vaccination

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read the file.

```r
vax <- read.csv("covid19vaccinesbyzipcode_test.csv")

head(vax,3)
```

```
##   as_of_date zip_code_tabulation_area local_health_jurisdiction        county
## 1 2021-01-05                    92549                   Riverside      Riverside
## 2 2021-01-05                    92130                   San Diego      San Diego
## 3 2021-01-05                    92397              San Bernardino San Bernardino
##   vaccine_equity_metric_quartile                  vem_source
## 1                              3 Healthy Places Index Score
## 2                              4 Healthy Places Index Score
## 3                              3 Healthy Places Index Score
##   age12_plus_population age5_plus_population persons_fully_vaccinated
## 1                2348.4                2461                       NA
## 2               46300.3               53102                       61
## 3                3695.6                4225                       NA
##   persons_partially_vaccinated percent_of_population_fully_vaccinated
## 1                           NA                                     NA
## 2                           27                               0.001149
## 3                           NA                                     NA
##   percent_of_population_partially_vaccinated
## 1                                         NA
## 2                                   0.000508
## 3                                         NA
##   percent_of_population_with_1_plus_dose booster_recip_count
## 1                                     NA                  NA
## 2                               0.001657                  NA
## 3                                     NA                  NA
##                                                                   redacted
## 1 Information redacted in accordance with CA state privacy requirements
## 2 Information redacted in accordance with CA state privacy requirements
## 3 Information redacted in accordance with CA state privacy requirements
```

```r
vax$as_of_date[1]
```

```
## [1] "2021-01-05"
```

Q1. What column details the total number of people fully vaccinated? #12

Q2. What column details the Zip code tabulation area? #2

```
vax$as_of_date[nrow(vax)]
```

```
## [1] "2022-03-01"
```

Q3. What is the earliest date in this dataset? 2021-01-05

Q4. What is the latest date in this dataset? 2022-03-01

we can use the skimr

```
skimr::skim(vax)
```

Table 1: Data summary

Name	vax
Number of rows	107604
Number of columns	15
Column type frequency:	
character	5
numeric	10
Group variables	None

Variable type: character

skim_variable	n_missing	complete_rate	min	max	empty	n_unique	whitespace
as_of_date	0	1	10	10	0	61	0
local_health_jurisdiction	0	1	0	15	305	62	0
county	0	1	0	15	305	59	0
vem_source	0	1	15	26	0	3	0
redacted	0	1	2	69	0	2	0

Variable type: numeric

skim_variable	n_missing	complete_rate	mean	sd	p0	p25	p50	p75	p100	hist
zip_code_tabulation_area	0	1.00	93665.11	1817.39	90001	92257.75	93658.50	95380.50	97635.0	
vaccine_equity_metric_quartile	5307	0.95	2.44	1.11	1	1.00	2.00	3.00	4.0	
age12_plus_population	0	1.00	18895.04	18993.91	0	1346.95	13685.10	31756.12	88556.7	
age5_plus_population	0	1.00	20875.24	21106.02	0	1460.50	15364.00	34877.00	101902.0	
persons_fully_vaccinated	18338	0.83	12155.61	13063.88	11	1066.25	7374.50	20005.00	77744.0	

2

skim_variable	n_missing	complete_rate	mean	sd	p0	p25	p50	p75	p100	hist
persons_partially_vaccinated	18338	0.83	831.74	1348.68	11	76.00	372.00	1076.00	34219.0	
percent_of_population_fully_vaccinated	18338	0.83	0.51	0.26	0	0.33	0.54	0.70	1.0	
percent_of_population_partially_vaccinated	18338	0.83	0.05	0.09	0	0.01	0.03	0.05	1.0	
percent_of_population_with_1plus_dose	18338	0.83	0.54	0.28	0	0.36	0.58	0.75	1.0	
booster_recip_count	64317	0.40	4100.55	5900.21	11	176.00	1136.00	6154.50	50602.0	

Q5. How many numeric columns are in this dataset? 10

Q6. Note that there are "missing values" in the dataset. How many NA values there in the persons_fully_vaccinated column? 18338

Q7. What percent of persons_fully_vaccinated values are missing (to 2 significant figures)?

```
sum(is.na(vax$persons_fully_vaccinated) )/sum(!is.na(vax$persons_fully_vaccinated))
```

```
## [1] 0.205431
```

```
library(lubridate)
```

```
##
## Attaching package: 'lubridate'
```

```
## The following objects are masked from 'package:base':
##
##     date, intersect, setdiff, union
```

```
time_length(today() - ymd("1978-06-22"), "years")
```

```
## [1] 43.70157
```

```
vax$as_of_date<- ymd(vax$as_of_date)
```

```
today() - vax$as_of_date[1]
```

```
## Time difference of 424 days
```

```
today()
```

```
## [1] "2022-03-05"
```

```
vax$as_of_date[nrow(vax)] - vax$as_of_date[1]
```

```
## Time difference of 420 days
```

Q9. How many days have passed since the last update of the dataset?

```
today() - vax$as_of_date[nrow(vax)]
```

```
## Time difference of 4 days
```

Q10. How many unique dates are in the dataset (i.e. how many different dates are detailed)?

```
unique(vax$as_of_date)
```

```
##  [1] "2021-01-05" "2021-01-12" "2021-01-19" "2021-01-26" "2021-02-02"
##  [6] "2021-02-09" "2021-02-16" "2021-02-23" "2021-03-02" "2021-03-09"
## [11] "2021-03-16" "2021-03-23" "2021-03-30" "2021-04-06" "2021-04-13"
## [16] "2021-04-20" "2021-04-27" "2021-05-04" "2021-05-11" "2021-05-18"
## [21] "2021-05-25" "2021-06-01" "2021-06-08" "2021-06-15" "2021-06-22"
## [26] "2021-06-29" "2021-07-06" "2021-07-13" "2021-07-20" "2021-07-27"
## [31] "2021-08-03" "2021-08-10" "2021-08-17" "2021-08-24" "2021-08-31"
## [36] "2021-09-07" "2021-09-14" "2021-09-21" "2021-09-28" "2021-10-05"
## [41] "2021-10-12" "2021-10-19" "2021-10-26" "2021-11-02" "2021-11-09"
## [46] "2021-11-16" "2021-11-23" "2021-11-30" "2021-12-07" "2021-12-14"
## [51] "2021-12-21" "2021-12-28" "2022-01-04" "2022-01-11" "2022-01-18"
## [56] "2022-01-25" "2022-02-01" "2022-02-08" "2022-02-15" "2022-02-22"
## [61] "2022-03-01"
```

```
library(zipcodeR)
```

```
sd<- vax[ vax$country == "San Diego", ]
```

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.6     v dplyr   1.0.8
## v tidyr   1.2.0     v stringr 1.4.0
## v readr   2.1.2     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x lubridate::as.difftime() masks base::as.difftime()
## x lubridate::date()        masks base::date()
## x dplyr::filter()          masks stats::filter()
## x lubridate::intersect()   masks base::intersect()
## x dplyr::lag()             masks stats::lag()
## x lubridate::setdiff()     masks base::setdiff()
## x lubridate::union()       masks base::union()
```

```
vax %>% filter(county=="San Diego") -> myans
```

```
head(sd,3)
```

```
##  [1] as_of_date
##  [2] zip_code_tabulation_area
##  [3] local_health_jurisdiction
##  [4] county
##  [5] vaccine_equity_metric_quartile
##  [6] vem_source
##  [7] age12_plus_population
##  [8] age5_plus_population
##  [9] persons_fully_vaccinated
## [10] persons_partially_vaccinated
## [11] percent_of_population_fully_vaccinated
## [12] percent_of_population_partially_vaccinated
## [13] percent_of_population_with_1_plus_dose
## [14] booster_recip_count
## [15] redacted
## <0 rows> (or 0-length row.names)
```

Q11. How many distinct zip codes are listed for San Diego County?

