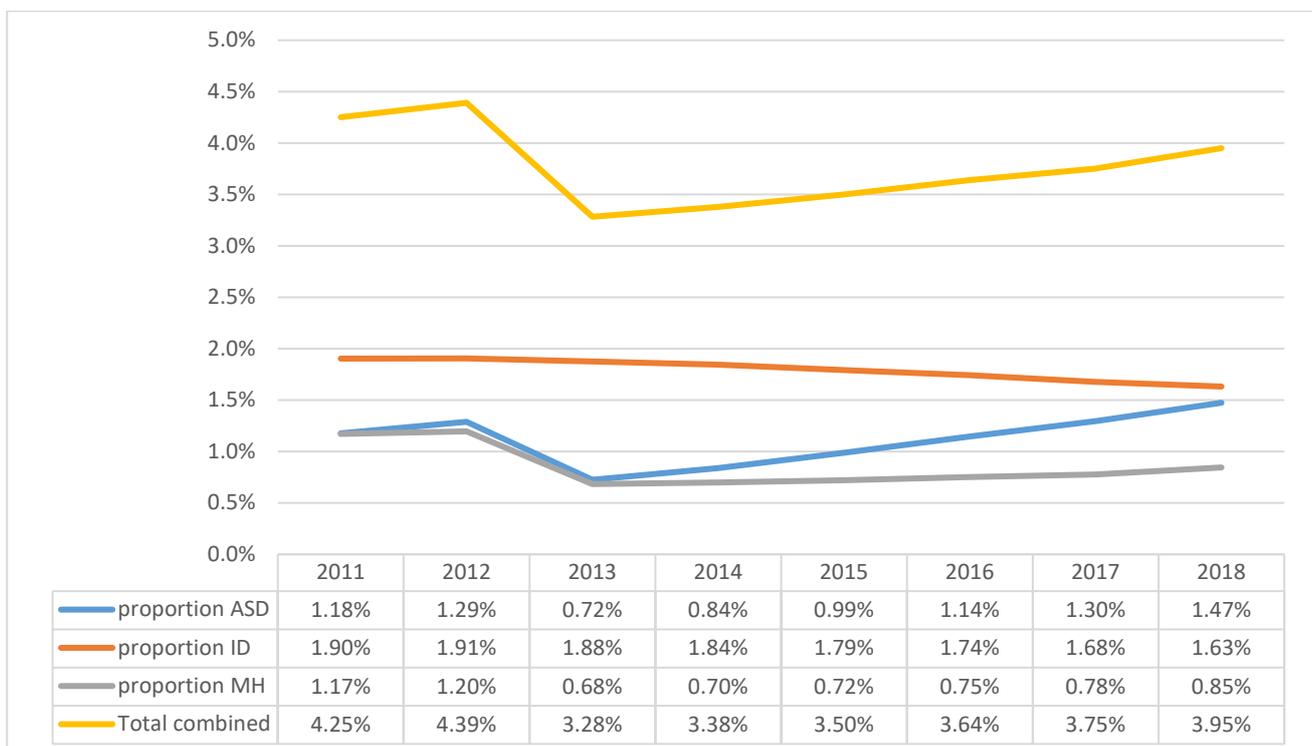


Figure 2. Proportion of primary and secondary school students with a Level 1 funding primary classification of Autism, ID and Mental Health Needs from 2011-2018, Method 3.

There has been an increase in primary diagnoses of Autism in primary and secondary students from 0.7% in 2013 to 1.5% in 2018.

There has been an increase in primary diagnoses of mental health needs in primary and secondary students from 2013 to 2017 from 0.7% to 0.9%.

There has been a decrease in primary diagnoses of ID in primary and secondary students from 1.9% in 2013 to 1.6% in 2018.

The total combined proportion of students receiving funding for ASD, ID and MH needs was 3.3% in 2013 and rose to 4.0% in 2018. The 2018 proportion was still slightly lower than the 4.3 and 4.4% in 2011 and 2012 prior to Level 2 funding.

Notes: The drop in 2013 numbers relates to ~15,000 students being removed from Level 1 funding with the introduction of Level 2 funding. As can be seen from the figure, primarily students with autism and MH were removed from the scheme.

The annual adjusted percentage prevalence increase was as follows:

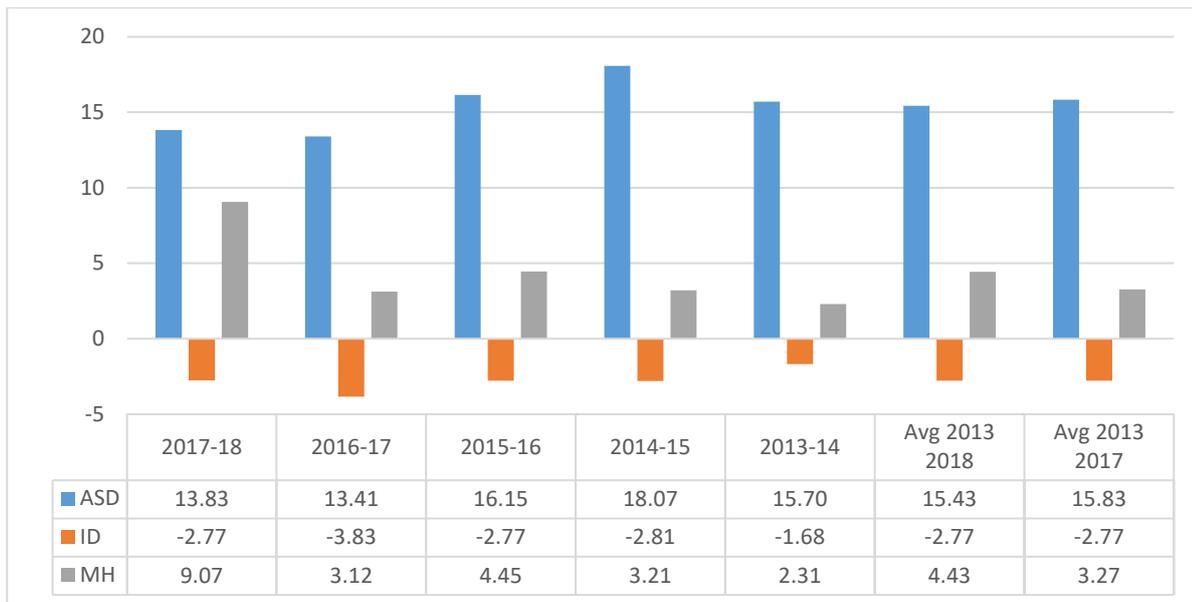


Figure 3 Annual adjusted percentage prevalence increase in primary diagnosis of ASD, ID and MH needs (Method 3), adjusted for increase in total NSW school enrolments from 2013 to 2018

The average annual prevalence increase in ASD (adjusted for increase in total enrolments) was for 2013-2017, 15.8%, and 15.4% from 2013 to 2018. The average annual prevalence increase in MH needs (adjusted for increase in total enrolments) was for 2013-2017, 3.3%, and 4.4% from 2013 to 2018. The average annual prevalence decrease in ID (adjusted for increase in total enrolments) was for 2013-2017, 2.8%, and 2.8% from 2013 to 2018.

## 9 OVERLAP OF AUTISM & INTELLECTUAL DISABILITY

### 9.1 Method

We ignored the primary disability type and used all flags for any ASD and any ID and identified a student as receiving funding for that year if they had a school code in that particular year. We then explored the overlap of ID and ASD versus ASD alone, and ID alone and we also combined 'any ID' and 'any ASD'. Using this method a student with both ID and ASD contributed to the count for both ID and ASD prevalence, whereas with a primary diagnosis they would have contributed to the count for only one category.

We also explored the proportion of children with ASD who had ID over the years, calculated as follows:

$$\text{Proportion students ASD who also have ID} = \frac{\text{Number of students with Autism+ID}}{\text{Number of children with Autism (with or without ID)}}$$

## 9.2 Results

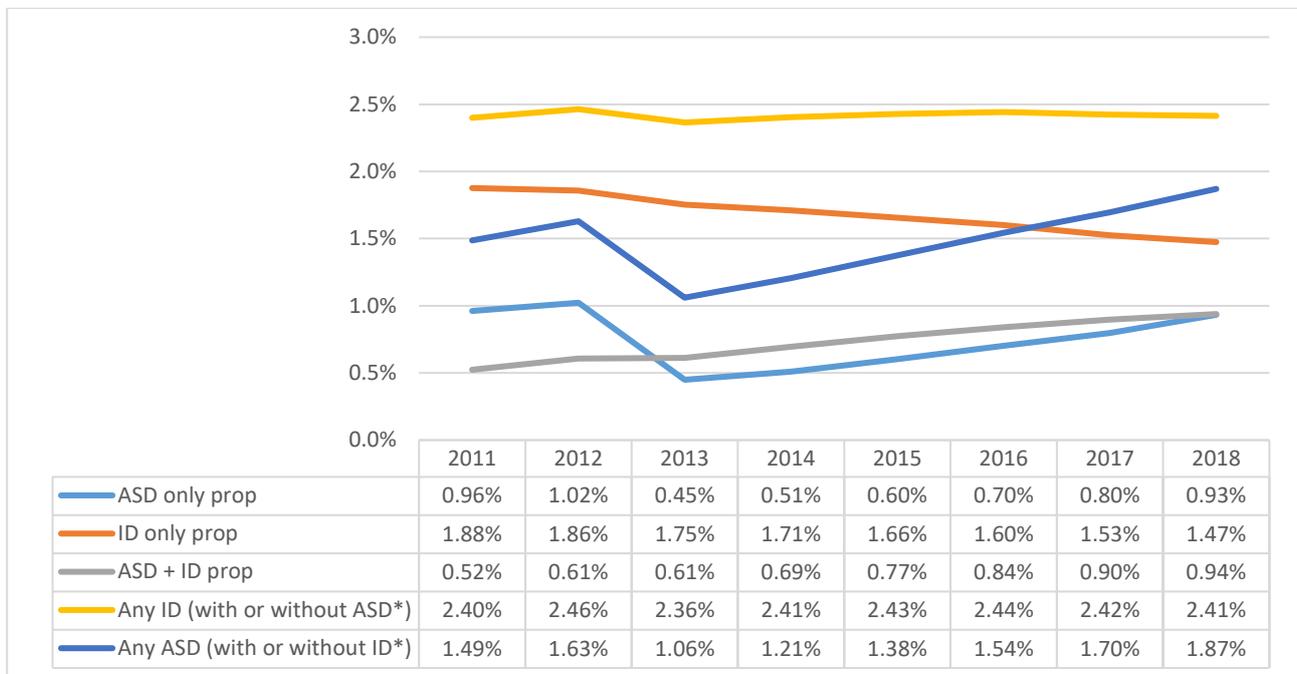


Figure 4 Proportion of students from 2011-2018, with ASD only, ID only, ASD+ASD, and any ID (e.g. ID with or without ASD)

The growth in students with ASD is largely attributable to ASD without intellectual disability (light blue line). Students with any ID (with or without autism; yellow line combines grey and orange) remain stable throughout the period accounting for around 2.4% of the school population from 2011 through 2018. Students with any ASD (with or without ID; dark blue line combines light blue and grey lines) increased from 1.1% to 1.9% from 2013 to 2018.

The proportion of students in NSW public schools with any ID has remained stable from 2011-2018 at 2.4%. The proportion of students in NSW public schools with any ASD has increased from 1.1% in 2013 to 1.9% in 2018.

As noted earlier, the drop in 2013 numbers relates to ~15,000 students being removed from Level 1 funding with the introduction of Level 2 funding.

The number of students with ASD who had ID was 35-37% prior to the introduction of Level 2 funding. After Level 2 funding was introduced the proportion of students with ASD and ID increased to 58% in 2013. This indicates that students with ASD without ID were removed from the scheme, as shown in the figure below. The rate of comorbid ID in students with ASD has reduced from 58% in 2013 to 50% in 2018, indicating that students with ASD without ID have been increasingly identified over the period.

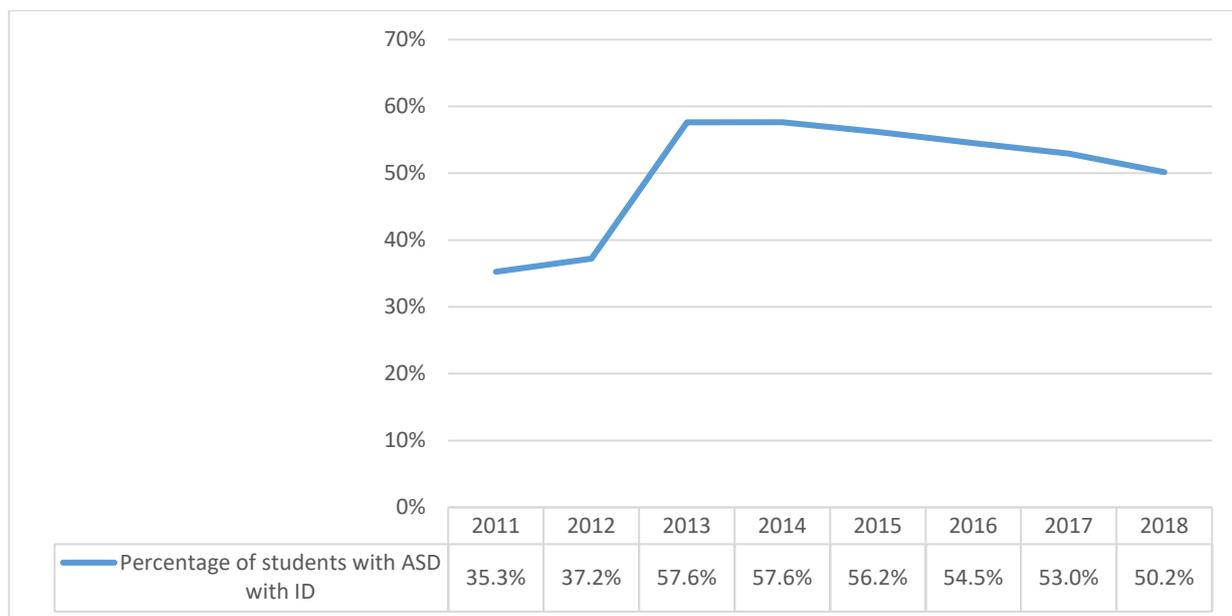


Figure 5 Percentage of students with ASD who have comorbid ID from 2011-2018

## 10 OVERLAP OF AUTISM, INTELLECTUAL DISABILITY & MENTAL HEALTH NEEDS

### 10.1 Method

As per the previous section, primary disability type was ignored and flags for any ASD, ID and MH were used, for each year where the student had a school code.

Comorbidity percentages for ASD, ID and MH needs were also calculated by year.

### 10.2 Results

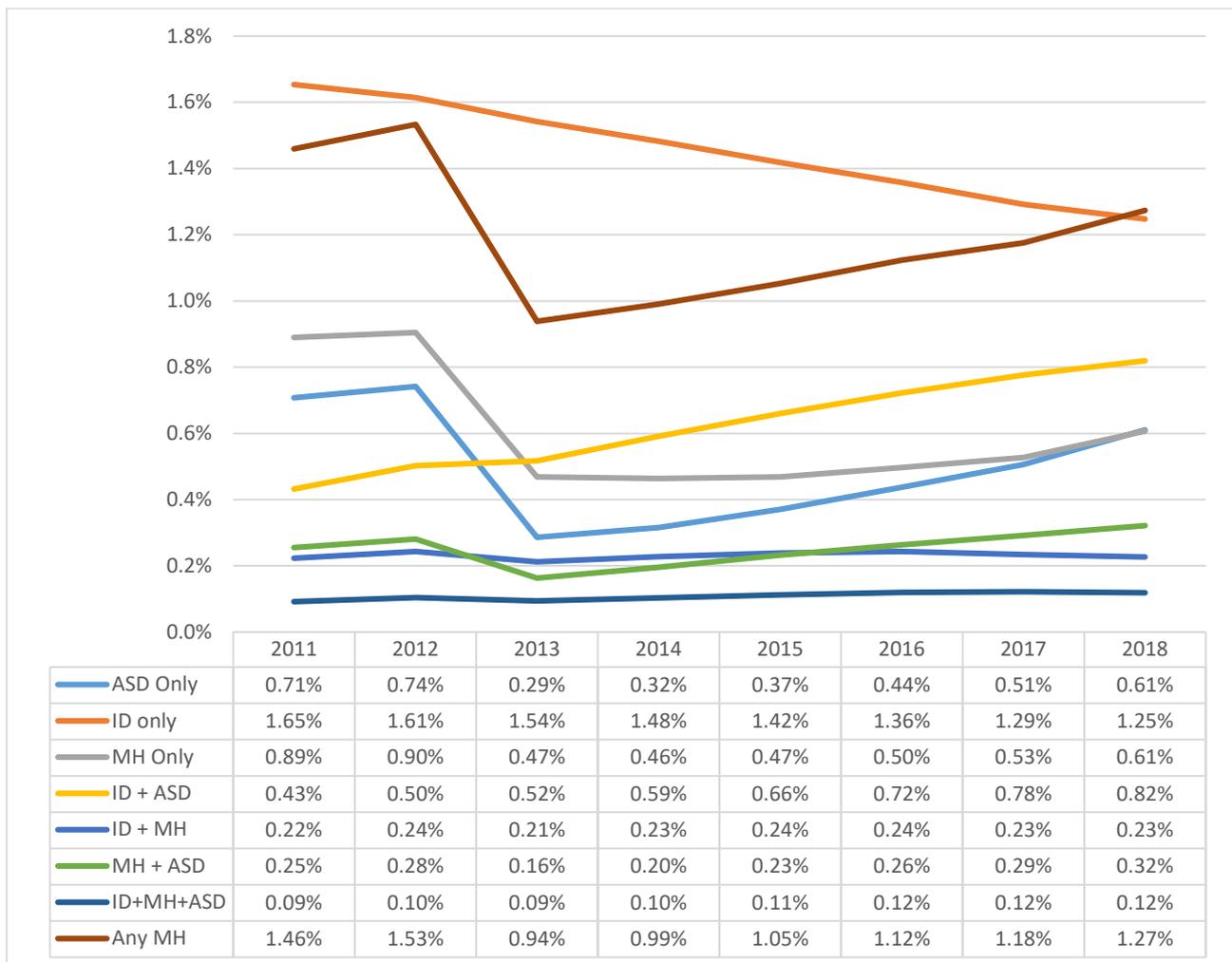


Figure 6 Proportion of students with ASD only, ID only, MH only, ID and ASD, ID and MH, MH and ASD, ID and MH and ASD, from 2011-2018

The growth in ASD is largely attributable to students with ASD without ID as per the previous section. The increase in MH is due to an increase in students with MH only and MH+ASD. MH students with ID remained stable over the period. There has also been a slightly increase in ASD with ID from 0.5% in 2013 to 0.8% in 2018.

The proportion of students in NSW public schools with MH Needs has increased from 0.9% in 2013 to 1.3% in 2018.

The annual adjusted percentage prevalence increase using the any diagnosis method was as follows:

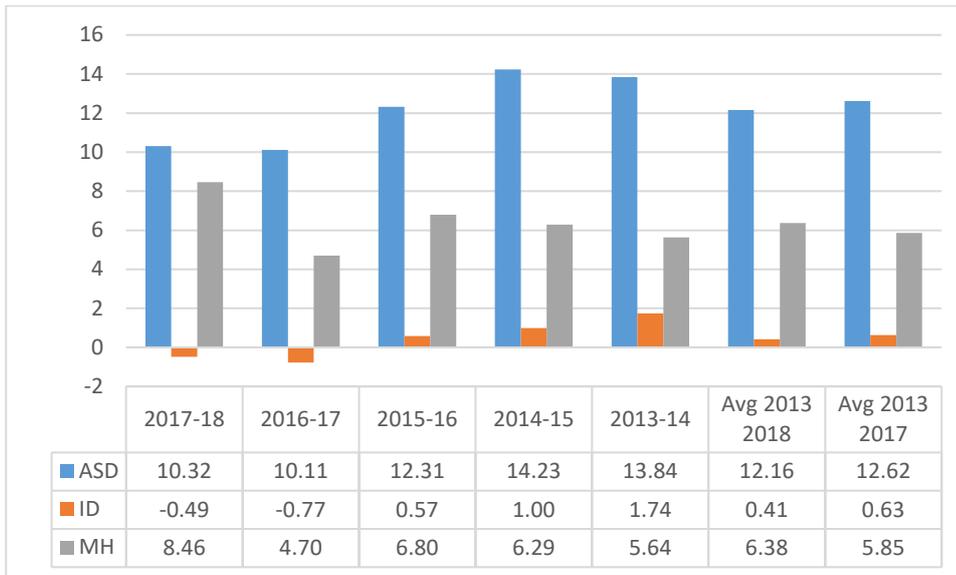


Figure 7, Annual adjusted percentage prevalence increase in any ASD, ID and MH needs, adjusted for increase in total NSW school enrolments from 2013 to 2018

The average annual prevalence increase in any ASD (adjusted for increase in total enrolments) was 12.2% from 2013 to 2018. The largest increase in percentage prevalence was from 2014 to 2015, with a gradual reduction following this period. The average annual prevalence increase in any MH needs (adjusted for increased in total enrolments) was 6.4% from 2013 to 2018. The average annual prevalence increase in any ID (adjusted for increased in total enrolments) was 0.4% from 2013 to 2018.

Comorbidity percentages for each disorder showed varying trends from 2011 to 2018 as per the figure below. There was an increase in comorbid disorders from 2013 when students were removed from the scheme, indicating that students without comorbidities were mostly removed.

