

Autism Studies Data

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Analyzing data of autistic studies

```
setwd("C://Users/maris/Downloads/Code/Autism_data")  
autism_studies_stats <- read.csv("autism_prevalence_studies.csv")
```

Sort Author by alphabet

```
Author_sorted <- sort(autism_studies_stats$Author)
```

Studies published in the 2000s

```
studies_2000s <- subset(autism_studies_stats, Year.Published > 1999)
```

What is the average participant age in these most recent studies?

```
class(studies_2000s$Age.Range)
```

```
## [1] "character"
```

```
age_range_factored <- as.factor(studies_2000s$Age.Range)  
na.omit(age_range_factored)
```

```
## [1] 3 to 17      1.5 to 8      0 to 15      1 to 4  
## [5] 5 to 18      5 to 14      5 to 15      2.5 to 6.5  
## [9] 3 to 10      0 to 12      5 to 11      3 to 10  
## [13] 6 to 17      5 to 14      7 to 11  
## [17] 2 to 17      8 to 9       0 to 9       4 to 6  
## [21] 5           6           3 to 6       2 to 6  
## [25] 5 to 21      0 to 17      9 to 10      7 to 24  
## [29] 0 to 14      1 to 14      8 to 9       6 to 11  
## [33] 8           8           4 to 9       8 to 17  
## [37] 5 to 10      0 to 17      6 to 9       3  
## [41] 4 to 9       9           0 to 14      6 to 12  
## [45] 3 to 9       0 to 11      8           5 to 9  
## [49] 8           4           2 to 8       0 to 13  
## [53] 1.5 to 2     3 to 17      6 to 17      7 to 9  
## [57]             6           0 to 14      3 to 17  
## [61] 6           5 to 10      5 to 10      0 to 17  
## [65] 0 to 8       7 to 12      7 to 12      あ%¥ 16  
## [69] 8           8           8           15 to 24  
## [73] 8           0 to 11      5           6 to 12  
## [77] 0 to 17      6 to 11      2           8  
## [81] 7 to 17      2 to 27      1 to 12      3 to 17  
## [85] 11 to 15     0 to 12      8           6 to 17
```

```
## [89] 8          1.5 to 3      7 to 12      2 to 14
## [93] 2 to 9      7          8          5 to 9
## [97] 3 to 17     0 to 21     0 to 21     0 to 19
## [101] 0 to 20     8          0 to 27
## [105] 4          6 to 11     7          8
## [109] 5 to 15     2 to 5      0 to 3
## [113] 6 to 11     0 to 27     1.3 to 4    4
## [117] 3 to 18     8          6 to 7      1 to 30
## [121] 8          8          10 to 11    1 to 10
## [125] 3 to 8      0 to 16     4          2 to 17
## [129] 0 to 17     3 to 17     3 to 17     6 to 9
## [133] 1 to 24     8          3 to 17     9 to 13
## [137] 0 to 25     0 to 24     1 to 17     5
## [141] 7 to 9      3 to 12     1.5 to 3    3 to 5
## [145] 6 to 10     3 to 17     8          3 to 17
## [149] 4          0 to 14     6 to 11     7 to 14
## [153] 1.5 to 2.5  6 to 18     2 to 17     18 to 64
## [157] 1 to 5      8          4
## [161] 5          3 to 17     7 to 9      12 to 13
## [165] 6 to 9      10 to 11    6 to 12     6
## [169] 6 to 21     5 to 17     4 to 5; 10 to 11
## 89 Levels: 0 to 11 0 to 12 0 to 13 0 to 14 0 to 15 0 to 16 0 to 17
... â%¥ 16
```

```
age_range_factored <- as.data.frame(age_range_factored)
average_age_2000s <- mean(age_range_factored)

## Warning in mean.default(age_range_factored): argument is not numeric
or logical:
## returning NA
```

The structure of the data for the age range of participants used is not best suited for this analysis.

What is the average sample size? (To remove NA values without altering initial dataset)

```
sample_size <- na.omit(studies_2000s$Sample.Size)
average_n <- mean(sample_size)
print(average_n)

## [1] 1101551

print(paste0(" The average sample size is ", average_n))

## [1] " The average sample size is 1101550.59872611"
```

What is the average sample size of studies completed before the 2000s?

```
studies_1900s <- subset(autism_studies_stats, Year.Published <2000)
sample_n_1900s <- mean(studies_1900s$Sample.Size)
```

```
print(paste0(" The average sample size for studies published before 2000  
is ", sample_n_1900s))
```

```
## [1] " The average sample size for studies published before 2000 is  
151815.068965517"
```

Sample size comparison

```
print(paste0(" The sample size for studies published in the 2000s ",  
(average_n), " is larger than the sample size for studies published  
before the 2000s ", sample_n_1900s))
```

```
## [1] " The sample size for studies published in the 2000s  
1101550.59872611 is larger than the sample size for studies published  
before the 2000s 151815.068965517"
```

