

Milwaukee Public School Dropout Rate - Exponential Data Analysis by Narendalai Mingat

Data structure understanding

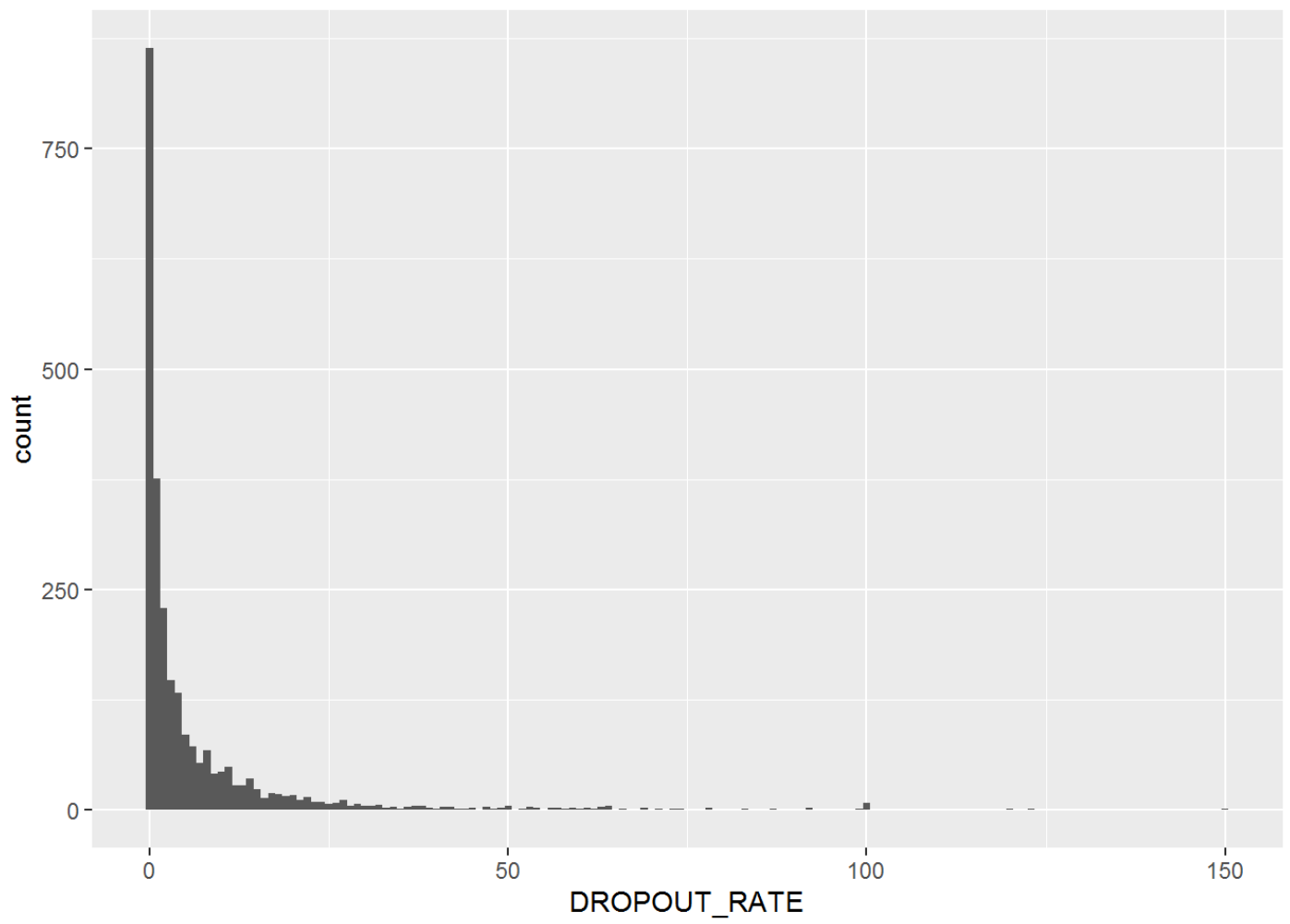
1. Basic Data structure

```
## [1] 2542    7
```

