Author/s:
O'Connor, M;O'Connor, E;Quach, J;Vashishtha, R;Goldfeld, S

Title:
Trends in the prevalence and distribution of teacher-identified special health-care needs across three successive population cohorts

Date:
2019-03-01

Citation:
O'Connor, M., O'Connor, E., Quach, J., Vashishtha, R. & Goldfeld, S. (2019). Trends in the prevalence and distribution of teacher-identified special health-care needs across three successive population cohorts. Journal of Paediatrics and Child Health, 55 (3), pp.312-319. https://doi.org/10.1111/jpc.14192.

Persistent Link:
https://hdl.handle.net/11343/284395

ABSTRACT

Aim

Some children's special health care needs (SHCN) are formalised at the start of schooling (established SHCN), but a larger proportion start with difficulties that are milder or not yet diagnosed (emerging SHCN). This study explores whether: 1) the prevalence of teacher-identified SHCN (both overall and according to type of needs), and 2) distribution across disadvantaged communities, has changed over three successive population cohorts of Australian children.

Methods

We draw on repeated cross-sectional data from the Australian Early Development Census, a teacher reported checklist completed on full populations of Australian school entrants in 2009, 2012 and 2015. It includes a measure of SHCN, as well as demographic information.

Results

The proportion of children with emerging and established needs were mostly stable from 2009 to 2015 (emerging needs: 17.1-18.9%; established needs: 4.4-4.9%). Change over time was observed in the prevalence of some specific types of impairment. Speech impairment rose 14.7% for children with emerging needs, and emotional problems rose 13.7% for children with established needs. Children living in the most disadvantaged neighbourhoods had higher odds of SHCN in all years (e.g., emerging needs RRR 1.65 [99%CI 1.55, 1.75] in 2015; established needs RRR 1.88 [99%CI 1.71, 2.06] in 2015).

Conclusions

A large proportion of children starting school each year have SHCN. The types of SHCN that children present with increasingly reflect complex difficulties that require input from both the health and education sectors. Effective responses also need to consider the added impact of disadvantage.

Keywords: Special health care needs; disability; chronic health condition; socioeconomic disadvantage.

WHAT IS ALREADY KNOWN ON THIS TOPIC

1. A large proportion of children who start school have or are at risk of having a chronic condition which requires more medical, allied health, education or related services than their peers.
2. Schools need an accurate picture of whether levels of these additional needs are changing over time, in order to plan for future service provision and highlight developing service gaps.

WHAT THIS PAPER ADDS

1. The proportion of children entering school with teacher-identified additional support needs each year remains relatively stable, but in absolute numbers is increasing, in line with the increasing population size.
2. These support needs increasingly reflect complex bio-psycho-social issues, and are concentrated in more disadvantaged areas.

Trends in the prevalence and distribution of teacher-identified special health care needs across three successive population cohorts

INTRODUCTION

Children with special health care needs (SHCN) have or are at increased risk of having a chronic physical, developmental, behavioural, or emotional condition which requires more medical, allied health, education or related services than their peers.[1] This definition of SHCN does not require children to have a diagnosed condition. Rather, it shifts focus towards children's need for additional support, in recognition of the important potential benefits of early intervention.[2] This shift in focus can also be seen in the education system, such as with the introduction of the model for the Nationally Consistent Collection of Data on School Students with Disability (NCCD) in Australian schools, which focuses on the adjustments that children require.[3]

Children with SHCN begin school with poorer academic and social-emotional skills compared to their non-SHCN peers,[4] and early differences persist.[5] Even conditions with no direct impact on cognitive or neurological functioning – like allergies or asthma – can influence academic performance.[6,7] This occurs through pathways such as school absenteeism, difficulties accessing the curriculum due to factors like fatigue or irritability, and restricted involvement in social activities with peers.[8]

In Australia, the provision of special education funding to support a child at school generally requires the presence of a formally identified disability (established SHCN) meeting strict eligibility criteria.[9] Children who experience emerging SHCN in their first year of school do not qualify due to milder, undiagnosed, or grey area problems. These children are expected to be supported by their schools' usual resources, with no additional funding, though general services like counselling or behaviour management programs are constrained in most schools.[9]

Part of developing an effective response to meeting the needs of these children is understanding the burden facing schools, and whether this is changing over time.[10,11] This basic information is essential for schools to plan for future service provision, and to highlight where service gaps may be developing. Australian evidence to date suggests that 4% of children have established SHCN formally recognised within the education system, while many more (18%) experience emerging SHCN.[4] In addition, both Australian[12] and international evidence suggests that disability rates are increasing substantially over time.[13-15] For schools, the complex causes of these trends are immaterial: they need to respond regardless.

