Lici_Díaz.Rmd

Lici Díaz

5/12/2022

```
#install.packages("reshape2")
#install.packages("reshape")
#install.packages("nycflights13")
#install.packages("tableone")
#install.packages("rvest")
library(tidyr)
library(MASS)
library(reshape2)
```

```
##
## Attaching package: 'reshape2'

## The following object is masked from 'package:tidyr':
##
##     smiths
```

```
library(reshape)
```

```
##
## Attaching package: 'reshape'

## The following objects are masked from 'package:reshape2':
##
##     colsplit, melt, recast

## The following objects are masked from 'package:tidyr':
##
##     expand, smiths
```

```
library(Hmisc)
```

```
## Loading required package: lattice

## Loading required package: survival

## Loading required package: Formula

## Warning: package 'Formula' was built under R version 4.1.1
```

```
## Loading required package: ggplot2

## Warning: package 'ggplot2' was built under R version 4.1.1

##
## Attaching package: 'Hmisc'

## The following objects are masked from 'package:base':
##
##     format.pval, units
```

```
library(psych)
```

```
##
## Attaching package: 'psych'

## The following object is masked from 'package:Hmisc':
##
##     describe

## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha
```

```
library(ggpubr)
```

```
## Warning: package 'ggpubr' was built under R version 4.1.1
```

```
library(readr)
library(tibble)
```

```
## Warning: package 'tibble' was built under R version 4.1.1
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.1.1

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:Hmisc':
##
##     src, summarize

## The following object is masked from 'package:reshape':
##
##     rename
```

```
## The following object is masked from 'package:MASS':
##
##     select

## The following objects are masked from 'package:stats':
##
##     filter, lag

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

```
library(magrittr)
```

```
##
## Attaching package: 'magrittr'

## The following object is masked from 'package:tidyr':
##
##     extract
```

```
library(lubridate)
```

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

## The following object is masked from 'package:reshape':
##
##     stamp

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

```
library(nycflights13)
library(tableone)
library(survival)
#library(nhanesA)
```

Dataframe from csv files:

```
example_lab_data <- read.table('example_lab_data.csv', sep=',', header=TRUE)
head(example_lab_data)
```

```
##   patient_id       date    lab_exam     result
## 1 cCnBeL4FBu 2021-03-09  Hematocrit 0.34678545
## 2 Xl5d5UcCYD 2021-02-03 Cholesterol 0.37630661
## 3 oa74Ed90gm 2020-03-05         CRP 0.88612849
## 4 rPjBoa86kB 2021-04-20   Platelets 0.09504662
## 5 uD0NxQpQ5F 2020-11-01     Glucose 0.01586868
## 6 3pZ2TqnNyn 2021-02-24 Lymphocytes 0.09372664
```

```r
synthetic_data <- read.table('synthetic_data.csv', sep=',', header=TRUE)
head(synthetic_data)
```

```
##   patient_id age  sex     race weight_kg height_cm  bsa      bmi
## 1 PlSf6mx953  68    M Hispanic      85.6     154.9 2.27 28.96000
## 2 sT8IH3ZooD  56    M    White     104.0     172.0   NA 25.62000
## 3 4Zz1llngXL  24    M    White     115.0     180.3   NA 36.99957
## 4 FlV8vFIekH  45    M    White      61.0     152.4 2.30 21.75507
## 5 XHODUqel1R  54    F    White        NA     170.0 2.39 26.01070
## 6 gvQFBONZVL  60 Male    White     190.5     177.8   NA 42.86250
##                     diagnosis diagnosis_icd10 supplemental_diagnoses
## 1                   COVID-19           I25.5                   <NA>
## 2                   COVID-19            <NA>                   <NA>
## 3 Other respiratory condition            <NA>                   <NA>
## 4                   COVID-19          I71.01                   <NA>
## 5    Cardiovascular condition            <NA>                   <NA>
## 6                   COVID-19            <NA>                   <NA>
##   distal_perfusion trauma infective_endocarditis reintubation trached   ph  co2
## 1               NA     NA                    NA           NA   FALSE 6.96 33.1
## 2             TRUE  FALSE                 FALSE        FALSE   FALSE 7.41   NA
## 3             TRUE  FALSE                    NA        FALSE    TRUE 7.39 42.7
## 4            FALSE  FALSE                 FALSE           NA   FALSE 7.18 72.0
## 5               NA  FALSE                 FALSE        FALSE    TRUE 7.44 62.0
## 6               NA  FALSE                    NA        FALSE   FALSE 7.42   NA
##    o2 lactate_peak creatinine_peak total_bilirubin_peak mechanical_vent_days
## 1  68          3.9            2.27                 3.9            12h - 24h
## 2 542           NA            1.67                  NA                <NA>
## 3  NA           NA            1.19                  NA               <= 12h
## 4 109          2.9            0.57                 0.9      2 days - 7 days
## 5  NA          2.3            1.04                 8.9                <NA>
## 6  49          2.3            2.08                 0.5            12h - 24h
##   systemic_anticoagulation_type acute_kidney_injury severity_score icu_los
## 1                 Heparin only               FALSE              7       5
## 2                 Heparin only               FALSE             11      42
## 3              No anticoagulant                TRUE              4      NA
## 4       Heparin and bivalirudin                TRUE             NA       1
## 5                 Heparin only               FALSE              8      NA
## 6              No anticoagulant                TRUE             NA      43
##   hospital_los discharge_location               insurance proning steroids
## 1           13               <NA>                     UMR   FALSE       No
## 2           15               Home                    <NA>   FALSE      Yes
## 3           20              Death                Medicare    TRUE     <NA>
## 4           49               <NA> Blue Cross/Blue Shield       NA     <NA>
## 5            1              Death     Aetna Better Health      NA     <NA>
## 6           29               Home            Acordia PEIA      NA      Yes
##    steroid_name cpc_score                                      infection
## 1          <NA>      <NA> (On-ECLS, Respiratory tract, Virus, Rhinovirus)
## 2          <NA>      <NA>                                            None
## 3          <NA>      <NA>                                            <NA>
## 4          <NA>      <NA>                                       SARS CoV19
## 5          <NA>       N/A                                       SARS CoV19
## 6 Dexemethasone      <NA>                                            <NA>
##   complication_mechanical complication_hemorrhage complication_neurological
```

```
## 1                    <NA>                    <NA>                       <NA>
## 2                    <NA>                       0                       <NA>
## 3                       0                    <NA>                       <NA>
## 4                       0                    <NA>                       <NA>
## 5                    <NA>                    <NA>                       <NA>
## 6                    <NA>                    <NA>                       None
##   complication_renal complication_cardiovascular complication_pulmonary
## 1               <NA>                       <NA>                   <NA>
## 2               <NA>                       <NA>                   <NA>
## 3               <NA>                       <NA>                   <NA>
## 4                  1                          0                   <NA>
## 5                Yes                       <NA>                      0
## 6               None                       <NA>                   <NA>
##   complication_metabolic complication_patient_limb il_6_blockers antivirals
## 1                   <NA>                      <NA>            NA         NA
## 2                   <NA>                         0            NA         NA
## 3                   <NA>                         0            NA         NA
## 4                   <NA>                      <NA>            NA         NA
## 5                   <NA>                      <NA>            NA         NA
## 6                   <NA>                      <NA>            NA         NA
##   antimalarials support_type transfer number_pt_visits_total_hosp_stay
## 1            NA      Cardiac    FALSE                              NA
## 2            NA         <NA>    FALSE                              NA
## 3            NA    Pulmonary    FALSE                              NA
## 4            NA         <NA>    FALSE                              NA
## 5            NA         <NA>    FALSE                              NA
## 6            NA         <NA>    FALSE                              NA
##   or_cannulation covid monoclonal_ab_treatment total_charges pregnant year
## 1             NA FALSE                      NA            NA       NA 2021
## 2             NA  TRUE                   FALSE            NA       NA 2018
## 3             NA FALSE                      NA            NA       NA 2018
## 4             NA FALSE                      NA      104724.6       NA 2020
## 5             NA FALSE                      NA            NA     TRUE 2022
## 6             NA  TRUE                      NA      966708.4       NA 2020
##   days_to_discharge    pcs12   mcs12 qal_ys admission_date discharge_date
## 1                70       NA      NA     NA     2021-08-26     2021-09-28
## 2                 7 23.06103 36.6572     NA     2020-10-17     2020-11-16
## 3                NA       NA      NA     NA     2021-12-25     2022-02-03
## 4                NA       NA      NA     NA     2020-01-29     2020-02-25
## 5                NA       NA      NA     NA     2021-07-02     2021-08-09
## 6                NA       NA      NA     NA     2021-06-18     2021-07-24
##   death_date
## 1       <NA>
## 2       <NA>
## 3       <NA>
## 4 2020-02-25
## 5       <NA>
## 6       <NA>
```

Remove any extraneous rows or columns:

Ensure that columns with numeric variables don't have characters #Count number of nulls per column

```
nullsum_example_lab_data <- sapply(example_lab_data, function(x) sum(is.na(x)))
nullsum_synthetic_data <- sapply(synthetic_data, function(x) sum(is.na(x)))
```

#drop columns with NA > 300 observations:

```
synthetic_data <- synthetic_data[,!names(synthetic_data) %in% c("diagnosis_icd10","supplemental_diagnos
 "trauma", "infective_endocarditis",  "severity_score", "icu_los","insurance", "proning",  "il_6_blocke
```

Review patient IDs and address repeated patients:

For synthetic_data

```
repeated_patients_syntetic_data <- data.frame(table(synthetic_data$patient_id))
repeated_patients_syntetic_data <- repeated_patients_syntetic_data[repeated_patients_syntetic_data$Freq
```

tells you which patient_id occurred more than once:

```
synthetic_data[synthetic_data$patient_id %in% repeated_patients_syntetic_data$Var1[repeated_patients_sy
```

```
##     patient_id age    sex     race weight_kg height_cm       bmi
## 1   PlSf6mx953  68      M Hispanic      85.6    154.90  28.96000
## 2   sT8IH3ZooD  56      M    White     104.0    172.00  25.62000
## 3   4Zz1llngXL  24      M    White     115.0    180.30  36.99957
## 4   FlV8vFIekH  45      M    White      61.0    152.40  21.75507
## 5   XHODUqel1R  54      F    White        NA    170.00  26.01070
## 6   gvQFBONZVL  60   Male    White     190.5    177.80  42.86250
## 7   9RJXcM3JN2  23      M    White     104.8    154.90  28.75295
## 8   zsEXlQoxFm  46      M    White     120.3    182.90  37.47000
## 9   gJ2ERPGGQc  56   Male    White        NA    176.00  18.93000
## 10  5TLquRFvBi  57      M    White      48.5    173.50  32.28650
## 11  RUJwtKyHR6  53      F    White      82.6    175.30  31.00000
## 12  VVxY2ojz0G  23   Male    White     122.0    188.00  36.49000
## 13  PlSf6mx953  32 Female    White      90.4    188.00  32.49000
## 20  IcjCW6rMOW  65      M    Other      91.4    173.00  22.68000
## 21  usAagb3Ys8  38 Female    White     103.0    175.30  36.35000
## 23  U5z4u340s9  28      F    White     104.0    160.00  37.33000
## 24  GMM5IIMsks  53      M    White      87.8    180.30  44.25000
## 25  XLquXLGSRi  55 Female Hispanic        NA    170.20  28.32000
## 28  DjjRrZGNhd  48      M    Black      84.0    177.80  36.49000
## 29  bpjYMzIhem  30 Female    White      88.7    177.80  36.78670
## 30  Cwy6w4MuKf  63      M    White      60.0    159.00  32.11000
## 31  nDyA0tpdsa  71   Male    White        NA    182.90  37.68000
## 34  RLIZJgcVd8  61      F    White     139.8    165.00  39.43000
## 35  wfzftPR62C  59      F Hispanic      70.1    147.30  31.59750
## 36  U5z4u340s9  78      M    White      48.0    180.00  40.34000
## 39  fxfMuneuZ4  52   Male    White     149.2    162.60  33.96000
## 40  0shbw3gvsR  49   Male    White     155.0    177.80  37.51850
## 42  w1d5gKl9AF  72      F    White     145.0    175.30  50.58000
## 43  XjRrih0zHr  67      F    White     101.5    167.00  22.80000
## 44  LBRVzQu5w9  71      M    White     102.9    157.50  30.75000
## 46  5u0Xu0Tdc0  41   Male    White      48.5    178.00  41.26000
## 47  bpjYMzIhem  36      M    White     116.0        NA  36.99957
```