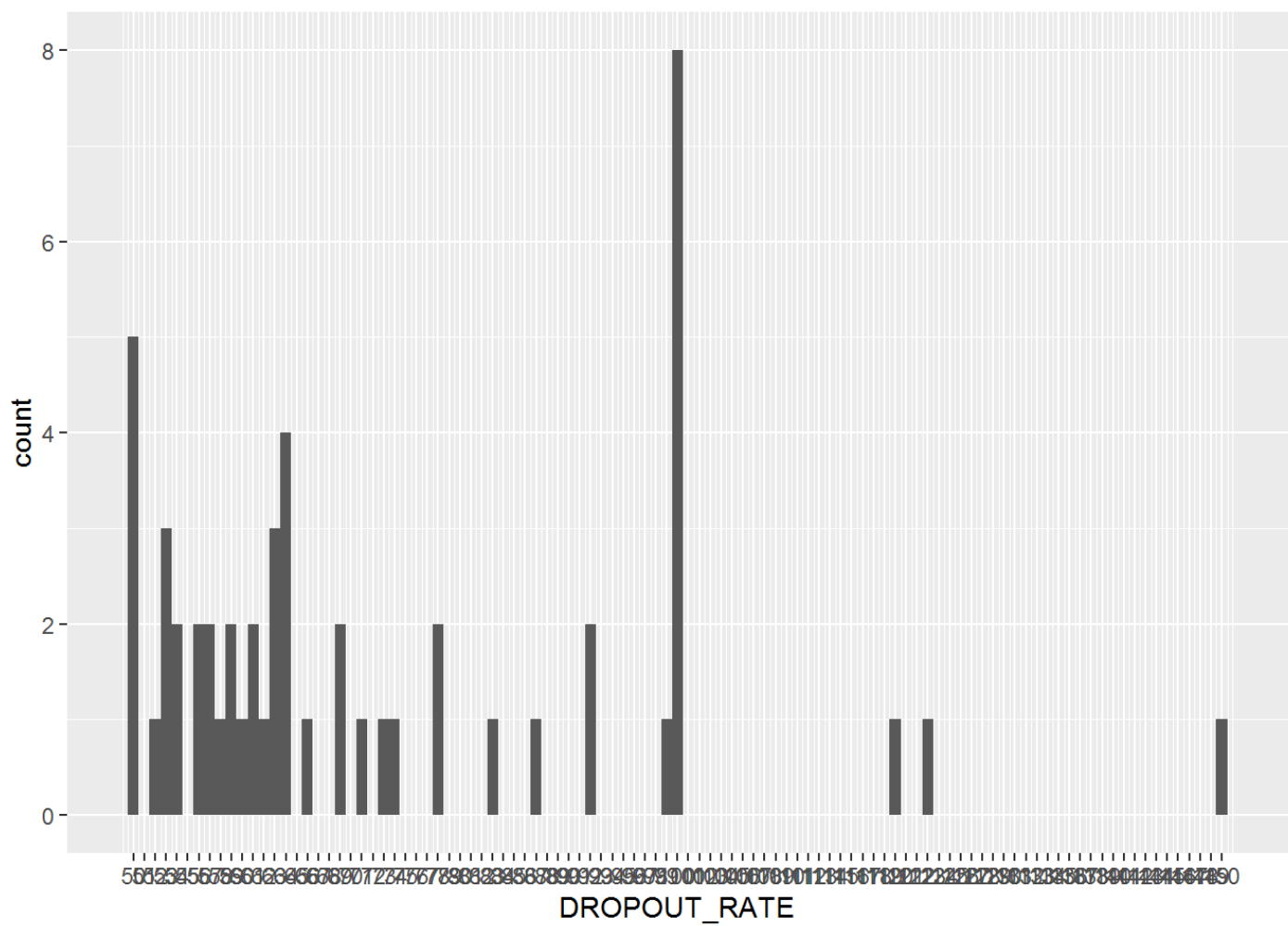
```
## [1] "SCHOOL_YEAR"    "DISTRICT_NAME"  "SCHOOL_NAME"    "GRADE_GROUP"  
## [5] "STUDENT_COUNT"  "DROPOUT_COUNT"  "DROPOUT_RATE"
```

```
## 'data.frame':   2542 obs. of  7 variables:  
## $ SCHOOL_YEAR   : chr  "2001" "2001" "2001" "2001" ...  
## $ DISTRICT_NAME: Factor w/ 20 levels "Brown Deer","Cudahy",...: 1 1 2 2 3 4 4 5 6 6  
...  
## $ SCHOOL_NAME   : Factor w/ 498 levels "Acad Learning Comp-Based Sch",...: 15 16 39 40  
12 52 54 59 64 65 ...  
## $ GRADE_GROUP   : Factor w/ 8 levels "El/Sec","Elem",...: 8 7 7 8 8 8 7 8 7 8 ...  
## $ STUDENT_COUNT: num  299 579 924 435 178 ...  
## $ DROPOUT_COUNT: num   0  0 13  0  0  0  2  0  6  0 ...  
## $ DROPOUT_RATE : num   0  0 1.41  0  0 ...
```