Shifts have also been observed in the types of problems that children present with, with a sharp increase in chronic and sometimes intractable problems associated with complex bio-psycho-social and environmental dimensions,[16] which often require very different types of support than, for example, infectious diseases that were prevalent in the early twentieth century. Data from the National Health Interview Survey in the United States indicates that, between 2001 and 2011, there was a 63% increase in disabling speech problems, 63% increase in disabling cognitive impairments, and 65% for other mental, emotional, or behavioural problems.[13] In contrast, disabling physical health conditions decreased by 12% during the same period.

Effective responses to supporting these children also need to take into account children's level of disadvantage. Evidence suggests that despite policy efforts, disadvantage continues to be a powerful influence on children's health and development.[17] Children with SHCN are overrepresented in more disadvantaged settings in countries such as the UK,[18] US,[19] Canada,[20] and Australia.[4] Disadvantaged children with SHCN have less access to the medical, allied health, education and/or related services that they require.[21,22] To formulate equitable and effective responses, schools need to know the extent to which SHCN relates to disadvantage and whether this is changing.

We aimed to determine for Australian children starting school trends in the prevalence of SHCN, both overall and for specific types of SHCN, and how these needs are distributed across disadvantaged communities. The Australian Early Development Census (AEDC) provides a rare opportunity to examine these trends across full populations of school entrants in 2009, 2012, and 2015, with teachers reporting on over 250,000 children in each cohort. We examine 1) whether the proportion of children with SHCN changed from 2009 to 2015; 2) whether the types of impairment experienced by children changed from 2009 to 2015, and 3) whether inequities in the distribution of SHCN were evident at each time point.

MATERIALS AND METHODS

Data source

The AEDC is a cross-sectional population measure of children's development completed by teachers, adapted from the Canadian Early Development Instrument.[23] Teachers are important informants on children's SHCN as manifested in the classroom and school environments, the demands of which often highlight children's additional support needs.[4,24,25] As such, their reports should be interpreted as an indicator of SHCN contextualised within the school setting.

The AEDC is conducted every three years, and data are now available from 2009, 2012 and 2015, with over 250,000 children in each cohort (96.8% of the estimated five-year-old population in each data collection). The AEDC provides information about children's demographic characteristics, SHCN, and early developmental outcomes. Teachers complete the AEDC for all Australian students in their first year of compulsory schooling (at about five years of age), using a secure web-based data entry system, across Government, Independent, and Catholic schools.[26] The AEDC data are used by communities, policymakers, and researchers to review the status of children's development and to guide service planning to improve children's outcomes.[27]

Measures

Special health care needs

SHCN status (established needs, emerging needs, standard population) was determined from existing teacher-reported data in the AEDC. This teacher-reported assessment of SHCN has been shown to correlate with other developmental indicators as expected,[4,5] and should be interpreted as an indicator of SHCN in the school setting.[24,25] Items were consistent across each data collection, except where noted below.

Established SHCN. Teachers were asked whether the child required "special assistance due to chronic medical, physical, or intellectually disabling conditions (e.g., autism, cerebral palsy, down syndrome)", with instructions to base their answer on an established medical diagnosis. Any child for whom teachers responded "yes" to this item was categorised as having established SHCN.

Emerging SHCN. If children did not have established SHCN, it was then determined whether they had emerging needs. Children were categorised as having emerging SHCN if teachers responded "yes" to either of the following questions: 1) whether any of a list of broad types of impairment necessitating additional support (see Table 2) impacted on each student's ability to do school work in a regular classroom, and 2) whether the child needed further assessment and/or was currently being assessed due to these difficulties.

In 2015, an additional response option for 1) above was provided to indicate types of impairment that did *not* impact on school functioning. These responses were combined with 'no' responses to be consistent with previous years.

Standard population. All other children were categorised as belonging to the standard population; that is, no SHCN.

Specific diagnoses

The concept of SHCN shifts focus away from diagnoses towards children's needs for additional support, thus diagnosis is not used to determine SHCN status. Nevertheless, information on teacher-reported diagnoses was available and was examined to provide

additional insights. Teacher-report of diagnoses should not be considered as definitive; for example, they may not know about diagnoses that are well managed in the home setting or that parents choose not to reveal. Rather, they reflect the teacher's understanding of the diagnostic information provided to them about the child.

In 2009, teachers were provided with a free-text field to indicate a child's diagnosis, which was subsequently coded using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10). In 2015, when teachers reported that children had established needs they were asked "what diagnosis (or diagnoses) qualifies this child as special needs", with 21 common diagnoses listed using the ICD-10; for all other children, teachers were asked "does the child have any specific condition", and if so, were then asked to specify the condition using the same drop down list.

