

Investigating the autism and ADHD prevalence in Chile through Bayesian prevalence analysis and clinical record data linkage

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This dissertation is submitted for the degree of Master of Philosophy. The dissertation does not exceed the word limit for the respective Degree Committee. Word count: xxx TODO

1 Abstract

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2 Declaration

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration except where specifically indicated in the text.

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3 Introduction

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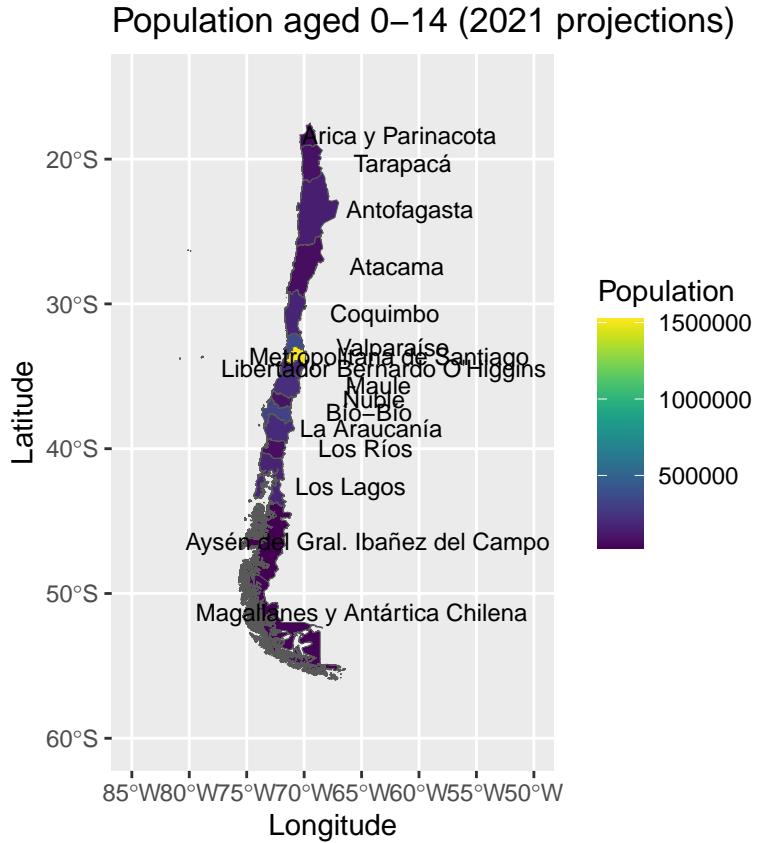


Figure 1: Population of 0-14 year olds in Chile in 2021 by region, from 2017 census projections.

4 Methods

4.1 Data management

The statistical software package R has been used to clean, link, analyse and visualise data. R analysis scripts and version control are managed in GitHub and are available at <https://github.com/delatee/Autism->

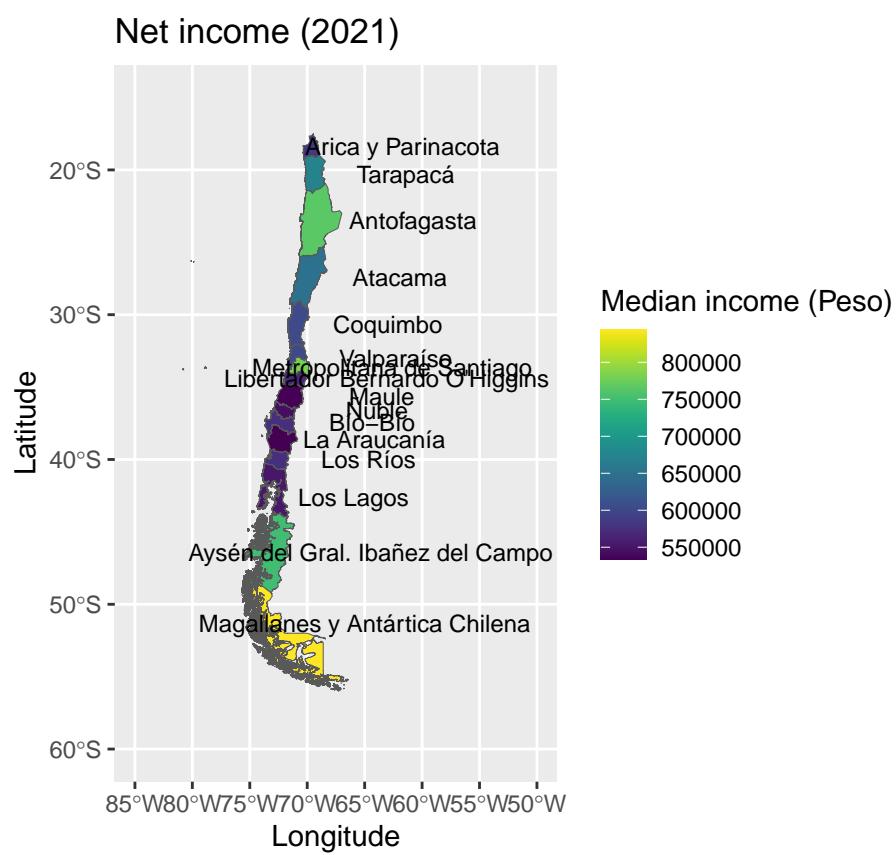


Figure 2: Net income from main job in Chile in 2021 by region, from the INE's Supplementary Income Survey.

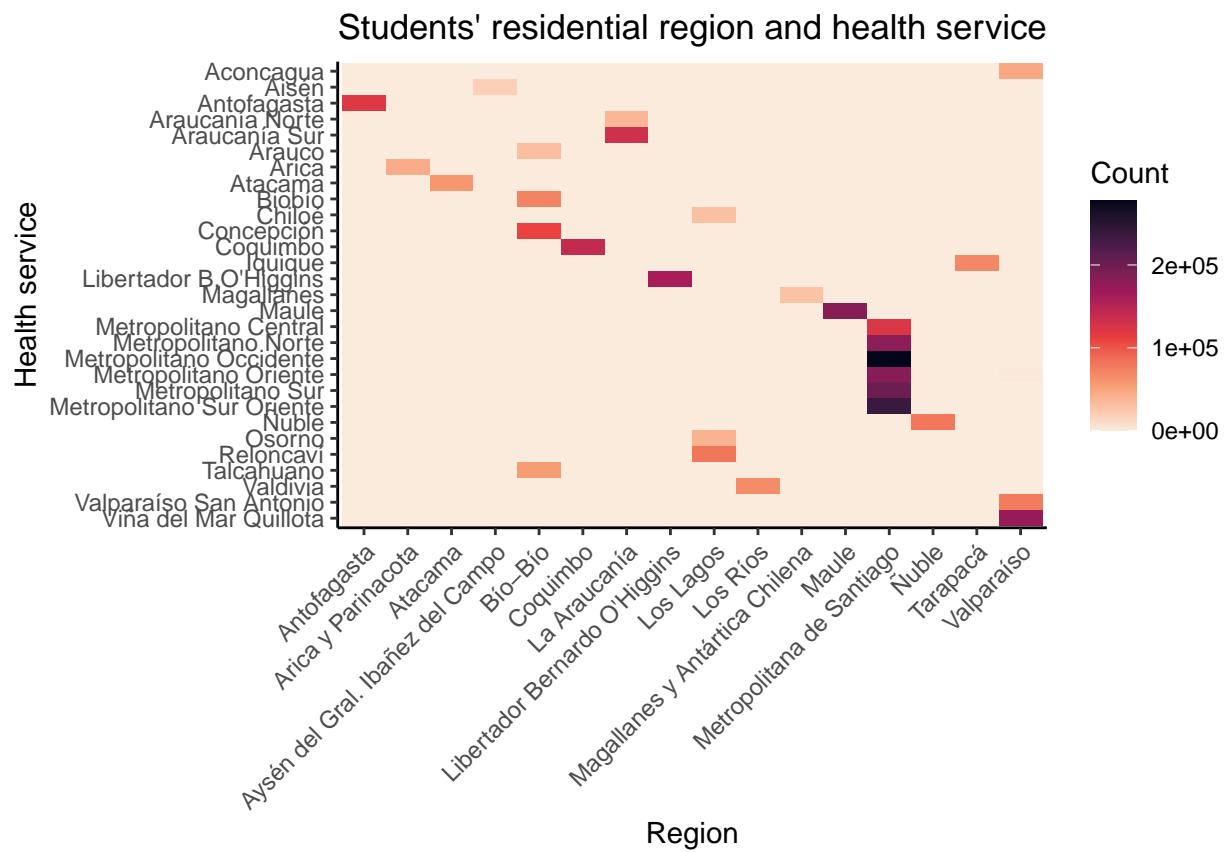


Figure 3: Residential communes aggregated to region level and the health services associated with the aggregated communes, with counts of the number of students resident in the communes in each health service's catchment area.

Communes in La Araucanía

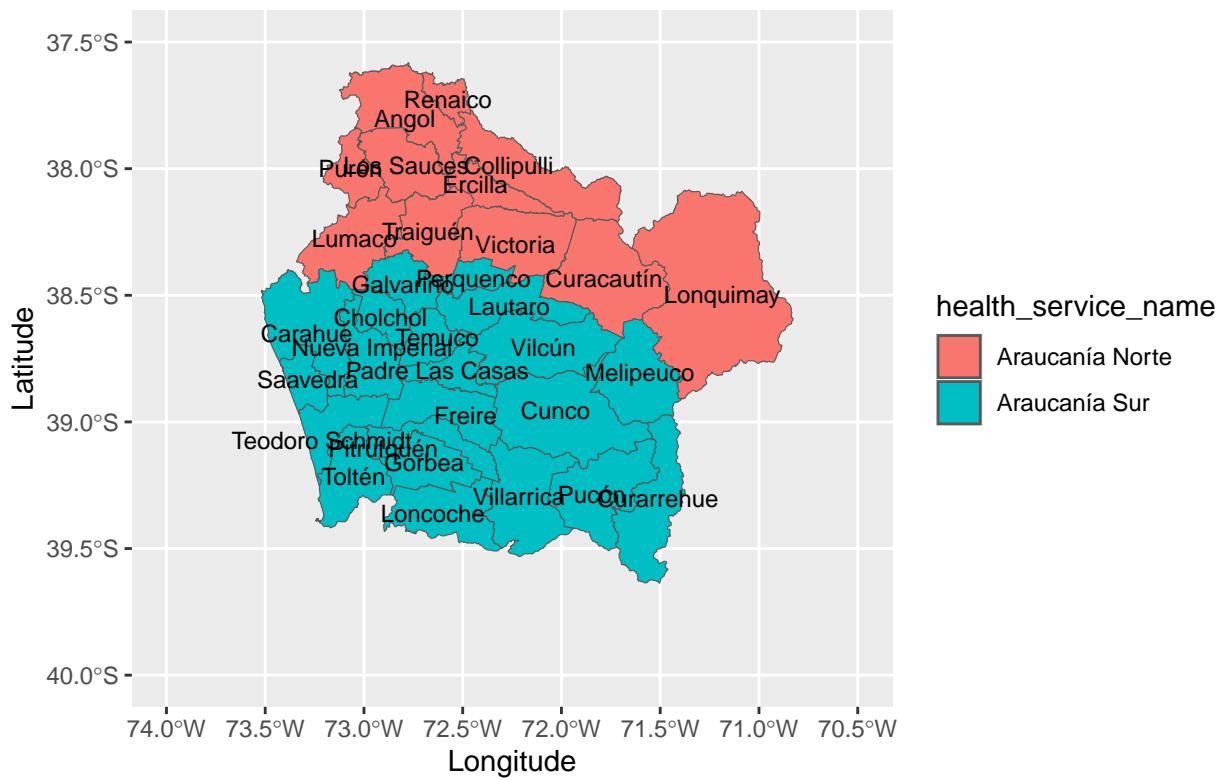


Figure 4: Communes in the Araucanía region, coloured red for the Araucanía Norte (north Araucanía) health services and blue for the Araucanía Sur (south Araucanía) health service.

diagnosis-age-ML. Raw data and analysis outputs have not been uploaded to GitHub. All data is stored on local devices and will be deleted at conclusion of the project.

4.2 Data collection

4.2.1 School data

This research uses data from the Chilean Government's Ministerio de Educación (Ministry of Education) that was provided under a freedom of information request. This dataset contains anonymised records of 3.6 million students in all Chilean schools in 2021. It was collected and curated by the Chilean Unidad de Estadísticas (Statistics Unit), Centro de Estudios (Study Centre) and Ministerio de Educación and is housed in the Sistema de Información General de Estudiantes (General Student Information System, SIGE). This dataset will be referred to as the school data.

The school data shows whether students have accessed the Subvención de Educación Especial Diferencial (Differential Special Education Grant, SEED), which is provided to students with severe physical or mental disabilities, including autism and ADHD, that require education adjustments such as specialist schools or small class sizes (28). The school data includes four groups of students who have autism but are recorded in this dataset as not having autism: students with autism who attend private schools which are not eligible for SEED; students with autism who choose not to apply for SEED; students with autism who apply for SEED but are found to not be sufficiently severely affected to receive SEED; and students with autism who receive SEED but for a different disability as only one can be recorded, perhaps one that more severely affects them. The number of students in each of these groups is unknown and these groups are analogous for students with ADHD. Thus all estimates of autism and ADHD prevalence from this dataset alone are likely to be underestimates.

A collection of economic data was supplied under the same FIO request to supplement the school data. It comprises wage deducted health insurance contributions from Chile's Fondo Nacional de Salud (National Health Fund, FONASA). This data provides the value of health insurance contributions that are based on parents' wages, from which a colleague previously inferred school fee contributions and hence socio-economic status of students' families.

4.2.2 Clinical data

This research also uses data from Chile's Servicio de Salud Araucanía Sur (South Araucanía health service, SSAS), obtained under a freedom of information request. This data is collated from secondary care clinical records, particularly from mental health community care services. It comprises two datasets which will be referred to as the small clinical data and large clinical data.

The small clinical data was provided by Villarrica Hospital in the Villarrica commune of Chile's Araucanía region. It comprises clinical records for public sector specialist health visits of every patient aged 6-18 with a primary, secondary or tertiary diagnosis of autism or intellectual disability between February 2014 and December 2021 that were registered for that hospital. This is understood to include every such patient resident in the communes of Curarrehue, Loncoche, Pucón and Villarrica in the SSAS catchment of Chile's Araucanía region, and include some such patients resident in the communes of Cunco, Freire, Gorbea, Nueva Imperial, Pitirufquén, Temuco, Teodoro Schmidt and Toltén in the SSAS catchment. It also includes some such patients resident in the communes of Algarrobo (Valparaíso San Antonio health service catchment, Valparaíso region), Cabo de Hornos (Magallanes health service catchment, Magallanes y Antártica Chilena region), Diego de Almagro (Atacama health service catchment, Atacama region), Hijuelas (Viña del Mar Quillota health service catchment, Valparaíso region), Machalí (Libertador B.O'Higgins health service catchment, Libertador B.O'Higgins region), Panguipulli (Valdivia health service catchment, Los Ríos region), Pencahue (Maule health service catchment, Maule region), Pica (Iquique health service catchment, Tarapacá region), Quinta Normal (Metropolitano Occidente health service catchment, Metropolitana de Santiago region) and Tocopilla (Antofagasta health service catchment, Antofagasta region).

The large clinical data comprises clinical records for public sector specialist health visits of every patient aged 6-18 with a primary diagnosis of autism between May 2015 and December 2021 for all communes in

the SSAS catchment and the communes of Curacautín, Lonquimay and Victoria in the Servicio de Salud Araucanía Norte (North Araucanía health service, SSAN) catchment, both in Chile's Araucanía region.

The small and large clinical datasets will be collectively referred to as the clinical data and they do not include any records for privately provided healthcare.

4.2.3 Supplementary data

Chile's 2017 census data, held by the Instituto Nacional de Estadísticas (National Statistics Institute, INE) (29), was used to create a standard population of Chile's age and sex distribution from projections of population size by age and sex in 2021. It was also used to obtain projections of population of youth aged 0-14 in 2021 by region.

Data from the INE's Encuesta Suplementaria de Ingresos (Supplementary Income Survey, ESI) of 2021 (30) was used to obtain the nominal median income by region in 2021.

For mapping, shapefiles of administrative areas were obtained from The Humanitarian Data Exchange of the United Nations Office for the Coordination of Humanitarian Affairs (31). Additional region and commune naming information was taken from the R package 'chilemapas'.

4.3 Aim 1: Use school data and frequentist method to find a lower bound on autism and ADHD prevalence

4.3.1 School data preparation

The school dataset was restricted to students aged 6-18 as of 30th June 2021 to capture children of school age in Chile. No restriction on sex was necessary as it contained only females and males. Students' commune of residence was mapped to their respective health service catchment areas. Two issues due to boundary changes were corrected. Firstly, the commune now called Tocopilla which falls across the Antofagasta and Tarapacá regions was formerly two communes, Tocopilla in Antofagasta and Pozo Almonte in Tarapacá. The old names have been retained to ensure appropriate region mapping and they are mapped to Antofagasta and Iquique health services respectively. Secondly, the communes recorded as belonging to the former Ñuble sub-region of the Bío-Bío region were mapped to their corresponding communes in the recently formed Ñuble region.

Commune of residence was missing for 4078 students (0.13%) and their school's commune was imputed as most students are likely to go to school near their place of residence.

Students' age as of 30th June 2021 was mapped to age-bands of 6-8, 9-11, 12-14 and 15-18, preserving the divide between primary and secondary school as secondary school starts at age 12 in Chile, and with a larger final band as fewer students are expected to be diagnosed older and the 18 years old group may be small due to students leaving schooling. Students' ethnicity was mapped to being a member of the Mapuche Indigenous group, being a member of another Chilean Indigenous group, or not being a member of an Indigenous group based on their recorded ethnicity which can take at most one value. The 6859 students (0.22%) with ethnicity recorded as 'no registry' were mapped to not being a member of an Indigenous group.

Students' school fee status was mapped to a proxy socio-economic status feature. Students with free schooling were given SES of 1 indicating low status as families with low SES are entitled to schooling rebates. Students paying \$1,000-\$100,000 monthly were given SES of 2, indicating medium status, and students paying more than \$100,000 monthly were given 3 to indicate high status. For school fee status, 49973 students (1.64%) were coded as 'No information' and 29 students (0.000949%) were missing school fee values and these were re-categorised as 'No information' to reflect their unknown school fee status. No other features of interest for this analysis had missingness.

4.3.2 Crude prevalence

The crude prevalences of autism and of ADHD were calculated as the count of cases divided by the relevant population size. Grouping features of sex, health service of residential commune, monthly school fee as a

proxy for SES, ethnicity and school's rurality were used, and calculations were made for aggregate, by sex, and by sex and age group.

4.3.3 Frequentist age and sex adjustment

For each grouping feature, prevalence was standardised by age and sex using direct standardisation. Following the method presented by Fay and Feuer (35), the age- and sex-adjusted prevalence rates for each group were calculated using the 2017 Chile census projections of the distribution of people by age and sex in 2021 as the standard population. Gamma confidence limits were calculated at the 95% level using chi-squared distributions. The adjusted prevalence rates were multiplied by their respective population sizes to give adjusted prevalence counts which were rounded to integers, therefore losing a small amount of precision.

Ethnicity analysis compared individuals from the Mapuche Indigenous group to those from other Indigenous groups or with no Indigenous group and used data from the Araucanía, Aysén, Biobío, Los Lagos, Los Ríos, Magallanes and Región Metropolitana de Santiago regions only as these regions are collectively the five regions with the largest Mapuche populations and the five regions with the highest proportion of Mapuche in their population.

4.4 Aim 2: Use clinical data and multiple component analysis to identify autism diagnosis characteristics

4.4.1 Clinical data preparation

The small and large clinical datasets were cleaned to ensure internal consistency in feature values and translated into English where appropriate. Patients were categorised as having autism if any of their diagnosis codes were in ICD F84-F89 for any appointment. Patients were categorised as having an intellectual disability if any of their diagnoses codes was in ICD F70-F79 for any appointment. No restriction on sex was necessary as these data contained only females and males. The clinical data includes economic data in the form of patients' family's health insurance contribution level. Values taken are 'FONASA-A' to 'FONASA-D' which are respectively larger contributions to this public health fund and are assumed to map to increasing socio-economic status, and 'Private health insurance' which indicates contributions to a private health insurance provider rather than the public fund and therefore is assumed to map to the highest socio-economic level.

For multiple correspondence analysis, only the small clinical dataset was used as it contained demographic fields not present in the large clinical data. In the small clinical data, patients' age as of 30th June 2021 was mapped to age-bands of 0-2, 3-5, 6-8, 9-11, 12-14 and 15-18 to provide comparability to the school data. The small clinical dataset had many values for ethnicity, disability status and foster care status that were recorded as 'no information'. For disability and foster care status, additional features were created with the 'no information' values imputed as 'no disability' and 'no foster care' respectively, as it is likely that patients who did have a disability or had experienced foster care would have this recorded.

The small clinical data was aggregated to patient level by selecting each patient's most recent commune and rurality, and most common health insurance contribution level, hospital and medical specialty of appointment. For ethnicity, Mapuche was selected if present in any of that patient's appointment records, then Chilean if present, then Foreign if present and else 'No information' was selected. Similarly disability and foster care status were selected as 'Yes' if recorded for any appointment, then 'No' was selected if present, then 'No information' if no status was recorded for any appointment. The data was restricted to patients with a diagnosis of autism.

Only patients with autism and living most recently in a commune in the SSAS catchment area were included.

4.4.2 Multiple correspondence analysis

Multiple correspondence analysis (MCA) was conducted using R's FactoMineR package with the number of output dimensions equal to the number of input features. MCA was an appropriate technique to use here because the small clinical dataset contains primarily categorical features which MCA is designed to handle.

Data-led analytics was used to identify features in the small clinical dataset that explained the variance in this patient-level data. Initially, all available features with suspected association with autism were included in MCA, specifically: sex, age group, commune of residence, health insurance contribution level as a proxy for SES, ethnicity, residential rurality, disability status and foster care status. The data grouped well into having information about disability and about foster care and not having information about each, therefore the MCA was rerun with the disability and foster care features exchanged for their respective imputed versions. This identified age, commune and ethnicity as important for explaining the variance, so the MCA was rerun with only these three features.

4.4.3 Alternative machine learning approaches

Component factor analysis (CFA) and principle component analysis (PCA) were also considered to analyse the features associated with autism diagnosis in the small clinical data. Both are powerful methods for uncovering the latent structure of data, however CFA typically requires ordered categorical variables and PCA requires continuous variables. As the commune feature, an unordered categorical variable, was thought to be important to the features associated with autism diagnosis and therefore needed to be included in analysis, using CFA or PCA would require one-hot-encoding of commune which would reduce the appropriateness of these tests.

4.5 Aim 3a: Link school and clinical records

4.5.1 School data preparation

For data linkage, the school data was further restricted to students with autism that were living in communes in the SSAS catchment in 2021 to maximise comparability with the clinical data. A false empty record was added to the school dataset before linkage that allowed the algorithm to correctly match on SES. This false record was only used during linkage, did not match to any patient records and was removed before comparing matched and unmatched records.

4.5.2 Clinical data preparation

For data linkage, the small and large clinical datasets were joined to form the clinical dataset. This was restricted to appointments for individuals resident in communes in the SSAS catchment as the data is believed to be complete for this catchment area only. It was also restricted to patients aged 6-18 as of 30th June 2021 to maximise compatibility to the school data. Appointment year was not restricted in order to retain more data and thus maximise linkage opportunities, and only patients of female and male sex were present. Patients with familial socio-economic level of FONASA-A were interpreted to be of low SES status and given proxy status of 1 (equivalent to students with free school fees); patients with FONASA-B, FONASA-C and FONASA-D were interpreted to have moderate SES status and given 2 (equivalent to students paying \$1,000-\$100,000 monthly for state schooling); and patients with private health insurance were interpreted to have high SES and given 3 (equivalent to students paying more than \$100,000 monthly). Students that did not have a clinical autism diagnosis but did have a clinical intellectual disability diagnosis were included to maximise opportunities for matching with the school data, with prioritisation of autism diagnosis over intellectual disability.

The clinical dataset had no missingness in the features of interest for data linkage.

The clinical data was aggregated to one row per patient per commune in the SSAS catchment, to maximise the opportunity for matching patients that had moved within this health service. The majority of patients lived in only one commune in the SSAS catchment during the study period. Aggregation to patient level took the most common SES value. The resulting dataset will be referred to as the patient data.

4.5.3 Selection of features for matching

The features available in both school and patient datasets for matching were sex, date of birth, commune of residence, diagnoses with autism, and the proxies for socio-economic status – monthly school fees in the

school data and mode health insurance contributions in the patient data. Although only students with autism diagnoses are included from the school dataset, the clinical dataset comprises primarily patients with a diagnosis of autism, some patients with a diagnosis of intellectual disability and some with both. The diagnosis with autism feature is therefore included in the features to match on to encourage matching of school records to clinical records for patients with an autism diagnosis, but to allow for matching to clinical records for patients with only a diagnosis of intellectual disability when no suitable patient with autism is present.

4.5.4 Manual record linkage

The school and patient data were blocked on sex and date of birth to improve match quality and reduce runtime. As both datasets are from trusted, large-scale data collections, it is reasonable to assume sex and dates of birth are highly accurate in both datasets, and it would not be reasonable to accept any proposed matches that do not agree on either sex or date of birth.

Two versions of manual record linkage were tried. First, the school and patient data were merged with perfect matches required on sex, date of birth, commune of residence and proxies for SES. Second, the school and patient data were merged with perfect matches required only on sex, date of birth and commune of residence, as the proxies for SES are known to be approximate and therefore requiring perfect matches on SES is not reasonable.

4.5.5 Probabilistic record linkage

All possible pairs of blocked matches were generated and agreement weights were calculated for each feature using expectation maximisation, then aggregated into a weight for the pair . Records with missing values were retained as this linkage method is robust to missingness. The similarity comparison method was exact matching for commune of residence, diagnosis with autism and socio-economic status; there was no value in using a string comparison method for commune of residence as all commune names were already standardised and two communes having similarly spelled names does not increase the likelihood of a match between those communes. Linkage was implemented using R's RecordLinkage package. This included consideration of the average frequencies of categories in each feature and estimated errors rates were supplied: the default estimated error rate of 0.01 was supplied for the commune of residence and diagnosis with autism features as they are expected to be fairly accurate features, and an estimated error rate of 0.6 was supplied for the socio-economic status feature as it is a loosely defined proxy. This value was chosen through trial and error to ensure the algorithm prioritised matching on diagnosis of autism above matching on socio-economic status. Pairs were then selected based on weight to create a 1-1, bipartite, matching between school records and patients.

4.5.6 Alternative record linkage methods

Record linkage using Bayesian methods in which matched status is modelled, as developed by Sadinle (32) and refined by Stringham (33), was considered for record linkage here. This technique is typically more complex and has longer runtimes than probabilistic matching but can more easily enforce one-to-one matching and is particularly well suited to matching names. As the datasets in this investigation did not include names, there was limited benefit from using Bayesian linkage methods.

Record linkage using machine learning to classify matched and unmatched pairs, as explored by Pita et al, was also considered as it is generally thought to be more accurate than probabilistic matching alone (34). However this was not pursued because the datasets under investigation have very few common features to match on, meaning machine learning algorithms would have few options to trial, and there are no known true matches with which to assess the accuracy of machine learning models.

4.5.7 Comparison of matched and unmatched records.

For the school and patient datasets, each record was classified as either matched or unmatched based on whether it appeared in the bipartite matching. The discrete Kolmogorov-Smirnov test was used to compare

Table 1: Count and prevalence of autism cases by age in Chile school data with normal confidence intervals.

Age	Autism cases	Prevalence % (95% CI)
6	1806	0.72 (0.69, 0.75)
7	1724	0.69 (0.66, 0.72)
8	1632	0.66 (0.63, 0.69)
9	1523	0.60 (0.57, 0.63)
10	1435	0.56 (0.53, 0.58)
11	1254	0.49 (0.46, 0.52)
12	1176	0.46 (0.43, 0.48)
13	1057	0.42 (0.40, 0.45)
14	805	0.33 (0.31, 0.36)
15	680	0.29 (0.27, 0.31)
16	665	0.28 (0.26, 0.30)
17	491	0.21 (0.19, 0.23)
18	301	0.34 (0.30, 0.38)

matched and unmatched records within each dataset for each of the features used for matching, excluding date of birth which has too many categories to have meaningful results and excluding diagnosis of autism which is uniformly true in the school dataset and therefore not informative. Missing values in the socio-economic status feature were omitted before testing.

Permutation tests were then performed for each of the features tested in each dataset by permuting the matched status 2000 times and recomputing the discrete Kolmogorov-Smirnov test for each permutation. The p-values for the Kolmogorov-Smirnov tests on the observed data were then compared to the distributions of p-values for the permuted data to determine the significance of the observed results.

4.6 Aim 3b: Accurately estimate autism prevalence and project across health services using Bayesian prevalence prediction

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5 Results

5.1 School data

The school dataset contained records for 3,056,306 Chilean students aged 6-18 in 2021. Of these, 1,487,224 (48.66%) were female and the rest were male. A special needs code was recorded for 339,968 (11.12%) students, indicating they received SEED during that school year. Of these students, 14,549 (4.28%) received SEED for autism and 46,224 (13.6%) received SEED for ADHD. Thus the global crude prevalence of autism in the school data was 0.476% (0.468-0.484%) and the global crude prevalence of ADHD was 1.51% (1.50-1.53%).

The crude prevalence of autism and ADHD vary with age, as shown in Tables 1 and 2, Figures 5 and 6, and Supplementary Figures 48 and 49. Autism prevalence is highest in 6-8 year olds and decreases with age while ADHD prevalence peaks around age 11 then decreases. Both conditions show a small increase in prevalence for age 18.

Autism prevalence is 0.133% (0.127-0.139%) for females and 0.80% (0.79-0.82%) for males, see Table 3 and Figure 7. ADHD prevalence is 1.01% (1.00-1.03%) for females and 1.98% (1.96-2.01%) for males, see Table 4 and Figure 8. Autism and ADHD prevalences are higher in males than females for all ages, see also Supplementary Figures 50 and 51.

Table 2: Count and prevalence of ADHD cases by age in Chile school data with normal confidence intervals.

Age	ADHD cases	Prevalence % (95% CI)
6	740	0.29 (0.27, 0.32)
7	1965	0.78 (0.75, 0.82)
8	3231	1.31 (1.27, 1.36)
9	4500	1.78 (1.73, 1.83)
10	5485	2.13 (2.07, 2.18)
11	5564	2.17 (2.11, 2.23)
12	5325	2.07 (2.01, 2.12)
13	4848	1.94 (1.88, 1.99)
14	3926	1.62 (1.57, 1.67)
15	3420	1.45 (1.40, 1.50)
16	3120	1.33 (1.28, 1.38)
17	2870	1.23 (1.19, 1.28)
18	1230	1.40 (1.33, 1.48)

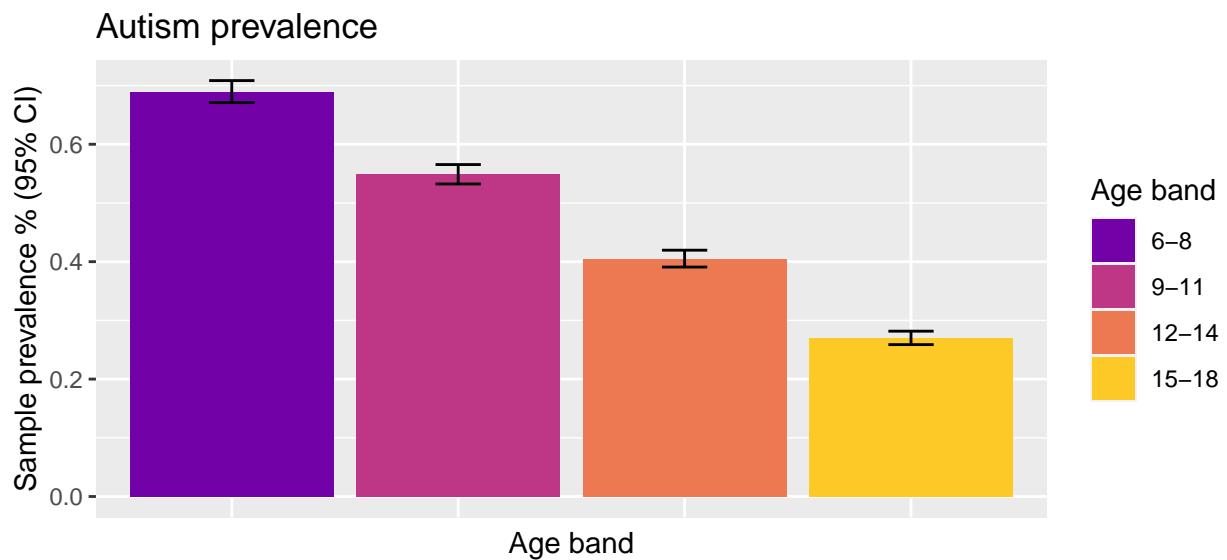


Figure 5: Sample prevalence of autism by age band. Bars show 95% normal confidence intervals.

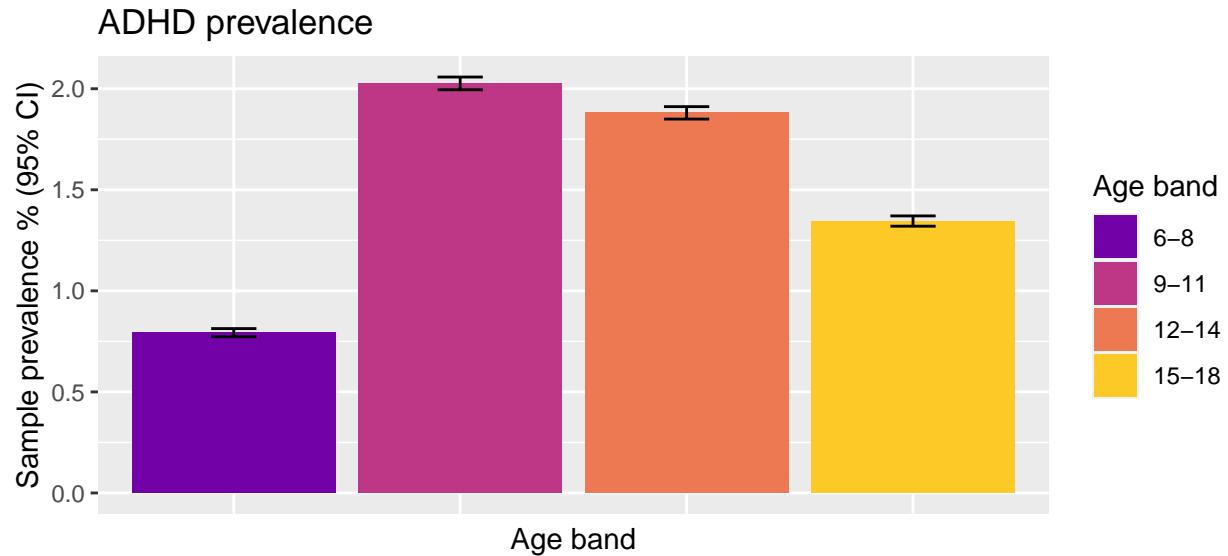


Figure 6: Sample prevalence of ADHD by age band. Bars show 95% normal confidence intervals.

Table 3: Count and prevalence of autism cases by age in Chile school data for females and males with normal confidence intervals.

Age	Female		Male	
	Autism cases	Prevalence % (95% CI)	Autism cases	Prevalence % (95% CI)
6	294	0.24 (0.21, 0.27)	1512	1.18 (1.12, 1.24)
7	241	0.20 (0.17, 0.22)	1483	1.15 (1.10, 1.21)
8	239	0.20 (0.17, 0.22)	1393	1.11 (1.05, 1.16)
9	198	0.16 (0.14, 0.18)	1325	1.02 (0.97, 1.08)
10	162	0.13 (0.11, 0.15)	1273	0.96 (0.91, 1.01)
11	163	0.13 (0.11, 0.15)	1091	0.83 (0.78, 0.88)
12	134	0.11 (0.09, 0.12)	1042	0.79 (0.74, 0.84)
13	145	0.12 (0.10, 0.14)	912	0.71 (0.66, 0.76)
14	112	0.09 (0.08, 0.11)	693	0.56 (0.52, 0.60)
15	96	0.08 (0.07, 0.10)	584	0.48 (0.44, 0.52)
16	100	0.09 (0.07, 0.10)	565	0.47 (0.43, 0.51)
17	55	0.05 (0.04, 0.06)	436	0.37 (0.33, 0.40)
18	39	0.10 (0.07, 0.14)	262	0.52 (0.46, 0.59)

Table 4: Count and prevalence of ADHD cases by age in Chile school data for females and males with normal confidence intervals.

Age	Female		Male	
	ADHD cases	Prevalence % (95% CI)	ADHD cases	Prevalence % (95% CI)
6	294	0.24 (0.21, 0.27)	478	0.37 (0.34, 0.41)
7	241	0.20 (0.17, 0.22)	1315	1.02 (0.97, 1.08)
8	239	0.20 (0.17, 0.22)	2151	1.71 (1.64, 1.78)
9	198	0.16 (0.14, 0.18)	2967	2.29 (2.21, 2.37)
10	162	0.13 (0.11, 0.15)	3664	2.77 (2.68, 2.86)
11	163	0.13 (0.11, 0.15)	3691	2.81 (2.72, 2.90)
12	134	0.11 (0.09, 0.12)	3582	2.72 (2.63, 2.81)
13	145	0.12 (0.10, 0.14)	3376	2.63 (2.54, 2.72)
14	112	0.09 (0.08, 0.11)	2756	2.23 (2.15, 2.31)
15	96	0.08 (0.07, 0.10)	2352	1.95 (1.87, 2.02)
16	100	0.09 (0.07, 0.10)	2097	1.75 (1.67, 1.82)
17	55	0.05 (0.04, 0.06)	1876	1.58 (1.51, 1.65)
18	39	0.10 (0.07, 0.14)	840	1.68 (1.57, 1.79)

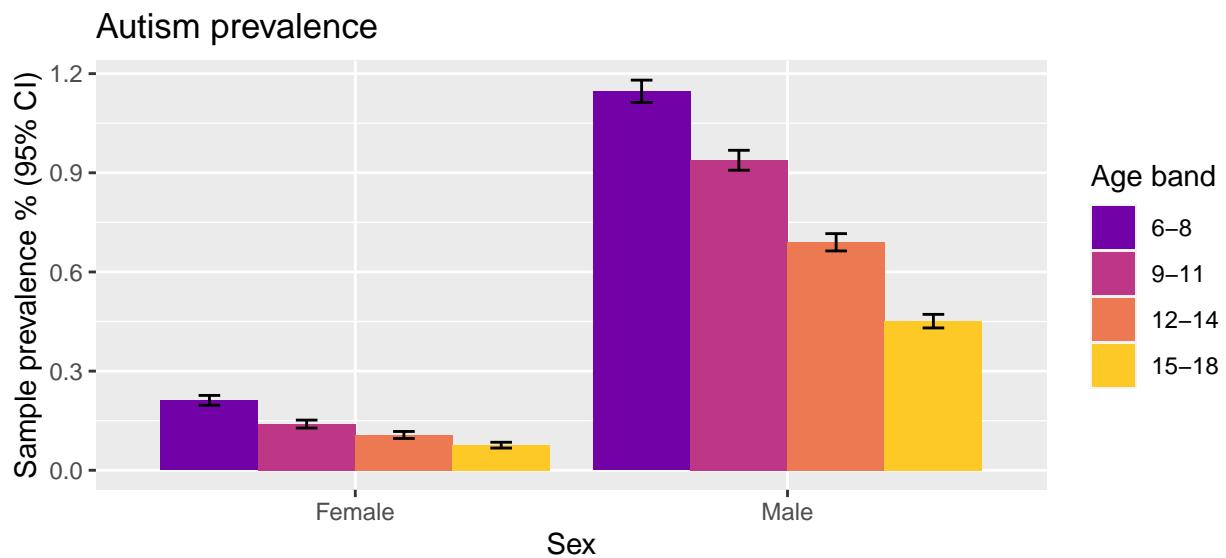


Figure 7: Sample prevalence of autism by age band and sex. Bars show 95% normal confidence intervals.

ADHD prevalence

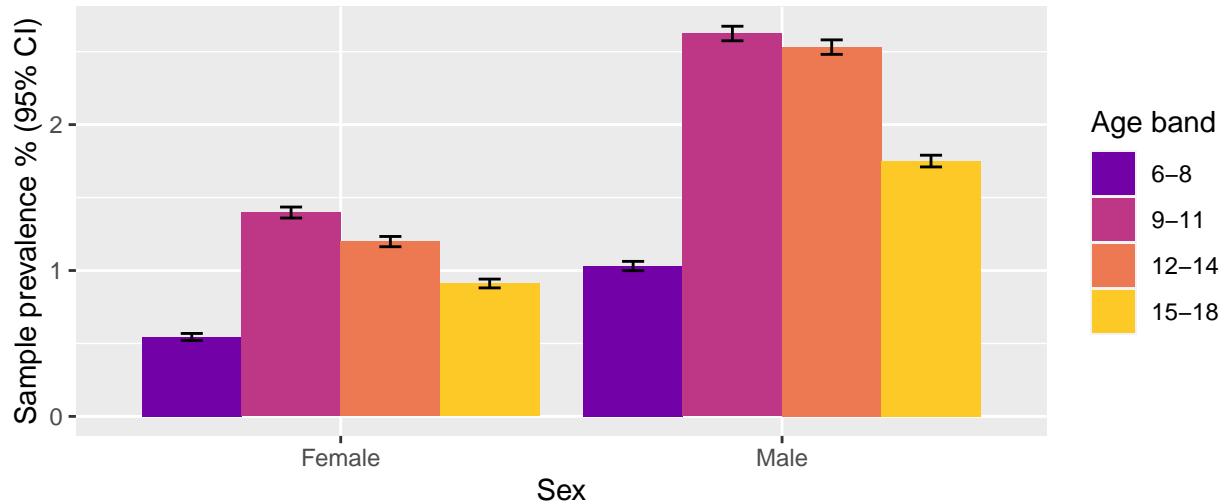


Figure 8: Sample prevalence of ADHD by age band and sex. Bars show 95% normal confidence intervals.

Autism varies by health service, as shown in Table 5, Figure 9 and Supplementary Figure 52. Autism prevalence is highest in Ñuble at 1.32% (1.24 - 1.40%) and Antofagasta at 0.84% (0.79- 0.89%), and is lowest in Metropolitano Norte at 0.29% (0.27 - 0.32%) and Araucanía Norte at 0.30% (0.24- 0.36%). Autism peaks in the 6-8 age band across all services except Chiloé and Magallanes where it peaks in the 9-11 band.

ADHD prevalence also varies across health services, as shown in Table 6, Figure 10 and Supplementary Figure 53. ADHD prevalence is highest in Magallanes at 3.07% (2.87 - 3.27%) and Talcahuano at 3.07% (2.93- 3.22%), and is lowest in Atacama at 0.49% (0.44 - 0.55%) and Antofagasta at 1.00% (0.94- 1.06%).