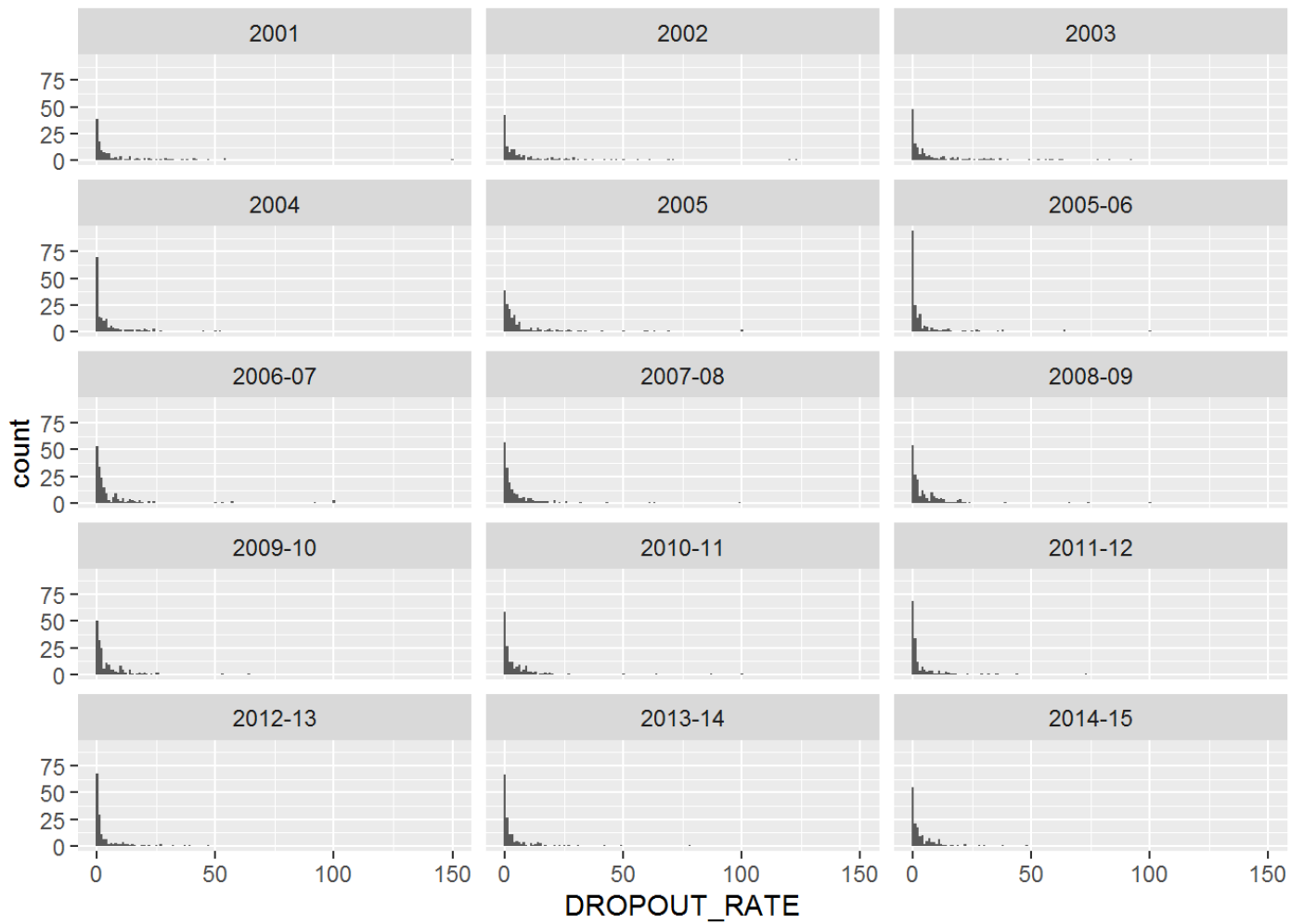
2. General Understanding



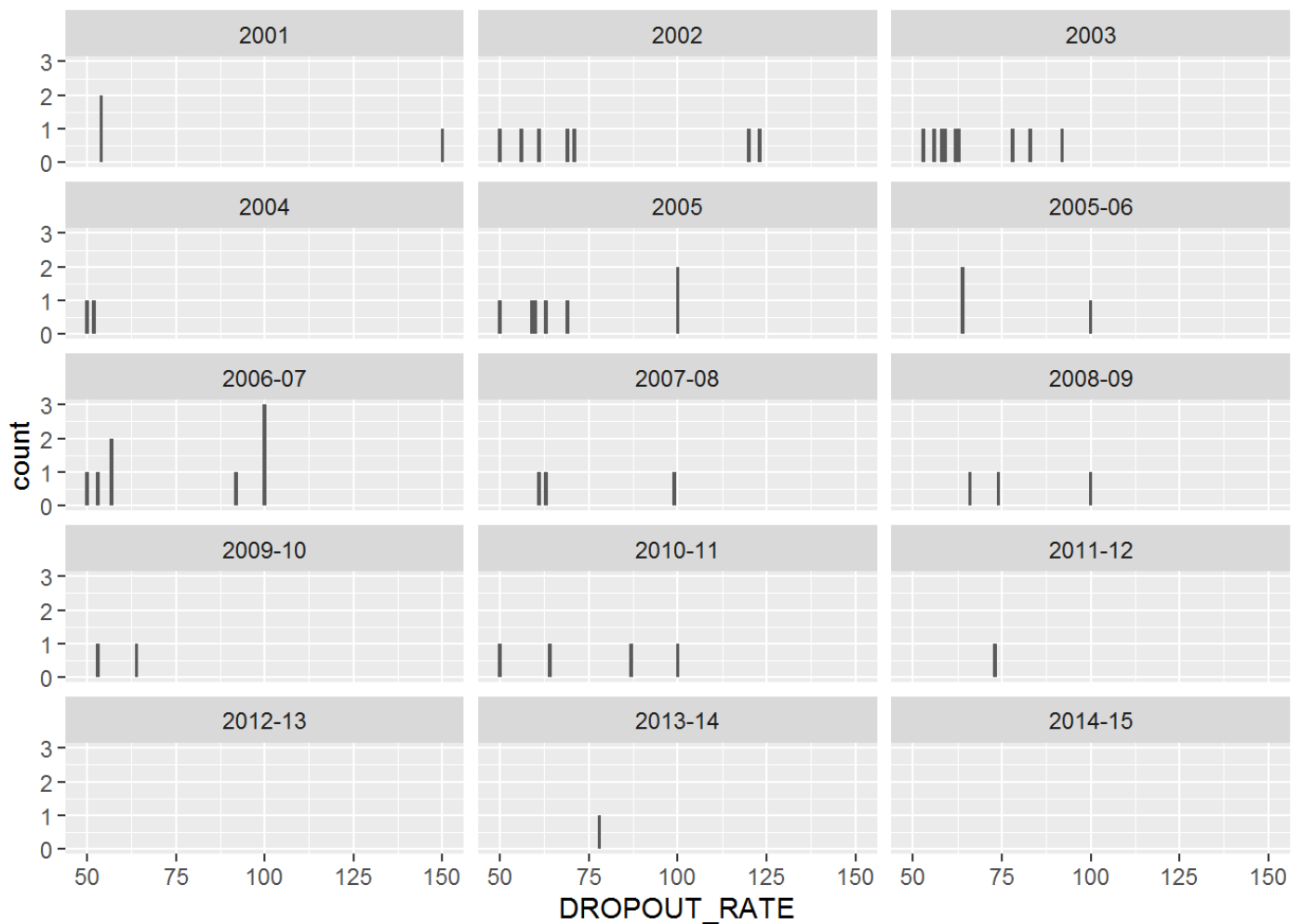
```
## Warning: Removed 2488 rows containing non-finite values (stat_bin).
```



Most dropout are in range of less than 25%. Dropout rate is higher than 50% is not normal, especially for those data that are 100%.



```
## Warning: Removed 2488 rows containing non-finite values (stat_bin).
```



Year 2012-13,2014-15 has no dropout rate higher than 50%. Year 2005-06,2006-07,2007-08,2008-09 have higher dropout rate.

Need to further check following high rate data: DROPOUT Rate > 50%. See detail in “MPS_Dropout_highrate.csv”

##	SCHOOL_YEAR	DISTRICT_NAME
## 40	2001	Milwaukee
## 59	2001	Milwaukee
## 180	2002	Milwaukee
## 182	2002	Milwaukee
## 210	2002	Milwaukee
## 226	2002	Milwaukee
## 289	2003	Milwaukee
## 320	2003	Milwaukee
## 341	2003	Milwaukee
## 348	2003	Milwaukee
## 351	2003	Milwaukee
## 368	2003	Milwaukee
## 370	