```
## 48  ds8kizHdyF  55      M    White     126.1    170.20  42.14943
## 49  1P5kPzvd9t  81      M    White     115.2    188.00  33.87235
## 50  CxsoWMlPJ7  53   Male    White      66.2    188.00  33.55795
## 52  l0dDAKKGyk  67      M    White      79.0    172.70  36.00000
## 53  nDyA0tpdsa  63      F    Other     112.0    182.90  49.78000
## 54  oa74Ed90gm  43      F    Black     100.3    180.30  21.40290
## 55  IqkI11WYK7  46 Female    White      87.8    185.00  39.03000
## 57  SHVAA5chqV  67   Male    White     103.0    173.50  37.67000
## 59  fbbgoc1RTa  60   Male    White      93.0    180.00  43.27000
## 61  eTIP4hpddm  36 Female    Black     104.0    160.00  19.20000
## 64  A85a96UqL3  55   Male    White     198.0    172.00  33.38000
## 66  pL7cjkuchS  60 Female    White     126.1    165.10  23.71094
## 69  3KSfMkioqd  81      F    White      79.8    178.00  25.86000
## 71  h0AW4YaVS6  56      F    White     161.0    182.90  43.61000
## 72  GMM5IIMsks  32      M    White      74.0    160.00  28.96000
## 74  KfxOQl50T8  49      M    White      82.5    175.00  39.49000
## 75  7kQUZ43oC8  23      F    White     104.0    182.90  35.15000
## 76  LBRVzQu5w9  40   Male    White      86.0    157.50       NA
## 77  VVxY2ojz0G  43      F    White      61.2    157.50  40.05477
## 79  KfxOQl50T8  55      M    White      79.8    162.60  41.16000
## 82  IqbiKaQrSQ  55      F    White     101.0    172.70  42.97000
## 83  IwoGIkuRxW  57      M    White      60.0    161.90  43.70000
## 84  owdrTVqd26  74      M    White     149.2    188.00  29.19184
## 85  TeelI019by  46      F    White      61.9    170.20  34.22041
## 86  C2DRgzRqj7  51 Female    White     100.3        NA  29.96000
## 88  GW3gmyWKj7  40      F    White      68.4    182.30  21.53000
## 89  5TLquRFvBi  47      F    Black      71.7    172.50  42.58000
## 91  5TLquRFvBi  41      F     <NA>        NA    185.00  28.96000
## 92  e2XxEm3acg  24   <NA>    White     136.9    170.00  18.79000
## 93  I4zTRqpHco  28      M    White     141.0    165.10  56.78000
## 95  SzCWauSPpe  44      M    Black      86.5    167.60  37.20000
## 96  1P5kPzvd9t  27   Male Hispanic      90.8    185.00  24.94000
## 97  FlV8vFIekH  56      M    White     110.0    177.80  32.55764
## 98  xxah5hoZVX  46   Male    Black      96.4    177.80       NA
## 100 oa74Ed90gm  61 Female    White      79.7    177.80  25.41000
## 102 owdrTVqd26  53      M    White      95.7    162.60  53.20000
## 103 pNzvrqNfXv  62      M    White     106.0    175.30  33.44000
## 104 KL9bwQLGY3  64      M    White     127.3    162.60  15.54000
## 105 SzCWauSPpe  52      M    White     112.4    177.80  26.84000
## 106 argAUZmnvn  56      F    White     121.8    175.00  45.75000
## 107 rPjBoa86kB  56   Male    White      64.5    170.20  27.65000
## 108 RPKFkP3mF7  67      M    White     170.0    180.30  36.70000
## 109 AQXGYHxdC0  59      M    White      72.0    177.80  50.58000
## 111 RLIZJgcVd8  64      M    White      69.4    180.00  32.03000
## 112 DjjRrZGNhd  35   Male    White     155.0    185.00  36.02736
## 113 GRgi1BcRFF  78   Male    White     106.0    165.10  29.70341
## 116 ar1fphuqKw  30   Male Hispanic      79.7    177.80  27.02979
## 117 8NReDzROyU  48      M    White      97.6    171.50 347.88167
## 121 A85a96UqL3  30   Male    White     124.0    170.20  26.01000
## 122 fxfMuneuZ4  51      M    White      65.0    152.00  39.03000
## 123 q6danf6ZhC  57      F    White      91.7    170.20  21.53000
## 124 IwoGIkuRxW  31   Male    White     106.0    175.30       NA
## 126 p3uCdY5XSk  52      M    White      74.8    180.30  25.51000
## 127 I4zTRqpHco  73      F    White      76.3    180.00  35.18232
```

```
## 128 OwwryljbEQ  32      M    White     131.0    172.00  25.62000
## 129 sT8IH3ZooD  43   Male    Black      96.1    183.00  28.32000
## 134 d5YupdnG8g  39      M    White     101.0    167.60  27.60000
## 135 CUkgYtax4B  59 Female    White      84.0    177.80  43.51834
## 136 d5YupdnG8g  54      M    White      74.0    157.50  49.78000
## 137 TqQ4YnODN5  23   Male    Black      85.7    188.00  28.52043
## 139 8NReDzROyU  73      F    White      55.0    152.40  28.97000
## 140 IqkI11WYK7  31 Female    White     104.5    189.00  26.84000
## 141 S65F25Nb7v  57      M    Black      62.0    182.60  21.70000
## 142 p3uCdY5XSk  58   Male     <NA>      82.1    170.20  33.24000
## 144 WpXIJg30L2  63 Female    White      87.8    167.00  23.11000
## 145 lgwsTbQ9bX  57      F    White     114.8    172.70  26.57000
## 148 1uksyaSHeL  52      M    White      95.0    162.60  33.95201
## 149 qBAgaxacbM  56   Male    White      74.0    170.20  34.21687
## 151 XLquXLGSRi  33   Male    White      94.7    157.50  29.52000
## 152 eTIP4hpddm  78      F    White      96.9    185.00  38.04000
## 156 SzCWauSPpe  56      M    White     122.0    177.80  19.57000
## 157 Cwy6w4MuKf  57      M    White     114.6    167.60  30.62134
## 158 W07O9mDWf5  42 Female    White      68.0    180.30  18.79000
## 159 7VN31dBvdO  29      F    White      95.3    152.00        NA
## 160 CUkgYtax4B  58      F    White      57.3    172.70  46.58000
## 162 7TZZyYOyMi  51      M    White      63.1    165.10  30.72000
## 164 lgwsTbQ9bX  46      F    White      72.0    180.00  22.48000
## 165 h0AW4YaVS6  52      F    White      91.7    190.50  43.70000
## 166 bGRYJRCGmT  28      M    White     193.7    176.00  30.53000
## 168 GRgi1BcRFF  56   Male    White     170.0    165.10  21.24000
## 169 5dVrn2ayfY  62      M    White      65.0    170.20  54.35000
## 171 uD0NxQpQ5F  67      M    White      68.0    190.50  36.49000
## 172 qBAgaxacbM  57      M    White      58.7    131.30  36.50000
## 174 TeelI019by  53      M    Black     126.0    182.90  24.82459
## 176 0shbw3gvsR  70   Male    White      61.0    185.00  44.25000
## 177 cCnBeL4FBu  56   Male    White      75.8    167.00  41.79592
## 178 bGRYJRCGmT  60      M    White     101.0    182.90  21.24000
## 179 EtsodwhqNO  73      M    White     109.0    182.90  28.47001
## 183 fbbgoc1RTa  65      M    White      65.0    157.00  32.98000
## 184 q6danf6ZhC  54   Male    White     113.0    174.00  26.12862
## 185 ds8kizHdyF  28      M    White     117.0    152.00  18.53688
## 188 3KSfMkioqd  52      M    White     107.0    165.10  36.35000
## 189 EtsodwhqNO  57      F    White      76.3    176.00  35.18232
## 193 d1KObvMArw  22   Male    White     136.0    182.90  53.52000
## 194 RPKFkP3mF7  59      M    White     118.6    184.00  45.75000
## 195 GRgi1BcRFF  19      M    White     104.5    170.00  26.60000
## 199 5dVrn2ayfY  23      F    White      96.0    180.30  44.74000
## 200 erG5SEIJWp  NA      M    White     115.2    170.20  27.02380
## 201 TqQ4YnODN5  38   Male    White     106.8    167.00  44.25000
## 202 uD0NxQpQ5F  56      M    White      77.8    170.20  28.12000
## 204 oa74Ed90gm  59   Male    White     124.0    165.10  36.89000
## 206 EgO9gedBMk  56   Male    White      96.4    159.00  28.72738
## 207 DjjRrZGNhd  52      F    White     159.2    185.00  22.79000
## 209 8NReDzROyU  56 Female    White      96.0    172.70  51.61000
## 210 uQKbY0aHUh  49      M    White      96.1    190.00  16.00043
## 214 argAUZmnvn  40      M    Other      65.0    177.80  52.64000
## 216 4Zz1llngXL  37      M    White     122.0    175.30  33.04000
## 217 9wMC9Rqblr  77   Male    White      58.0    175.30  24.63531
```

```
## 220 nY6IQYyUNJ  29      M    White     101.0        NA  27.80000
## 223 pL7cjkuchS  49      M    White      98.9    175.30  20.20000
## 226 9RJXcM3JN2  65   Male    White     115.0    180.30  40.84000
## 229 cCnBeL4FBu  67   Male    White     107.0    189.00  23.84620
## 230 3KSfMkioqd  28   Male    White        NA    161.30  22.80852
## 231 XLquXLGSRi  64      M    White     107.0    162.60  32.72000
## 234 5u0Xu0Tdc0  64      F    White      73.7    180.30  52.70000
## 235 CxsoWMlPJ7  52      M    White      95.0    170.20  39.14000
## 236 AQXGYHxdC0  47   Male    White      96.0    196.00  32.06000
## 237 sMJ8f6IKAW  65      M    White     110.0    175.30  42.21000
## 238 isLH4ZYjDV  65      M    White     154.7    175.30  36.56337
## 239 SHVAA5chqV  78      F    White      66.2    162.60  36.56337
## 240 aCmgyoBDAU  61      M    White      99.9    182.90  23.20312
## 242 Yx4YroY44a  29      F    White      85.6    162.60  46.48022
## 244 EgO9gedBMk  69      M    White     113.7        NA  34.81000
## 245 wExoR3npUK  62 Female    White      96.1        NA  39.71000
## 246 RLIZJgcVd8  57      M    Other      77.9    180.00  32.50000
## 247 pNzvrqNfXv  29 Female    White     125.2    170.00  21.53000
## 249 oa74Ed90gm  70      F    White     105.3    185.40  30.75000
## 250 3NQYqtSjUW  67      F    White     122.0    160.54  28.90000
## 251 dt1qZYVvWv  65      M    White     100.3    182.90  32.50000
## 252 3NQYqtSjUW  44 Female    White      75.2    163.00  26.90644
## 253 IwoGIkuRxW  40      F    Black     110.0    172.70  38.19000
## 254 nY6IQYyUNJ  30      F    White     110.0    160.54  48.44000
## 255 XjRrih0zHr  56      M    White      94.1    184.00  26.01000
## 256 sMJ8f6IKAW  70   Male    White      82.0    163.00  34.45000
## 257 OwwryljbEQ  54      F    White     115.0    162.00  34.32992
## 259 gvQFBONZVL  78      F    White      50.4    160.00  26.90644
## 260 wfzftPR62C  40   Male    White     127.3    188.00  34.58000
## 261 xPNg98Rj2c  36      M     <NA>      95.0    175.30  32.85000
## 262 XLquXLGSRi  40      F    White     104.0    152.40        NA
## 263 5u0Xu0Tdc0  47      M    White     124.0    170.20  23.71094
## 264 oa74Ed90gm  67      M    White     160.0    172.50  17.40000
## 265 8NReDzROyU  56      M    White      97.5    154.90  31.01507
## 268 AQXGYHxdC0  53 Female    White      66.2    184.50  23.06000
## 269 wExoR3npUK  53      M    White      81.7    157.50  25.51000
## 270 e2XxEm3acg  67      M    White     101.0    170.20  22.48000
## 271 HDHj5t6h8Q  58      M    White     125.5    165.10  30.23000
## 272 mcVVfHOKEn  47      F    White     105.0    185.40  46.87297
## 273 gJ2ERPGGQc  62   Male    White      59.4    172.70  50.58000
## 274 JibNJxmh9o  59   Male    Black     123.0    182.90  32.04000
## 275 WpXIJg30L2  27      M    White     114.8    172.70  31.88000
## 276 sMJ8f6IKAW  54      M    White      96.1    182.30  37.30000
## 277 eWV175w6O4  53   Male    White     103.5    188.00  37.77000
## 278 gJ2ERPGGQc  41   Male    White      81.9    176.00  28.83000
## 279 ghGLxbqUot  29 Female     <NA>     136.9    170.20  32.29000
## 280 eWV175w6O4  57      F    White     123.0    185.40  22.48000
## 282 7VN31dBvdO  29      F    White      73.0    172.00  35.80000
## 286 mcVVfHOKEn  31      F    White      80.4    175.00  34.43000
## 287 ghGLxbqUot  59      M    White      55.7    149.90  31.59122
## 289 dt1qZYVvWv  44      M    White     107.0    170.20  56.78000
## 290 W07O9mDWf5  27   Male    Black     140.0    180.00  19.57000
## 293 l0dDAKKGyk  48   Male Hispanic      76.8    167.60  31.77000
## 294 usAagb3Ys8  63      F    White      64.7    177.80  42.58000
```