Which autism types were analyzed in all studies?

```
classified_types_ASD <-  
unique(autism_studies_stats$Autism.Types.Included)  
print(classified_types_ASD)
```

```
## [1] "autistic conditions"  
## [2] "classic infantile autism"  
## [3] "autistic syndrome"  
## [4] "early childhood autism"  
## [5] "autism"  
## [6] "early infantile autism, autistic mental retardation"  
## [7] "early infantile autism"  
## [8] "childhood autism"  
## [9] "infantile autism"  
## [10] "infantile autism, autistic-like conditions"  
## [11] "infantile autism, childhood onset PDD, atypical PDD, all PDD"  
## [12] "simple autism, autism with major neurological abnormalities"  
## [13] "autism syndrome"  
## [14] "autistic disorder, autistic-like conditions"  
## [15] "ASD (not specified)"  
## [16] "childhood autism, early infantile autism, autism-like  
conditions"  
## [17] "autistic disorder"  
## [18] "childhood autism, atypical autism, disintegrative disorder,  
Asperger syndrome"  
## [19] "autistic disorder, Asperger syndrome, other autistic-like  
conditions"  
## [20] "core autism, atypical autism, Asperger syndrome"  
## [21] "childhood autism, Asperger syndrome, PDD (including atypical  
autism)"  
## [22] "autistic disorder, PDD, Asperger syndrome, atypical autism,  
OMRS, Rett syndrome"  
## [23] "autism, autistic-like conditions"  
## [24] "infantile autism, childhood autism, atypical autism"  
## [25] "PDD (not specified)"
```

[26] "PDD (AD, Asperger syndrome, Rett syndrome, PDD-NOS, childhood disintegrative disorder)"

[27] "AD, PDD-NOS, Asperger syndrome"

[28] "full syndrome autism"

[29] "autism spectrum condition"

[30] "autistic disorder, PDD-NOS, Asperger syndrome"

[31] "autism, PDD-NOS, Asperger syndrome, Rett syndrome, childhood disintegrative disorder"

[32] "high functioning autism, asperger syndrome, PDD-NOS"

[33] "ASD (autistic disorder, Asperger's syndrome, PDD-NOS)"

[34] "PDD (childhood autism, Asperger's syndrome, and autistic spectrum disorder)"

[35] "childhood autism, atypical autism, Asperger syndrome, PDD-NOS"

[36] "PDD (autistic disorder, PDD-NOS, Asperger syndrome, childhood disintegrative disorder)"

[37] "autistic disorder; Asperger syndrome"

[38] "PDD (autistic disorder, PDD-NOS, Asperger syndrome)"

[39] "ASD (infantile autism, autistic disorder, childhood disintegrative disorder, PDD-NOS, Asperger syndrome)"

[40] "PDD/ASD (AD, PDD-NOS, Asperger syndrome, Rett syndrome, childhood disintegrative disorder)"

[41] "PDD (autistic disorder, Asperger syndrome)"

[42] "ASD (autistic disorder, Asperger syndrome, PDD-NOS)"

[43] "childhood autism, atypical autism, Asperger syndrome, childhood disintegrative disorder"

[44] "ASD (autistic disorder, PDD-NOS, Asperger syndrome)"

[45] "ASD (Kanner autism, Asperger syndrome, 'other forms' which include atypical autism, mental retardation, fragile x, and other conditions associated with autism)"

[46] "PDD"

[47] "ASD, childhood autism"

[48] "ASD (autism, Asperger syndrome, PDD-NOS)"

[49] "ASD (childhood autism, atypical autism, Asperger syndrome, unspecified ASD)"

[50] "ASD (autism, Asperger syndrome, PDD-NOS, atypical autism)"

[51] "autistic disorder, PDD-NOS (including atypical autism), Asperger syndrome"

[52] "ASD (autistic disorder, PDD-NOS including atypical autism, Asperger syndrome)"

[53] "ASD (autistic disorder, PDD-NOS, Rett, Asperger syndrome, childhood disintegrative disorder)"

[54] "ASD (unspecified)"

[55] "ASD (autism, Asperger syndrome, PDD, other ASD)"

[56] "PDD (autistic disorder, Asperger syndrome, PDD-NOS, childhood disintegrative disorder)"

[57] "ASD (autistic disorder, childhood autism, Asperger syndrome, PDD-NOS/atypical autism)"

[58] "ASD (autistic disorder, Asperger syndrome, atypical autism, unspecified ASD)"

[59] "autism (not specified)"

[60] "childhood autism, atypical autism, Asperger syndrome, other PDD, PDD-NOS"

[61] "autistic disorder, Asperger syndrome, PDD-NOS (including atypical autism)"