Table 5: Count and prevalence of autism cases by health service and age in Chile school data for females and males with normal confidence intervals.

Health service	Age	Female		Male	
		Autism cases	Prevalence % (95% CI)	Autism cases	Prevalence % (95% CI)
Aconcagua	6	4	0.21 (0.00, 0.41)	23	1.14 (0.68, 1.61)
Aisén	6	5	0.71 (0.09, 1.33)	12	1.63 (0.72, 2.55)
Antofagasta	6	17	0.38 (0.20, 0.56)	108	2.31 (1.88, 2.74)
Araucanía Norte	6	1	0.08 (0.00, 0.22)	15	0.99 (0.49, 1.50)
Araucanía Sur	6	9	0.17 (0.06, 0.28)	46	0.88 (0.63, 1.14)
Arauco	6	6	0.50 (0.10, 0.90)	26	2.14 (1.33, 2.96)
Arica	6	11	0.63 (0.26, 1.01)	33	1.77 (1.17, 2.37)
Atacama	6	8	0.36 (0.11, 0.61)	15	0.67 (0.33, 1.00)
Biobío	6	6	0.22 (0.04, 0.39)	33	1.16 (0.77, 1.56)
Chiloé	6	1	0.09 (0.00, 0.27)	10	0.86 (0.33, 1.39)
Concepción	6	13	0.29 (0.13, 0.45)	82	1.81 (1.42, 2.20)
Coquimbo	6	16	0.29 (0.15, 0.43)	74	1.26 (0.98, 1.55)
Iquique	6	7	0.26 (0.07, 0.45)	45	1.53 (1.09, 1.98)
Libertador B.O'Higgins	6	8	0.13 (0.04, 0.22)	69	1.04 (0.80, 1.28)
Magallanes	6	1	0.10 (0.00, 0.29)	11	1.04 (0.43, 1.66)
Maule	6	15	0.21 (0.10, 0.31)	75	0.98 (0.76, 1.20)
Metropolitano Central	6	6	0.13 (0.03, 0.24)	55	1.14 (0.84, 1.43)

Metropolitano Norte	6	11	0.15 (0.06, 0.25)	56	0.77 (0.57, 0.97)
Metropolitano Occidente	6	32	0.20 (0.13, 0.26)	141	0.85 (0.71, 0.98)
Metropolitano Oriente	6	7	0.10 (0.03, 0.17)	52	0.72 (0.52, 0.91)
Metropolitano Sur	6	18	0.23 (0.12, 0.34)	91	1.10 (0.87, 1.32)
Metropolitano Sur Oriente	6	14	0.16 (0.08, 0.25)	73	0.79 (0.61, 0.97)
Osorno	6	4	0.29 (0.01, 0.57)	20	1.35 (0.76, 1.93)
Reloncaví	6	9	0.30 (0.11, 0.50)	30	0.98 (0.63, 1.33)
Talcahuano	6	15	0.73 (0.36, 1.10)	48	2.19 (1.58, 2.81)
Valdivia	6	3	0.12 (0.00, 0.27)	22	0.89 (0.52, 1.26)
Valparaíso San Antonio	6	8	0.26 (0.08, 0.44)	48	1.51 (1.09, 1.94)
Viña del Mar Quillota	6	23	0.34 (0.20, 0.48)	94	1.34 (1.07, 1.61)
Ñuble	6	16	0.53 (0.27, 0.79)	105	3.37 (2.73, 4.00)
Aconcagua	7	5	0.27 (0.03, 0.50)	19	0.93 (0.52, 1.35)
Aisén	7	4	0.51 (0.01, 1.00)	17	2.26 (1.20, 3.32)
Antofagasta	7	18	0.39 (0.21, 0.58)	98	2.01 (1.62, 2.40)
Araucanía Norte	7	2	0.14 (0.00, 0.33)	6	0.38 (0.08, 0.68)
Araucanía Sur	7	5	0.10 (0.01, 0.18)	45	0.83 (0.59, 1.07)
Arauco	7	3	0.23 (0.00, 0.49)	19	1.47 (0.81, 2.13)
Arica	7	3	0.17 (0.00, 0.36)	33	1.68 (1.11, 2.25)
Atacama	7	8	0.34 (0.10, 0.58)	22	0.92 (0.54, 1.31)
Biobío	7	2	0.07 (0.00, 0.17)	30	1.00 (0.64, 1.35)
Chiloé	7	0	0.00 (0.00, 0.00)	14	1.20 (0.57, 1.82)
Concepción	7	14	0.33 (0.16, 0.50)	99	2.20 (1.77, 2.63)
Coquimbo	7	9	0.16 (0.05, 0.26)	78	1.28 (1.00, 1.56)
Iquique	7	4	0.14 (0.00, 0.28)	31	1.03 (0.67, 1.38)
Libertador B.O'Higgins	7	16	0.25 (0.13, 0.37)	61	0.91 (0.69, 1.14)
Magallanes	7	2	0.19 (0.00, 0.45)	16	1.44 (0.74, 2.14)
Maule	7	12	0.16 (0.07, 0.26)	71	0.90 (0.69, 1.11)
Metropolitano Central	7	9	0.19 (0.07, 0.32)	42	0.81 (0.56, 1.05)
Metropolitano Norte	7	6	0.08 (0.02, 0.15)	62	0.80 (0.60, 1.00)
Metropolitano Occidente	7	15	0.13 (0.07, 0.20)	87	0.73 (0.57, 0.88)
Metropolitano Oriente	7	11	0.15 (0.06, 0.23)	57	0.74 (0.55, 0.94)
Metropolitano Sur	7	16	0.20 (0.10, 0.29)	85	1.01 (0.79, 1.22)
Metropolitano Sur Oriente	7	12	0.13 (0.06, 0.20)	108	1.08 (0.88, 1.28)
Osorno	7	2	0.13 (0.00, 0.32)	13	0.80 (0.37, 1.23)
Reloncaví	7	7	0.23 (0.06, 0.39)	44	1.36 (0.96, 1.77)
Talcahuano	7	6	0.28 (0.06, 0.50)	40	1.76 (1.22, 2.29)
Valdivia	7	4	0.16 (0.00, 0.31)	24	0.88 (0.53, 1.23)
Valparaíso San Antonio	7	11	0.34 (0.14, 0.54)	62	1.87 (1.41, 2.33)
Viña del Mar Quillota	7	15	0.22 (0.11, 0.33)	99	1.37 (1.11, 1.64)
Ñuble	7	20	0.66 (0.37, 0.95)	101	3.06 (2.47, 3.65)
Aconcagua	8	5	0.27 (0.03, 0.52)	17	0.88 (0.46, 1.30)
Aisén	8	0	0.00 (0.00, 0.00)	23	2.93 (1.75, 4.10)
Antofagasta	8	19	0.40 (0.22, 0.58)	96	1.95 (1.56, 2.33)
Araucanía Norte	8	0	0.00 (0.00, 0.00)	11	0.73 (0.30, 1.16)
Araucanía Sur	8	12	0.23 (0.10, 0.36)	48	0.87 (0.62, 1.11)
Arauco	8	2	0.16 (0.00, 0.38)	22	1.78 (1.04, 2.51)
Arica	8	4	0.22 (0.00, 0.44)	28	1.46 (0.92, 1.99)
Atacama	8	2	0.09 (0.00, 0.21)	16	0.65 (0.33, 0.97)
Biobío	8	4	0.14 (0.00, 0.28)	29	1.03 (0.66, 1.40)
Chiloé	8	1	0.09 (0.00, 0.27)	14	1.16 (0.55, 1.76)
Concepción	8	17	0.39 (0.20, 0.57)	71	1.59 (1.22, 1.95)
Coquimbo	8	11	0.19 (0.08, 0.30)	55	0.89 (0.65, 1.12)

Iquique	8	4	0.14 (0.00, 0.29)	24	0.79 (0.47, 1.10)
Libertador B.O'Higgins	8	14	0.22 (0.10, 0.33)	85	1.29 (1.02, 1.56)
Magallanes	8	3	0.29 (0.00, 0.62)	15	1.42 (0.71, 2.14)
Maule	8	14	0.19 (0.09, 0.29)	47	0.63 (0.45, 0.81)
Metropolitano Central	8	7	0.15 (0.04, 0.26)	65	1.27 (0.96, 1.58)
Metropolitano Norte	8	9	0.12 (0.04, 0.21)	56	0.73 (0.54, 0.93)
Metropolitano Occidente	8	15	0.14 (0.07, 0.21)	95	0.84 (0.67, 1.01)
Metropolitano Oriente	8	13	0.18 (0.08, 0.27)	46	0.61 (0.43, 0.78)
Metropolitano Sur	8	10	0.13 (0.05, 0.20)	85	1.01 (0.80, 1.23)
Metropolitano Sur Oriente	8	15	0.16 (0.08, 0.25)	96	0.98 (0.79, 1.18)
Osorno	8	3	0.18 (0.00, 0.39)	18	1.11 (0.60, 1.62)
Reloncaví	8	6	0.20 (0.04, 0.35)	22	0.71 (0.42, 1.01)
Talcahuano	8	4	0.19 (0.00, 0.38)	41	1.94 (1.35, 2.53)
Valdivia	8	4	0.15 (0.00, 0.30)	25	0.91 (0.56, 1.27)
Valparaíso San Antonio	8	3	0.10 (0.00, 0.21)	45	1.39 (0.98, 1.79)
Viña del Mar Quillota	8	17	0.25 (0.13, 0.37)	99	1.38 (1.11, 1.65)
Ñuble	8	21	0.69 (0.39, 0.98)	99	3.20 (2.58, 3.82)
Aconcagua	9	3	0.15 (0.00, 0.32)	25	1.19 (0.73, 1.65)
Aisén	9	2	0.28 (0.00, 0.66)	9	1.11 (0.39, 1.84)
Antofagasta	9	19	0.40 (0.22, 0.58)	82	1.62 (1.27, 1.97)
Araucanía Norte	9	2	0.13 (0.00, 0.32)	11	0.70 (0.29, 1.12)
Araucanía Sur	9	9	0.17 (0.06, 0.28)	41	0.75 (0.52, 0.97)
Arauco	9	2	0.16 (0.00, 0.38)	21	1.61 (0.93, 2.30)
Arica	9	6	0.33 (0.07, 0.59)	18	0.90 (0.49, 1.32)
Atacama	9	3	0.12 (0.00, 0.26)	22	0.90 (0.53, 1.28)
Biobío	9	9	0.31 (0.11, 0.52)	24	0.83 (0.50, 1.16)
Chiloé	9	0	0.00 (0.00, 0.00)	18	1.39 (0.75, 2.03)
Concepción	9	12	0.27 (0.12, 0.42)	75	1.60 (1.24, 1.96)
Coquimbo	9	6	0.10 (0.02, 0.18)	50	0.82 (0.59, 1.04)
Iquique	9	5	0.18 (0.02, 0.34)	33	1.04 (0.69, 1.39)
Libertador B.O'Higgins	9	9	0.14 (0.05, 0.23)	70	1.02 (0.78, 1.26)
Magallanes	9	0	0.00 (0.00, 0.00)	21	1.93 (1.11, 2.75)
Maule	9	10	0.14 (0.05, 0.23)	55	0.74 (0.54, 0.93)
Metropolitano Central	9	10	0.20 (0.08, 0.33)	52	0.99 (0.72, 1.26)
Metropolitano Norte	9	6	0.08 (0.02, 0.15)	41	0.52 (0.36, 0.68)
Metropolitano Occidente	9	9	0.08 (0.03, 0.14)	93	0.80 (0.64, 0.96)
Metropolitano Oriente	9	9	0.12 (0.04, 0.20)	50	0.65 (0.47, 0.82)
Metropolitano Sur	9	7	0.08 (0.02, 0.14)	82	0.94 (0.74, 1.14)
Metropolitano Sur Oriente	9	5	0.05 (0.01, 0.10)	73	0.74 (0.57, 0.91)
Osorno	9	1	0.06 (0.00, 0.19)	18	1.05 (0.57, 1.53)
Reloncaví	9	3	0.10 (0.00, 0.21)	24	0.75 (0.45, 1.04)
Talcahuano	9	9	0.40 (0.14, 0.67)	46	1.91 (1.36, 2.46)
Valdivia	9	2	0.07 (0.00, 0.18)	13	0.48 (0.22, 0.73)
Valparaíso San Antonio	9	6	0.19 (0.04, 0.34)	52	1.57 (1.15, 1.99)
Viña del Mar Quillota	9	22	0.31 (0.18, 0.43)	107	1.45 (1.18, 1.73)
Ñuble	9	12	0.39 (0.17, 0.60)	99	3.04 (2.45, 3.63)
Aconcagua	10	0	0.00 (0.00, 0.00)	24	1.16 (0.70, 1.62)
Aisén	10	0	0.00 (0.00, 0.00)	9	1.05 (0.37, 1.74)
Antofagasta	10	11	0.22 (0.09, 0.35)	93	1.77 (1.41, 2.13)
Araucanía Norte	10	1	0.07 (0.00, 0.20)	10	0.67 (0.26, 1.08)
Araucanía Sur	10	1	0.02 (0.00, 0.05)	47	0.81 (0.58, 1.04)
Arauco	10	4	0.30 (0.01, 0.59)	23	1.68 (1.00, 2.36)
Arica	10	4	0.21 (0.00, 0.41)	20	0.98 (0.55, 1.41)

Atacama	10	1	0.04 (0.00, 0.12)	13	0.49 (0.23, 0.76)
Biobío	10	2	0.07 (0.00, 0.17)	25	0.84 (0.51, 1.17)
Chiloé	10	0	0.00 (0.00, 0.00)	15	1.20 (0.60, 1.81)
Concepción	10	10	0.21 (0.08, 0.33)	83	1.63 (1.29, 1.98)
Coquimbo	10	4	0.07 (0.00, 0.13)	57	0.90 (0.67, 1.14)
Iquique	10	5	0.17 (0.02, 0.32)	22	0.72 (0.42, 1.01)
Libertador B.O'Higgins	10	9	0.14 (0.05, 0.22)	65	0.94 (0.71, 1.16)
Magallanes	10	4	0.36 (0.01, 0.70)	18	1.51 (0.82, 2.20)
Maule	10	4	0.05 (0.00, 0.11)	53	0.66 (0.49, 0.84)
Metropolitano Central	10	3	0.06 (0.00, 0.13)	45	0.86 (0.61, 1.11)
Metropolitano Norte	10	6	0.08 (0.02, 0.15)	63	0.80 (0.60, 1.00)
Metropolitano Occidente	10	10	0.09 (0.04, 0.15)	69	0.59 (0.45, 0.73)
Metropolitano Oriente	10	6	0.08 (0.02, 0.14)	37	0.46 (0.31, 0.61)
Metropolitano Sur	10	18	0.22 (0.12, 0.32)	83	0.95 (0.75, 1.15)
Metropolitano Sur Oriente	10	11	0.11 (0.05, 0.18)	63	0.62 (0.47, 0.77)
Osorno	10	2	0.12 (0.00, 0.28)	18	1.05 (0.57, 1.53)
Reloncaví	10	4	0.12 (0.00, 0.24)	26	0.75 (0.46, 1.03)
Talcahuano	10	10	0.45 (0.17, 0.73)	45	1.94 (1.38, 2.50)
Valdivia	10	1	0.04 (0.00, 0.11)	13	0.46 (0.21, 0.72)
Valparaíso San Antonio	10	6	0.19 (0.04, 0.34)	32	0.99 (0.65, 1.34)
Viña del Mar Quillota	10	10	0.14 (0.05, 0.23)	106	1.43 (1.16, 1.70)
Ñuble	10	15	0.47 (0.23, 0.70)	96	2.91 (2.34, 3.49)
Aconcagua	11	0	0.00 (0.00, 0.00)	10	0.50 (0.19, 0.81)
Aisén	11	0	0.00 (0.00, 0.00)	8	0.98 (0.30, 1.66)
Antofagasta	11	15	0.30 (0.15, 0.44)	85	1.61 (1.27, 1.95)
Araucanía Norte	11	1	0.07 (0.00, 0.21)	5	0.33 (0.04, 0.63)
Araucanía Sur	11	6	0.11 (0.02, 0.20)	32	0.57 (0.37, 0.76)
Arauco	11	3	0.23 (0.00, 0.49)	26	1.88 (1.17, 2.60)
Arica	11	1	0.05 (0.00, 0.16)	19	0.97 (0.53, 1.40)
Atacama	11	3	0.12 (0.00, 0.25)	10	0.38 (0.15, 0.62)
Biobío	11	5	0.17 (0.02, 0.32)	19	0.61 (0.34, 0.89)
Chiloé	11	2	0.16 (0.00, 0.39)	16	1.22 (0.63, 1.82)
Concepción	11	8	0.18 (0.05, 0.30)	58	1.22 (0.91, 1.54)
Coquimbo	11	8	0.13 (0.04, 0.22)	38	0.61 (0.42, 0.81)
Iquique	11	6	0.21 (0.04, 0.38)	25	0.81 (0.49, 1.12)
Libertador B.O'Higgins	11	12	0.18 (0.08, 0.28)	58	0.82 (0.61, 1.03)
Magallanes	11	2	0.17 (0.00, 0.40)	21	1.77 (1.02, 2.53)
Maule	11	2	0.03 (0.00, 0.06)	32	0.41 (0.27, 0.55)
Metropolitano Central	11	4	0.08 (0.00, 0.16)	39	0.73 (0.50, 0.96)
Metropolitano Norte	11	4	0.05 (0.00, 0.11)	43	0.55 (0.38, 0.71)
Metropolitano Occidente	11	9	0.08 (0.03, 0.14)	72	0.64 (0.49, 0.78)
Metropolitano Oriente	11	9	0.12 (0.04, 0.20)	44	0.57 (0.40, 0.73)
Metropolitano Sur	11	13	0.16 (0.07, 0.24)	73	0.82 (0.63, 1.00)
Metropolitano Sur Oriente	11	8	0.08 (0.03, 0.14)	55	0.55 (0.40, 0.69)
Osorno	11	3	0.18 (0.00, 0.39)	18	1.05 (0.57, 1.53)
Reloncaví	11	2	0.06 (0.00, 0.14)	31	0.89 (0.58, 1.20)
Talcahuano	11	6	0.28 (0.06, 0.49)	41	1.75 (1.22, 2.29)
Valdivia	11	1	0.04 (0.00, 0.11)	12	0.41 (0.18, 0.64)
Valparaíso San Antonio	11	3	0.10 (0.00, 0.20)	36	1.12 (0.75, 1.48)
Viña del Mar Quillota	11	15	0.21 (0.10, 0.32)	81	1.09 (0.86, 1.33)
Ñuble	11	12	0.37 (0.16, 0.58)	84	2.53 (1.99, 3.06)
Aconcagua	12	2	0.10 (0.00, 0.24)	16	0.84 (0.43, 1.25)
Aisén	12	3	0.34 (0.00, 0.72)	9	0.98 (0.34, 1.61)

Antofagasta	12	6	0.12 (0.02, 0.22)	74	1.38 (1.07, 1.70)
Araucanía Norte	12	3	0.20 (0.00, 0.42)	6	0.37 (0.08, 0.67)
Araucanía Sur	12	4	0.07 (0.00, 0.14)	31	0.55 (0.35, 0.74)
Arauco	12	4	0.32 (0.01, 0.64)	20	1.49 (0.84, 2.14)
Arica	12	2	0.11 (0.00, 0.26)	13	0.67 (0.31, 1.04)
Atacama	12	1	0.04 (0.00, 0.12)	16	0.63 (0.32, 0.94)
Biobío	12	2	0.07 (0.00, 0.16)	22	0.71 (0.41, 1.00)
Chiloé	12	1	0.08 (0.00, 0.23)	11	0.78 (0.32, 1.23)
Concepción	12	9	0.21 (0.07, 0.34)	60	1.32 (0.99, 1.65)
Coquimbo	12	10	0.17 (0.06, 0.27)	33	0.54 (0.36, 0.73)
Iquique	12	1	0.04 (0.00, 0.10)	19	0.61 (0.34, 0.88)
Libertador B.O'Higgins	12	6	0.09 (0.02, 0.16)	47	0.67 (0.48, 0.86)
Magallanes	12	3	0.26 (0.00, 0.54)	16	1.34 (0.69, 2.00)
Maule	12	5	0.07 (0.01, 0.12)	25	0.31 (0.19, 0.44)
Metropolitano Central	12	2	0.04 (0.00, 0.10)	40	0.76 (0.53, 1.00)
Metropolitano Norte	12	5	0.07 (0.01, 0.13)	28	0.35 (0.22, 0.48)
Metropolitano Occidente	12	9	0.08 (0.03, 0.14)	78	0.68 (0.53, 0.83)
Metropolitano Oriente	12	6	0.08 (0.02, 0.14)	49	0.64 (0.46, 0.81)
Metropolitano Sur	12	6	0.07 (0.01, 0.13)	57	0.64 (0.48, 0.81)
Metropolitano Sur Oriente	12	10	0.10 (0.04, 0.17)	70	0.68 (0.52, 0.84)
Osorno	12	1	0.06 (0.00, 0.17)	9	0.51 (0.18, 0.84)
Reloncaví	12	8	0.24 (0.07, 0.40)	19	0.55 (0.30, 0.80)
Talcahuano	12	0	0.00 (0.00, 0.00)	38	1.57 (1.08, 2.07)
Valdivia	12	1	0.04 (0.00, 0.11)	15	0.52 (0.26, 0.78)
Valparaíso San Antonio	12	5	0.16 (0.02, 0.30)	50	1.54 (1.12, 1.96)
Viña del Mar Quillota	12	9	0.13 (0.04, 0.21)	89	1.21 (0.96, 1.46)
Ñuble	12	10	0.30 (0.11, 0.48)	82	2.37 (1.86, 2.88)
Aconcagua	13	3	0.16 (0.00, 0.35)	12	0.63 (0.27, 0.98)
Aisén	13	1	0.13 (0.00, 0.37)	12	1.38 (0.61, 2.16)
Antofagasta	13	11	0.23 (0.09, 0.36)	54	1.05 (0.77, 1.32)
Araucanía Norte	13	0	0.00 (0.00, 0.00)	10	0.61 (0.23, 0.99)
Araucanía Sur	13	4	0.08 (0.00, 0.15)	33	0.59 (0.39, 0.79)
Arauco	13	0	0.00 (0.00, 0.00)	16	1.27 (0.65, 1.89)
Arica	13	3	0.17 (0.00, 0.36)	13	0.71 (0.33, 1.10)
Atacama	13	2	0.08 (0.00, 0.20)	8	0.32 (0.10, 0.54)
Biobío	13	1	0.03 (0.00, 0.10)	18	0.61 (0.33, 0.89)
Chiloé	13	0	0.00 (0.00, 0.00)	12	0.89 (0.39, 1.39)
Concepción	13	10	0.23 (0.09, 0.37)	48	1.06 (0.76, 1.36)
Coquimbo	13	2	0.04 (0.00, 0.09)	35	0.62 (0.41, 0.82)
Iquique	13	3	0.11 (0.00, 0.24)	11	0.37 (0.15, 0.59)
Libertador B.O'Higgins	13	11	0.16 (0.07, 0.26)	39	0.57 (0.39, 0.75)
Magallanes	13	3	0.26 (0.00, 0.55)	25	2.12 (1.29, 2.94)
Maule	13	6	0.08 (0.02, 0.15)	35	0.46 (0.30, 0.61)
Metropolitano Central	13	3	0.06 (0.00, 0.13)	32	0.61 (0.40, 0.81)
Metropolitano Norte	13	6	0.08 (0.02, 0.15)	25	0.33 (0.20, 0.46)
Metropolitano Occidente	13	7	0.07 (0.02, 0.12)	54	0.49 (0.36, 0.62)
Metropolitano Oriente	13	10	0.14 (0.05, 0.22)	43	0.57 (0.40, 0.74)
Metropolitano Sur	13	10	0.12 (0.05, 0.20)	55	0.65 (0.48, 0.82)
Metropolitano Sur Oriente	13	4	0.04 (0.00, 0.08)	59	0.59 (0.44, 0.73)
Osorno	13	3	0.18 (0.00, 0.38)	6	0.35 (0.07, 0.63)
Reloncaví	13	2	0.06 (0.00, 0.15)	28	0.80 (0.50, 1.09)
Talcahuano	13	7	0.32 (0.08, 0.56)	34	1.42 (0.94, 1.89)
Valdivia	13	1	0.04 (0.00, 0.11)	12	0.42 (0.18, 0.66)

Valparaíso San Antonio	13	6	0.20 (0.04, 0.36)	33	1.04 (0.69, 1.39)
Viña del Mar Quillota	13	11	0.16 (0.06, 0.25)	85	1.17 (0.92, 1.42)
Ñuble	13	15	0.47 (0.23, 0.70)	65	1.89 (1.44, 2.35)
Aconcagua	14	1	0.06 (0.00, 0.17)	10	0.53 (0.20, 0.85)
Aisén	14	2	0.25 (0.00, 0.60)	4	0.46 (0.01, 0.91)
Antofagasta	14	11	0.23 (0.10, 0.37)	42	0.83 (0.58, 1.08)
Araucanía Norte	14	3	0.19 (0.00, 0.41)	5	0.33 (0.04, 0.62)
Araucanía Sur	14	4	0.08 (0.00, 0.15)	30	0.56 (0.36, 0.76)
Arauco	14	1	0.08 (0.00, 0.24)	10	0.76 (0.29, 1.23)
Arica	14	5	0.31 (0.04, 0.58)	18	1.05 (0.57, 1.53)
Atacama	14	0	0.00 (0.00, 0.00)	4	0.16 (0.00, 0.32)
Biobío	14	2	0.07 (0.00, 0.17)	18	0.58 (0.31, 0.84)
Chiloé	14	0	0.00 (0.00, 0.00)	9	0.70 (0.24, 1.15)
Concepción	14	9	0.22 (0.07, 0.36)	47	1.05 (0.75, 1.35)
Coquimbo	14	2	0.04 (0.00, 0.09)	20	0.36 (0.20, 0.52)
Iquique	14	4	0.15 (0.00, 0.30)	22	0.77 (0.45, 1.10)
Libertador B.O'Higgins	14	4	0.06 (0.00, 0.13)	30	0.46 (0.30, 0.62)
Magallanes	14	1	0.09 (0.00, 0.27)	14	1.20 (0.57, 1.82)
Maule	14	5	0.07 (0.01, 0.13)	26	0.35 (0.22, 0.49)
Metropolitano Central	14	0	0.00 (0.00, 0.00)	24	0.48 (0.29, 0.67)
Metropolitano Norte	14	4	0.06 (0.00, 0.12)	25	0.35 (0.22, 0.49)
Metropolitano Occidente	14	9	0.09 (0.03, 0.15)	54	0.50 (0.37, 0.64)
Metropolitano Oriente	14	5	0.07 (0.01, 0.13)	32	0.43 (0.28, 0.58)
Metropolitano Sur	14	2	0.03 (0.00, 0.06)	25	0.30 (0.18, 0.42)
Metropolitano Sur Oriente	14	3	0.03 (0.00, 0.07)	43	0.45 (0.32, 0.58)
Osorno	14	2	0.13 (0.00, 0.31)	12	0.72 (0.31, 1.13)
Reloncaví	14	3	0.10 (0.00, 0.21)	16	0.49 (0.25, 0.72)
Talcahuano	14	4	0.18 (0.00, 0.36)	15	0.66 (0.33, 1.00)
Valdivia	14	1	0.04 (0.00, 0.11)	16	0.60 (0.30, 0.89)
Valparaíso San Antonio	14	5	0.17 (0.02, 0.32)	22	0.72 (0.42, 1.02)
Viña del Mar Quillota	14	11	0.16 (0.07, 0.26)	56	0.83 (0.61, 1.04)
Ñuble	14	9	0.28 (0.10, 0.46)	44	1.33 (0.94, 1.72)
Aconcagua	15	1	0.06 (0.00, 0.16)	7	0.40 (0.11, 0.70)
Aisén	15	3	0.39 (0.00, 0.82)	8	0.99 (0.31, 1.66)
Antofagasta	15	6	0.13 (0.03, 0.24)	36	0.75 (0.50, 0.99)
Araucanía Norte	15	0	0.00 (0.00, 0.00)	5	0.34 (0.04, 0.63)
Araucanía Sur	15	2	0.04 (0.00, 0.09)	21	0.40 (0.23, 0.57)
Arauco	15	0	0.00 (0.00, 0.00)	7	0.56 (0.15, 0.98)
Arica	15	1	0.06 (0.00, 0.18)	13	0.76 (0.35, 1.17)
Atacama	15	0	0.00 (0.00, 0.00)	8	0.35 (0.11, 0.59)
Biobío	15	0	0.00 (0.00, 0.00)	17	0.58 (0.30, 0.85)
Chiloé	15	1	0.08 (0.00, 0.22)	3	0.23 (0.00, 0.50)
Concepción	15	10	0.24 (0.09, 0.39)	36	0.82 (0.55, 1.09)
Coquimbo	15	7	0.13 (0.03, 0.23)	18	0.33 (0.18, 0.48)
Iquique	15	0	0.00 (0.00, 0.00)	16	0.58 (0.30, 0.86)
Libertador B.O'Higgins	15	1	0.02 (0.00, 0.05)	21	0.33 (0.19, 0.47)
Magallanes	15	3	0.26 (0.00, 0.56)	12	0.97 (0.42, 1.52)
Maule	15	3	0.04 (0.00, 0.09)	12	0.16 (0.07, 0.26)
Metropolitano Central	15	2	0.04 (0.00, 0.10)	25	0.51 (0.31, 0.71)
Metropolitano Norte	15	5	0.08 (0.01, 0.14)	19	0.27 (0.15, 0.40)
Metropolitano Occidente	15	6	0.06 (0.01, 0.11)	44	0.42 (0.30, 0.55)
Metropolitano Oriente	15	1	0.01 (0.00, 0.04)	24	0.34 (0.20, 0.47)
Metropolitano Sur	15	3	0.04 (0.00, 0.09)	28	0.36 (0.23, 0.49)

Metropolitano Sur Oriente	15	7	0.08 (0.02, 0.13)	37	0.39 (0.26, 0.51)
Osorno	15	0	0.00 (0.00, 0.00)	11	0.66 (0.27, 1.06)
Reloncaví	15	1	0.03 (0.00, 0.10)	17	0.52 (0.27, 0.76)
Talcahuano	15	5	0.24 (0.03, 0.46)	10	0.46 (0.17, 0.74)
Valdivia	15	1	0.04 (0.00, 0.11)	11	0.40 (0.17, 0.64)
Valparaíso San Antonio	15	6	0.20 (0.04, 0.37)	28	0.90 (0.57, 1.24)
Viña del Mar Quillota	15	11	0.17 (0.07, 0.27)	53	0.77 (0.56, 0.97)
Ñuble	15	10	0.32 (0.12, 0.52)	37	1.14 (0.78, 1.51)
Aconcagua	16	1	0.05 (0.00, 0.16)	9	0.49 (0.17, 0.81)
Aisén	16	1	0.13 (0.00, 0.38)	5	0.61 (0.08, 1.14)
Antofagasta	16	11	0.24 (0.10, 0.38)	35	0.75 (0.51, 1.00)
Araucanía Norte	16	0	0.00 (0.00, 0.00)	6	0.39 (0.08, 0.69)
Araucanía Sur	16	2	0.04 (0.00, 0.09)	22	0.42 (0.24, 0.59)
Arauco	16	0	0.00 (0.00, 0.00)	7	0.56 (0.15, 0.98)
Arica	16	1	0.06 (0.00, 0.18)	5	0.29 (0.04, 0.54)
Atacama	16	0	0.00 (0.00, 0.00)	5	0.22 (0.03, 0.41)
Biobío	16	2	0.07 (0.00, 0.17)	12	0.41 (0.18, 0.65)
Chiloé	16	0	0.00 (0.00, 0.00)	6	0.47 (0.09, 0.85)
Concepción	16	4	0.10 (0.00, 0.19)	29	0.68 (0.43, 0.92)
Coquimbo	16	3	0.06 (0.00, 0.12)	22	0.41 (0.24, 0.58)
Iquique	16	2	0.08 (0.00, 0.19)	17	0.62 (0.33, 0.92)
Libertador B.O'Higgins	16	8	0.13 (0.04, 0.22)	24	0.37 (0.22, 0.52)
Magallanes	16	9	0.81 (0.28, 1.33)	15	1.27 (0.63, 1.91)
Maule	16	6	0.09 (0.02, 0.16)	15	0.21 (0.10, 0.31)
Metropolitano Central	16	6	0.13 (0.03, 0.23)	17	0.35 (0.18, 0.51)
Metropolitano Norte	16	3	0.05 (0.00, 0.10)	16	0.23 (0.12, 0.35)
Metropolitano Occidente	16	4	0.04 (0.00, 0.08)	35	0.34 (0.23, 0.46)
Metropolitano Oriente	16	3	0.04 (0.00, 0.09)	18	0.25 (0.13, 0.36)
Metropolitano Sur	16	2	0.03 (0.00, 0.06)	24	0.32 (0.19, 0.45)
Metropolitano Sur Oriente	16	4	0.04 (0.00, 0.09)	44	0.47 (0.33, 0.60)
Osorno	16	1	0.06 (0.00, 0.19)	6	0.36 (0.07, 0.65)
Reloncaví	16	1	0.03 (0.00, 0.10)	18	0.56 (0.30, 0.81)
Talcahuano	16	0	0.00 (0.00, 0.00)	15	0.69 (0.34, 1.03)
Valdivia	16	0	0.00 (0.00, 0.00)	14	0.51 (0.24, 0.78)
Valparaíso San Antonio	16	2	0.07 (0.00, 0.16)	32	1.04 (0.68, 1.40)
Viña del Mar Quillota	16	11	0.17 (0.07, 0.28)	62	0.91 (0.68, 1.13)
Ñuble	16	13	0.41 (0.19, 0.64)	30	0.91 (0.58, 1.23)
Aconcagua	17	0	0.00 (0.00, 0.00)	4	0.22 (0.00, 0.44)
Aisén	17	1	0.13 (0.00, 0.40)	6	0.77 (0.16, 1.39)
Antofagasta	17	5	0.11 (0.01, 0.21)	33	0.71 (0.47, 0.95)
Araucanía Norte	17	1	0.07 (0.00, 0.21)	2	0.15 (0.00, 0.35)
Araucanía Sur	17	1	0.02 (0.00, 0.06)	16	0.31 (0.16, 0.46)
Arauco	17	0	0.00 (0.00, 0.00)	4	0.32 (0.01, 0.64)
Arica	17	2	0.12 (0.00, 0.28)	8	0.46 (0.14, 0.79)
Atacama	17	1	0.05 (0.00, 0.14)	6	0.27 (0.05, 0.48)
Biobío	17	4	0.14 (0.00, 0.28)	18	0.63 (0.34, 0.93)
Chiloé	17	0	0.00 (0.00, 0.00)	5	0.38 (0.05, 0.71)
Concepción	17	3	0.07 (0.00, 0.16)	34	0.81 (0.54, 1.08)
Coquimbo	17	0	0.00 (0.00, 0.00)	14	0.26 (0.13, 0.40)
Iquique	17	0	0.00 (0.00, 0.00)	7	0.27 (0.07, 0.47)
Libertador B.O'Higgins	17	6	0.10 (0.02, 0.18)	13	0.20 (0.09, 0.31)
Magallanes	17	1	0.09 (0.00, 0.27)	10	0.85 (0.32, 1.37)
Maule	17	1	0.01 (0.00, 0.04)	13	0.18 (0.08, 0.28)

Metropolitano Central	17	0	0.00 (0.00, 0.00)	14	0.28 (0.13, 0.42)
Metropolitano Norte	17	1	0.02 (0.00, 0.05)	15	0.22 (0.11, 0.33)
Metropolitano Occidente	17	4	0.04 (0.00, 0.08)	29	0.30 (0.19, 0.40)
Metropolitano Oriente	17	2	0.03 (0.00, 0.07)	15	0.21 (0.10, 0.31)
Metropolitano Sur	17	4	0.05 (0.00, 0.11)	22	0.29 (0.17, 0.41)
Metropolitano Sur Oriente	17	2	0.02 (0.00, 0.05)	23	0.25 (0.15, 0.35)
Osorno	17	0	0.00 (0.00, 0.00)	7	0.44 (0.11, 0.77)
Reloncaví	17	0	0.00 (0.00, 0.00)	9	0.29 (0.10, 0.47)
Talcahuano	17	3	0.14 (0.00, 0.29)	12	0.52 (0.23, 0.82)
Valdivia	17	0	0.00 (0.00, 0.00)	9	0.35 (0.12, 0.58)
Valparaíso San Antonio	17	0	0.00 (0.00, 0.00)	21	0.68 (0.39, 0.97)
Viña del Mar Quillota	17	9	0.14 (0.05, 0.23)	33	0.49 (0.32, 0.66)
Ñuble	17	4	0.13 (0.00, 0.25)	34	1.05 (0.70, 1.40)
Aconcagua	18	2	0.37 (0.00, 0.89)	2	0.28 (0.00, 0.67)
Aisén	18	0	0.00 (0.00, 0.00)	5	1.22 (0.16, 2.29)
Antofagasta	18	3	0.22 (0.00, 0.46)	16	0.93 (0.48, 1.39)
Araucanía Norte	18	0	0.00 (0.00, 0.00)	4	0.73 (0.02, 1.44)
Araucanía Sur	18	2	0.13 (0.00, 0.31)	15	0.73 (0.36, 1.10)
Arauco	18	0	0.00 (0.00, 0.00)	3	0.61 (0.00, 1.31)
Arica	18	0	0.00 (0.00, 0.00)	9	1.56 (0.55, 2.57)
Atacama	18	2	0.29 (0.00, 0.69)	4	0.45 (0.01, 0.89)
Biobío	18	0	0.00 (0.00, 0.00)	4	0.35 (0.01, 0.69)
Chiloé	18	0	0.00 (0.00, 0.00)	0	0.00 (0.00, 0.00)
Concepción	18	6	0.45 (0.09, 0.80)	12	0.72 (0.32, 1.13)
Coquimbo	18	0	0.00 (0.00, 0.00)	9	0.43 (0.15, 0.71)
Iquique	18	0	0.00 (0.00, 0.00)	4	0.39 (0.01, 0.76)
Libertador B.O'Higgins	18	1	0.06 (0.00, 0.17)	14	0.52 (0.25, 0.80)
Magallanes	18	1	0.29 (0.00, 0.86)	6	1.28 (0.26, 2.30)
Maule	18	4	0.20 (0.00, 0.39)	11	0.40 (0.16, 0.63)
Metropolitano Central	18	3	0.19 (0.00, 0.41)	11	0.53 (0.22, 0.85)
Metropolitano Norte	18	2	0.08 (0.00, 0.18)	12	0.37 (0.16, 0.58)
Metropolitano Occidente	18	0	0.00 (0.00, 0.00)	14	0.34 (0.16, 0.51)
Metropolitano Oriente	18	3	0.11 (0.00, 0.23)	8	0.22 (0.07, 0.38)
Metropolitano Sur	18	0	0.00 (0.00, 0.00)	12	0.37 (0.16, 0.58)
Metropolitano Sur Oriente	18	2	0.06 (0.00, 0.14)	27	0.63 (0.39, 0.86)
Osorno	18	1	0.18 (0.00, 0.53)	0	0.00 (0.00, 0.00)
Reloncaví	18	0	0.00 (0.00, 0.00)	8	0.54 (0.17, 0.91)
Talcahuano	18	0	0.00 (0.00, 0.00)	5	0.64 (0.08, 1.21)
Valdivia	18	0	0.00 (0.00, 0.00)	1	0.10 (0.00, 0.28)
Valparaíso San Antonio	18	3	0.31 (0.00, 0.66)	10	0.80 (0.31, 1.29)
Viña del Mar Quillota	18	4	0.18 (0.00, 0.36)	24	0.78 (0.47, 1.09)
Ñuble	18	0	0.00 (0.00, 0.00)	12	0.96 (0.42, 1.50)

Table 6: Count and prevalence of ADHD cases by health service and age in Chile school data for females and males with normal confidence intervals.