2003	Milwaukee
## 386	2003	Milwaukee
## 392	2003	Milwaukee
## 510	2004	Milwaukee
## 618	2005	Milwaukee
## 659	2005	Milwaukee
## 678	2005	Milwaukee
## 680	2005	Milwaukee
## 687	2005	Milwaukee
## 691	2005	Milwaukee
## 871	2005-06	Milwaukee
## 877	2005-06	Milwaukee
## 889	2005-06	Milwaukee
## 983	2006-07	Franklin Public
## 1052	2006-07	Milwaukee
## 1054	2006-07	Milwaukee
## 1070	2006-07	Milwaukee
## 1076	2006-07	Milwaukee
## 1103	2006-07	Milwaukee
## 1113	2006-07	Milwaukee
## 1177	2007-08	Franklin Public
## 1258	2007-08	Milwaukee
## 1269	2007-08	Milwaukee
## 1370	2008-09	Franklin Public
## 1455	2008-09	Milwaukee
## 1463	2008-09	Milwaukee
## 1561	2009-10	Franklin Public
## 1647	2009-10	Milwaukee
## 1744	2010-11	Franklin Public
## 1819	2010-11	Milwaukee
## 1826	2010-11	Milwaukee
## 2024	2011-12	Milwaukee
## 2236	2013-14	Franklin Public
##		SCHOOL_NAME
## 40		Groppi Hi
## 59		Milw Co Youth Educ Center
## 180		Lad Lake Synergy South