```
## 296 PlSf6mx953  52      M    White      85.7    162.60  26.08525
## 297 7TZZyY0yMi  49      F    White      51.3    167.60  37.33000
## 298 HDHj5t6h8Q  31      M    White      99.2    183.00  34.76000
## 299 u8FjkVujGh  44      M    White      69.2    173.60  42.14943
## 300 pL7cjkuchS  58      M    White      86.5    185.40  25.78740
## 301 RUJwtKyHR6  17      M    White     115.3    162.60  38.71000
## 302 XjRrih0zHr  38 Female    White     102.9    179.60  26.01000
## 303 IqbiKaQrSQ  39      M    White      98.5    182.90  31.67000
## 305 3KSfMkioqd  64      F    White     148.0    170.20  33.53012
## 308 KL9bwQLGY3  56 Female    White      90.4    175.30  35.80000
## 314 w1d5gKl9AF  67      M    White      86.3    152.00  29.30000
## 315 d1KObvMArw  32      M    White      82.4    170.20  46.58000
## 316 vlb0gzZhmX  81      M    White      50.2    170.20  43.27000
## 319 rPjBoa86kB  49      M    White     114.8    163.00  21.53000
## 320 u8FjkVujGh  29 Female    White      88.4    198.10  53.20000
## 323 FlV8vFIekH  49      M    Black      97.6    170.20  41.79592
## 324 vSewHcBXnT  61      F    White     132.0    188.00  25.51000
## 326 GMM5IIMsks  53 Female    White      85.4    182.90  40.39018
## 328 ysIXFTGIsU  51      F     <NA>        NA    147.30  29.76000
## 330 9wMC9Rqblr  55      M    White     124.0    160.00  31.26370
## 332 zsEXlQoxFm  58 Female    White     105.0    162.90  36.08000
## 333 CUkgYtax4B  14      M    White      70.1    163.00  36.00000
## 334 zsEXlQoxFm  49      F    White     122.0    183.00  41.54000
## 336 sdfifHRB6T  25      M    White      83.2    157.00  28.38000
## 337 bGRYJRCGmT  53      F    White      79.7    170.20  33.82641
## 342 7TZZyY0yMi  50   Male    White      96.4    150.00  26.57000
## 344 EePz5z5OfK  43      F    White     170.0    188.00  32.29000
## 345 nY6IQYyUNJ  69      F    White     146.0    171.50  37.05333
## 346 C2DRgzRqj7  61   Male    White      92.8    172.70  24.82459
## 347 v9PAyt2zS6  14   Male    White     124.0    182.90  38.59000
## 348 gJ2ERPGGQc  65      M    White     122.0    170.20  30.27000
## 350 ysIXFTGIsU  83      M    White      65.0    160.00  37.17000
## 352 v9PAyt2zS6  61      M    White      64.5    160.00  32.49000
## 353 gJ2ERPGGQc  36      F    White      86.5    170.20  31.44437
## 355 XjRrih0zHr  60   Male    Black     100.3    170.00  33.53012
## 357             NA           <NA>        NA        NA        NA
## 359 OwwryljbEQ  44   Male    White     193.7    177.00  34.22041
## 361 vSewHcBXnT  35      M    White      79.0    154.90  30.53000
## 363             NA           <NA>        NA        NA        NA
## 364 ekDtKmOTAg  38      F    White      84.1    190.50  31.44766
## 365 v9PAyt2zS6  63   Male    Black     132.0    185.00  34.81000
## 368 eTIP4hpddm  30      F    Black     110.9    180.30  40.13841
## 369 TXgFTizXwY  39   <NA>    Black      75.2    185.40  27.70000
## 372 1P5kPzvd9t  76      F    White      80.7    157.70  26.01070
## 374 EePz5z5OfK  62      F Hispanic      96.0    172.70  21.81000
## 375 VVxY2ojz0G  76      M    White     125.0    170.20  51.60000
## 376 TXgFTizXwY  59      M    White      89.9    182.90  33.82641
## 378 GW3gmyWKj7  48      M    White      79.4    172.00  37.47000
## 379 7kQUZ43oC8  53   Male    White      90.7        NA  24.68372
## 380 IqbiKaQrSQ  51      F    White      81.6    165.10  33.62000
## 381 XHODUqel1R  65 Female    White      78.3    195.60  25.28000
## 382 Yx4YroY44a  39      M    Black      94.7    172.70        NA
## 383 nY6IQYyUNJ  72   Male    White     113.7    183.00  23.84620
## 384 sMJ8f6IKAW  NA      M    White      78.3    157.00  15.60000
```

```
## 385 5TLquRFvBi  43      F    White      69.8    177.80  39.03000
## 386 ar1fphuqKw  58   Male    White     115.0    163.00  37.08000
## 387 ekDtKmOTAg  55 Female    White      78.2    131.30  18.53688
## 389 qapZgo14KS  53      F    White      90.8    182.90  28.38000
## 391 vlb0gzZhmX  26   Male    White     160.0    185.40  38.44212
## 393 PlSf6mx953  22      F    White      83.5    162.60  38.43000
## 397 4Zz1llngXL  30   Male    White     154.7    198.10  18.79425
## 398 S65F25Nb7v  54   <NA>    White      96.0    182.90  22.25945
## 399 xPNg98Rj2c  49      F    White      58.3    175.00  26.11877
## 400 sMJ8f6IKAW  32   Male    White      95.7    165.10  17.40000
## 403 TeelI019by  18      M    White      82.0    188.00  31.59750
## 404 aCmgyoBDAU  35      M    White     190.5    185.40  26.55000
## 406 erG5SEIJWp  40   Male    White     114.0    167.00  35.19692
## 407 IcjCW6rMOW  24      M    White      95.4    190.50  26.57000
## 408 isLH4ZYjDV  68 Female    White     123.0    182.90  38.68000
## 409 RLIZJgcVd8  60      F    White     164.9    175.30  50.58000
## 411 uQKbY0aHUh  25   Male    White     100.0    182.90  37.51850
## 414 1uksyaSHeL  44 Female    White     105.3    160.00  21.40290
## 416 WpXIJg30L2  32      M    White      79.8    160.00  33.11000
## 417 JibNJxmh9o  23      F    White      90.8     74.00  26.31000
## 418 1uksyaSHeL  47 Female    White     122.0    167.60  32.22488
## 419 sdfifHRB6T  59      F    White     159.2    162.90  32.06000
## 422 qapZgo14KS  67      M    Black     132.0    175.30  27.04000
## 423 xxah5hoZVX  42      F    White      82.7    160.00  37.67000
##                        diagnosis reintubation trached                 ph   co2
## 1                      COVID-19           NA   FALSE               6.96  33.1
## 2                      COVID-19        FALSE   FALSE               7.41    NA
## 3   Other respiratory condition        FALSE    TRUE               7.39  42.7
## 4                      COVID-19           NA   FALSE               7.18  72.0
## 5      Cardiovascular condition        FALSE    TRUE               7.44  62.0
## 6                      COVID-19        FALSE   FALSE               7.42    NA
## 7                         Other        FALSE   FALSE               7.34  44.3
## 8                         <NA>         FALSE    TRUE               7.28  37.0
## 9                      COVID-19           NA    TRUE               7.18  44.0
## 10                        <NA>           NA   FALSE               7.09  77.0
## 11                     COVID-19           NA    TRUE                7.6  39.0
## 12                     COVID-19        FALSE   FALSE                NDA  59.0
## 13  Other respiratory condition        FALSE   FALSE                NDA  59.0
## 20                        <NA>           NA    TRUE               7.08    NA
## 21  Other respiratory condition           NA   FALSE               <NA>  35.7
## 23  Other respiratory condition        FALSE    TRUE               7.24  44.0
## 24                     COVID-19        FALSE   FALSE               7.32  72.0
## 25     Cardiovascular condition           NA   FALSE               7.32  58.3
## 28     Cardiovascular condition           NA    TRUE               7.09    NA
## 29  Other respiratory condition        FALSE    TRUE               7.35  38.0
## 30                     COVID-19        FALSE   FALSE               7.02  36.0
## 31                        <NA>           NA   FALSE               7.45  47.3
## 34                        <NA>         FALSE    TRUE               7.46  75.0
## 35  Other respiratory condition         TRUE   FALSE               7.39  37.0
## 36     Cardiovascular condition        FALSE    TRUE               7.11    NA
## 39                        <NA>           NA   FALSE               7.49  41.6
## 40  Other respiratory infection         TRUE      NA               7.39  30.0
## 42                        Other        FALSE    TRUE               7.11    NA
## 43                     COVID-19           NA    TRUE               7.36 100.0
```

```
## 44  Other respiratory infection       FALSE    TRUE               7.41  75.0
## 46                      COVID-19          NA   FALSE               7.14  38.0
## 47                      COVID-19       FALSE    TRUE                7.2  45.0
## 48                         Other       FALSE   FALSE               6.95    NA
## 49  Other respiratory condition       FALSE    TRUE               7.20  19.5
## 50  Other respiratory condition       FALSE    TRUE                NDA  37.0
## 52  Other respiratory condition          NA    TRUE               7.26    NA
## 53                      COVID-19          NA   FALSE                NDA    NA
## 54                      COVID-19          NA   FALSE               7.40    NA
## 55  Other respiratory condition       FALSE      NA               7.37  72.0
## 57     Cardiovascular condition        TRUE   FALSE               7.21    NA
## 59                          <NA>          NA   FALSE               7.46  64.0
## 61     Cardiovascular condition       FALSE    TRUE               7.38    NA
## 64                          <NA>       FALSE   FALSE               7.10  59.0
## 66     Cardiovascular condition       FALSE      NA               7.28  51.0
## 69                      COVID-19          NA    TRUE                NDA  30.0
## 71                          <NA>        TRUE   FALSE               <NA>  48.0
## 72     Cardiovascular condition          NA    TRUE               7.44  39.0
## 74     Cardiovascular condition       FALSE      NA               7.25 101.8
## 75     Cardiovascular condition       FALSE   FALSE                NDA  86.0
## 76  Other respiratory condition       FALSE    TRUE               7.49    NA
## 77                          <NA>       FALSE    TRUE               7.43    NA
## 79     Cardiovascular condition       FALSE   FALSE               7.43  61.0
## 82                      COVID-19       FALSE   FALSE                NDA    NA
## 83                          <NA>       FALSE      NA               7.11  56.3
## 84                         Other       FALSE   FALSE               7.37 115.0
## 85     Cardiovascular condition       FALSE    TRUE               7.36    NA
## 86                          <NA>       FALSE    TRUE               7.40  36.0
## 88                      COVID-19       FALSE      NA               7.11  35.0
## 89                         Other          NA   FALSE               7.27  41.0
## 91                      COVID-19       FALSE   FALSE               7.33  56.0
## 92  Other respiratory condition          NA      NA                NDA  44.0
## 93                      COVID-19          NA   FALSE               7.36  46.0
## 95                          <NA>       FALSE    TRUE               7.22  39.0
## 96  Other respiratory condition       FALSE    TRUE               7.08  41.0
## 97                         Other        TRUE   FALSE               7.36    NA
## 98  Other respiratory condition       FALSE    TRUE               7.27  63.4
## 100    Cardiovascular condition          NA   FALSE               7.37  33.8
## 102    Cardiovascular condition       FALSE   FALSE                NDA  56.3
## 103                     COVID-19       FALSE      NA               6.78  43.0
## 104 Other respiratory condition       FALSE   FALSE                NDA  74.0
## 105    Cardiovascular condition          NA    TRUE               7.48  39.0
## 106    Cardiovascular condition        TRUE    TRUE               7.11  35.0
## 107                     COVID-19          NA   FALSE               7.11  71.9
## 108    Cardiovascular condition          NA   FALSE                NDA  40.0
## 109    Cardiovascular condition       FALSE   FALSE               7.16  79.0
## 111    Cardiovascular condition          NA   FALSE               7.42  41.9
## 112    Cardiovascular condition       FALSE   FALSE                NDA  62.0
## 113                        Other          NA   FALSE   no info from OSH    NA
## 116                     COVID-19       FALSE   FALSE               7.22  57.0
## 117                        Other          NA      NA               <NA>  48.0
## 121    Cardiovascular condition       FALSE    TRUE               7.24  57.0
## 122    Cardiovascular condition       FALSE      NA               7.47 128.0
## 123 Other respiratory condition       FALSE   FALSE               7.24  75.0
```

