

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

TODO

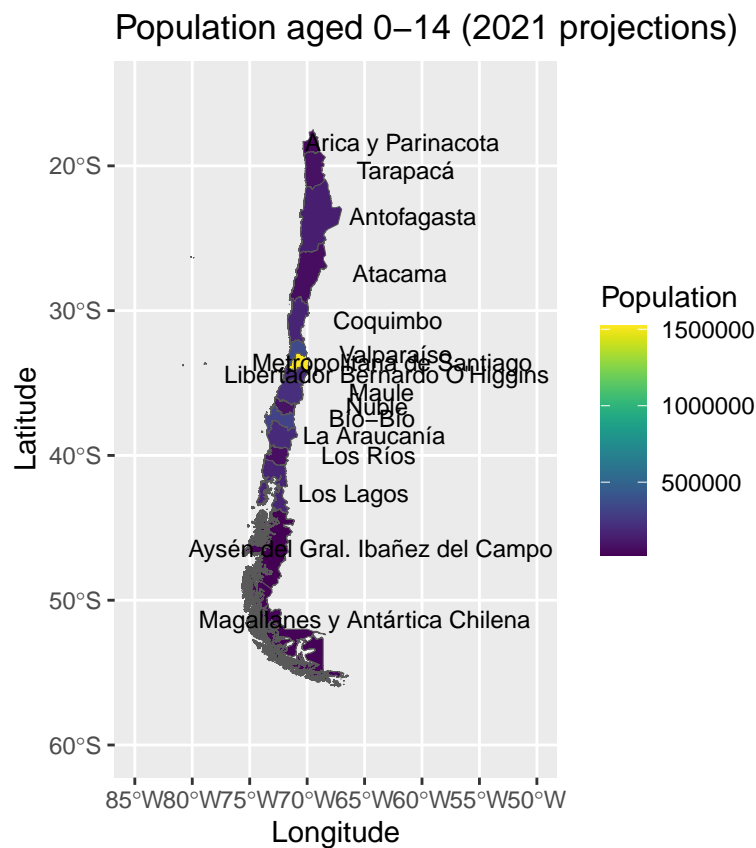
2 Declaration

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.