Community disadvantage

The socioeconomic status of the local community (i.e., neighbourhood) where children lived was indicated by the Socio-Economic Indexes for Areas (SEIFA) Index for Relative Socio-Economic Disadvantage developed by the Australian Bureau of Statistics. This variable is a composite of census information reflecting community disadvantage in the child's local area, such as low levels of educational attainment and high unemployment.[28]

Potential confounders of the relationship between disadvantage and SHCN

Potential confounders were identified using a previously developed conceptual model.[8] Teachers reported the child's gender, whether they were of Aboriginal and/or Torres Strait Islander descent (Indigenous), and whether they came from a non-English speaking background. Teachers were instructed to refer to their school database or enrolment records when reporting this information. Using the Accessibility/Remoteness Index of Australia,[29] children's local areas were categorised as a major city, regional area, or remote area, to provide an indicator of geographic remoteness.

Statistical analyses

All analyses were conducted using Stata 14.[30] There was a very low proportion of missing data across the variables (average of <1%). Complete case results are presented.

First, multinomial logistic regression analyses were used to explore whether the proportion of SHCN changed from 2009 to 2015, with year (2009, 2012, and 2015) predicting SHCN status (standard population, emerging needs, established needs). Next, logistic regression analyses were used to explore whether year predicted the odds of experiencing specific types of impairment. Unadjusted results are presented, because we were interested in whether the burden facing schools had changed, regardless of cause.

Finally, multinomial logistic regression analyses were used to examine community disadvantage as a predictor of SHCN status, separately in 2009, 2012, and 2015. These estimates were adjusted for gender, language background, Indigenous status, and remoteness, allowing the effect of disadvantage to be examined once accounting for potential interrelations among these demographic characteristics.

All regression analyses were clustered on teacher to account for the non-independence of observations. 99% CIs are reported due to the extremely large number of cases; even trivial differences are likely to reach statistical significance with this large cohort.

RESULTS

Cohort characteristics

A total of 853,123 children were assessed across years, including 261,147 in 2009, 289,973 in 2012, and 302,003 in 2015, reflecting an increasing population size. Over 96% of the estimated 5 year old population was captured in each year. Children were on average 5 years, 6 months (SD 4.63 months), and 51% were boys in all years.

Proportion of children with SHCN

The proportion of children with emerging needs and established needs was mostly stable, with only slight variations across cohorts (Table 1). The multinomial logistic regression

confirmed a statistically significant but very slight reduction in emerging needs between 2009 and 2015 (from 18.0% to 17.1%). While proportions remained stable, the absolute number of children with SHCN increased from 2009 to 2015 (from 46,938 to 51,716 for emerging needs; from 11,484 to 14,065 for established needs), in line with the increase in the population size.

Types of impairment

Substantial change over time was evident for some specific types of impairment (Table 2). For children with emerging needs, increases in speech impairment (14.7%) and learning disability (5.3%) were largest, while for established needs, increases in emotional problems (13.7%) and behavioural problems (7.1%) were largest. Logistic regression analyses confirmed differences between 2009 and 2015 in these types of impairment.

Specific diagnoses

While diagnoses in isolation do not necessarily indicate SHCN, it is noteworthy that the diagnoses reported by teachers also aligned with these trends in the common types of impairment (Table 3). For children with established needs in 2015, autism spectrum disorder (ASD; 45.0%), global developmental delay (9.3%) and attention deficit hyperactive disorder (7.8%) were the three most common teacher-reported diagnoses. In contrast (and not surprisingly given our definition), very few children with emerging needs were reported by teachers to have a diagnosed condition.

Disadvantage and SHCN status across cohorts

Children living in the most disadvantaged areas had increased odds of presenting with established needs and emerging needs in each cohort (Table 4). These effects were evident after accounting for potential confounders. The same pattern of findings was evident when considering disadvantage at the family level using an indicator of family level disadvantage only available in 2015 (results not shown).

DISCUSSION

The proportion of Australian children starting school with SHCN as identified by their teachers was relatively stable between 2009 and 2015. For established needs, this reflects stability within the school funding structures that define special needs eligibility. These findings also show that the large group of children with emerging SHCN, many of whom have complex difficulties across bio-psycho-social conditions, is not abating over time. As the size of the population is increasing, this translates to a substantial increase in the absolute number of children entering school with SHCN. While the prevalence of established versus emerging needs is sensitive to Australian educational policies defining cut-off criteria, the overall large proportion of children entering school with SHCN likely has relevance to other countries such as the US, UK, and Canada.[9]

Change over time was observed in the types of impairments reported by teachers, with a clear increase in language, behavioural, and emotional problems. It has been suggested elsewhere that the rise in these types of impairments may be due to factors such as socioeconomic influences on health (including poverty), health disparities, technological changes, overweight and obesity, and increasing mental health concerns.[16] Aligning with these types of impairment, the most common diagnosis reported by teachers was ASD. In Australia, more than 1 in 100 children are now diagnosed with ASD before the age of seven.[31] It is not yet clear whether the condition is becoming more prevalent or if the increase can be explained by changes in recognition, broader diagnostic criteria, earlier diagnosis, and increased incentives for early identification and intervention.[15,31] Regardless, the data show that this is a key reason for children acquiring special needs status in Australian schools.