```
## 124 Other respiratory infection          NA   FALSE                7.31  56.3
## 126                     COVID-19       FALSE   FALSE                 NDA    NA
## 127    Cardiovascular condition        FALSE    TRUE                7.22    NA
## 128 Other respiratory infection         TRUE   FALSE                7.22  37.0
## 129 Other respiratory condition          NA   FALSE                 7.3  60.0
## 134 Other respiratory condition          NA   FALSE                 7.1  48.0
## 135    Cardiovascular condition          NA   FALSE                7.09  39.4
## 136                     COVID-19         NA      NA                7.06  37.0
## 137                     COVID-19       TRUE      NA                7.31    NA
## 139    Cardiovascular condition          NA   FALSE                7.32  59.0
## 140                     COVID-19         NA   FALSE                 NDA  12.0
## 141    Cardiovascular condition        FALSE   FALSE                 NDA  38.4
## 142                        Other         NA    TRUE                7.34  47.0
## 144                        Other         NA   FALSE                7.35  71.8
## 145    Cardiovascular condition        FALSE    TRUE                <NA>  31.0
## 148    Cardiovascular condition          NA      NA                7.33  37.0
## 149                     COVID-19       FALSE   FALSE                7.33  60.0
## 151                     COVID-19         NA    TRUE                7.21  38.4
## 152    Cardiovascular condition         TRUE   FALSE                7.35    NA
## 156    Cardiovascular condition        FALSE      NA                7.46  63.4
## 157                     COVID-19         NA      NA                7.11  77.0
## 158    Cardiovascular condition          NA    TRUE                7.21  59.0
## 159    Cardiovascular condition        FALSE    TRUE    no info from OSH  45.0
## 160                     COVID-19         NA      NA                7.31  47.3
## 162                        Other         NA    TRUE       Not Available  46.0
## 164 Other respiratory condition          NA   FALSE                7.42  60.0
## 165    Cardiovascular condition          NA    TRUE                7.04  43.0
## 166                         <NA>         NA   FALSE 7.32099999999999884  46.0
## 168    Cardiovascular condition          NA   FALSE                7.11  36.0
## 169 Other respiratory condition          NA    TRUE                7.22  34.0
## 171 Other respiratory condition          NA    TRUE                 7.4  41.0
## 172                     COVID-19         NA      NA                 NDA  61.0
## 174    Cardiovascular condition        FALSE   FALSE                7.27  24.2
## 176    Cardiovascular condition        FALSE    TRUE                7.04  71.6
## 177    Cardiovascular condition        FALSE    TRUE                6.78  64.0
## 178                     COVID-19         NA   FALSE                7.52  31.0
## 179    Cardiovascular condition         TRUE      NA                7.31  31.0
## 183                     COVID-19       FALSE    TRUE                7.14    NA
## 184                     COVID-19         NA    TRUE                <NA>  56.0
## 185    Cardiovascular condition          NA   FALSE                7.31  75.0
## 188 Other respiratory condition        FALSE    TRUE        not measured  81.0
## 189                     COVID-19         NA      NA                7.52  53.0
## 193 Other respiratory condition          NA   FALSE                7.43  24.2
## 194 Other respiratory condition          NA      NA                7.12  60.0
## 195                        Other       FALSE      NA                7.39  80.3
## 199                     COVID-19       FALSE    TRUE                7.49  49.0
## 200 Other respiratory infection          NA    TRUE                <NA>  64.8
## 201                     COVID-19         NA    TRUE                7.37 128.0
## 202                         <NA>       FALSE      NA                7.31  33.1
## 204    Cardiovascular condition        FALSE    TRUE                7.11    NA
## 206    Cardiovascular condition          NA   FALSE                <NA>  86.0
## 207                     COVID-19         NA    TRUE                7.42    NA
## 209                         <NA>         NA    TRUE                7.31  50.7
## 210 Other respiratory condition        FALSE   FALSE                7.32    NA
```

```
## 214                    COVID-19        FALSE      NA                7.49  44.3
## 216    Cardiovascular condition           NA    TRUE                7.38  63.0
## 217 Other respiratory condition         TRUE      NA                7.37    NA
## 220                    COVID-19         TRUE    TRUE                7.39    NA
## 223 Other respiratory condition           NA   FALSE                7.39  34.0
## 226    Cardiovascular condition        FALSE   FALSE                7.25  53.0
## 229                    COVID-19        FALSE   FALSE                7.30  43.0
## 230    Cardiovascular condition        FALSE   FALSE                7.26  43.0
## 231                    COVID-19           NA      NA                7.33  39.4
## 234 Other respiratory condition        FALSE   FALSE                7.40    NA
## 235                    COVID-19        FALSE    TRUE                7.33  43.9
## 236 Other respiratory infection           NA   FALSE                7.29    NA
## 237                    COVID-19        FALSE    TRUE                7.34  64.0
## 238                    COVID-19        FALSE    TRUE                7.20  44.3
## 239                    COVID-19           NA      NA                 7.6  63.0
## 240 Other respiratory infection           NA    TRUE                7.21  56.3
## 242 Other respiratory infection           NA   FALSE                   N  63.0
## 244                    COVID-19        FALSE   FALSE                7.25  48.0
## 245                    COVID-19        FALSE   FALSE                7.41  40.0
## 246                    COVID-19        FALSE   FALSE                7.45  47.3
## 247    Cardiovascular condition           NA      NA                6.78  36.2
## 249    Cardiovascular condition        FALSE    TRUE                <NA>  57.0
## 250                    COVID-19           NA   FALSE                7.11  86.0
## 251 Other respiratory condition           NA    TRUE                7.38  60.0
## 252    Cardiovascular condition         TRUE    TRUE                7.38  58.0
## 253                    COVID-19        FALSE   FALSE                7.42  39.0
## 254    Cardiovascular condition           NA      NA                7.33  57.0
## 255                    COVID-19        FALSE    TRUE                7.12  52.0
## 256                       Other           NA    TRUE                6.86  34.0
## 257                       Other        FALSE   FALSE                7.31  71.5
## 259                    COVID-19           NA      NA                 NDA  47.0
## 260                    COVID-19           NA   FALSE                 NDA  48.0
## 261    Cardiovascular condition        FALSE      NA                7.36  19.5
## 262                    COVID-19        FALSE      NA                7.16  24.2
## 263                    COVID-19           NA    TRUE 7.15299999999999958    NA
## 264                       Other           NA   FALSE                7.37  43.9
## 265 Other respiratory condition           NA    TRUE                7.15  56.0
## 268                         <NA>         TRUE    TRUE                7.24  52.0
## 269    Cardiovascular condition        FALSE   FALSE                7.04  70.0
## 270 Other respiratory condition           NA      NA                7.26 125.0
## 271                    COVID-19           NA    TRUE                7.22  57.0
## 272 Other respiratory infection           NA    TRUE                7.30  53.0
## 273 Other respiratory condition           NA   FALSE                7.35  39.5
## 274    Cardiovascular condition        FALSE      NA                7.10  48.0
## 275 Other respiratory infection        FALSE   FALSE                7.21  61.0
## 276 Other respiratory infection        FALSE   FALSE                 NDA  77.0
## 277    Cardiovascular condition           NA   FALSE                7.24    NA
## 278                    COVID-19           NA   FALSE                7.26  52.0
## 279                        <NA>        FALSE      NA                7.20  63.0
## 280    Cardiovascular condition        FALSE   FALSE                 NDA  51.0
## 282    Cardiovascular condition        FALSE      NA                7.11  49.0
## 286    Cardiovascular condition        FALSE    TRUE                 7.2  53.0
## 287    Cardiovascular condition        FALSE      NA                7.53  31.0
## 289 Other respiratory condition        FALSE    TRUE                 NDA  37.3
```

```
## 290    Cardiovascular condition          NA   FALSE                7.02    NA
## 293                        <NA>       FALSE   FALSE                NDA  49.0
## 294    Cardiovascular condition          NA   FALSE                7.3  35.7
## 296    Cardiovascular condition          NA    TRUE                7.09 77.0
## 297                    COVID-19          NA   FALSE             V: 6.92 108.0
## 298                       Other          NA    TRUE                7.27 44.0
## 299                    COVID-19          NA   FALSE                7.36 62.5
## 300 Other respiratory condition          NA    TRUE                7.35 39.4
## 301                    COVID-19       FALSE    TRUE                7.40 30.0
## 302                    COVID-19          NA    TRUE                NDA    NA
## 303    Cardiovascular condition          NA    TRUE                7.31 51.0
## 305 Other respiratory condition        TRUE    TRUE                7.52 37.3
## 308                       Other        TRUE      NA                NDA  48.0
## 314 Other respiratory condition          NA   FALSE                7.15 56.2
## 315    Cardiovascular condition       FALSE   FALSE                7.33    NA
## 316    Cardiovascular condition        TRUE    TRUE                NDA  45.0
## 319                    COVID-19       FALSE      NA                7.14 61.0
## 320 Other respiratory condition        TRUE    TRUE                7.11 51.0
## 323 Other respiratory condition       FALSE   FALSE                7.34 39.0
## 324                       Other       FALSE   FALSE                7.17 48.0
## 326 Other respiratory condition          NA   FALSE                7.43 39.0
## 328 Other respiratory condition       FALSE      NA                7.49 33.0
## 330                    COVID-19        TRUE    TRUE                7.44    NA
## 332 Other respiratory condition       FALSE      NA                7.27 42.7
## 333    Cardiovascular condition       FALSE    TRUE                7.41 45.0
## 334    Cardiovascular condition          NA   FALSE                7.33 77.0
## 336                    COVID-19       FALSE      NA        not measured 68.0
## 337                       Other       FALSE   FALSE                7.24 42.7
## 342                       Other          NA   FALSE                7.23 39.4
## 344                    COVID-19       FALSE   FALSE                7.24 42.0
## 345                    COVID-19       FALSE   FALSE                7.10    NA
## 346    Cardiovascular condition          NA   FALSE                7.12 43.9
## 347                    COVID-19       FALSE      NA                7.26 63.0
## 348                        <NA>        TRUE    TRUE                6.78 125.0
## 350                    COVID-19       FALSE   FALSE                7.35    NA
## 352                    COVID-19       FALSE    TRUE                7.35    NA
## 353                    COVID-19          NA    TRUE                7.48 36.0
## 355                    COVID-19          NA   FALSE                7.14    NA
## 357                        <NA>          NA      NA                      NA
## 359 Other respiratory infection       FALSE   FALSE                7.12    NA
## 361                    COVID-19       FALSE      NA                7.40    NA
## 363                        <NA>          NA      NA                      NA
## 364 Other respiratory condition       FALSE   FALSE                7.42 39.5
## 365    Cardiovascular condition          NA    TRUE                7.35 72.0
## 368    Cardiovascular condition          NA    TRUE                7.24 41.0
## 369                        <NA>          NA    TRUE                7.44 35.3
## 372 Other respiratory condition        TRUE      NA                7.27 80.0
## 374                        <NA>       FALSE      NA                <NA> 39.0
## 375 Other respiratory infection       FALSE      NA                7.37 43.0
## 376                    COVID-19          NA   FALSE                7.49 80.3
## 378                    COVID-19        TRUE    TRUE                 7.4 32.0
## 379    Cardiovascular condition       FALSE   FALSE                7.35 57.0
## 380                       Other       FALSE      NA                7.48    NA
## 381                    COVID-19          NA   FALSE                7.05 71.9
```