## 182	Learning Enterprise of WI		
## 210	Project Excel		
## 226	St Charles Youth & Family		
## 289	Afro Urban Institute		
## 320	Gropi Hi		
## 341	Lrng Enterprise Voc & Trng		
## 348	MATC 118.15 Program		
## 351	Milw Co Youth Educ Center		
## 368	Project Excel - Regular		
## 370	Project STAY		
## 386	St Charles Intensive Day Treat		
## 392	Transition Success		
## 510	MATC 118.15 Program		
## 618	Afro Urban Institute		
## 659	Hamilton Hi		
## 678	Learning Enterprise of WI		
## 680	Lrng Enterprise Voc & Trng		
## 687	MATC 118.15 Program		
## 691	Milw Co Youth Educ Center		
## 871	MATC-Project Hold		
## 877	Milwaukee County Youth Education Center		
## 889	New Hope Inst of Science & Technology		
## 983	Milwaukee County House of Correction		
## 1052	La Causa Charter School		
## 1054	Lad Lake Synergy South School		
## 1070	MATC-Project Hold		
## 1076	Milwaukee County Youth Education Center		
## 1103	School of Humanities		
## 1113	Special Services Site-IEP EVAL		
## 1177	Milwaukee County House of Correction		
## 1258	Madison High		
## 1269	Milwaukee County Youth Education Center		
## 1370	Milwaukee County House of Correction		
## 1455	MATC 118.15 Program		
## 1463	Milwaukee County Youth Education Center		
## 1561	Milwaukee County Correctional Facility South		
## 1647	Milwaukee County Youth Education Center		
## 1744	Milwaukee County Correctional Facility South		
## 1819	Marshall High		
## 1826	Milwaukee County Youth Education Center		
## 2024	Special Services Sites-RCC		
## 2236	Milwaukee County Correctional Facility South		
##	GRADE_GROUP	STUDENT_COUNT	DROPOUT_COUNT
## 40	High School	265	143
## 59	Combined Elementary/Secondary School	46	25
## 180	Combined Elementary/Secondary School	41	25
## 182	High School	155	87
## 210	Combined Elementary/Secondary School	17	12
## 226	Combined Elementary/Secondary School	13	9
## 289	High School	59	31

## 320	High School	386	241
## 341	High School	50	29
## 348	High School	66	61
## 351	Combined Elementary/Secondary School	53	44
## 368	Combined Elementary/Secondary School	16	9
## 370	High School	177	112
## 386	Combined Elementary/Secondary School	17	10
## 392	High School	9	7
## 510	High School	84	57
## 618	High School	144	82
## 659	High School	2126	438
## 678	High School	158	45
## 680	High School	78	22
## 687	High School	71	76
## 691	Combined Elementary/Secondary School	67	68
## 871	High School	102	65
## 877	Combined Elementary/Secondary School	123	79
## 889	High School	50	50
## 983	High School	188	107
## 1052	Elementary School	9	9
## 1054	High School	13	12
## 1070	High School	104	55
## 1076	Combined Elementary/Secondary School	173	98
## 1103	High School	27	27
## 1113	Combined Elementary/Secondary School	38	38
## 1177	High School	163	162
## 1258	High School	19	12
## 1269	Combined Elementary/Secondary School	191	117
## 1370	High School	149	149
## 1455	High School	32	21
## 1463	Combined Elementary/Secondary School	148	110
## 1561	High School	175	92
## 1647	Combined Elementary/Secondary School	107	68
## 1744	High School	141	122
## 1819	High School	17	17
## 1826	Combined Elementary/Secondary School	56	36
## 2024	Combined Elementary/Secondary School	11	8
## 2236	High School	97	76
##	DROPOUT_RATE		
## 40	53.962		
## 59	54.348		
## 180	60.976		
## 182	56.129		
## 210	70.588		
## 226	69.231		
## 289	52.542		
## 320	62.435		
## 341	58.000		
## 348	92.424		
## 351	83.019		


```

## 368      56.250
## 370      63.277
## 386      58.824
## 392      77.778
## 510      52.294
## 618     100.000
## 659      62.661
## 678     100.000
## 680      68.750
## 687      60.317
## 691      58.621
## 871      63.730
## 877      64.230
## 889     100.000
## 983      56.910
## 1052     100.000
## 1054      92.310
## 1070      52.880
## 1076      56.650
## 1103     100.000
## 1113     100.000
## 1177      99.390
## 1258      63.160
## 1269      61.260
## 1370     100.000
## 1455      65.630
## 1463      74.320
## 1561      52.570
## 1647      63.550
## 1744      86.520
## 1819     100.000
## 1826      64.290
## 2024      72.730
## 2236      78.350