```
library(dplyr)

sd <- filter(vax, county == "San Diego")

nrow(sd)
```

```
## [1] 6527
```

```
library(dplyr)

vax %>%
  filter(county == "San Diego") %>%
  select(zip_code_tabulation_area)%>%
  unique() %>%
  nrow()
```

```
## [1] 107
```

```
sd.10 <- filter(vax, county == "San Diego" &
                 age5_plus_population > 10000)
```

Q12. What San Diego County Zip code area has the largest 12 + Population in this dataset

```
inds<- which.max(sd$age12_plus_population)
sd$zip_code_tabulation_area[inds]
```

```
## [1] 92154
```

Using dplyr

```
#this code will print very long result
#arrange(sd, -age12_plus_population) %>%
#select(zip_code_tabulation_area)
```

```
library(ggplot2)
```

Q13. What is the overall average "Percent of Population Fully Vaccinated" value for all San Diego "County" as of "2022-02-22"?

```
filter(sd, as_of_date == "2022-02-22")
```

```
##      as_of_date zip_code_tabulation_area local_health_jurisdiction    county
## 1    2022-02-22                    92064                  San Diego San Diego
## 2    2022-02-22                    92103                  San Diego San Diego
## 3    2022-02-22                    92118                  San Diego San Diego
## 4    2022-02-22                    92083                  San Diego San Diego
## 5    2022-02-22                    92056                  San Diego San Diego
## 6    2022-02-22                    92069                  San Diego San Diego
## 7    2022-02-22                    92066                  San Diego San Diego
## 8    2022-02-22                    92060                  San Diego San Diego
## 9    2022-02-22                    91917                  San Diego San Diego
## 10   2022-02-22                    91977                  San Diego San Diego
## 11   2022-02-22                    92130                  San Diego San Diego
## 12   2022-02-22                    92086                  San Diego San Diego
## 13   2022-02-22                    92113                  San Diego San Diego
## 14   2022-02-22                    92104                  San Diego San Diego
## 15   2022-02-22                    91931                  San Diego San Diego
## 16   2022-02-22                    91945                  San Diego San Diego
## 17   2022-02-22                    92116                  San Diego San Diego
## 18   2022-02-22                    92054                  San Diego San Diego
## 19   2022-02-22                    92040                  San Diego San Diego
## 20   2022-02-22                    92091                  San Diego San Diego
## 21   2022-02-22                    92126                  San Diego San Diego
## 22   2022-02-22                    92084                  San Diego San Diego
## 23   2022-02-22                    92025                  San Diego San Diego
## 24   2022-02-22                    92004                  San Diego San Diego
## 25   2022-02-22                    91915                  San Diego San Diego
## 26   2022-02-22                    92036                  San Diego San Diego
## 27   2022-02-22                    92106                  San Diego San Diego
## 28   2022-02-22                    92037                  San Diego San Diego
## 29   2022-02-22                    92075                  San Diego San Diego
## 30   2022-02-22                    92020                  San Diego San Diego
## 31   2022-02-22                    92007                  San Diego San Diego
## 32   2022-02-22                    92065                  San Diego San Diego
## 33   2022-02-22                    92070                  San Diego San Diego
## 34   2022-02-22                    92108                  San Diego San Diego
## 35   2022-02-22                    92008                  San Diego San Diego
## 36   2022-02-22                    92027                  San Diego San Diego
## 37   2022-02-22                    92101                  San Diego San Diego
## 38   2022-02-22                    92107                  San Diego San Diego
## 39   2022-02-22                    92128                  San Diego San Diego
## 40   2022-02-22                    92109                  San Diego San Diego
```

```
## 41   2022-02-22              92028                    San Diego San Diego
## 42   2022-02-22              92024                    San Diego San Diego
## 43   2022-02-22              92003                    San Diego San Diego
## 44   2022-02-22              92129                    San Diego San Diego
## 45   2022-02-22              92110                    San Diego San Diego
## 46   2022-02-22              92071                    San Diego San Diego
## 47   2022-02-22              92021                    San Diego San Diego
## 48   2022-02-22              92119                    San Diego San Diego
## 49   2022-02-22              92059                    San Diego San Diego
## 50   2022-02-22              92105                    San Diego San Diego
## 51   2022-02-22              92111                    San Diego San Diego
## 52   2022-02-22              92121                    San Diego San Diego
## 53   2022-02-22              92127                    San Diego San Diego
## 54   2022-02-22              91914                    San Diego San Diego
## 55   2022-02-22              91910                    San Diego San Diego
## 56   2022-02-22              92055                    San Diego San Diego
## 57   2022-02-22              92081                    San Diego San Diego
## 58   2022-02-22              91978                    San Diego San Diego
## 59   2022-02-22              92078                    San Diego San Diego
## 60   2022-02-22              92019                    San Diego San Diego
## 61   2022-02-22              92134                    San Diego San Diego
## 62   2022-02-22              92139                    San Diego San Diego
## 63   2022-02-22              92155                    San Diego San Diego
## 64   2022-02-22              92135                    San Diego San Diego
## 65   2022-02-22              92145                    San Diego San Diego
## 66   2022-02-22              91948                    San Diego San Diego
## 67   2022-02-22              91941                    San Diego San Diego
## 68   2022-02-22              91963                    San Diego San Diego
## 69   2022-02-22              92173                    San Diego San Diego
## 70   2022-02-22              91962                    San Diego San Diego
## 71   2022-02-22              91916                    San Diego San Diego
## 72   2022-02-22              91913                    San Diego San Diego
## 73   2022-02-22              92011                    San Diego San Diego
## 74   2022-02-22              92140                    San Diego San Diego
## 75   2022-02-22              92117                    San Diego San Diego
## 76   2022-02-22              92114                    San Diego San Diego
## 77   2022-02-22              92122                    San Diego San Diego
## 78   2022-02-22              92147                    San Diego San Diego
## 79   2022-02-22              92010                    San Diego San Diego
## 80   2022-02-22              92132                    San Diego San Diego
## 81   2022-02-22              92154                    San Diego San Diego
## 82   2022-02-22              91902                    San Diego San Diego
## 83   2022-02-22              91901                    San Diego San Diego
## 84   2022-02-22              92058                    San Diego San Diego
## 85   2022-02-22              92123                    San Diego San Diego
## 86   2022-02-22              92115                    San Diego San Diego
## 87   2022-02-22              92014                    San Diego San Diego
## 88   2022-02-22              92057                    San Diego San Diego
## 89   2022-02-22              91911                    San Diego San Diego
## 90   2022-02-22              92026                    San Diego San Diego
## 91   2022-02-22              91935                    San Diego San Diego
## 92   2022-02-22              92009                    San Diego San Diego
## 93   2022-02-22              92061                    San Diego San Diego
## 94   2022-02-22              92131                    San Diego San Diego
```

```
## 95  2022-02-22                         92029              San Diego San Diego
## 96  2022-02-22                         92124              San Diego San Diego
## 97  2022-02-22                         92120              San Diego San Diego
## 98  2022-02-22                         91950              San Diego San Diego
## 99  2022-02-22                         91905              San Diego San Diego
## 100 2022-02-22                         91934              San Diego San Diego
## 101 2022-02-22                         92102              San Diego San Diego
## 102 2022-02-22                         92082              San Diego San Diego
## 103 2022-02-22                         92067              San Diego San Diego
## 104 2022-02-22                         91906              San Diego San Diego
## 105 2022-02-22                         91932              San Diego San Diego
## 106 2022-02-22                         91980              San Diego San Diego
## 107 2022-02-22                         91942              San Diego San Diego
##      vaccine_equity_metric_quartile                 vem_source
## 1                                 4 Healthy Places Index Score
## 2                                 4 Healthy Places Index Score
## 3                                 3 Healthy Places Index Score
## 4                                 2 Healthy Places Index Score
## 5                                 3 Healthy Places Index Score
## 6                                 2 Healthy Places Index Score
## 7                                 1     CDPH-Derived ZCTA Score
## 8                                 3     CDPH-Derived ZCTA Score
## 9                                 1     CDPH-Derived ZCTA Score
## 10                                2 Healthy Places Index Score
## 11                                4 Healthy Places Index Score
## 12                                1 Healthy Places Index Score
## 13                                1 Healthy Places Index Score
## 14                                3 Healthy Places Index Score
## 15                                3     CDPH-Derived ZCTA Score
## 16                                2 Healthy Places Index Score
## 17                                3 Healthy Places Index Score
## 18                                2 Healthy Places Index Score
## 19                                3 Healthy Places Index Score
## 20                                4     CDPH-Derived ZCTA Score
## 21                                4 Healthy Places Index Score
## 22                                2 Healthy Places Index Score
## 23                                2 Healthy Places Index Score
## 24                                2 Healthy Places Index Score
## 25                                4 Healthy Places Index Score
## 26                                2 Healthy Places Index Score
## 27                                4 Healthy Places Index Score
## 28                                4 Healthy Places Index Score
## 29                                4 Healthy Places Index Score
## 30                                2 Healthy Places Index Score
## 31                                4 Healthy Places Index Score
## 32                                3 Healthy Places Index Score
## 33                                2     CDPH-Derived ZCTA Score
## 34                                3 Healthy Places Index Score
## 35                                3 Healthy Places Index Score
## 36                                2 Healthy Places Index Score
## 37                                2 Healthy Places Index Score
## 38                                3 Healthy Places Index Score
## 39                                4 Healthy Places Index Score
## 40                                3 Healthy Places Index Score
```