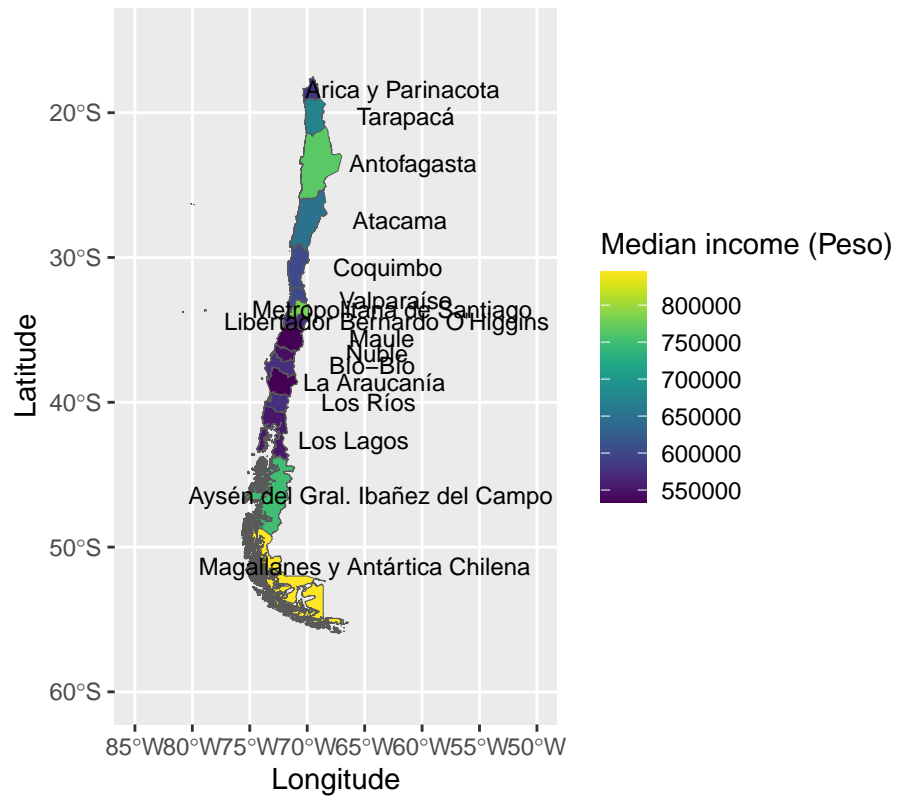
USN: xxxxxx July, 2022

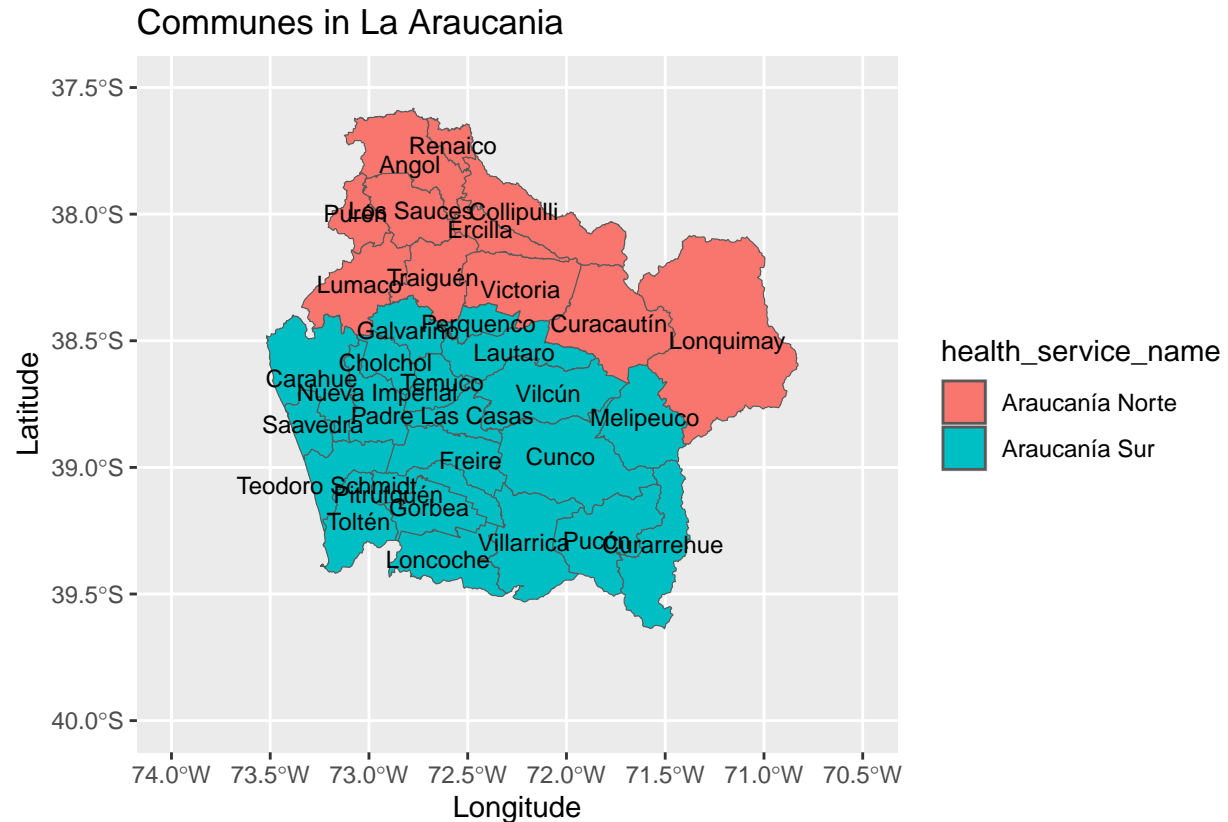
TODO - is this section needed?