```

```

##      SCHOOL_YEAR DISTRICT_NAME      SCHOOL_NAME
## 64      2001      Milwaukee Milwaukee Area Technical College
## 194     2002      Milwaukee      Milw Co Youth Educ Center
## 201     2002      Milwaukee Milwaukee Area Technical College
##
##              GRADE_GROUP STUDENT_COUNT DROPOUT_COUNT
## 64              High School           42             63
## 194 Combined Elementary/Secondary School           41             49
## 201              High School           71             87
##
##      DROPOUT_RATE
## 64      150.000
## 194     119.512
## 201     122.535

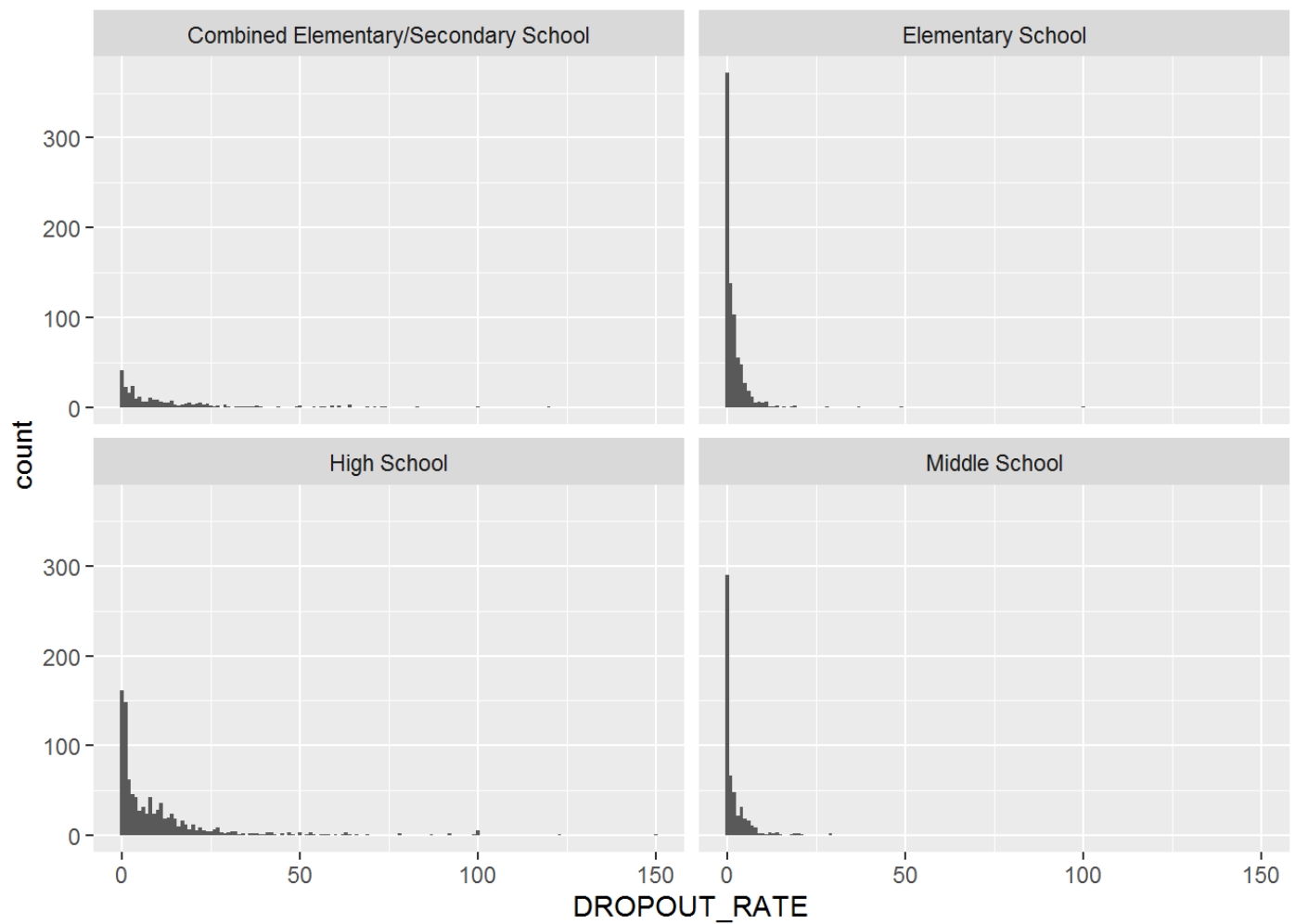
```

Above 3 data are even greater than 100%. Need to check.