```
## 41                                       2 Healthy Places Index Score
## 42                                       4 Healthy Places Index Score
## 43                                       3 Healthy Places Index Score
## 44                                       4 Healthy Places Index Score
## 45                                       3 Healthy Places Index Score
## 46                                       3 Healthy Places Index Score
## 47                                       2 Healthy Places Index Score
## 48                                       4 Healthy Places Index Score
## 49                                       2 Healthy Places Index Score
## 50                                       1 Healthy Places Index Score
## 51                                       3 Healthy Places Index Score
## 52                                       4 Healthy Places Index Score
## 53                                       4 Healthy Places Index Score
## 54                                       4 Healthy Places Index Score
## 55                                       2 Healthy Places Index Score
## 56                                       3    CDPH-Derived ZCTA Score
## 57                                       2 Healthy Places Index Score
## 58                                       2 Healthy Places Index Score
## 59                                       3 Healthy Places Index Score
## 60                                       3 Healthy Places Index Score
## 61                                      NA            No VEM Assigned
## 62                                       2 Healthy Places Index Score
## 63                                      NA            No VEM Assigned
## 64                                      NA            No VEM Assigned
## 65                                      NA            No VEM Assigned
## 66                                       4    CDPH-Derived ZCTA Score
## 67                                       3 Healthy Places Index Score
## 68                                       2    CDPH-Derived ZCTA Score
## 69                                       1 Healthy Places Index Score
## 70                                       3 Healthy Places Index Score
## 71                                       2 Healthy Places Index Score
## 72                                       3 Healthy Places Index Score
## 73                                       4 Healthy Places Index Score
## 74                                      NA            No VEM Assigned
## 75                                       3 Healthy Places Index Score
## 76                                       2 Healthy Places Index Score
## 77                                       4 Healthy Places Index Score
## 78                                      NA            No VEM Assigned
## 79                                       4 Healthy Places Index Score
## 80                                      NA            No VEM Assigned
## 81                                       2 Healthy Places Index Score
## 82                                       4 Healthy Places Index Score
## 83                                       3 Healthy Places Index Score
## 84                                       1 Healthy Places Index Score
## 85                                       3 Healthy Places Index Score
## 86                                       2 Healthy Places Index Score
## 87                                       4 Healthy Places Index Score
## 88                                       2 Healthy Places Index Score
## 89                                       2 Healthy Places Index Score
## 90                                       2 Healthy Places Index Score
## 91                                       3 Healthy Places Index Score
## 92                                       4 Healthy Places Index Score
## 93                                       2 Healthy Places Index Score
## 94                                       4 Healthy Places Index Score
```

```
## 95                                3 Healthy Places Index Score
## 96                                3 Healthy Places Index Score
## 97                                4 Healthy Places Index Score
## 98                                1 Healthy Places Index Score
## 99                                1 Healthy Places Index Score
## 100                               1    CDPH-Derived ZCTA Score
## 101                               1 Healthy Places Index Score
## 102                               3 Healthy Places Index Score
## 103                               4 Healthy Places Index Score
## 104                               1 Healthy Places Index Score
## 105                               2 Healthy Places Index Score
## 106                              NA           No VEM Assigned
## 107                               3 Healthy Places Index Score
##     age12_plus_population age5_plus_population persons_fully_vaccinated
## 1                42177.1               46855                    34266
## 2                32146.4               33213                    46456
## 3                19835.0               21470                    14954
## 4                32246.5               36283                    24146
## 5                45552.2               49110                    34782
## 6                41447.3               46850                    32505
## 7                  589.5                 685                      181
## 8                  166.0                 166                      163
## 9                  826.1                 939                      968
## 10               53851.0               59911                    38823
## 11               46300.3               53102                    50300
## 12                1460.5                1492                      731
## 13               47799.7               53883                    36354
## 14               40343.9               42839                    33667
## 15                 475.7                 586                      216
## 16               22820.5               25486                    18125
## 17               30255.7               31673                    24093
## 18               35176.1               39270                    23944
## 19               39405.0               42833                    23614
## 20                1238.3                1303                     1213
## 21               71820.2               77775                    58503
## 22               42677.7               47784                    29940
## 23               43598.3               49162                    31104
## 24                2151.8                2186                     2623
## 25               26688.6               30884                    25915
## 26                2333.9                2496                     1851
## 27               17253.3               19025                    13842
## 28               33675.6               36144                    34859
## 29               11136.3               12177                    10056
## 30               49284.5               54991                    37783
## 31               10061.5               10704                     8044
## 32               32025.6               35208                    19451
## 33                 682.4                 743                      637
## 34               20384.0               21182                    18118
## 35               24104.7               25958                    19152
## 36               47422.5               52758                    34494
## 37               39588.5               40077                    34339
## 38               28321.0               29863                    19756
## 39               44465.5               48329                    37924
## 40               43222.5               44953                    32503
```

```
## 41            41252.1          44782               29341
## 42            44405.4          48477               37429
## 43             4475.4           4803                3118
## 44            46449.1          51493               41622
## 45            27003.5          28597               19998
## 46            49137.8          53795               34481
## 47            59134.5          65415               39893
## 48            21444.8          23472               17840
## 49             1200.0           1371                 906
## 50            61097.9          68711               46545
## 51            44075.0          48160               33715
## 52             4134.7           4387                4611
## 53            38942.3          46080               39294
## 54            14156.9          16302               15112
## 55            64013.6          70086               65376
## 56            11548.0          11654                 136
## 57            25558.0          27632               18615
## 58             8644.9           9663                6516
## 59            41789.5          47476               33706
## 60            37439.4          40464               27272
## 61              285.0            285                  52
## 62            30679.9          33923               25420
## 63              456.0            456                  66
## 64              635.0            635                  36
## 65             1603.5           1821                 156
## 66              130.0            130                  49
## 67            27354.6          29757               22437
## 68             1010.3           1089                1070
## 69            25332.5          28487               48629
## 70             1758.7           2020                 968
## 71             1621.4           1812                 986
## 72            43514.7          50461               41413
## 73            20503.6          23247               16741
## 74             3747.7           3737                  38
## 75            50041.6          53839               38537
## 76            59050.7          64945               47012
## 77            44091.1          45951               37493
## 78              518.0            518                  NA
## 79            13762.3          14939               12393
## 80                0.0              0                  88
## 81            76365.2          82971               77457
## 82            16620.7          18026               13987
## 83            15549.8          16905                9170
## 84            34956.0          39695               15406
## 85            28353.3          30426               23525
## 86            56152.4          60409               40630
## 87            11942.5          13149               11169
## 88            51927.0          56906               35165
## 89            71642.8          79225               73649
## 90            42613.9          46283               32057
## 91             7390.0           8101                5526
## 92            39183.5          43710               32863
## 93             1981.1           2336                1896
## 94            28789.5          32291               29537
```