```
## 382 Other respiratory condition        FALSE    TRUE                7.32  42.0
## 383 Other respiratory condition        FALSE   FALSE                7.50  52.0
## 384                    COVID-19        FALSE      NA                7.54  25.0
## 385                    COVID-19           NA    TRUE                7.36  62.0
## 386    Cardiovascular condition           NA   FALSE                7.40  43.0
## 387                    COVID-19           NA   FALSE                7.12  86.0
## 389                    COVID-19         TRUE    TRUE                7.16  37.0
## 391                        <NA>        FALSE   FALSE                7.39  69.0
## 393    Cardiovascular condition        FALSE   FALSE                7.15  81.0
## 397                    COVID-19           NA      NA                7.46    NA
## 398                        <NA>        FALSE   FALSE                7.32    NA
## 399                        <NA>           NA   FALSE                7.42  39.0
## 400                    COVID-19        FALSE   FALSE                 7.1  41.0
## 403                    COVID-19        FALSE   FALSE    no info from OSH    NA
## 404    Cardiovascular condition         TRUE   FALSE                7.17  59.0
## 406 Other respiratory condition        FALSE    TRUE                7.43  40.0
## 407                        <NA>        FALSE    TRUE                7.28  57.0
## 408                       Other           NA   FALSE                7.28  37.0
## 409    Cardiovascular condition           NA    TRUE                7.33 140.0
## 411                    COVID-19           NA   FALSE             V: 6.92  49.0
## 414 Other respiratory condition           NA   FALSE                7.03  53.0
## 416    Cardiovascular condition        FALSE      NA                 7.3  70.8
## 417    Cardiovascular condition           NA    TRUE                7.23  52.0
## 418    Cardiovascular condition        FALSE    TRUE                7.31  38.0
## 419    Cardiovascular condition           NA   FALSE                7.23 118.0
## 422    Cardiovascular condition        FALSE      NA                7.37  72.0
## 423                        <NA>        FALSE   FALSE                7.25  59.0
##        o2 lactate_peak creatinine_peak total_bilirubin_peak
## 1    68.0          3.9            2.27                 3.9
## 2   542.0           NA            1.67                  NA
## 3      NA           NA            1.19                  NA
## 4   109.0          2.9            0.57                 0.9
## 5      NA          2.3            1.04                 8.9
## 6    49.0          2.3            2.08                 0.5
## 7      NA           NA            3.34                 1.0
## 8   135.0          3.0            3.97                 2.7
## 9      NA          8.5            0.83                 1.4
## 10  116.0          9.0            1.14                  NA
## 11     NA          4.8              NA                  NA
## 12   49.0          3.7              NA                 4.4
## 13  232.0          3.2            2.04                  NA
## 20   80.0          7.3            0.64                 4.4
## 21  186.0          1.5            0.94                 1.3
## 23   69.2          2.6              NA                 3.4
## 24   62.0         13.3            2.80                 3.5
## 25   11.0          2.9              NA                 8.9
## 28     NA          2.0            5.52                 2.7
## 29  130.0          2.6            1.90                 1.5
## 30   76.1          6.8            0.40                  NA
## 31     NA           NA            2.97                  NA
## 34   25.0          2.0            1.57                 1.4
## 35  125.0          9.0              NA                 0.7
## 36   66.0          1.9              NA                 4.6
## 39   45.8           NA            0.81                  NA
```

```
## 40  116.0         1.9          1.90               NA
## 42   51.0         2.4          6.09              2.5
## 43  419.0          NA          0.92              4.8
## 44   66.0         3.7          6.02               NA
## 46  208.0         3.3          0.90              4.9
## 47  121.0        13.1          0.63              1.1
## 48   36.0         8.5          2.91              5.4
## 49     NA         4.2            NA               NA
## 50  208.0         9.7          0.74              0.9
## 52   54.0        17.5            NA              3.0
## 53     NA         2.6          0.60             29.8
## 54  394.4        10.0          2.23               NA
## 55     NA         1.0          2.28             14.0
## 57  253.6         8.7            NA               NA
## 59   79.0         4.9            NA              1.6
## 61  323.0         1.9            NA               NA
## 64   76.0         3.7          4.46              2.2
## 66   59.0         5.0          0.82              5.4
## 69   70.0         9.4            NA              6.7
## 71   27.0        12.0            NA               NA
## 72     NA         2.0          0.90              0.9
## 74   49.0          NA          3.00              6.8
## 75   98.0         3.7            NA               NA
## 76  351.0         1.7          0.87               NA
## 77     NA         6.6          1.50              1.6
## 79  253.6         2.7            NA              1.4
## 82  103.0         1.5          2.71              5.5
## 83  151.0         1.9          2.64             12.6
## 84  408.3         2.0          0.72               NA
## 85   53.0        17.5          0.86              3.5
## 86   26.0         3.2          1.86              3.7
## 88  207.0         2.1            NA              0.2
## 89     NA         2.2            NA              3.1
## 91   46.0         3.9          0.60               NA
## 92     NA         4.8          2.66             15.1
## 93   60.0        12.4          0.60              1.5
## 95   64.0         2.4          4.09              5.5
## 96     NA         4.4          4.09              0.9
## 97     NA         3.0          1.19              0.8
## 98     NA         1.2          1.57              1.6
## 100  39.0         2.6          1.86              1.0
## 102  88.0          NA            NA              1.4
## 103 116.0         0.9            NA              2.9
## 104  99.0         1.3          2.10               NA
## 105  41.8         4.0          1.90              6.7
## 106    NA         2.1            NA               NA
## 107  68.9          NA            NA              1.9
## 108  68.0        13.1          6.09              1.4
## 109  57.0         4.8          1.35              0.7
## 111 175.0        11.4          0.90             12.1
## 112  44.0         1.5          2.97               NA
## 113    NA          NA          3.00               NA
## 116  69.0         2.5          0.97               NA
## 117  66.5         5.2          0.90              8.5
```

```
## 121 179.3          9.5           1.56                3.6
## 122  38.0          2.6           0.95                 NA
## 123  64.0          1.4           2.23                0.5
## 124 144.9         11.4           2.15                 NA
## 126  56.0          2.0             NA                 NA
## 127  87.0          2.0           1.33                 NA
## 128    NA          3.8           1.03                0.8
## 129  68.0           NA             NA                0.9
## 134  67.0           NA           3.00                2.2
## 135    NA          9.4           5.12                 NA
## 136  41.4          1.8             NA                 NA
## 137  73.0          2.1           2.70                1.2
## 139 107.0          2.9           0.54                5.5
## 140 525.6          3.9           3.41                 NA
## 141  69.5          1.2           0.95                1.0
## 142    NA          5.2           0.94                4.0
## 144  63.0         29.0             NA                1.0
## 145  66.0          7.6           5.13                0.7
## 148  89.4           NA             NA                 NA
## 149 376.2          5.8             NA                6.1
## 151 139.4          1.9             NA                0.5
## 152 119.0          8.3             NA                2.6
## 156 108.8           NA             NA                8.5
## 157  64.0          4.8           1.35                2.2
## 158 374.7           NA             NA                 NA
## 159  80.0          2.0           1.27                1.7
## 160 266.0          2.0           0.88                4.6
## 162  95.0          7.9             NA                0.8
## 164    NA          2.3           2.88                0.8
## 165  66.5          2.2             NA                6.1
## 166 109.6          2.4           1.33                2.6
## 168 135.0         10.9           1.56               12.6
## 169 174.0          2.1           1.14                2.1
## 171 124.0          0.8           1.72                0.7
## 172    NA           NA           0.87                 NA
## 174 330.4         17.5           2.88               40.0
## 176 152.0          6.2           0.92                3.4
## 177  19.0          4.3             NA                1.1
## 178    NA          2.3             NA               13.3
## 179 102.6          3.8             NA                 NA
## 183  67.0          2.9           0.69                 NA
## 184  76.0          3.9             NA                 NA
## 185  49.0         17.5             NA                 NA
## 188 330.4          1.6             NA               19.1
## 189    NA          1.5           1.66                 NA
## 193    NA          3.0           1.19                0.8
## 194 102.6          2.4           5.10                1.8
## 195 288.0          2.0           2.70                 NA
## 199  83.0           NA           2.66                 NA
## 200 383.0          6.9           1.56                 NA
## 201 112.0          5.4             NA                 NA
## 202 116.0          1.5           0.73                2.5
## 204  53.0         15.3           0.57                4.7
## 206  73.0          7.6           1.10                6.7
```

```
## 207  68.0         0.8           NA           1.6
## 209  47.0         1.7         1.38            NA
## 210  86.0         2.8         7.50           0.4
## 214 106.0         6.4           NA           3.4
## 216 221.0         3.2           NA            NA
## 217  65.0         2.8           NA            NA
## 220    NA         2.3           NA           2.0
## 223 221.0         2.5         0.63           1.3
## 226    NA         2.0         0.54           8.5
## 229  63.0         3.6         2.70           1.6
## 230 330.4        17.5         0.96            NA
## 231  54.0         9.0           NA            NA
## 234 253.7          NA           NA           5.3
## 235  69.0         7.8         3.11           2.6
## 236    NA         2.2         1.46           0.7
## 237 109.0          NA         1.35            NA
## 238 232.0         2.9           NA           0.4
## 239  19.0         5.8         1.04            NA
## 240  94.5        10.2           NA           1.8
## 242    NA         1.7         6.09           1.0
## 244 287.0         3.5         2.15           2.2
## 245    NA         1.9           NA            NA
## 246  86.0        15.4         4.25            NA
## 247    NA        17.5         1.19           1.9
## 249  60.0         8.9           NA           2.5
## 250  87.0          NA         0.71           6.1
## 251  76.0          NA         1.56           0.8
## 252 117.0         8.9         1.90           8.1
## 253  37.9         4.8           NA            NA
## 254  56.0          NA         1.57           0.3
## 255  73.0        12.9           NA            NA
## 256  57.0         5.2         0.51           2.6
## 257 107.0          NA         0.40           8.2
## 259  60.0          NA         2.14           2.8
## 260  65.0         0.9         1.04           2.9
## 261    NA         3.8         1.56            NA
## 262  44.0         2.5         0.74           0.3
## 263  60.0         1.9           NA           2.4
## 264  61.0        10.9         1.64           0.7
## 265  69.0         0.8         0.63           1.4
## 268  68.9        15.4         1.10           1.1
## 269 266.0          NA           NA            NA
## 270 116.0         3.9         3.05            NA
## 271  87.0        11.7         1.96           0.3
## 272 124.0         8.4           NA            NA
## 273    NA         1.9           NA            NA
## 274  88.0         3.5           NA           1.6
## 275  52.0        10.9         1.67            NA
## 276  61.0        15.3           NA           1.4
## 277    NA          NA         0.81           1.1
## 278  24.0         4.9         2.90           1.7
## 279    NA         2.1           NA            NA
## 280    NA         3.2         2.01           5.3
## 282 249.0         2.3         0.47            NA
```

```
## 286  19.0          NA          0.81                4.7
## 287    NA         2.9          0.57                2.1
## 289  91.1          2.7          0.88                 NA
## 290  72.0          6.1          2.50                 NA
## 293 360.0          9.0          1.65                0.7
## 294 207.0         11.8          0.81                2.2
## 296    NA          4.7          2.71                 NA
## 297  54.0          NA          1.35                 NA
## 298  36.0          7.8          0.81                 NA
## 299  93.0          5.9          1.14                0.7
## 300 288.0          2.3          0.71                2.6
## 301  47.0          1.3          0.83                2.2
## 302  76.0          9.6            NA                1.7
## 303  58.0         17.5            NA                1.3
## 305  59.0          6.0            NA                2.1
## 308 123.0          1.1          4.46                3.1
## 314 130.0         17.5          1.35                 NA
## 315  68.0          4.0          0.57                7.9
## 316  90.0          3.3            NA                0.4
## 319    NA          4.7            NA                 NA
## 320 113.0          8.1            NA                2.0
## 323  34.0          1.6          2.17                1.4
## 324 232.0          NA             NA                4.7
## 326  14.9          NA             NA                3.4
## 328 179.3          7.6          0.54                 NA
## 330 464.0          3.8          0.72                 NA
## 332    NA          2.5          1.10                2.5
## 333 464.0          0.9          0.47                8.2
## 334    NA          6.2          0.79                 NA
## 336  66.4          7.7          2.40                1.3
## 337 208.0          9.0          1.80               27.3
## 342    NA          3.1          1.46                1.3
## 344 139.4          7.8          2.11                0.5
## 345 139.4         15.0            NA                1.0
## 346  59.0          4.5          0.79                6.7
## 347    NA          3.9          1.73                 NA
## 348 119.0          3.0          0.79                2.9
## 350  56.0          2.7          3.75                 NA
## 352  37.9          3.0          0.80                 NA
## 353  79.0          5.9            NA                 NA
## 355  60.0          1.9          2.00                 NA
## 357    NA           NA            NA                 NA
## 359 121.0          3.2            NA                1.7
## 361  68.6          2.4            NA                1.3
## 363    NA           NA            NA                 NA
## 364  58.0         17.5          2.55                0.9
## 365  65.0         17.5            NA                 NA
## 368 208.0         15.0            NA                1.1
## 369  84.0          1.7          3.30                1.3
## 372  50.0          1.6          1.67                1.1
## 374 118.9          3.5          6.09                0.9
## 375  54.0           NA            NA                0.4
## 376  42.0          5.9          1.57                1.9
## 378  58.0           NA          1.65                1.1
```