3 Introduction



Net income from main job (2021)





4 Methods

5 Results

5.1 School data

TODO - table summarising data content

5.2 Frequentist prevalence estimation

```
## # A tibble: 1 x 6
##   crude_ci_lower crude_rate crude_ci_upper adjusted_ci_lower adjusted_~1 adjus-2
##   <dbl>         <dbl>         <dbl>         <dbl>         <dbl>   <dbl>
## 1         0.00468     0.00476         0.00484         0.00457     0.00465 0.00473
## # ... with abbreviated variable names 1: adjusted_rate, 2: adjusted_ci_upper

## # A tibble: 1 x 6
##   crude_ci_lower crude_rate crude_ci_upper adjusted_ci_lower adjusted_~1 adjus-2
##   <dbl>         <dbl>         <dbl>         <dbl>         <dbl>   <dbl>
## 1         0.0150     0.0151         0.0153         0.0148     0.0150 0.0151
## # ... with abbreviated variable names 1: adjusted_rate, 2: adjusted_ci_upper

## # A tibble: 2 x 7
##   sex_desc crude_ci_lower crude_rate crude_ci_upper adjusted_c~1 adjus-2 adjus-3
##   <chr>         <dbl>         <dbl>         <dbl>         <dbl>   <dbl>   <dbl>
## 1 Male         0.00787     0.00801         0.00815         0.00773 0.00787 0.00801
```

```

## 2 Female          0.00127    0.00133          0.00139          0.00125 0.00131 0.00138
## # ... with abbreviated variable names 1: adjusted_ci_lower, 2: adjusted_rate,
## #   3: adjusted_ci_upper

## # A tibble: 2 x 7
##   sex_desc crude_ci_lower crude_rate crude_ci_upper adjusted_c~1 adjus~2 adjus~3
##   <chr>      <dbl>      <dbl>      <dbl>      <dbl> <dbl> <dbl>
## 1 Male          0.0196      0.0198      0.0201      0.0194  0.0197  0.0199
## 2 Female        0.00998      0.0101      0.0103      0.00997 0.0101  0.0103
## # ... with abbreviated variable names 1: adjusted_ci_lower, 2: adjusted_rate,
## #   3: adjusted_ci_upper

##               health_service_name crude_ci_lower crude_rate
## 1          Servicio de Salud Aconcagua 0.003765247 0.004362610
## 2          Servicio de Salud Aisén 0.006302370 0.007502518
## 3          Servicio de Salud Antofagasta 0.007900361 0.008418934
## 4 Servicio de Salud Araucanía Norte 0.002448533 0.003010235
## 5          Servicio de Salud Araucanía Sur 0.003362908 0.003690037
## 6          Servicio de Salud Arauco 0.006350580 0.007293899
## 7          Servicio de Salud Arica 0.005399735 0.006123960
## 8          Servicio de Salud Atacama 0.002619687 0.003067067
## 9          Servicio de Salud Biobío 0.003812530 0.004292448
## 10         Servicio de Salud Chiloé 0.003761122 0.004509034
## 11         Servicio de Salud Concepción 0.007325145 0.007848231
## 12         Servicio de Salud Coquimbo 0.003786519 0.004120918
## 13 Servicio de Salud Del Libertador B.O'Higgins 0.004022862 0.004343968
## 14         Servicio de Salud Del Maule 0.002796485 0.003049836
## 15         Servicio de Salud Del Reloncaví 0.003792073 0.004243512
## 16         Servicio de Salud Iquique 0.003812383 0.004310930
## 17         Servicio de Salud Magallanes 0.007263090 0.008327972
## 18         Servicio de Salud Metropolitano Central 0.003841873 0.004204219
## 19         Servicio de Salud Metropolitano Norte 0.002683403 0.002933236
## 20         Servicio de Salud Metropolitano Occidente 0.003359240 0.003581732
## 21         Servicio de Salud Metropolitano Oriente 0.002790208 0.003041759
## 22         Servicio de Salud Metropolitano Sur 0.003854393 0.004135134
## 23 Servicio de Salud Metropolitano Sur Oriente 0.003426473 0.003670190
## 24         Servicio de Salud Osorno 0.003800458 0.004451075
## 25         Servicio de Salud Talcahuano 0.007620336 0.008385053
## 26         Servicio de Salud Valdivia 0.002677103 0.003100939
## 27         Servicio de Salud Valparaíso San Antonio 0.006347491 0.006933534
## 28         Servicio de Salud Viña del Mar Quillota 0.006302379 0.006687255
## 29         Servicio de Salud Ñuble 0.012555694 0.013363201

##   crude_ci_upper adjusted_ci_lower adjusted_rate adjusted_ci_upper
## 1 0.004959972 0.003677876 0.004265237 0.004981837
## 2 0.008702665 0.006355171 0.007533467 0.008972238
## 3 0.008937508 0.007748673 0.008268784 0.008835526
## 4 0.003571936 0.002459792 0.003021992 0.003775450
## 5 0.004017166 0.003386406 0.003724000 0.004105605
## 6 0.008237219 0.006230700 0.007142133 0.008240720
## 7 0.006848184 0.005393491 0.006145999 0.007046999
## 8 0.003514446 0.002659960 0.003120956 0.003684220
## 9 0.004772365 0.003717458 0.004179314 0.004731123
## 10 0.005256947 0.003652087 0.004346018 0.005198775
## 11 0.008371317 0.007189318 0.007713961 0.008287673
## 12 0.004455317 0.003647066 0.003970800 0.004337663