3. Further understanding of data

See data by the Grade

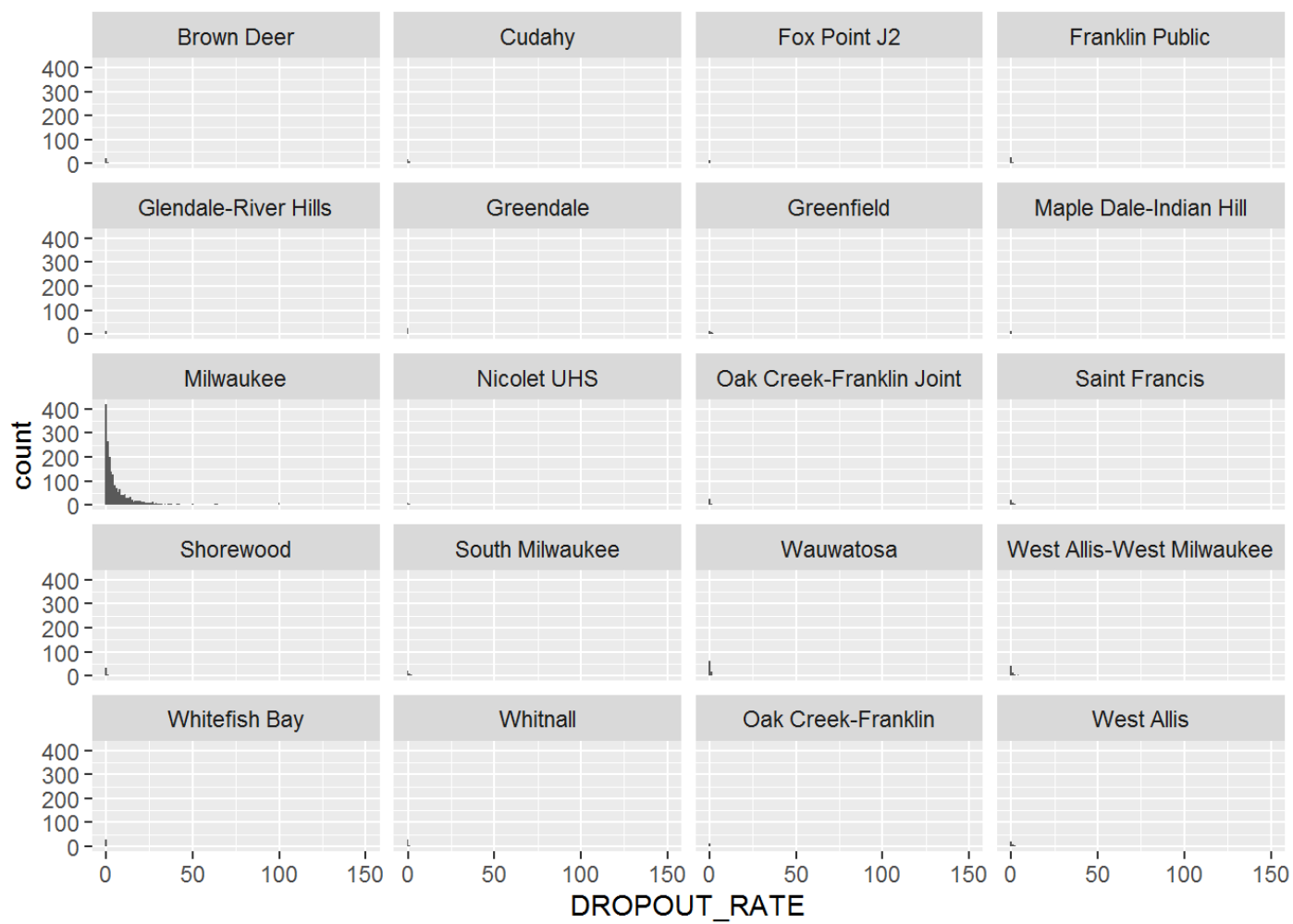
```
##
## Combined Elementary/Secondary School      Elementary School
##                                     264      807
##                                     High School Middle School
##                                     935      536
```



```
## df.MPS$GRADE_GROUP: Combined Elementary/Secondary School
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.000   1.730   6.345  13.310  17.590 119.500
## -----
## df.MPS$GRADE_GROUP: Elementary School
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.000   0.000   0.810   1.928   2.395 100.000
## -----
## df.MPS$GRADE_GROUP: High School
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.000   0.895   4.710  10.260  12.960 150.000
## -----
## df.MPS$GRADE_GROUP: Middle School
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.000   0.000   0.290   1.938   2.424  29.410
```