In each cohort, prevalence rates for SHCN were higher for children living in more disadvantaged communities. Children living in disadvantaged communities had higher odds of SHCN and this was observed consistently in 2009, 2012, and 20115. Disadvantage and SHCN is a particularly adverse mixture for children. In combination, they have been found to impact more on academic learning than both would contribute in isolation.[32] This suggests the importance of responding within a proportionate universalism framework into the future, whereby universal efforts to promote the learning and health outcomes of children with

SHCN are implemented, but with an intensity that is proportionate to the level of socioeconomic disadvantage.[33]

Overall these findings suggest that a substantial number of children with SHCN enter schools each year, and this is likely to be even higher for schools in disadvantaged areas. Currently, Australian educational policy responses do not align with this reality. There is a failure to fully capitalise on the potential to promote healthy childhood development before children start school, such as through high quality early childhood education and care,[34] sustained nurse home visiting,[35] or interventions that promote rich home learning environments.[36] Once children start school, funding structures fail to take into account the large number of children with emerging needs, the impact of disadvantage, or the greater malleability of learning trajectories during the early years of school.[9] Together these represent lost opportunities to substantially shift the outcomes for large groups of children.

These results suggest that identifying the strongest opportunities in terms of both system leverage points and specific interventions to support children with SHCN at school, particularly those who are also disadvantaged, should be a priority for both the health and education systems. Resources and incentives are needed for schools to support their use of evidence-based strategies, such as direct instruction (explicit, structured, systematic teaching methods), which have sound evidence for their effectiveness.[37] But this evidence base also needs to grow; further research should consider how best to make a difference and test interventions at scale. Assessment is currently geared towards determining eligibility for services, but needs to shift towards informing planning for intervention, and opportunities for more systematic approaches towards early identification of difficulties should be considered.

In addition, addressing the risk of school failure for children with SHCN requires effective, coordinated and comprehensive support across the education and health systems. For example, paediatricians can help to reduce the impact of SHCN on school performance through practices such as collaborating with the family and educational team in developing a child's Individual Education Plan.[38,39] However, the engagement between clinicians and

schools can be improved. For example, Australian research found that although 89.1% of parents wanted their pediatrician to help to inform their child's school after an ASD diagnosis, only 18.6% received this support.[40] Future research will have an important role to plan in facilitating this, for example, by evaluating different approaches to fostering such engagement.

The AEDC provided a powerful opportunity to quantify trends in SHCN over time, particularly for children with emerging needs who otherwise have little visibility. Its population coverage is a major strength, which ensures that the most vulnerable children are represented and that actual numbers of children requiring additional support can be directly reported. Using teachers as informants has the advantage of being feasible at the population level, ensures that functioning within the school context is captured, and corresponds well to directly administered cognitive and language assessments.[41]

Nevertheless, some limitations should be considered. The way teachers were asked about specific diagnoses changed over time (free text responses in 2009, versus drop-down in 2015). These data on diagnoses should be interpreted as reflecting the teacher's understanding of a child's diagnosis, which they will use to inform school supports, but which may not correspond to the clinician's original formulation. In addition, it is possible that the differences observed between cohorts in the types of impairment experienced by children could be influenced by changes to the response scale in 2015, which included an option of reporting that the child had an type of impairment that did not affect school functioning (coded here as 0 to align with previous years and with the SHCN definition). This seems an unlikely explanation however, as we would have expected a consistent change in response patterns across all types of impairment.

Conclusions

A large proportion of children starting school each year are identified by their teachers as experiencing SHCN, with no evidence that this group is diminishing over time. Indeed, due to population growth the absolute number of children is getting larger. Children are

increasingly presenting with types of impairments that require supports spanning the health and education sectors, and continue to disproportionately occur in more disadvantaged neighbourhoods. Greater attention from both policy makers and future research needs to be given to ensuring these children are effectively supported during the early school years, as this reflects a valuable opportunity to substantially shift outcomes for this large groups of children.

REFERENCES

1. McPherson M, Arango P, Fox H, et al. A new definition of children with special health care needs. *Pediatrics.* 1998;102(1):137-139.
2. Newacheck P, Rising J, Kim S. Children at risk for special health care needs. *Pediatrics.* 2006;118(1):334-342.
3. Education Council. *Nationally Consistent Collection of Data on School Students with Disability: 2016 emergent data on students in Australian schools receiving adjustments for disability.* 2016.
4. Goldfeld S, O'Connor M, Sayers M, Moore T, Oberklaid F. Prevalence and correlates of special health care needs in a population cohort of Australian children at school entry. *Journal of Developmental & Behavioral Pediatrics.* 2012;33(4):319-327.
5. Goldfeld S, O'Connor M, Quach J, Tarasuik J, Kvalsvig A. Learning trajectories of children with special health care needs across the severity spectrum. *Academic Pediatrics.* 2015;15(2):177-184.
6. Mir E, Panjabi C, Shah A. Impact of allergic rhinitis in school going children. *Asia Pacific Allergy.* 2012;2(2):93-100.
7. Moonie S, Sterling D, Figgs L, Castro M. The relationship between school absence, academic performance, and asthma status. *Journal of School Health.* 2008;78(3):140-148.
8. O'Connor M, Howell-Meurs S, Kvalsvig A, Goldfeld S. Understanding the impact of special health care needs on early school functioning: A conceptual model. *Child: Care Health and Development.* 2015;41(1):15-22.