```

```
## 13 0.004665074 0.003931991 0.004248402 0.004601628
## 14 0.003303187 0.002775082 0.003033079 0.003323332
## 15 0.004694952 0.003737327 0.004177576 0.004681293
## 16 0.004809476 0.003637367 0.004109694 0.004663655
## 17 0.009392854 0.007253011 0.008320539 0.009590295
## 18 0.004566564 0.003791639 0.004153261 0.004557999
## 19 0.003183068 0.002621014 0.002865404 0.003136275
## 20 0.003804224 0.003160762 0.003373394 0.003605720
## 21 0.003293310 0.002741891 0.002987535 0.003258161
## 22 0.004415876 0.003708350 0.003978947 0.004276184
## 23 0.003913908 0.003398113 0.003642252 0.003907120
## 24 0.005101693 0.003720955 0.004339749 0.005086330
## 25 0.009149770 0.007389368 0.008130494 0.008982241
## 26 0.003524776 0.002593669 0.002992100 0.003481956
## 27 0.007519577 0.006245924 0.006830269 0.007483930
## 28 0.007072131 0.006184226 0.006566452 0.006978617
## 29 0.014170708 0.012233443 0.013024782 0.013890164

## # A tibble: 21 x 7
##   commune_name crude_ci_lower crude_rate crude_ci_upper adjus~1 adjus~2 adjus~3
##   <chr>          <dbl>          <dbl>          <dbl> <dbl> <dbl> <dbl>
## 1 Carahue        0.00116        0.00266        0.00417 1.29e-3 0.00251 0.00589
## 2 Cholchol     -0.000181       0.00138        0.00295 2.62e-4 0.00128 0.00816
## 3 Cunco         0.00230        0.00481        0.00733 2.59e-3 0.00474 0.0101
## 4 Curarrehue   -0.000569       0.00148        0.00353 1.72e-4 0.00147 0.00814
## 5 Freire        0.00195        0.00381        0.00567 2.10e-3 0.00369 0.00672
## 6 Galvarino     0.00196        0.00479        0.00761 2.31e-3 0.00465 0.0101
## 7 Gorbea        0.00237        0.00544        0.00851 2.60e-3 0.00523 0.0118
## 8 Lautaro       0.00256        0.00402        0.00548 2.60e-3 0.00389 0.00650
## 9 Loncoche      0.000622       0.00202        0.00342 8.99e-4 0.00295 0.00845
## 10 Melipeuco   -0.000720       0.00187        0.00447 2.26e-4 0.00187 0.0145
## # ... with 11 more rows, and abbreviated variable names 1: adjusted_ci_lower,
## # 2: adjusted_rate, 3: adjusted_ci_upper
```

Report frequentist prevalence estimates for all, by sex, for health services and for Arauc Sur's communes

5.3 Bayesian prevalence estimation