```
## 95               16904.2              18441                14175
## 96               25422.4              29040                17712
## 97               26372.9              28414                22720
## 98               54341.2              59361                44024
## 99                1395.4               1451                  764
## 100                330.7                323                  390
## 101              37042.3              41033                31663
## 102              16113.9              17551                11738
## 103               6973.9               7480                 8193
## 104               3594.7               3982                 1935
## 105              21968.2              24874                16797
## 106                  0.0                  0                 1629
## 107              34685.9              37483                27145
##     persons_partially_vaccinated percent_of_population_fully_vaccinated
## 1                           6861                              0.731320
## 2                           8434                              1.000000
## 3                           7405                              0.696507
## 4                           5924                              0.665491
## 5                           7362                              0.708247
## 6                           7043                              0.693810
## 7                             35                              0.264234
## 8                             52                              0.981928
## 9                            355                              1.000000
## 10                          8749                              0.648011
## 11                         12642                              0.947234
## 12                           173                              0.489946
## 13                         10564                              0.674684
## 14                          7621                              0.785896
## 15                            61                              0.368601
## 16                          3964                              0.711175
## 17                          5291                              0.760679
## 18                          5880                              0.609728
## 19                          4529                              0.551304
## 20                           341                              0.930929
## 21                         12369                              0.752208
## 22                          6929                              0.626570
## 23                          9759                              0.632684
## 24                           917                              1.000000
## 25                          9092                              0.839108
## 26                           596                              0.741587
## 27                          3545                              0.727569
## 28                         10997                              0.964448
## 29                          2720                              0.825819
## 30                          9452                              0.687076
## 31                          1702                              0.751495
## 32                          3803                              0.552460
## 33                           147                              0.857335
## 34                          6986                              0.855349
## 35                          4467                              0.737807
## 36                          9105                              0.653816
## 37                         16002                              0.856826
## 38                          4080                              0.661554
## 39                          8448                              0.784705
## 40                          8066                              0.723044
```

```
## 41                6744                              0.655196
## 42                8743                              0.772098
## 43                 680                              0.649178
## 44                8077                              0.808304
## 45                6553                              0.699304
## 46                6591                              0.640970
## 47                9109                              0.609845
## 48                3065                              0.760055
## 49                 165                              0.660832
## 50               11359                              0.677402
## 51                7587                              0.700062
## 52                1599                              1.000000
## 53                8830                              0.852734
## 54                4550                              0.927003
## 55               24868                              0.932797
## 56                  81                              0.011670
## 57                4035                              0.673675
## 58                1413                              0.674325
## 59                7107                              0.709959
## 60                5454                              0.673982
## 61                  22                              0.182456
## 62                5881                              0.749344
## 63                  31                              0.144737
## 64                  18                              0.056693
## 65                  77                              0.085667
## 66                  18                              0.376923
## 67                4869                              0.754007
## 68                 419                              0.982553
## 69               20743                              1.000000
## 70                 190                              0.479208
## 71                 189                              0.544150
## 72               11624                              0.820693
## 73                3910                              0.720136
## 74                  26                              0.010169
## 75                7448                              0.715782
## 76               11102                              0.723874
## 77               10131                              0.815934
## 78                  NA                                    NA
## 79                2546                              0.829574
## 80                  33                              1.000000
## 81               29331                              0.933543
## 82                3761                              0.775935
## 83                1684                              0.542443
## 84                4363                              0.388109
## 85                7498                              0.773187
## 86                9991                              0.672582
## 87                2960                              0.849418
## 88                8334                              0.617949
## 89               27682                              0.929618
## 90                7855                              0.692630
## 91                1041                              0.682138
## 92                7025                              0.751842
## 93                 467                              0.811644
## 94                5982                              0.914713
```

```
## 95                           3103                              0.768668
## 96                           3750                              0.609917
## 97                           4466                              0.799606
## 98                          13435                              0.741632
## 99                            172                              0.526533
## 100                           111                              1.000000
## 101                          8237                              0.771647
## 102                          2501                              0.668794
## 103                          3056                              1.000000
## 104                           452                              0.485937
## 105                          4898                              0.675283
## 106                           963                              1.000000
## 107                          6102                              0.724195
##      percent_of_population_partially_vaccinated
## 1                                      0.146430
## 2                                      0.253937
## 3                                      0.344900
## 4                                      0.163272
## 5                                      0.149908
## 6                                      0.150331
## 7                                      0.051095
## 8                                      0.313253
## 9                                      0.378062
## 10                                     0.146033
## 11                                     0.238070
## 12                                     0.115952
## 13                                     0.196054
## 14                                     0.177899
## 15                                     0.104096
## 16                                     0.155536
## 17                                     0.167051
## 18                                     0.149733
## 19                                     0.105736
## 20                                     0.261704
## 21                                     0.159036
## 22                                     0.145007
## 23                                     0.198507
## 24                                     0.419488
## 25                                     0.294392
## 26                                     0.238782
## 27                                     0.186334
## 28                                     0.304255
## 29                                     0.223372
## 30                                     0.171883
## 31                                     0.159006
## 32                                     0.108015
## 33                                     0.197847
## 34                                     0.329808
## 35                                     0.172086
## 36                                     0.172580
## 37                                     0.399281
## 38                                     0.136624
## 39                                     0.174802
## 40                                     0.179432
```

```
## 41                                    0.150596
## 42                                    0.180354
## 43                                    0.141578
## 44                                    0.156856
## 45                                    0.229150
## 46                                    0.122521
## 47                                    0.139249
## 48                                    0.130581
## 49                                    0.120350
## 50                                    0.165316
## 51                                    0.157537
## 52                                    0.364486
## 53                                    0.191623
## 54                                    0.279107
## 55                                    0.354821
## 56                                    0.006950
## 57                                    0.146026
## 58                                    0.146228
## 59                                    0.149697
## 60                                    0.134786
## 61                                    0.077193
## 62                                    0.173363
## 63                                    0.067982
## 64                                    0.028346
## 65                                    0.042284
## 66                                    0.138462
## 67                                    0.163625
## 68                                    0.384757
## 69                                    0.728157
## 70                                    0.094059
## 71                                    0.104305
## 72                                    0.230356
## 73                                    0.168194
## 74                                    0.006957
## 75                                    0.138338
## 76                                    0.170945
## 77                                    0.220474
## 78                                          NA
## 79                                    0.170426
## 80                                    1.000000
## 81                                    0.353509
## 82                                    0.208643
## 83                                    0.099615
## 84                                    0.109913
## 85                                    0.246434
## 86                                    0.165389
## 87                                    0.225112
## 88                                    0.146452
## 89                                    0.349410
## 90                                    0.169717
## 91                                    0.128503
## 92                                    0.160718
## 93                                    0.199914
## 94                                    0.185253
```

```
## 95                                   0.168266
## 96                                   0.129132
## 97                                   0.157176
## 98                                   0.226327
## 99                                   0.118539
## 100                                  0.343653
## 101                                  0.200741
## 102                                  0.142499
## 103                                  0.408556
## 104                                  0.113511
## 105                                  0.196912
## 106                                  1.000000
## 107                                  0.162794
##     percent_of_population_with_1_plus_dose booster_recip_count
## 1                                 0.877750               15499
## 2                                 1.000000               14627
## 3                                 1.000000                5721
## 4                                 0.828763                7322
## 5                                 0.858155               15441
## 6                                 0.844141               12168
## 7                                 0.315329                  58
## 8                                 1.000000                  73
## 9                                 1.000000                 263
## 10                                0.794044               13723
## 11                                1.000000               23272
## 12                                0.605898                 293
## 13                                0.870738                9821
## 14                                0.963795               14950
## 15                                0.472697                  73
## 16                                0.866711                6477
## 17                                0.927730               11413
## 18                                0.759461                9014
## 19                                0.657040                9070
## 20                                1.000000                 598
## 21                                0.911244               26579
## 22                                0.771577               10450
## 23                                0.831191                9644
## 24                                1.000000                1098
## 25                                1.000000                9099
## 26                                0.980369                 675
## 27                                0.913903                6596
## 28                                1.000000               16380
## 29                                1.000000                4635
## 30                                0.858959               13055
## 31                                0.910501                3770
## 32                                0.660475                7084
## 33                                1.000000                 246
## 34                                1.000000                7124
## 35                                0.909893                8460
## 36                                0.826396               11614
## 37                                1.000000               12257
## 38                                0.798178                8881
## 39                                0.959507               18793
## 40                                0.902476               13251
```