9. O'Connor M, Quach J, Goldfeld S, et al. *Approaches to the provision of educational support for children and young people with additional health and developmental needs: Autism spectrum disorders.* Melbourne, Australia: Centre for Community Child Health; 2015.

10. Patalay P, Giese L, Stankovi M, Curtin C, Moltrecht B, Gondek D. Mental health provision in schools: Priority, facilitators and barriers in 10 European countries. *Child and Adolescent Mental Health.* 2016;21(3):139-147.

11. Blair M, DeBell D. Reconceptualising health services for school-age children in the 21st century. *Archives of Disease in Childhood.* 2010;96(7):616-618.

12. Dempsey I. Trends in the proportion of students with a disability in Australian schools, 2000–2009. *Journal of Intellectual and Developmental Disability.* 2011;36(2):144-145.

13. Houtrow A, Larson K, Olson L, Newacheck P, Halfon N. Changing trends of childhood disability, 2001-2011. *Pediatrics.* 2014;134(3):530-538.

14. Newacheck P, Budetti P, McManus P. Trends in childhood disability. *American Journal of Public Health.* 1984;74(3):232-236.

15. Halfon N, Houtrow A, Larson K, Newacheck PW. The changing landscape of disability in childhood. *The Future of Children.* 2012;22(1):13-42.

16. Palfrey J, Tonniges T, Green M, Richmond J. Introduction: Addressing the millennial morbidity--The context of community pediatrics. *Pediatrics.* 2005;115(4):1121-1123.

17. Goldfeld S, O'Connor M, Chong S, et al. The impact of multidimensional disadvantage over childhood on developmental outcomes in Australia. *International Journal of Epidemiology.* in press.

18. Dyson A, Gallannaugh F. Disproportionality in special needs education in England. *The Journal of Special Education.* 2008;42(1):36-46.

19. Newacheck P, Kim S. A national profile of health care utilization and expenditures for children with special health care needs. *Archives of Pediatrics & Adolescent Medicine.* 2005;159(1):10-17.

20. Janus M, Hughes D, Duku E. *Patterns of school readiness among selected subgroups of Canadian children: Children with special needs and children with diverse language backgrounds.* Ontario, Canada: Offord Centre for Child Studies, McMaster University; 2010.

21. Dalziel K, Huang L, Hiscock H, Clarke P. Born equal? The distribution of government Medicare spending for children. *Social Science & Medicine.* 2018.

22. Productivity Commission. *Schools Workforce.* Canberra, Australia: Commonwealth of Australia; April 2012 2012.

23. Janus M, Offord D. Development and psychometric properties of the Early Development Instrument (EDI): A measure of children's school readiness. *Canadian Journal of Behavioural Science.* 2007;39(1):1-22.

24. O'Connor M, Rosema S, Quach J, Kvalsvig A, Goldfeld S. Special health care needs across the school and family contexts: Implications for service utilization. *Academic Pediatrics.* in press.

25. O'Connor M, Rosema S, Quach J, Kvalsvig A, Goldfeld S. Parent and teacher perceptions of emerging special health care needs. *Journal of Paediatrics and Child Health.* 2016;52(10):950–956.

26. Brinkman S, Gregory T, Goldfeld S, Lynch J, Hardy M. Data resource profile: The Australian Early Development Index (AEDI). *International Journal of Epidemiology.* 2014;43(4):1089-1096.

27. Goldfeld S, Sayers M, Brinkman S, Silburn S, Oberklaid F. The process and policy challenges of adapting and implementing the Early Development Instrument in Australia. *Early Education & Development.* 2009;20(6):978-991.

28. Australian Bureau of Statistics. *Information paper: An introduction to Socio-Economic Indexes for Areas.* Canberra, Australia: Author; 2006.

29. Australian Bureau of Statistics. *Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness structure.* Canberra, Australia: Author; 2011.

30. StataCorp. *Stata statistical software: Release 14.* College Station, TX: StataCorp LP; 2015.

31. Randall M, Sciberras E, Brignell A, et al. Autism spectrum disorder: Presentation and prevalence in a nationally representative Australian sample. *Aust N Z J Psychiatry.* 2016;50(3):243-253.

32. O'Connor M, Chong S, Quach J, Goldfeld S. Learning outcomes of children with emerging additional health and developmental needs. submitted.