See data by District

```
##
##           Brown Deer           Cudahy
##           28           30
##       Fox Point J2       Franklin Public
##           15           39
##   Glendale-River Hills       Greendale
##           15           30
##       Greenfield   Maple Dale-Indian Hill
##           30           15
##       Milwaukee       Nicolet UHS
##           1922           15
##   Oak Creek-Franklin Joint       Saint Francis
##           30           39
##       Shorewood       South Milwaukee
##           40           33
##       Wauwatosa West Allis-West Milwaukee
##           86           66
##       Whitefish Bay       Whitnall
##           30           30
##   Oak Creek-Franklin       West Allis
##           15           34
```



```

## df.MPS$DISTRICT_NAME: Brown Deer
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.0000  0.2999  0.3962  1.5100
## -----
## df.MPS$DISTRICT_NAME: Cudahy
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.2250  0.5180  0.7405  2.2200
## -----
## df.MPS$DISTRICT_NAME: Fox Point J2
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.000  0.000  0.000  0.267  0.000  2.490
## -----
## df.MPS$DISTRICT_NAME: Franklin Public
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.000  0.000  0.297  14.840  1.022 100.000
## -----
## df.MPS$DISTRICT_NAME: Glendale-River Hills
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.0000  0.1489  0.2015  0.8800
## -----
## df.MPS$DISTRICT_NAME: Greendale
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.0000  0.1633  0.3350  0.7500
## -----
## df.MPS$DISTRICT_NAME: Greenfield
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.5125  0.7784  1.2350  2.7100
## -----
## df.MPS$DISTRICT_NAME: Maple Dale-Indian Hill
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.0000  0.1587  0.0000  2.3810
## -----
## df.MPS$DISTRICT_NAME: Milwaukee
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.000  0.810  3.080  7.653  9.090 150.000
## -----
## df.MPS$DISTRICT_NAME: Nicolet UHS
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.2570  0.6500  0.7641  0.9750  3.3060
## -----
## df.MPS$DISTRICT_NAME: Oak Creek-Franklin Joint
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.0000  0.1833  0.2125  1.3950
## -----
## df.MPS$DISTRICT_NAME: Saint Francis
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.0000  0.0000  0.1850  1.1850  0.9925 21.7400
## -----
## df.MPS$DISTRICT_NAME: Shorewood
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.

```

```
## 0.0000 0.0000 0.0000 0.7312 0.3575 9.5200
## -----
## df.MPS$DISTRICT_NAME: South Milwaukee
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.0000 0.0000 0.0800 0.8316 0.8200 14.2900
## -----
## df.MPS$DISTRICT_NAME: Wauwatosa
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.000 0.000 0.000 1.022 0.525 50.000
## -----
## df.MPS$DISTRICT_NAME: West Allis-West Milwaukee
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.000 0.000 0.135 1.057 0.899 25.810
## -----
## df.MPS$DISTRICT_NAME: Whitefish Bay
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.0000 0.0000 0.0500 0.1514 0.2375 0.9000
## -----
## df.MPS$DISTRICT_NAME: Whitnall
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.0000 0.0000 0.0000 0.1292 0.1928 0.9200
## -----
## df.MPS$DISTRICT_NAME: Oak Creek-Franklin
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.0000 0.0000 0.0000 0.2027 0.3450 1.0600
## -----
## df.MPS$DISTRICT_NAME: West Allis
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.000 0.000 0.200 1.867 1.425 15.220
```

4. Final data

if everything is right, we can get our final data. It is better to use mean data.

```
## # A tibble: 15 × 7
```

```
##   SCHOOL_YEAR count total_student dropout Median Mean_DROPOUT_RATE year
##   <chr> <int>      <dbl>    <dbl> <dbl>      <dbl> <dbl>
## 1 2001    131      62914    3170 2.1430      9.028229 2000
## 2 2002    144      64050    3004 3.3905     10.712375 2001
## 3 2003    162      65532    3271 3.3355     10.580432 2002
## 4 2004    167      66520    2026 1.4490      5.023982 2003
## 5 2005    177      64345    2871 2.6320      8.172068 2004
## 6 2005-06 194      65575    1349 0.5750      4.555309 2005
## 7 2006-07 194      65458    2522 1.8200      7.055052 2006
## 8 2007-08 193      64760    2621 1.6900      5.603212 2007
## 9 2008-09 191      62508    2715 2.2300      5.936545 2008
## 10 2009-10 183      61316    2342 1.6400      4.953825 2009
## 11 2010-11 172      59898    1953 1.4350      5.382791 2010
## 12 2011-12 165      58644    1831 0.7600      4.120364 2011
## 13 2012-13 156      58032    1996 0.9100      4.163269 2012
## 14 2013-14 158      57742    2085 0.8800      4.368608 2013
## 15 2014-15 155      57659    2061 1.5400      4.241613 2014
```