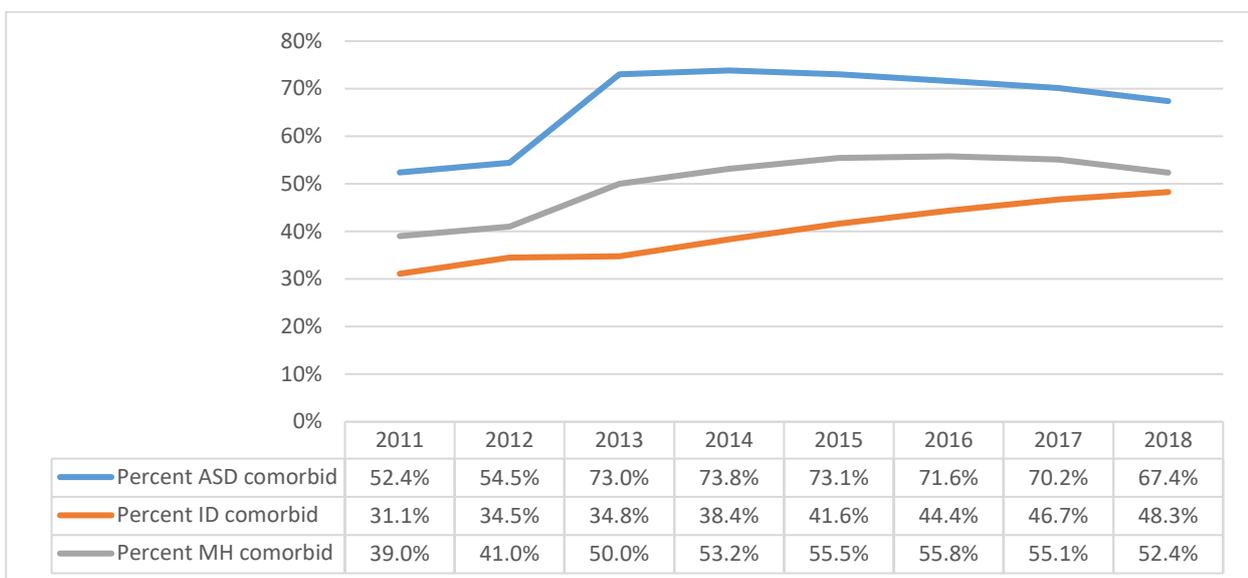


Figure 8 Percentage of students (any diagnosis) who have a comorbidity (MH, ID or ASD) by each diagnosis, from 2011 to 2018

Students with MH needs who had a comorbidity of ID or ASD increased from 50% in 2013 to 52% in 2018. Students with ID who had a comorbidity of ASD or MH needs increased from 35% in 2013 to 48% in 2018. Students with ASD showed a pattern of increase in comorbidities (MH and/or ID) in 2013 which is due to students with ASD without a comorbidity being removed from the scheme, and then a decrease from 73% to 67% from 2013 to 2018. This mirrors that described above, such that students with ASD without comorbidities are being increasingly identified.

## PART 4: 10 YEAR FORECAST FOR LEVEL 1 AUTISM & MENTAL HEALTH NEEDS

### 11 METHOD

Time series analysis with Autoregressive Integrated Moving Average (ARIMA) models were used taking into account the previous prevalence of ASD and mental health needs in NSW schools (based on Method 3 and any diagnosis). We used prevalence from 6 time points – 2013 to 2018- to calculate forecasts. This is below the optimum number of data points and hence these predictions should be interpreted with caution. We decided to exclude 2011 and 2012 figures due to the change in funding levels and large reduction in student numbers in 2013.

### 12 AUTISM FORECAST

Primary Diagnosis Method 3:

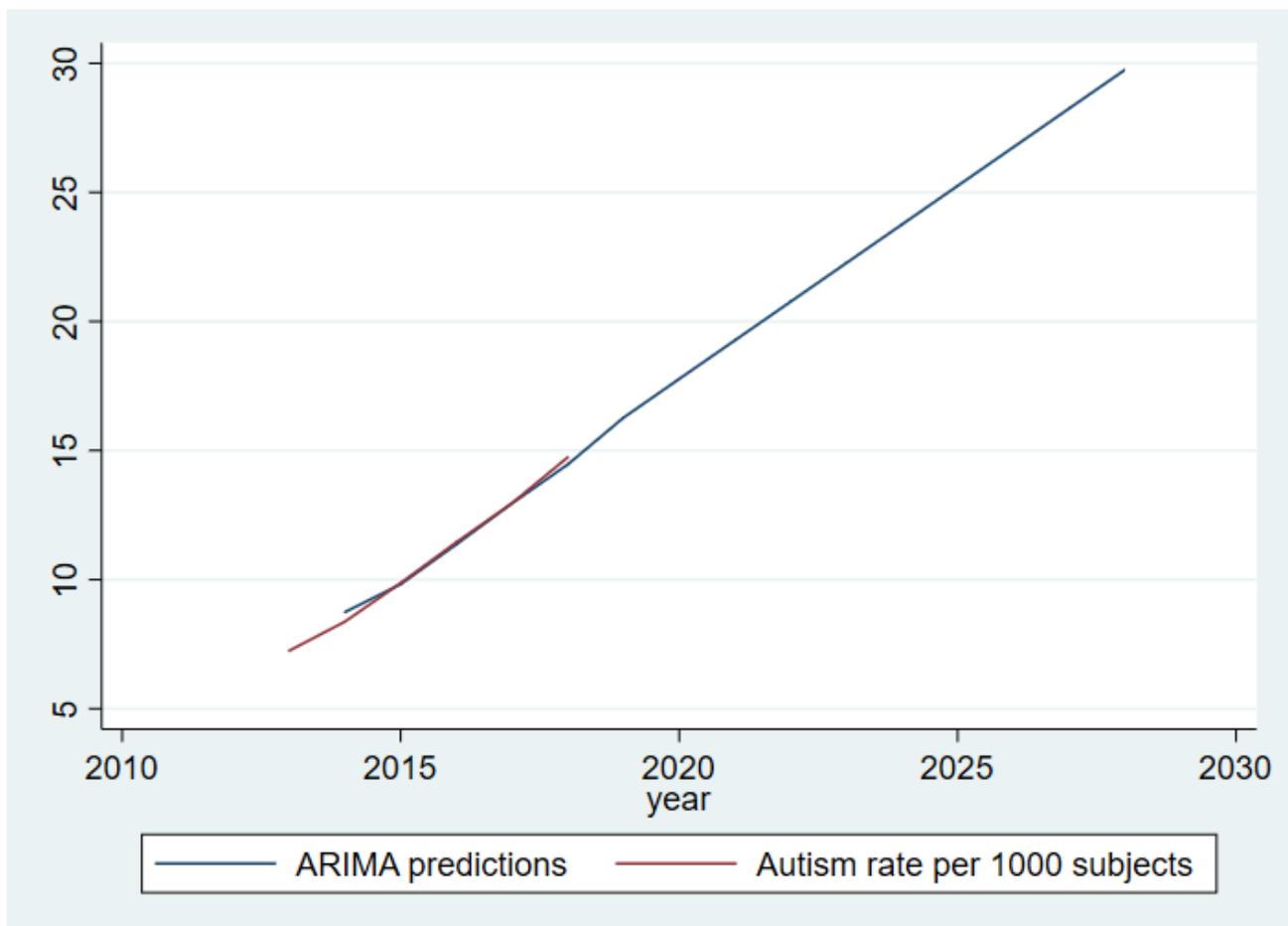


Figure 9 ARIMA predictions for autism rate per 1000 students based on 2013-2018 prevalence figures based on Primary Diagnosis Method 3

Note: ARIMA model with 1 autoregressive term. Results need to be interpreted with caution due to small number of prior time points in series.

*Table 2 Predicted ASD prevalence 2019 to 2028 based on Primary Diagnosis Method 3*

Year	Predicted ASD prevalence/1000 students	Lower 95% CI	Upper 95% CI
2019	16.27	15.86	16.68
2020	17.77	17.36	18.19
2021	19.27	18.85	19.68
2022	20.76	20.35	21.18
2023	22.26	21.84	22.68
2024	23.76	23.34	24.17
2025	25.25	24.84	25.67
2026	26.75	26.33	27.16
2027	28.24	27.83	28.66
2028	29.74	29.32	30.16

The predicted rise in ASD prevalence for students receiving Level 1 funding in NSW DoE schools is from 1.6% in 2019 to 3.0% in 2028. This figure should be interpreted with caution given the limited previous data points available for the calculation.

Any ASD diagnosis:

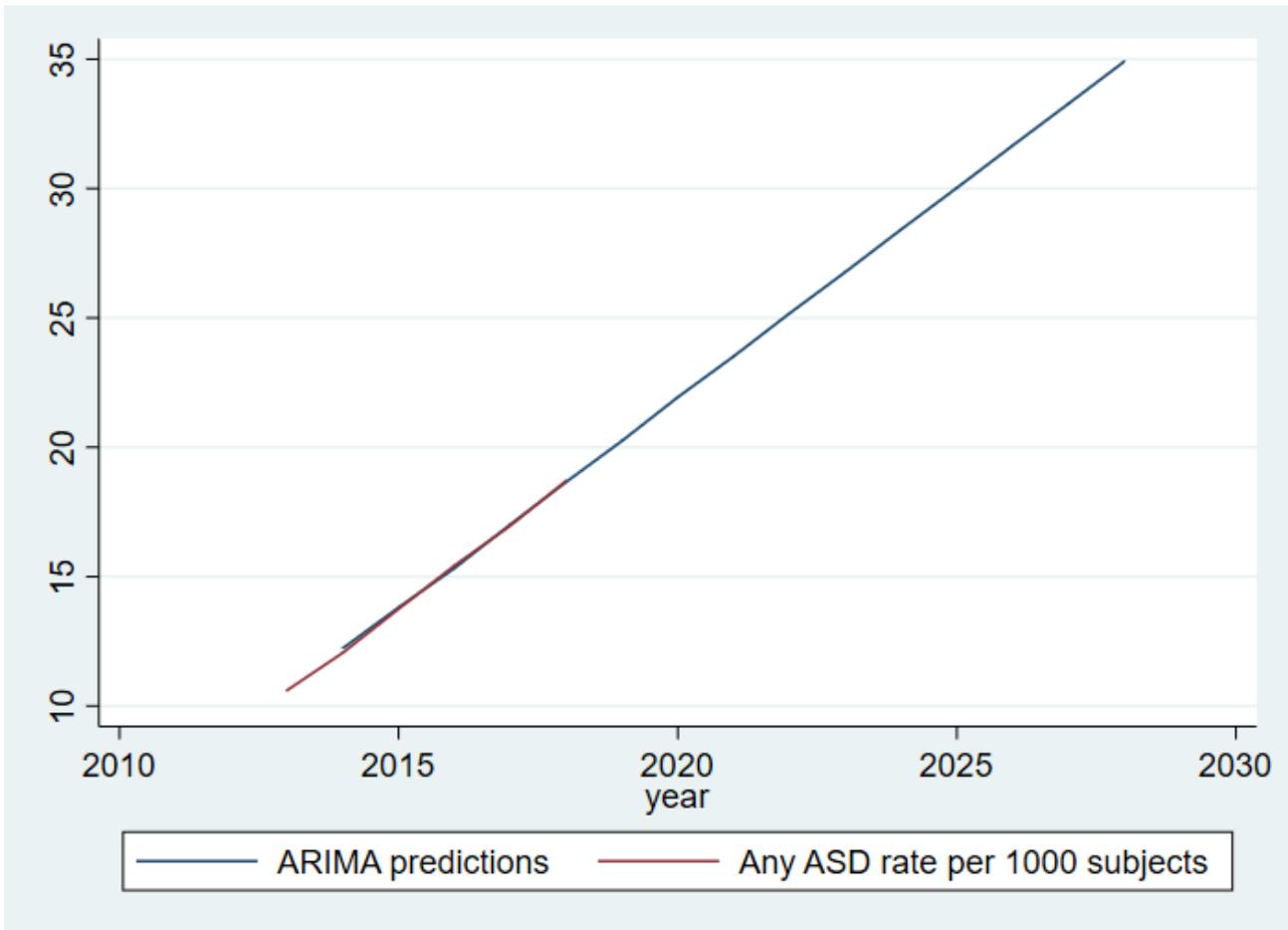


Table 3 Predicted ASD prevalence 2019 to 2028 based on any ASD diagnosis

Year	Predicted ASD prevalence/1000 students	Lower 95% CI	Upper 95% CI
2019	20.24	20.09	20.40
2020	21.93	21.74	22.13
2021	23.51	23.29	23.72
2022	25.17	24.95	25.40
2023	26.77	26.54	27.00
2024	28.41	28.18	28.65
2025	30.02	29.79	30.26
2026	31.66	31.42	31.90
2027	33.28	33.04	33.52
2028	34.91	34.67	35.15

The predicted rise in ASD prevalence using the 'any diagnosis method' for students receiving Level 1 funding in NSW DoE schools was from 2.0% in 2019 to 3.5% in 2028. This figure should be interpreted with caution given the limited previous data points available for the calculation.

### 13 MENTAL HEALTH NEEDS FORECAST

Primary Diagnosis Method 3:

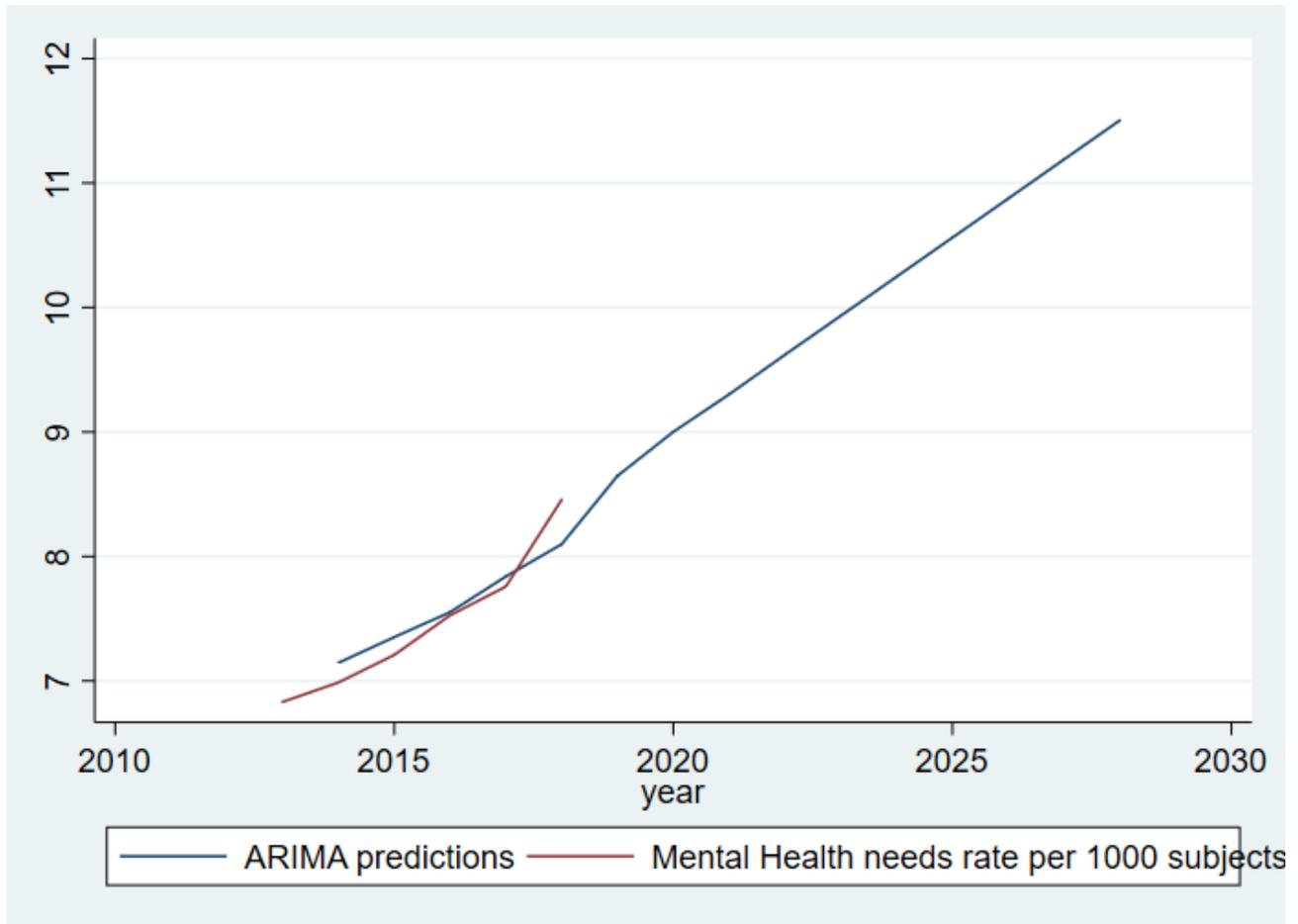


Figure 10 ARIMA predictions for mental health needs based on 2013-2018 mental health prevalence based on Primary Diagnosis Method 3

Note: ARIMA model with 1 autoregressive term. Results need to be interpreted with caution due to small number of prior time points in series.

Table 4 Predicted mental health needs prevalence 2019 to 2028 based on Primary Diagnosis Method 3

Year	Predicted mental health needs prevalence per 1000 students	Lower 95% CI	Upper 95% CI
2019	8.65	8.28	9.02
2020	9.00	8.61	9.39
2021	9.30	8.91	9.69
2022	9.62	9.23	10.01
2023	9.93	9.54	10.32
2024	10.25	9.86	10.64
2025	10.56	10.17	10.95
2026	10.88	10.49	11.27
2027	11.19	10.80	11.58

2028	11.50	11.11	11.89
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The predicted rise in mental health needs prevalence for students receiving Level 1 funding in NSW DoE schools is from 0.9% in 2019 to 1.2% in 2028. This figure should be interpreted with caution given the limited previous data points available for the calculation.

Any MH needs diagnosis:

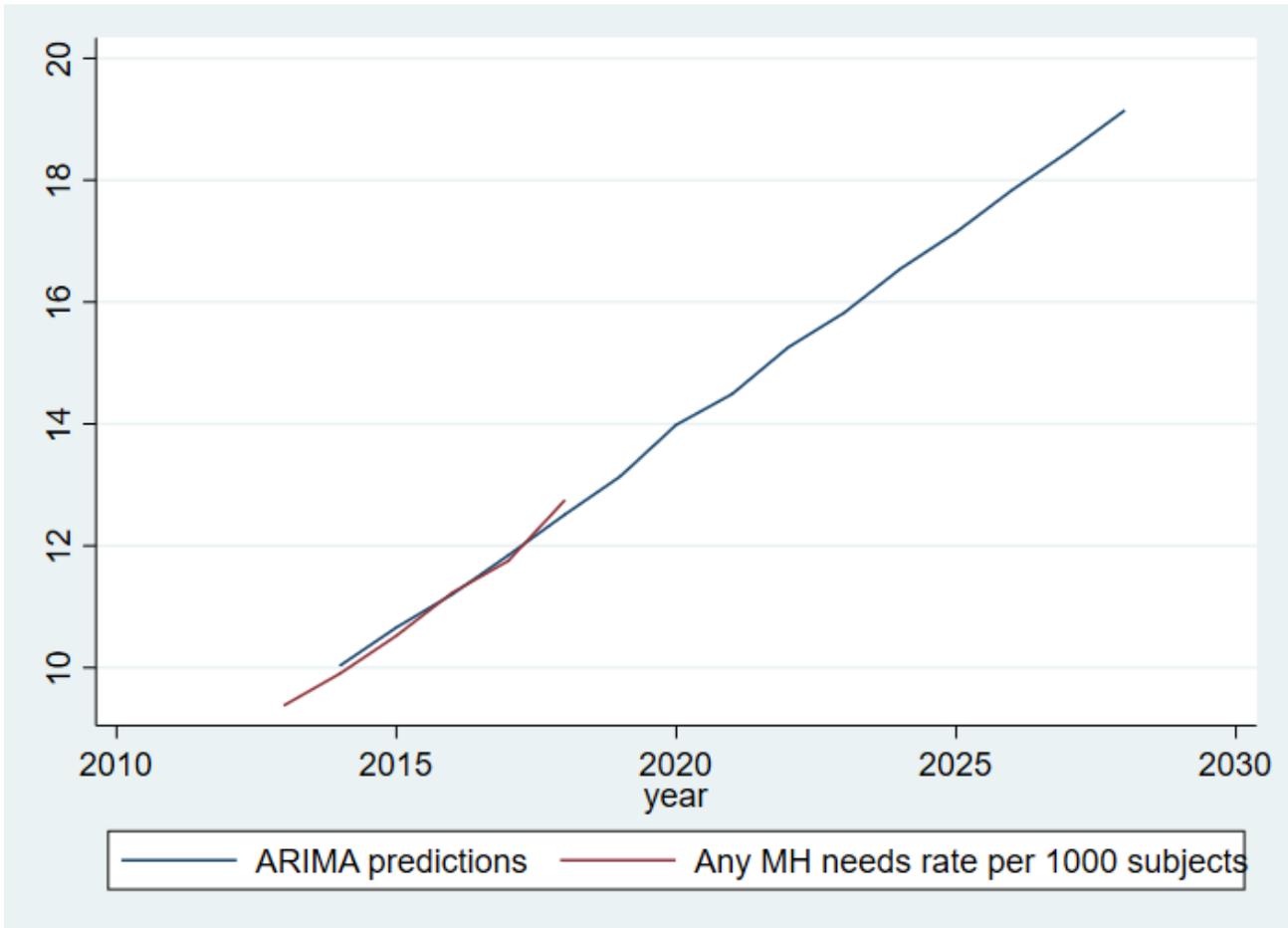


Table 5 Predicted mental health needs prevalence 2019 to 2028 based on Primary Diagnosis Method 3

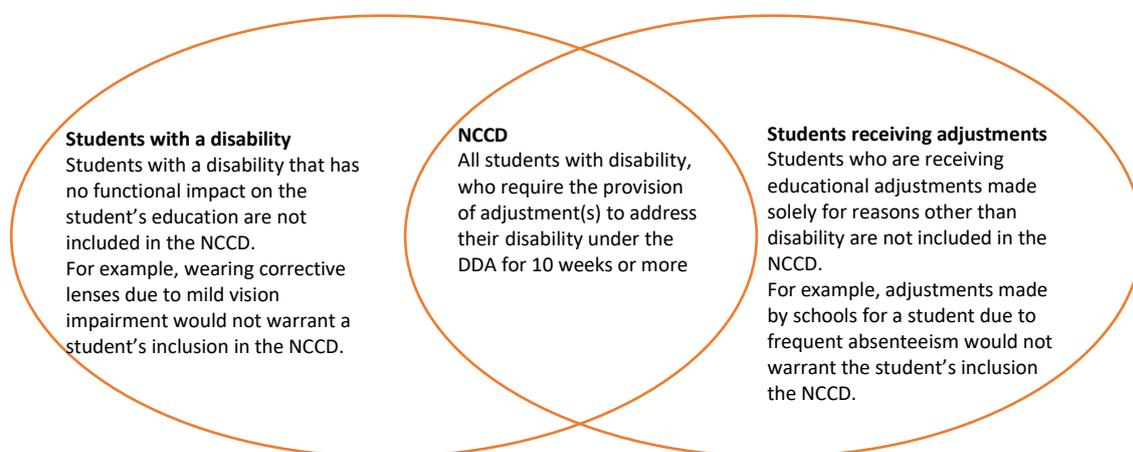
Year	Predicted mental health needs prevalence per 1000 students	Lower 95% CI	Upper 95% CI
2019	13.14	12.88	13.40
2020	13.98	13.66	14.31
2021	14.49	14.13	14.85
2022	15.26	14.88	15.63
2023	15.82	15.44	16.21
2024	16.54	16.15	16.94
2025	17.15	16.75	17.54
2026	17.84	17.44	18.24
2027	18.46	18.06	18.86
2028	19.14	18.74	19.54

The predicted rise in mental health needs prevalence using any diagnosis method for students receiving Level 1 funding in NSW DoE schools is from 1.3% in 2019 to 1.9% in 2028. This figure should be interpreted with caution given the limited previous data points available for the calculation.