33. Carey G, Crammond B, De Leeuw E. Towards health equity: A framework for the application of proportionate universalism. *International Journal for Equity in Health.* 2015;14(81).

34. Tayler C. *The E4Kids study: Assessing the effectiveness of Australian early childhood education and care programs. Overview of findings at 2016.* Melbourne, Australia: Melbourne Graduate School of Education; 2016.

35. Olds D. Prenatal and infancy home visiting by nurses: From randomized trials to community replication. *Prevention Science.* 2002;3(3):153-172.

36. Nicholson J, Cann W, Matthews J, et al. Enhancing the early home learning environment through a brief group parenting intervention: Study protocol for a cluster randomised controlled trial. *BMC Pediatrics.* 2016;16(1):73.

37. Mitchell D. *What really works in special and inclusive education.* Florence, United States: Taylor and Francis; 2014.

38. Shah R, Kunnavakkam R, Msall M. Pediatricians' knowledge, attitudes, and practice patterns regarding special education and Individualized Education Programs. *Academic Paediatrics.* 2013;13(5):430-435.

39. Quach J, Nguyen C, O'Connor M, Wake M. The cumulative impact of health adversities on children's later academic achievement. *Academic Paediatrics.* in press.

40. Hennel S, Coates C, Symeonides C, et al. Diagnosing autism: Contemporaneous surveys of parent needs and paediatric practice. *Journal of Paediatrics and Child Health.* 2016;52(5):506-511.

41. Janus M, Offord D, Walsh C. Population-level assessment of readiness to learn at school for 5-year-olds in Canada: Relation to child and parent measures. SRCD Meeting; April, 2001; Minneapolis, US.

Table 1. Prevalence of teacher-reported SHCN and multinomial logistic regression analyses predicting SHCN status according to year.

	Standard population	Emerging needs	Established needs	Emerging needs vs standard population	Established needs vs standard population
	n (%)	n (%)	n (%)	RRR (99% CI)	RRR (99% CI)
Cohort					
2009	202,725 (77.6)	46,938 (18.0)	11,484 (4.4)	Ref	Ref
2012	220,889 (76.2)	54,911 (18.9)	14,173 (4.9)	1.07 (1.04-1.11)	1.13 (1.08-1.19)
2015	236,222 (78.2)	51,716 (17.1)	14,065 (4.7)	0.95 (0.92-0.97)	1.05 (1.00-1.10)
% change (2009-2015)	↑0.6%	↓0.9%	↑0.3%		

CI = confidence interval; RRR = relative risk ratio; SHCN = special health care needs.

Table 2. Logistic regression analyses examining year as a predictor of teacher-reported types of impairment for children with emerging and established needs.

	Emerging needs		Established needs	
	n (%)	OR (99% CI)	n (%)	OR (99% CI)
Physical disability				
2009	1,184 (2.6)	Ref	1,988 (17.7)	Ref
2012	1,387 (2.6)	1.00 (0.89-1.12)	2,094 (15.1)	0.83 (0.75-0.91)
2015	2,444 (4.8)	1.91 (1.70-2.14)	2,824 (20.3)	1.18 (1.07-1.30)
% change (2009-2015)	↑2.2%		↑2.6%	
Visual impairment				
2009	2,957 (6.4)	Ref	864 (7.8)	Ref
2012	4,158 (7.7)	1.22 (1.13-1.31)	1,139 (8.3)	1.07 (0.94-1.22)
2015	3,299 (6.5)	1.01 (0.93-1.10)	1,377 (10.0)	1.31 (1.16-1.49)

% change (2009-2015)	↑0.1%		↑2.2%	
Hearing impairment				
2009	2,208 (4.8)	Ref	922 (8.4)	Ref

Table 2. *Continued.*

	Emerging needs		Established needs	
	n (%)	OR (99% CI)	n (%)	OR (99% CI)
2012	2,137 (4.0)	0.82 (0.75-0.91)	1,037 (7.6)	0.90 (0.78-1.04)
2015	2,189 (4.4)	0.90 (0.80-1.01)	1,086 (7.9)	0.94 (0.82-1.08)
% change (2009-2015)	↓0.5%		↓0.5%	
Speech impairment				
2009	13,355 (29.1)	Ref	5,814 (52.0)	Ref
2012	17,174 (32.2)	1.16 (1.11-1.21)	6,749 (49.0)	0.89 (0.82-0.96)
2015	22,049 (43.7)	1.90 (1.82-1.99)	8,045 (58.1)	1.28 (1.18-1.39)

% change (2009-2015)	↑14.7%		↑6.1%	
Learning disability				
2009	2,278 (5.1)	Ref	5,841 (54.0)	Ref
2012	2,508 (4.9)	0.96 (0.86-1.06)	7,148 (53.7)	0.99 (0.91-1.08)
2015	4,988 (10.4)	2.15 (1.96-2.35)	7,255 (53.6)	0.99 (0.90-1.08)
% change (2009-2015)	↑5.3%		↓0.3%	