Health service	Age	Female		Male	
		ADHD cases	Prevalence % (95% CI)	ADHD cases	Prevalence % (95% CI)
Aconcagua	6	8	0.42 (0.13, 0.70)	6	0.30 (0.06, 0.54)
Aisén	6	3	0.43 (0.00, 0.91)	5	0.68 (0.09, 1.28)

Antofagasta	6	14	0.31 (0.15, 0.47)	12	0.26 (0.11, 0.40)
Araucanía Norte	6	4	0.30 (0.01, 0.60)	9	0.60 (0.21, 0.99)
Araucanía Sur	6	12	0.23 (0.10, 0.36)	26	0.50 (0.31, 0.69)
Arauco	6	4	0.33 (0.01, 0.66)	6	0.49 (0.10, 0.89)
Arica	6	0	0.00 (0.00, 0.00)	5	0.27 (0.03, 0.50)
Atacama	6	0	0.00 (0.00, 0.00)	2	0.09 (0.00, 0.21)
Biobío	6	10	0.36 (0.14, 0.59)	20	0.71 (0.40, 1.01)
Chiloé	6	3	0.28 (0.00, 0.59)	7	0.60 (0.16, 1.05)
Concepción	6	11	0.25 (0.10, 0.39)	12	0.27 (0.12, 0.42)
Coquimbo	6	23	0.42 (0.25, 0.59)	30	0.51 (0.33, 0.70)
Iquique	6	6	0.22 (0.04, 0.40)	12	0.41 (0.18, 0.64)
Libertador B.O'Higgins	6	14	0.23 (0.11, 0.35)	36	0.54 (0.37, 0.72)
Magallanes	6	2	0.20 (0.00, 0.47)	2	0.19 (0.00, 0.45)
Maule	6	7	0.10 (0.02, 0.17)	18	0.24 (0.13, 0.34)
Metropolitano Central	6	17	0.37 (0.20, 0.55)	32	0.66 (0.43, 0.89)
Metropolitano Norte	6	7	0.10 (0.03, 0.17)	22	0.30 (0.18, 0.43)
Metropolitano Occidente	6	34	0.21 (0.14, 0.28)	38	0.23 (0.16, 0.30)
Metropolitano Oriente	6	10	0.14 (0.05, 0.22)	25	0.34 (0.21, 0.48)
Metropolitano Sur	6	10	0.13 (0.05, 0.21)	33	0.40 (0.26, 0.53)
Metropolitano Sur Oriente	6	24	0.28 (0.17, 0.39)	40	0.43 (0.30, 0.57)
Osorno	6	3	0.22 (0.00, 0.46)	2	0.13 (0.00, 0.32)
Reloncaví	6	8	0.27 (0.08, 0.46)	11	0.36 (0.15, 0.57)
Talcahuano	6	5	0.24 (0.03, 0.46)	12	0.55 (0.24, 0.86)
Valdivia	6	6	0.25 (0.05, 0.45)	19	0.77 (0.42, 1.11)
Valparaíso San Antonio	6	2	0.07 (0.00, 0.16)	8	0.25 (0.08, 0.43)
Viña del Mar Quillota	6	8	0.12 (0.04, 0.20)	17	0.24 (0.13, 0.36)
Ñuble	6	7	0.23 (0.06, 0.40)	11	0.35 (0.14, 0.56)
Aconcagua	7	16	0.85 (0.43, 1.26)	25	1.23 (0.75, 1.71)
Aisén	7	3	0.38 (0.00, 0.81)	12	1.59 (0.70, 2.49)
Antofagasta	7	27	0.59 (0.37, 0.82)	44	0.90 (0.64, 1.17)
Araucanía Norte	7	3	0.21 (0.00, 0.44)	19	1.20 (0.66, 1.73)
Araucanía Sur	7	30	0.58 (0.37, 0.79)	63	1.16 (0.88, 1.45)
Arauco	7	6	0.46 (0.09, 0.82)	16	1.24 (0.64, 1.84)
Arica	7	5	0.28 (0.03, 0.52)	17	0.87 (0.46, 1.28)
Atacama	7	2	0.09 (0.00, 0.20)	5	0.21 (0.03, 0.39)
Biobío	7	30	1.09 (0.70, 1.47)	47	1.56 (1.12, 2.00)
Chiloé	7	8	0.72 (0.22, 1.21)	23	1.97 (1.17, 2.76)
Concepción	7	45	1.05 (0.75, 1.36)	56	1.25 (0.92, 1.57)
Coquimbo	7	31	0.53 (0.35, 0.72)	60	0.98 (0.74, 1.23)
Iquique	7	4	0.14 (0.00, 0.28)	30	0.99 (0.64, 1.35)
Libertador B.O'Higgins	7	31	0.48 (0.31, 0.65)	83	1.24 (0.98, 1.51)
Magallanes	7	4	0.38 (0.01, 0.74)	22	1.98 (1.16, 2.80)
Maule	7	31	0.42 (0.27, 0.57)	63	0.80 (0.60, 1.00)
Metropolitano Central	7	30	0.64 (0.41, 0.86)	58	1.12 (0.83, 1.40)
Metropolitano Norte	7	36	0.49 (0.33, 0.65)	74	0.96 (0.74, 1.17)
Metropolitano Occidente	7	52	0.46 (0.33, 0.58)	96	0.80 (0.64, 0.96)
Metropolitano Oriente	7	44	0.59 (0.42, 0.76)	79	1.03 (0.80, 1.26)
Metropolitano Sur	7	49	0.60 (0.43, 0.77)	72	0.85 (0.66, 1.05)
Metropolitano Sur Oriente	7	57	0.60 (0.45, 0.76)	124	1.24 (1.02, 1.46)
Osorno	7	5	0.33 (0.04, 0.63)	11	0.68 (0.28, 1.07)
Reloncaví	7	13	0.42 (0.19, 0.65)	25	0.78 (0.47, 1.08)
Talcahuano	7	21	0.97 (0.56, 1.39)	39	1.71 (1.18, 2.24)
Valdivia	7	15	0.59 (0.29, 0.89)	30	1.10 (0.71, 1.50)

Valparaíso San Antonio	7	10	0.31 (0.12, 0.50)	27	0.81 (0.51, 1.12)
Viña del Mar Quillota	7	25	0.36 (0.22, 0.50)	55	0.76 (0.56, 0.96)
Ñuble	7	17	0.56 (0.30, 0.83)	40	1.21 (0.84, 1.59)
Aconcagua	8	32	1.76 (1.15, 2.36)	40	2.08 (1.44, 2.71)
Aisén	8	6	0.81 (0.16, 1.45)	21	2.67 (1.54, 3.80)
Antofagasta	8	25	0.53 (0.32, 0.74)	50	1.01 (0.73, 1.29)
Araucanía Norte	8	17	1.18 (0.62, 1.74)	24	1.59 (0.96, 2.22)
Araucanía Sur	8	57	1.09 (0.81, 1.37)	117	2.11 (1.73, 2.49)
Arauco	8	10	0.79 (0.30, 1.29)	27	2.18 (1.37, 2.99)
Arica	8	12	0.67 (0.29, 1.05)	24	1.25 (0.75, 1.74)
Atacama	8	5	0.22 (0.03, 0.42)	13	0.53 (0.24, 0.82)
Biobío	8	39	1.40 (0.96, 1.84)	66	2.34 (1.78, 2.90)
Chiloé	8	17	1.56 (0.83, 2.30)	36	2.97 (2.01, 3.93)
Concepción	8	45	1.03 (0.73, 1.32)	94	2.10 (1.68, 2.52)
Coquimbo	8	51	0.88 (0.64, 1.12)	144	2.32 (1.94, 2.69)
Iquique	8	25	0.90 (0.55, 1.25)	54	1.77 (1.31, 2.24)
Libertador B.O'Higgins	8	79	1.24 (0.97, 1.51)	133	2.02 (1.68, 2.36)
Magallanes	8	11	1.06 (0.44, 1.69)	33	3.13 (2.08, 4.18)
Maule	8	31	0.42 (0.28, 0.57)	101	1.36 (1.10, 1.63)
Metropolitano Central	8	40	0.86 (0.59, 1.12)	83	1.62 (1.28, 1.97)
Metropolitano Norte	8	71	0.99 (0.76, 1.21)	122	1.60 (1.32, 1.88)
Metropolitano Occidente	8	81	0.75 (0.58, 0.91)	162	1.43 (1.21, 1.65)
Metropolitano Oriente	8	62	0.83 (0.63, 1.04)	99	1.30 (1.05, 1.56)
Metropolitano Sur	8	72	0.90 (0.69, 1.11)	135	1.61 (1.34, 1.88)
Metropolitano Sur Oriente	8	108	1.17 (0.95, 1.39)	191	1.95 (1.68, 2.23)
Osorno	8	8	0.49 (0.15, 0.83)	19	1.18 (0.65, 1.70)
Reloncaví	8	20	0.66 (0.37, 0.94)	40	1.30 (0.90, 1.70)
Talcahuano	8	36	1.74 (1.17, 2.30)	59	2.79 (2.09, 3.50)
Valdivia	8	20	0.76 (0.43, 1.10)	53	1.94 (1.42, 2.45)
Valparaíso San Antonio	8	21	0.68 (0.39, 0.98)	53	1.63 (1.20, 2.07)
Viña del Mar Quillota	8	46	0.67 (0.48, 0.87)	99	1.38 (1.11, 1.65)
Ñuble	8	33	1.08 (0.71, 1.45)	59	1.91 (1.42, 2.39)
Aconcagua	9	52	2.62 (1.92, 3.33)	84	4.00 (3.16, 4.83)
Aisén	9	8	1.10 (0.34, 1.87)	24	2.97 (1.80, 4.14)
Antofagasta	9	46	0.97 (0.69, 1.25)	77	1.52 (1.18, 1.86)
Araucanía Norte	9	9	0.61 (0.21, 1.00)	41	2.62 (1.83, 3.41)
Araucanía Sur	9	84	1.57 (1.23, 1.90)	148	2.69 (2.26, 3.12)
Arauco	9	12	0.96 (0.42, 1.51)	26	2.00 (1.24, 2.76)
Arica	9	20	1.09 (0.61, 1.56)	37	1.85 (1.26, 2.44)
Atacama	9	16	0.66 (0.34, 0.98)	17	0.70 (0.37, 1.03)
Biobío	9	63	2.20 (1.66, 2.74)	89	3.08 (2.45, 3.71)
Chiloé	9	25	2.20 (1.35, 3.05)	59	4.57 (3.43, 5.70)
Concepción	9	82	1.85 (1.45, 2.25)	174	3.72 (3.18, 4.26)
Coquimbo	9	90	1.47 (1.17, 1.78)	164	2.68 (2.28, 3.09)
Iquique	9	34	1.22 (0.81, 1.63)	74	2.34 (1.81, 2.86)
Libertador B.O'Higgins	9	101	1.57 (1.27, 1.87)	193	2.81 (2.42, 3.20)
Magallanes	9	22	1.91 (1.12, 2.70)	52	4.79 (3.52, 6.06)
Maule	9	65	0.91 (0.69, 1.13)	166	2.22 (1.89, 2.55)
Metropolitano Central	9	46	0.93 (0.66, 1.19)	95	1.81 (1.45, 2.18)
Metropolitano Norte	9	83	1.13 (0.89, 1.37)	133	1.69 (1.41, 1.98)
Metropolitano Occidente	9	119	1.09 (0.90, 1.29)	197	1.69 (1.46, 1.92)
Metropolitano Oriente	9	64	0.88 (0.66, 1.09)	129	1.67 (1.38, 1.95)
Metropolitano Sur	9	117	1.39 (1.14, 1.64)	186	2.13 (1.82, 2.43)

Metropolitano Sur Oriente	9	121	1.29 (1.06, 1.52)	237	2.40 (2.09, 2.70)
Osorno	9	10	0.63 (0.24, 1.02)	25	1.45 (0.89, 2.02)
Reloncaví	9	18	0.58 (0.31, 0.85)	74	2.30 (1.78, 2.82)
Talcahuano	9	70	3.15 (2.42, 3.87)	84	3.49 (2.76, 4.22)
Valdivia	9	23	0.86 (0.51, 1.21)	54	1.97 (1.45, 2.50)
Valparaíso San Antonio	9	22	0.70 (0.41, 0.99)	52	1.57 (1.15, 1.99)
Viña del Mar Quillota	9	58	0.81 (0.60, 1.02)	171	2.32 (1.98, 2.67)
Ñuble	9	53	1.71 (1.25, 2.16)	105	3.22 (2.62, 3.83)
Aconcagua	10	42	2.12 (1.48, 2.75)	82	3.95 (3.11, 4.79)
Aisén	10	9	1.06 (0.37, 1.74)	35	4.10 (2.77, 5.43)
Antofagasta	10	47	0.94 (0.67, 1.21)	107	2.04 (1.65, 2.42)
Araucanía Norte	10	12	0.81 (0.35, 1.26)	43	2.87 (2.02, 3.72)
Araucanía Sur	10	82	1.51 (1.18, 1.83)	168	2.89 (2.46, 3.32)
Arauco	10	19	1.41 (0.78, 2.04)	35	2.55 (1.72, 3.39)
Arica	10	24	1.25 (0.75, 1.75)	39	1.92 (1.32, 2.51)
Atacama	10	5	0.20 (0.02, 0.37)	17	0.65 (0.34, 0.95)
Biobío	10	59	2.09 (1.56, 2.62)	119	4.01 (3.30, 4.71)
Chiloé	10	30	2.40 (1.55, 3.25)	58	4.66 (3.49, 5.83)
Concepción	10	116	2.38 (1.95, 2.81)	224	4.41 (3.85, 4.98)
Coquimbo	10	107	1.77 (1.44, 2.10)	188	2.98 (2.56, 3.40)
Iquique	10	36	1.21 (0.82, 1.60)	84	2.73 (2.16, 3.31)
Libertador B.O'Higgins	10	106	1.59 (1.29, 1.89)	234	3.37 (2.95, 3.79)
Magallanes	10	35	3.11 (2.09, 4.12)	56	4.69 (3.49, 5.89)
Maule	10	73	0.98 (0.76, 1.21)	205	2.57 (2.22, 2.91)
Metropolitano Central	10	80	1.65 (1.29, 2.00)	169	3.23 (2.75, 3.70)
Metropolitano Norte	10	101	1.38 (1.11, 1.65)	181	2.30 (1.97, 2.64)
Metropolitano Occidente	10	143	1.32 (1.10, 1.53)	267	2.27 (2.00, 2.54)
Metropolitano Oriente	10	87	1.15 (0.91, 1.39)	173	2.16 (1.84, 2.47)
Metropolitano Sur	10	135	1.62 (1.35, 1.89)	230	2.63 (2.29, 2.96)
Metropolitano Sur Oriente	10	159	1.66 (1.41, 1.92)	315	3.09 (2.75, 3.43)
Osorno	10	13	0.76 (0.35, 1.17)	27	1.57 (0.98, 2.16)
Reloncaví	10	25	0.77 (0.47, 1.06)	63	1.81 (1.37, 2.25)
Talcahuano	10	60	2.69 (2.02, 3.37)	104	4.48 (3.64, 5.33)
Valdivia	10	24	0.86 (0.52, 1.21)	66	2.35 (1.79, 2.92)
Valparaíso San Antonio	10	42	1.33 (0.93, 1.73)	68	2.11 (1.62, 2.61)
Viña del Mar Quillota	10	84	1.20 (0.95, 1.46)	170	2.29 (1.95, 2.63)
Ñuble	10	66	2.06 (1.57, 2.55)	137	4.16 (3.48, 4.84)
Aconcagua	11	50	2.63 (1.91, 3.35)	80	3.99 (3.13, 4.85)
Aisén	11	21	2.64 (1.53, 3.76)	35	4.29 (2.90, 5.68)
Antofagasta	11	50	0.98 (0.71, 1.26)	91	1.73 (1.37, 2.08)
Araucanía Norte	11	13	0.92 (0.42, 1.41)	46	3.07 (2.20, 3.94)
Araucanía Sur	11	74	1.36 (1.05, 1.67)	171	3.03 (2.59, 3.48)
Arauco	11	16	1.23 (0.63, 1.83)	46	3.33 (2.38, 4.27)
Arica	11	16	0.87 (0.44, 1.29)	42	2.14 (1.50, 2.78)
Atacama	11	7	0.28 (0.07, 0.48)	28	1.08 (0.68, 1.47)
Biobío	11	53	1.79 (1.32, 2.27)	121	3.90 (3.22, 4.58)
Chiloé	11	28	2.30 (1.46, 3.15)	66	5.05 (3.86, 6.24)
Concepción	11	135	3.01 (2.51, 3.51)	235	4.96 (4.34, 5.58)
Coquimbo	11	124	2.06 (1.70, 2.41)	193	3.11 (2.68, 3.54)
Iquique	11	38	1.32 (0.90, 1.74)	87	2.81 (2.23, 3.39)
Libertador B.O'Higgins	11	111	1.65 (1.34, 1.95)	223	3.16 (2.75, 3.57)
Magallanes	11	26	2.19 (1.36, 3.02)	59	4.98 (3.74, 6.22)
Maule	11	89	1.21 (0.96, 1.46)	196	2.50 (2.16, 2.85)

\$1,000-\$10,000	18	0	0.00 (0.00, 0.00)	0	0.00 (0.00, 0.00)
\$10,001-\$25,000	18	3	0.81 (0.00, 1.72)	3	0.62 (0.00, 1.31)
\$25,001-\$50,000	18	33	1.75 (1.16, 2.34)	59	2.65 (1.98, 3.32)
\$50,001-\$100,000	18	30	1.32 (0.85, 1.78)	95	2.93 (2.35, 3.51)
\$100,001+	18	9	0.28 (0.10, 0.46)	12	0.29 (0.13, 0.45)
No information	18	8	1.08 (0.33, 1.82)	18	1.53 (0.83, 2.23)

Autism prevalence and distribution by age is very similar between Mapuche and non-Indigenous students in the Araucanía, Aysén, Biobío, Los Lagos, Los Ríos, Magallanes and Región Metropolitana de Santiago regions, as shown in Table 9, Figure 13 and Supplementary Figure 56. ADHD prevalence is also consistent across Mapuche and non-Indigenous students, see Table 10, Figure 14 and Supplementary Figure 57. Among students of other Indigenous groups, autism and ADHD prevalence appear to peak in older age groups, however this result is based on very few cases.

Autism and ADHD are slightly more prevalent for students at rural schools and both follow the same age patterns observed earlier. See Tables 11 and 12, Figures 15 and ?? and Supplementary Figures 58 and ??.

5.2 Frequentist prevalence estimation

After using frequentist methods to adjust for the age and sex distribution of the child population of Chile in 2021, the adjusted prevalence of autism was 0.465% (0.457-0.473%) and the adjusted prevalence of ADHD was 1.50% (1.48-1.51%). Among females, the adjusted prevalence of autism was 0.131% (0.125-0.138%) and among males it was 0.787% (0.773-0.801%). Among females, the adjusted prevalence of ADHD was 1.01% (1.00-1.03%) and among males it was 1.97% (1.94-1.99%). As we know the prevalences of autism and ADHD in this data are likely to be underestimates, the age- and sex-adjusted prevalences can be considered a lower bound on the true prevalence of autism and of ADHD in Chile.

Considering school data by health service, shown in Table 13, the adjusted prevalence of autism is much higher in Ñuble at 1.29% (1.21 - 1.37%) than other health services and is low in rural areas such as Araucanía. It is also low in the Metropolitano health services which serve Santiago, Chile's largest city. Adjusted ADHD prevalence, shown in Table 14, is medial for Metropolitano health services and very low for Atacama, a fairly urbanised region, at 0.49% (0.43 - 0.56%).

Table 13: Crude and age- and sex-adjusted autism prevalence by health service in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

Health service	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Aconcagua	0.44 (0.38, 0.50)	0.43 (0.37, 0.50)
Aisén	0.75 (0.63, 0.87)	0.75 (0.63, 0.90)
Antofagasta	0.84 (0.79, 0.89)	0.83 (0.77, 0.88)
Araucanía Norte	0.30 (0.24, 0.36)	0.30 (0.24, 0.38)
Araucanía Sur	0.37 (0.34, 0.40)	0.37 (0.34, 0.41)
Arauco	0.73 (0.64, 0.83)	0.72 (0.62, 0.82)
Arica	0.61 (0.54, 0.68)	0.61 (0.54, 0.70)
Atacama	0.31 (0.26, 0.35)	0.31 (0.27, 0.37)
Biobío	0.43 (0.38, 0.48)	0.42 (0.37, 0.47)
Chiloé	0.45 (0.38, 0.52)	0.43 (0.36, 0.52)
Concepción	0.78 (0.73, 0.84)	0.77 (0.72, 0.83)
Coquimbo	0.41 (0.38, 0.45)	0.40 (0.36, 0.43)
Libertador B.O'Higgins	0.43 (0.40, 0.47)	0.42 (0.39, 0.46)
Maule	0.31 (0.28, 0.33)	0.30 (0.28, 0.33)
Reloncaví	0.42 (0.38, 0.47)	0.42 (0.37, 0.47)

Health service	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Iquique	0.45 (0.40, 0.50)	0.43 (0.38, 0.49)
Magallanes	0.83 (0.72, 0.94)	0.83 (0.72, 0.96)
Metropolitano Central	0.42 (0.38, 0.46)	0.42 (0.38, 0.46)
Metropolitano Norte	0.29 (0.27, 0.32)	0.29 (0.26, 0.31)
Metropolitano Occidente	0.36 (0.34, 0.38)	0.34 (0.32, 0.36)
Metropolitano Oriente	0.30 (0.28, 0.33)	0.30 (0.27, 0.33)
Metropolitano Sur	0.41 (0.39, 0.44)	0.40 (0.37, 0.43)
Metropolitano Sur Oriente	0.37 (0.34, 0.39)	0.36 (0.34, 0.39)
Osorno	0.44 (0.38, 0.51)	0.43 (0.37, 0.51)
Talcahuano	0.84 (0.76, 0.92)	0.81 (0.74, 0.90)
Valdivia	0.31 (0.27, 0.35)	0.30 (0.26, 0.35)
Valparaíso San Antonio	0.69 (0.64, 0.75)	0.68 (0.62, 0.75)
Viña del Mar Quillota	0.67 (0.63, 0.71)	0.66 (0.62, 0.70)
Ñuble	1.32 (1.24, 1.40)	1.29 (1.21, 1.37)

Table 14: Crude and age- and sex-adjusted ADHD prevalence by health service in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

Health service	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Aconcagua	2.08 (1.95, 2.21)	2.04 (1.91, 2.19)
Aisén	2.23 (2.03, 2.44)	2.17 (1.97, 2.40)
Antofagasta	1.00 (0.94, 1.06)	0.98 (0.93, 1.04)
Araucanía Norte	1.33 (1.22, 1.45)	1.29 (1.18, 1.43)
Araucanía Sur	1.42 (1.36, 1.49)	1.38 (1.32, 1.45)
Arauco	1.64 (1.50, 1.78)	1.64 (1.50, 1.81)
Arica	1.14 (1.04, 1.24)	1.12 (1.02, 1.24)
Atacama	0.49 (0.44, 0.55)	0.49 (0.43, 0.56)
Biobío	2.27 (2.16, 2.38)	2.26 (2.15, 2.38)
Chiloé	2.96 (2.77, 3.15)	2.87 (2.68, 3.07)
Concepción	2.94 (2.84, 3.04)	3.00 (2.89, 3.11)
Coquimbo	1.98 (1.91, 2.05)	2.00 (1.92, 2.08)
Libertador B.O'Higgins	1.73 (1.66, 1.79)	1.69 (1.63, 1.76)
Maule	1.19 (1.14, 1.24)	1.15 (1.11, 1.21)
Reloncaví	1.02 (0.95, 1.09)	0.99 (0.92, 1.07)
Iquique	1.49 (1.40, 1.58)	1.50 (1.40, 1.60)
Magallanes	3.07 (2.87, 3.27)	3.06 (2.85, 3.29)
Metropolitano Central	1.53 (1.46, 1.59)	1.49 (1.43, 1.57)
Metropolitano Norte	1.42 (1.36, 1.47)	1.42 (1.36, 1.48)
Metropolitano Occidente	1.09 (1.05, 1.13)	1.12 (1.08, 1.17)
Metropolitano Oriente	1.21 (1.16, 1.26)	1.20 (1.15, 1.25)
Metropolitano Sur	1.42 (1.37, 1.48)	1.41 (1.35, 1.46)
Metropolitano Sur Oriente	1.56 (1.51, 1.61)	1.53 (1.48, 1.58)
Osorno	1.05 (0.95, 1.14)	1.02 (0.92, 1.13)
Talcahuano	3.07 (2.93, 3.22)	3.02 (2.87, 3.18)
Valdivia	1.08 (1.00, 1.16)	1.06 (0.98, 1.15)
Valparaíso San Antonio	1.21 (1.13, 1.29)	1.21 (1.13, 1.29)
Viña del Mar Quillota	1.17 (1.12, 1.22)	1.15 (1.10, 1.20)
Ñuble	2.12 (2.02, 2.22)	2.11 (2.00, 2.22)

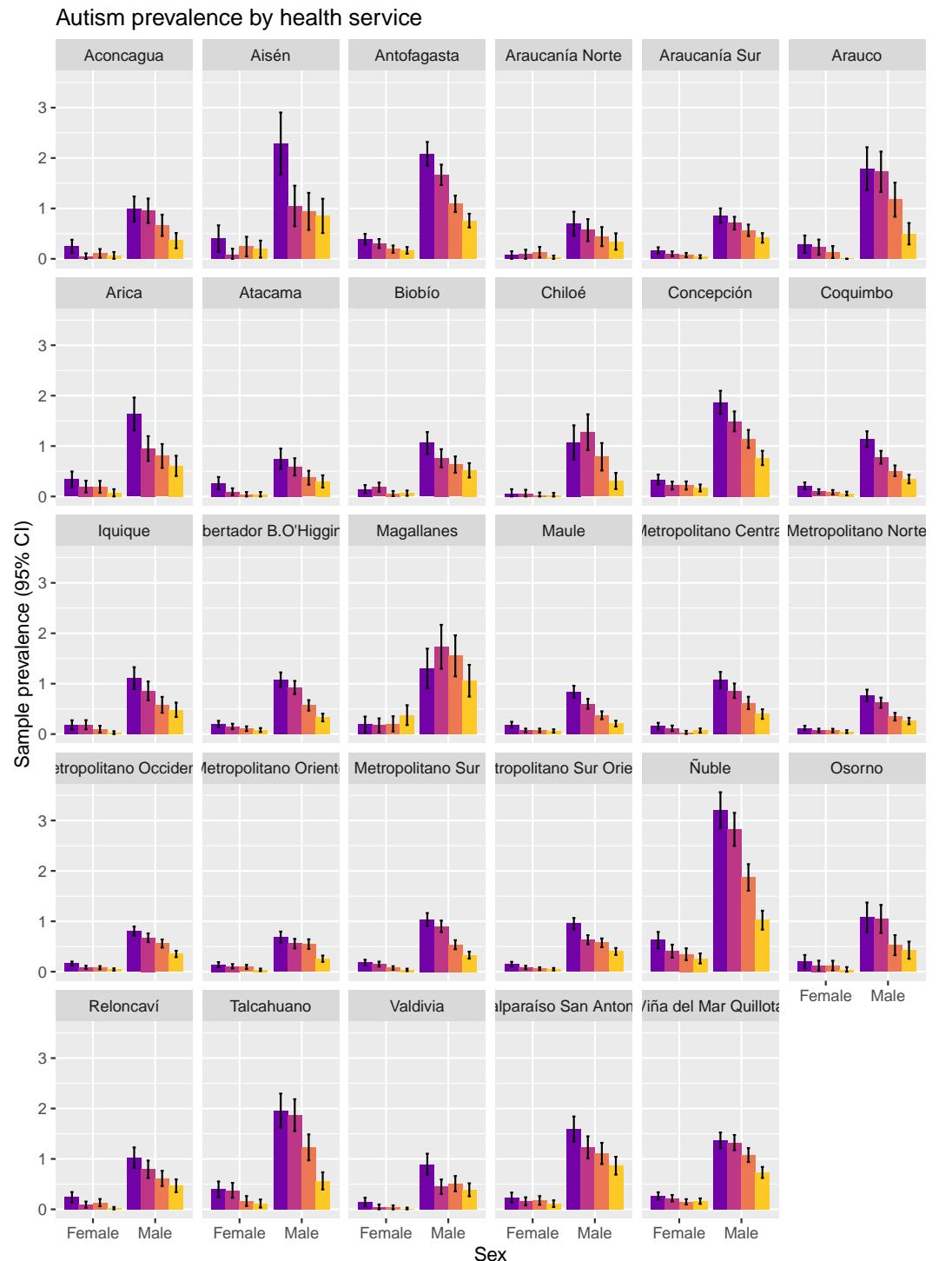


Figure 9: Sample prevalence of autism by health service, age band and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by health service

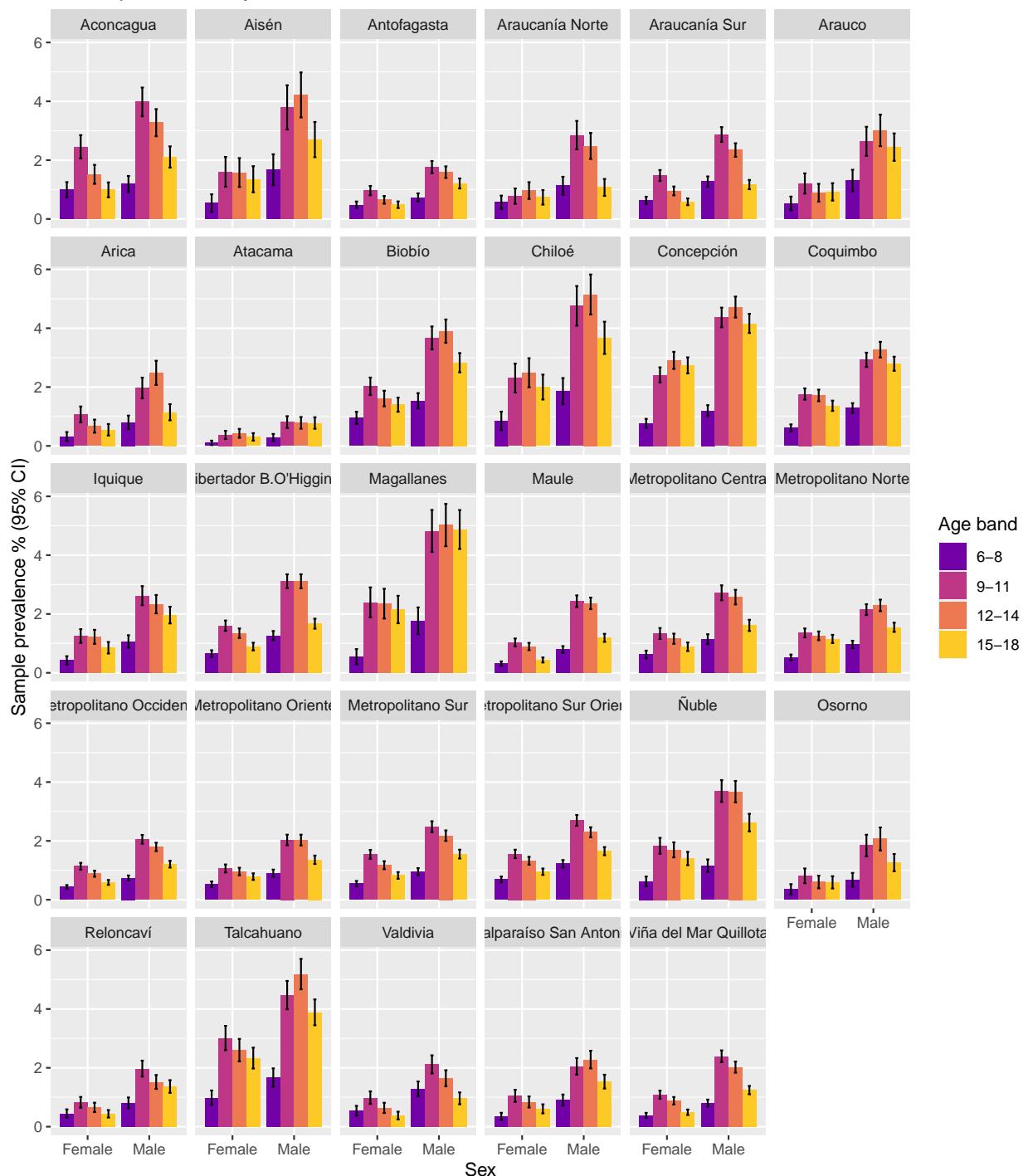


Figure 10: Sample prevalence of ADHD by health service, age band and sex. Bars show 95% normal confidence intervals.

Autism prevalence by school fee

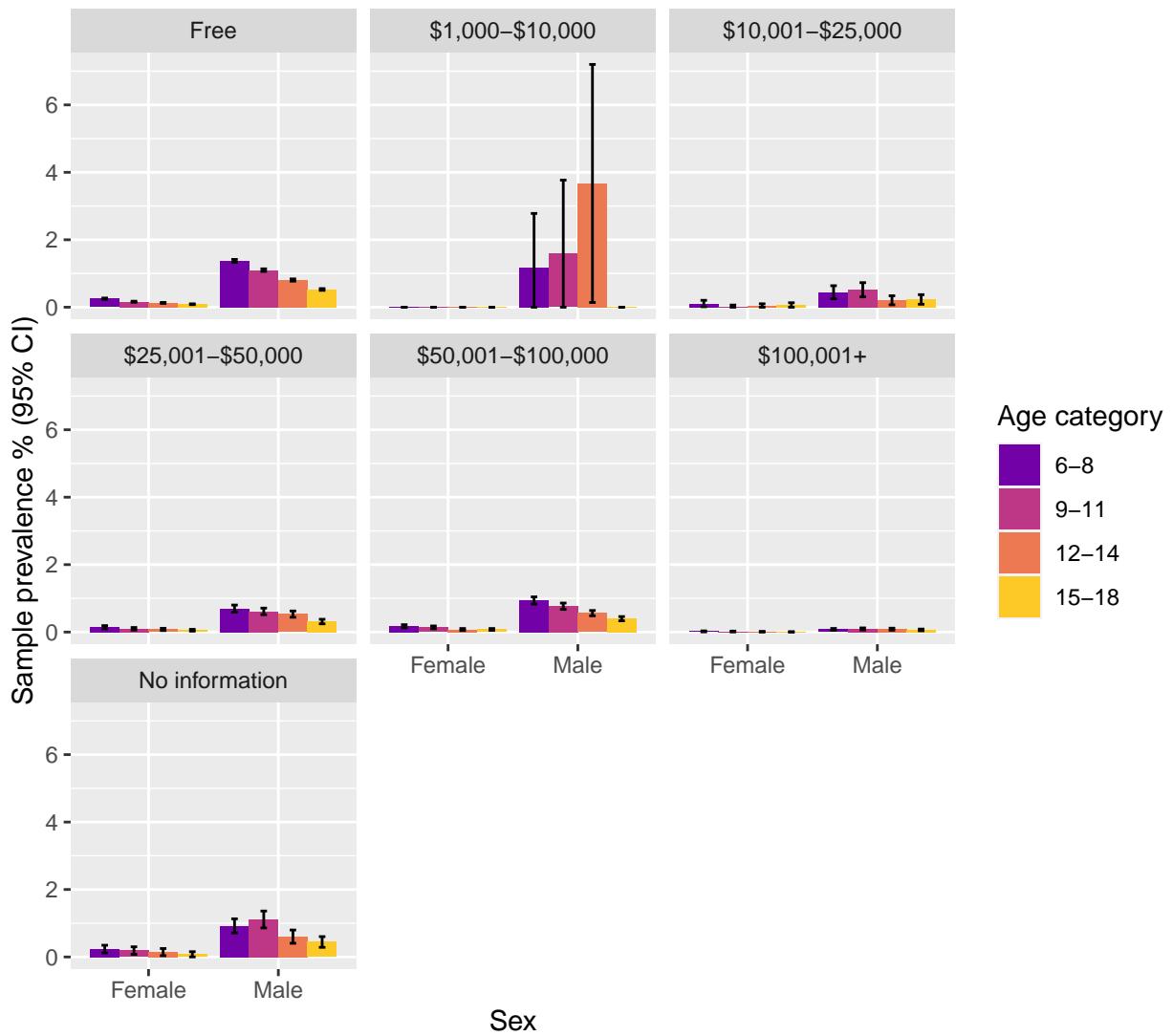


Figure 11: Sample prevalence of autism by student's monthly school fee (Peso), age band and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by school fee

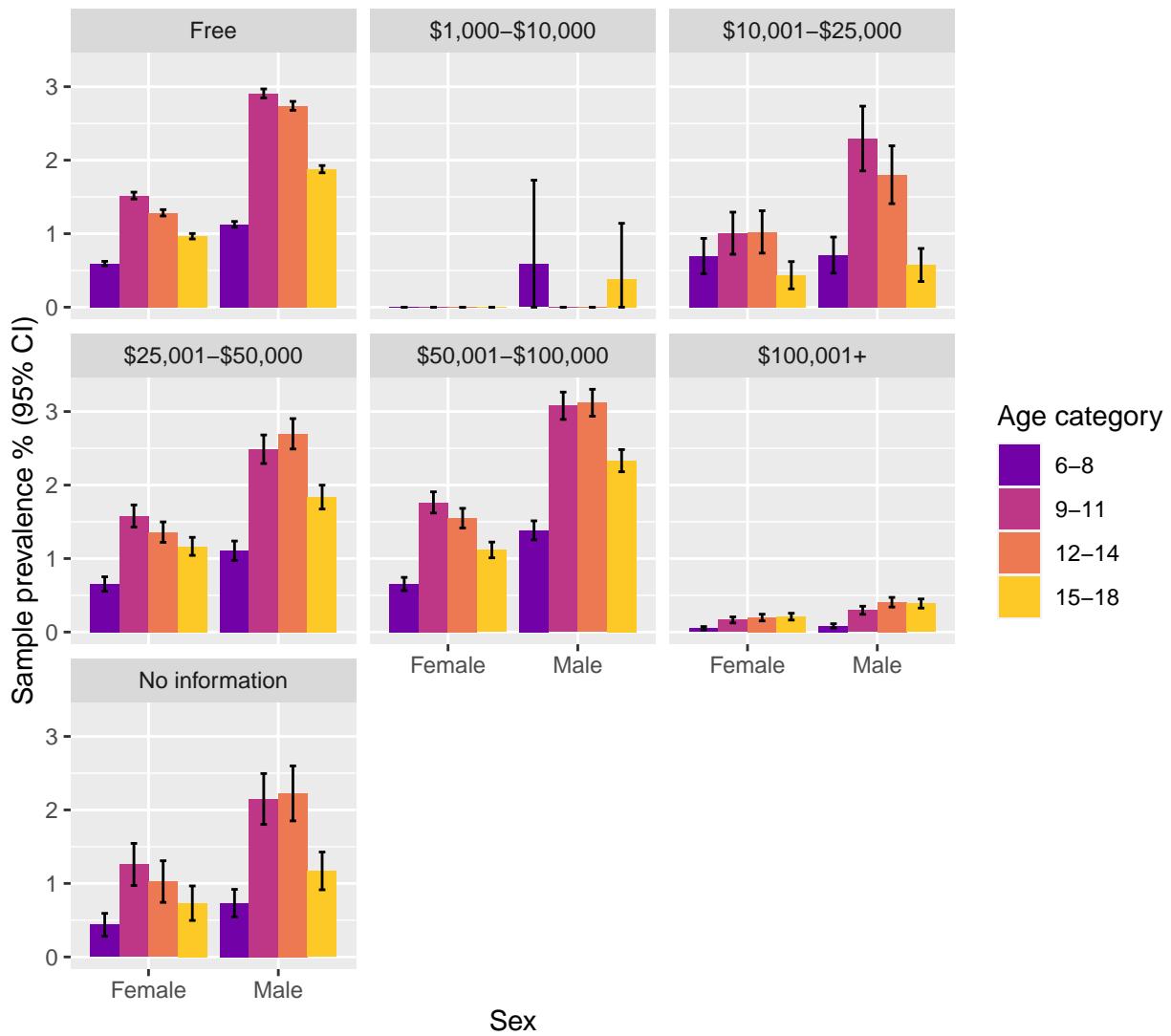


Figure 12: Sample prevalence of ADHD by student's monthly school fee (Peso), age band and sex. Bars show 95% normal confidence intervals.

Autism prevalence by ethnicity

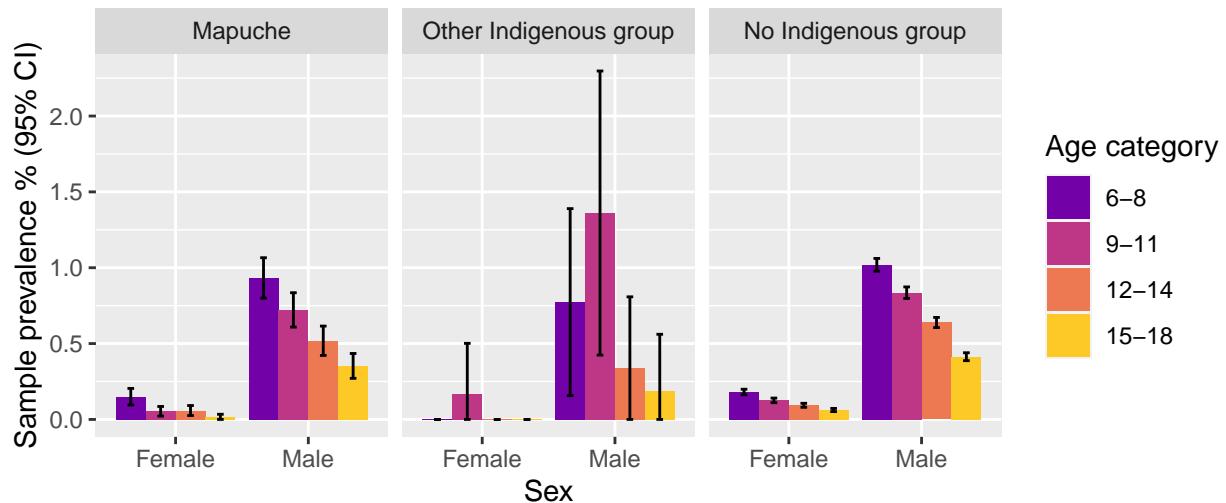


Figure 13: Sample prevalence of autism by ethnicity, age band and sex. Bars show 95% normal confidence intervals. Regions with high Mapuche populations only.

ADHD prevalence by ethnicity

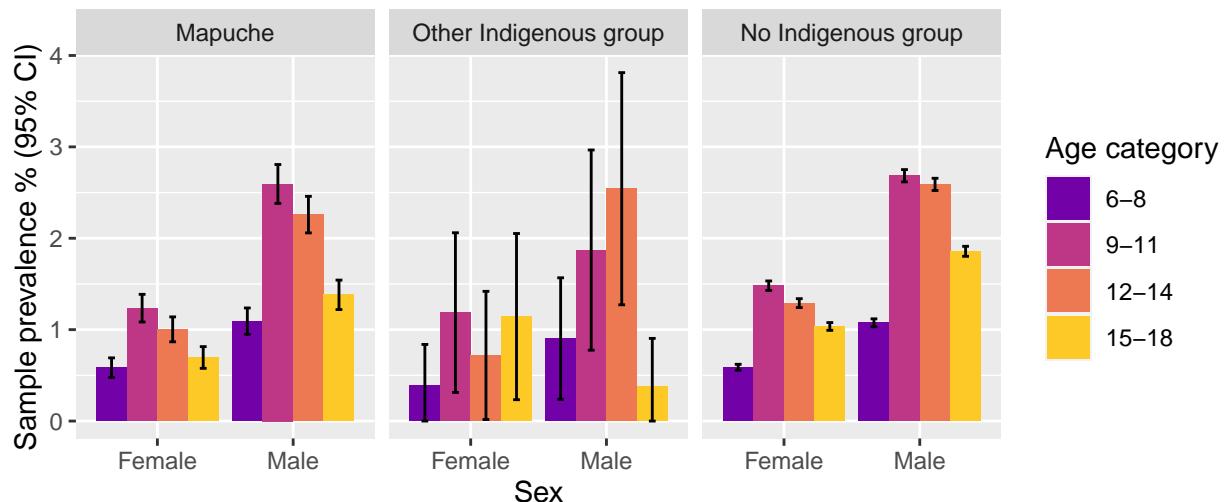


Figure 14: Sample prevalence of ADHD by ethnicity, age band and sex. Bars show 95% normal confidence intervals. Regions with high Mapuche populations only.

Table 11: Count and prevalence of Autism cases by school's rurality and age in Chile school data for females and males with normal confidence intervals.

School rurality	Age	Female		Male	
		Autism cases	Prevalence % (95% CI)	Autism cases	Prevalence % (95% CI)
Rural	6	33	0.28 (0.19, 0.38)	168	1.33 (1.13, 1.53)
Urban	6	261	0.23 (0.21, 0.26)	1344	1.16 (1.10, 1.22)
Rural	7	31	0.26 (0.17, 0.35)	184	1.37 (1.17, 1.56)
Urban	7	210	0.19 (0.17, 0.22)	1299	1.13 (1.07, 1.19)
Rural	8	29	0.24 (0.15, 0.33)	167	1.30 (1.10, 1.49)
Urban	8	210	0.19 (0.17, 0.22)	1226	1.08 (1.02, 1.14)
Rural	9	26	0.21 (0.13, 0.29)	166	1.24 (1.05, 1.43)
Urban	9	172	0.16 (0.13, 0.18)	1159	1.00 (0.94, 1.06)
Rural	10	13	0.10 (0.05, 0.16)	157	1.12 (0.94, 1.29)
Urban	10	149	0.13 (0.11, 0.15)	1116	0.94 (0.89, 1.00)
Rural	11	22	0.17 (0.10, 0.24)	149	1.06 (0.89, 1.23)
Urban	11	141	0.13 (0.10, 0.15)	942	0.80 (0.75, 0.85)
Rural	12	20	0.17 (0.10, 0.25)	120	0.93 (0.76, 1.09)
Urban	12	114	0.10 (0.08, 0.12)	922	0.78 (0.73, 0.83)
Rural	13	20	0.19 (0.11, 0.27)	107	0.89 (0.72, 1.06)
Urban	13	125	0.11 (0.09, 0.13)	805	0.69 (0.64, 0.74)
Rural	14	4	0.09 (0.00, 0.17)	64	1.00 (0.75, 1.24)
Urban	14	108	0.10 (0.08, 0.11)	629	0.54 (0.49, 0.58)
Rural	15	2	0.05 (0.00, 0.13)	35	0.72 (0.48, 0.96)
Urban	15	94	0.08 (0.07, 0.10)	549	0.47 (0.43, 0.51)
Rural	16	6	0.17 (0.04, 0.31)	30	0.70 (0.45, 0.95)
Urban	16	94	0.08 (0.07, 0.10)	535	0.46 (0.42, 0.50)
Rural	17	0	0.00 (0.00, 0.00)	16	0.39 (0.20, 0.58)
Urban	17	55	0.05 (0.04, 0.06)	420	0.37 (0.33, 0.40)
Rural	18	1	0.08 (0.00, 0.25)	11	0.59 (0.24, 0.94)
Urban	18	38	0.10 (0.07, 0.14)	251	0.52 (0.46, 0.59)

Table 12: Count and prevalence of ADHD cases by school's rurality and age in Chile school data for females and males with normal confidence intervals.