```
## 41                           0.805792                  10837
## 42                           0.952452                  17482
## 43                           0.790756                   1218
## 44                           0.965160                  20425
## 45                           0.928454                   7896
## 46                           0.763491                  14195
## 47                           0.749094                  13171
## 48                           0.890636                   8791
## 49                           0.781182                    274
## 50                           0.842718                  15198
## 51                           0.857599                  14122
## 52                           1.000000                   1921
## 53                           1.000000                  18024
## 54                           1.000000                   5632
## 55                           1.000000                  22477
## 56                           0.018620                     NA
## 57                           0.819701                   7990
## 58                           0.820553                   2480
## 59                           0.859656                  14847
## 60                           0.808768                  10211
## 61                           0.259649                     14
## 62                           0.922707                   9694
## 63                           0.212719                     NA
## 64                           0.085039                     NA
## 65                           0.127951                     18
## 66                           0.515385                     21
## 67                           0.917632                  10201
## 68                           1.000000                    265
## 69                           1.000000                  10879
## 70                           0.573267                    372
## 71                           0.648455                    385
## 72                           1.000000                  15485
## 73                           0.888330                   7920
## 74                           0.017126                     NA
## 75                           0.854120                  17263
## 76                           0.894819                  17437
## 77                           1.000000                  17150
## 78                                 NA                     NA
## 79                           1.000000                   5791
## 80                           1.000000                     16
## 81                           1.000000                  23701
## 82                           0.984578                   5770
## 83                           0.642058                   3757
## 84                           0.498022                   5011
## 85                           1.000000                  11919
## 86                           0.837971                  15875
## 87                           1.000000                   5670
## 88                           0.764401                  13757
## 89                           1.000000                  23267
## 90                           0.862347                  12346
## 91                           0.810641                   2168
## 92                           0.912560                  15837
## 93                           1.000000                    655
## 94                           1.000000                  15211
```

```
## 95                           0.936934          6424
## 96                           0.739049          8053
## 97                           0.956782         10816
## 98                           0.967959         13713
## 99                           0.645072           279
## 100                          1.000000           119
## 101                          0.972388         10942
## 102                          0.811293          4396
## 103                          1.000000          3362
## 104                          0.599448           628
## 105                          0.872195          5310
## 106                          1.000000           300
## 107                          0.886989         11514
##                                                        redacted
## 1                                                            No
## 2                                                            No
## 3                                                            No
## 4                                                            No
## 5                                                            No
## 6                                                            No
## 7                                                            No
## 8                                                            No
## 9                                                            No
## 10                                                           No
## 11                                                           No
## 12                                                           No
## 13                                                           No
## 14                                                           No
## 15                                                           No
## 16                                                           No
## 17                                                           No
## 18                                                           No
## 19                                                           No
## 20                                                           No
## 21                                                           No
## 22                                                           No
## 23                                                           No
## 24                                                           No
## 25                                                           No
## 26                                                           No
## 27                                                           No
## 28                                                           No
## 29                                                           No
## 30                                                           No
## 31                                                           No
## 32                                                           No
## 33                                                           No
## 34                                                           No
## 35                                                           No
## 36                                                           No
## 37                                                           No
## 38                                                           No
## 39                                                           No
## 40                                                           No
```

```
## 41                                                                  No
## 42                                                                  No
## 43                                                                  No
## 44                                                                  No
## 45                                                                  No
## 46                                                                  No
## 47                                                                  No
## 48                                                                  No
## 49                                                                  No
## 50                                                                  No
## 51                                                                  No
## 52                                                                  No
## 53                                                                  No
## 54                                                                  No
## 55                                                                  No
## 56  Information redacted in accordance with CA state privacy requirements
## 57                                                                  No
## 58                                                                  No
## 59                                                                  No
## 60                                                                  No
## 61                                                                  No
## 62                                                                  No
## 63  Information redacted in accordance with CA state privacy requirements
## 64  Information redacted in accordance with CA state privacy requirements
## 65                                                                  No
## 66                                                                  No
## 67                                                                  No
## 68                                                                  No
## 69                                                                  No
## 70                                                                  No
## 71                                                                  No
## 72                                                                  No
## 73                                                                  No
## 74  Information redacted in accordance with CA state privacy requirements
## 75                                                                  No
## 76                                                                  No
## 77                                                                  No
## 78  Information redacted in accordance with CA state privacy requirements
## 79                                                                  No
## 80                                                                  No
## 81                                                                  No
## 82                                                                  No
## 83                                                                  No
## 84                                                                  No
## 85                                                                  No
## 86                                                                  No
## 87                                                                  No
## 88                                                                  No
## 89                                                                  No
## 90                                                                  No
## 91                                                                  No
## 92                                                                  No
## 93                                                                  No
## 94                                                                  No
```

```
## 95                                                    No
## 96                                                    No
## 97                                                    No
## 98                                                    No
## 99                                                    No
## 100                                                   No
## 101                                                   No
## 102                                                   No
## 103                                                   No
## 104                                                   No
## 105                                                   No
## 106                                                   No
## 107                                                   No
```

```r
sd.now<-filter(sd, as_of_date == "2022-03-01")
sd.ave<- mean(sd.now$percent_of_population_fully_vaccinated, na.rm=T)
```

```r
hist(sd.now$percent_of_population_fully_vaccinated)
```

Histogram of sd.now$percent_of_population_fully_vaccinated
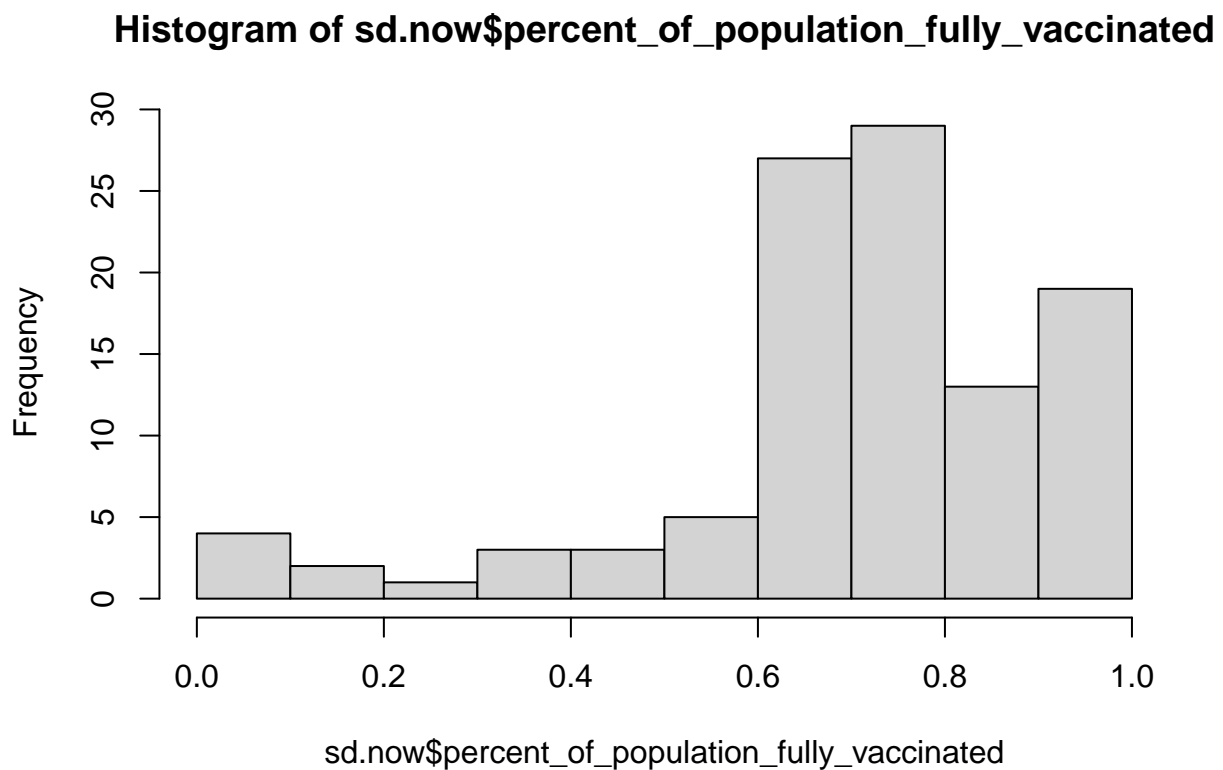
Q14. Using either ggplot or base R graphics make a summary figure that shows the distribution of Percent of Population Fully Vaccinated values as of "2022-02-22"?