Table 2. *Continued.*

	Emerging needs		Established needs	
	n (%)	OR (99% CI)	n (%)	OR (99% CI)
Emotional problems				
2009	4,241 (9.3)	Ref	2,334 (21.5)	Ref
2012	5,436 (10.3)	1.12 (1.04-1.20)	3,566 (26.6)	1.33 (1.21-1.46)

2015	8,171 (16.3)	1.89 (1.77-2.03)	4,767 (35.1)	1.98 (1.81-2.17)
% change (2009-2015)	↑7.0%		↑13.7%	
Behavioural problems				
2009	5,731 (12.5)	Ref	3,459 (31.2)	Ref
2012	6,465 (12.1)	0.97 (0.91-1.03)	4,401 (32.1)	1.04 (0.96-1.14)
2015	8,671 (17.1)	1.45 (1.37-1.54)	5,284 (38.3)	1.37 (1.26-1.49)
% change (2009-2015)	↑4.7%		↑7.1%	
Home environment				
2009	8,955 (20.0)	Ref	1,713 (16.0)	Ref
2012	10,884 (21.2)	1.07 (1.01-1.13)	2,114 (16.2)	1.02 (0.92-1.13)

Table 2. *Continued.*

	Emerging needs		Established needs	

	n (%)	OR (99% CI)	n (%)	OR (99% CI)
2015	10,173 (21.2)	1.07 (1.01-1.14)	2,309 (17.8)	1.13 (1.03-1.25)
% change (2009-2015)	↑1.1%		↑1.8%	
Trauma, difficulties with resettlement				
2009	2,053 (4.5)	Ref	609 (5.6)	Ref
2012	2,757 (5.3)	1.17 (1.06-1.29)	723 (5.5)	0.97 (0.83-1.14)
2015	3,485 (7.1)	1.61 (1.46-1.78)	934 (7.1)	1.28 (1.10-1.49)
% change (2009-2015)	↑2.6%		↑1.5%	

CI = confidence interval; OR = odds ratio. Note. Numbers and percentages reflect the proportion of children with emerging or established needs who experience a type of impairment in each year (e.g., of those with established needs, 20.3% have a physical disability in 2015).

Table 3. Rates of teacher-reported diagnoses for children with emerging needs and established needs in 2009 and 2015.

	Emerging needs		Established needs	
	2009† (N=46,938)	2015† (N=51,716)	2009† (N=11,484)	2015†‡ (N=14,065)
	n (% yes)	n (% yes)	n (% yes)	n (% yes)
Any of the listed diagnoses (excluding 'other')	2,983 (6.4)	6,302 (12.2)	3,247 (28.3)	10,828 (77.0)
Common diagnoses				
Autism spectrum disorder/Autism/Asperger syndrome	169 (0.4)	549 (1.1)	2,080 (18.1)	6,325 (45.0)
Global Developmental Delay	88 (0.2)	444 (0.9)	283 (2.5)	1,307 (9.3)
Attention Deficit Hyperactive Disorder	259 (0.6)	585 (1.1)	150 (1.3)	1,098 (7.8)
Asthma	1,749 (3.7)	3,173 (6.1)	111 (1.0)	1,028 (7.3)
Anaphylaxis	220 (0.5)	1,108 (2.1)	21 (0.2)	602 (4.3)
Cerebral Palsy	34 (0.1)	36 (0.1)	189 (1.7)	496 (3.5)

Deaf	130 (0.3)	§	88 (0.8)	472 (3.4)
Epilepsy	0 (0.0)	172 (0.3)	0 (0.0)	405 (2.9)
Dyspraxia	32 (0.1)	173 (0.3)	45 (0.4)	288 (2.1)

Table 3. *Continued.*

	Emerging needs		Established needs	
	2009† (N=46,938)	2015† (N=51,716)	2009† (N=11,484)	2015†‡ (N=14,065)
	n (% yes)	n (% yes)	n (% yes)	n (% yes)
Down syndrome	1 (0.0)	2 (0.0)	169 (1.5)	231 (1.6)
Oppositional Defiance Disorder	22 (0.1)	74 (0.1)	28 (0.2)	184 (1.3)
Diabetes	46 (0.1)	75 (0.2)	32 (0.3)	180 (1.3)
Anxiety	73 (0.2)	230 (0.4)	14 (0.1)	141 (1.0)
Blind	8 (0.0)	§	4 (0.0)	89 (0.6)

Foetal Alcohol Spectrum Disorder	74 (0.2)	39 (0.1)	62 (0.5)	78 (0.6)
Selective Mutism	84 (0.2)	116 (0.2)	34 (0.3)	71 (0.5)
Spina bifida	0 (0.0)	10 (0.0)	0 (0.0)	40 (0.3)
Dyslexia	7 (0.0)	48 (0.1)	2 (0.0)	29 (0.2)
Other	7,079 (15.1)	5,762 (11.1)	2,070 (18.0)	4,519 (32.1)

†More than one teacher-reported diagnosis could be listed for each child.