School rurality	Age	Female		Male	
		ADHD cases	Prevalence % (95% CI)	ADHD cases	Prevalence % (95% CI)
Rural	6	25	0.21 (0.13, 0.30)	65	0.52 (0.39, 0.64)
Urban	6	237	0.21 (0.19, 0.24)	413	0.36 (0.32, 0.39)
Rural	7	58	0.48 (0.36, 0.60)	172	1.28 (1.09, 1.47)
Urban	7	592	0.54 (0.50, 0.58)	1143	0.99 (0.94, 1.05)
Rural	8	138	1.14 (0.95, 1.33)	266	2.06 (1.82, 2.31)
Urban	8	942	0.87 (0.81, 0.92)	1885	1.67 (1.59, 1.74)
Rural	9	155	1.26 (1.06, 1.45)	382	2.85 (2.57, 3.13)
Urban	9	1378	1.24 (1.18, 1.31)	2585	2.23 (2.14, 2.31)
Rural	10	177	1.41 (1.20, 1.61)	483	3.43 (3.13, 3.74)
Urban	10	1644	1.45 (1.38, 1.52)	3181	2.69 (2.60, 2.78)
Rural	11	200	1.56 (1.35, 1.78)	439	3.12 (2.84, 3.41)
Urban	11	1673	1.49 (1.42, 1.56)	3252	2.77 (2.68, 2.87)
Rural	12	141	1.23 (1.03, 1.43)	402	3.10 (2.80, 3.40)
Urban	12	1602	1.40 (1.34, 1.47)	3180	2.68 (2.59, 2.77)
Rural	13	123	1.16 (0.96, 1.37)	344	2.87 (2.57, 3.17)
Urban	13	1349	1.21 (1.15, 1.27)	3032	2.61 (2.51, 2.70)
Rural	14	59	1.26 (0.94, 1.58)	200	3.11 (2.69, 3.54)
Urban	14	1111	0.98 (0.92, 1.04)	2556	2.18 (2.10, 2.26)
Rural	15	45	1.21 (0.86, 1.56)	106	2.18 (1.77, 2.60)
Urban	15	1023	0.92 (0.86, 0.98)	2246	1.94 (1.86, 2.01)
Rural	16	29	0.84 (0.54, 1.15)	81	1.88 (1.48, 2.29)
Urban	16	994	0.89 (0.84, 0.95)	2016	1.74 (1.67, 1.82)
Rural	17	30	0.93 (0.60, 1.26)	71	1.74 (1.34, 2.14)
Urban	17	964	0.87 (0.81, 0.92)	1805	1.58 (1.51, 1.65)
Rural	18	8	0.67 (0.21, 1.13)	29	1.55 (0.99, 2.11)
Urban	18	382	1.05 (0.95, 1.16)	811	1.68 (1.57, 1.80)

Autism prevalence by school's rurality

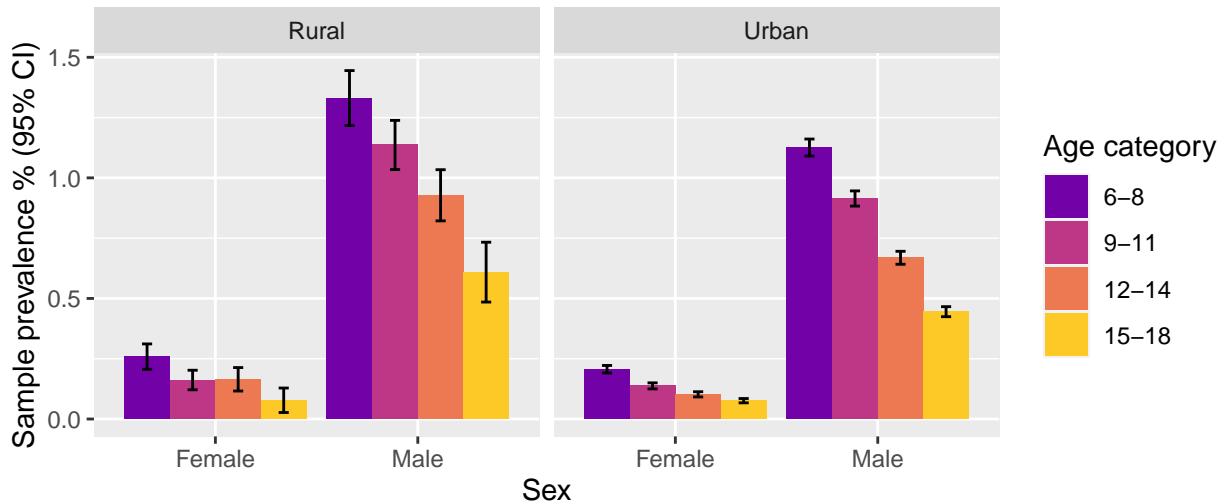


Figure 15: Sample prevalence of autism by school's rurality, age band and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by school's rurality

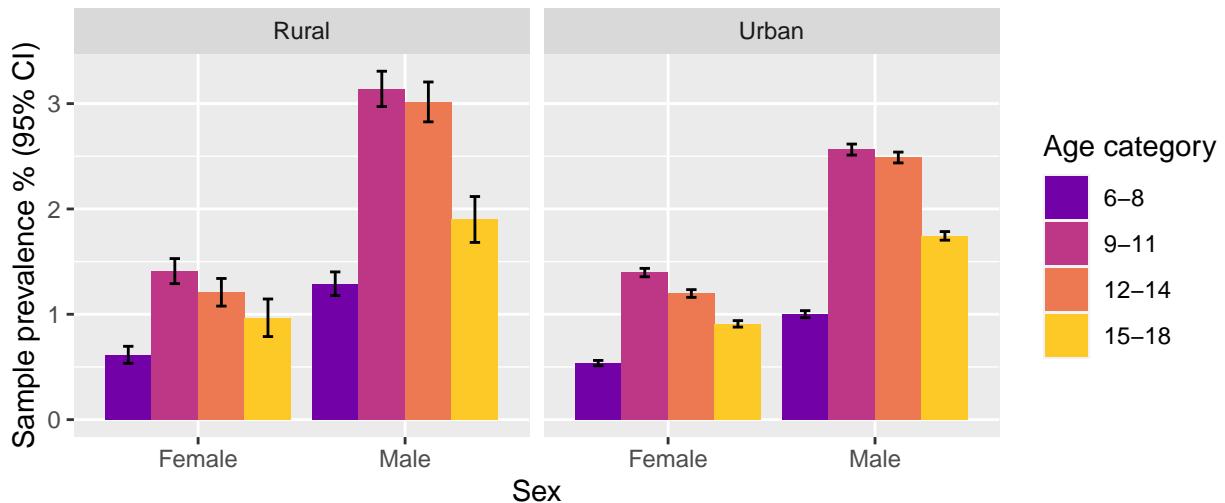


Figure 16: Sample prevalence of ADHD by school's rurality, age band and sex. Bars show 95% normal confidence intervals.

For both autism and ADHD, adjusted prevalences by school fees, ethnicity and school's rurality show similar patterns to crude prevalences, except for students at rural schools which have notably lower adjusted prevalence for both conditions. See tables 15 - 20. These results indicate that for autism and ADHD there are differences in prevalence across location and demographic features.

Table 15: Crude and age- and sex-adjusted autism prevalence by monthly school fee (Peso) in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

School fee	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Free	0.57 (0.56, 0.58)	0.55 (0.54, 0.56)
\$1,000-\$10,000	0.71 (0.22, 1.21)	0.69 (0.29, 3.25)
\$10,001-\$25,000	0.20 (0.15, 0.25)	0.20 (0.16, 0.27)
\$25,001-\$50,000	0.30 (0.28, 0.33)	0.32 (0.29, 0.34)
\$50,001-\$100,000	0.39 (0.36, 0.41)	0.40 (0.37, 0.43)
\$100,001+	0.05 (0.04, 0.05)	0.05 (0.04, 0.06)
No information	0.50 (0.44, 0.57)	0.46 (0.40, 0.52)

Table 16: Crude and age- and sex-adjusted ADHD prevalence by monthly school fee (Peso) in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

School fee	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Free	1.65 (1.63, 1.67)	1.62 (1.60, 1.64)
\$1,000-\$10,000	0.18 (0.00, 0.43)	0.11 (0.01, 2.74)
\$10,001-\$25,000	1.06 (0.95, 1.16)	1.05 (0.94, 1.17)
\$25,001-\$50,000	1.59 (1.54, 1.65)	1.65 (1.59, 1.72)
\$50,001-\$100,000	1.90 (1.84, 1.95)	1.90 (1.84, 1.96)
\$100,001+	0.22 (0.21, 0.24)	0.23 (0.21, 0.25)
No information	1.21 (1.11, 1.31)	1.22 (1.13, 1.33)

Table 17: Crude and age- and sex-adjusted autism prevalence by ethnicity in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

Ethnicity	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Mapuche	0.36 (0.33, 0.39)	0.34 (0.31, 0.37)
Other Indigenous group	0.37 (0.20, 0.54)	0.38 (0.21, 0.75)
No Indigenous group	0.43 (0.42, 0.44)	0.42 (0.41, 0.43)

Table 18: Crude and age- and sex-adjusted ADHD prevalence by ethnicity in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

Ethnicity	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Mapuche	1.38 (1.32, 1.44)	1.33 (1.28, 1.39)
Other Indigenous group	1.12 (0.82, 1.41)	1.10 (0.83, 1.55)
No Indigenous group	1.59 (1.57, 1.61)	1.58 (1.56, 1.60)

Table 19: Crude and age- and sex-adjusted autism prevalence by school's rurality in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

School rurality	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Rural	0.66 (0.63, 0.69)	0.57 (0.54, 0.61)
Urban	0.46 (0.45, 0.47)	0.46 (0.45, 0.46)

Table 20: Crude and age- and sex-adjusted ADHD prevalence by school's rurality in Chile school data. Crude prevalence has 95% normal confidence intervals and adjusted prevalence has 95% gamma confidence intervals.

School rurality	Crude prevalence (95% CI)	Adjusted prevalence (95% CI)
Rural	1.77 (1.72, 1.82)	1.67 (1.61, 1.74)
Urban	1.49 (1.48, 1.50)	1.48 (1.47, 1.50)

5.3 Clinical data

The small clinical dataset has data on 2,263 appointments for 405 unique patients aged 1-18 in 2021, of which 247 patients have autism and have lived in a commune in the SSAS catchment area during the period the data covers. Among the patients with autism that live in SSAS, 55 (22.27%) are female, 4 (1.62%) are Mapuche, 221 (89.47%) live in an urban area, 12 (4.86%) have a disability and 2 (0.81%) have experienced foster care. 17 (6.88%) have an intellectual disability as well as autism.

5.4 Multiple Correspondence Analysis

Multiple correspondence analysis was first conducted with all features thought to be associated with autism diagnosis with no imputation. Figure 17 shows approximately 14.6% of the variance in this data can be captured by the first two dimensions of MCA. Disability and foster care status are well separated by the first dimension but Figures 26 and 27 show that this separation is primarily driven by whether information is available for these features. Ethnicity, age band and commune of residence are well separated by the second dimension of MCA, as shown in Figure 17, and are somewhat separated by the first dimension. Figures 18 and 19 further shows the importance of categories within the foster care, disabilities, ethnicity, age band and commune features for explaining the variance in this data. In particular, categories that explain more of the variance include not having disability or foster care status, or not having information on these, age 0-2 and 3-5, being foreign or Chilean, living in Toltén and having private health insurance. Examining the clustering of individual patients by the first two dimensions of MCA, Figure 20 demonstrates that patients in age bands 0-2 and 3-5 cluster well and those in older age bands do not. There is some clustering by ethnicity

Table 21: Count and percentage of features' values in the small clinical dataset.

Feature	Available values	Count (%)
Sex	Female	55 (22.27%)
Sex	Male	192 (77.73%)
Age band	Age 0-2	13 (5.26%)
Age band	Age 3-5	55 (22.27%)
Age band	Age 6-8	37 (14.98%)
Age band	Age 9-11	56 (22.67%)
Age band	Age 12-14	45 (18.22%)
Age band	Age 15-18	41 (16.60%)
Private health level	FONASA - A	99 (40.08%)
Private health level	FONASA - B	67 (27.13%)
Private health level	FONASA - C	35 (14.17%)
Private health level	FONASA - D	38 (15.38%)
Private health level	Private Health Insurance	8 (3.24%)
Commune	Curarrehue	6 (2.43%)
Commune	Freire	2 (0.81%)
Commune	Gorbea	1 (0.40%)
Commune	Loncoche	39 (15.79%)
Commune	Nueva Imperial	1 (0.40%)
Commune	Pitrufquén	2 (0.81%)
Commune	Pucón	50 (20.24%)
Commune	Temuco	7 (2.83%)
Commune	Teodoro Schmidt	1 (0.40%)
Commune	Toltén	1 (0.40%)
Commune	Villarrica	137 (55.47%)
Rurality	Rural	26 (10.53%)
Rurality	Urban	221 (89.47%)
Ethnicity	Mapuche	4 (1.62%)
Ethnicity	Chilean	131 (53.04%)
Ethnicity	Foreign	32 (12.96%)
Ethnicity	No ethnicity information	80 (32.39%)
Disability	Yes disability	12 (4.86%)
Disability	No disability	78 (31.58%)
Disability	No disability information	157 (63.56%)
Foster care	Yes foster care	2 (0.81%)
Foster care	No foster care	88 (35.63%)
Foster care	No foster care information	157 (63.56%)
Intellectual disability	Yes intellectual disability	17 (6.88%)
Intellectual disability	No intellectual disability	230 (93.12%)

in Figure 21 but it is obscured by the separation of points into the two larger clustered defined by having or not having information on disability and foster care status. Figure 22 shows clear separation of Toltén and Nueva Imperial communes, however it is important to know here that these and several other communes are represented by only one patient, see Table 21. There is decent clustering of patients in Temuco and Pitrufquén communes. Figure 23 shows possible separation for patients with private health insurance and Figures 24 and 25 show little clustering by sex or rurality of residence.

Categorical features by first two dimensions, no imputation

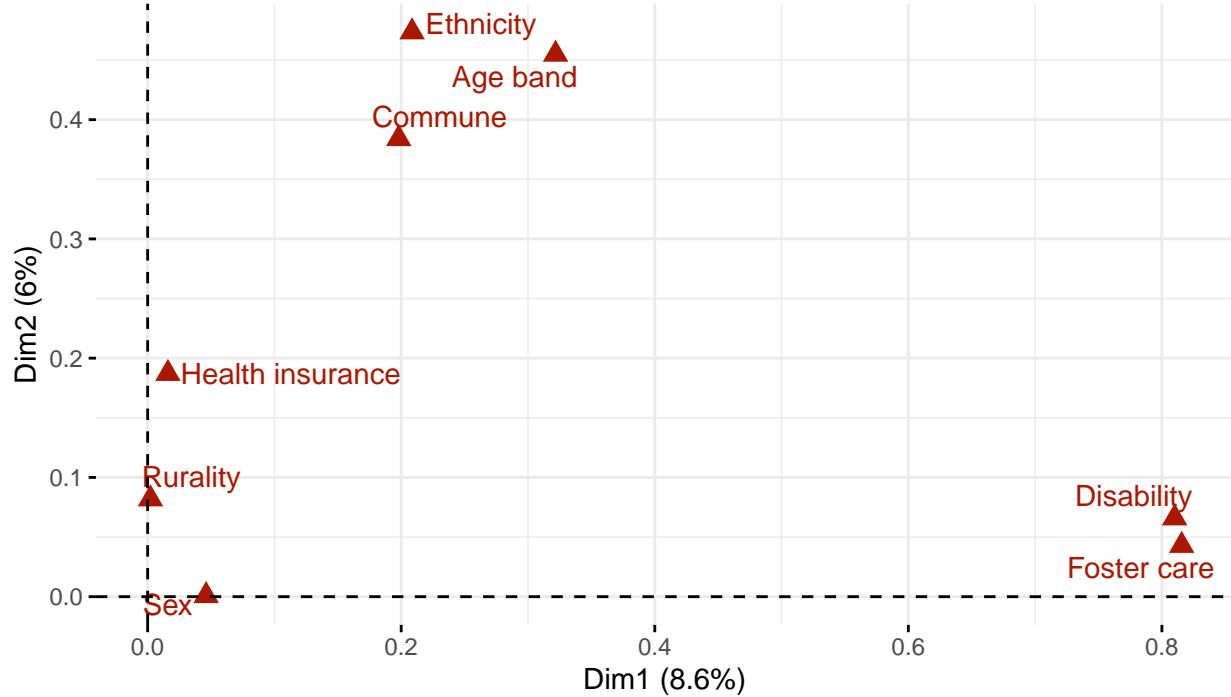


Figure 17: Categorical features by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation.

Exchanging disability and foster care status for their imputed versions leads to the MCA capturing approximately 14.1% of the variance in that data with its first two dimensions, as shown in Figure 28. Disability and foster care status are no longer well separated by the first dimension and Figures 37 and 38 show that the patients who have experienced foster care do cluster well but the patients with a disability do not. In Figure 28, age band and ethnicity are now well separated by both dimensions and commune mostly by the second. With the reduced importance of disability and foster care, age bands 0-2 and 3-5, foreign, no information and Chilean ethnicity and Toltén and Nueva Imperial communes contribute most to the first two dimensions, see Figures 29 and 30. Again patients with age bands 0-2 and 3-5 cluster well and older age bands do not, as shown in Figure 31. Figure 32 shows much clearer clustering of ethnicity than before. For communes with more than one patient resident, clustering is less clear than before with only Pitrufquén well separated by these dimensions, see Figure 33. In Figures 34, 35 and 36, clustering by feature is weak.

MCA on the small clinical data using only age band, ethnicity and commune results in the first two dimensions capturing 17.8% of the variance in that data, see Figure 39, and these features are fairly well represented by the first two dimensions. Again age bands 0-2 and 3-5, foreign, no information and Chilean ethnicity and Toltén and Nueva Imperial communes contribute most to the first two dimensions, see Figures 40 and 41. By patient, age bands 0-2 and 3-5 still cluster well (Figure 42), ethnicity clusters are very distinct (Figure 43), and communes show more structure than previously (Figure 44).

Contribution of categories to first two dimensions, no imputation

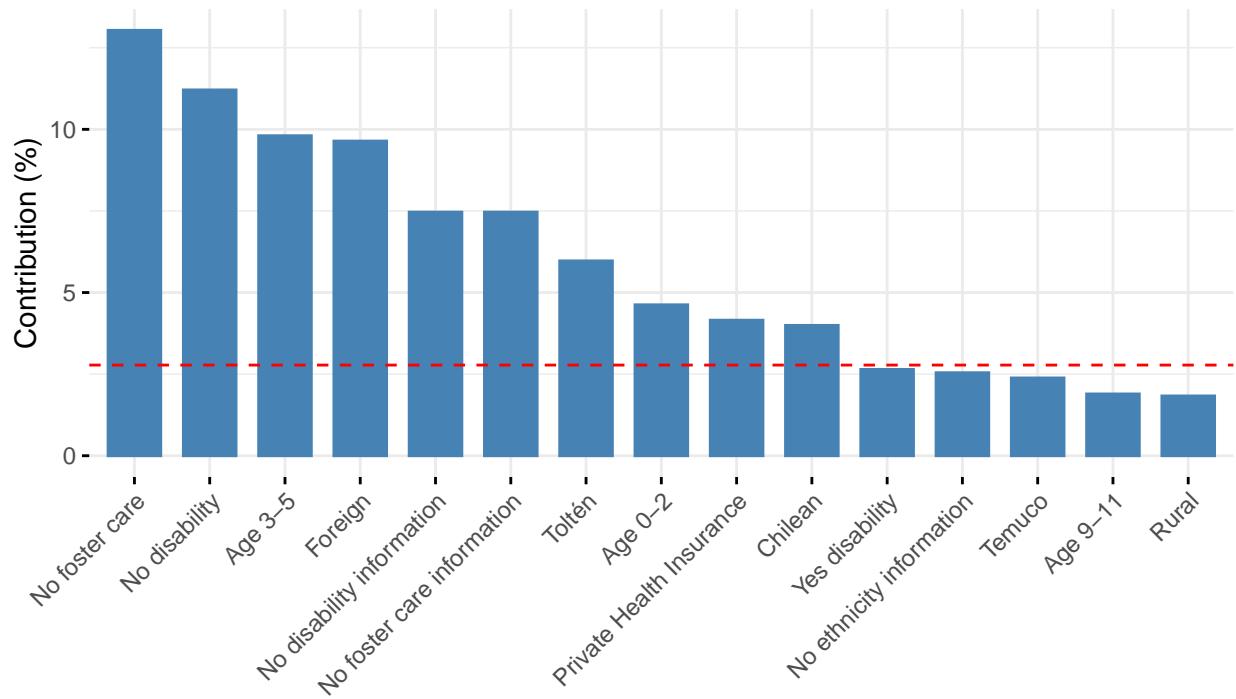


Figure 18: Contribution of the top 15 categories to the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation. The red line shows the expected average if contributions were uniform.

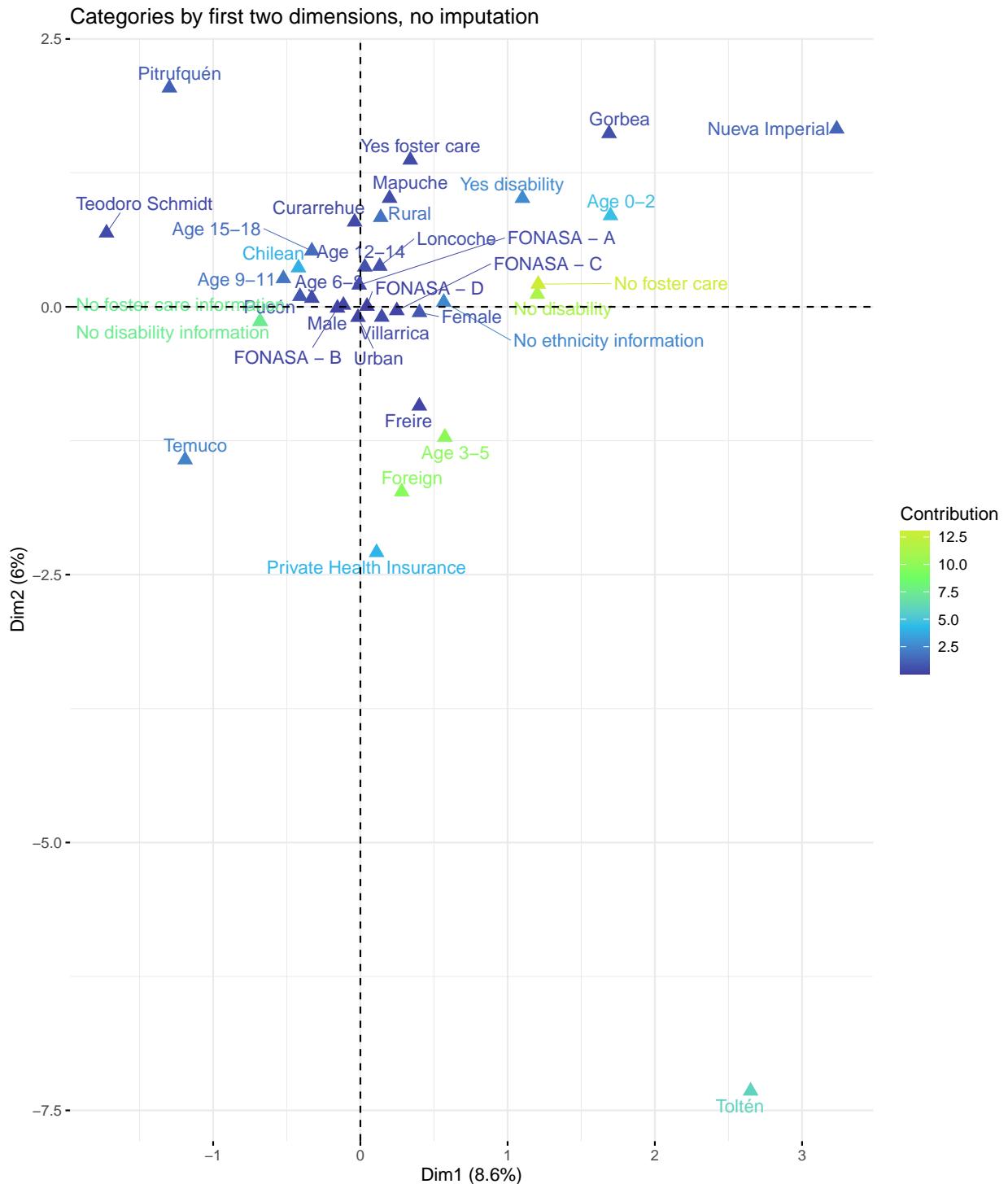


Figure 19: Available categories by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation. Brighter, more yellow colours indicate larger contribution to the first two dimensions.

Patients by age band, no imputation

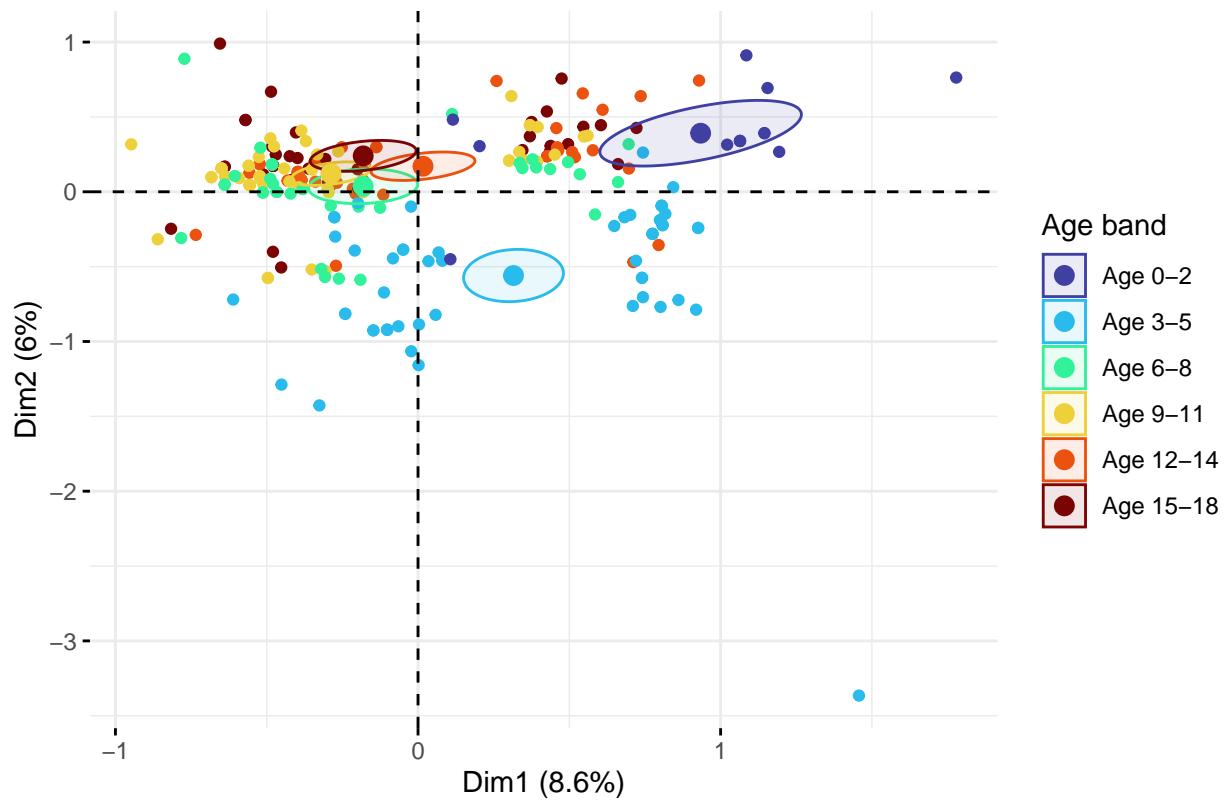


Figure 20: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by age band.

Patients by ethnicity, no imputation

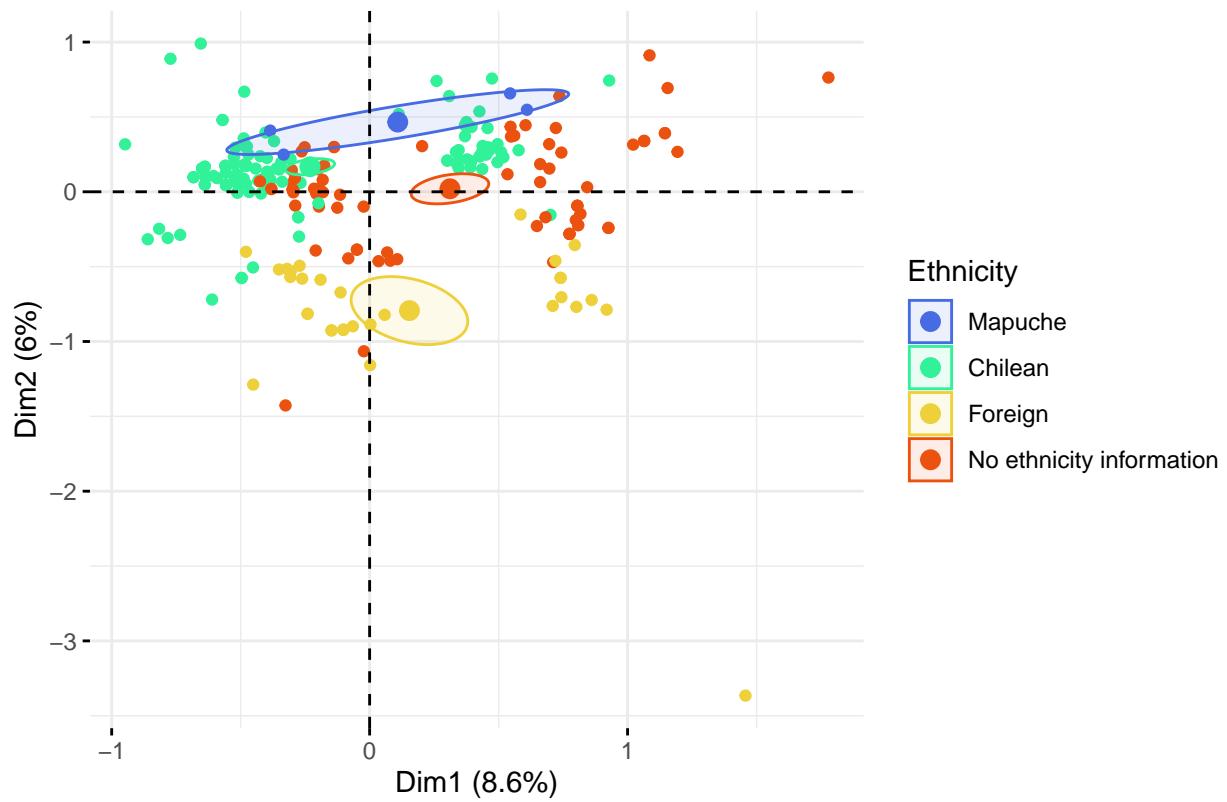


Figure 21: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by ethnicity.

Patients by commune of residence, no imputation

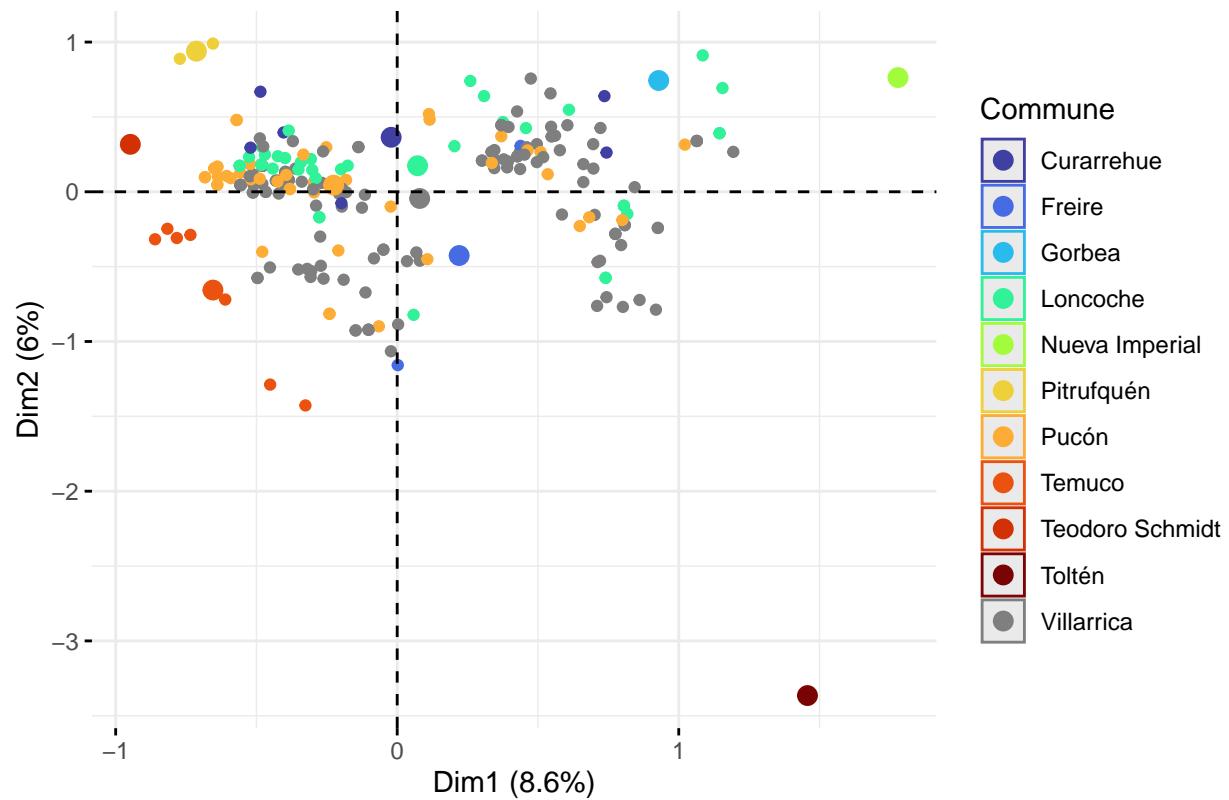


Figure 22: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by commune of residence.

Patients by SES status, no imputation

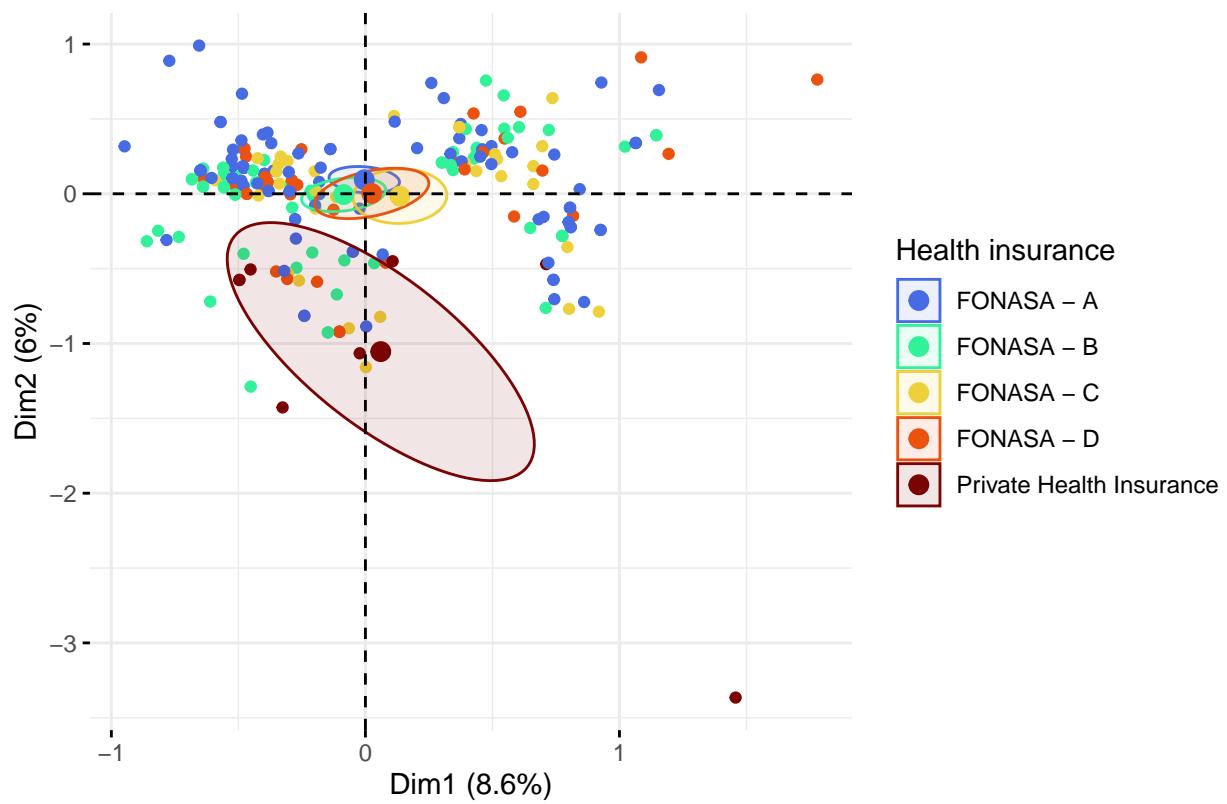


Figure 23: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by health insurance level.

Patients by sex, no imputation

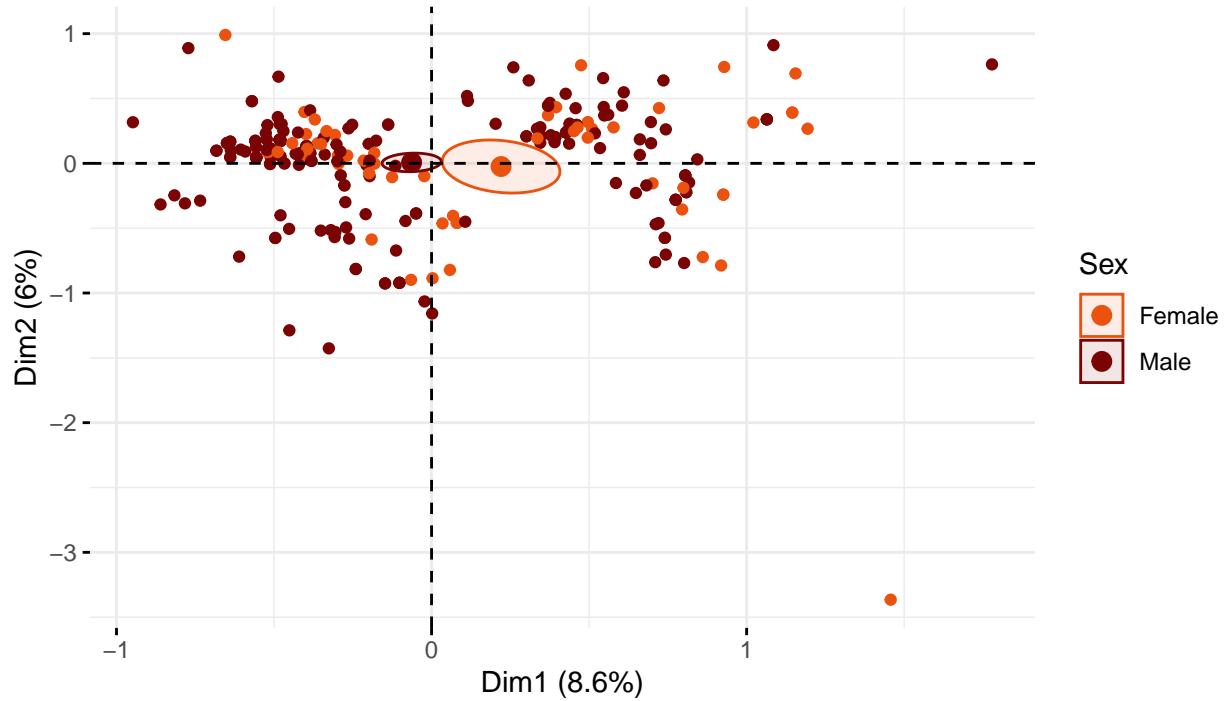


Figure 24: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by sex.

5.5 Linkage of school and patient records

In the school records, 132,242 students live in SSAS health service catchment, of which 488 (0.37%) have autism.

Aggregating the combined clinical data to patient-level data for linkage resulted in the patient dataset with 1,528 records for 1,514 unique patients as 12 patients lived in 2 communes and 1 lived in 3 during the period covered by the data.

5.5.1 Manual record linkage

Using perfect match on sex, date of birth, commune of residence and the proxies for SES, 79 matches can be found between the school and patient records. Of these, 77 unique school records can be perfectly matched to clinical records, and all perfect matches were for unique patients. When mismatch on SES proxy is allowed, 197 matches can be manually found between the school and patient records. Of these, 188 unique school records can be perfectly matched to clinical records and 193 patients can be perfectly matched to school records.