```
## 379 221.0         17.5           1.00                  NA
## 380  91.1           NA           3.27                 0.8
## 381    NA         11.8           1.90                  NA
## 382 518.0          2.3           1.20                11.7
## 383    NA          1.3           3.41                  NA
## 384  68.6          5.2             NA                 0.9
## 385    NA          1.9           1.27                 3.7
## 386  66.0           NA           2.50                  NA
## 387 117.6         17.5             NA                 1.6
## 389 101.0          6.0           1.64                 8.5
## 391  49.0          3.5           3.85                 5.7
## 393 351.0          1.9           1.39                 1.1
## 397 119.0          3.8             NA                 3.1
## 398    NA          1.3           5.12                  NA
## 399  88.0         17.5           1.67                  NA
## 400 317.0           NA           2.40                  NA
## 403  87.0          4.8           1.38                 2.0
## 404    NA          5.9           2.23                 0.5
## 406    NA          3.8             NA                 2.0
## 407  69.0          1.2           2.80                 1.3
## 408  77.0          4.8           0.60                 3.4
## 409 166.0          0.8             NA                 1.6
## 411 124.0          7.9             NA                 2.1
## 414  45.8          8.9           6.02                 3.0
## 416  67.3         16.5           1.10                 0.3
## 417 282.0         16.5           3.30                 0.5
## 418 283.0          2.5           2.40                  NA
## 419 324.0          3.5             NA                 4.3
## 422 146.0          5.2             NA                 2.4
## 423 152.0          6.4             NA                 0.9
##     mechanical_vent_days systematic_anticoagulation_type acute_kidney_injury
## 1              12h - 24h                     Heparin only               FALSE
## 2                   <NA>                     Heparin only               FALSE
## 3                 <= 12h                No anticoagulant                TRUE
## 4        2 days - 7 days          Heparin and bivalirudin                TRUE
## 5                   <NA>                     Heparin only               FALSE
## 6              12h - 24h                No anticoagulant                TRUE
## 7        2 days - 7 days                     Heparin only               FALSE
## 8              12h - 24h                Bivalirudin only                  NA
## 9              12h - 24h                     Heparin only                TRUE
## 10       2 days - 7 days                Bivalirudin only               FALSE
## 11                  <NA>                Bivalirudin only               FALSE
## 12                  <NA>                Bivalirudin only                  NA
## 13                  <NA>                Bivalirudin only                TRUE
## 20             12h - 24h                             <NA>               FALSE
## 21             12h - 24h                     Heparin only                TRUE
## 23                <= 12h                     Heparin only                TRUE
## 24             12h - 24h                     Heparin only                TRUE
## 25             12h - 24h                             <NA>               FALSE
## 28                <= 12h                     Heparin only                TRUE
## 29                  <NA>                     Heparin only               FALSE
## 30                <= 12h                     Heparin only               FALSE
## 31       2 days - 7 days                No anticoagulant               FALSE
## 34             12h - 24h                Bivalirudin only               FALSE
```

```
## 35            12h - 24h            Bivalirudin only              TRUE
## 36            12h - 24h            No anticoagulant             FALSE
## 39                 <NA>      Heparin and bivalirudin                NA
## 40            12h - 24h            No anticoagulant             FALSE
## 42            12h - 24h            No anticoagulant              TRUE
## 43            12h - 24h                Heparin only              TRUE
## 44            >= 7 days                Heparin only             FALSE
## 46               <= 12h            Bivalirudin only                NA
## 47               <= 12h      Heparin and bivalirudin              TRUE
## 48            12h - 24h            Bivalirudin only             FALSE
## 49               <= 12h            Bivalirudin only              TRUE
## 50                 <NA>                Heparin only             FALSE
## 52       2 days - 7 days                        <NA>             FALSE
## 53               <= 12h      Heparin and bivalirudin             FALSE
## 54            12h - 24h                Heparin only             FALSE
## 55            12h - 24h            Bivalirudin only             FALSE
## 57       2 days - 7 days                Heparin only             FALSE
## 59            12h - 24h                Heparin only             FALSE
## 61       2 days - 7 days                Heparin only             FALSE
## 64               <= 12h            No anticoagulant              TRUE
## 66               <= 12h                        <NA>             FALSE
## 69                 <NA>                Heparin only                NA
## 71               <= 12h                Heparin only                NA
## 72       2 days - 7 days                Heparin only             FALSE
## 74            12h - 24h      Heparin and bivalirudin              TRUE
## 75            12h - 24h            Bivalirudin only              TRUE
## 76                 <NA>                Heparin only              TRUE
## 77                 <NA>            Bivalirudin only              TRUE
## 79            12h - 24h                Heparin only             FALSE
## 82            12h - 24h            No anticoagulant             FALSE
## 83                 <NA>                Heparin only             FALSE
## 84            12h - 24h            Bivalirudin only             FALSE
## 85                 <NA>                        <NA>             FALSE
## 86                 <NA>                Heparin only             FALSE
## 88                 <NA>                Heparin only             FALSE
## 89                 <NA>                        <NA>             FALSE
## 91            12h - 24h            No anticoagulant                NA
## 92            >= 7 days                Heparin only             FALSE
## 93            12h - 24h                Heparin only             FALSE
## 95       2 days - 7 days                Heparin only              TRUE
## 96            12h - 24h            Bivalirudin only              TRUE
## 97            12h - 24h                Heparin only              TRUE
## 98                 <NA>            Bivalirudin only              TRUE
## 100              <= 12h            No anticoagulant              TRUE
## 102                <NA>                Heparin only             FALSE
## 103                <NA>            Bivalirudin only              TRUE
## 104      2 days - 7 days                Heparin only                NA
## 105              <= 12h                        <NA>             FALSE
## 106                <NA>                Heparin only              TRUE
## 107           12h - 24h            Bivalirudin only                NA
## 108      2 days - 7 days            Bivalirudin only             FALSE
## 109           12h - 24h                        <NA>             FALSE
## 111           12h - 24h                Heparin only             FALSE
## 112              <= 12h                Heparin only             FALSE
```

```
## 113           12h - 24h            Bivalirudin only                NA
## 116              <= 12h                        <NA>                NA
## 117                <NA>              Heparin only               FALSE
## 121                <NA>                        <NA>               FALSE
## 122              <= 12h                        <NA>               FALSE
## 123           12h - 24h            No anticoagulant                TRUE
## 124           12h - 24h            No anticoagulant                TRUE
## 126           >= 7 days            Bivalirudin only                NA
## 127              <= 12h                        <NA>               FALSE
## 128           12h - 24h              Heparin only                FALSE
## 129           12h - 24h            No anticoagulant               FALSE
## 134              <= 12h            No anticoagulant               FALSE
## 135                <NA>              Heparin only                TRUE
## 136           >= 7 days              Heparin only                FALSE
## 137           >= 7 days                        <NA>                NA
## 139           12h - 24h            No anticoagulant               FALSE
## 140           12h - 24h            Bivalirudin only               FALSE
## 141                <NA>                        <NA>               FALSE
## 142              <= 12h              Heparin only                NA
## 144              <= 12h              Heparin only                FALSE
## 145                <NA>            Bivalirudin only               FALSE
## 148              <= 12h            No anticoagulant                TRUE
## 149           12h - 24h            Bivalirudin only                TRUE
## 151     2 days - 7 days            Bivalirudin only                NA
## 152     2 days - 7 days            No anticoagulant                NA
## 156                <NA>              Heparin only                TRUE
## 157              <= 12h              Heparin only                FALSE
## 158           12h - 24h            Bivalirudin only               FALSE
## 159              <= 12h            No anticoagulant               FALSE
## 160     2 days - 7 days            Bivalirudin only                TRUE
## 162           12h - 24h              Heparin only                FALSE
## 164           12h - 24h            Bivalirudin only                TRUE
## 165           12h - 24h              Heparin only                NA
## 166           >= 7 days            Bivalirudin only                NA
## 168              <= 12h              Heparin only                FALSE
## 169                <NA>      Heparin and bivalirudin               TRUE
## 171              <= 12h              Heparin only                NA
## 172              <= 12h      Heparin and bivalirudin               FALSE
## 174                <NA>                        <NA>                TRUE
## 176     2 days - 7 days             Argatroban only                TRUE
## 177           12h - 24h              Heparin only                FALSE
## 178           12h - 24h              Heparin only                NA
## 179                <NA>              Heparin only                TRUE
## 183     2 days - 7 days              Heparin only                FALSE
## 184           12h - 24h              Heparin only                NA
## 185                <NA>              Heparin only                NA
## 188     2 days - 7 days              Heparin only                TRUE
## 189           12h - 24h              Heparin only                FALSE
## 193              <= 12h      Heparin and bivalirudin               TRUE
## 194              <= 12h              Heparin only                FALSE
## 195              <= 12h              Heparin only                FALSE
## 199           12h - 24h              Heparin only                FALSE
## 200           12h - 24h            No anticoagulant              FALSE
## 201           >= 7 days              Heparin only                NA
```

```
## 202              <NA>             Bivalirudin only              FALSE
## 204          >= 7 days                         <NA>                 NA
## 206             <= 12h           No anticoagulant                 NA
## 207          >= 7 days               Heparin only              FALSE
## 209     2 days - 7 days               Heparin only               TRUE
## 210          12h - 24h               Heparin only               TRUE
## 214             <= 12h               Heparin only                 NA
## 216              <NA>               Heparin only                 NA
## 217              <NA>                       <NA>              FALSE
## 220             <= 12h                       <NA>              FALSE
## 223             <= 12h      Heparin and bivalirudin               TRUE
## 226     2 days - 7 days               Heparin only              FALSE
## 229              <NA>               Heparin only              FALSE
## 230              <NA>               Heparin only                 NA
## 231             <= 12h               Heparin only                 NA
## 234             <= 12h           Bivalirudin only                 NA
## 235          12h - 24h               Heparin only                 NA
## 236          12h - 24h               Heparin only                 NA
## 237              <NA>      Heparin and bivalirudin              FALSE
## 238              <NA>                       <NA>              FALSE
## 239          12h - 24h               Heparin only               TRUE
## 240     2 days - 7 days               Heparin only               TRUE
## 242              <NA>                       <NA>                 NA
## 244          12h - 24h               Heparin only               TRUE
## 245              <NA>               Heparin only              FALSE
## 246              <NA>               Heparin only              FALSE
## 247              <NA>           No anticoagulant              FALSE
## 249          12h - 24h           No anticoagulant              FALSE
## 250          12h - 24h           Bivalirudin only              FALSE
## 251             <= 12h                       <NA>               TRUE
## 252          12h - 24h               Heparin only                 NA
## 253             <= 12h           No anticoagulant               TRUE
## 254             <= 12h           Bivalirudin only               TRUE
## 255     2 days - 7 days               Heparin only               TRUE
## 256          12h - 24h           Bivalirudin only               TRUE
## 257             <= 12h           Bivalirudin only              FALSE
## 259          12h - 24h           Bivalirudin only              FALSE
## 260     2 days - 7 days           Bivalirudin only               TRUE
## 261          12h - 24h               Heparin only              FALSE
## 262             <= 12h      Heparin and bivalirudin               TRUE
## 263          12h - 24h               Heparin only               TRUE
## 264          12h - 24h               Heparin only              FALSE
## 265              <NA>                       <NA>               TRUE
## 268          12h - 24h               Heparin only                 NA
## 269          >= 7 days           Bivalirudin only              FALSE
## 270              <NA>               Heparin only               TRUE
## 271          12h - 24h           Bivalirudin only               TRUE
## 272              <NA>           Bivalirudin only              FALSE
## 273          12h - 24h               Heparin only              FALSE
## 274              <NA>                       <NA>               TRUE
## 275             <= 12h           Bivalirudin only               TRUE
## 276              <NA>           No anticoagulant               TRUE
## 277          >= 7 days                         <NA>               TRUE
## 278              <NA>               Heparin only              FALSE
```