```r
ggplot(sd.now)+
aes(percent_of_population_fully_vaccinated) +
  geom_histogram()
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
## Warning: Removed 1 rows containing non-finite values (stat_bin).
```
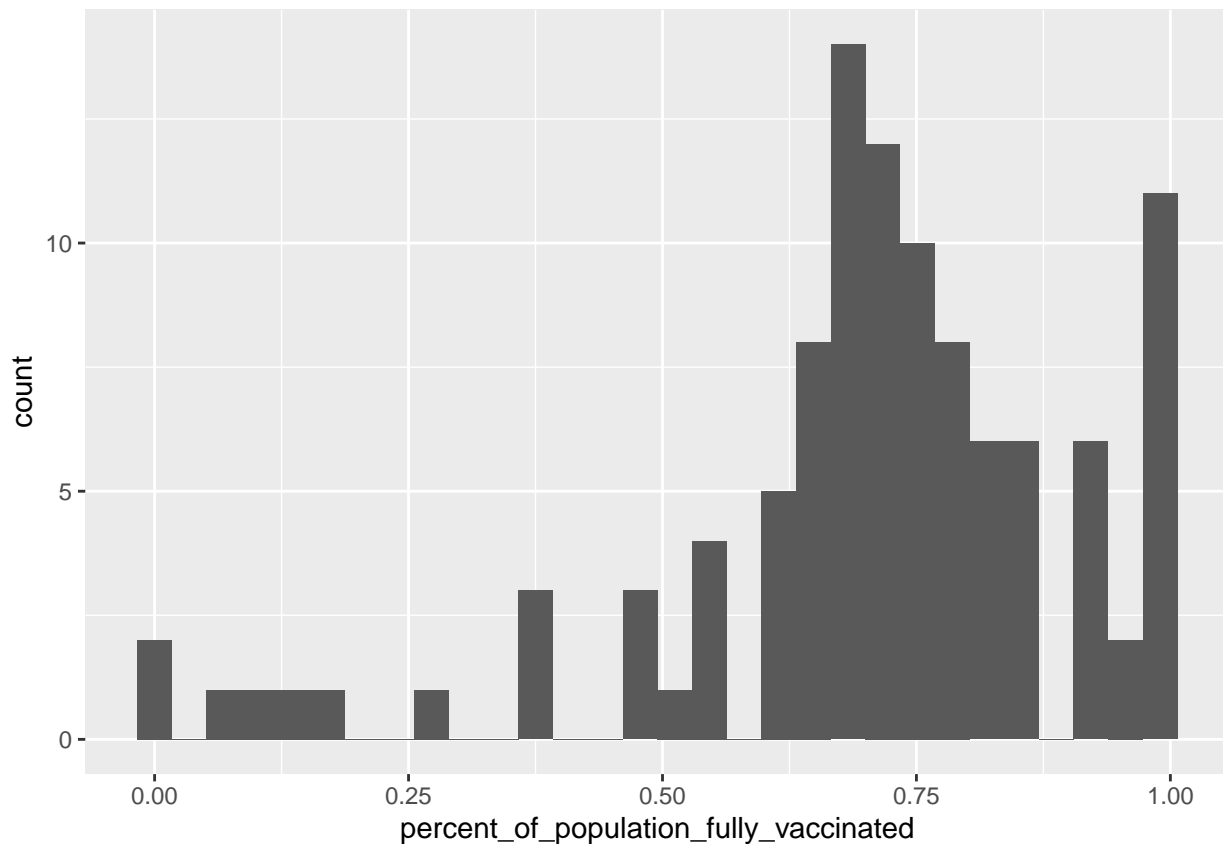

Q15. Using ggplot make a graph of the vaccination rate time course for the 92037 ZIP code area:

```
ucsd <- filter(sd, zip_code_tabulation_area=="92037")
ucsd[1,]$age5_plus_population
```

```
## [1] 36144
```

```
#ucsd
```

```
filter(vax,zip_code_tabulation_area=="92037") %>%
ggplot() +
  aes(as_of_date,
      percent_of_population_fully_vaccinated) +
  geom_point()+
  geom_line(group=1) +
  ylim(c(0,1)) +
  labs(x="Date", y="Percent Vaccinated")
```
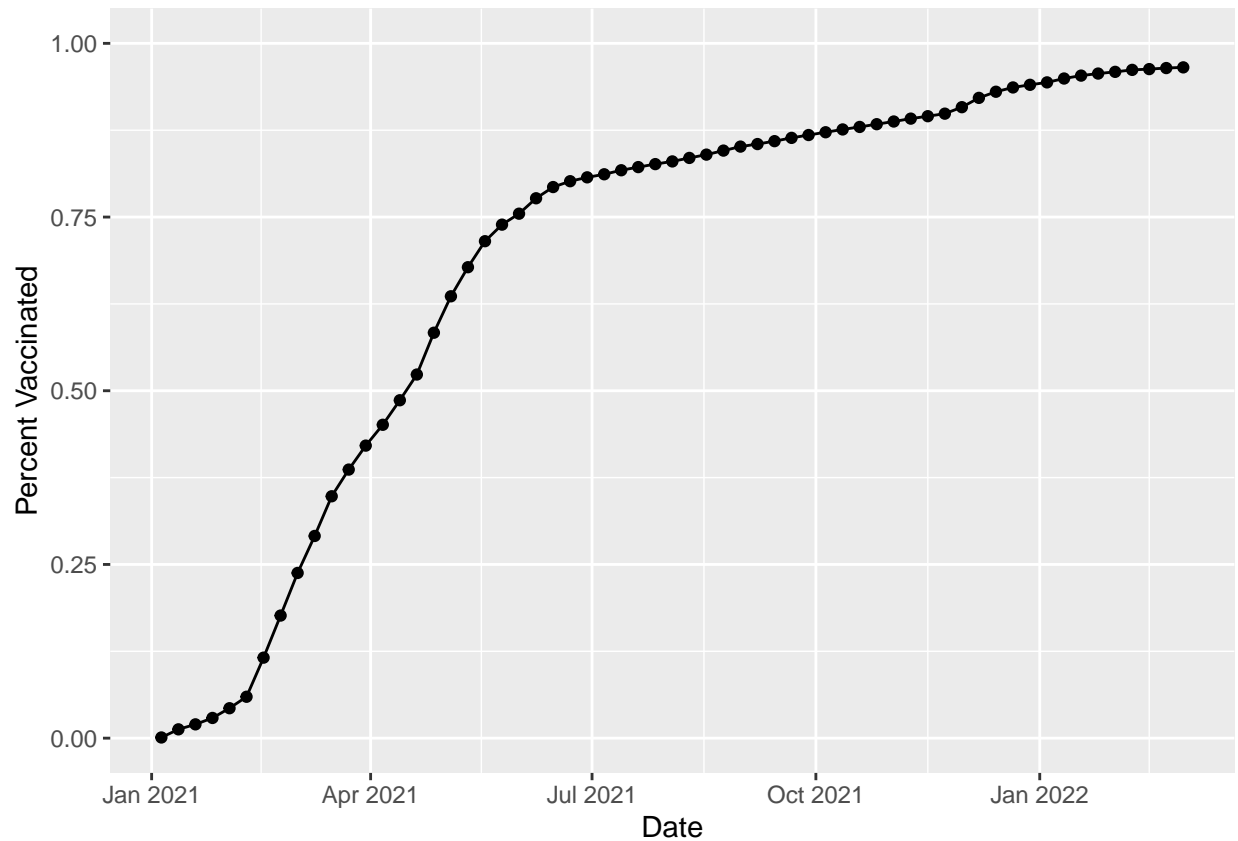
Q16. Calculate the mean "Percent of Population Fully Vaccinated" for ZIP code areas with a population as large as 92037 (La Jolla) as_of_date "2022-02-22". Add this as a straight horizontal line to your plot from above with the geom_hline() function?