5.5.2 Probabilistic record linkage

Blocking on sex and date of birth, resulted in 301 blocked pairs. Probabilistic matching on sex, date of birth, commune of residence and the proxies for SES with selection of possible matches to create a bijective set of matches resulted in 236 matches of unique school and patient records. This corresponds to 48.26% of the school records having a match in the patient records, 15.45% of the patient records having a match in the school records and 15.59% of the unique patients having a match in the school records. For each patient that had lived more than one commune and therefore appeared more than once in the patient data, only one match to a school record was made, meaning the linked data was bijective for school records and unique

Patients by rurality, no imputation

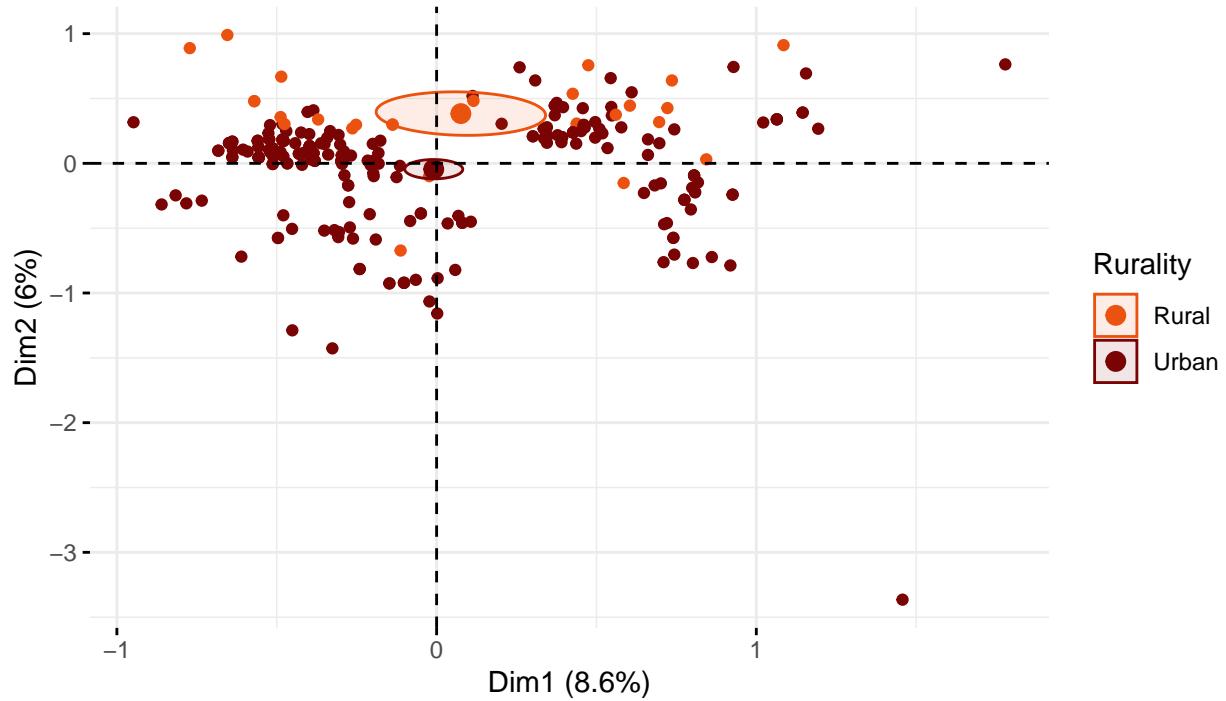


Figure 25: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by rurality of residence.

patients. 3 matches were made between a school record and a patient that did not have autism, rather had intellectual disability. For each of these, only one patient had sex and date of birth that perfectly matched the sex and date of birth in the school records, therefore no match to a patient with autism was available and thus these matches to patients with diagnosis of intellectual disability only were retained.

Analysis of differences between matched and unmatched records in the school data and in the patient data by sex, commune and proxy for SES are provided in the Supplementary Figures. Kolmogorov-Smirnov permutation tests found no difference in frequency of sexes between matched and unmatched school records, see Figure 60. They did find a difference in the frequency of sexes between matched and unmatched patient records, see Figure 61. This difference is likely due to the sex ratios differing across the datasets: the school data is 12.47% female, the patient data is 21.34% female and the matches are 13.14% females. Kolmogorov-Smirnov permutation testing found matched and unmatched records differed by commune for both the school data, see Figure 62, and patient data, see Figure 62. This appears to be driven by the matchability of students and patients living in Temuco, the most prevalent commune. Differences were also found by proxy SES for both school and patient data, see Figure 64 and Figure 65 respectively, likely reflecting different frequencies in these values across datasets. Kolmogorov-Smirnov permutation testing was not conducted for date of birth as this feature contains too many categories for results to be meaningful.

5.5.3 Linked dataset

The linked dataset contains 133,520 records, comprising 132,242 school records and 1,278 patient records.

5.6 Updated autism prevalence estimates and delta

Using the linked dataset, the crude prevalence of autism in SSAS is 1.213% (1.155-1.272%) and the age- and sex-adjusted prevalence of autism is 1.204% (1.144-1.268%). For females, crude prevalence is 0.468%

Patients by disability status, no imputation

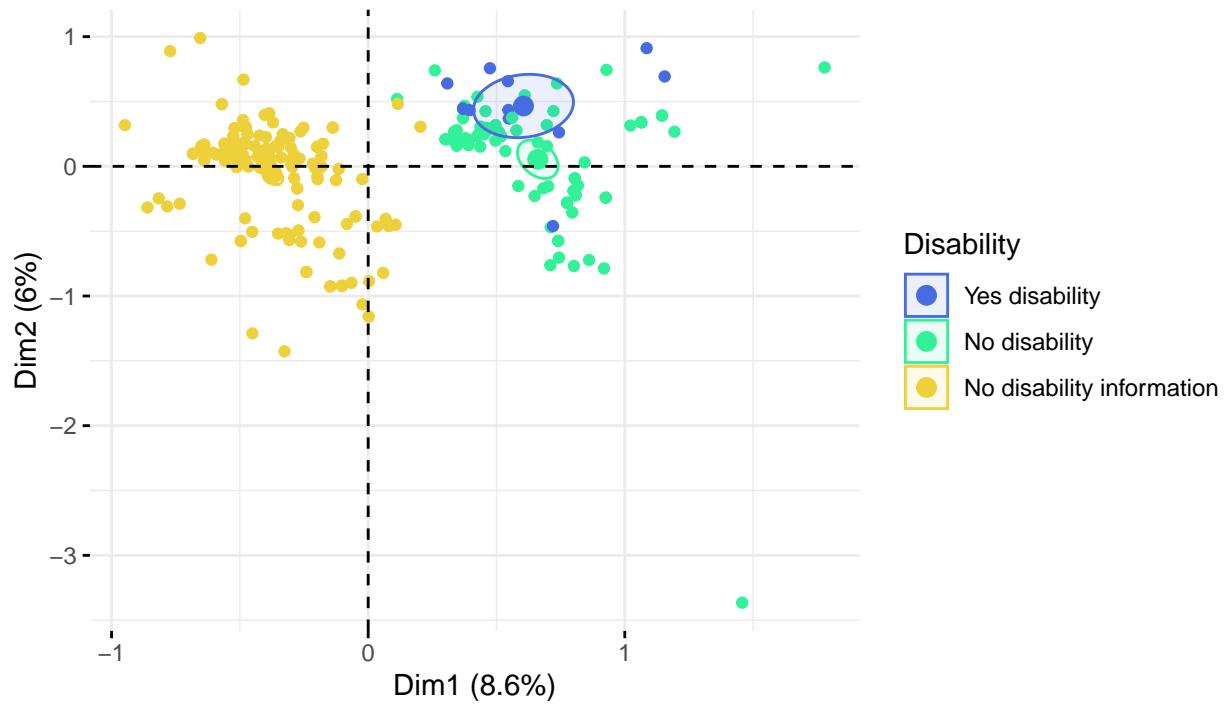


Figure 26: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by disability status.

(0.415-0.520%) and the adjusted prevalence is 0.464% (0.411-0.526%). For males, crude prevalence is 1.921% (1.818-2.024%) and the adjusted prevalence is 1.918% (1.812-2.031%).

\begin{table}

\caption{Projected age- and sex-adjusted autism prevalence by health service in Chile school data and linked school and patient data. Projections for the linked adjusted prevalence for health services other than Araucanía Sur were calculated by adding delta to each health service's adjusted prevalence from the school data. Adjusted prevalence from the school data has 95% gamma confidence intervals and projected adjusted prevalence from the linked data has confidence intervals equal in width to the school data adjusted prevalence intervals for each health service other than Araucanía Sur which has the 95% gamma confidence intervals found earlier.}

Patients by foster care status, no imputation

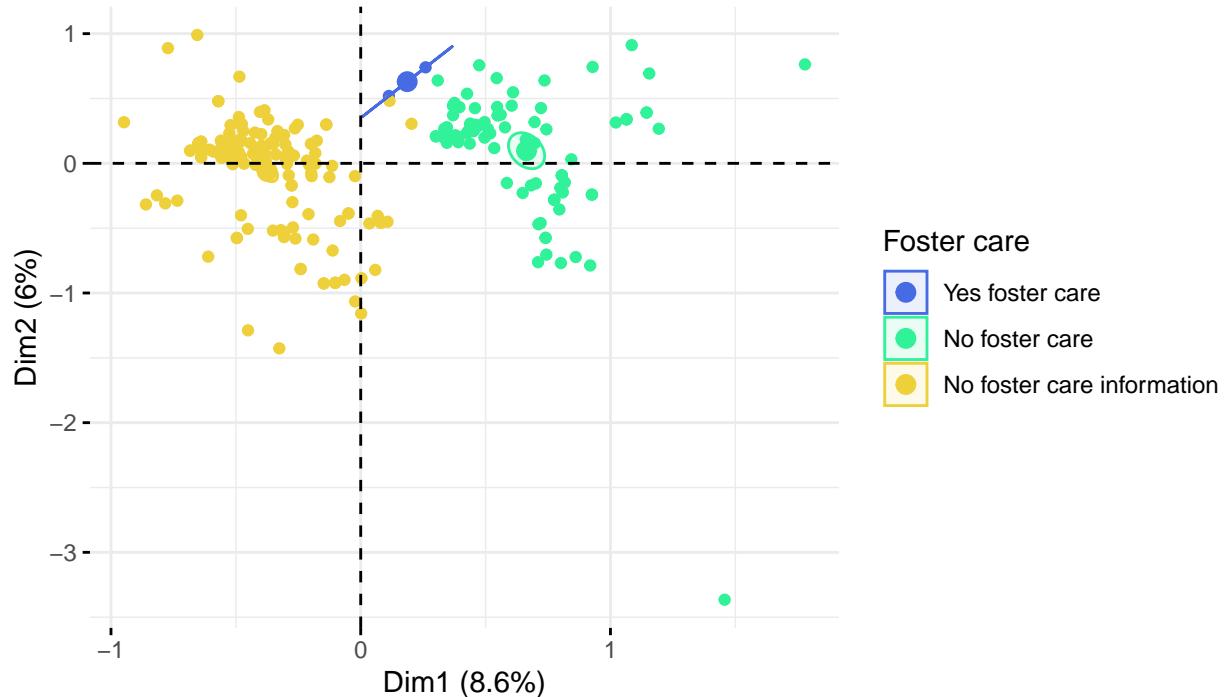


Figure 27: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features without imputation, coloured by foster care status.

Health service	Adjusted prevalence	
	School data (95% CI)	Projected linked data (Equivalent CI)
Aconcagua	0.43 (0.37, 0.50)	1.26 (1.19, 1.32)
Aisén	0.75 (0.63, 0.90)	1.58 (1.45, 1.71)
Antofagasta	0.83 (0.77, 0.88)	1.66 (1.60, 1.71)
Araucanía Norte	0.30 (0.24, 0.38)	1.13 (1.07, 1.20)
Araucanía Sur	0.37 (0.34, 0.41)	1.20 (1.14, 1.27)
Arauco	0.72 (0.62, 0.82)	1.55 (1.45, 1.65)
Arica	0.61 (0.54, 0.70)	1.45 (1.36, 1.53)
Atacama	0.31 (0.27, 0.37)	1.14 (1.09, 1.19)
Biobío	0.42 (0.37, 0.47)	1.25 (1.20, 1.30)
Chiloé	0.43 (0.36, 0.52)	1.26 (1.19, 1.34)
Concepción	0.77 (0.72, 0.83)	1.60 (1.55, 1.66)
Coquimbo	0.40 (0.36, 0.43)	1.23 (1.19, 1.26)
Libertador B.O'Higgins	0.42 (0.39, 0.46)	1.26 (1.22, 1.29)
Maule	0.30 (0.28, 0.33)	1.13 (1.11, 1.16)
Reloncaví	0.42 (0.37, 0.47)	1.25 (1.20, 1.30)
Iquique	0.43 (0.38, 0.49)	1.26 (1.21, 1.31)
Magallanes	0.83 (0.72, 0.96)	1.66 (1.55, 1.78)
Metropolitano Central	0.42 (0.38, 0.46)	1.25 (1.21, 1.29)
Metropolitano Norte	0.29 (0.26, 0.31)	1.12 (1.09, 1.14)
Metropolitano Occidente	0.34 (0.32, 0.36)	1.17 (1.15, 1.19)
Metropolitano Oriente	0.30 (0.27, 0.33)	1.13 (1.10, 1.16)
Metropolitano Sur	0.40 (0.37, 0.43)	1.23 (1.20, 1.26)
Metropolitano Sur Oriente	0.36 (0.34, 0.39)	1.20 (1.17, 1.22)
Osorno	0.43 (0.37, 0.51)	1.26 (1.20, 1.33)
Talcahuano	0.81 (0.74, 0.90) ⁵⁹	1.65 (1.57, 1.72)
Valdivia	0.30 (0.26, 0.35)	1.13 (1.09, 1.18)
Valparaíso San Antonio	0.68 (0.62, 0.75)	1.52 (1.45, 1.58)
Viña del Mar Quillota	0.66 (0.62, 0.70)	1.49 (1.45, 1.53)

Categorical features by first two dimensions, with imputation

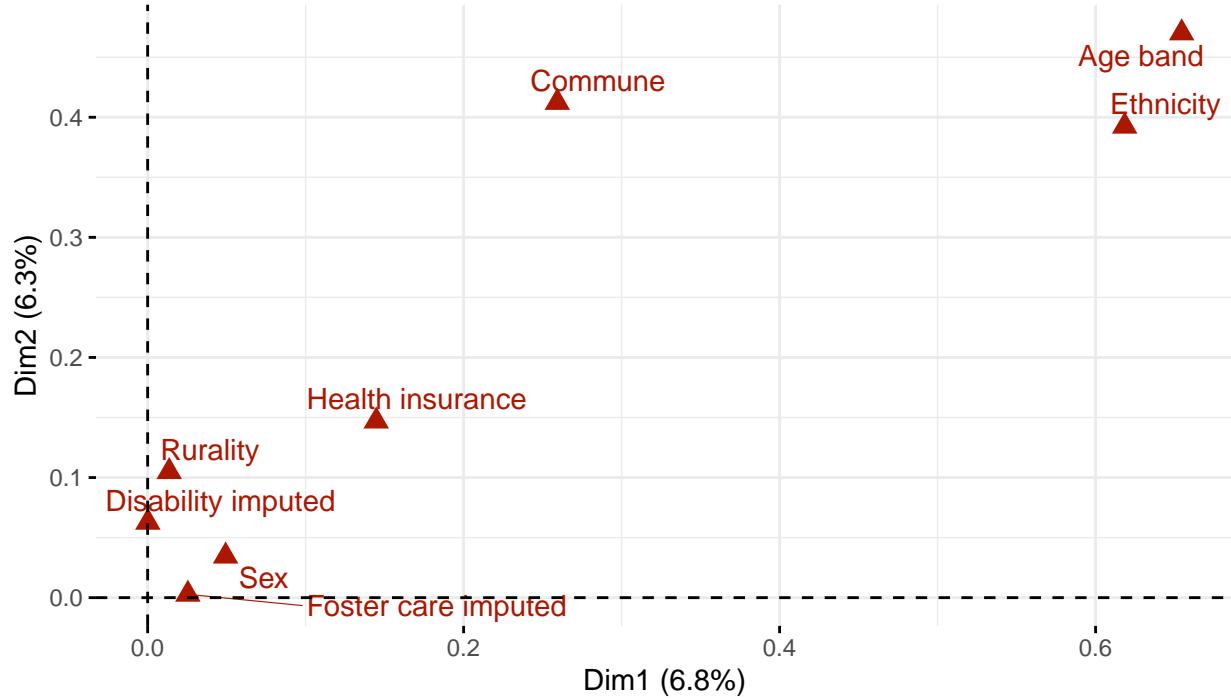


Figure 28: Categorical features by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation.

\end{table}

This gives an adjusted prevalence delta for SSAS of 0.832%. Table 5.6 shows the projection of adjusted prevalence from the linked data for SSAS onto the other health services. The patterns of prevalence across health services are retained and Nuble has the highest projected adjusted prevalence at 2.12% (2.04, 2.20%).

5.7 Bayesian prevalence projection

Red is the prior 95% CI (adjusted sample rate and it + prev_delta), blue is posterior 95% CrI

6 Supplementary materials

- 6.1 AraucS prevalence
- 6.2 Adjusted prevalence
- 6.3 Differences between un/matched
- 6.4 Bayesian prevalence estimation

Contribution of categories to first two dimensions, with imputation

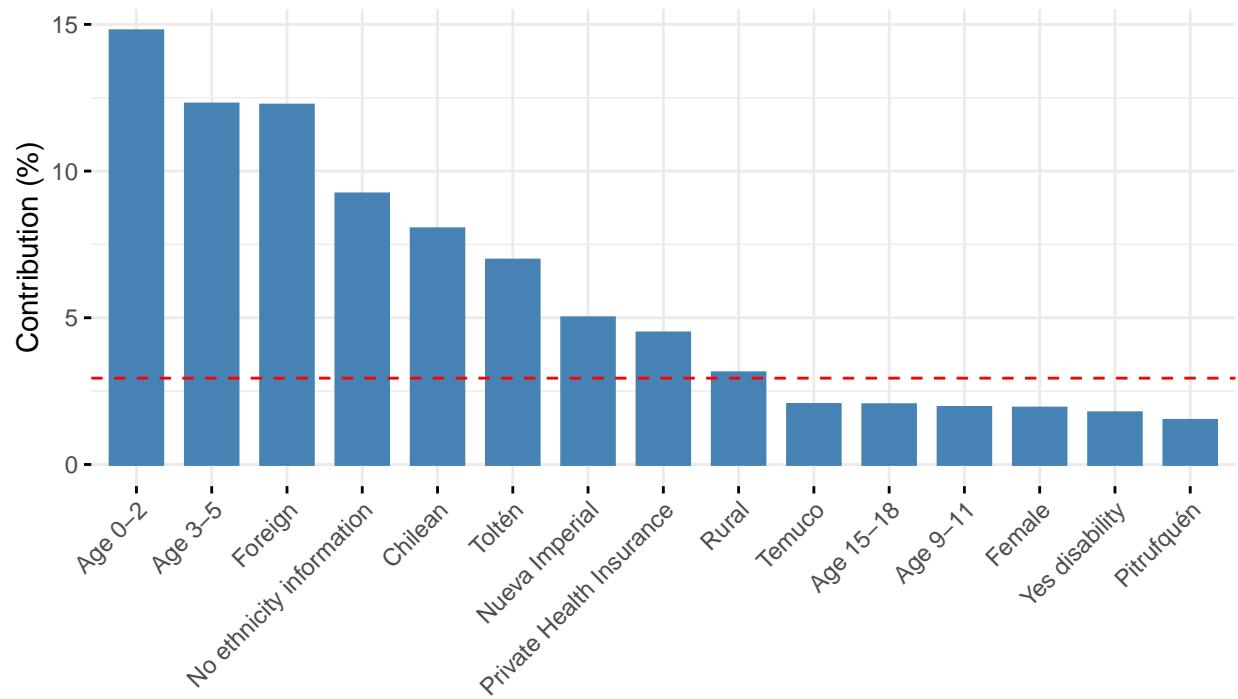


Figure 29: Contribution of the top 15 categories to the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation. The red line shows the expected average if contributions were uniform.

Categories by first two dimensions, with imputation

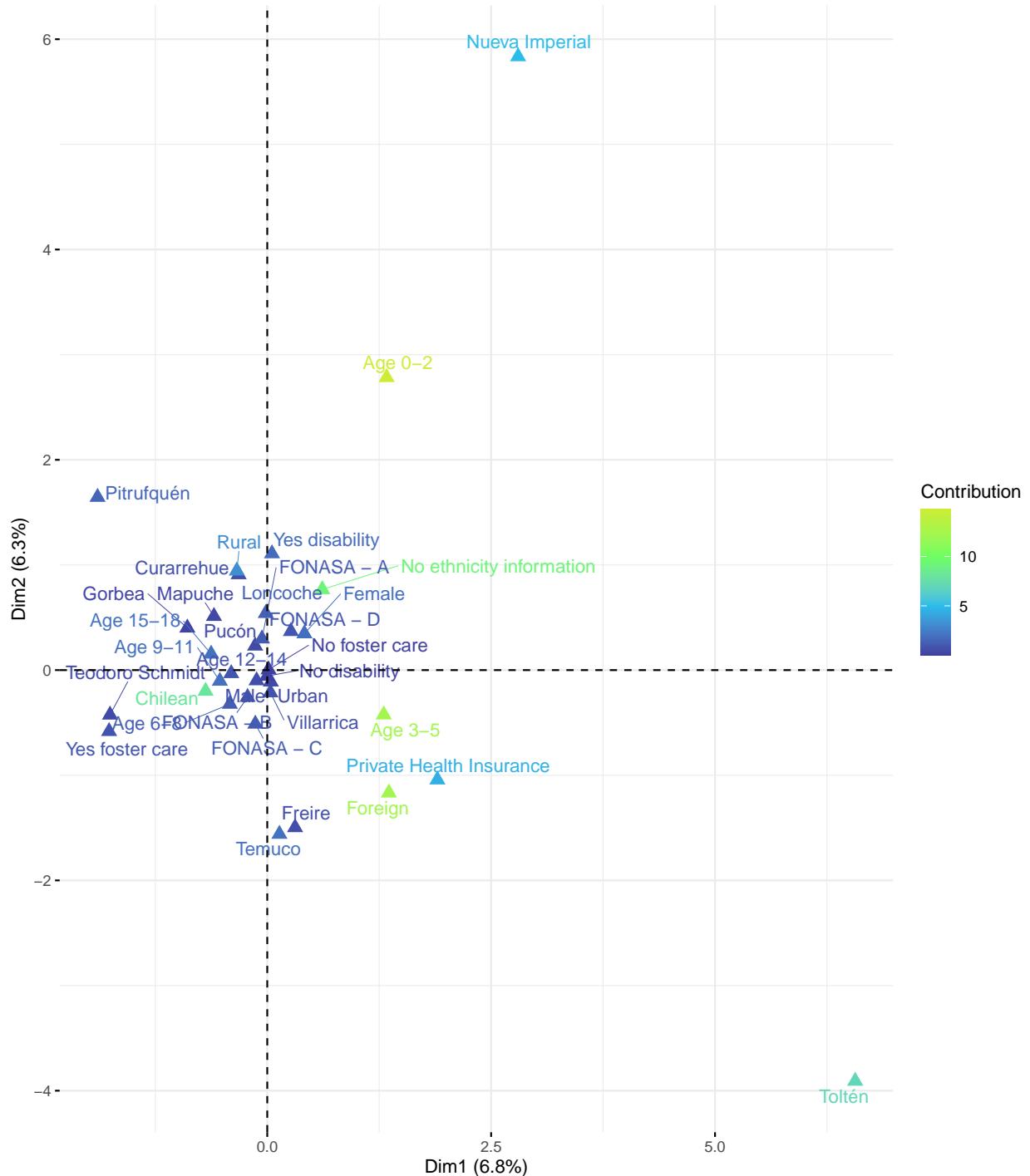


Figure 30: Available categories by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation. Brighter, more yellow colours indicate larger contribution to the first two dimensions.

Patients by age band, with imputation

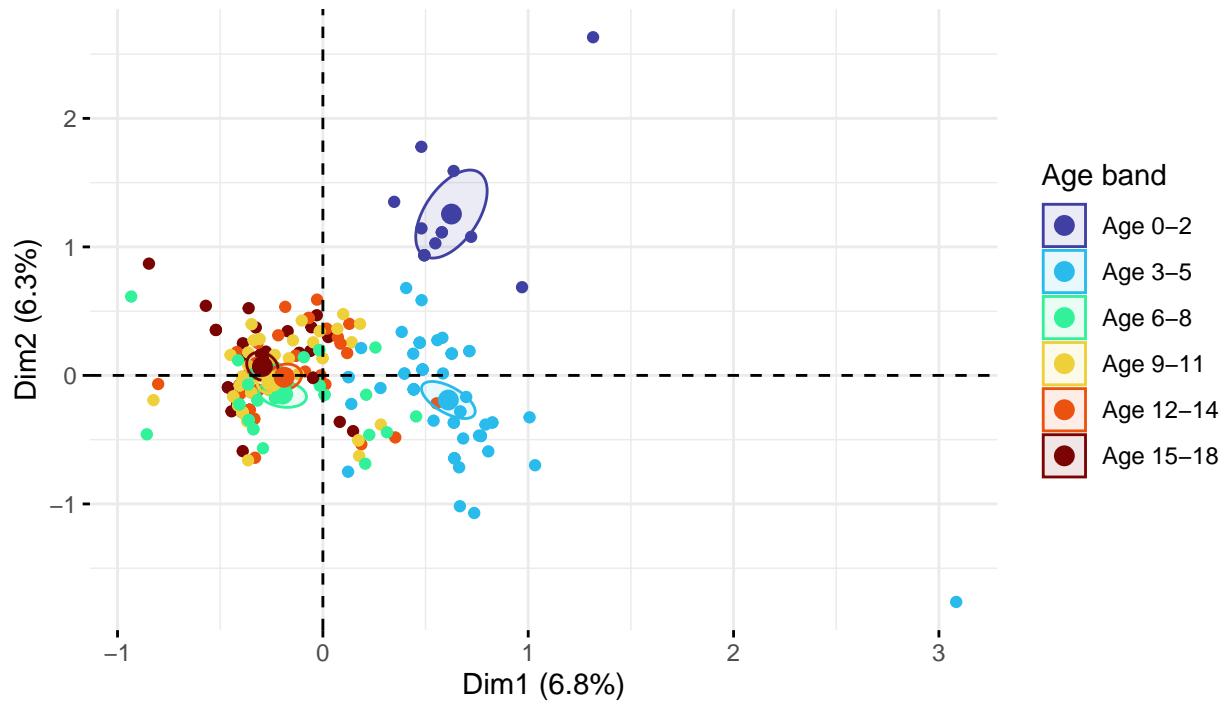


Figure 31: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by age band.

Patients by ethnicity, with imputation

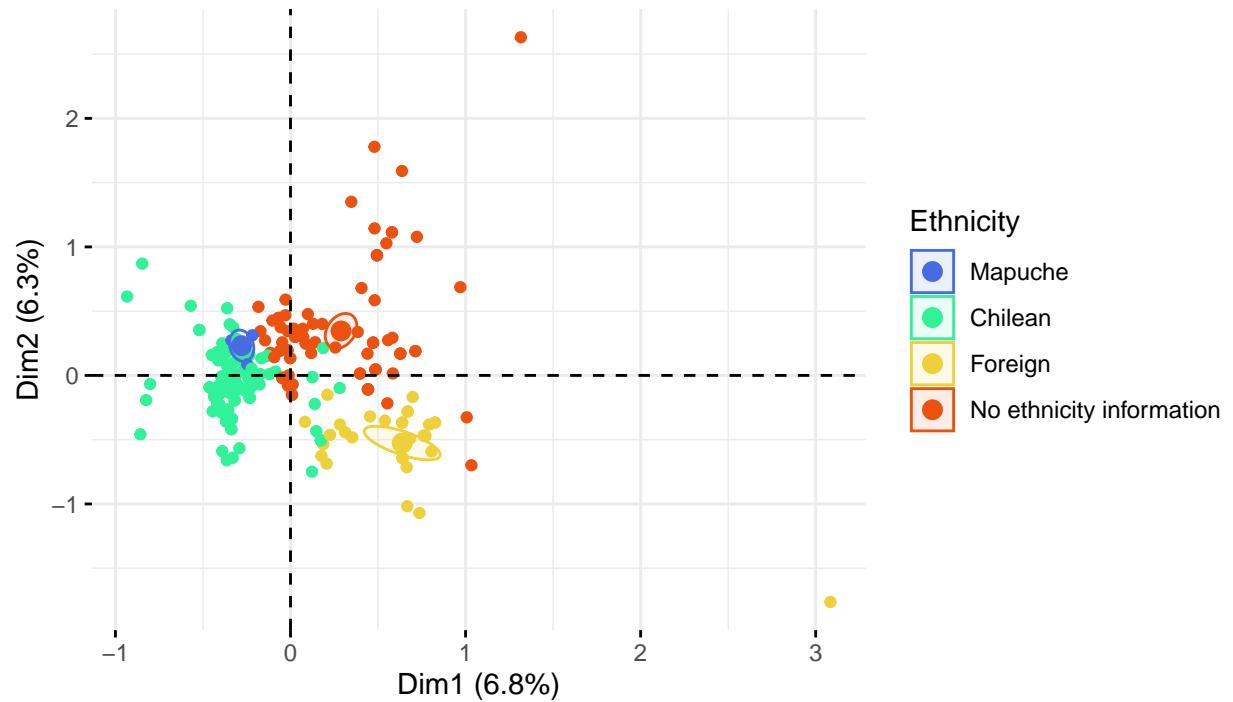


Figure 32: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by ethnicity.

Patients by commune of residence, with imputation

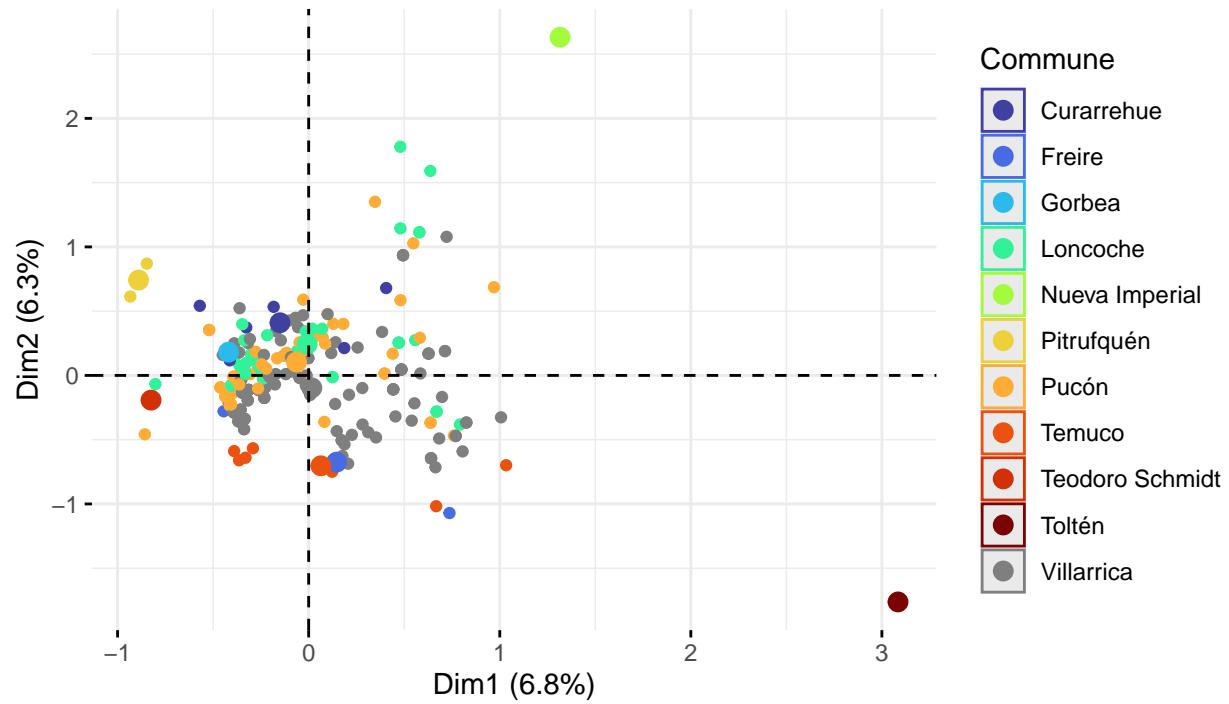


Figure 33: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by commune of residence.

Patients by SES status, with imputation

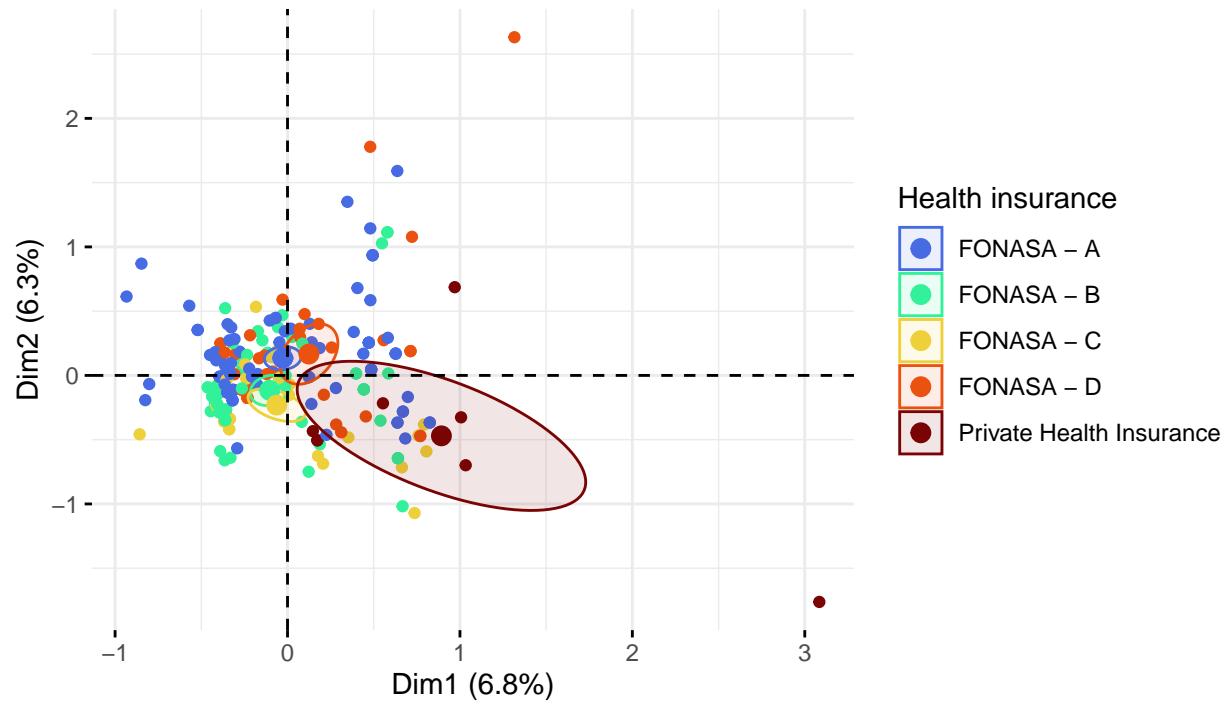


Figure 34: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by health insurance level.

Patients by sex, with imputation

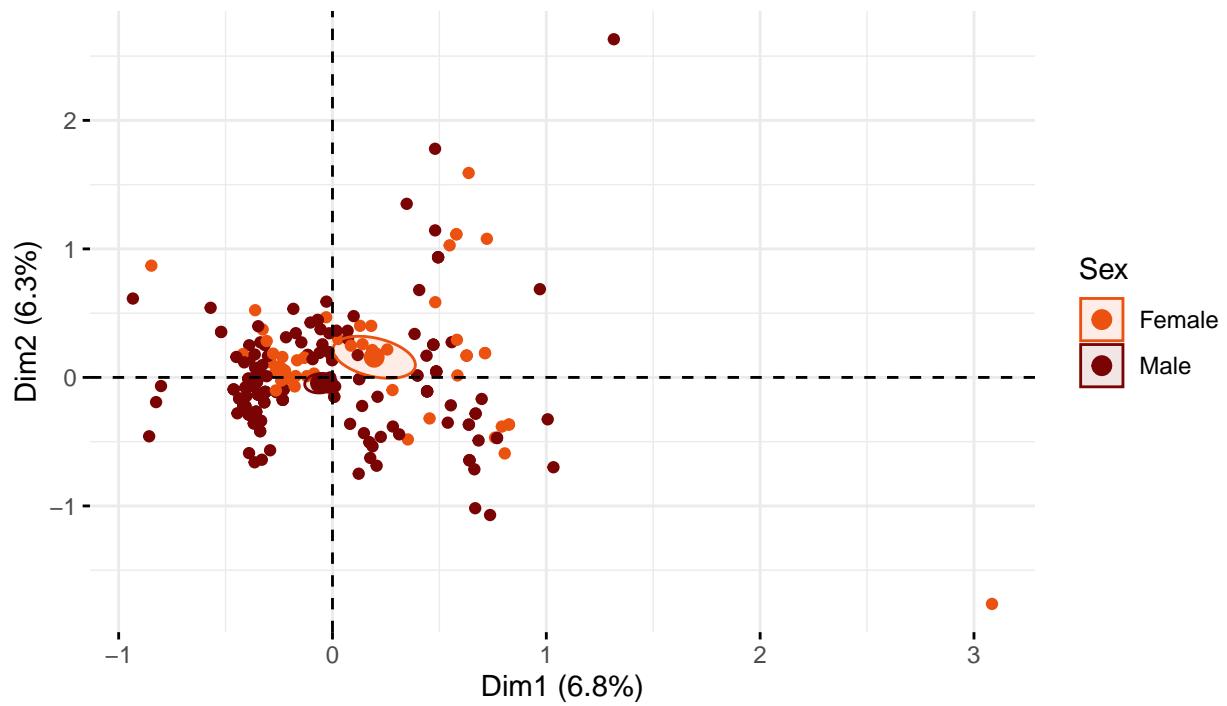


Figure 35: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by sex.

Patients by rurality, with imputation

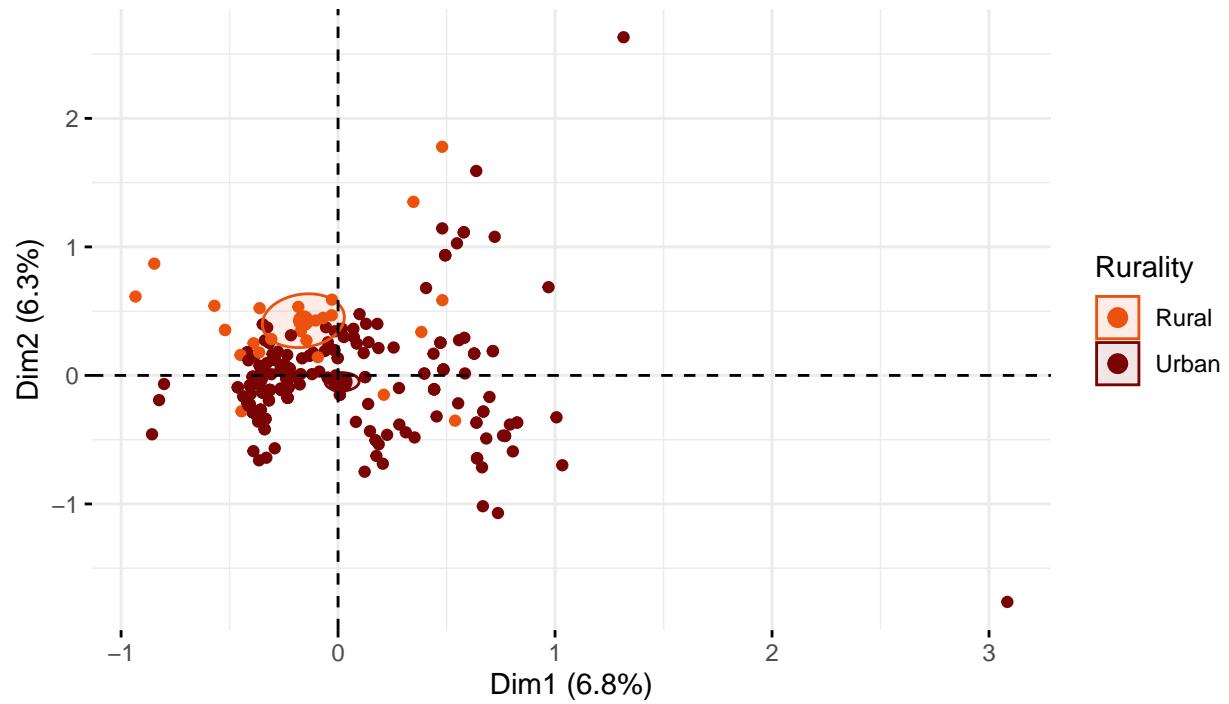


Figure 36: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by rurality of residence.

Patients by disability status, with imputation

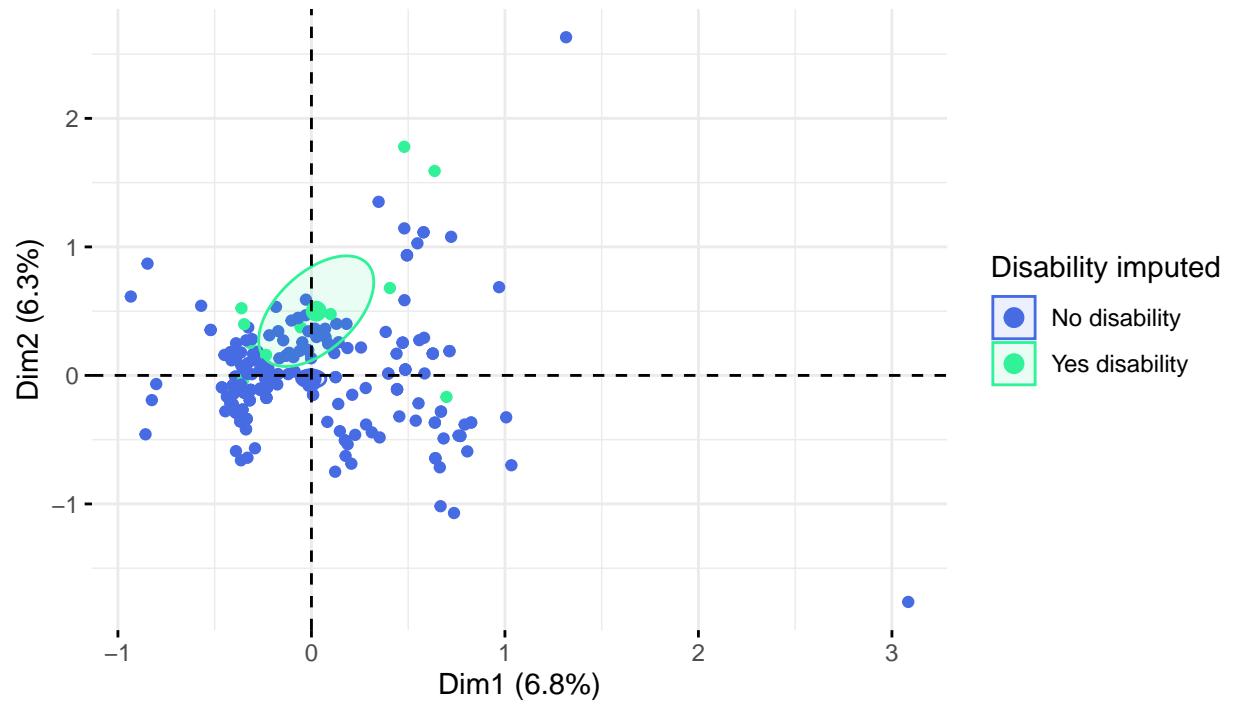


Figure 37: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by disability status.