[62] "ASD (infantile autism, disintegrative psychosis, other specified early childhood psychoses, unspecified psychoses with origin specific to childhood)"

[63] "ASD (PDD, autistic disorder, Asperger syndrome, PDD-NOS, Rett syndrome, childhood disintegrative disorder)"

[64] "PDD (autistic disorder, childhood disintegrative disorder, PDD-NOS, Asperger syndrome)"

[65] "childhood autism/autistic disorder, atypical autism/PDD-NOS, Asperger's disorder"

[66] "ASD (autistic disorder, PDD-NOS/atypical autism, Asperger syndrome)"

[67] "ASD (autistic disorder)"

[68] "ASD (childhood autism, atypical autism, Asperger syndrome)"

[69] "ASD (autism, atypical autism)"

[70] "ASD (autism, Asperger syndrome, PDD, other autism spectrum disorder)"

[71] "ASD (childhood autism, Asperger syndrome)"

[72] "ASD (autistic disorder, PDD-NOS/atypical autism, PDD-NOS, Asperger syndrome)"

[73] "autism (autistic disorder, Asperger syndrome)"

[74] "ASD (autism spectrum disorder, autistic disorder, Asperger syndrome)"

[75] "ASD (autism spectrum disorder, autistic disorder, Asperger syndrome, PDD-NOS)"

[76] "Autistic Spectrum Conditions (classic autism, Asperger syndrome, and PDD-NOS)"

[77] "ASD (autism)"

[78] "autism spectrum conditions (ASC)"

[79] "childhood autism, Asperger syndrome, and other ASDs (excluding Rett syndrome)"

[80] "ASD (classical autism, Asperger syndrome, PDD-NOS, childhood disintegrative disorder, Rett syndrome)"

[81] "autism spectrum disorder trait"

[82] "autism, Asperger syndrome, Rett syndrome, childhood disintegrative disorder, PDD-NOS"

[83] "autism, Asperger syndrome, other autism spectrum"

[84] "ASD (autism, Asperger syndrome, other autism spectrum)"

[85] "ASD (autism, broader autism spectrum)"

[86] "ASD (autism, atypical autism, Rett syndrome, children disintegrative disorder, hyperkinetic disorder accompanied mental retardation and stereotyped movements, Asperger syndrome, PDD, PDD-NOS)"

[87] "ASD (autism, Asperger syndrome, PDD-NOS, childhood disintegrative disorder)"

[88] "ASD (autistic disorder, PDD-NOS/atypical autism, Asperger syndrome)"

[89] "ASD, Asperger syndrome"

```
## [90] "ASD (autistic disorder, childhood disintegrative disorder, PDD,
PDD-NOS, Rett syndrome)"
## [91] "autism disorder"
## [92] "autistic disorder, PDD-NOS including atypical autism or Asperger
syndrome"
## [93] "ASD (autism, Asperger syndrome, PDD)"
## [94] "autistic disorder, childhood disintegrative disorder, other
specified pervasive development disorder, PDD-NOS"
## [95] "ASD, autism, PDD"
```

Did the ASD prevalence estimate per 1000 individuals increase over the years?

```
prevalence_2000s <- mean(studies_2000s$ASD.Prevalence.Estimate.per.1.000)
prevalence_1900s <- mean(studies_1900s$ASD.Prevalence.Estimate.per.1.000)
print(" The prevalence is reported to be higher in the 2000s.")

## [1] " The prevalence is reported to be higher in the 2000s."
```

Is autism more prevalent among a specific gender?

```
average_ratio <- mean(autism_studies_stats$Male.Female.Sex.Ratio)
class(autism_studies_stats$Male.Female.Sex.Ratio)

## [1] "numeric"

sex_ratio <- na.omit(autism_studies_stats$Male.Female.Sex.Ratio)
average_ratio <- mean(sex_ratio)
print(" Autism disorders are more prevalent among males, possibly 4x as
likely.")

## [1] "Autism disorders are more prevalent among males, possibly 4x as
likely."
```

Graph number of studies over the years Install ggplot2 from packages

```
library(ggplot2)
tally_years <- table(autism_studies_stats$Year.Published)
tally_years <- as.data.frame(tally_years)
Published_Study_Progression_plot = ggplot(tally_years, aes(x=Var1, y=
Freq))+
  geom_line()+
  geom_point(shape=5, color= "black", fill= "red", size=2 )+
  ggtitle("Progression of Autism Studies Published")+
  labs(x= "Years",
       y= "Amount of Studies Published")+
  scale_x_discrete(label= function(x) stringr:: str_trunc(x,12))+
  theme(axis.text.x = element_text(angle= 90, hjust = 25, vjust = 2))

print(Published_Study_Progression_plot)
```

```
## geom_path: Each group consists of only one observation. Do you need to  
adjust  
## the group aesthetic?
```