```
vax.36 <- filter(vax, age5_plus_population > 36144 &
                 as_of_date == "2022-02-22")
mean(vax.36$percent_of_population_fully_vaccinated, na.rm=T)
```

```
## [1] 0.733385
```

```
filter(vax,zip_code_tabulation_area=="92037") %>%
ggplot() +
  aes(as_of_date,
      percent_of_population_fully_vaccinated) +
  geom_point()+
  geom_line() +
  geom_hline(yintercept = sd.ave, col='red', linetype=2) +
  labs(x="Date", y="Percent Vaccinated")
```
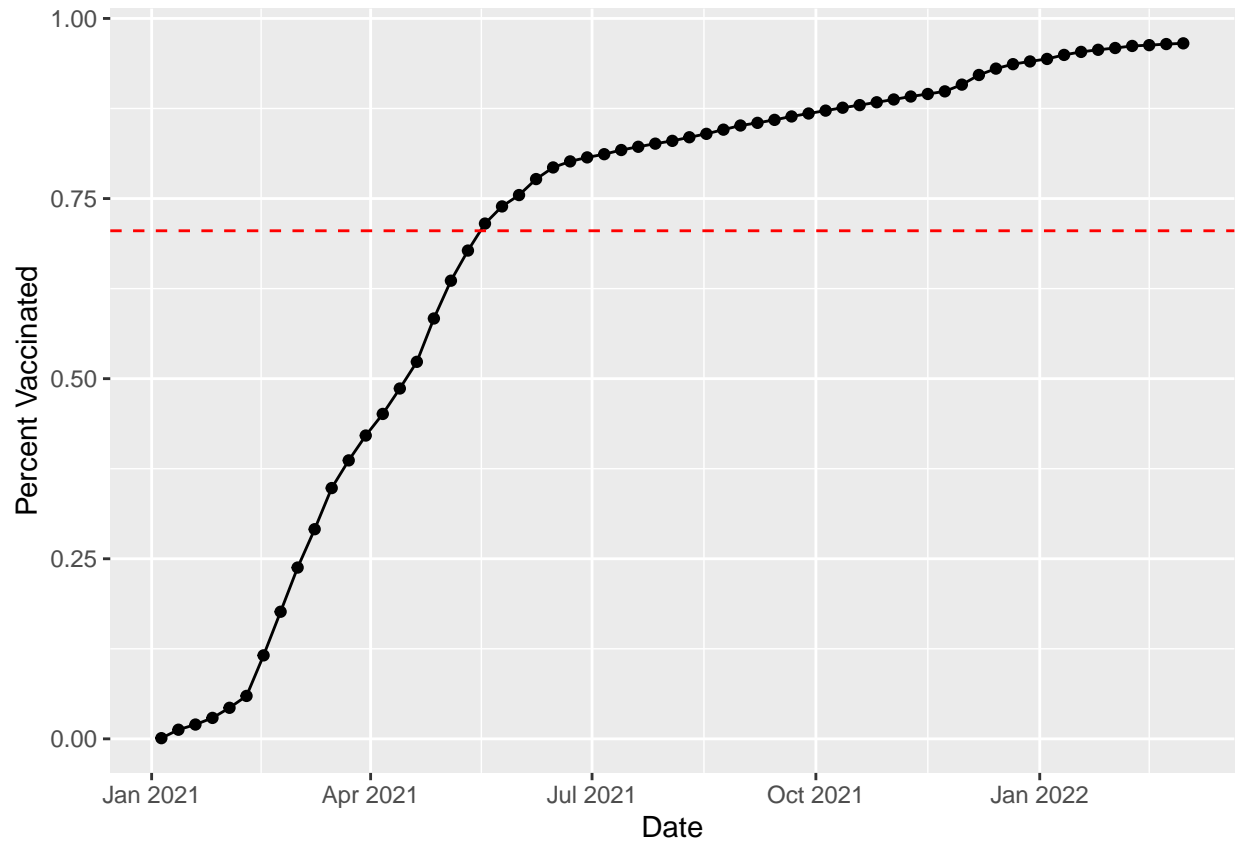
Q19. Is the 92109 and 92040 ZIP code areas above or below the average value you calculated for all these above?

```
vax %>% filter(as_of_date == "2022-02-22") %>%
  filter(zip_code_tabulation_area=="92040") %>%
  select(percent_of_population_fully_vaccinated)
```

```
##   percent_of_population_fully_vaccinated
## 1                              0.551304
```

Q20. Finally make a time course plot of vaccination with a population as large as CA 92037

```
vax.36 <- filter(vax,age5_plus_population> 36144)

ggplot(vax.36) +
  aes(as_of_date,
      percent_of_population_fully_vaccinated,
      group=zip_code_tabulation_area) +
  geom_line(alpha=0.2, color="blue") +
  ylim(c(0,1)) +
  labs(x="Date", y="Percent Vaccinated",
       title="Vaccination rate cross California",
       subtitle="only areas with a population above 36K are shown") +
  geom_hline(yintercept = sd.ave, linetype=2)
```

```
## Warning: Removed 311 row(s) containing missing values (geom_path).
```

Vaccination rate cross California
only areas with a population above 36K are shown
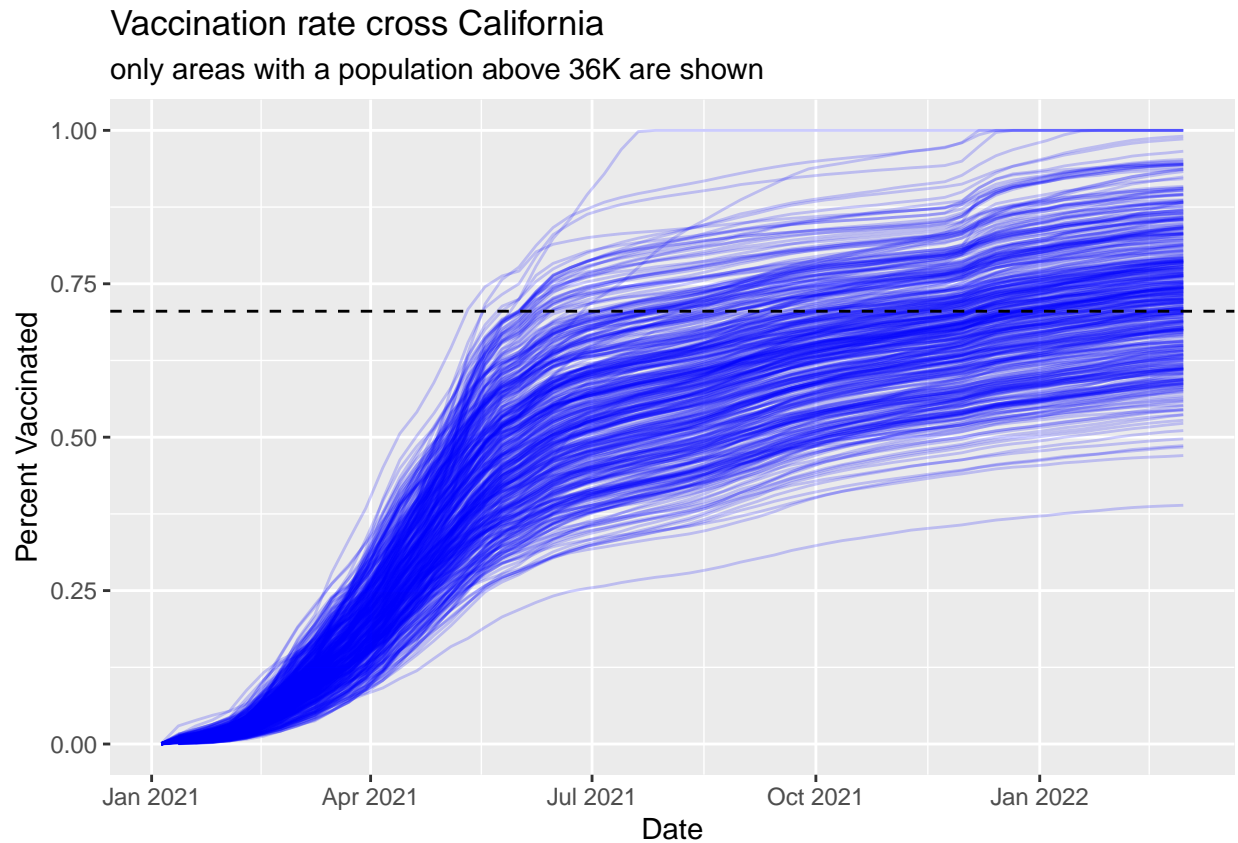