## PART 5. STUDENTS RECEIVING ADJUSTMENTS – NCCD

The Nationally Consistent Collection of Data (NCCD) has annually collected information on adjustments that are made to personalise learning and support for students with disability since 2015. The data collection recognises the unique needs of students of all abilities and that personalised learning and support may involve one or a combination of approaches in relation to curriculum, instruction and the environment.

Quality teaching practice is responsive to the individual needs of all students. For some students with disability, adjustments beyond those that are reasonably expected as part of quality teaching are not required. In providing an adjustment, teachers assess the functional impact of the student's disability in relation to education. This includes the impact on communication, mobility, curriculum access, personal care, social participation safety, motor development, emotional wellbeing and sensory needs.



Based on teacher professional judgement, adjustments to personalise student learning and support are recorded under one of four broad categories (physical, cognitive, sensory and social/emotional). Where a student has more than one disability, only the primary disability is recorded. A direct consequence of this approach is that a student will not necessarily have the same disability recorded each year and two students with the same disability type could be placed into different categories. For example, a student with ASD could fit under the Social/Emotional, Sensory or Cognitive category. As such, there is no accurate way to match the Level 1 disorder types used in this report to the NCCD categories.

There are four levels of support:

1. Support provided within quality differentiated teaching practice (QDTP)
2. Supplementary adjustments – Adjustments that are supplementary to the strategies and resources already available for all students within the school
3. Substantial adjustments - More substantial support provided with essential adjustments and considerable adult assistance
4. Extensive adjustments - Extensive targeted measures and sustained levels of intensive support. The adjustments are highly individualised, comprehensive and ongoing

The categories of disability are as follows:

Table 6. NCCD Categories of disability

Category	NCCD definition based on definitions from the Disability Discrimination Act 1992 and the Disability Standards for Education 2005
Physical	Total or partial loss of a part of the body The malfunction, malformation or disfigurement of a part of the person's body The presence in the body of organisms causing disease or illness The presence in the body of organisms capable of causing disease or illness
Cognitive	Total or partial loss of the person's bodily or mental functions A disorder or malfunction that results in the person learning differently from a person without the disorder or malfunction
Sensory	Total or partial loss of the person's bodily or mental functions The malfunction, malformation or disfigurement of a part of the person's body
Social/Emotional	A disorder, illness or disease that affects the person's thought processes, perception of reality, emotions or judgement, or that results in disturbed behaviour

There are further caveats on the NCCD data which impact on use as a predictive tool. The following information was provided by DoE:

- NCCD data collection is based on the professional judgement of individual teachers and school learning support teams rather than clinical diagnoses. While students in Support classes and students receiving Integrated Funding Support are subsets of this data, they are neither exclusive nor majority subsets of the NCCD. As such, there is no reliable input of information on the exact nature of the learning disability. The four categories of primary disability identified by the collection (cognitive, physical, sensory and social-emotional) may or may not correspond to specific diagnoses such as autism. A corollary to this concern is that specifically diagnosed disabilities may inevitably exhibit symptoms in multiple categories of the NCCD.
- Current quality assurance measures are based on statistical comparisons and analysis. There is no empirical data to ensure that moderation and identification processes within each school comply with specified or best practice standards.
- The application of analysis of annual trend data relating to total or category data may of dubious merit given that changes over the 5 years of data collection may be either real or attributable to improvements in the data collection processes. E.g. The 2019 increase in reporting of Extensive support can be directly linked to the pre-population of IFS funded students into ERN which addressed the under-reporting of these students.
- Recent evidence from a Monash University study in relation to the consistency of teacher judgement in identifying levels of support and primary disability indicate that teacher error in this process may be as high as 40%.

Below are the figures publicly reported for government and non-government schools on NCCD disability categories by state for 2017<sup>3</sup>. The difference between 2016 and 2017 is small<sup>4</sup>. NSW supports the fourth

highest number of students with disabilities of the eight states and territories with 19.2% of students in NSW schools receiving support, with 10.8% of students receiving support in the cognitive category and 5.1% in the social-emotional category.

Table 7 2017 NCCD Categories of Disability by state

Categories of Disability	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	National
Cognitive	10.8%	9.6%	9.5%	13.5%	11.8%	7.6%	12.0%	7.4%	10.4%
Physical	2.7%	3.5%	1.6%	1.8%	5.0%	1.9%	3.0%	1.5%	2.8%
Sensory	0.6%	0.5%	1.0%	0.8%	0.8%	0.3%	2.3%	0.5%	0.7%
Social-Emotional	5.1%	5.5%	4.8%	4.8%	2.9%	2.8%	9.5%	4.3%	4.9%
All Categories of Disability	19.2%	19.1%	16.8%	21.0%	20.5%	12.7%	26.8%	13.7%	18.8%

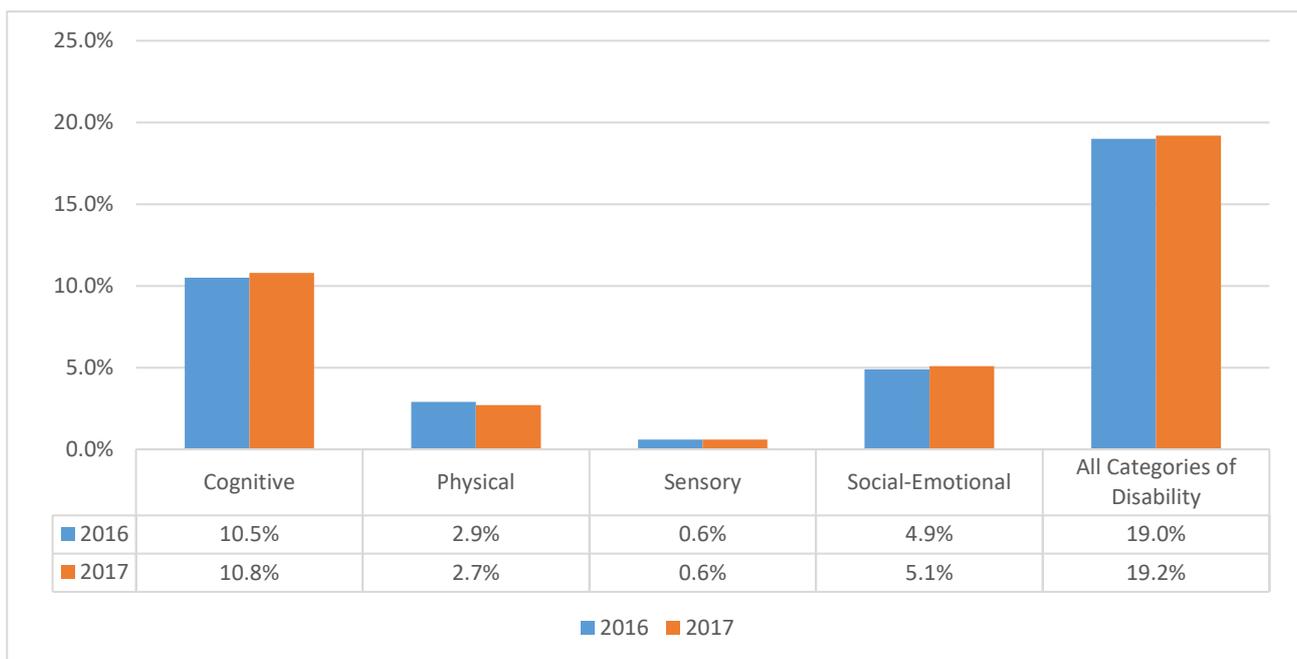


Figure 11 Comparison of students receiving adjustments under the NCCD from 2016 to 2017

In 2017, based on primary diagnosis method, there were 3.75% of NSW public school enrolments receiving Level 1 funding for MH needs, ID and ASD. As the data collection procedures for the NCCD are being refined it is unclear if all these students were captured in the 19.2% reported as receiving adjustments.

The 2018 Disability Strategy report extrapolated diagnoses from the NCCD data as follows:

*Table 8 Disability Strategy method for deriving diagnosis from NCCD categories*

<b>NCCD Categories</b>	<b>Program Data categories</b>
Physical	Physical
Sensory	Deaf/Blind
	Vision
	Hearing
Cognitive	Severe Intellectual
	Moderate-severe intellectual
	Moderate Intellectual
	Mild Intellectual
Social and emotional	Autism
	Behavioural Disturbance
	Emotional Disturbance

Given the limitations noted above, the NCCD data cannot currently be combined with the Level 1 NSW data to accurately calculate current or future total ASD and MH needs prevalence.

## PART 6: INTRODUCTION TO KEY FACTORS WHICH MAY IMPACT ON PREVALENCE

In response to the request for an analysis of internal and external factors which may have contributed to the increase in ASD and MH needs in NSW public schools over the period the following sections review key available factors. There have been a number of major changes to the way ASD and MH needs are defined with the introduction of the Diagnostic and Statistical Manual of Mental Disorders DSM) 5<sup>th</sup> Edition in May 2013. This diagnostic manual is widely used in Australia (and internationally) and was used by DoE from 2014 onward to diagnose ASD. In addition, the National Disability Insurance Scheme (NDIS) commenced trial sites in NSW Hunter region from 2013 and became fully available in NSW in 2018. This national approach to disability support has marked a major change in Australia. While it does not provide support specifically for education, awareness of the scheme and the funding available for individuals may have flow on impacts to education settings with more individuals seeking diagnoses to access the new support mechanisms. This could occur for preschool aged children who can benefit from early childhood early intervention services and school aged children who can benefit from disability support packages.

### Timeline of key factors which may impact on enrolments of students with autism and mental health needs over time in NSW DoE Schools

Green = DoE NSW Initiatives  
Yellow = Commonwealth Government Initiatives  
Blue = International initiatives

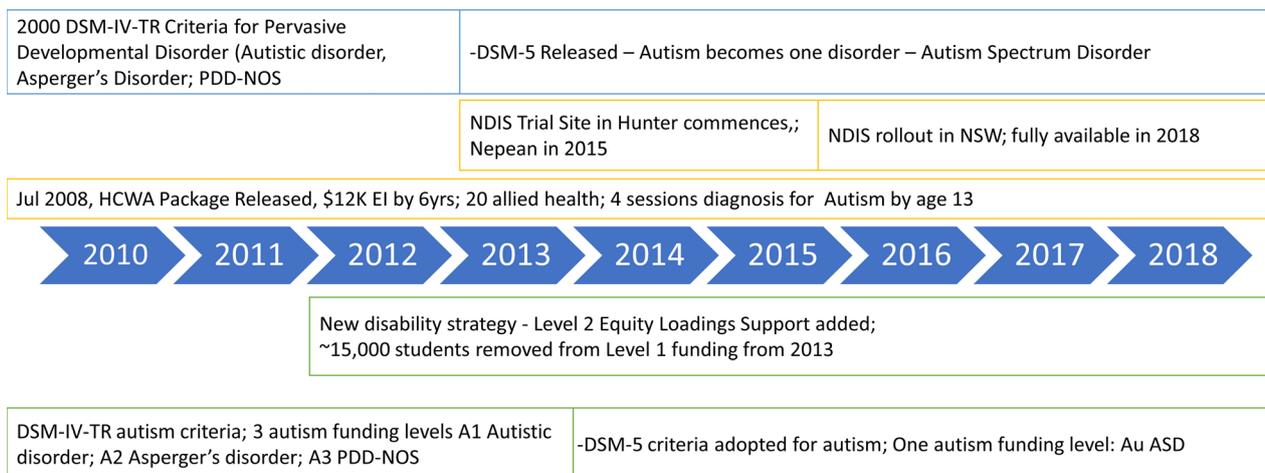


Figure 12 Timeline of key internal and external factors which may impact on enrolments of students with autism and mental health needs over time in NSW DoE schools

## PART 7: CONTRIBUTION OF DOE NSW INTERNAL FACTORS

### 14 CHANGES TO FUNDING PROGRAMS

#### 14.1 Background

In 2013 around 15,000 students were removed from Level 1 funding because of the introduction of Level 2 school wide funding as previously described.

#### 14.2 Method

We explored whether students removed from Level 1 funding returned to the scheme in later years. This was assessed by identifying students who had received funding in 2012, did not receive funding in 2013, and then received funding again at any time between 2014 to 2018. We note there may be other reasons apart from being removed from the scheme in 2013 that resulted in a student not receiving funding in 2013. Hence, these figures are an estimate only.

#### 14.3 Results

Between 2014 to 2018, 1,432 students (3% of the 46,659 students who received funding over these years) who received disability funding in 2012 but not in 2013, returned to the scheme. As per below, mental health needs had the highest proportions made up by returning students over the years followed by autism and ID. Thus, returning students contributed to only around 3% of the increase across the disorders.

*Table 9 Proportion of total autism/ID/MH students accounted for by students returning to the scheme by year (using Primary diagnosis Method 3)*

	2014	2015	2016	2017	2018	Total returned students of total Number of students 2014-2018
Proportion of ASD students returning	2.8%	2.2%	1.3%	1.0%	0.6%	1.35%
Proportion of ID students returning	0.7%	0.3%	0.2%	0.1%	0.1%	0.44%
Proportion of MH students returning	4.6%	2.8%	1.7%	1.0%	0.4%	1.27%

### 15 DIAGNOSTIC CRITERIA FOR DISABILITIES USED BY DOE

#### 15.1 Background

The Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD) are used to assess whether an individual meets criteria for a particular disorder. These classification systems are updated over time as new information about the aetiology and presentation of disorders arises. The DSM-III (1980/7) first described Infantile Autism. The DSM-IV (1994/2000)<sup>5</sup> broadened this to Pervasive Developmental Disorders with three main autism diagnoses: Autistic Disorder, Asperger's Disorder, PDD – Not otherwise specified. The DSM-5 (2013)<sup>6</sup> reclassified autism into just one category: Autism Spectrum Disorder. The changes over time have led to change and broadening of symptoms required

for a diagnosis of ASD. The DSM-5 reduces age restrictions for onset and describes a much broader level of symptoms than previous versions. Therefore, some students now being diagnosed under DSM-5 would not have met criteria under earlier versions of the DSM.

A Swedish study<sup>7</sup> explored the phenotype or behavioural presentation or symptoms of autism in twins which did not change over 10 years and remained at about 1%. However, in the same twins, the prevalence of a diagnosis of autism steadily increased over this time. Thus, although the prevalence increased, the rate of autism symptoms did not change in the population, providing evidence that the increase is due to changes in diagnosis rather than changes in autism consistent behaviours.

## 15.2 Method

From 2014 DoE commenced using the DSM-5 for verifying a student's ASD diagnosis. To explore the impact of this change we calculated the number of new students with ASD in 2012, compared to the number of new students each year from 2014 onwards. We defined a new student as any student from 2012 onwards who did not have funding (based on the presence of a SchoolCode) in the prior year(s). For example, 2012 new students did not receive funding in 2011; 2013 new students did not receive funding in 2011 or 2012. We explored students with any ASD, not just a primary diagnosis of ASD. To calculate the proportion of new students with any ASD diagnosis we divided the number of new students with ASD by the total number of NSW public school enrolments for the corresponding year.

## 15.3 Results

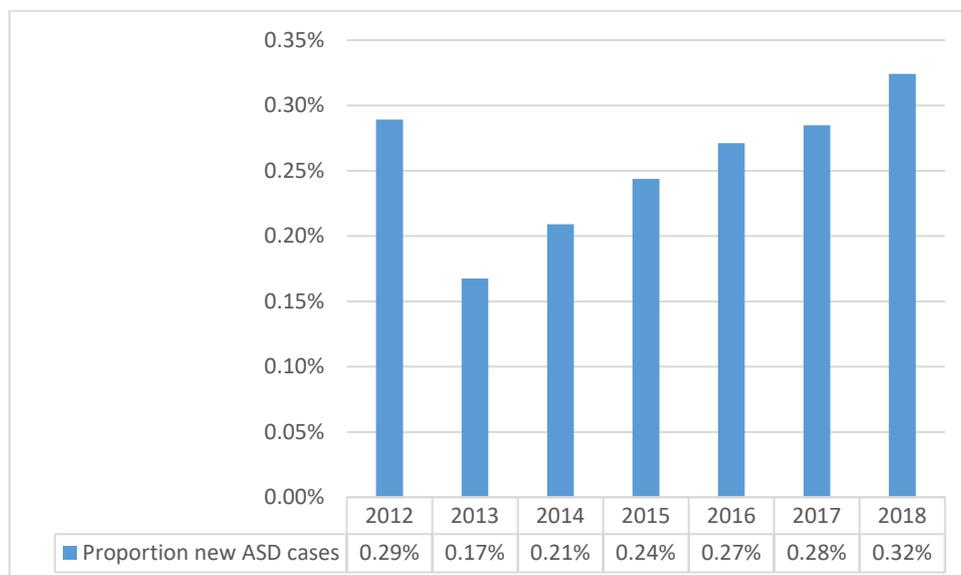


Figure 13 Proportion of new students with any ASD diagnosis of total NSW enrolments from 2012-2018

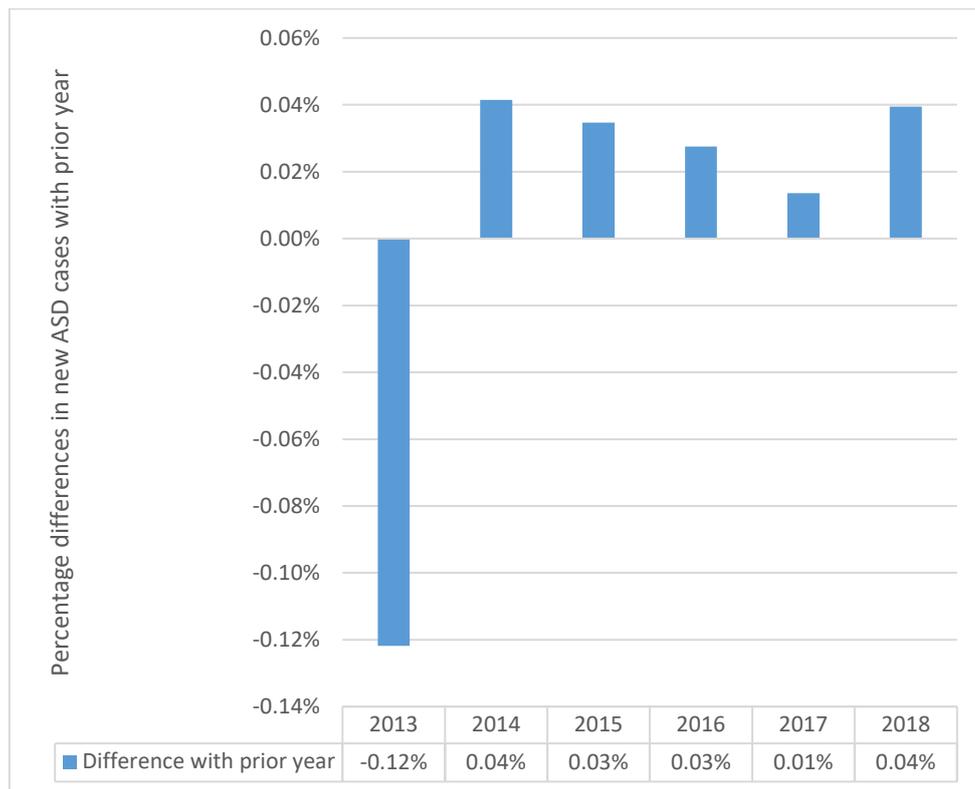


Figure 14 Percentage difference in new ASD cases with prior year

The drop in new students with any ASD in 2013 likely relates to Level 2 funding introduction. In 2012 the proportion of new students with ASD was 0.3% of the total school population. This reduced in 2013 to 0.2% then gradually increased back to 0.3% in 2018. The impact of Level 2 funding is difficult to separate from the impact of DSM-5 introduction in 2014. Data prior to 2011 would be required to understand the rate of increase of ASD before 2013 to compare this to after 2014 given they occurred at the same time. Figure 14 shows the increase in new cases in 2014 was slightly larger than in following years but changes following this could be related other factors.

## 16 TEACHER AWARENESS OF DISABILITES VIA TRAINING

### 16.1 Method

Teacher awareness of ASD might result in teacher's better identifying students with ASD related symptoms which may prompt them to suggest assessment. Information about online learning courses completed by teachers over the period was provided by DoE. In particular, the number of teachers completing online learning about ASD was provided.

*Table 10 Number of teacher completed online courses over the period*

Year	Autism Online Courses Completed
2011	1123
2012	1566
2013	1793
2014	1221
2015	1079
2016	1015
2017	994
2018	946

The ASD course numbers were modelled via ARIMA to understand whether they were associated with an increase in students with ASD primary diagnoses (Method 3).

## 16.2 Results

There was no significant association with the number of completions of the ASD online course and ASD prevalence, coefficient=-0.004,  $p=.117$ . Results need to be interpreted with caution due to the small number of time points in the series.

## 17 STUDENT CHARACTERISTICS (GENDER, ATSI STATUS, GRADE)

### 17.1 Gender

#### Background

There is a consistent finding that more males than females have ASD, although, numerous studies now indicate that gender ratio may be smaller than originally described<sup>8</sup>. The Male:Female (M:F) gender ratio for ASD was estimated to be around 4:1<sup>9</sup> with lower ratios in more severely impaired individuals (e.g. with comorbid intellectual disability) and higher ratios in those less impaired<sup>9</sup>. A recent systematic review of the gender ratio in ASD, examining  $N = 53,712$  individuals, reported the gender ratio to be closer to 3:1<sup>8</sup>. The DSM-5, released in 2013, noted that high-functioning girls with ASD may go unrecognised “perhaps because of subtler manifestation of social and communication difficulties”<sup>6</sup>.

Using Medicare data we found the M:F ratio significantly decreased over the period 2008/2009 to 2015/2016 from 4.1 to 3.1. Hence, females in Australia are being newly diagnosed proportionally more frequently compared to males<sup>10</sup>. The M:F ratio was lower in older children, consistent with prior research<sup>11</sup>. Thus the identification of older girls (5 years and above) and not younger girls is driving the reduction in the M:F ratio. Notably this reduction in the M:F ratio in older children was significant in the more recent years of 2014/2015 onward. We speculated this could be associated with the awareness of under-diagnosis of females specifically mentioned with the DSM-5 2013 release, prompting more clinicians to diagnose older girls with ASD. It may also be that changes in DSM criteria enable diagnosis of more girls because there is less requirement for preoccupying special interests and restricted and repetitive behaviours.