‡Child's primary teacher-reported diagnosis/diagnoses for which they are funded.

§Teachers were not asked about this specific diagnosis.

Note: Percentages are of children within the special health care needs (SHCN) category. Diagnosis is not required for SHCN status; as such, diagnoses listed here are indicative of the types of problems experienced only. Direct comparison of 2009 to 2015 should be made with caution due to item changes.

Table 4. Multinomial logistic regression analyses examining community disadvantage as a predictor of teacher-reported SHCN for children with emerging and established needs in 2009, 2012 and 2015.

	Emerging needs						Established needs					
	2009		2012		2015		2009		2012		2015	
	%	RRR (99% CI)	%	RRR (99% CI)	%	RRR (99% CI)	%	RRR (99% CI)	%	RRR (99% CI)	%	RRR (99% CI)
Community disadvantage												
Quintile 1 (most)	21.5	1.63 (1.53-1.73)	23.3	1.73 (1.63-1.83)	21.3	1.65 (1.55-1.75)	5.7	2.02 (1.82-2.23)	6.1	1.90 (1.73-2.09)	5.8	1.88 (1.71-2.06)
Quintile 2	19.8	1.44 (1.36-1.54)	21.0	1.48 (1.40-1.56)	19.1	1.43 (1.35-1.51)	5.0	1.71 (1.54-1.90)	5.2	1.53 (1.40-1.68)	5.0	1.50 (1.37-1.64)
Quintile 3	18.0	1.29 (1.22-	18.9	1.31 (1.24-	17.1	1.26 (1.19-	4.3	1.41 (1.27-	4.9	1.39 (1.28-	4.6	1.33 (1.22-

		1.37)		1.38)		1.33)		1.55)		1.52)		1.45)
Quintile 4	16.7	1.18 (1.12-1.25)	17.2	1.17 (1.11-1.23)	15.2	1.09 (1.04-1.15)	4.0	1.25 (1.14-1.38)	4.6	1.25 (1.15-1.36)	4.3	1.17 (1.08-1.27)
Quintile 5 (least)	14.6	Ref	15.2	Ref	14.1	Ref	3.3	Ref	3.8	Ref	3.8	Ref

CI = confidence interval; RRR = relative risk ratio; SHCN = special health care needs. Note: Proportions reflect SHCN within each level of disadvantage. All models are adjusted for gender, language background, Indigenous status, and remoteness.

Original article

Trends in the prevalence and distribution of teacher-identified special health care needs across three successive population cohorts

Meredith O'Connor[a,b], DEdPsych
meredith.oconnor@mcri.edu.au

Elodie O'Connor[a], PhD
elodie.oconnor@mcri.edu.au

Jon Quach[a,c] PhD
jon.quach@mcri.edu.au

Rakhi Vashishtha[a], MPH
rakhi.vashishtha42@mcri.edu.au

Sharon Goldfeld[a,b], PhD, FRACP
sharon.goldfeld@rch.org.au

Affiliations: [a]Centre for Community Child Health, Murdoch Children's Research Institute, Royal Children's Hospital, Melbourne, Australia; [b]Department of Paediatrics, University of Melbourne, Melbourne, Australia; and [c]Melbourne Graduate School of Education, University of Melbourne, Melbourne, Australia

Address correspondence to: Professor Sharon Goldfeld, Centre for Community Child Health, Royal Children's Hospital, 2 East Clinical Offices, 50 Flemington Road, Parkville, 3052, Victoria, Australia. Email: Sharon.Goldfeld@rch.org.au. Phone: +61 3 9345 6408. Fax: +61 3 9345 5900.

ACKNOWLEDGEMENTS

Conflict of Interest Disclosures

None reported.

Funding/Support

Personnel support for this analysis was funded by the Australian Government, and was supported by the Victorian Government's Operational Infrastructure Support Program. Prof Goldfeld is supported by Australian National Health and Medical Research Council (NHMRC) Career Development Fellowship 1082922. Dr Quach is supported by an Australian Research Council Discovery Early Career Researcher Award (DE140100751). The funding bodies had no role in relation to the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Contributions

This paper uses data from the Australian Early Development Census (AEDC). The AEDC is funded by the Australian Government Department of Education and Training. The findings and views reported are those of the author and should not be attributed to the Department or the Australian Government. There are a number of key groups to be acknowledged for their support of the AEDC: including all schools, principals, and teachers across Australia that participated in the AEDC; and each of the State and Territory AEDC Coordinators and their Coordinating Committees who helped to facilitate the AEDC data collection in their respective jurisdictions. We appreciate their time and commitment. We would like to thank Dr Fiona Mensah (Clinical Epidemiology and Biostatistics Unit) for her consultation on the analysis approach.