```
myarea<- filter(vax, zip_code_tabulation_area %in% c("92122"))

ggplot(myarea) +
  aes(as_of_date,
      percent_of_population_fully_vaccinated,
      group=zip_code_tabulation_area) +
  geom_line(alpha=0.2, color="blue") +
  ylim(c(0,1)) +
  labs(x="Date", y="Percent Vaccinated",
       title="Vaccination rate cross California",
       subtitle="only areas with a population above 36K are shown") +
  geom_hline(yintercept = sd.ave, linetype=2)
```

Vaccination rate cross California
only areas with a population above 36K are shown
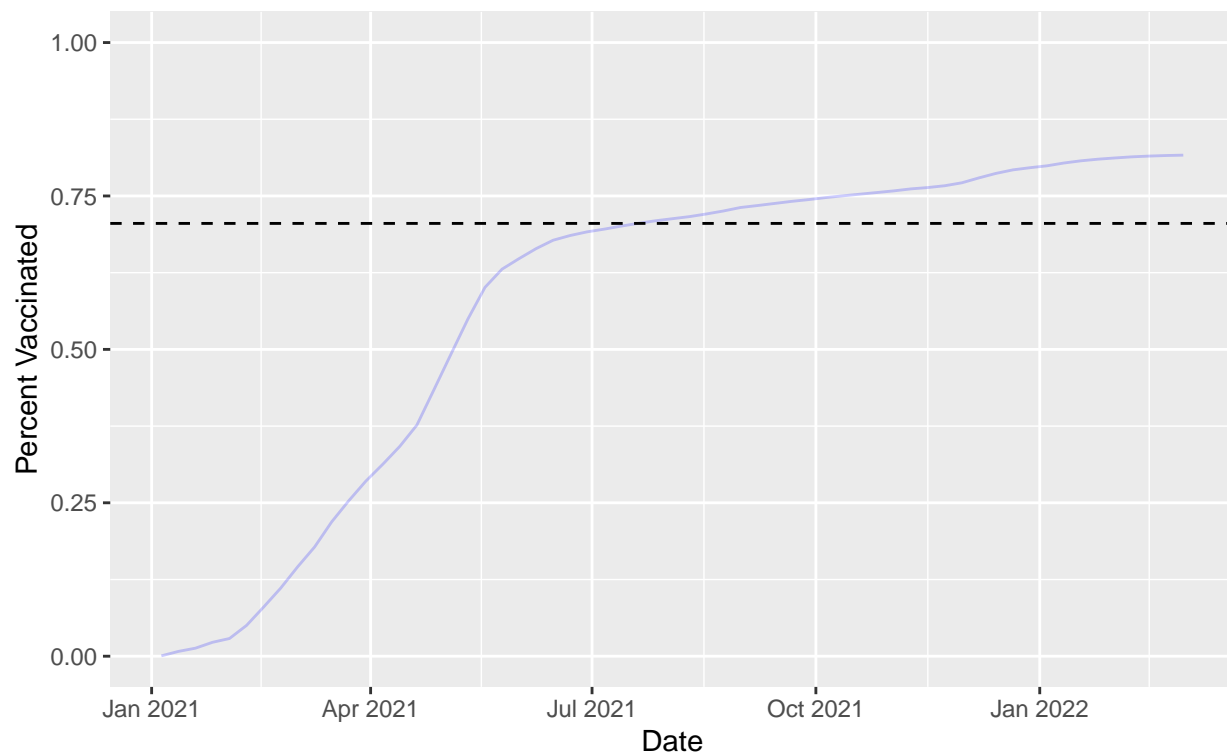
Q21. How do you feel about traveling for Spring Break and meeting for in-person class afterwards?

I got COVID after meeting with lab member who traveled during the Spring Break. :)

```
sessionInfo()
```

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-apple-darwin17.0 (64-bit)
## Running under: macOS Mojave 10.14.6
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/4.1/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.1/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] forcats_0.5.1   stringr_1.4.0   dplyr_1.0.8     purrr_0.3.4
##  [5] readr_2.1.2     tidyr_1.2.0     tibble_3.1.6    ggplot2_3.3.5
##  [9] tidyverse_1.3.1 zipcodeR_0.3.3  lubridate_1.8.0
##
```

```
## loaded via a namespace (and not attached):
##  [1] httr_1.4.2          bit64_4.0.5        jsonlite_1.8.0     modelr_0.1.8
##  [5] assertthat_0.2.1    sp_1.4-6           highr_0.9          blob_1.2.2
##  [9] cellranger_1.1.0    yaml_2.3.5         tidycensus_1.1     pillar_1.7.0
## [13] RSQLite_2.2.10      backports_1.4.1    lattice_0.20-45    glue_1.6.2
## [17] uuid_1.0-3          digest_0.6.29      rvest_1.0.2        colorspace_2.0-3
## [21] htmltools_0.5.2     pkgconfig_2.0.3    broom_0.7.12       raster_3.5-15
## [25] haven_2.4.3         scales_1.1.1       terra_1.5-21       tzdb_0.2.0
## [29] tigris_1.6          proxy_0.4-26       farver_2.1.0       generics_0.1.2
## [33] ellipsis_0.3.2      withr_2.4.3        cachem_1.0.6       repr_1.1.4
## [37] skimr_2.1.3         cli_3.2.0          readxl_1.3.1       magrittr_2.0.2
## [41] crayon_1.5.0        memoise_2.0.1      maptools_1.1-2     evaluate_0.15
## [45] fs_1.5.2            fansi_1.0.2        xml2_1.3.3         foreign_0.8-82
## [49] class_7.3-20        tools_4.1.2        hms_1.1.1          lifecycle_1.0.1
## [53] reprex_2.0.1        munsell_0.5.0      compiler_4.1.2     e1071_1.7-9
## [57] rlang_1.0.1         classInt_0.4-3     units_0.8-0        grid_4.1.2
## [61] rstudioapi_0.13     rappdirs_0.3.3     labeling_0.4.2     base64enc_0.1-3
## [65] rmarkdown_2.11      gtable_0.3.0       codetools_0.2-18   DBI_1.1.2
## [69] curl_4.3.2          R6_2.5.1           knitr_1.37         rgdal_1.5-28
## [73] fastmap_1.1.0       bit_4.0.4          utf8_1.2.2         KernSmooth_2.23-20
## [77] stringi_1.7.6       Rcpp_1.0.8         vctrs_0.3.8        sf_1.0-6
## [81] dbplyr_2.1.1        tidyselect_1.1.2   xfun_0.29
```