## Method

We explored the percentage of males for each type of disorder based on primary diagnosis Method 3 and any diagnosis, by year.

## Results

There was a slight decrease in the proportion of males with ASD from 86% to 83% over the period, and similarly for mental health needs from 79% to 77%. The male to female ratio for ID remained stable over the period at 65%. This indicates there have been slightly more females receiving funding over time for MH and ASD.

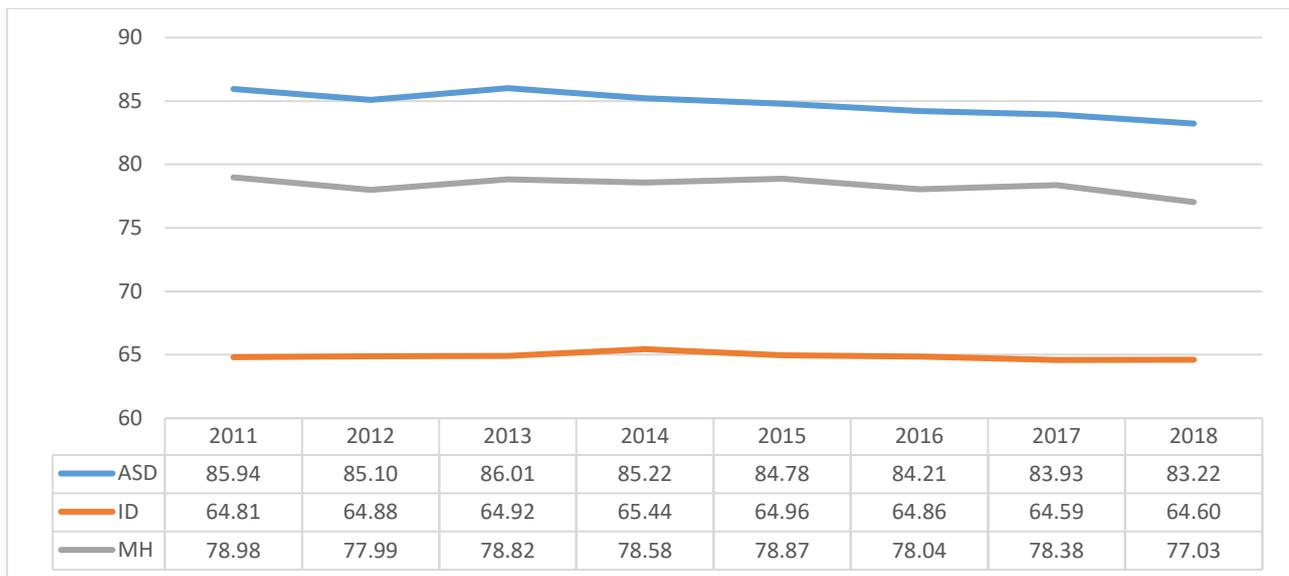


Figure 15 Percentage of males with ASD, ID or MH needs, from 2011-2018, based on primary diagnosis Method 3.

## Any diagnosis method:

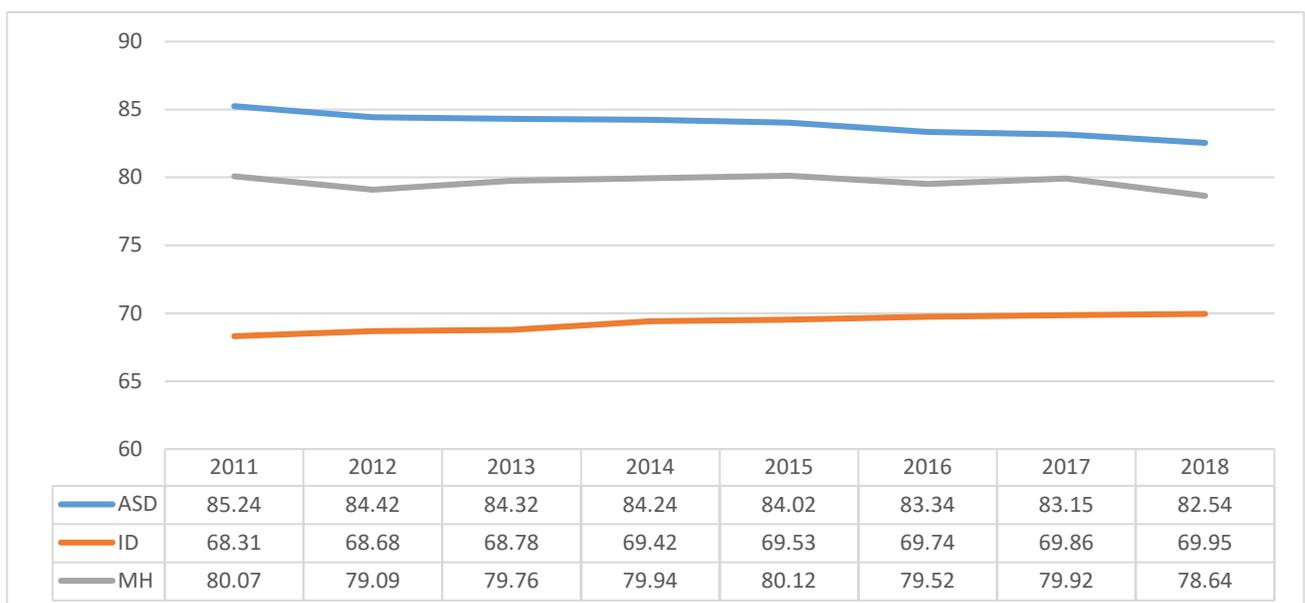


Figure 16. Percentage of males with ASD, ID or MH needs, from 2011-2018, based on any diagnosis method.

As per above, the proportion of males with ASD decreased from 85% to 83% from 2011 to 2018. The proportion of males with ID slightly increased from 68% in 2011 to 70% in 2018. The proportion of males with mental health needs slightly decreased from 80% in 2011 to 79% in 2018.

The proportion of males were modelled via ARIMA to understand whether they were statistically associated with an increase in ASD or MH needs primary diagnoses (Method 3). The decrease in the proportion of males was significantly associated with the increase in ASD prevalence, coefficient=-2.8,  $p<.001$ ; and similarly MH needs prevalence, coefficient=-1.1,  $p<.001$ . Results need to be interpreted with caution due to small number of time points in the series. This indicates that an increase in females being diagnosed with MH needs and ASD has significantly contributed to the increase in prevalence of MH needs and ASD.

## 17.2 Aboriginal and Torres Strait Islander Status

### Background

Prior Australian studies have shown that Aboriginal and Torres Strait Islander children have higher rates of disability than their non-Aboriginal peers<sup>12</sup>. Despite many initiatives to improve the physical, social and emotional wellbeing of Aboriginal and Torres Strait Islander children and adolescents, they continue to experience reduced physical health and well-being relative to non-Indigenous children<sup>13-15</sup>. In particular, Aboriginal and Torres Strait Islander children are at higher risk of experiencing psychological distress and mental health problems than non-Indigenous children<sup>16, 17</sup>.

### Method

The proportion of Aboriginal and Torres Strait Islander students in NSW public schools rose from 6.1% in 2011 to 7.8% in 2018. We explored the percentage of Aboriginal students in by each primary diagnosis type (method 3) over the years 2011 to 2018.

*Table 11 Aboriginal students as a percentage of total NSW DoE enrolment, by level of schooling, 2011- 2018*

Level of schooling	2011	2012	2013	2014	2015	2016	2017	2018
<b>Primary</b>	6.1%	6.3%	6.6%	6.8%	7.1%	7.2%	7.5%	7.7%
<b>Secondary</b>	6.0%	6.3%	6.5%	6.7%	7.0%	7.2%	7.5%	7.8%
<b>Total</b>	6.1%	6.3%	6.5%	6.8%	7.0%	7.2%	7.5%	7.8%

Data source: Statistics Unit, Centre for Education Statistics and Evaluation, DoE. Data extracted October 2019 from National Schools Statistics Collection enrolments datacube for 2011-2018.

### Results

Primary Diagnosis method 3:

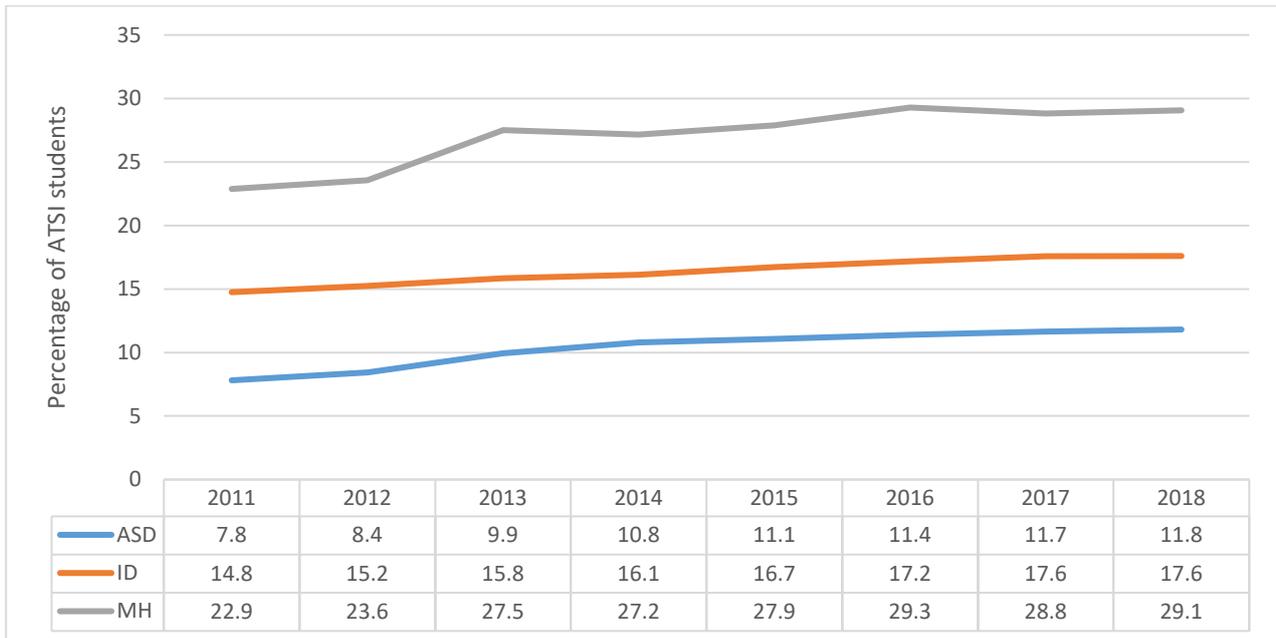


Figure 17 Percentage of Aboriginal and Torres Strait Islander students with ASD, ID, MH based on primary diagnosis method 3, from 2011-2018

Aboriginal and Torres Strait Islander students with ASD, ID and MH needs are over-represented relative to their enrolment levels in NSW public schools. In 2018 ATSI students made up 29% of the students receiving funding for MH needs, 12% of students receiving funding for ASD and 18% of students receiving funding for ID, while only representing around 8% of the student population. This overrepresentation is increasing over the years since 2011, particularly for MH needs (up 6%), and ASD (up 4%) and ID up 3%.

Any diagnosis method:

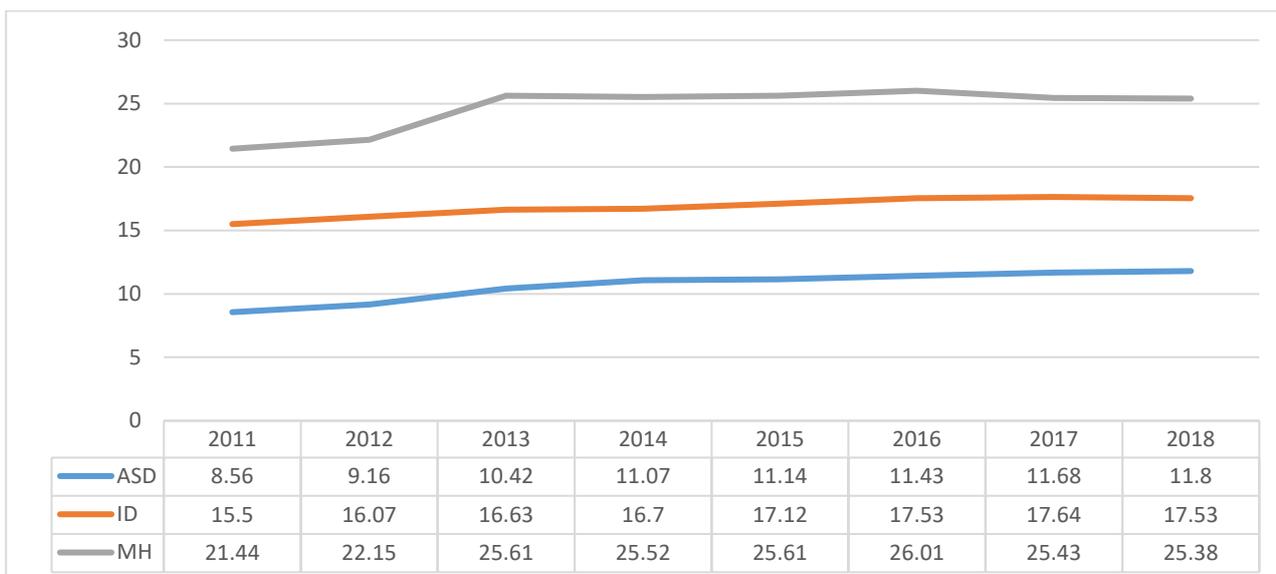


Figure 18 Percentage of Aboriginal and Torres Strait Islander students with ASD, ID, MH based on any diagnosis from 2011-2018

Using the any diagnosis method, results were similar, but MH needs were not as high at 25% in 2018 up from 21% in 2011.

The increase in the proportion of ATSI students were modelled via ARIMA to understand whether they were statistically associated with an increase in ASD or MH needs primary diagnoses (Method 3). The increase in the proportion of ATSI students with ASD was significantly associated with the increase in ASD prevalence, coefficient=3.9,  $p < .001$ .

The proportion of ATSI students with MH needs trended but was not significantly associated with the increase in MH needs prevalence, coefficient=0.55  $p = .107$ . Results need to be interpreted with caution due to small number of time points in the series. The overrepresentation of Aboriginal and Torres Strait Islander students in students with ASD, ID and MH reflects national trends for these students to have much higher rates of disabilities.

### 17.3 Average Grade Level of support

#### Background

ID and ASD are considered to be lifelong disorders. The majority of students with ID are identified upon or before school entry. Using Medicare data from 2008-2016 we reported the average age of diagnosis of ASD was around 6 years of age; although the most frequent age of diagnosis reduced from 5 to 4 years of age in 2016<sup>10</sup>. The most severe cases of ASD are being diagnosed in the community from 18 months of age. The introduction of the Helping Children with Autism package which provided \$12,000 in funding for children diagnosed before their 6th birthday and 20 allied health sessions prior to their 13<sup>th</sup> birthday may also contribute to the decrease in average age of diagnosis of ASD in Australia.

The diagnostic stability of ASD is not 100% hence students with ASD may no longer meet criteria at a later time point. Our Australian data from the Longitudinal Study of Australian Children (unpublished) suggests that up to 14.7% of children lost their ASD diagnosis according to parent report between 6 and 12 years of age (Birth Cohort) and 25.3% between 10 and 16 years (Kinder Cohort).

Mental health disorders may not be lifelong and may present as chronic, one or multiple episodes. Onset of mental health disorders varies greatly depending on the type of disorder. For example, internalising disorders such as mood disorders usually have onset in adolescent. Some anxiety disorders may have onset in childhood such as separation anxiety, while other anxiety disorders such as social anxiety and generalised anxiety, have onset in adolescence. Oppositional behaviour disorder will typically have onset in the primary school years.

#### Method

We explored the average grade level that received funding per year based on Primary diagnosis method 3 and any diagnosis. To do this we excluded pre-school children and indicated Kindergarten as grade level 0 with a maximum grade level of 12.

#### Results

##### Primary Diagnosis Method 3

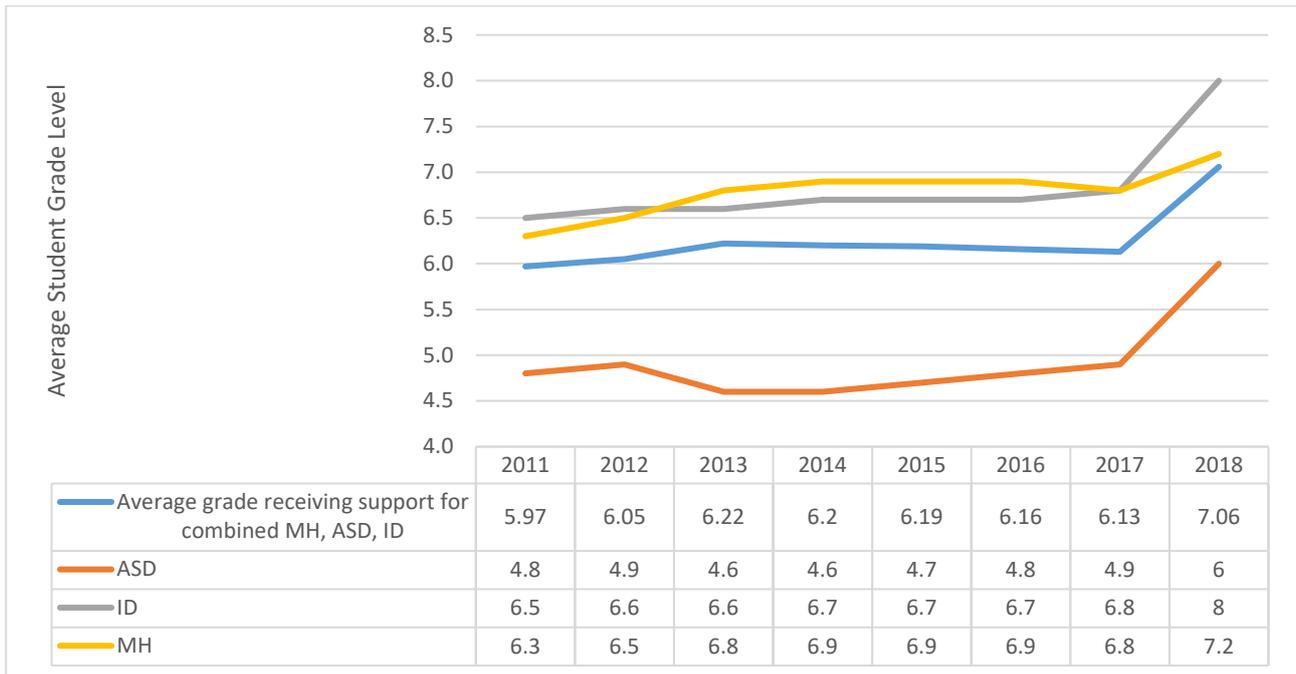


Figure 19 Average grade level a student received support (combined, MH, ASD, ID), from 2011-2018, Primary Diagnosis Method 3

The average grade level that a student received funding for ASD was 4.8 in 2011; and this average increased to Grade 6 in 2018. For mental health needs the average grade level that a student received funding for in 2011 was 6.3 which increased to 7.2 in 2018.

Findings suggested generally stable average grade levels across the period. Between 2017 and 2018 there was an increase in around 1 grade level for ASD and ID; with ASD rising from grade 5 to grade 6, and ID from Grade 7 to Grade 8. This suggests an increase in older students receiving support.

For ID which is arguably the most stable diagnosis over time we would expect the average grade of funding to be in Grade 6, but this could be pushed lower by a drop out of students in high school, or higher if younger students with ID don't receive support until later in their primary school years.

ASD has a lower average grade of support indicating that as students age they may not continue to receive support for ASD. This could be consistent with our findings described above that 25% of adolescents 'lose' their ASD diagnosis over time. However, the jump in average grade level in 2018 suggests that this may be reducing; or that there is more identification of older students.

MH needs had the highest grade of support which may relate to the onset of internalising disorders mostly occurring in adolescence with the onset of puberty balancing the onset of childhood disorders which fit under this category. It is difficult to interpret this finding given the numerous disorders captured under the MH needs category.

Any Diagnosis:

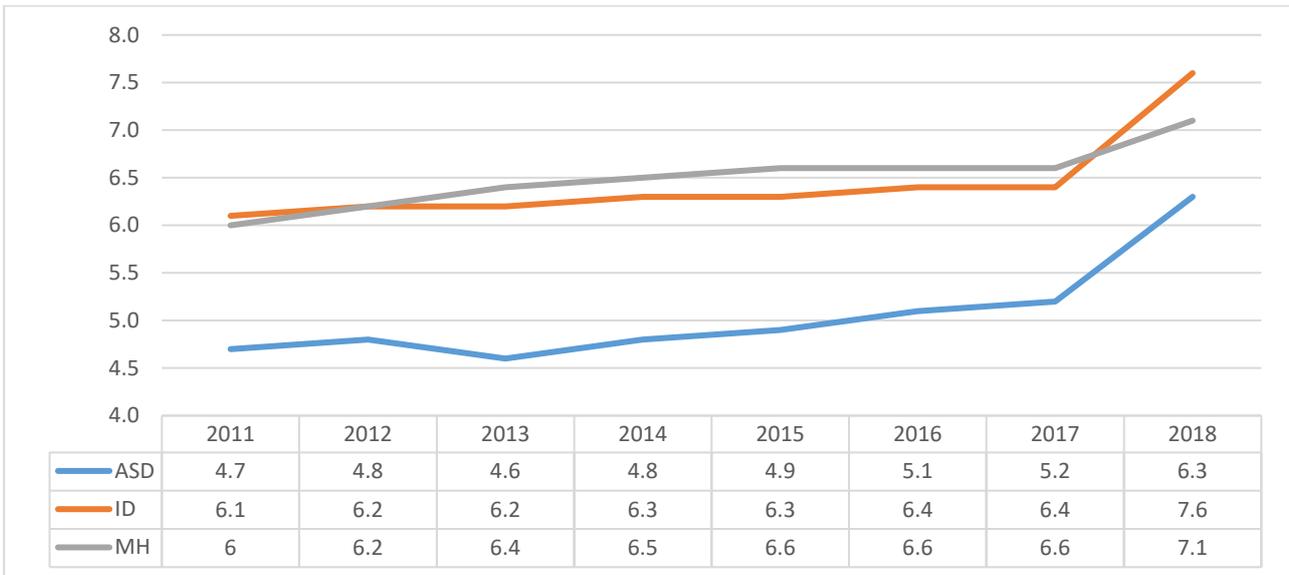


Figure 20 Average grade level a student received support (combined, MH, ASD, ID) from 2011-2018, any diagnosis

The findings for ‘any’ diagnosis are similar to that used for primary diagnosis above.