```
## 279          >= 7 days              Heparin only              TRUE
## 280     2 days - 7 days           Bivalirudin only             TRUE
## 282          12h - 24h              Heparin only             FALSE
## 286          12h - 24h          No anticoagulant              TRUE
## 287             <= 12h              Heparin only              TRUE
## 289          12h - 24h          No anticoagulant                NA
## 290               <NA>              Heparin only             FALSE
## 293          >= 7 days              Heparin only             FALSE
## 294          12h - 24h                      <NA>             FALSE
## 296               <NA>              Heparin only              TRUE
## 297          12h - 24h              Heparin only              TRUE
## 298               <NA>              Heparin only             FALSE
## 299             <= 12h           Bivalirudin only              TRUE
## 300     2 days - 7 days              Heparin only              TRUE
## 301     2 days - 7 days              Heparin only              TRUE
## 302          12h - 24h              Heparin only              TRUE
## 303             <= 12h                      <NA>                NA
## 305          12h - 24h           Bivalirudin only                NA
## 308          12h - 24h              Heparin only              TRUE
## 314     2 days - 7 days              Heparin only             FALSE
## 315               <NA>              Heparin only                NA
## 316          12h - 24h              Heparin only              TRUE
## 319             <= 12h           Bivalirudin only             FALSE
## 320          12h - 24h              Heparin only                NA
## 323             <= 12h          No anticoagulant              TRUE
## 324             <= 12h                      <NA>              TRUE
## 326          12h - 24h              Heparin only              TRUE
## 328          12h - 24h                      <NA>             FALSE
## 330             <= 12h              Heparin only              TRUE
## 332          12h - 24h                      <NA>             FALSE
## 333          12h - 24h                      <NA>              TRUE
## 334          12h - 24h              Heparin only              TRUE
## 336             <= 12h              Heparin only              TRUE
## 337               <NA>           Bivalirudin only             FALSE
## 342               <NA>           Bivalirudin only              TRUE
## 344             <= 12h                      <NA>              TRUE
## 345               <NA>              Heparin only              TRUE
## 346               <NA>           Bivalirudin only              TRUE
## 347             <= 12h              Heparin only                NA
## 348             <= 12h              Heparin only             FALSE
## 350               <NA>           Bivalirudin only              TRUE
## 352               <NA>          No anticoagulant             FALSE
## 353               <NA>           Bivalirudin only              TRUE
## 355          12h - 24h           Bivalirudin only             FALSE
## 357               <NA>                      <NA>                NA
## 359               <NA>                      <NA>              TRUE
## 361               <NA>              Heparin only             FALSE
## 363               <NA>                      <NA>                NA
## 364          12h - 24h              Heparin only             FALSE
## 365               <NA>      Heparin and bivalirudin                NA
## 368     2 days - 7 days             No anticoagulant                NA
## 369             <= 12h              Heparin only             FALSE
## 372               <NA>           Bivalirudin only             FALSE
## 374             <= 12h           Bivalirudin only                NA
```

```
## 375            12h - 24h                        <NA>               FALSE
## 376               <= 12h             Bivalirudin only                  NA
## 378      2 days - 7 days             Bivalirudin only                  NA
## 379               <= 12h                 Heparin only                TRUE
## 380            >= 7 days                 Heparin only                TRUE
## 381            >= 7 days                 Heparin only                TRUE
## 382            12h - 24h                 Heparin only                TRUE
## 383            12h - 24h                 Heparin only               FALSE
## 384               <= 12h                 Heparin only                  NA
## 385            >= 7 days             Bivalirudin only                  NA
## 386            12h - 24h             Bivalirudin only                TRUE
## 387            12h - 24h                 Heparin only               FALSE
## 389               <= 12h                 Heparin only               FALSE
## 391            12h - 24h             No anticoagulant                TRUE
## 393               <= 12h                 Heparin only               FALSE
## 397                 <NA>             No anticoagulant               FALSE
## 398               <= 12h                        <NA>               FALSE
## 399                 <NA>                        <NA>                  NA
## 400      2 days - 7 days             No anticoagulant                TRUE
## 403               <= 12h                 Heparin only                TRUE
## 404               <= 12h             Bivalirudin only                TRUE
## 406            >= 7 days                 Heparin only                TRUE
## 407                 <NA>                 Heparin only               FALSE
## 408               <= 12h                 Heparin only                  NA
## 409      2 days - 7 days                 Heparin only                TRUE
## 411               <= 12h             Bivalirudin only                  NA
## 414                 <NA>             Bivalirudin only               FALSE
## 416               <= 12h             No anticoagulant                TRUE
## 417               <= 12h                        <NA>                TRUE
## 418                 <NA>             Bivalirudin only                TRUE
## 419               <= 12h                 Heparin only                TRUE
## 422                 <NA>             No anticoagulant               FALSE
## 423            >= 7 days                 Heparin only               FALSE
##     hospital_los discharge_location steroids
## 1           13.0               <NA>       No
## 2           15.0               Home      Yes
## 3           20.0              Death     <NA>
## 4           49.0               <NA>     <NA>
## 5            1.0              Death     <NA>
## 6           29.0               Home      Yes
## 7           34.0               Home     <NA>
## 8           32.0               <NA>       No
## 9           16.0              Death       No
## 10         109.0               <NA>       No
## 11          34.0              Death     <NA>
## 12            NA               <NA>     <NA>
## 13         153.0               <NA>     <NA>
## 20          12.0               Home     <NA>
## 21            NA              Death      Yes
## 23          88.0               <NA>      Yes
## 24          34.0               Home      N/A
## 25           6.0              Death     <NA>
## 28           4.0              Death      Yes
## 29          29.0        LTAC/rehab     <NA>
```

```
## 30          26.0              Death       No
## 31          20.0               <NA>      Yes
## 34          14.0               Home     <NA>
## 35           2.0              Death       No
## 36           8.0              Death     <NA>
## 39           6.0               Home     <NA>
## 40           7.0               <NA>       No
## 42           8.0              Death       No
## 43          18.0               <NA>      Yes
## 44           7.0               <NA>       No
## 46           8.0               <NA>      Yes
## 47          88.0        LTAC/rehab     <NA>
## 48          36.8               Home     <NA>
## 49          41.0               <NA>       No
## 50         101.0              Death     <NA>
## 52          12.0        LTAC/rehab     <NA>
## 53          20.0               Home     <NA>
## 54          17.0               <NA>     <NA>
## 55          18.0              Death       No
## 57            NA               <NA>     <NA>
## 59          10.0               <NA>     <NA>
## 61            NA        LTAC/rehab     <NA>
## 64          13.0        LTAC/rehab     <NA>
## 66          51.0               <NA>     <NA>
## 69          43.0              Death     <NA>
## 71          13.0              Death      Yes
## 72            NA               Home     <NA>
## 74          38.0               <NA>     <NA>
## 75          56.0               <NA>      Yes
## 76          15.0        LTAC/rehab       No
## 77          36.0              Death     <NA>
## 79           6.0               <NA>       No
## 82          27.0               Home     <NA>
## 83          46.0               <NA>     <NA>
## 84            NA        LTAC/rehab      Yes
## 85          12.0        LTAC/rehab     <NA>
## 86          18.0        LTAC/rehab     <NA>
## 88            NA        LTAC/rehab      Yes
## 89          47.0               Home      Yes
## 91          38.0              Death     <NA>
## 92            NA              Death      Yes
## 93            NA              Death     <NA>
## 95          54.0              Death     <NA>
## 96          33.0              Death     <NA>
## 97           1.0              Death     <NA>
## 98            NA               Home     <NA>
## 100         22.0              Death     <NA>
## 102        103.0               Home      Yes
## 103         12.0               Home     <NA>
## 104         67.0              Death     <NA>
## 105          7.0               Home       No
## 106           NA              Death     <NA>
## 107         70.0               <NA>      Yes
## 108         23.0               <NA>      Yes
```

```
## 109          NA             Death     <NA>
## 111         1.0        LTAC/rehab       No
## 112        17.0             Death     <NA>
## 113         8.0              <NA>     <NA>
## 116        19.0        LTAC/rehab     <NA>
## 117        54.0             Death     <NA>
## 121        27.0             Death     <NA>
## 122         1.0        LTAC/rehab     <NA>
## 123        38.0              Home     <NA>
## 124        26.0              <NA>       No
## 126        27.0        LTAC/rehab     <NA>
## 127         4.0              Home       No
## 128        13.0              <NA>     <NA>
## 129        19.0              <NA>     <NA>
## 134        20.0             Death       No
## 135         8.0              <NA>      Yes
## 136        22.0              Home      Yes
## 137          NA              <NA>     <NA>
## 139        16.0              <NA>     <NA>
## 140          NA        LTAC/rehab     <NA>
## 141        12.0              Home      Yes
## 142         5.0             Death     <NA>
## 144       123.0              <NA>     <NA>
## 145       123.0        LTAC/rehab       No
## 148          NA             Death     <NA>
## 149        23.0              <NA>     <NA>
## 151        32.0        LTAC/rehab     <NA>
## 152        79.0              <NA>     <NA>
## 156        77.0             Death      Yes
## 157        16.0              <NA>     <NA>
## 158        25.0              Home     <NA>
## 159        28.0              Home      Yes
## 160         2.0             Death     <NA>
## 162        77.0              <NA>     <NA>
## 164        37.0        LTAC/rehab      Yes
## 165          NA              <NA>     <NA>
## 166          NA              Home     <NA>
## 168        19.0             Death     <NA>
## 169          NA             Other     <NA>
## 171        13.0             Death       No
## 172        43.0              <NA>       No
## 174        27.0              <NA>     <NA>
## 176          NA             Death       No
## 177         8.0              <NA>     <NA>
## 178        58.0             Death     <NA>
## 179        16.0              Home     <NA>
## 183          NA              Home     <NA>
## 184        73.0              Home     <NA>
## 185        26.0             Death     <NA>
## 188          NA              <NA>     <NA>
## 189        55.0              <NA>     <NA>
## 193        42.0             Death     <NA>
## 194          NA             Death      Yes
## 195        43.0              Home     <NA>
```

```
## 199         52.0             Death     <NA>
## 200         58.0              Home      Yes
## 201           NA        LTAC/rehab       No
## 202         31.0             Death      Yes
## 204           NA             Death     <NA>
## 206         85.0             Death     <NA>
## 207         19.0        LTAC/rehab     <NA>
## 209           NA              <NA>     <NA>
## 210         15.0              <NA>     <NA>
## 214         29.0        LTAC/rehab      Yes
## 216         61.0              <NA>      Yes
## 217         36.8             Death      Yes
## 220         40.0              <NA>     <NA>
## 223          1.0             Death     <NA>
## 226           NA             Death      Yes
## 229         94.0             Death     <NA>
## 230         17.0              <NA>       No
## 231         21.0              Home      Yes
## 234         86.0             Death      N/A
## 235           NA              <NA>      Yes
## 236          2.0              Home     <NA>
## 237         70.0             Death     <NA>
## 238         46.0              <NA>      N/A
## 239         37.0             Death     <NA>
## 240           NA              Home       No
## 242           NA        LTAC/rehab     <NA>
## 244        101.0        LTAC/rehab       No
## 245           NA             Death     <NA>
## 246         17.0              Home     <NA>
## 247         47.0              <NA>     <NA>
## 249         26.0        LTAC/rehab      Yes
## 250        108.0              <NA>       No
## 251         16.0              <NA>     <NA>
## 252         33.0              <NA>       No
## 253           NA              <NA>      Yes
## 254         32.0              <NA>      Yes
## 255           NA             Death     <NA>
## 256         24.0             Death     <NA>
## 257         43.0              <NA>     <NA>
## 259           NA              <NA>     <NA>
## 260         52.0        LTAC/rehab     <NA>
## 261         75.0             Death     <NA>
## 262         30.0             Death     <NA>
## 263         49.0              <NA>      Yes
## 264         29.0              <NA>     <NA>
## 265         36.0        LTAC/rehab       No
## 268         29.0              Home      Yes
## 269         27.0              <NA>     <NA>
## 270         12.0              <NA>     <NA>
## 271         53.0        LTAC/rehab      Yes
## 272         36.0              Home     <NA>
## 273           NA        LTAC/rehab     <NA>
## 274         11.0        LTAC/rehab       No
## 275         23.0             Other     <NA>
```