Patients by foster care status, with imputation

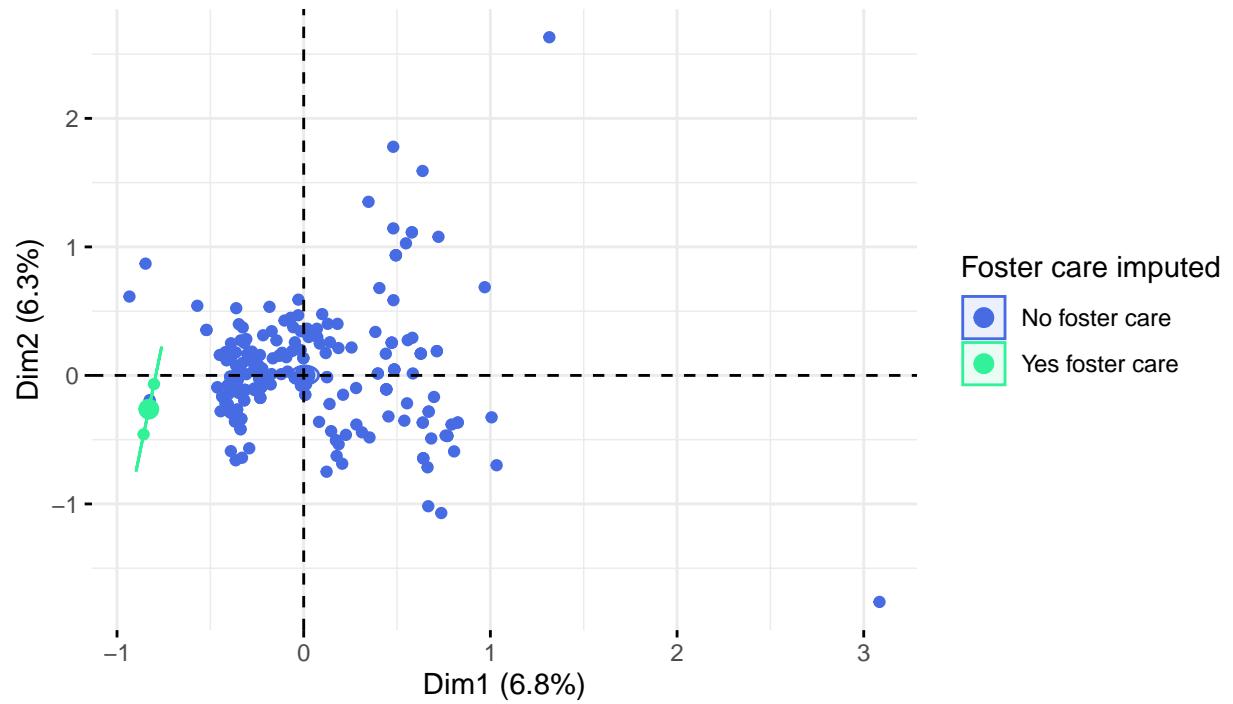


Figure 38: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using all features with imputation, coloured by foster care status.

Categorical features by first two dimensions for age band, commune and ethnicity

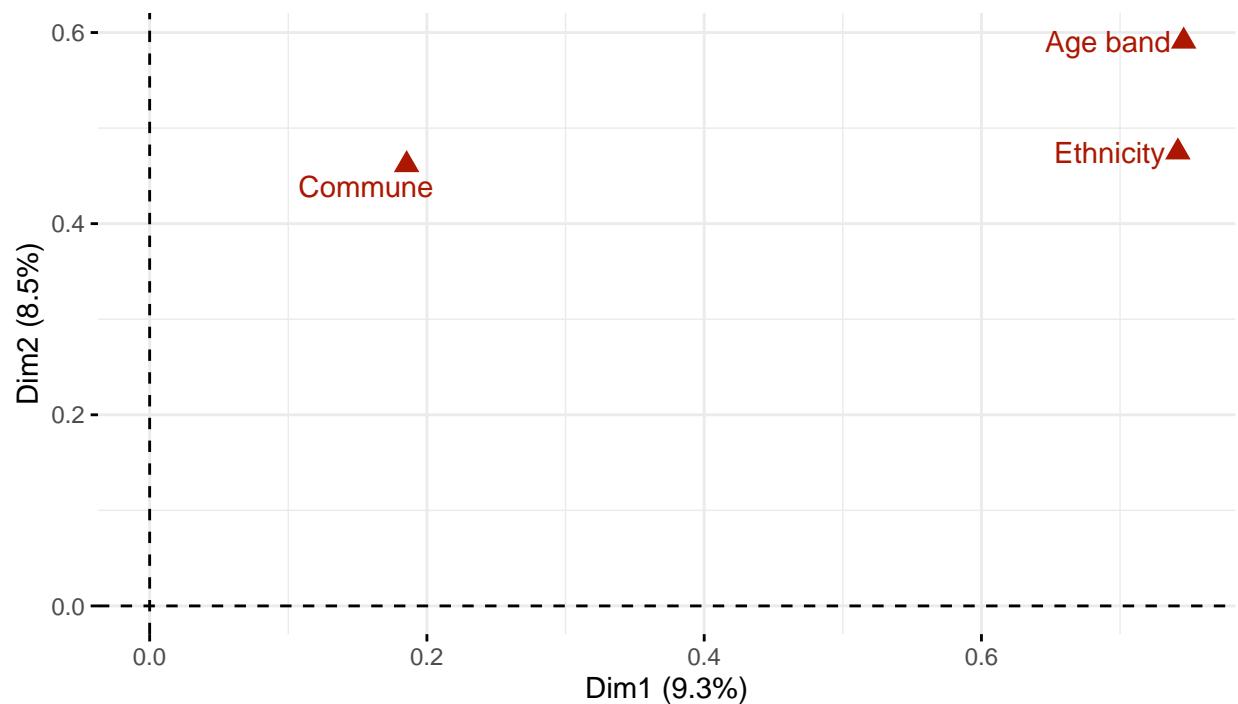


Figure 39: Categorical features by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using patients' age band, commune of residence and ethnicity.

Contribution of categories to first two dimensions for age band, commune ar

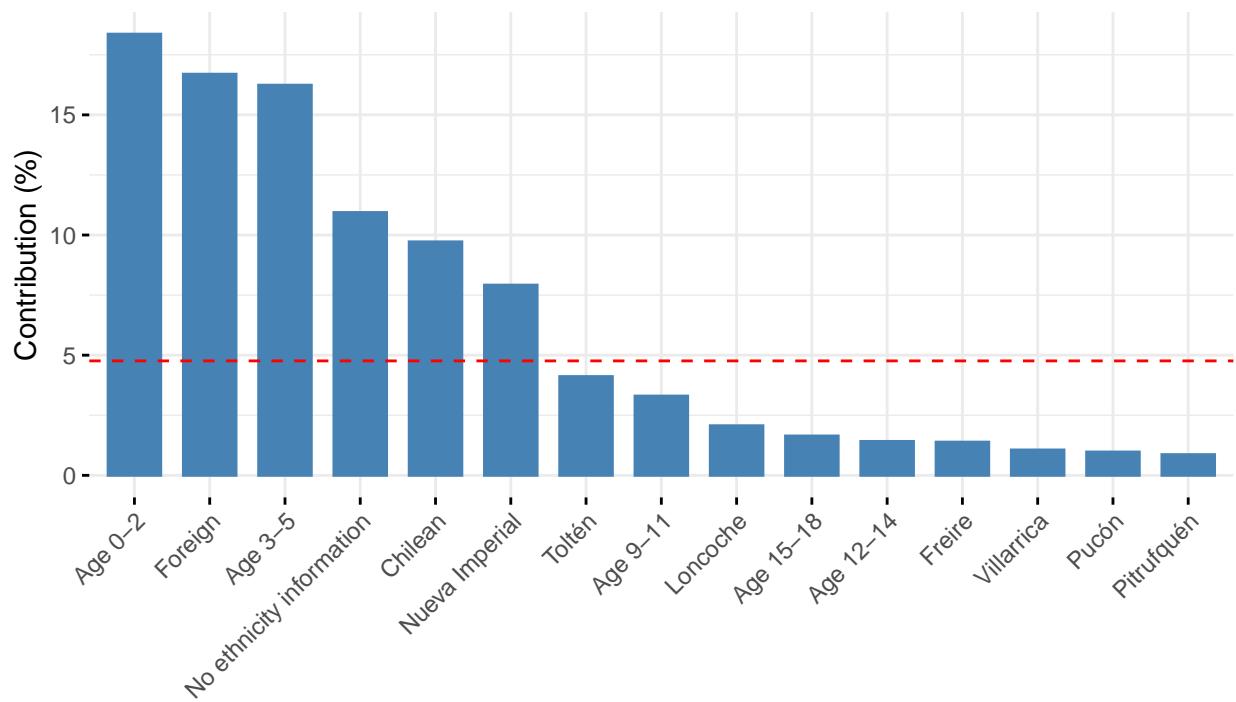


Figure 40: Contribution of the top 15 categories to the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using patients' age band, commune and ethnicity. The red line shows the expected average if contributions were uniform.

Categories by first two dimensions for age band, commune and ethnicity

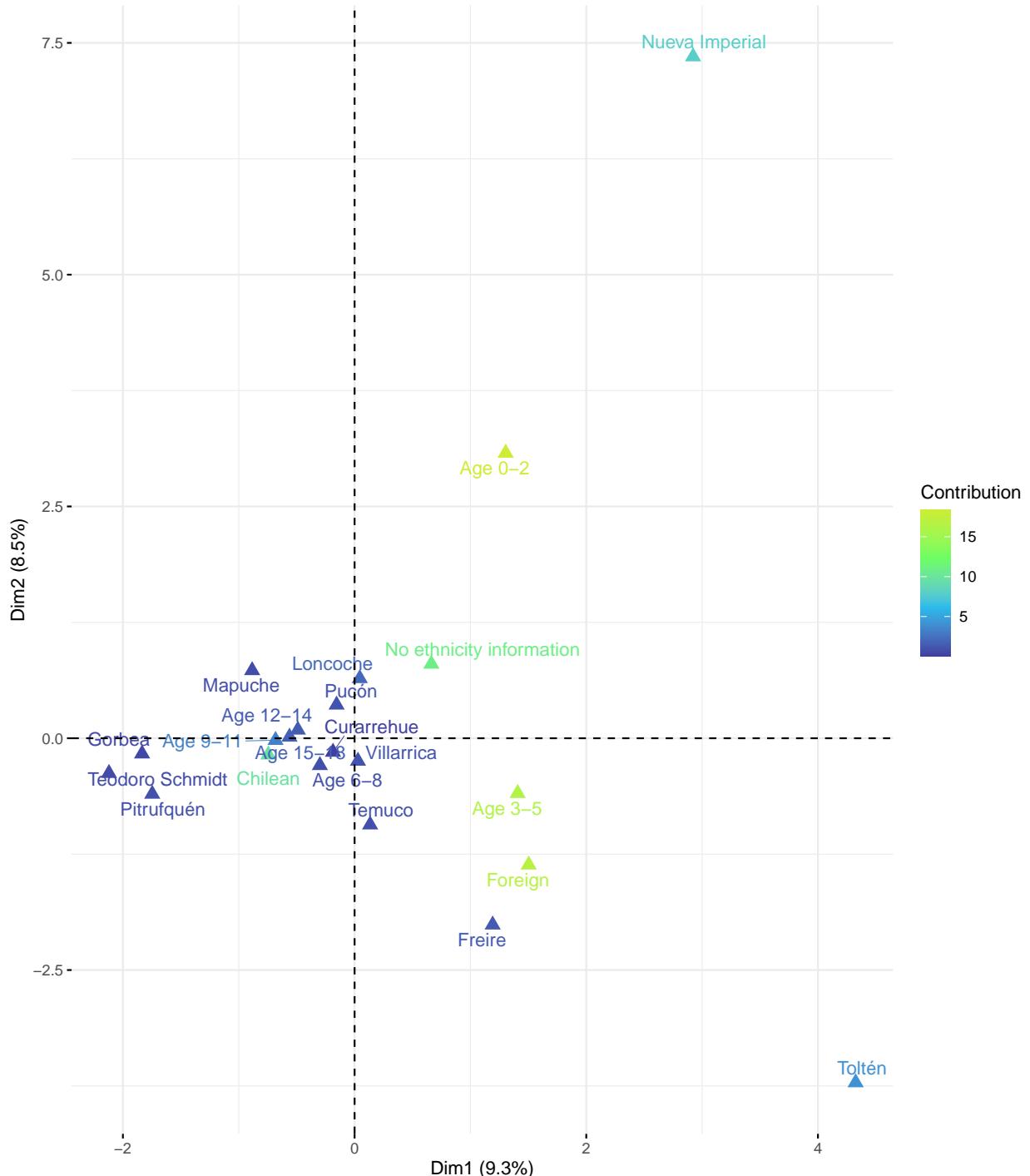


Figure 41: Available categories by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using patients' age band, commune and ethnicity. Brighter, more yellow colours indicate larger contribution to the first two dimensions.

Patients by age band for age band, commune and ethnicity

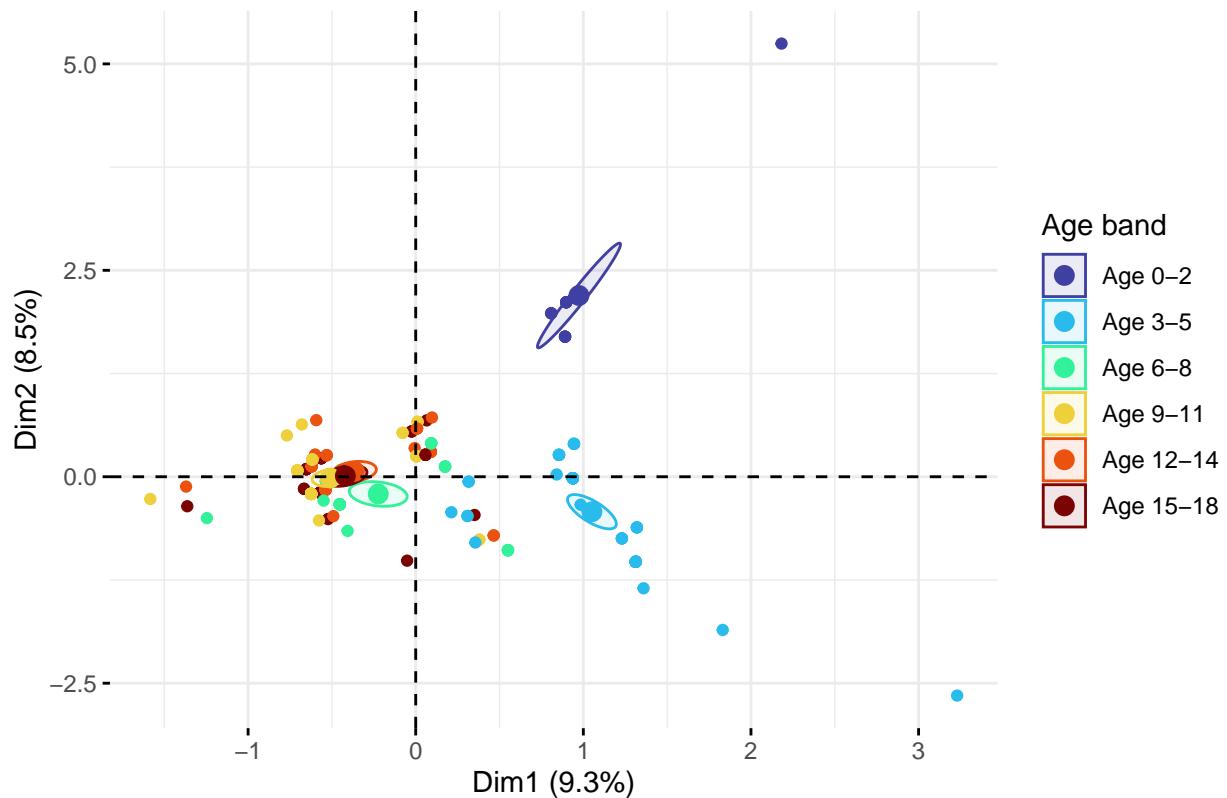


Figure 42: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using patients' age band, commune and ethnicity, coloured by age band.

Patients by ethnicity, with imputation for age band, commune and ethnicity

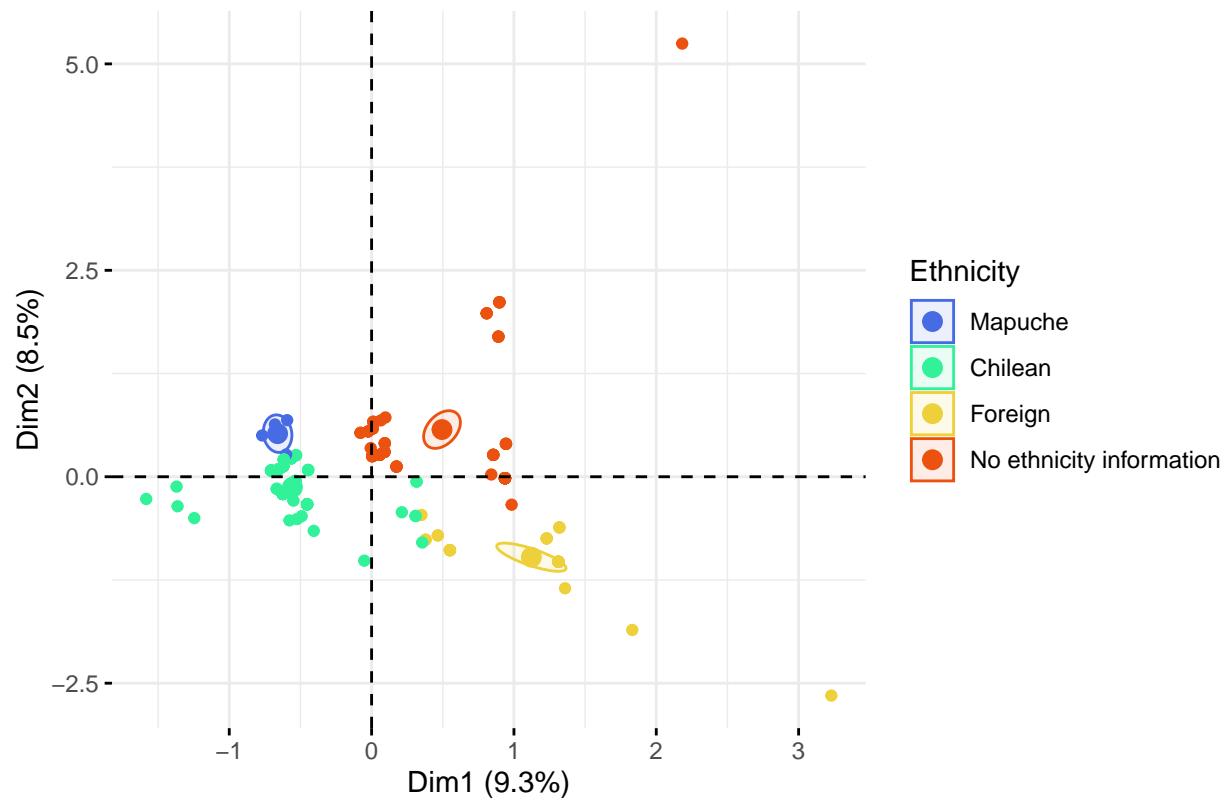


Figure 43: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using age band, commune and ethnicity, coloured by ethnicity.

Patients by commune of residence for age band, commune and ethnicity

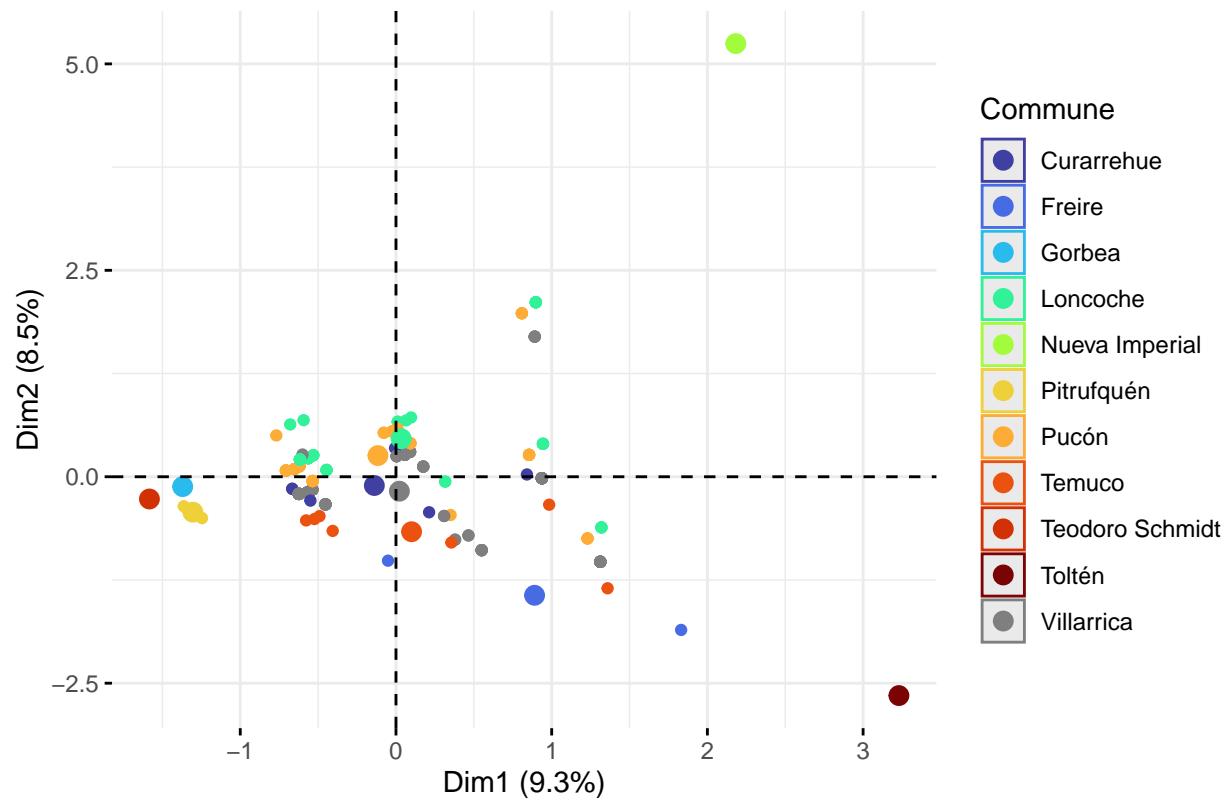


Figure 44: Patients by the first two dimensions of multiple correspondence analysis on autism patients in the small clinical data using age band, commune and ethnicity, coloured by commune of residence.

Autism prevalence, prior mean = 0.00465, prior sd = 3.98e-05

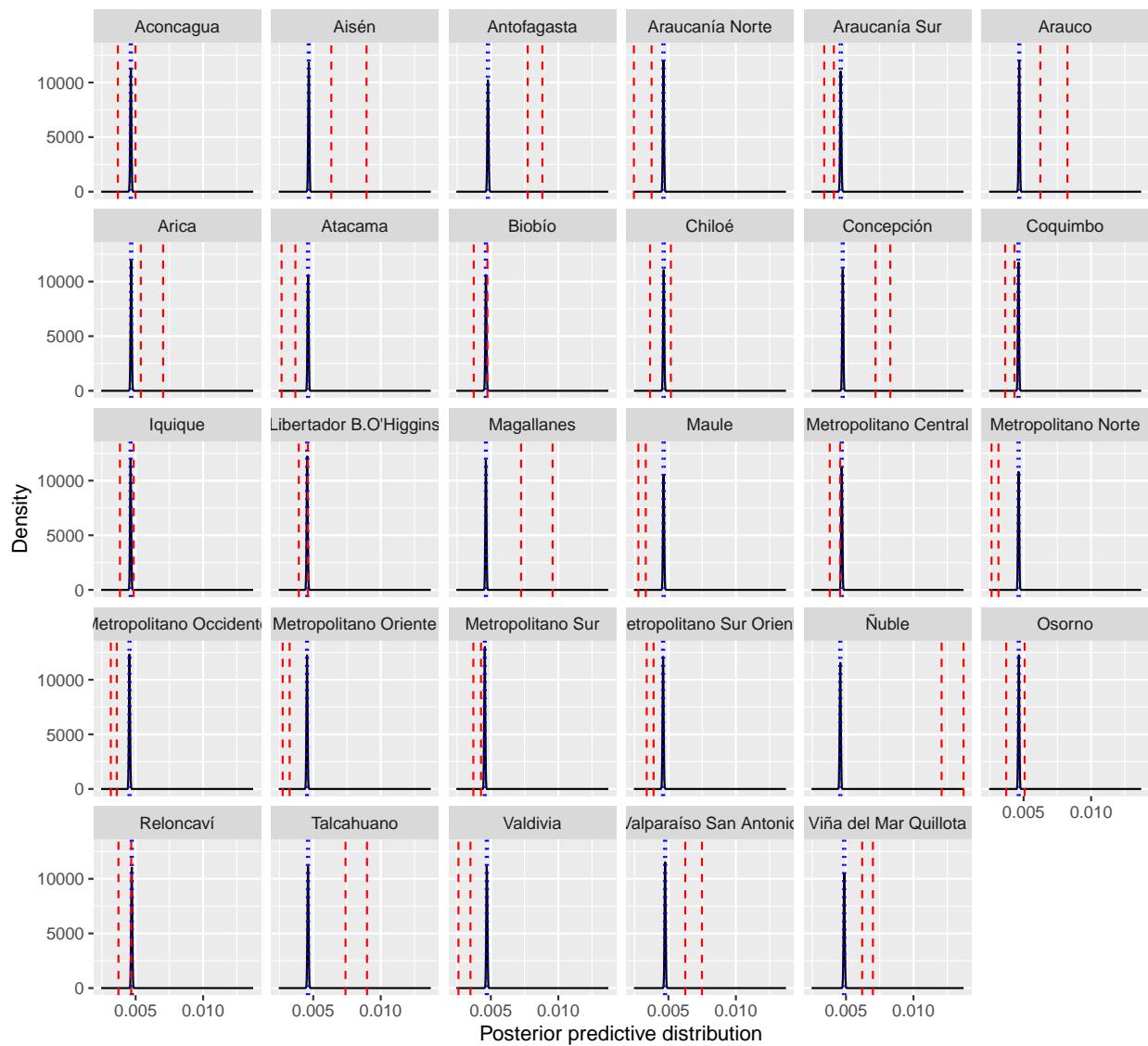


Figure 45: Posterior predictive distributions for autism prevalence using school data with a random effect on student's health service. Beta conjugate prior of age- and sex-adjusted global autism prevalence from school data. Red dashed lines show the prior 95% confidence interval, blue dotted lines show the posterior 95% credible interval.

Region specific priors informed by clinical data from Araucanía Sur

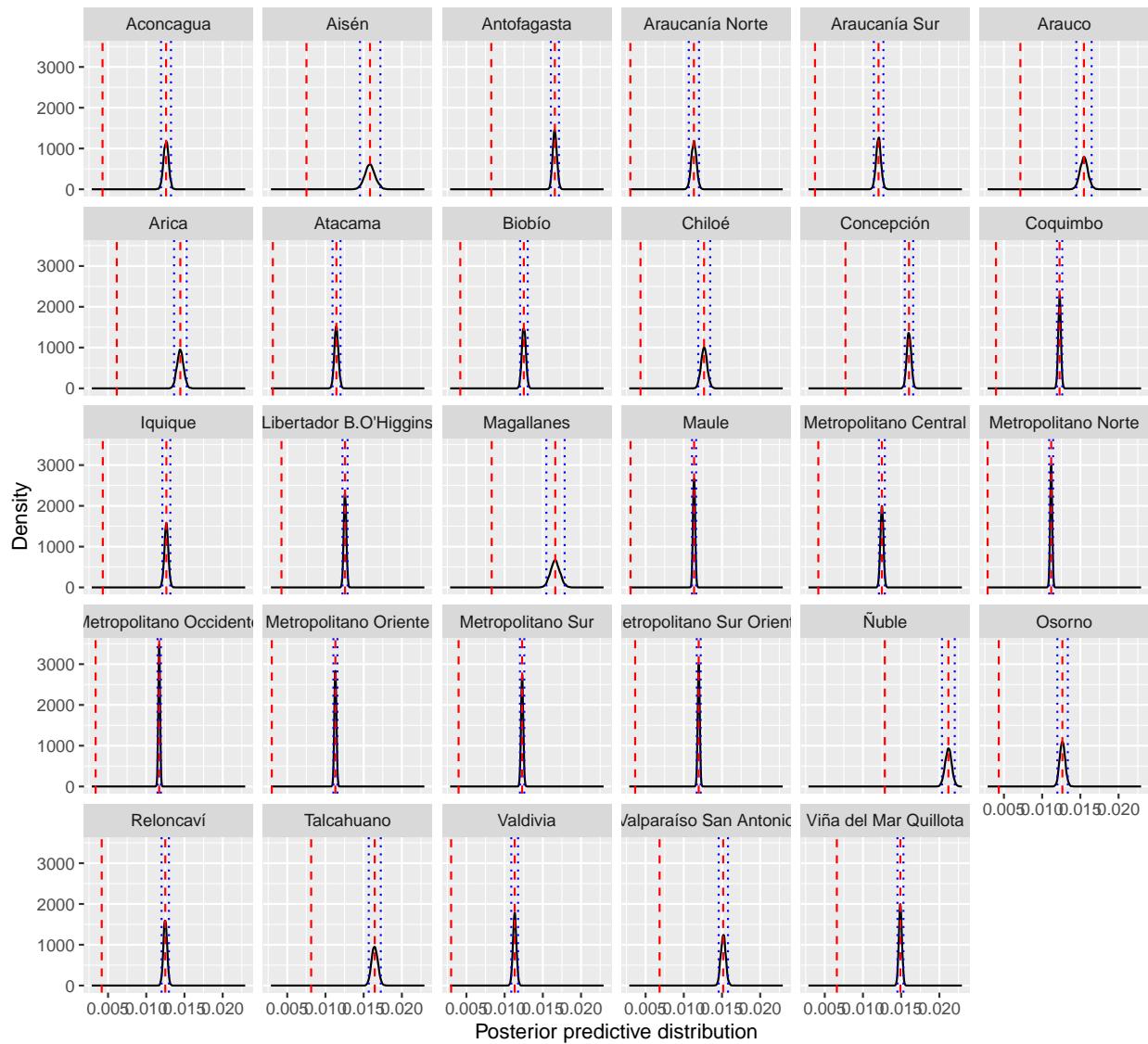


Figure 46: Posterior predictive distributions for autism prevalence using school data with a random effect on student's health service. Beta conjugate prior of health service specific age- and sex-adjusted projected autism prevalence from linked data. Red dashed lines show the prior 95% confidence interval, blue dotted lines show the posterior 95% credible interval.

Region specific priors informed by clinical data from Araucanía Sur

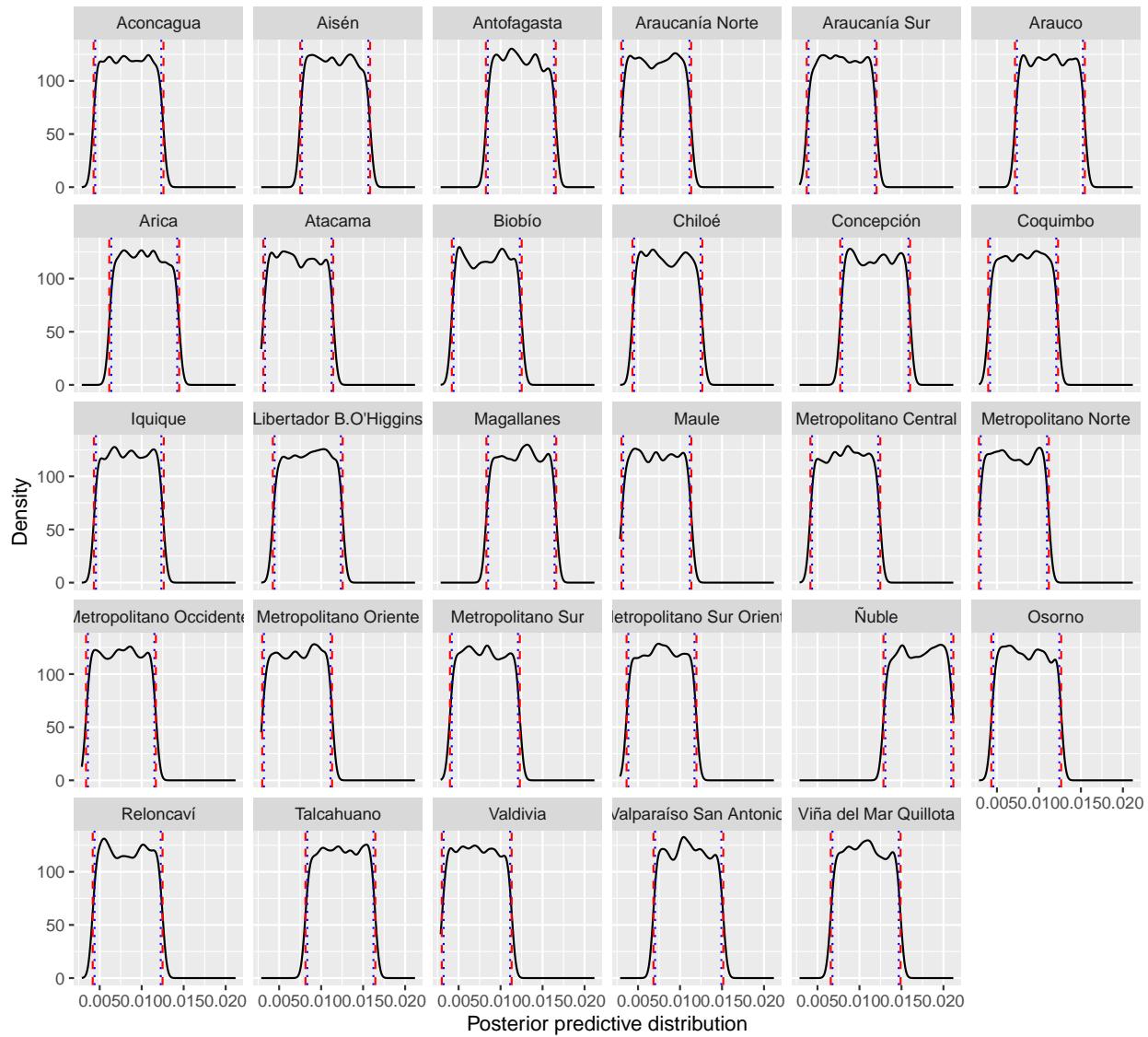


Figure 47: Posterior predictive distributions for autism prevalence using school data with a random effect on student's health service. Uniform prior bounded by health service specific age- and sex-adjusted autism prevalence from school data, and health service specific age- and sex-adjusted projected autism prevalence from linked data. Red dashed lines show the prior 95% confidence interval, blue dotted lines show the posterior 95% credible interval.

Autism prevalence

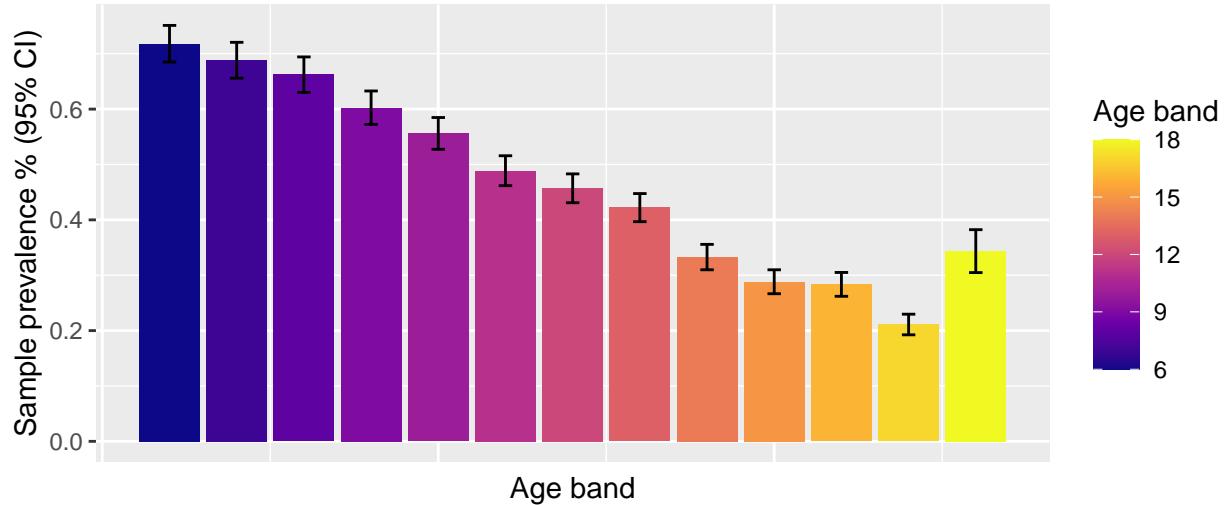


Figure 48: Sample prevalence of autism by age band. Bars show 95% normal confidence intervals.

ADHD prevalence

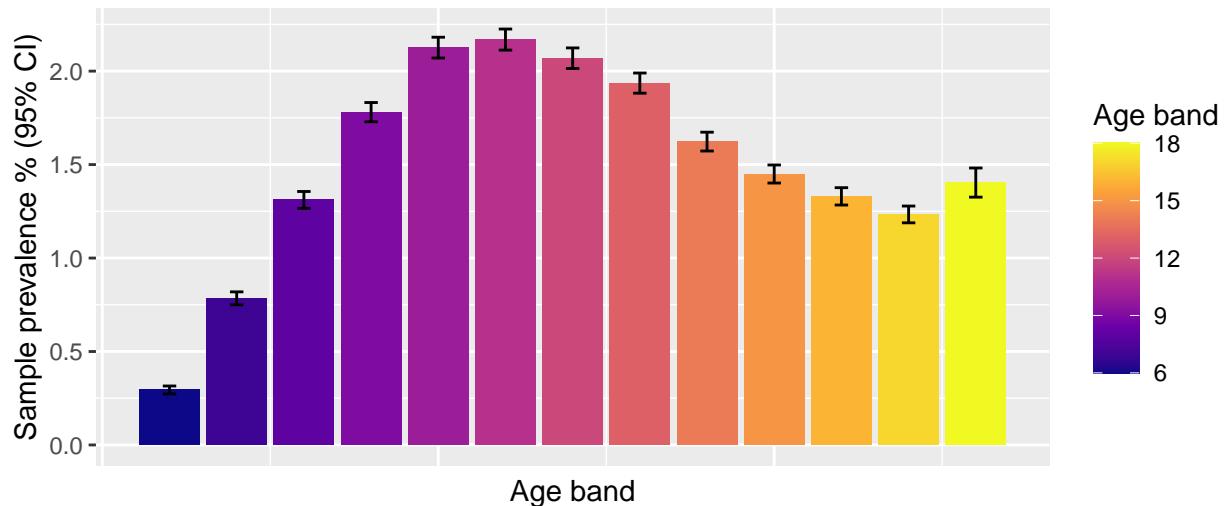


Figure 49: Sample prevalence of ADHD by age band. Bars show 95% normal confidence intervals.

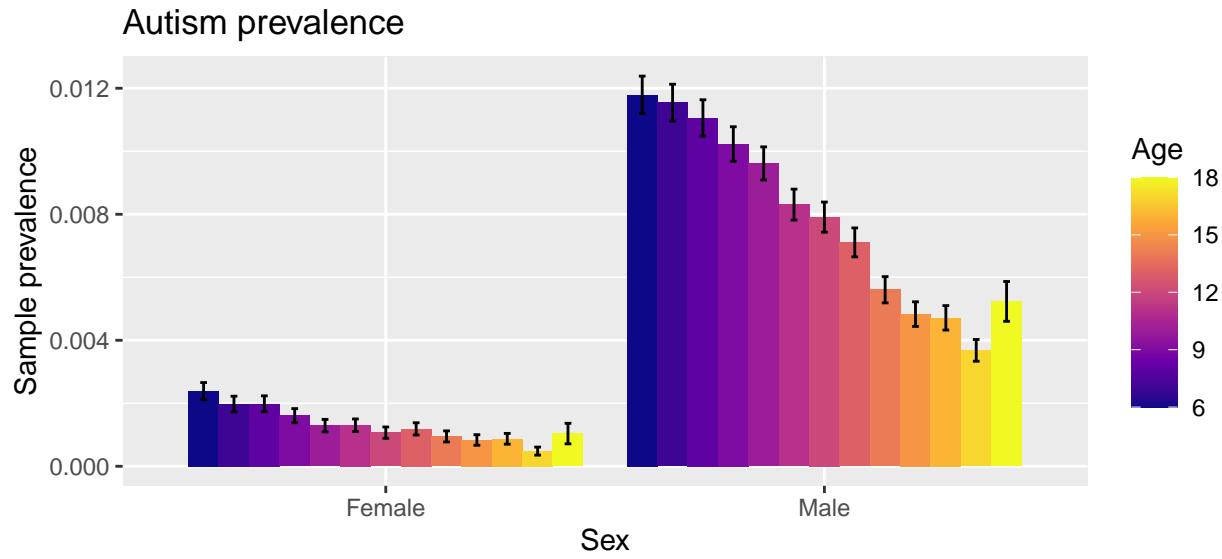


Figure 50: Sample prevalence of autism by age and sex. Bars show 95% normal confidence intervals.

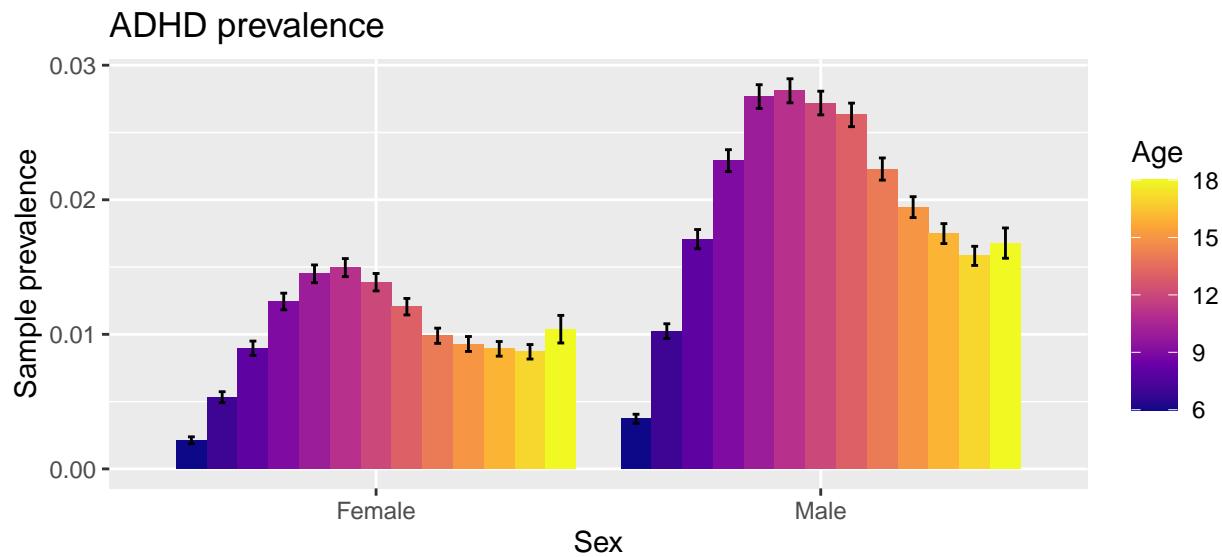


Figure 51: Sample prevalence of ADHD by age and sex. Bars show 95% normal confidence intervals.