#### 17.4 Average grade a student first received funding

##### Method

For each year from 2012 to 2018, if a student received funding for the first time, the corresponding grade level was used as their grade of first funding. They must have received no funding in the previous years through any scheme (IFS, Statewide, SC). The average grade that a student first received funding, by each type of disability (classified as having any ID, ASD or MH needs in that year) was calculated.

##### Results

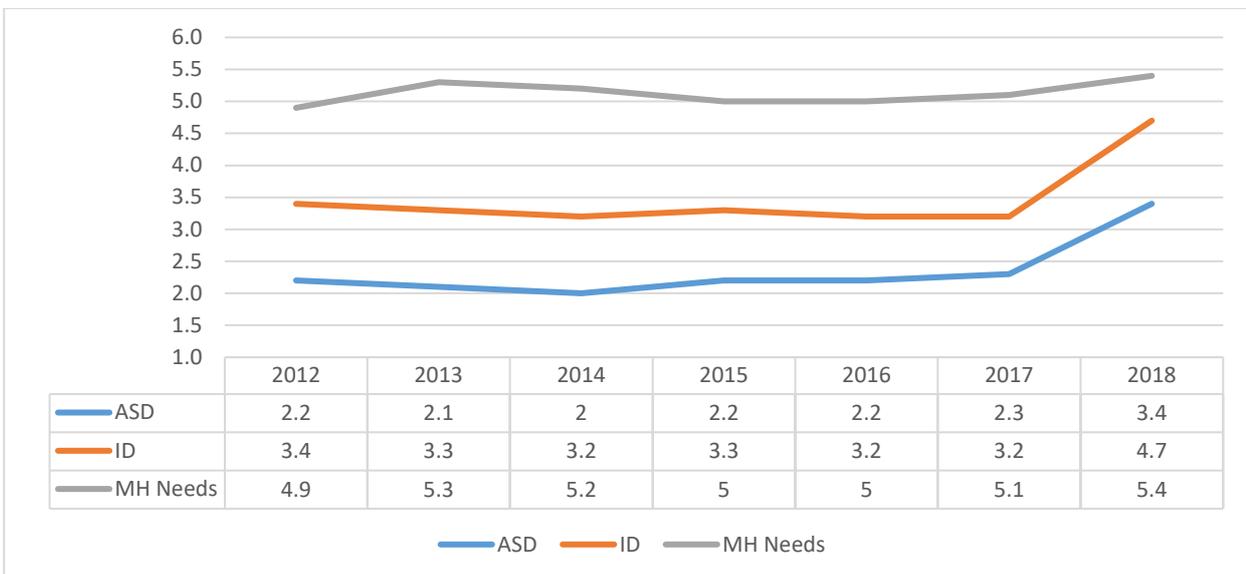


Figure 21 Average age a student first received funding from 2012-2018, by diagnosis (any diagnosis method)

In 2012, the average grade that students first received funding for ASD was grade 2. This increased to grade 3 by 2018. For ID, the average grade that students first received funding in 2012 was Grade 3 which increased to Grade 5 by 2018. For MH Needs the average grade that a student first received funding remained stable at around Grade 5.

As per the shift for average grade of diagnosis overall to increase over time; the increase over time in grade level that a student first receives funding indicates that students are coming onto the scheme for the first time in later grades (at older ages).

### 17.5 Level of Intellectual Disability

#### Method

We used primary diagnosis from the IFS, AR or DE-AR record to define type of intellectual disability: mild, moderate or severe. We explored any changes to the percentage of students with mild, moderate or severe ID from 2011 to 2018.

We then explored any changes to percentages of students with any ASD with mild, moderate or severe ID from 2011 to 2018 to understand any changes to the intellectual disability profile in students with ASD and ID.

#### Results

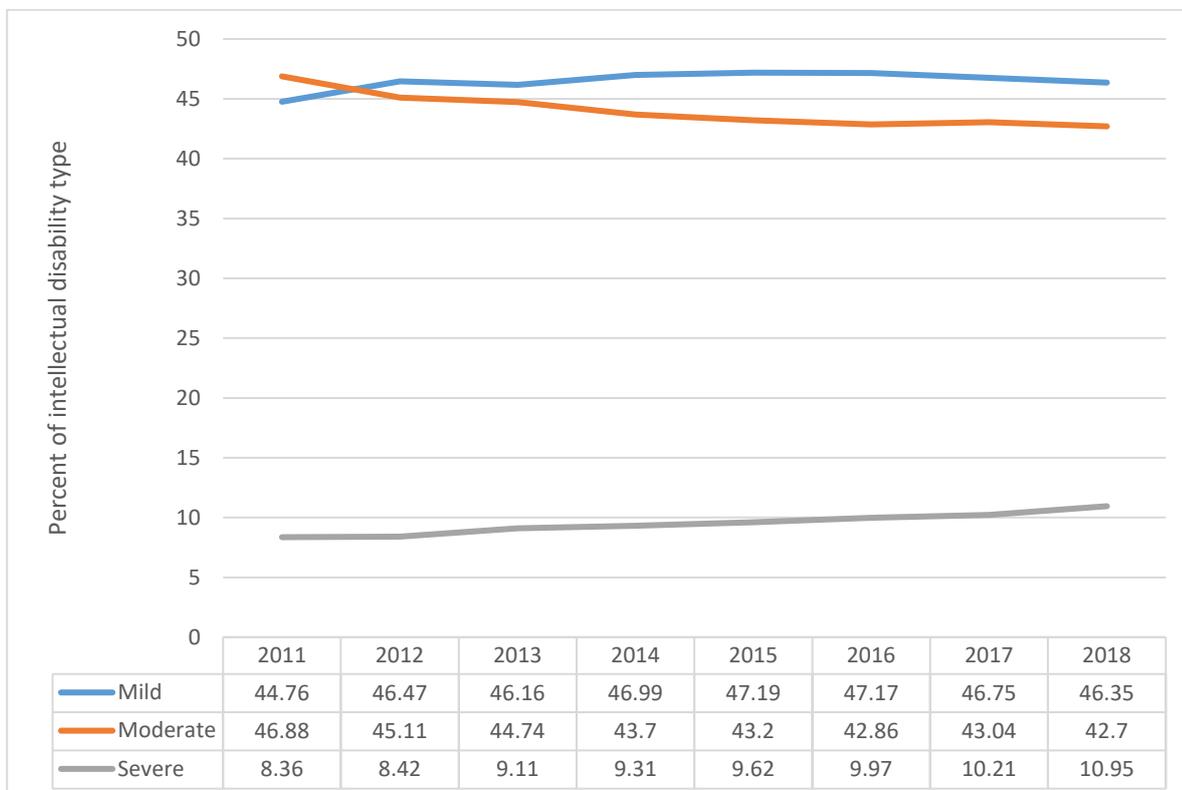


Figure 22 Proportion of students with ID having mild, moderate and severe ID from 2011 to 2018

The levels of severity of intellectual disability remained fairly stable over the period. From 2011 to 2018 the proportion of severe cases increased from 8% to 11%, Moderate decreased from 47% to 43% and levels of

mild ID were relatively stable rising from 45% to 46% in 2018. The decrease in moderate ID is likely accounted for by the increase in severe ID.

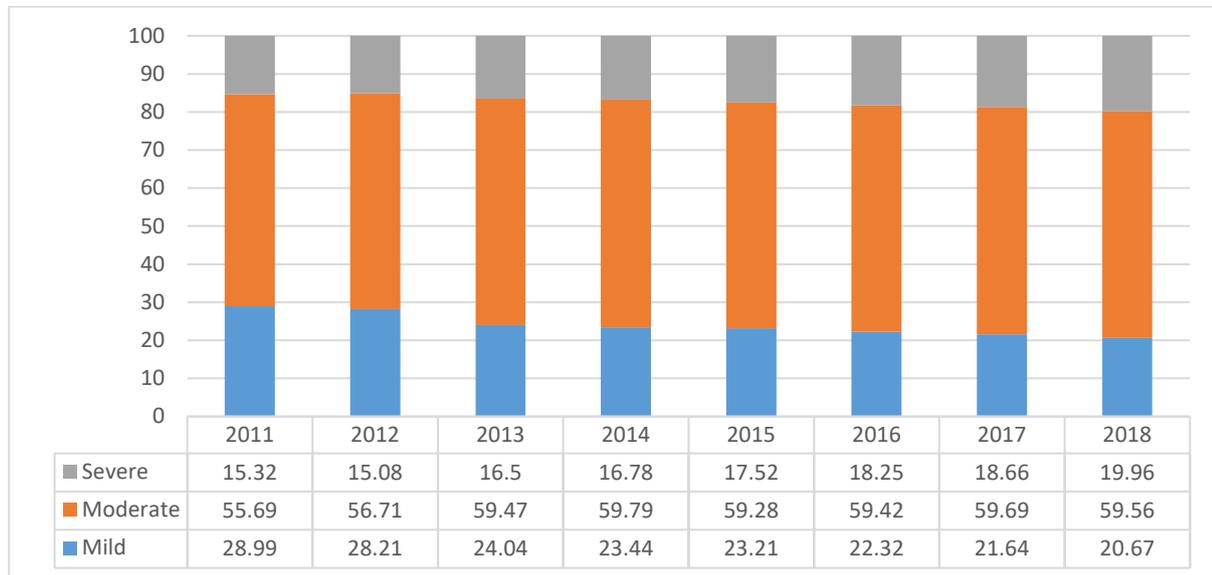


Figure 23 Proportion of students with any ASD, with mild, moderate, severe ID from 2011 to 2018.

The intellectual disability profile in students with ASD with ID changed over the period such that there were fewer students with mild intellectual disability and ASD from 29% in 2011 to 21% in 2018, relative to an increase in the proportion of students with moderate ID, 56% to 60%, and severe ID, 15% to 20%. This is not due to a decreasing number of cases, with all categories increasing in absolute numbers over the period, except for mild intellectual disability which increased up to N=537 cases in 2017 and reduced slightly to N=526 cases in 2018.

As per section 10.2, we speculate that this data indicates clinicians are becoming more inclined to diagnose comorbidities, particularly ASD, in individuals with moderate and severe ID.

## 18 TRENDS IN TOTAL STUDENTS ACCESSING LEVEL 1 FUNDING, IFS VERSUS SC OVER TIME

### Method

We compared students receiving individual funding support (IFS) and Special Support Classes over time to see if there was any change in proportions. Students attending Statewide Support classes (e.g. hospital schools for students with severe mental health needs) were also explored. Percentages are based on proportion of students receiving funding relative to the total NSW public schools population.

### Results

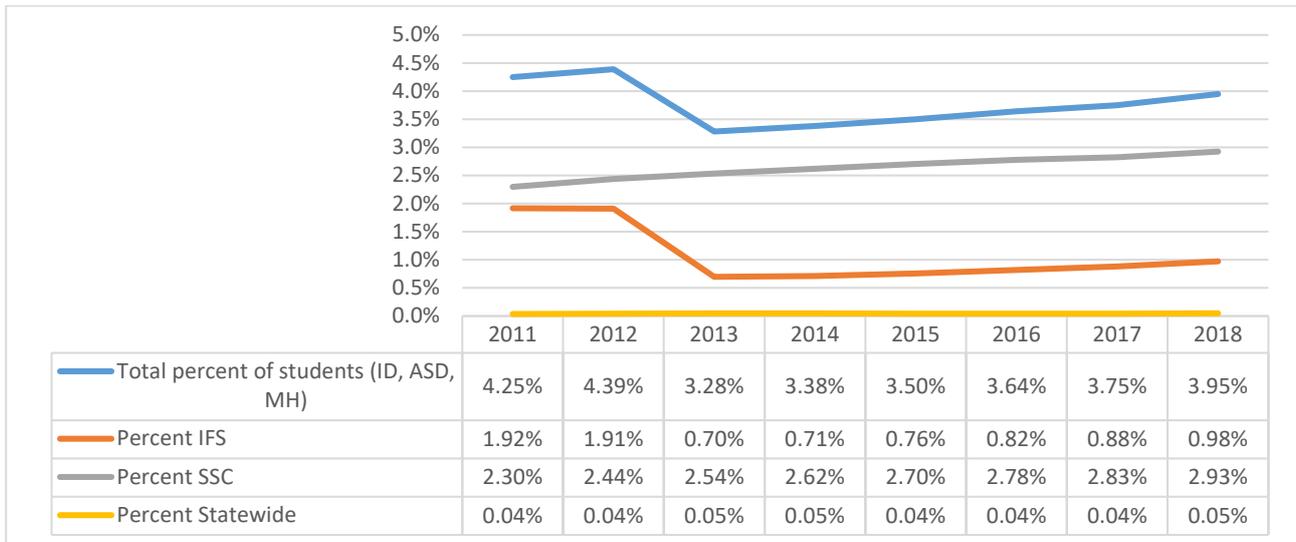


Figure 24 Percentage of students with ID, ASD, MH receiving Level 1 support for SC, IFS or Statewide supports, of the total NSW public school population, from 2011-2018

The number of children accessing Level 1 funding for ASD, ID, MH in 2018 levels has almost returned to Pre-Level 2 funding levels before the removal of 15,000 students. In 2011 the total percentage of students with ASD, ID, MH needs receiving funding was 4.3% and in 2018 was 4.0%, following a reduction in 2013 to 3.3%.

As per section 13 only a small proportion of the students removed from Level 1 funding in 2013 returned to the scheme, hence the increase is driven by new students accessing the scheme.

## 19 DIAGNOSTIC SWITCHING: PRIMARY DIAGNOSIS DECISION RELATIVE TO COMORBIDITIES

### 19.1 Background

There is significant overlap between ASD, ID and MH features in children. For children and adolescents with intellectual disability, the estimated rate of co-occurrence of other types of psychiatric disorders is 30 to 50%<sup>18</sup>. Up to 70% of children with ASD will have a co-occurring psychiatric disorder such as anxiety, attention deficit hyperactivity disorder or oppositional defiant disorder<sup>19</sup>. Older prevalence estimates suggested that around 70% of individuals with ASD had ID<sup>20</sup>, with newer figures suggesting around 55%<sup>21</sup>. Similarly, individuals with MH disorders experience high rates of overlap, for example, in US adolescents with a DSM-IV mental disorder, 40% had a second disorder<sup>22</sup>.

The need to select a primary diagnosis for reporting or funding purposes may result in a simplification of the complexity of student presentation and needs. It may also result in a bias toward a particular disorder based on available funding or other factors.

The term diagnostic switching refers to a diagnostic re-categorisation or switch from one disorder to another that is co-occurring in an individual. As described previously, there is a high overlap between ID, ASD and mental health features, with the occurrence of only one particular disorder in a child more the exception than the rule.

### 19.2 Method

We explored the number of students who switched from having one primary diagnosis at one time point between 2011 and 2017 to another diagnosis at a later time point between 2012 and 2018. This was based on Method 3 primary diagnosis calculation.

This included students who had experienced multiple differing primary diagnoses over the period. For example, a student may have had a primary diagnosis of ASD, ID, MH, ASD over the period with a maximum of 8 different primary diagnoses possible.

### 19.3 Results

Of the total number of students, 4.4% had experienced a diagnostic switch. However, this included students who only had only the most recent diagnosis in their record with no history. We then explored the number of students with an IFS history and AR history with findings of 5.8% in IFS history data, and 5.6% in AR history data.

The highest total number of diagnostic switching cases were for ID to ASD, followed closely by MH to ASD and ASD to ID. Note that as each student could switch diagnosis multiple times, the figure below does not represent unique students and a student might be represented in multiple categories e.g. ASD to ID and ID to MH. Overall, the rate of around 6% of students having a diagnostic switch was low and has a minimal impact on the increase in ASD/MH needs over the period with students moving across all categories relatively equally.

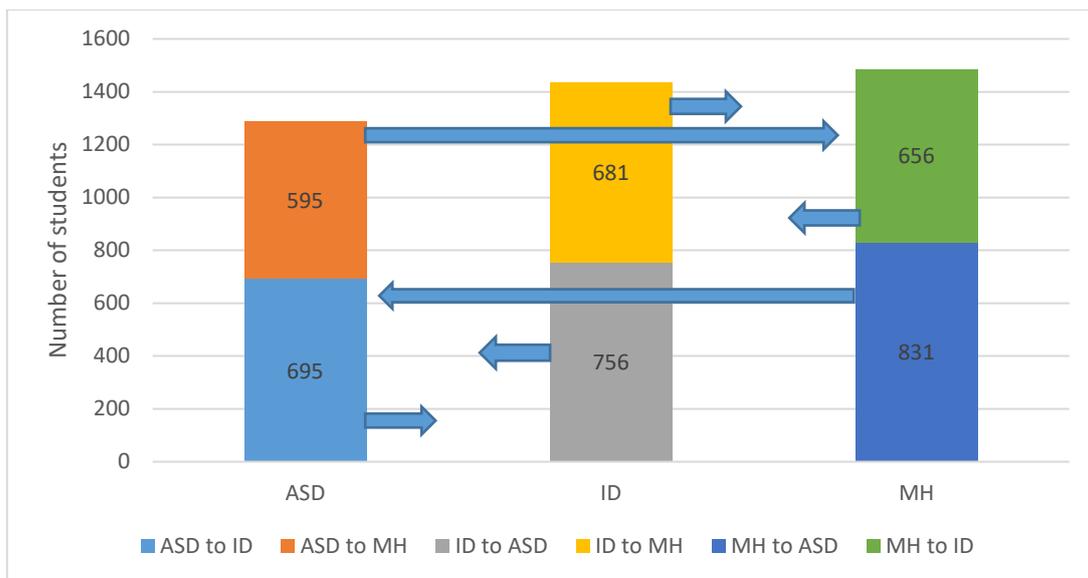


Figure 25 Total number switches from one primary diagnosis (ASD, ID, MH needs) at an earlier time point to a different primary diagnosis (ASD, ID, MH needs) at a later time point (between 2011 and 2018), based on method 3

## PART 8: CONTRIBUTION OF EXTERNAL FACTORS

### 20 BACKGROUND: AUTISM PREVALENCE

Once thought to be a rare condition, there has been a worldwide increase in the prevalence of children diagnosed with ASD with figures rising from 2 to 6 per 10,000 in epidemiological studies prior to the 1990s<sup>23</sup> to current estimates of up to 260/10,000 or 2.6%.<sup>3-5</sup>

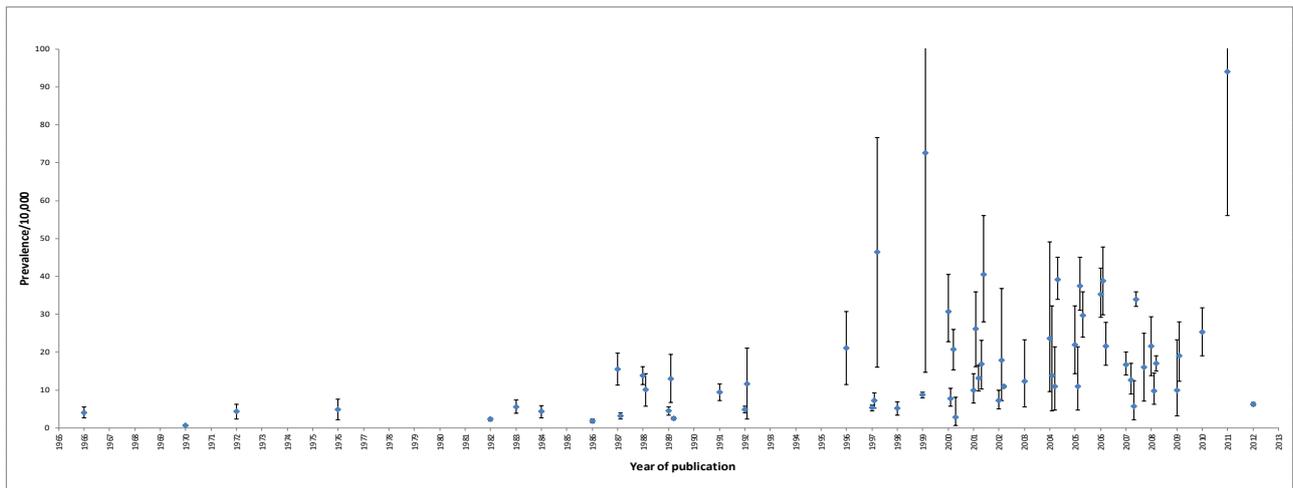


Figure 26 Studies as reported in Elsabbagh M et al. *Global Prevalence of Autism and Other Pervasive Developmental Disorders*. *Autism Research* 2012 Jun;5(3):160-79. <sup>23</sup>

The recent Global Burden of Disease Study 2017 found the percentage change in ASD prevalence counts from 1990 to 2007 was 22.8% and from 2007 to 2017 was 11.4%.<sup>24</sup>

#### 20.1 Increasing identification of 'high-functioning' individuals with ASD

The increase in ASD prevalence has been attributed in part to the increasing identification of higher functioning individuals with ASD. For example, Keyes et al<sup>25</sup> explored autism diagnoses in California from 1994 to 2005 and explored the functioning level of children based on autism dimensions – social interaction and communication and language. They considered those above the 80<sup>th</sup> percentile on the CDER diagnostic and evaluation instrument as high functioning, and those below the 20<sup>th</sup> percentile low-functioning at the time of diagnosis. As per the figure below, the increase in ASD prevalence was attributed to an increase in high-functioning cases with only a relatively minor increase in low functioning cases.

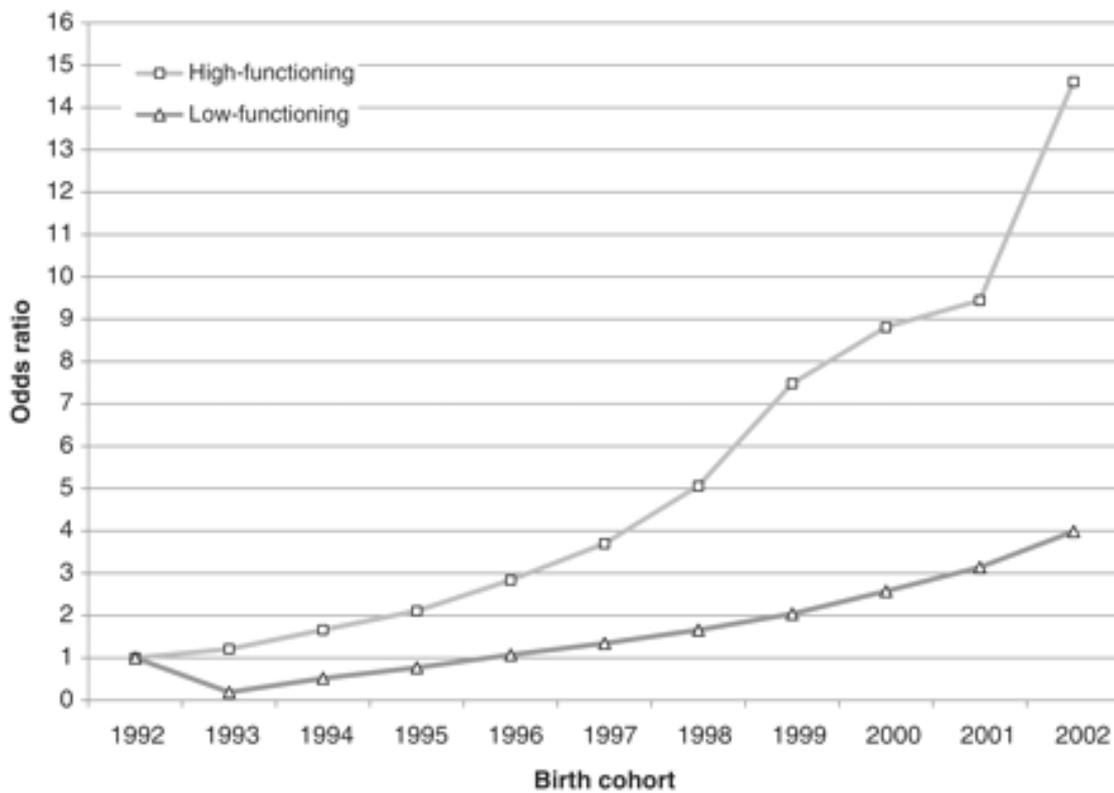


Figure 27. Cohort effects in autism diagnosis in California from 1994 to 2005 by child's functioning (Keyes et al)<sup>25</sup>

Similarly, a study exploring ASD prevalence in Sweden from 2001 to 2011 found a 3.5 times increase among children aged 2-17 years<sup>26</sup>. This was accounted for by an eightfold increase in ASD without intellectual disability, while the prevalence of ASD with intellectual disability increased only slightly. They attributed this to an increase awareness in ASD.

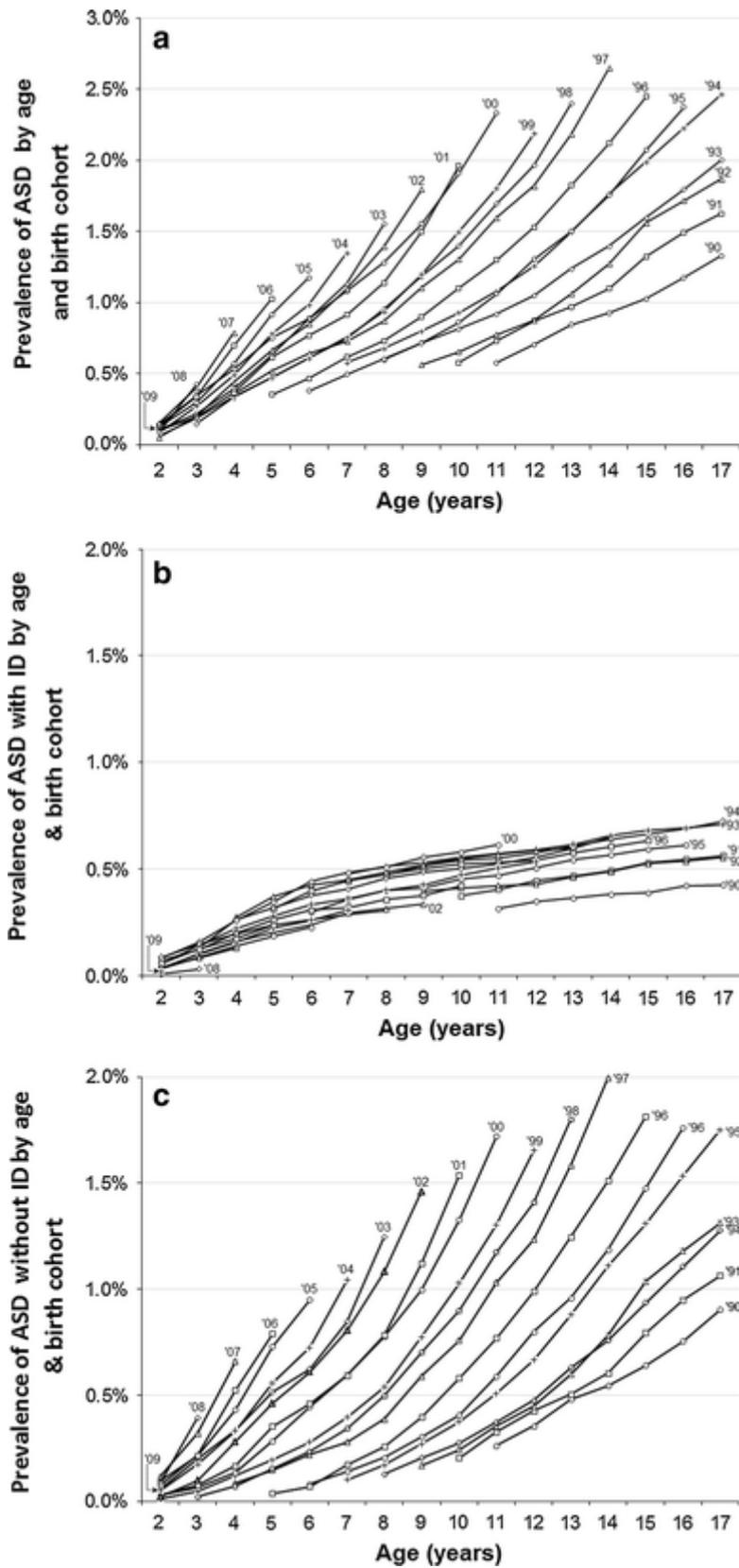


Figure 28 Prevalence of ASD overall (a), with (b) and without intellectual disability (c) among 2–17 year olds in the Stockholm Youth Cohort in 2001–2011, by age and birth cohort. Note: Although birth cohorts from 1990 to 2009 are displayed, only certain cohort curves are labelled due to overlapping curves. Idring et al<sup>26</sup>

## 20.2 Medicare Data

We used Medicare data from 2008 to 2016 and reported the cumulative incidence of ASD in 4 year old children was 1.10% [95% CI 1.06–1.14], and in males 1.66% [95% CI 1.60–1.72] and in females 0.51% [95% CI 0.47–0.55]<sup>10</sup>.

The figure below shows the use of the autism diagnostic item 135 which is used by paediatricians to confirm a diagnosis of autism and is used once per child. There is an increase over time in use of this item in Victoria, NSW, QLD, SA and WA while rates are low in the less frequently populated areas of TAS, ACT and NT. The initial high number in NSW and Victoria and subsequent drop (in 2010/2011) is thought to be due to children previously known to have autism being diagnosed in the first and second year, as well as those newly identified that year, to enable the child to access to the Helping Children with Autism \$12,000 in early intervention funding that required an autism diagnosis.

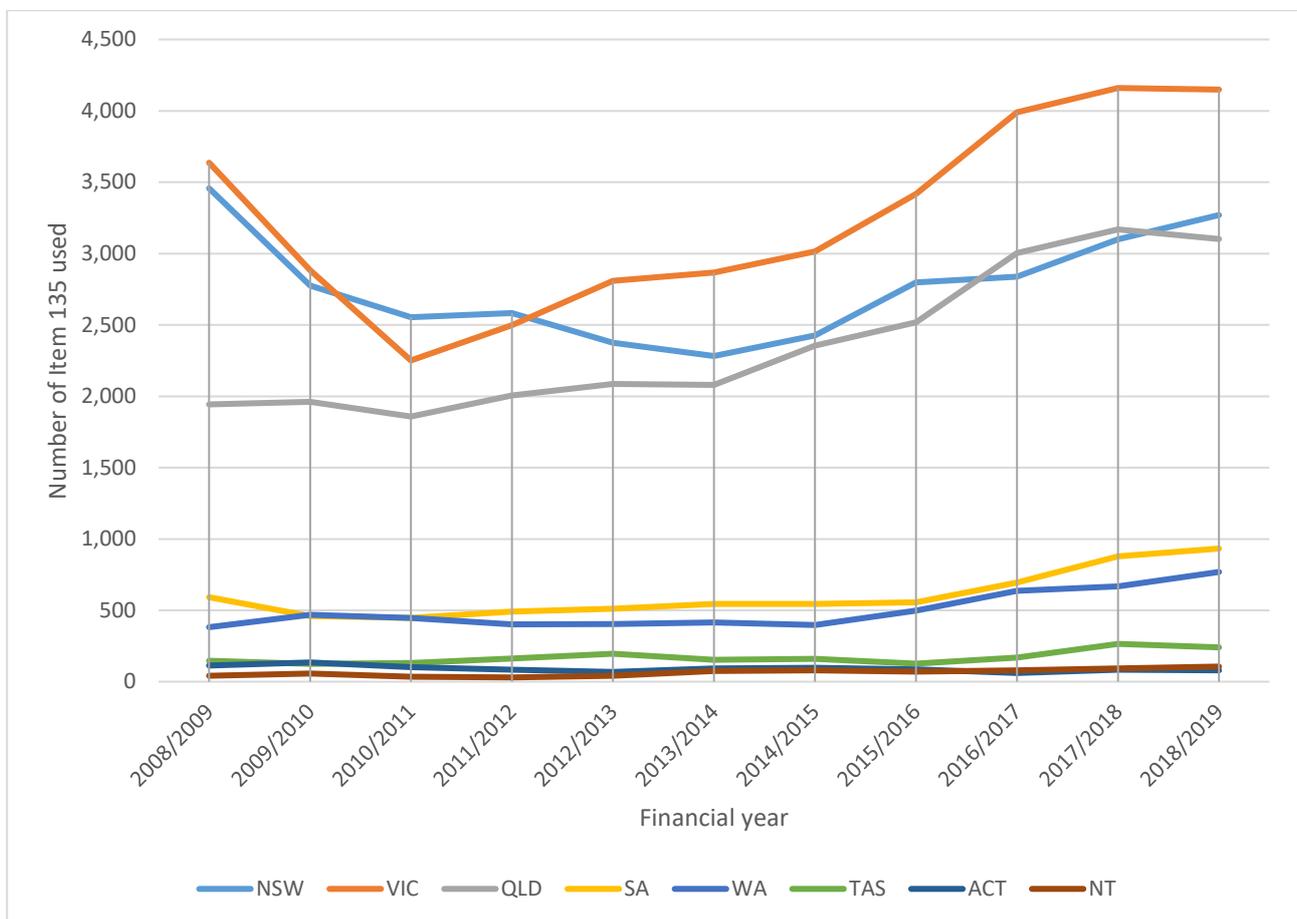


Figure 29 Number of paediatrician cases of ASD using Medicare item 135 in Australia from FY 2008/2009 through 2018/2019

## 20.3 Australian population representative research study: Longitudinal Study of Australian Children (LSAC)

LSAC employs a cross-sequential design that follows two Australian population representative cohorts of children, initially aged 0–1 years (B cohort; n=5107) and 4–5 years (K cohort; n=4983) in 2004, assessed at

two yearly waves. At wave 7 there were N=3,381 (66%) responding in the B cohort (age 12-13) and N=3089 (62%) for the K cohort (age 16-17 years)<sup>27</sup>.

The adjusted prevalence of parent reported ASD in the Birth cohort at age 12-13 years was 4.36 [95% Confidence Interval (CI) 3.56 -5.19] (unadjusted 4.39 [95% CI 3.75-5.15]) and 2.60% [95% CI 2.07-3.31] (unadjusted 2.5 [95% CI 2.06-3.04]) in the Kinder cohort, which was significantly different ( $z=4.1, p<.001$ ). The Kinder cohort ASD prevalence increased to 2.9% [95% CI 2.28-3.48] at 14-15 years and 3.53% [95% CI 2.79 – 4.47] at 16-17 years.

Teacher reported ASD in the Birth cohort at age 12-13 years was 2.29% [95% CI 1.7-3.1] (unadjusted 2.40 [95% CI 1.8-3.1]) and 1.38% [95% CI 0.99-1.91] (unadjusted 1.48 [95% CI 1.1-2.0]) in the Kinder Cohort, which was significantly different ( $z=-2.43, p<.015$ ). In the Kinder cohort at 14-15 years, teacher reported ASD adjusted prevalence slightly reduced to 1.23% [95% CI 0.85-1.77].

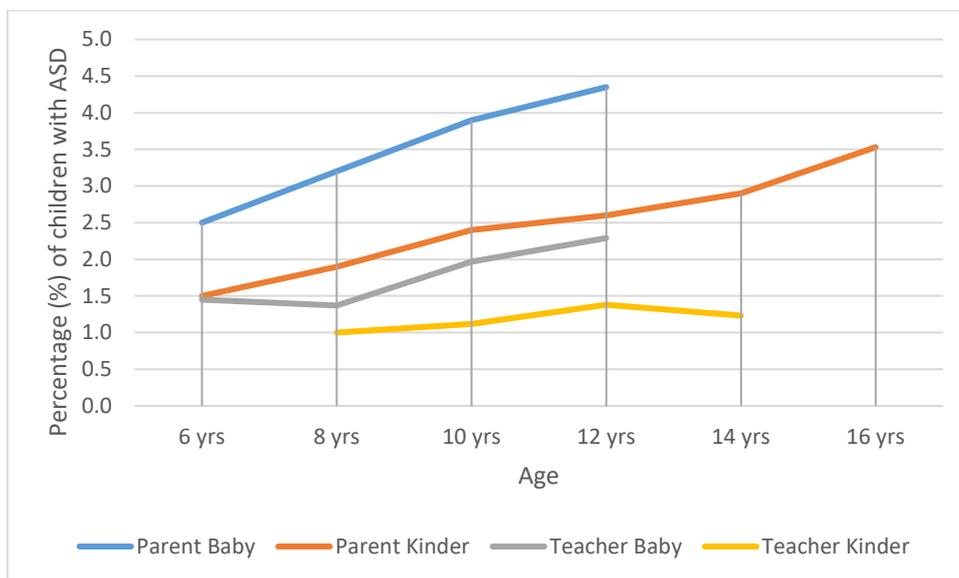


Figure 30 Proportion of children with parent and teacher reported ASD from 6-12 years (Birth cohort – spans 2010-2016) and Kinder cohort from 10 to 16 years (spans 2010-2016)

As shown in the figure above, there has been an increase in ASD prevalence in Australia from 2010 to 2016 based on parent and teacher report of ASD diagnosis. The proportion of 4.4% in 12 year old children in 2016 in the Birth cohort is one of the highest ASD prevalence estimates reported worldwide. Teacher report of 2.3% is based on the teacher report of whether the student receives support for ASD at school. This figure is higher than the 1.5% estimate from 2016 of any ASD diagnoses in NSW public schools from this report.

There was also evidence from this data that parent and teacher reported emotional and behavioural problems (based on the strengths and difficulties questionnaire) were less severe in the children with ASD in the birth cohort compared to the kinder cohort. This indicated a trend over time for children with fewer problems to be classified as having ASD. Parents classified 70% of children in the Birth cohort as having mild ID, versus 54% in the Kinder cohort. This is also consistent with the findings in this report of a reduction in comorbid problems, particularly ID in children with ASD from 2013 to 2018.

## 20.4 Other Education Data

### 20.4.1 Victoria

From the 2016 report on the program for students with disabilities, the DoE Victoria reported that 4% of students in government schools received funding and that figure had remained stable over the last 15 years<sup>28</sup>. The categories for disabilities are different than in NSW. For example, for ASD students require a co-occurring severe language impairment (e.g. speech/language ability <70 on standardised tests). As such, milder cases of ASD are unlikely to receive funding. As these cases with fewer comorbidities are primarily the individuals driving the increase in ASD prevalence worldwide, the stable ASD prevalence in VIC schools likely reflects not capturing this growing group of students.

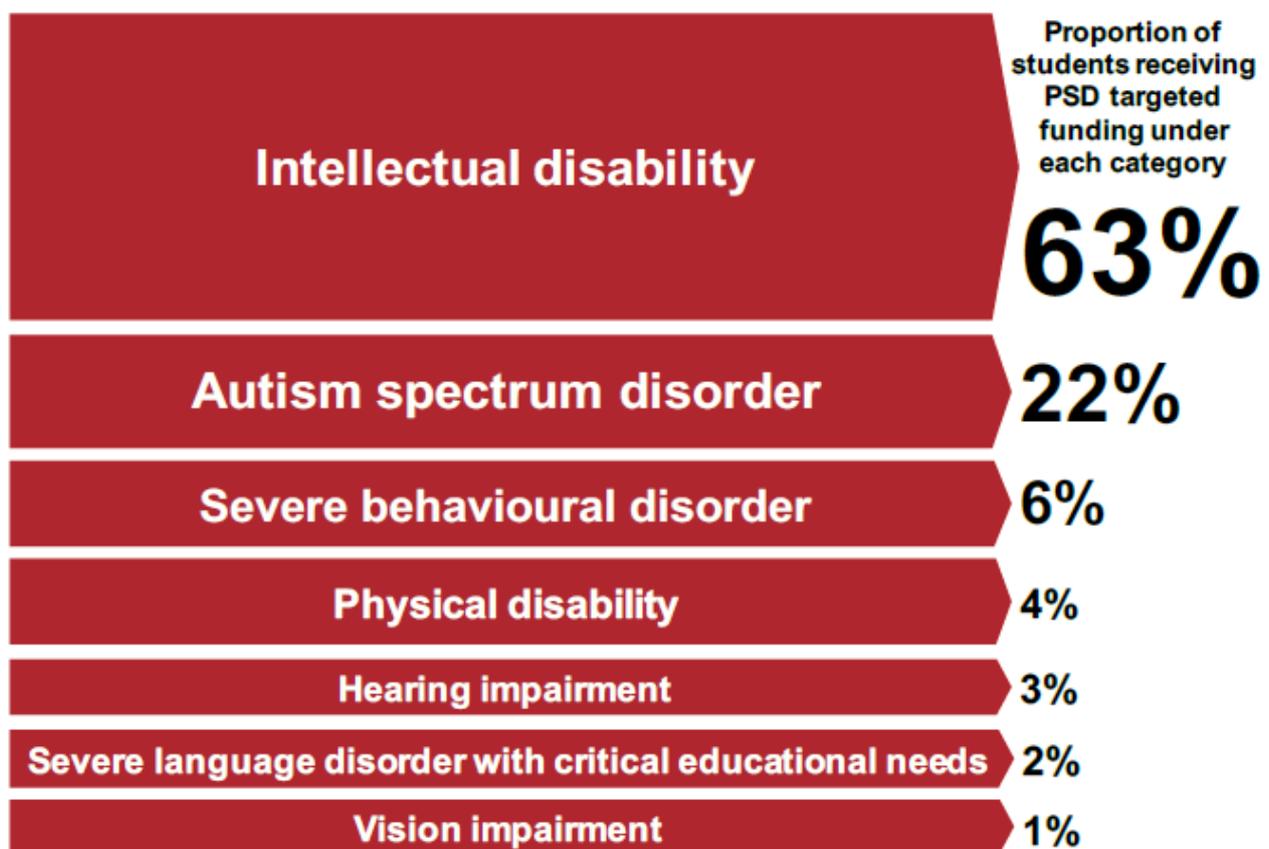


Figure 31 From 2015 DoE VIC data, as reported in the Program for Students with Disabilities Review Report, 2016<sup>28</sup>.

As per the NCCD data previously described, Victoria reported 19.1% of students receiving adjustments which was similar to the 19.2% reported by NSW<sup>3</sup>.

### 20.4.2 Queensland

The Review of education for students with disability in Queensland state schools, 2017<sup>29</sup> was used to understand rates of enrolments of children with disabilities. The Educational Adjustment Program provides individual funding for students in QLD schools. It has six categories and does not include a mental health needs or equivalent category. They reported in 2016 just under 6% of students in QLD schools had disabilities

under EAP funding, up from under 4% in 2010. There was a 9% increase per year from 2011 to 2016 in students with ASD.

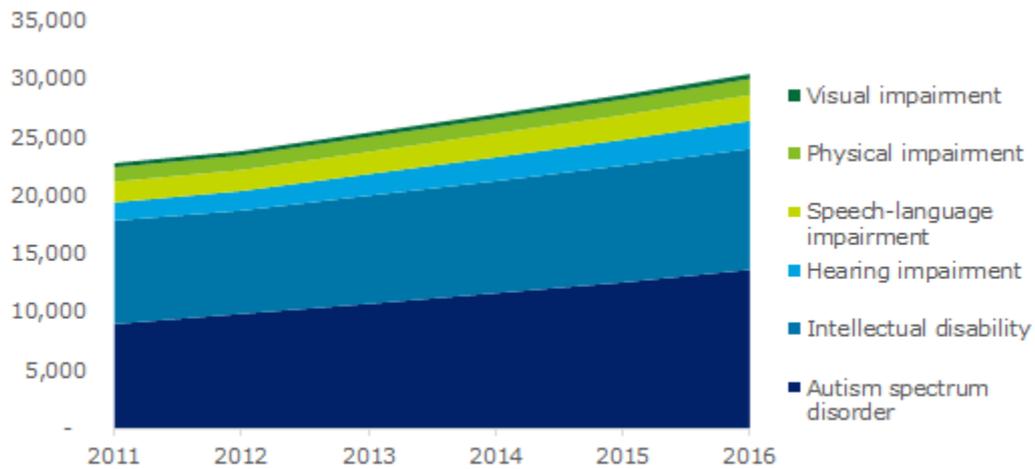


Figure 32. QLD EAP enrolments, by major type (2011-16)<sup>29</sup>

Table 12 QLD Average annual growth rate in EAP enrolments between 2011 to 2016<sup>29</sup>

Type	Annual Growth rate
Physical Impairment	2%
Intellectual Disability	3%
Visual Impairment	3%
Specific Language Impairment	5%
Autism Spectrum Disorder	9%
Hearing Impairment	9%

As per the NCCD data previously described, Queensland reported 16.8% of students receiving adjustments which was less than the 19.2% reported by NSW<sup>3</sup>. There are no equivalent mental health needs categories in QLD EAP types.

#### 20.4.3 Tasmania

Based on the Tasmanian Education Department Disability Action Plan 2018-2021<sup>30</sup>, they report in 2017, 1.66% of total enrolments in Tasmanian schools received funding through the Severe Disability Register (SDR) for students with a severe disability. A breakdown by type of disability was not reported. An additional 2.4% students with IQ between 55 – 70 (e.g. mild ID) received targeted funding. This totals 4.2% and is slightly higher than that reported in NSW (3.75% in this report in 2017 for combined ASD, ID and MH needs).

As per the NCCD data previously described, Tasmania reported 12.7% of students receiving adjustments which was less than the 19.2% reported by NSW<sup>3</sup>.