Autism prevalence by health service

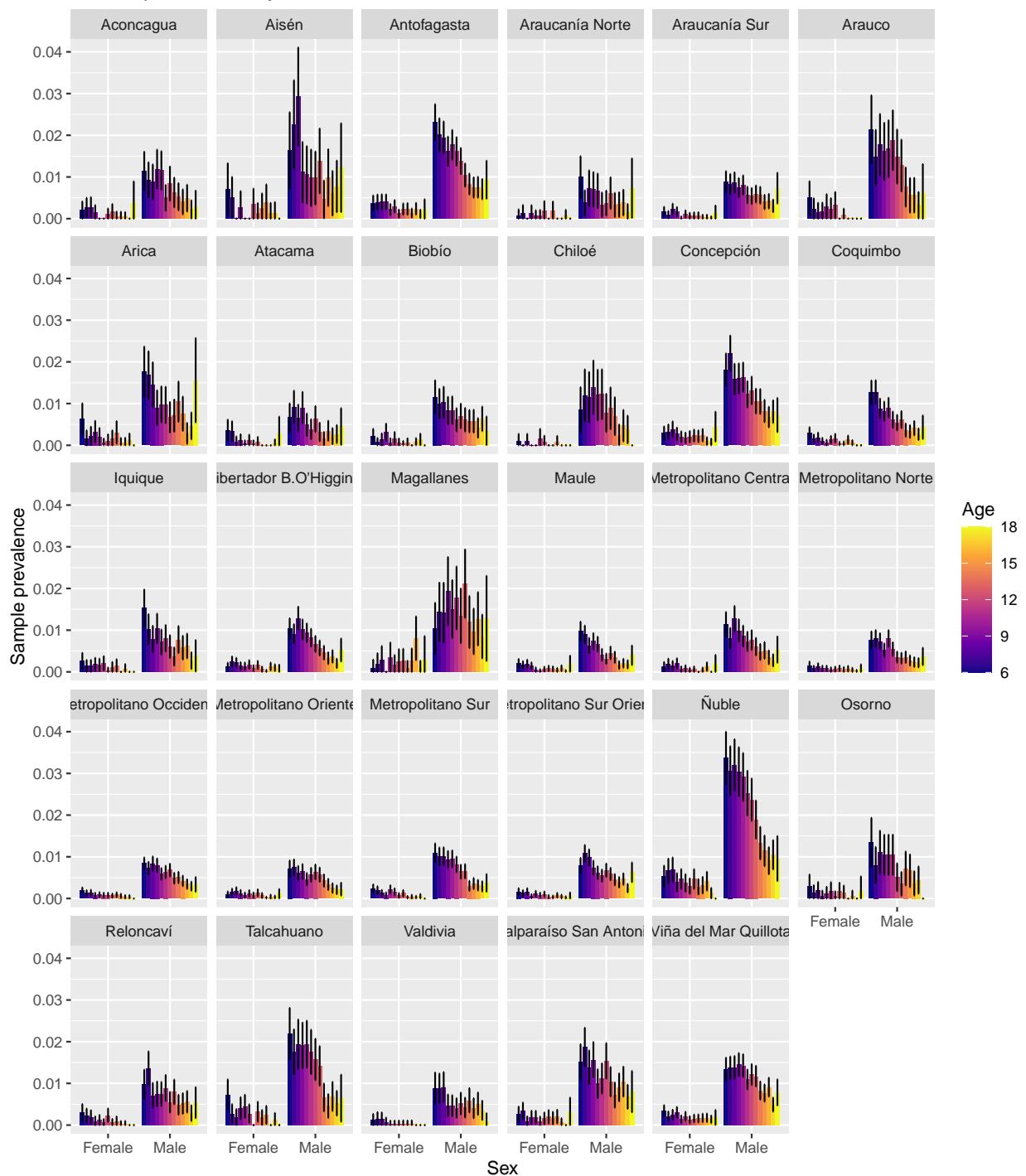


Figure 52: Sample prevalence of autism by health service, age and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by health service

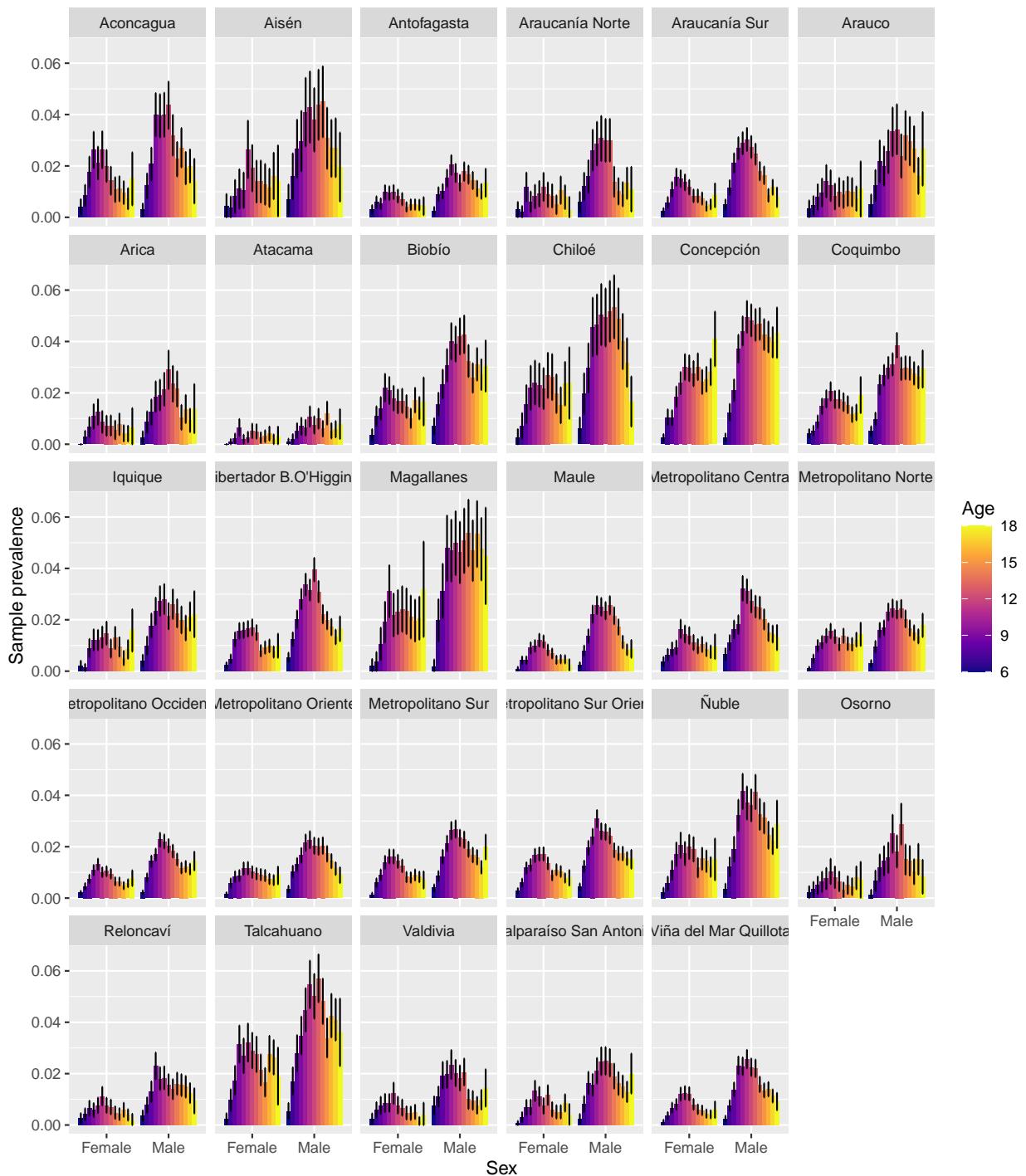


Figure 53: Sample prevalence of ADHD by health service, age and sex. Bars show 95% normal confidence intervals.

Autism prevalence by SES status

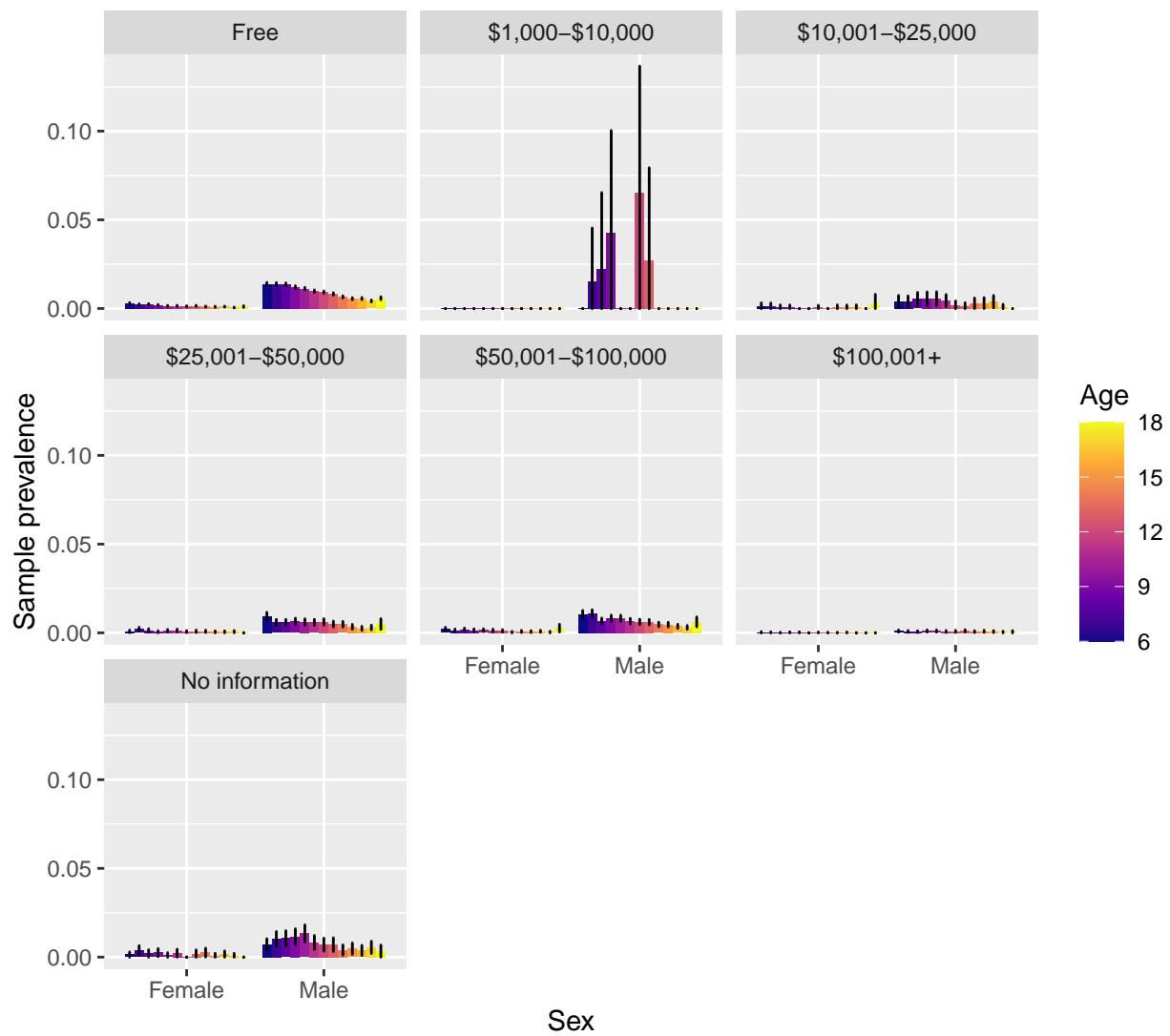


Figure 54: Sample prevalence of autism by socio-economic (SES) status of student's family, age and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by SES status

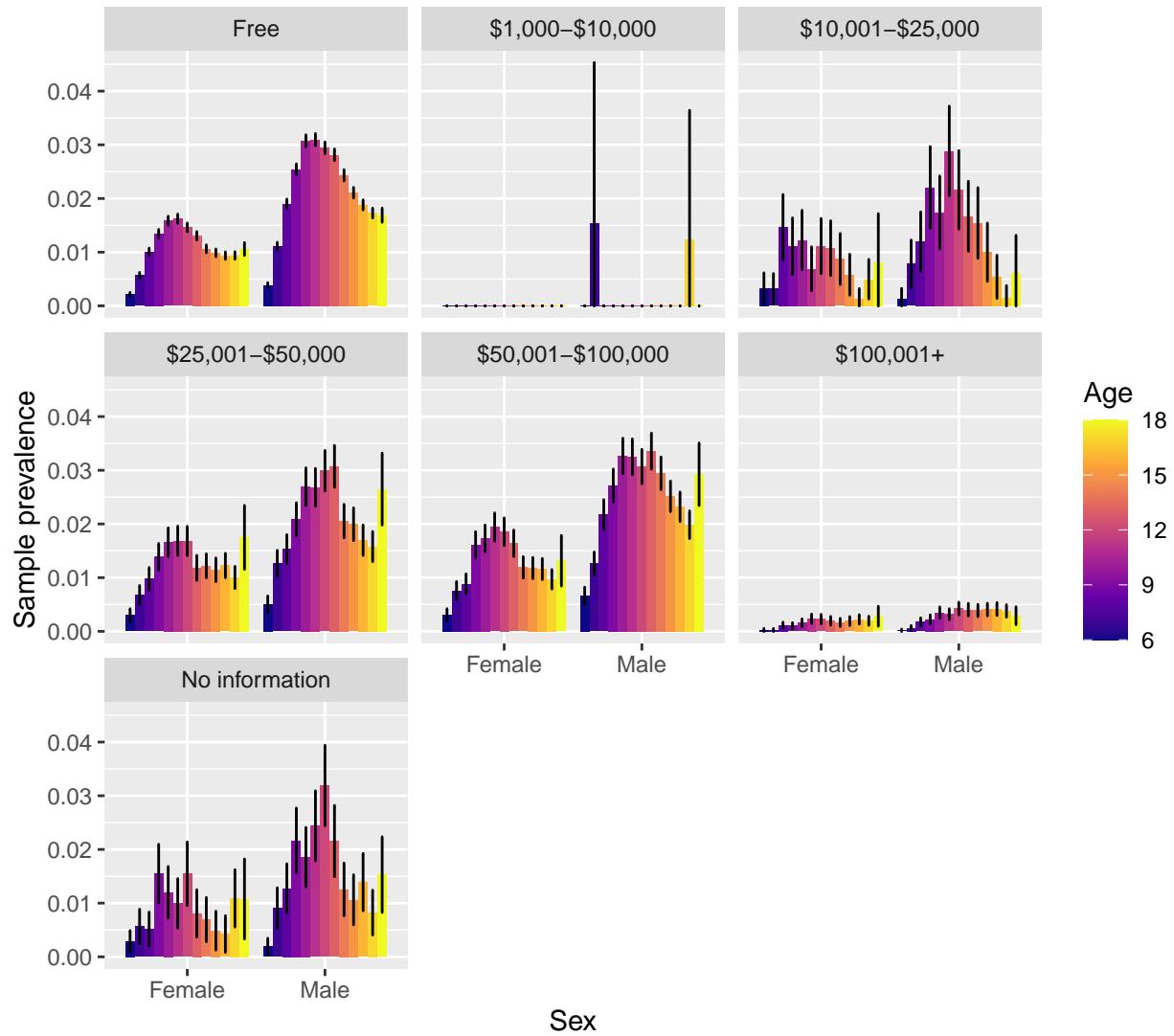


Figure 55: Sample prevalence of ADHD by socio-economic (SES) status of student's family, age and sex. Bars show 95% normal confidence intervals.

Autism prevalence by ethnicity

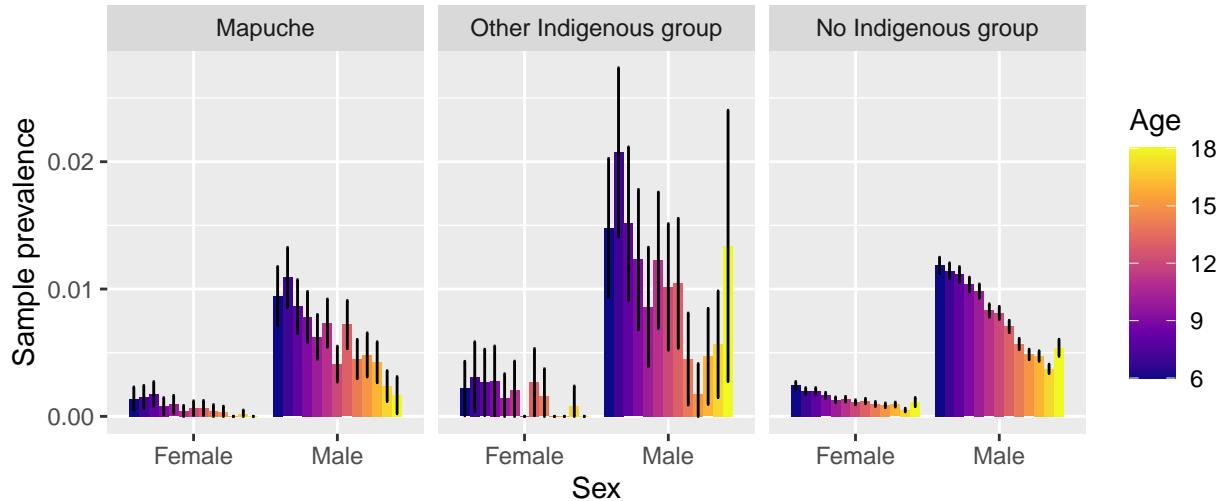


Figure 56: Sample prevalence of autism by ethnicity, age and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by ethnicity

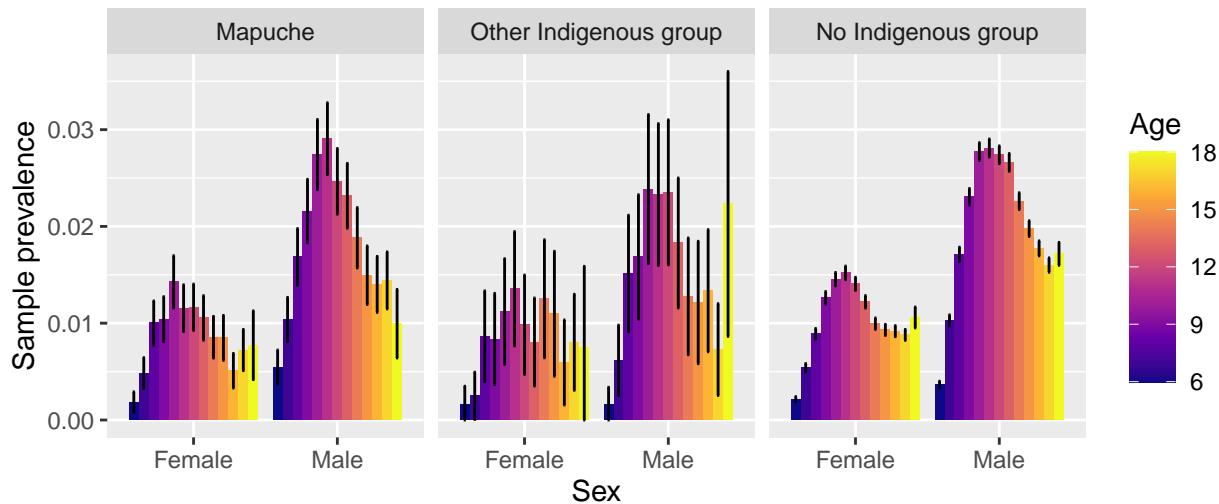


Figure 57: Sample prevalence of ADHD by ethnicity, age and sex. Bars show 95% normal confidence intervals.

Autism prevalence by school's rurality

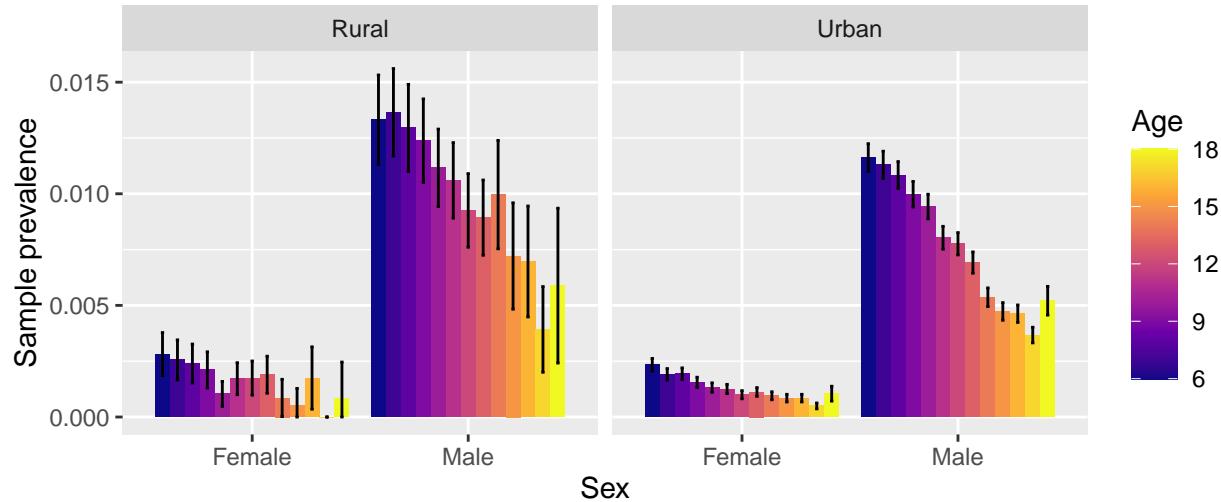


Figure 58: Sample prevalence of autism by school's rurality, age and sex. Bars show 95% normal confidence intervals.

ADHD prevalence by school's rurality

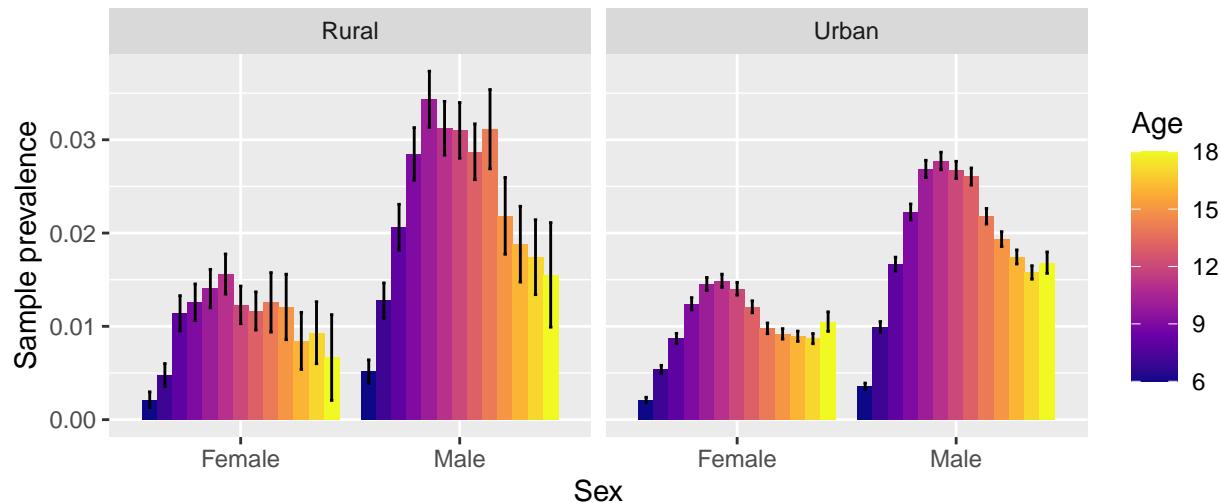
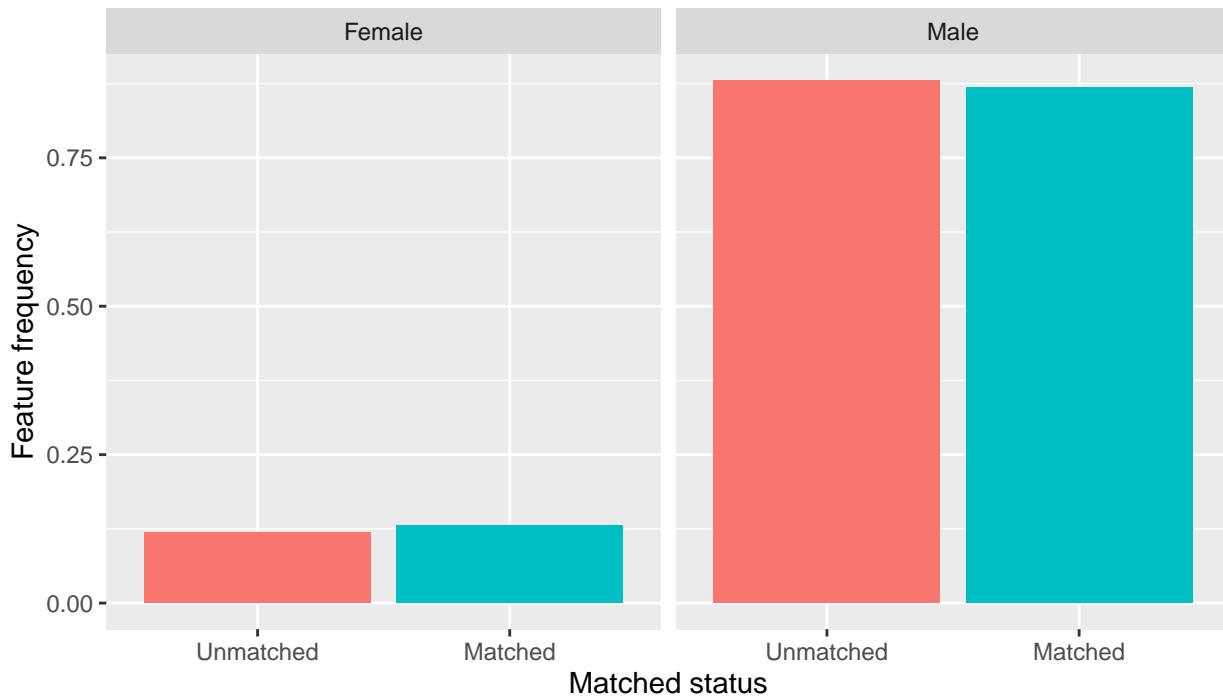


Figure 59: Sample prevalence of ADHD by school's rurality, age and sex. Bars show 95% normal confidence intervals.

Matching of school record to clinical record by sex



Kolmogorov–Smirnov permutation test on matched status in school data |

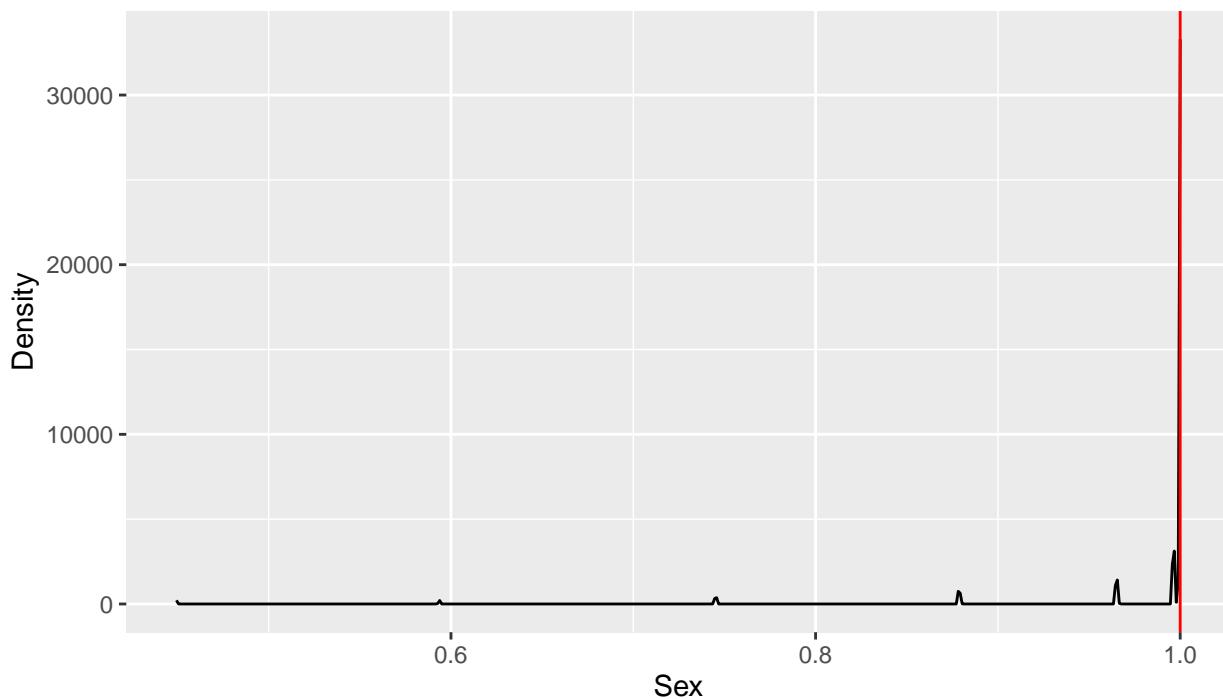
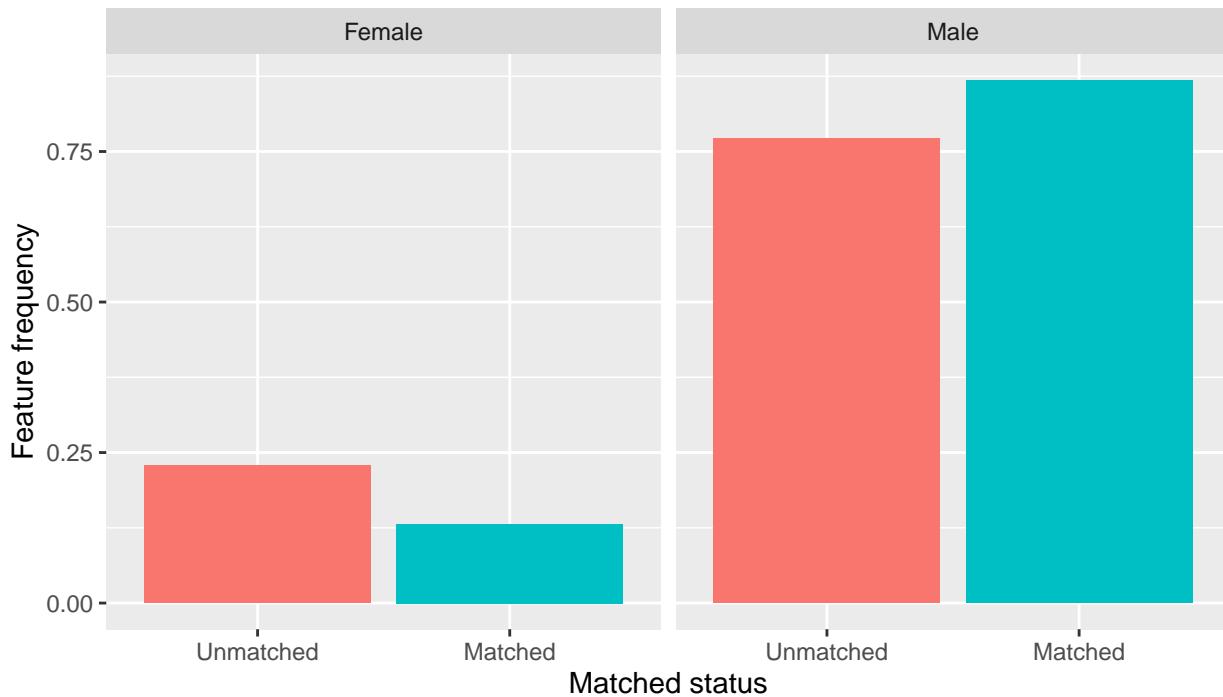


Figure 60: a) Difference in frequency of sexes among school records that matched to patient records and school records that did not match. b) Density of Kolmogorov-Smirnov p-values for 2000 permutations of matched status for school records by sex with observed p-value shown in red.

Matching of clinical record to school record by sex



Kolmogorov–Smirnov permutation test on matched status in patient data by

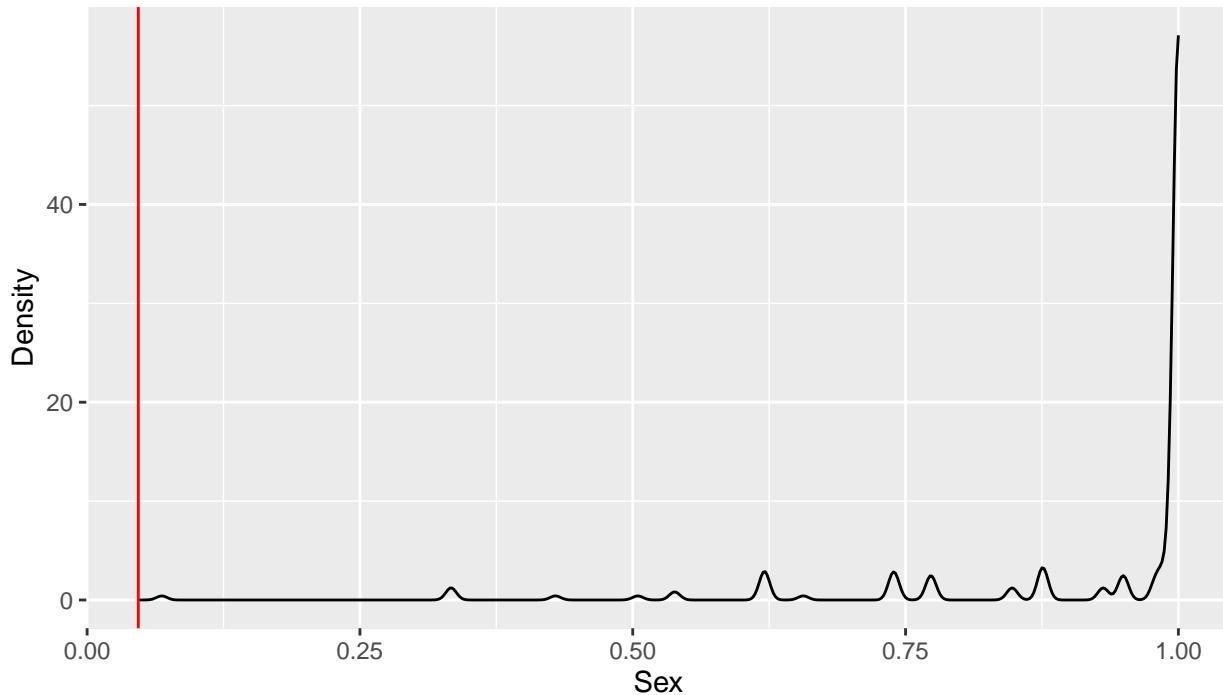
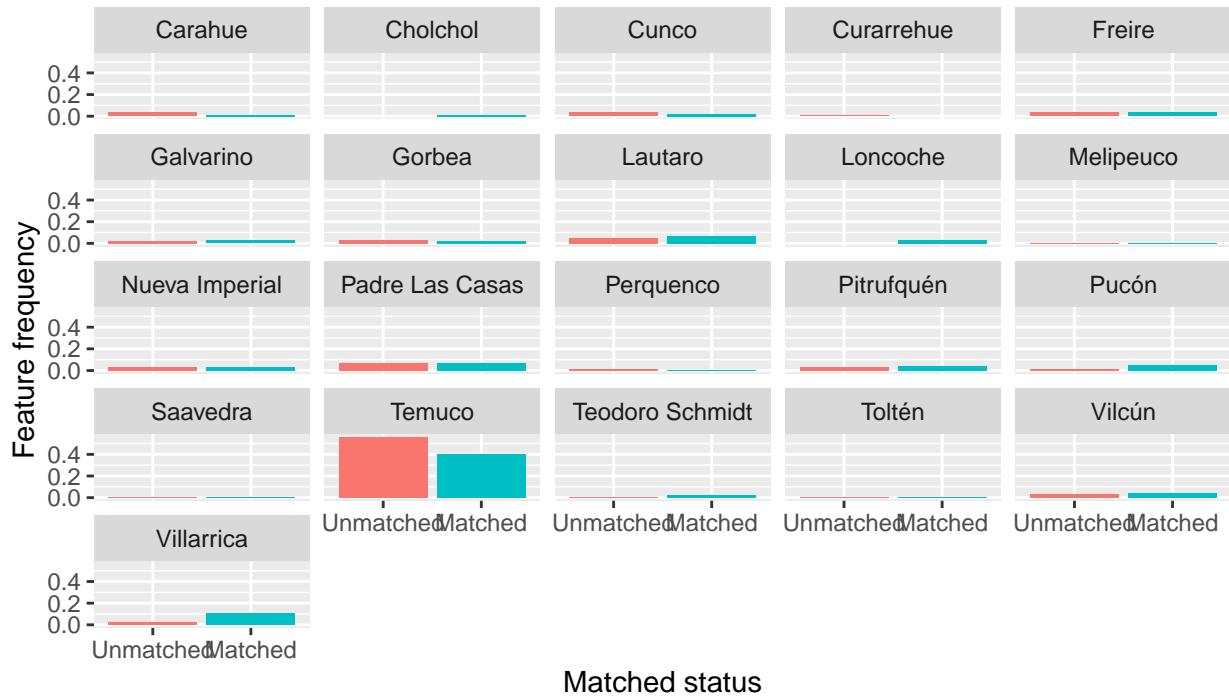


Figure 61: a) Difference in frequency of sexes among patient records that matched to school records and patient records that did not match. b) Density of Kolmogorov-Smirnov p-values for 2000 permutations of matched status for patient records by sex with observed p-value shown in red.

Matching of school record to clinical record by commune



Kolmogorov–Smirnov permutation test on matched status in school data by commune

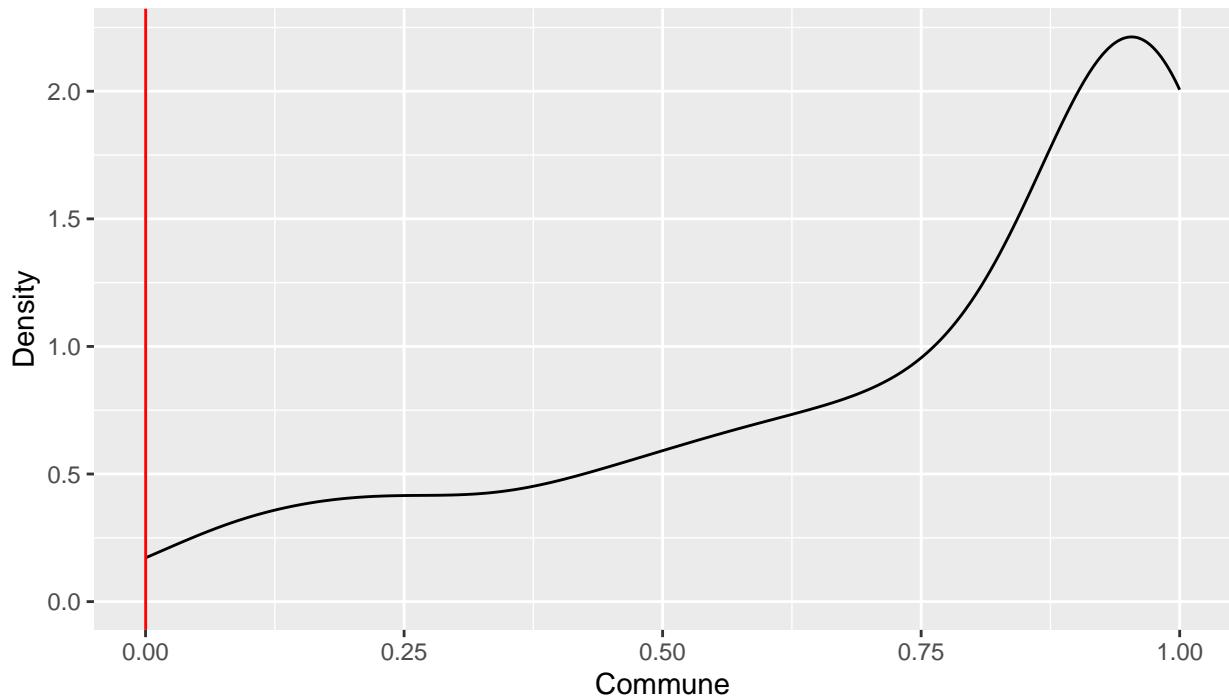
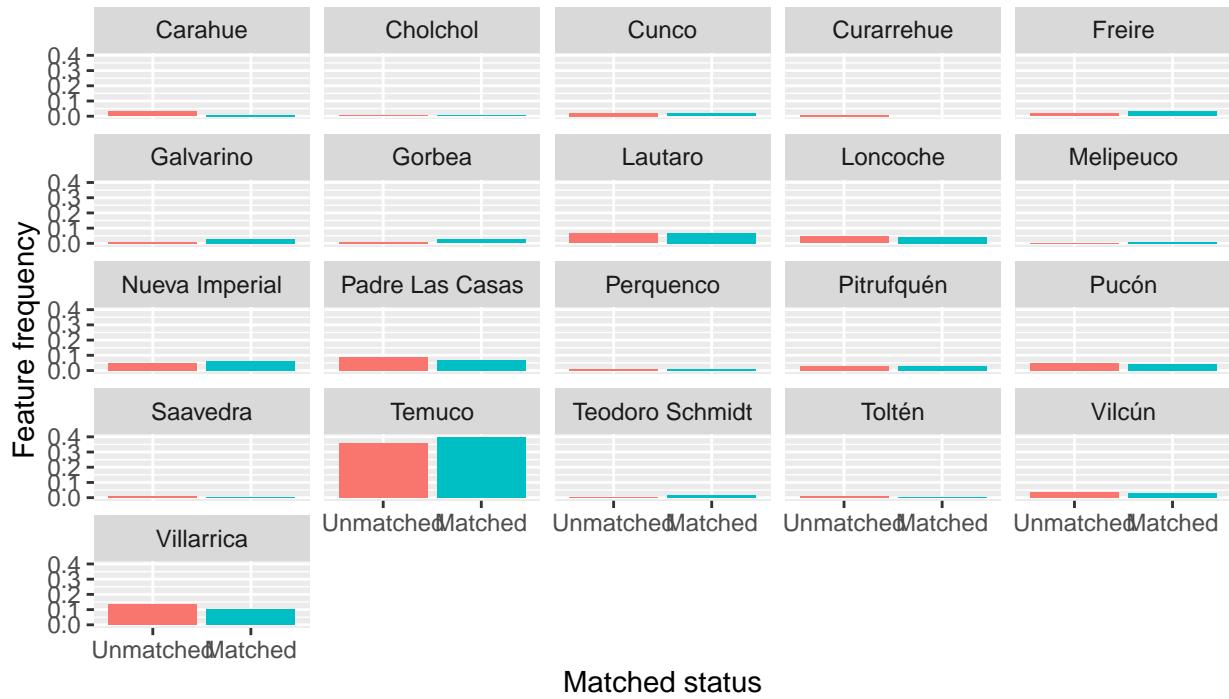


Figure 62: a) Difference in frequency of communes of residence among school records that matched to patient records and school records that did not match. b) Density of Kolmogorov-Smirnov p-values for 2000 permutations of matched status for school records by commune of residence with observed p-value shown in red.