## 20.5 Public awareness of autism

### Method

Increased awareness and reduced stigma associated with ASD and mental health disorders may have resulted in more individuals seeking a diagnosis and treatment. We explored the public awareness of ASD using the number of google hits on Australian websites for each year from 2011 to 2018.

### Results

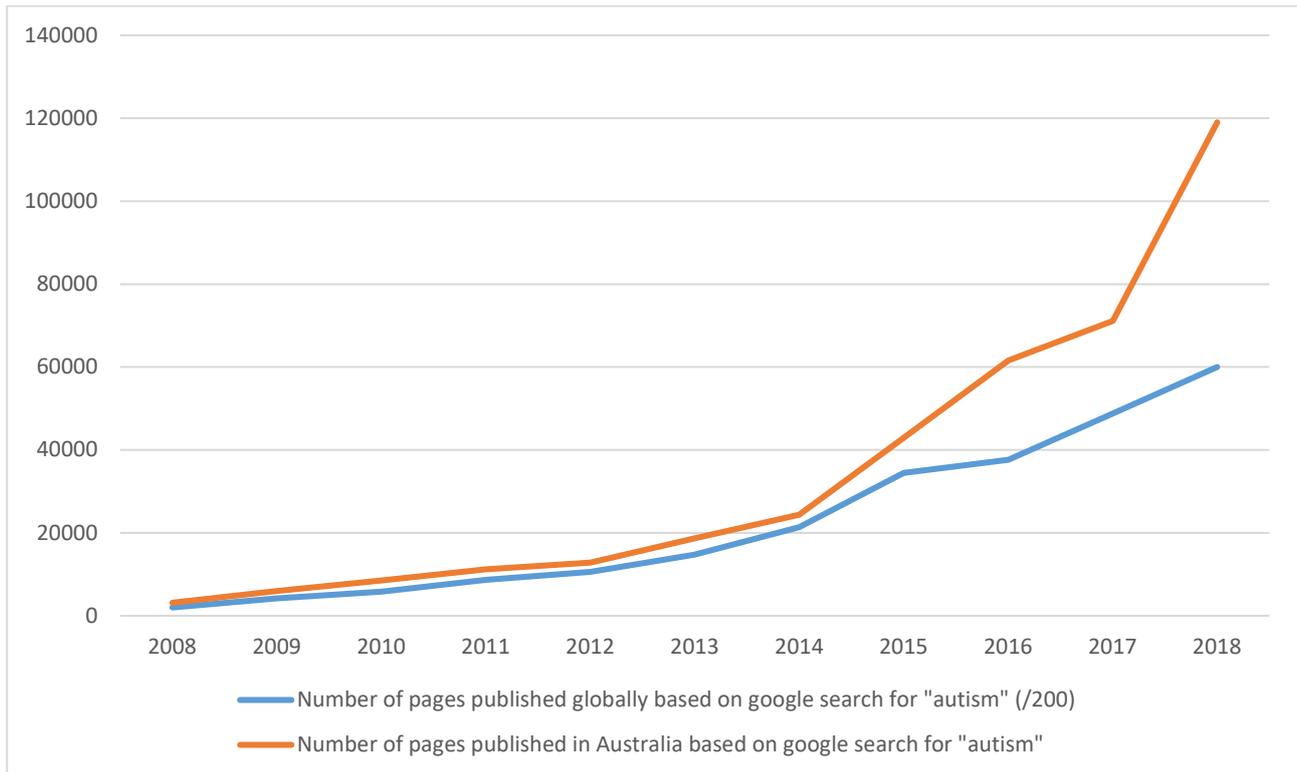


Figure 33 Trends in number of google hits for webpages based on search for 'autism' in Australia and globally from 2008 – 2018. Global hits divided by 200 for scale.

The public awareness of ASD was modelled via ARIMA to understand whether awareness was associated with an increase in students with a primary diagnosis of ASD (Method 3). The increase in public awareness of ASD based on google hits was significantly associated with the increase in ASD prevalence, coefficient=0.0001, p=.032. Results need to be interpreted with caution due to the small number of time points in the series.

## 21 BACKGROUND: AUSTRALIA – MENTAL HEALTH NEEDS PREVALENCE

The recent Global Burden of Disease Study 2017 found the percentage change in mental health disorders from 1990 to 2017 were as follows<sup>24</sup>.

Table 13 Percentage increase in prevalence counts from the Global Burden of Disease Study 2017<sup>24</sup>

Disorder	Increase in prevalence counts from 1990 to 2007	Increase in prevalence counts from 2007 to 2017
Depressive disorders	33.4%	14.3%
Anxiety disorders	32.3%	12.8%
Conduct disorder	16.1%	4.8%

Thus, there has been a significant global increase in the types of Mental health disorders likely captured under the NSW MH needs disorders.

### 21.1 Trends in anxiety/depression prevalence in Australia using LSAC

Parents reported at each LSAC wave whether their child had anxiety and/or depression. The proportion of parents indicating yes was divided by the total number of children with a parent report at that wave.

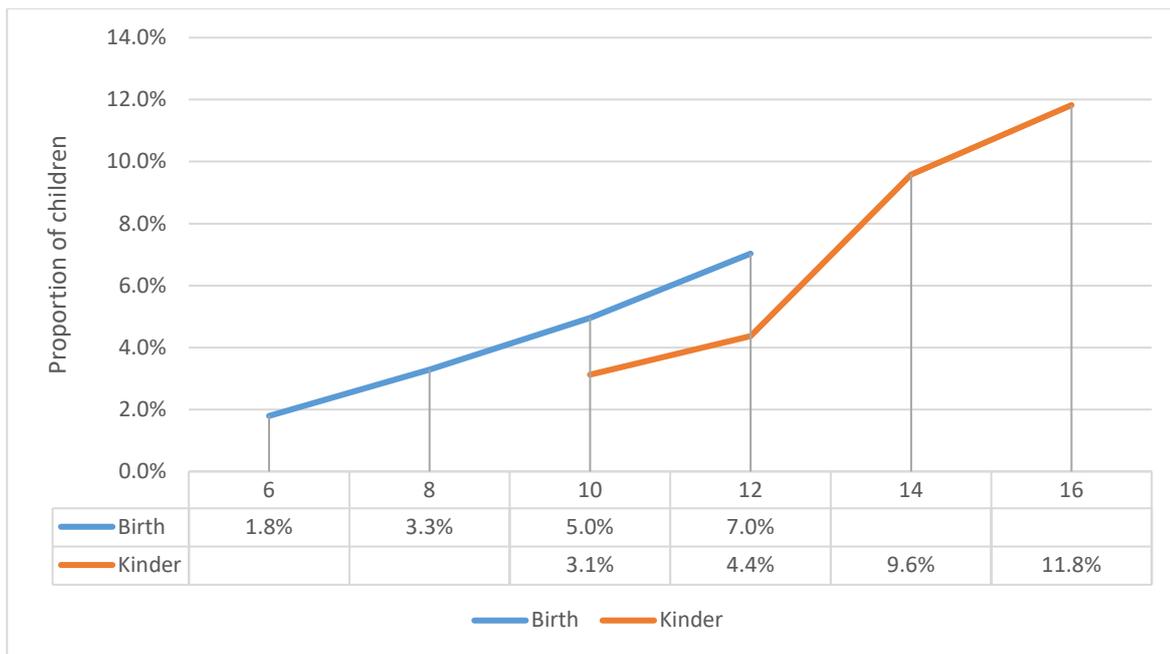


Figure 34 Proportion of children in Birth and Kinder cohort with anxiety and/or depression according to parent report from 6 to 16 years of age, LSAC (spans 2010-2016)

The proportion of parents indicating their child had anxiety and/or depression increased in the Birth cohort from 1.8% to 7% from age 6 to 12. In the Kinder cohort the prevalence increased from 3% at age 10 to 12% at age 16. We expect that internalising disorders increase with child age given their typical onset in adolescence. However, the increased prevalence in the Birth cohort relative to the kinder cohort at ages 10 to 12 suggests a cohort effect such that later born children have more reported anxiety and/or depression disorders than earlier born children. These figures are much higher than the MH needs prevalence derived in this report; particularly considering that the MH needs category includes all DSM-IV-TR diagnosis. These findings indicate a national increase in the number of students with anxiety/depression.

## 21.2 National mental health service use over the period using Medicare

We explored the number of Medicare mental health psychology services (MBS items 80110 and 80010) used between 2011 and 2018 for young people aged from 0 to 24 years.

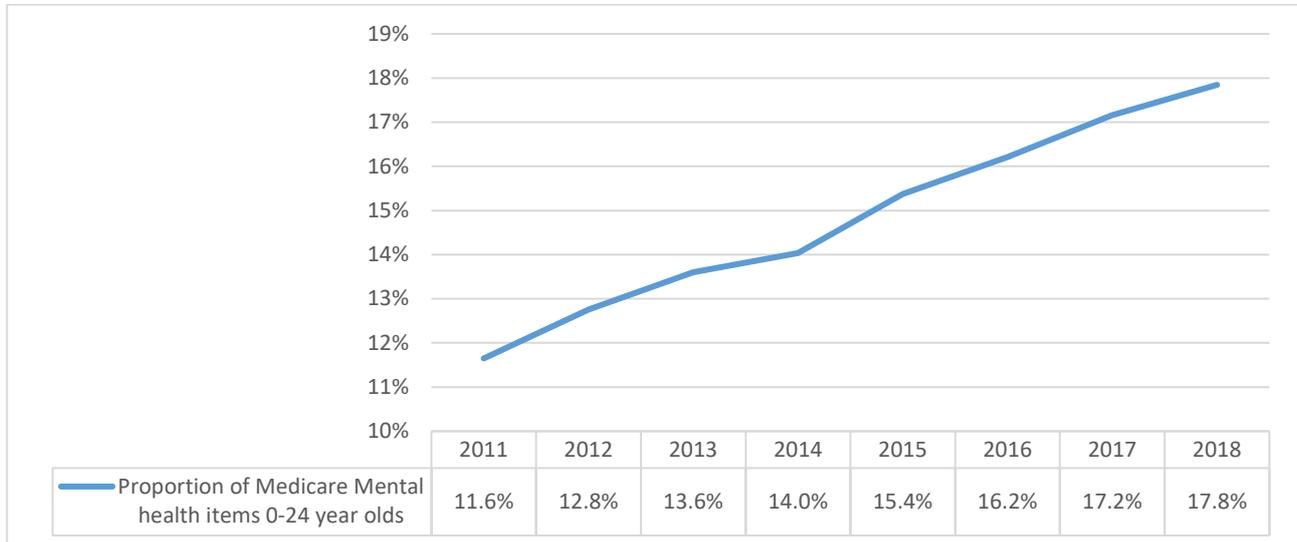


Figure 35 Occasions of Medicare mental health items (80110, 80010) in 0-24 year olds/ NSW population of 0-24 year olds from 2011-2018

There has been an increase in the number of mental health therapy items used from 2011 to 2018 in NSW. While each individual can use multiple sessions hence this percentage is not indicative of absolute prevalence, it indicates an increase in service use for mental health therapy in this group of young people. This is consistent with an increase in mental health needs over the period.

## 22 NDIS ROLLOUT

The National Disability Insurance Scheme (NDIS) commenced trial sites in NSW Hunter region from 2013 and became fully available in NSW in 2018. Awareness of the scheme and the funding available for individuals with disability may have flow on impacts to education settings with more individuals seeking diagnoses to access the new support mechanisms.

We identified school codes in the Hunter region. We then calculated the percentage of students with disability who came from the Hunter region for ASD, ID and mental health needs over the period.

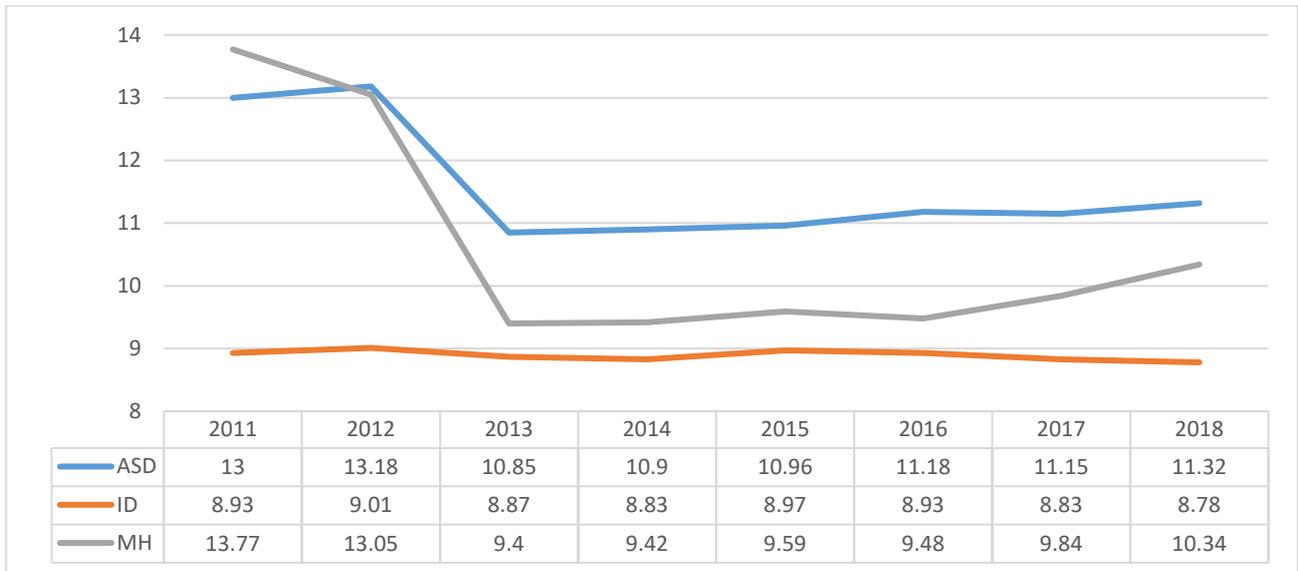


Figure 36 Proportion of students with a disability from the Hunter AECG Region receiving support for ASD, ID and Mental Health needs from 2011-2018

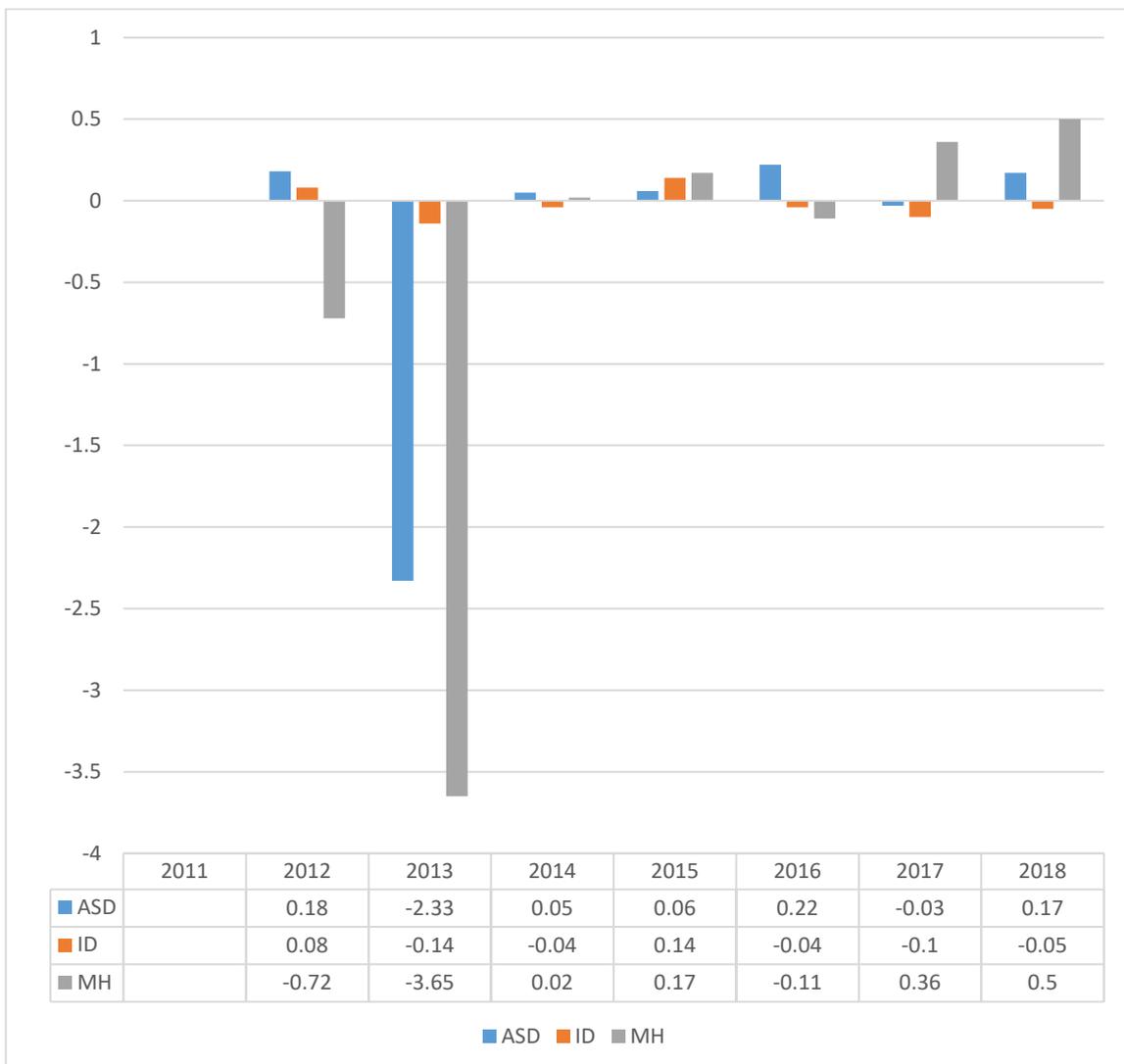


Figure 37 Percentage difference from the prior year, in the proportion of students with ASD, ID and MH needs in the Hunter region

There was a decrease of students receiving Level 1 funding for ASD and MH needs with the introduction of Level 2 funding in 2013. From 2013 to 2018 the proportion of students in the Hunter region remained stable with ASD at 11%, ID at 9% and MH needs increased slightly from 9 to 10% of the total students with a disability.

The figure above shows the percentage difference from the prior year in the percentage of students with ASD, ID and MH needs in the hunter region. There was a large decrease in 2013 but a gradual increase peaking in for ASD in 2016.

As the year students were removed from Level 1 funding coincides with the introduction of the NDIS in Hunter in 2013, the relative contribution of each event cannot be separated from this dataset. The lack of an increase in cases of ID and ASD suggests no significant contribution at this time from the rollout of the NDIS in Hunter.

As the NDIS is has been fully available in NSW since 2018 there may be an impact to students seeking support in NSW public schools in the future, but the statistical contribution cannot be calculated from the current dataset.

## PART 9: DISCUSSION

### 23 OVERVIEW

This report explored 1) the key internal and external reasons and their relative contribution to explain the observed increase in enrolments of students with autism (14.5%) and mental health needs (5.4%) in NSW public schools, during the period 2013-17; 2) the prevalence of autism and mental health needs in 2018 and, 3) 5 and 10 year predicted prevalence of autism and mental health needs.

The following prevalence figures were estimated for a primary diagnosis:

- There was an increase in primary diagnoses of ASD from 0.7% in 2013 to 1.5% in 2018. The average annual prevalence increase in ASD (adjusted for increase in total enrolments) was for 2013-2017, 15.8%, and 15.4% from 2013 to 2018.
- There was an increase in primary diagnoses of MH needs from 2013 to 2017 from 0.7% to 0.9%. The average annual prevalence increase in MH needs (adjusted for increase in total enrolments) was for 2013-2017, 3.3%, and 4.4% from 2013 to 2018.
- There was a decrease in primary diagnoses of Intellectual Disability (ID) from 1.9% in 2013 to 1.6% in 2018. The average annual prevalence decrease in ID (adjusted for increase in total enrolments) was for 2013-2017, 2.8%, and 2.8% from 2013 to 2018.

The 10 year prevalence predictions based on a primary diagnosis are:

- Primary diagnosis of ASD to increase from 1.6% in 2019 to 3.0% of students in 2028
- Primary diagnosis of MH needs to increase from 0.9% in 2019 to 1.2% of students in 2028

As many students will have more than one disorder (e.g. comorbid ASD and ID) the proportion of students with any of these diagnoses, regardless of their primary diagnosis, in NSW public schools was also calculated:

- The proportion of students in NSW schools with any ASD has increased from 1.1% in 2013 to 1.9% in 2018. The average annual prevalence increase in any ASD (adjusted for increase in total enrolments) was 12.2% from 2013 to 2018.
- The proportion of students in NSW schools with any MH needs has increased from 0.9% in 2013 to 1.3% in 2018. The average annual prevalence increase in any MH needs (adjusted for increase in total enrolments) was 6.4% from 2013 to 2018.
- The proportion of students in NSW schools with any ID has remained stable from 2011-2018 at around 2.4%. The average annual prevalence increase in any ID (adjusted for increase in total enrolments) was 0.4% from 2013 to 2018.

The 10 year prevalence predictions based on any diagnosis is:

- ASD to increase from 2.0% in 2019 to 3.5% of students in 2028
- MH needs to increase from 1.3% in 2019 to 1.9% of students in 2028

The Nationally Consistent Collection of Data on school students with disability (NCCD) includes all students that required adjustments in schools and has collected data since 2015. In 2017, 19.2% of NSW students were reported to receive adjustments. As per this report, in 2017, 3.75% of NSW public school enrolments received Level 1 funding for MH needs, ID and ASD. As the data collection procedures for the NCCD are being refined

it is unclear if all students receiving Level 1 support at this time were captured in the NCCD figure from the same period. The four broad categories of disability from the NCCD cannot be compared to the narrow disorder defined categories captured by Level 1 funding. Further work to explore the overlap of NCCD and Level 1 funding is needed to understand the profile of students captured in the NCCD who are, and are not, receiving Level 1 funding.