Matching of clinical record to school record by commune



Kolmogorov–Smirnov permutation test on matched status in patient data by commune

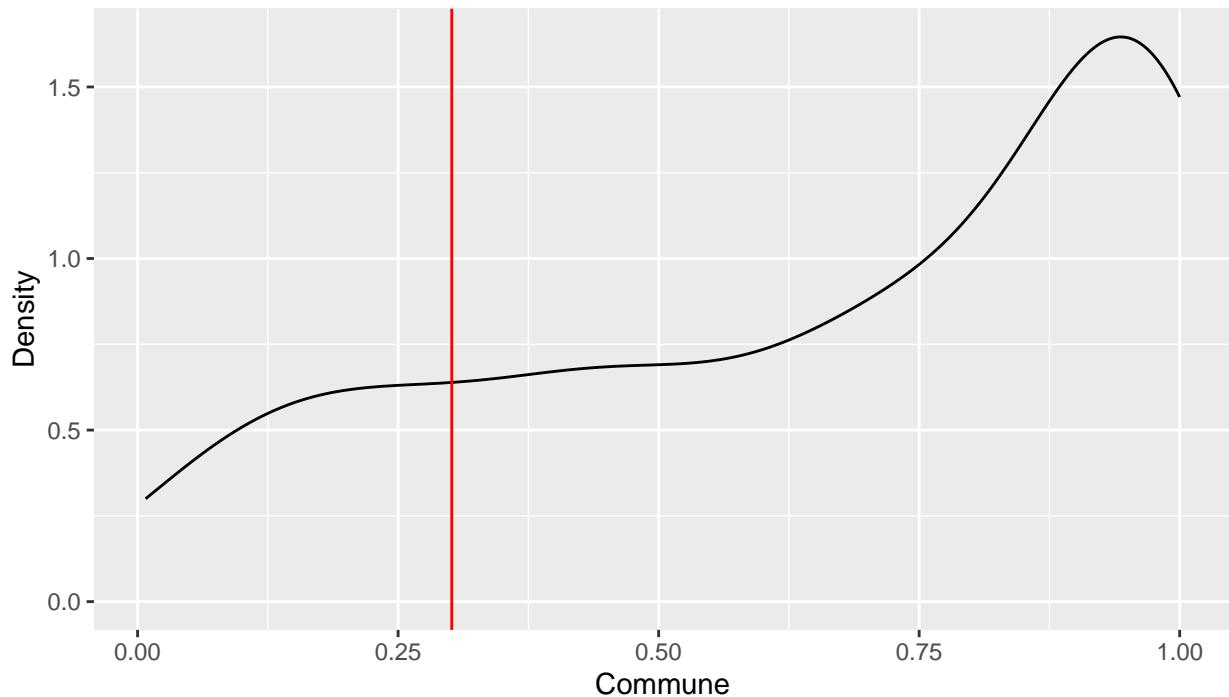
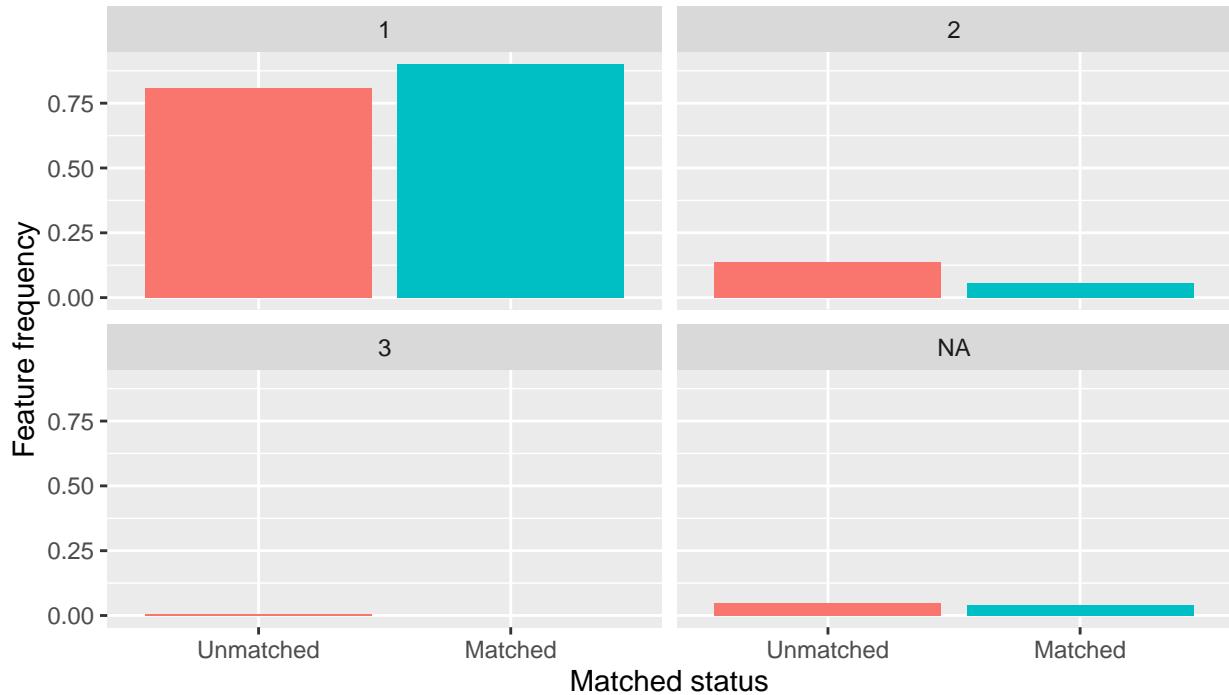


Figure 63: a) Difference in frequency of commune of residence among patient records that matched to school records and patient records that did not match. b) Density of Kolmogorov-Smirnov p-values for 2000 permutations of matched status for patient records by commune of residence with observed p-value shown in red.

Matching of school record to clinical record by SES status



Kolmogorov–Smirnov permutation test on matched status in school data by

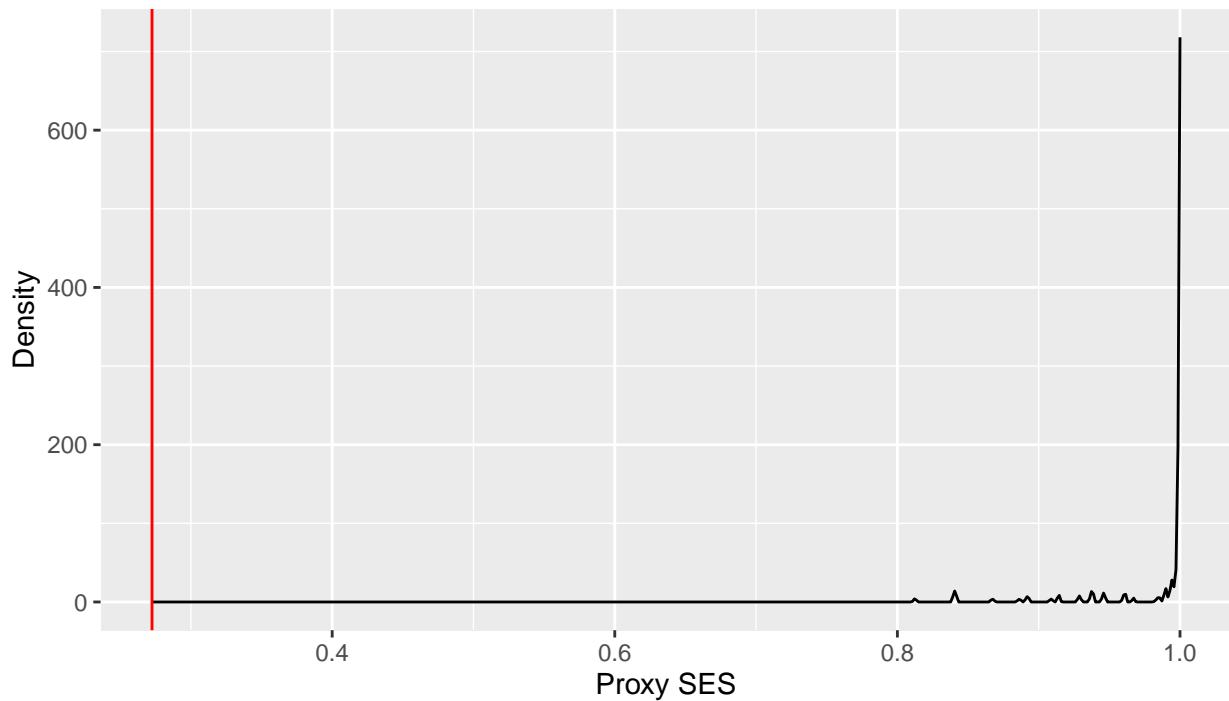
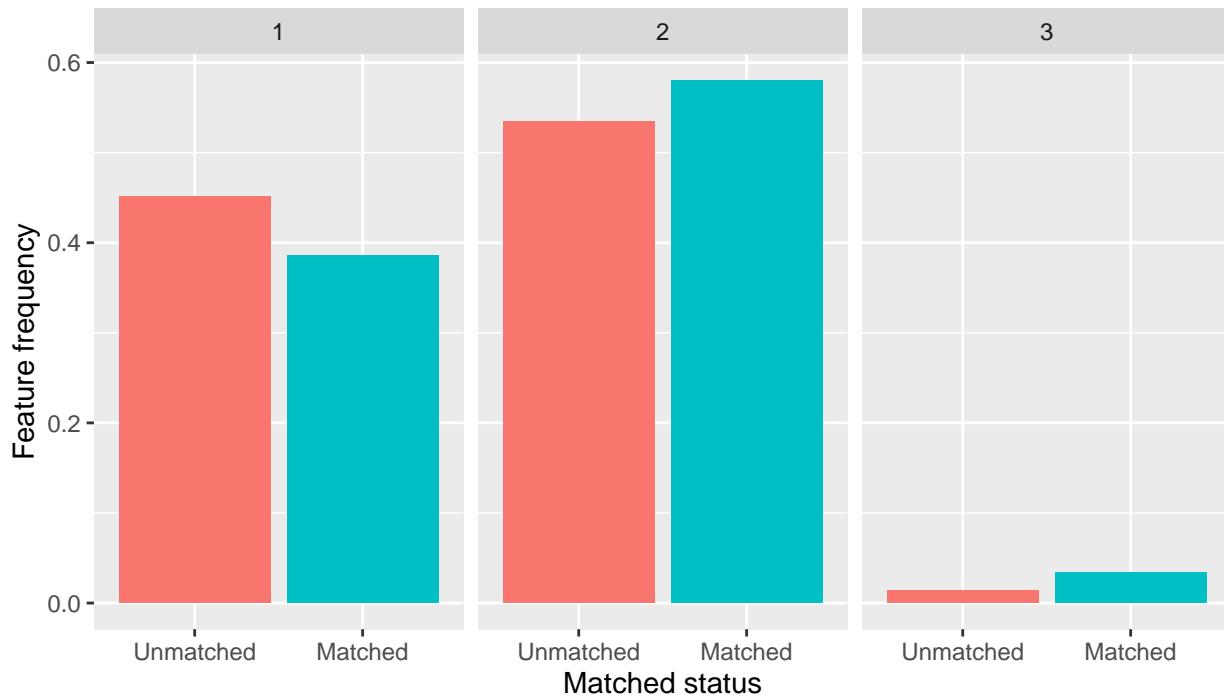


Figure 64: a) Difference in frequency of proxy SES among school records that matched to patient records and school records that did not match. b) Density of Kolmogorov-Smirnov p-values for 2000 permutations of matched status for school records by proxy SES with observed p-value shown in red.

Matching of clinical record to school record by SES status



Kolmogorov–Smirnov permutation test on matched status in patient data by proxy SES

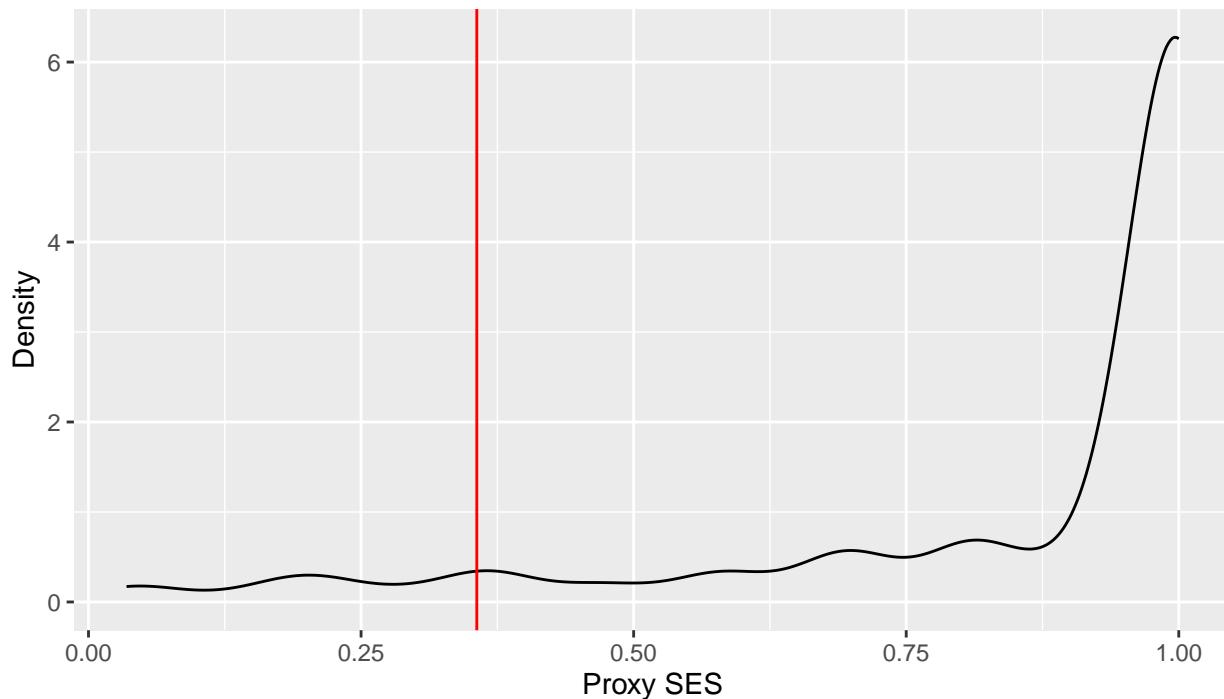


Figure 65: a) Difference in frequency of proxy SES among patient records that matched to school records and patient records that did not match. b) Density of Kolmogorov-Smirnov p-values for 2000 permutations of matched status for patient records by proxy SES with observed p-value shown in red.

Autism prevalence, prior mean = 0.00465, prior sd = 3.98e-05

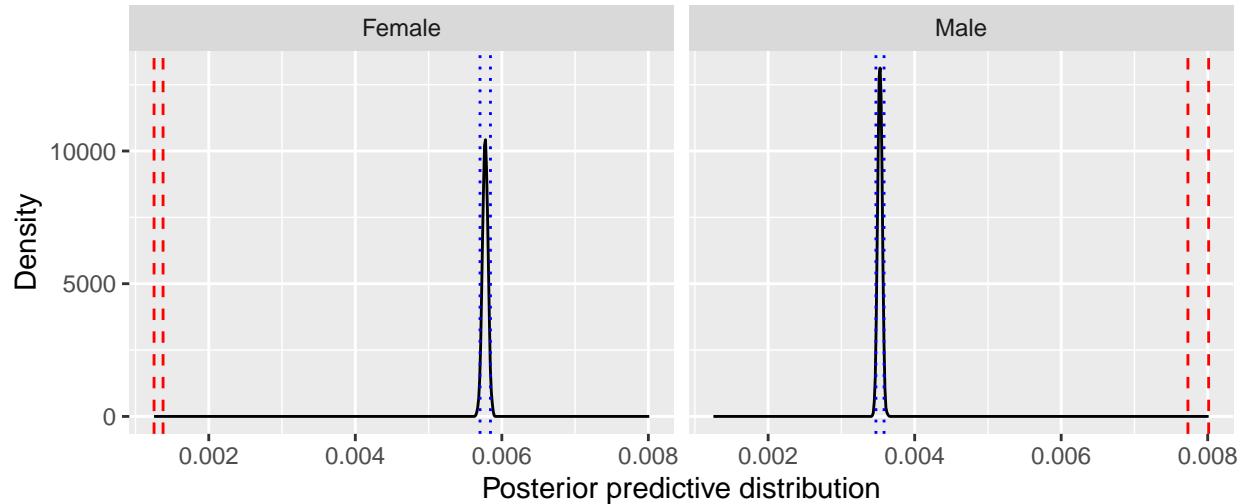


Figure 66: Posterior predictive distribution for autism with a random effect on sex, and with age- and sex-adjusted global prevalence prior.

ADHD prevalence, prior mean = 0.015, prior sd = 7.25e-05

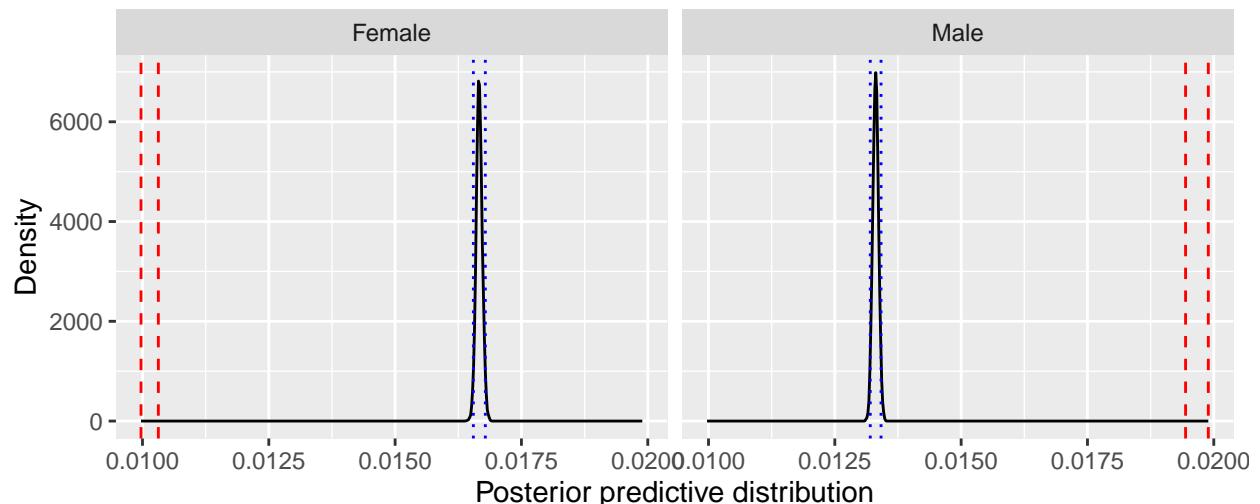


Figure 67: Posterior predictive distribution for ADHD with a random effect on sex, and with age- and sex-adjusted global prevalence prior.

Autism prevalence, prior mean = 0.00465, prior sd = 3.98e-05

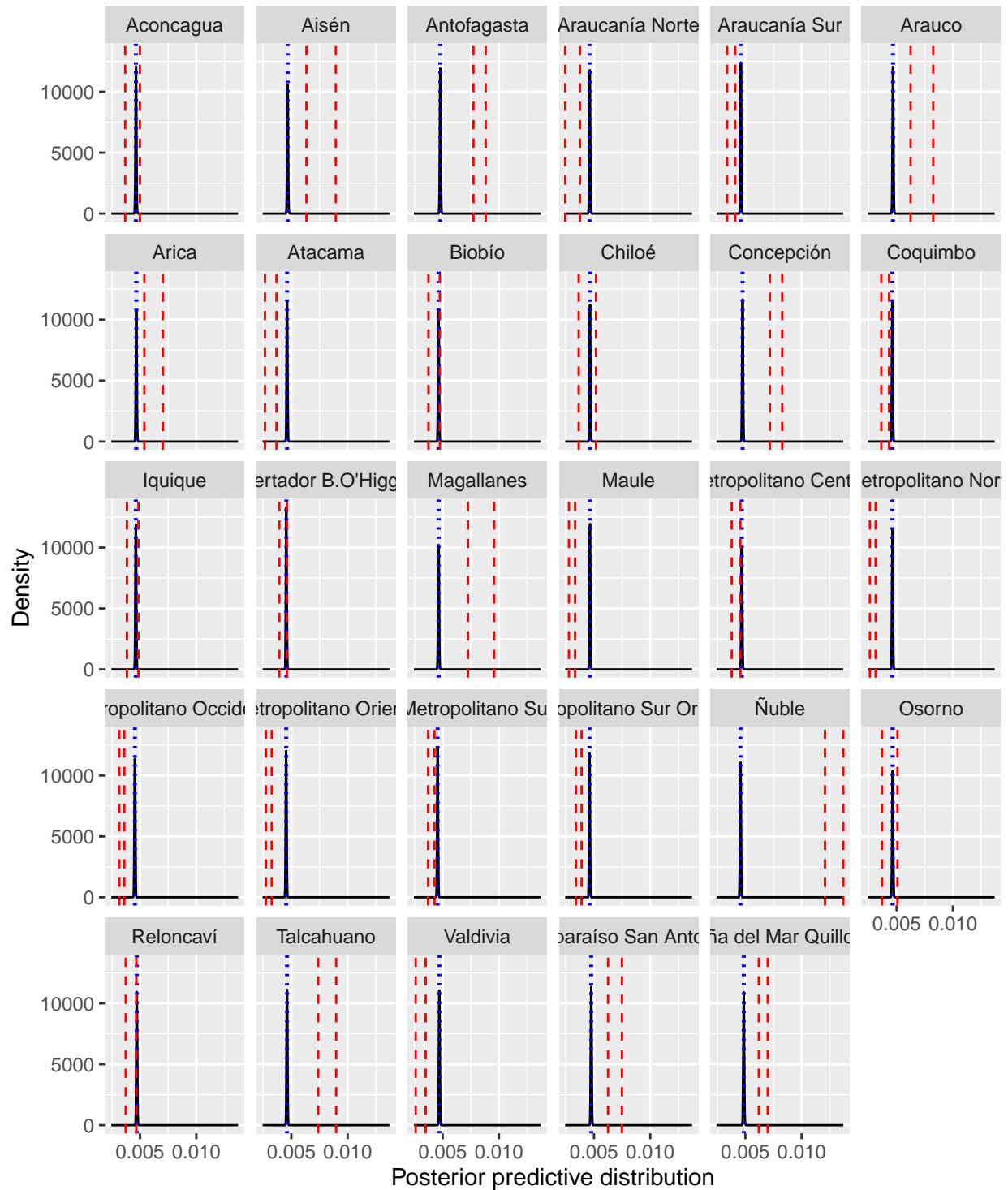


Figure 68: Posterior predictive distribution for autism with a random effect on student's health service, and with age- and sex-adjusted global prevalence prior.

ADHD prevalence, prior mean = 0.015, prior sd = 7.25e–05

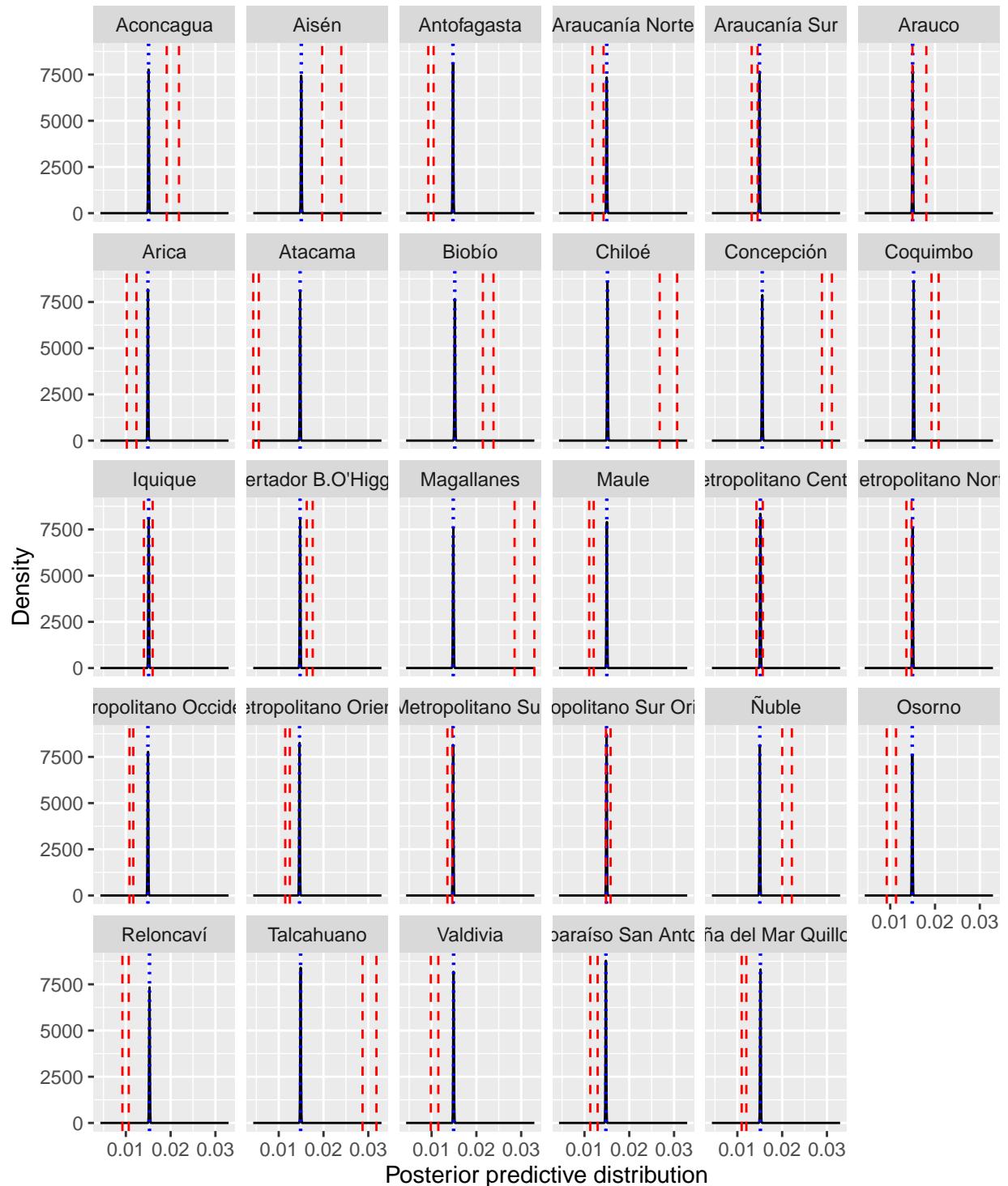


Figure 69: Posterior predictive distribution for ADHD with a random effect on health service, and with age- and sex-adjusted global prevalence prior.

Autism prevalence, prior mean = 0.00465, prior sd = 3.98e-05

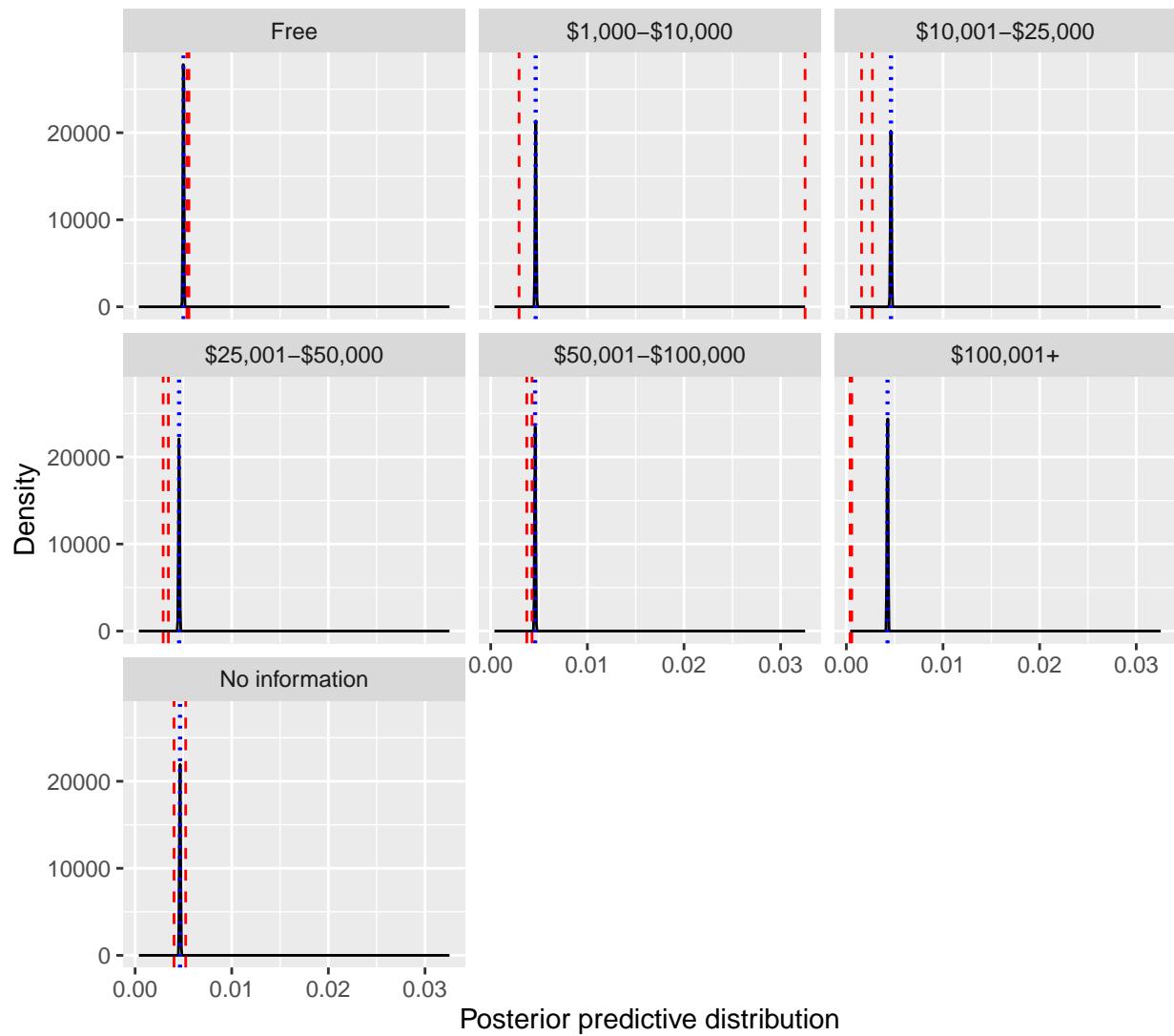


Figure 70: Posterior predictive distribution for autism with a random effect on socio-economic status of student's family, and with age- and sex-adjusted global prevalence prior.

ADHD prevalence, prior mean = 0.015, prior sd = 7.25e-05

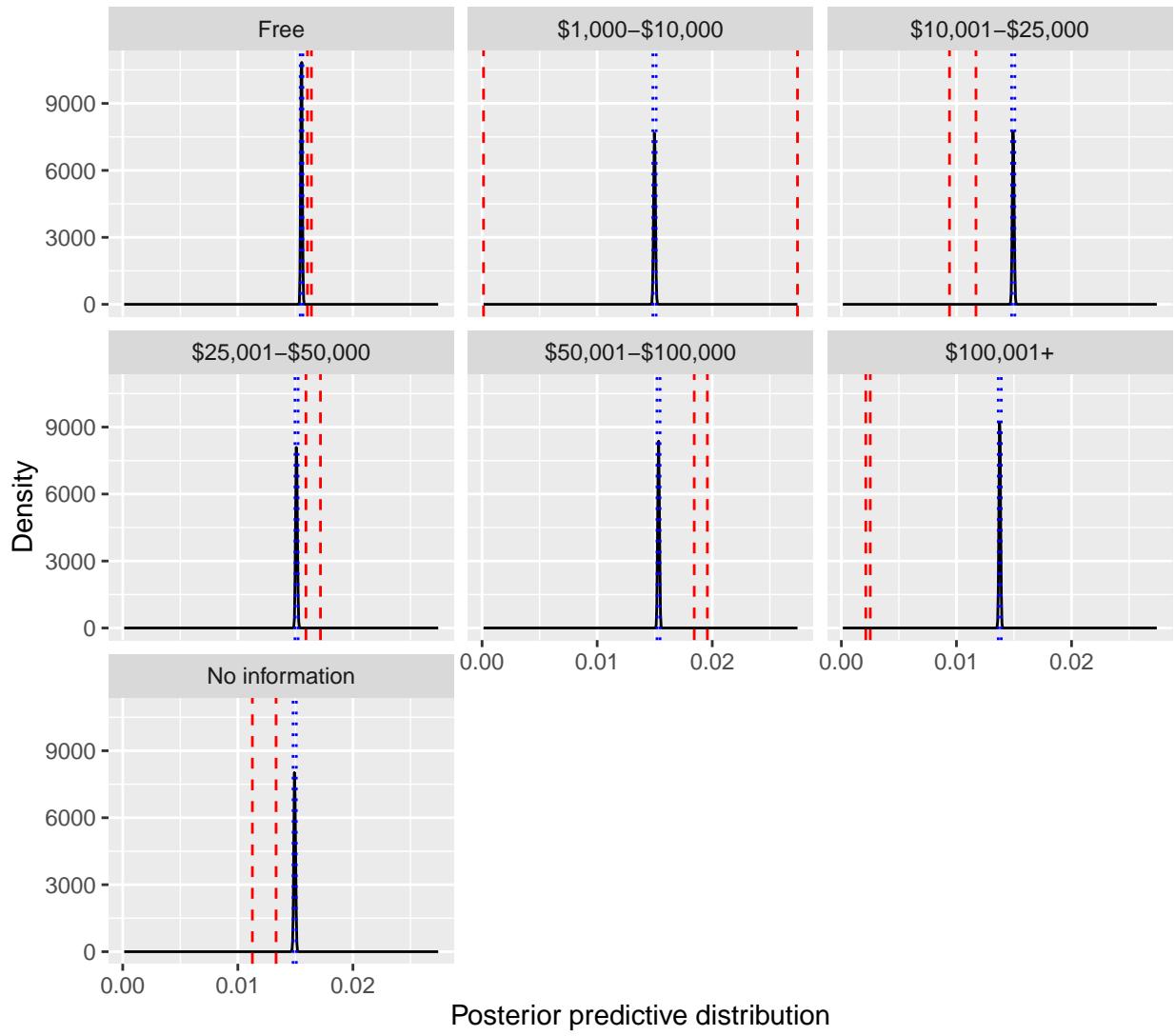


Figure 71: Posterior predictive distribution for ADHD with a random effect on socio-economic status of student's family, and with age- and sex-adjusted global prevalence prior.

Autism prevalence, prior mean = 0.00465, prior sd = 3.98e-05

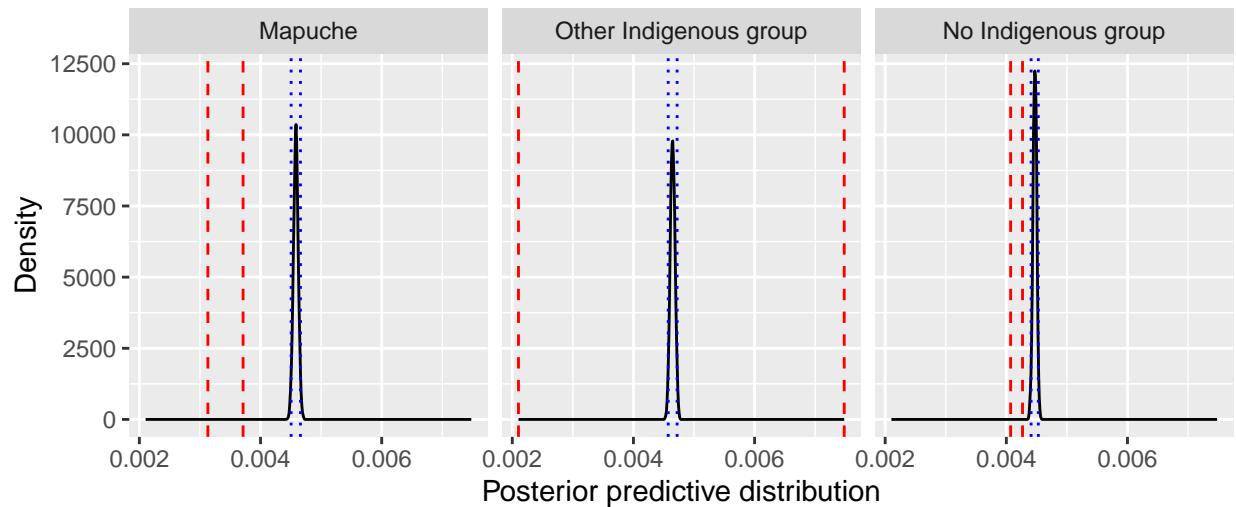


Figure 72: Posterior predictive distribution for autism with a random effect on ethnicity, and with age- and sex-adjusted global prevalence prior.

ADHD prevalence, prior mean = 0.015, prior sd = 7.25e-05

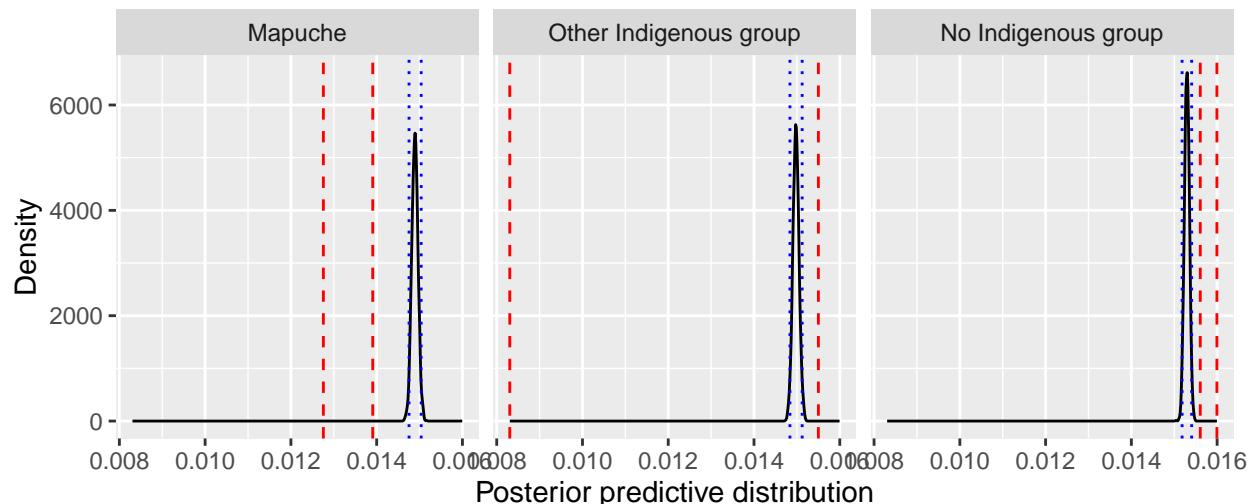


Figure 73: Posterior predictive distribution for ADHD with a random effect on ethnicity, and with age- and sex-adjusted global prevalence prior.

Autism prevalence, prior mean = 0.00465, prior sd = 3.98e-05

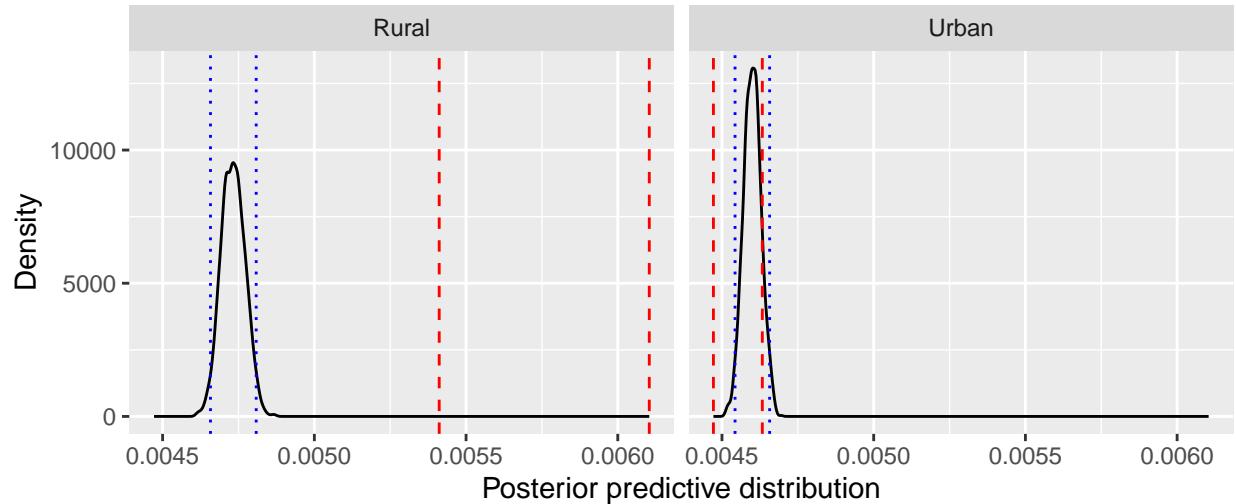


Figure 74: Posterior predictive distribution for autism with a random effect on school's rurality, and with age- and sex-adjusted global prevalence prior.

ADHD prevalence, prior mean = 0.015, prior sd = 7.25e-05

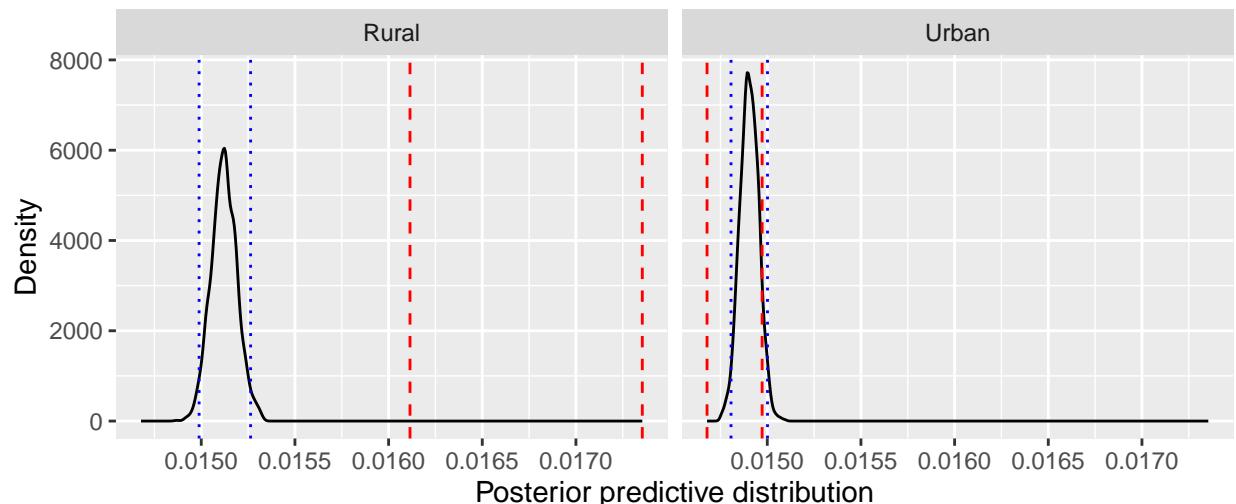


Figure 75: Posterior predictive distribution for ADHD with a random effect on school's rurality, and with age- and sex-adjusted global prevalence prior.