For internal factors that may have contributed to the increase in Level 1 funding for ASD and MH needs:

- Many students have overlapping features of ASD, ID, MH needs (and other co-occurring disorders). While the proportion of students with intellectual disability (regardless of any other co-occurring disorders) remained stable from 2011 to 2018; the proportion of students with autism without intellectual disability increased over the period 2011 to 2018. Thus, the enrolment of intellectually-able students with ASD was the main contributor to the increase over the period.
- The proportion of comorbidity in students with ASD also decreased from 73% to 67% from 2013-2018 indicating that students with ASD with fewer other problems were increasingly identified over the period.
- In 2013 around 15,000 students were removed from level 1 funding with the introduction of Level 2 funding. Approximately 1,432 of these students returned to Level 1 funding from 2014 to 2018 accounting for 1.4% of ASD, 0.4% of ID and 1.3% of MH needs students over the five year period (3% of the total students receiving funding for ASD, ID & MH needs from 2014-2018). Thus, returning students contributed only 3% to the increase across these disorders.
- There was no indication that teachers completing online ASD professional development courses was associated with the increase in ASD prevalence.
- The change to DSM-5 in 2014 from the DSM-IV-TR for ASD could not be confirmed as a cause or correlate of the increase in students with ASD. This was due to the concurrent introduction of Level 2 funding resulting in a large group of students being removed in 2013 and insufficient prior data time points to compare.
- Diagnostic switching between any MH, ID or ASD diagnoses impacted only around 6% of students receiving Level 1 funding support. This indicates that students changing primary diagnosis from ID to ASD or MH needs did not make a substantial impact to the increase in ASD and MH needs.

For student characteristics:

- Proportionally more females with ASD and MH needs have been identified over time which has made a small contribution to the increase in the primary diagnosis levels of both categories.
- Aboriginal and Torres Strait Islander students were over-represented as having primary diagnoses of ASD, ID and MH needs relative to the NSW public school population prevalence of Aboriginal students. In 2018 Aboriginal students made up 8% of the NSW public school enrolments but 12% of students with ASD, 18% of students with ID and 29% of students with MH needs based on primary diagnosis. The proportion of Aboriginal and Torres Strait Islander students with MH needs has increased 6%, ASD 4% and ID 4% from 2011 to 2018. This has made a small contribution to the increase in MH and ASD prevalence.
- The average grade level that a student receives support has increased for ASD from grade 5 to 6, ID from Grade 6 to 8, and MH needs from Grade 6 to Grade 7. The grade a student first receives support has also increased from 2011 to 2018, from Grade 2 to 3 for ASD, Grade 3 to 5 for ID, and MH needs has remained stable at Grade 5. This indicates that increasing numbers of older students are being

identified as having ASD and ID, and similarly, increasing numbers of older students are receiving support.

For external factors

- There has been a significant and large international and national increase in ASD prevalence and an increase in other Australian states/territories over the period, as demonstrated by health, education and research data. Thus, the increase in ASD prevalence in NSW public schools reflects an international and national trend and one found in other states. The increase in ASD prevalence has been attributed in part to 'higher-functioning' individuals being identified who have lower levels of symptoms and fewer comorbidities such as ID, as reported in other national and international data. The NSW findings of the increase in ASD being mostly students without ID is consistent with these broader trends.
- There has similarly been an increase in MH needs prevalence in Australia and internationally and the increase in NSW public schools likely reflects this national trend.
- There has been a large increase in public awareness in ASD over the period which has likely contributed to the national increase in prevalence and to the increase in NSW public schools.
- The NDIS impact could not be confirmed because of the removal of students from Level 1 funding coinciding with the introduction of the NDIS in the Hunter region in 2013.

## 24 ASD PREVALENCE

International studies and our Australian studies suggest the increase prevalence of ASD is related to children of school age without intellectual disability and with milder behavioural characteristics being identified<sup>31</sup>. This is reflected in the NSW DoE data with students with ASD without ID contributing to the increase in ASD prevalence over the period.

## 25 MH NEEDS PREVALENCE

The reported Australian data shows an increase in use of Mental Health psychology services over the period and also a cohort effect in the LSAC study such that later born children are reported to experience more anxiety/depression than younger born children. Together, this is indicative of a broader increase in mental health disorders being identified over time in Australia. The NSW DoE dataset reflects this trend with a small increase in primary diagnoses of MH. As MH needs includes all DSM-IV-TR psychiatric diagnoses any underlying trends in prevalence for the different types of disorders, for example, internalising disorders such as mood and anxiety disorders, versus externalising disorders such as oppositional defiant disorder, could not be explored.

## 26 DSM-IV-TR TO DSM-5 FOR ASD

Using the NSW DoE data the impact of moving to DSM-5 from 2014 could not be clearly established. This was due to the previous reduction in students in 2013 with students moving to Level 2 funding and no data prior to 2011. It is still possible that the change from DSM-IV to DSM-5 has resulted in more school aged children being diagnosed with autism and hence being eligible for education support funding.

## 27 STUDENT CHARACTERISTICS

### 27.1 Aboriginal and Torres Strait Islander students

The findings within the NSW DoE dataset reflects other Australian studies, with over-representation of Aboriginal and Torres Strait Islander students in ID, ASD and mental health needs diagnosis. Aboriginal and Torres Strait Islander students made up 12% of ASD, 18% of ID and 29% of MH needs disability population in

2018 despite only accounting for around 8% of NSW public school enrolments. The increase in the proportion of Aboriginal students with MH needs grew from 23% to 29% and for ASD from 8 to 12% from 2011 to 2018 which contributes a small amount to the increase in ASD and MH needs over the period.

## 27.2 Gender

The NSW DoE data indicates that proportionally more girls are receiving an ASD diagnosis over time, with the male percentage decreasing from 86% to 83% from 2011 to 2018. This is a relatively small decrease and contribution to the increase in ASD diagnoses. This trend mirrors that found in other Australian datasets and is thus, unlikely due to internal NSW DoE factors.

## 28 LIMITATIONS

Missing disability information about primary and other diagnoses was derived by NSW DoE based on support class type and Factors of Need. Prediction and association statistics need to be interpreted with caution given the small number of data points used to make calculations. The MH Needs category includes all DSM-IV-TR psychiatric diagnoses. It does not provide the required granularity to explore potential specific diagnostic categories that might be contributing to the increase, such as a breakdown of internalising versus externalising disorders.

## 29 SUMMARY

The increase in the prevalence of ASD from 2013 to 2018 is due to the identification of intellectually-able students with ASD. The prevalence of students with any intellectual disability (regardless of their primary diagnosis) remained stable over the last 8 years. The increase in mental health needs is likely due to increasing public awareness of MH needs. The MH needs category is too broad to understand specific causal factors for the increase. There is minimal contribution from the explored internal factors to the increase in ASD and MH needs. Three percent of the total students receiving funding for ASD, ID & MH needs from 2014-2018 were those who returned to Level 1 funding after being removed in 2013 with the introduction of Level 2 funding. Student characteristics have changed over the period, with slightly more girls with ASD and MH needs being identified and an increase in Aboriginal and Torres Strait Islander students receiving funding for ASD and MH needs. These changes each make a small contribution to the increase in prevalence of ASD. The impact of the NDIS and from changes to DSM-IV-TR to DSM-5 could not be confirmed due to too few prior data points and the co-occurring introduction of Level 2 funding in 2013. Increased ASD and MH needs prevalence likely reflects Australian and international trends of increased prevalence due to growing awareness, increased screening and identification of students with disabilities, and diagnosis of students with normal intelligence and less behavioural challenges.

## **PART 10: EXAMPLE PLAIN LANGUAGE EXPLANATION**

### **Has there been a rise in students with Autism Spectrum Disorder?**

There has been a rise in the number of students with Autism Spectrum Disorder (ASD) in NSW public schools. There are more students with ASD in 2018 than there were in 2013. There are a few reasons for the rise. The rise in NSW is like that found in other states of Australia and other countries around the world. This is probably because more people are aware of ASD. This means the signs and symptoms a student needs to have to be diagnosed with ASD are better noticed by parents and others in the community. There is now also a single diagnosis of ASD. The signs and symptoms are broader than some of the past diagnoses for ASD, which means more students have them. This also means more students who don't also have intellectual disability but have ASD signs and symptoms are being diagnosed. This also results in more girls being noticed as having ASD.

### **Has there been a rise in students with Mental Health needs?**

There has been a rise in the number of students with mental health needs in NSW public schools. There are more students with mental health needs in 2018 than there were in 2013. There are a few reasons for the rise. The rise in NSW is like that found in other states of Australia and other countries around the world. This is probably because more people are aware of mental health. There is less stigma (or negative beliefs) about mental health. This means that if a student has the signs and symptoms of a mental health need, parents and the community may be more likely to notice and get them help.

### **What is comorbidity?**

Lots of the signs and symptoms of disabilities are similar or overlap. For example, students with ASD might also have anxiety or need support with their cognition or thinking. Comorbidity is when one student has more than one type of disability. For example, a student with ASD might also have an intellectual disability or a mental health need.

### **How might comorbidity affect the rise in ASD or Mental Health needs?**

Often, systems used to count the number of students with a disability only use one 'primary' diagnosis to count each student. This means when a student has two or more disabilities one must be chosen as the primary diagnosis. The choice might be made based on the disability the student seems to need the most help with, or by what funding might be available for different disabilities. When a primary diagnosis is used to calculate the number of students with a disability, it might not show the real number of students with each disability. For example, if a student with comorbid ASD and intellectual disability is counted as having a primary diagnosis of ASD, the number of students with a primary diagnosis of intellectual disability will be less than the actual number of students with intellectual disability. If they are counted as having intellectual disability instead, then the numbers of students with a primary diagnosis of ASD will be lower than the actual number of students with ASD. Having a primary diagnosis helps, as it means each student is counted only once, so the total number of students with disabilities is easier to calculate.

Some systems include primary, but also any other comorbid diagnoses a student might have, such as that used by NSW DoE. This means that the number of students with each type of primary disability can be reported; but the total number of students with each disability, regardless of what their primary disability is, can also be calculated. When this way is used it means students can be counted more than once. For example a student with comorbid ASD and Intellectual Disability will be counted twice, once for ASD and once for Intellectual Disability. This tells us a bit more about the students, but it means we can't add up the total number

of each disability to get the total number of students with a disability. The number of students with each disability is higher than when a primary disability is used, because students can be counted more than once. When we know both the primary diagnosis and other diagnoses a student might have we can also count the number of students with one disability and those with two or more. This helps us better know what types and amount of support might be needed for each student.

## APPENDIX A – PREVALENCE ESTIMATES OTHER METHODS

### Primary Diagnosis Method 1 – ID Precedence

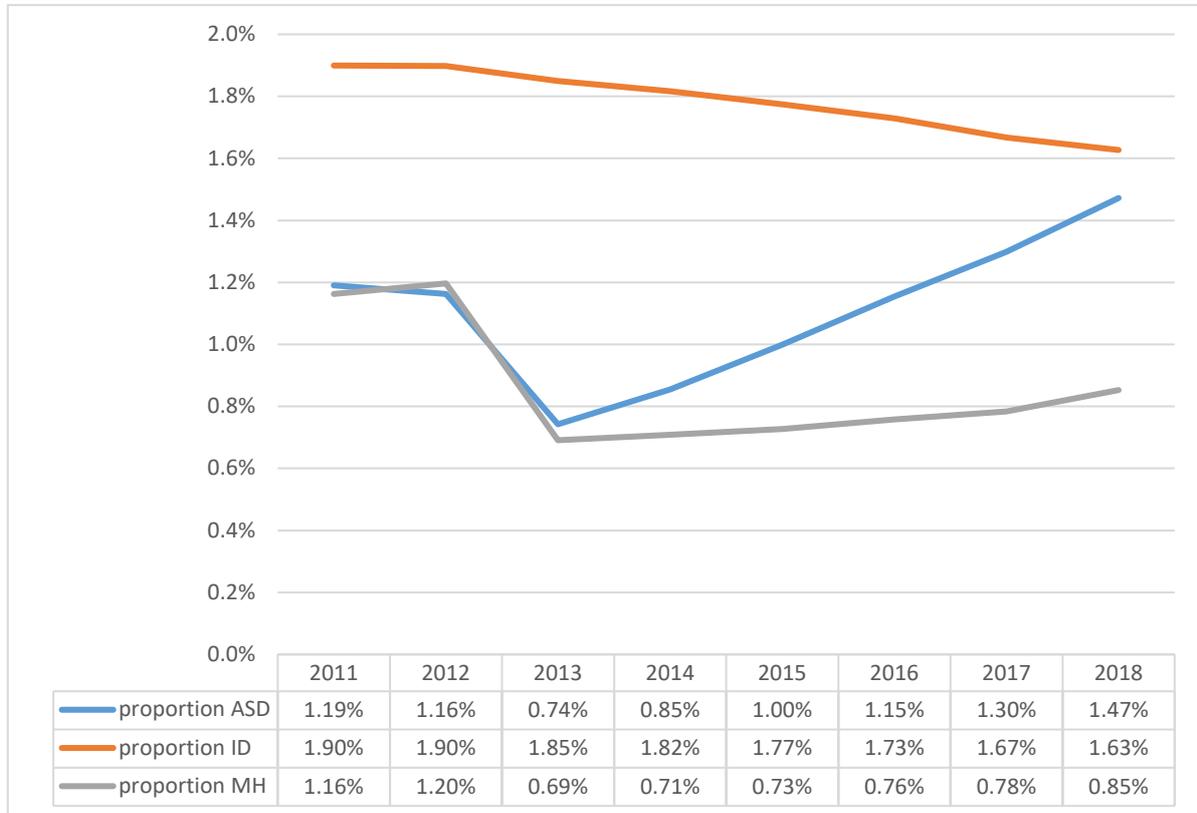


Figure 38 Proportion of students with a Level 1 funding primary classification of Autism, ID and Mental Health Needs, from 2011-2018, Method 1

## Primary Diagnosis Prevalence Method 2 – ASD Precedence

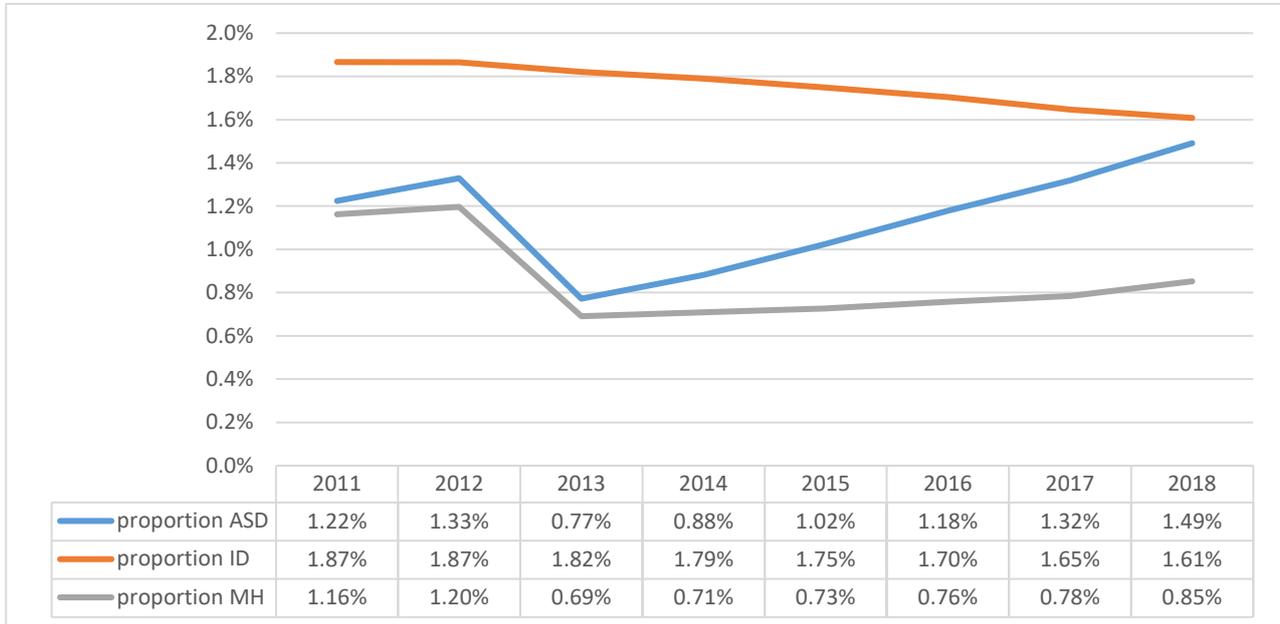


Figure 39 Proportion of students with a Level 1 funding primary classification of Autism, ID and Mental Health Needs, from 2011-2018, Method 2

## APPENDIX B – OTHER DATA SOURCES

School type – Primary, Secondary, Central/Community, Schools for Specific Purposes taken from: <https://data.cese.nsw.gov.au/data/dataset/specialist-support-classes-by-school-and-support-needs-type>

AECG Region (Hunter) – taken from <https://data.cese.nsw.gov.au/data/dataset/nsw-public-schools-master-dataset>

Number of Enrolments taken from: <https://www.cese.nsw.gov.au/images/stories/PDF/2018-mid-year-brief-AA.pdf>

Year	Primary(k-6)	Secondary(7-12)	SSP	Total
2011	433,873	306,893.20	4,774	745,540.20
2012	438,681	304,632.10	4,921	748,234.10
2013	446,848	303,433.60	5,064	755,345.60
2014	456,151	302,339.70	5,207	763,697.70
2015	465,767	300,871.10	5,340	771,978.10
2016	475,073	300,069.90	5,457	780,599.90
2017	484,645	300,832.80	5,562	791,039.80
2018	491,043	301,315.20	5,664	798,022.20

Number of preschool enrolments taken from DoE Annual Reports: <https://education.nsw.gov.au/about-us/strategies-and-reports/annual-reports>

	2011	2012	2013	2014	2015	2016	2017	2018
Number of NSW public preschool students	4416	4424	4433	4365	4278	4441	4442	4522

NCCD Data taken from: <http://www.educationcouncil.edu.au/EC-Reports-and-Publications.aspx>

## REFERENCES

1. NSW Department of Education. The Disability Strategy 2018.
2. NDIS. <https://www.ndis.gov.au/about-us/operational-guidelines/access-ndis-operational-guideline/list-conditions-which-are-likely-meet-disability-requirements-section-24-ndis-act>.
3. Education Council. 2017 data on students in Australian schools receiving adjustments for disability. 2017.
4. Education Council. 2016 emergent data on students in Australian schools receiving adjustments for disability. 2016.
5. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders 4th Edition text revised*: American Psychiatric Pub; 2000.
6. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders (DSM-5®)*: American Psychiatric Pub; 2013.
7. Lundström S, Reichenberg A, Anckarsäter H, Lichtenstein P, Gillberg C. Autism phenotype versus registered diagnosis in Swedish children: prevalence trends over 10 years in general population samples. *bmj*. 2015;350:h1961.
8. Loomes R, Hull L, Mandy WPL. What is the male-to-female ratio in autism spectrum disorder? A systematic review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2017;56(6):466-474.
9. Fombonne E. The prevalence of autism. *Jama*. 2003;289(1):87-89.
10. May T, Williams K. Brief report: gender and age of diagnosis time trends in children with autism using Australian medicare data. *Journal of autism and developmental disorders*. 2018;48(12):4056-4062.
11. Rutherford M, McKenzie K, Johnson T, Catchpole C, O'Hare A, McClure I, et al. Gender ratio in a clinical population sample, age of diagnosis and duration of assessment in children and adults with autism spectrum disorder. *Autism*. 2016;20(5):628-634.
12. DiGiacomo M, Davidson PM, Abbott P, Delaney P, Dharmendra T, McGrath SJ, et al. Childhood disability in Aboriginal and Torres Strait Islander peoples: a literature review. *International journal for equity in health*. 2013;12(1):7.
13. Blair EM, Zubrick SR, Cox AH, Committee WS. The Western Australian Aboriginal Child Health Survey: findings to date on adolescents. *Med J Aust*. 2005;183(8):433-435.
14. Australian Bureau of Statistics. Australian Aboriginal and Torres Strait Islander Health Survey: Updated Results, 2012–13. 2016.
15. Azzopardi PS, Sawyer SM, Carlin JB, Degenhardt L, Brown N, Brown AD, et al. Health and wellbeing of Indigenous adolescents in Australia: a systematic synthesis of population data. *The Lancet*. 2018;391(10122):766-782.
16. Twizeyemariya A, Guy S, Furber G, Segal L. Risks for Mental Illness in Indigenous Australian Children: A Descriptive Study Demonstrating High Levels of Vulnerability. *Milbank Q*. 2017;95(2):319-357.
17. Shepherd CC, Li J, Mitrou F, Zubrick SR. Socioeconomic disparities in the mental health of Indigenous children in Western Australia. *BMC Public Health*. 2012;12(1):756.
18. Einfeld SL, Ellis LA, Emerson E. Comorbidity of intellectual disability and mental disorder in children and adolescents: A systematic review. *Journal of Intellectual and Developmental Disability*. 2011;36(2):137-143.
19. Simonoff E, Pickles A, Charman T, Chandler S, Loucas T, Baird G. Psychiatric disorders in children with autism spectrum disorders: prevalence, comorbidity, and associated factors in a population-derived sample. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2008;47(8):921-929.
20. La Malfa G, Lassi S, Bertelli M, Salvini R, Placidi G. Autism and intellectual disability: a study of prevalence on a sample of the Italian population. *Journal of intellectual disability research*. 2004;48(3):262-267.

21. Charman T, Pickles A, Simonoff E, Chandler S, Loucas T, Baird G. IQ in children with autism spectrum disorders: data from the Special Needs and Autism Project (SNAP). *Psychological medicine*. 2011;41(3):619-627.
22. Merikangas KR, He J-p, Burstein M, Swanson SA, Avenevoli S, Cui L, et al. Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*. 2010;49(10):980-989.
23. Elsabbagh M, Divan G, Koh YJ, Kim YS, Kauchali S, Marcín C, et al. Global prevalence of autism and other pervasive developmental disorders. *Autism research*. 2012;5(3):160-179.
24. James SL, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*. 2018;392(10159):1789-1858.
25. Keyes KM, Susser E, Cheslack-Postava K, Fountain C, Liu K, Bearman PS. Cohort effects explain the increase in autism diagnosis among children born from 1992 to 2003 in California. *International journal of epidemiology*. 2011;41(2):495-503.
26. Idring S, Lundberg M, Sturm H, Dalman C, Gumpert C, Rai D, et al. Changes in prevalence of autism spectrum disorders in 2001–2011: findings from the Stockholm youth cohort. *Journal of autism and developmental disorders*. 2015;45(6):1766-1773.
27. Sanson AV, Nicholson J, Ungerer J, Zubrick S, Wilson K, Ainley J, et al. Introducing the longitudinal study of Australian children. 2002.
28. Victorian Department of Education and Training. Review of the program for students with disabilities. In: Training VDoEa, editor. VIC: Victorian Department of Education and Training; 2016.
29. Deloitte Access Economics. Review of education for students with disability in Queensland state schools. 2017.
30. Department of Education Tasmania. Accessible Island: Tasmania's disability framework for action 2018-2021 Disability Action Plan 2018-2021. In: Tasmania DoE, editor. Tasmania: Department of Education; 2018.
31. May T, Sciberras E, Brignell A, Williams K. Autism spectrum disorder: updated prevalence and comparison of two birth cohorts in a nationally representative Australian sample. *BMJ open*. 2017;7(5):e015549.

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