```
## 276         33.0              <NA>     <NA>
## 277         17.0         LTAC/rehab     <NA>
## 278         10.0              <NA>      Yes
## 279           NA             Death     <NA>
## 280           NA         LTAC/rehab       No
## 282        123.0              Home     <NA>
## 286         19.0              <NA>       No
## 287         56.0             Death     <NA>
## 289         25.0              <NA>     <NA>
## 290         12.0              <NA>     <NA>
## 293           NA              <NA>      Yes
## 294        106.8              <NA>     <NA>
## 296         10.0              <NA>     <NA>
## 297         22.0             Death     <NA>
## 298         14.0              <NA>      Yes
## 299         77.0              <NA>     <NA>
## 300         33.0              Home     <NA>
## 301         17.0             Death      Yes
## 302         46.0             Death     <NA>
## 303         23.0              <NA>     <NA>
## 305         12.0              <NA>      Yes
## 308         19.0             Death      Yes
## 314         36.8             Death     <NA>
## 315         24.0             Death      Yes
## 316         12.0             Death       No
## 319           NA              <NA>       No
## 320         10.0             Death     <NA>
## 323           NA             Death      Yes
## 324        153.0              <NA>     <NA>
## 326         52.0             Death     <NA>
## 328          7.0              <NA>     <NA>
## 330         42.0             Death     <NA>
## 332           NA              Home     <NA>
## 333         62.0              <NA>     <NA>
## 334         58.0              Home     <NA>
## 336          3.0              Home     <NA>
## 337          2.0              Home     <NA>
## 342         35.0              <NA>     <NA>
## 344         11.0         LTAC/rehab     <NA>
## 345         22.0              <NA>       No
## 346         49.0              Home     <NA>
## 347          1.0              Home     <NA>
## 348           NA              Home      Yes
## 350         41.0              <NA>     <NA>
## 352          4.0             Death     <NA>
## 353           NA             Death     <NA>
## 355          7.0              <NA>     <NA>
## 357           NA
## 359          7.0              <NA>     <NA>
## 361         46.0             Death      N/A
## 363           NA
## 364           NA         LTAC/rehab     <NA>
## 365         11.0             Death     <NA>
## 368          2.0             Death       No
```

```
## 369        173.0             Death      Yes
## 372         38.0              <NA>      Yes
## 374           NA              <NA>     <NA>
## 375         57.0              Home     <NA>
## 376         37.0       LTAC/rehab     <NA>
## 378          7.0             Death       No
## 379         60.0             Death     <NA>
## 380         21.0             Death     <NA>
## 381         17.0              Home     <NA>
## 382         26.0              <NA>     <NA>
## 383         15.0             Death       No
## 384          2.0              Home       No
## 385          9.0              Home     <NA>
## 386        103.0       LTAC/rehab       No
## 387         14.0              <NA>     <NA>
## 389          8.0       LTAC/rehab       No
## 391         41.0              <NA>     <NA>
## 393         12.0       LTAC/rehab     <NA>
## 397        117.0       LTAC/rehab       No
## 398           NA             Death     <NA>
## 399          8.0              <NA>     <NA>
## 400         37.0              <NA>     <NA>
## 403          1.0             Death      Yes
## 404           NA             Death     <NA>
## 406          1.5             Death      Yes
## 407         29.0       LTAC/rehab     <NA>
## 408           NA              Home     <NA>
## 409         23.0              <NA>       No
## 411         38.0              <NA>     <NA>
## 414         29.0              Home     <NA>
## 416          7.0       LTAC/rehab       No
## 417         23.0             Death       No
## 418           NA              Home     <NA>
## 419         53.0              <NA>     <NA>
## 422          8.0              <NA>       No
## 423         17.0              <NA>     <NA>
##
## 1
## 2
## 3
## 4
## 5
## 6
## 7
## 8
## 9
## 10
## 11
## 12
## 13
## 20
## 21
## 23
## 24
```

```
## 25
## 28
## 29
## 30
## 31
## 34
## 35
## 36
## 39                                    (On-ECLS, Blood, Bacteria, Enterobacter cloacae), (On-ECLS, 
## 40
## 42
## 43
## 44
## 46
## 47
## 48
## 49
## 50
## 52
## 53
## 54
## 55
## 57
## 59
## 61
## 64
## 66
## 69
## 71
## 72
## 74
## 75                                                          (Pre-ECLS, Urine, Bacteria, En
## 76
## 77
## 79
## 82
## 83
## 84
## 85                                 (Pre-ECLS, Respiratory Tract, Bacteria, Serratia mars
## 86
## 88
## 89
## 91
## 92
## 93
## 95
## 96
## 97
## 98
## 100
## 102
## 103
## 104
## 105
```

```
## 106
## 107
## 108
## 109
## 111
## 112
## 113
## 116                                        (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Ba
## 117
## 121
## 122
## 123
## 124
## 126
## 127
## 128
## 129
## 134
## 135
## 136
## 137
## 139
## 140
## 141
## 142
## 144
## 145
## 148
## 149
## 151
## 152
## 156
## 157                                                                  (On-ECLS, Respiratory tract, Fungu
## 158
## 159
## 160
## 162
## 164
## 165
## 166
## 168
## 169
## 171
## 172
## 174
## 176 (On-ECLS, Respiratory Tract, Fungus, Candida Albicans), (On-ECLS, Respiratory Tract, Bacteria, C
## 177
## 178
## 179
## 183
## 184
## 185
## 188
## 189
```

```
## 193
## 194
## 195
## 199
## 200
## 201
## 202                                                                     (On-ECLS, Respiratory tract, Fungus
## 204
## 206
## 207
## 209
## 210
## 214
## 216
## 217
## 220
## 223
## 226
## 229
## 230
## 231
## 234
## 235
## 236
## 237
## 238
## 239
## 240                                                                         (Pre-ECLS, Urine, Bacteria, Ent
## 242
## 244
## 245
## 246
## 247
## 249
## 250
## 251
## 252
## 253                                         (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Bac
## 254
## 255
## 256                                         (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Bac
## 257
## 259
## 260
## 261
## 262
## 263
## 264
## 265
## 268
## 269
## 270
## 271                                         (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Bac
## 272
```

```
## 273
## 274
## 275
## 276
## 277
## 278
## 279
## 280
## 282
## 286
## 287
## 289
## 290
## 293
## 294
## 296
## 297
## 298
## 299
## 300
## 301
## 302
## 303
## 305
## 308
## 314
## 315
## 316
## 319
## 320
## 323
## 324
## 326
## 328
## 330
## 332
## 333
## 334
## 336
## 337
## 342
## 344
## 345
## 346
## 347
## 348
## 350
## 352
## 353
## 355
## 357
## 359
## 361
## 363
```

```
## 364
## 365
## 368
## 369
## 372
## 374
## 375
## 376
## 378
## 379
## 380
## 381
## 382
## 383
## 384
## 385
## 386
## 387
## 389
## 391
## 393
## 397
## 398
## 399
## 400
## 403
## 404
## 406
## 407
## 408
## 409
## 411
## 414
## 416
## 417
## 418
## 419
## 422
## 423
##     support_type transfer covid pregnant year days_to_discharge admission_date
## 1        Cardiac    FALSE FALSE       NA 2021                70     2021-08-26
## 2           <NA>    FALSE  TRUE       NA 2018                 7     2020-10-17
## 3      Pulmonary    FALSE FALSE       NA 2018                NA     2021-12-25
## 4           <NA>    FALSE FALSE       NA 2020                NA     2020-01-29
## 5           <NA>    FALSE FALSE     TRUE 2022                NA     2021-07-02
## 6           <NA>    FALSE  TRUE       NA 2020                NA     2021-06-18
## 7           <NA>    FALSE  TRUE       NA 2020                NA     2020-05-10
## 8           <NA>    FALSE FALSE       NA 2019                 6     2021-09-13
## 9        Cardiac    FALSE FALSE       NA 2020                18     2021-07-08
## 10          <NA>    FALSE  TRUE       NA 2018                NA     2021-11-03
## 11          <NA>    FALSE FALSE       NA 2019                38     2021-06-01
## 12       Cardiac    FALSE FALSE       NA 2018                NA     2021-05-15
## 13          <NA>    FALSE FALSE       NA 2018                10     2021-12-30
## 20     Pulmonary    FALSE FALSE       NA 2020                36     2020-02-19
```

```
## 21       Cardiac    FALSE FALSE       NA 2019                7     2021-07-11
## 23       Cardiac    FALSE FALSE       NA 2020               66     2020-05-15
## 24          <NA>    FALSE FALSE       NA 2021               NA     2020-02-12
## 25          <NA>    FALSE FALSE       NA 2019               NA     2021-11-01
## 28          <NA>    FALSE FALSE       NA 2020               NA     2021-01-08
## 29          <NA>    FALSE FALSE       NA 2018              101     2020-10-05
## 30       Cardiac    FALSE  TRUE       NA 2019               NA     2020-07-16
## 31          ECPR    FALSE FALSE       NA 2018               12     2020-05-08
## 34          ECPR    FALSE  TRUE       NA 2019               71     2020-11-03
## 35          <NA>    FALSE FALSE       NA 2022                9     2020-06-09
## 36          <NA>    FALSE  TRUE       NA 2019               66     2020-11-23
## 39     Pulmonary    FALSE FALSE       NA 2021               27     2020-04-14
## 40       Cardiac    FALSE FALSE       NA 2021               14     2021-10-25
## 42          <NA>    FALSE FALSE       NA 2018               48     2020-08-23
## 43       Cardiac    FALSE FALSE       NA 2019               75     2020-12-17
## 44          <NA>    FALSE  TRUE       NA 2018              107     2021-08-11
## 46          ECPR    FALSE FALSE       NA 2020               19     2020-07-03
## 47          ECPR    FALSE FALSE       NA 2019               38     2021-04-08
## 48          <NA>    FALSE FALSE       NA 2019                9     2020-02-06
## 49          <NA>    FALSE FALSE       NA 2021               NA     2020-09-19
## 50     Pulmonary    FALSE FALSE       NA 2019               NA     2020-03-21
## 52          <NA>    FALSE  TRUE       NA 2021               45     2020-03-20
## 53          <NA>    FALSE    NA       NA 2020              107     2020-09-06
## 54          <NA>    FALSE FALSE       NA 2020               NA     2021-12-23
## 55          <NA>    FALSE FALSE       NA 2020               21     2020-08-28
## 57          <NA>    FALSE  TRUE       NA 2021               69     2020-02-17
## 59     Pulmonary    FALSE  TRUE       NA 2020               17     2021-07-30
## 61          <NA>    FALSE  TRUE       NA 2021               NA     2020-10-10
## 64          <NA>    FALSE  TRUE       NA 2021               26     2021-10-07
## 66     Pulmonary    FALSE FALSE       NA 2019                8     2020-12-29
## 69          <NA>    FALSE  TRUE       NA 2019               11     2021-06-29
## 71     Pulmonary    FALSE FALSE       NA 2019               NA     2020-03-14
## 72          <NA>    FALSE FALSE       NA 2020               54     2021-07-22
## 74          <NA>    FALSE FALSE       NA 2020               18     2020-07-29
## 75          <NA>    FALSE FALSE       NA 2022                1     2021-12-16
## 76     Pulmonary    FALSE FALSE       NA 2020               11     2020-04-10
## 77       Cardiac    FALSE FALSE       NA 2018               15     2021-12-27
## 79     Pulmonary    FALSE  TRUE       NA 2020               19     2020-07-25
## 82          <NA>    FALSE FALSE       NA 2021               19     2021-08-04
## 83       Cardiac    FALSE FALSE       NA 2019               23     2020-11-24
## 84          <NA>    FALSE FALSE       NA 2019               46     2021-07-20
## 85       Cardiac    FALSE FALSE       NA 2020               37     2021-10-08
## 86          <NA>    FALSE FALSE       NA 2019               17     2021-11-19
## 88          <NA>    FALSE FALSE       NA 2021               41     2020-04-28
## 89       Cardiac    FALSE FALSE       NA 2017                8     2020-09-12
## 91     Pulmonary    FALSE FALSE       NA 2022               12     2020-08-15
## 92       Cardiac    FALSE FALSE       NA 2021               NA     2021-06-15
## 93          <NA>    FALSE  TRUE       NA 2021               43     2021-12-21
## 95          <NA>    FALSE FALSE       NA 2021               NA     2021-07-27
## 96          <NA>    FALSE  TRUE       NA 2019               NA     2020-03-09
## 97       Cardiac    FALSE FALSE       NA 2021               53     2020-09-20
## 98          <NA>    FALSE FALSE       NA 2021               13     2021-04-14
## 100         <NA>    FALSE FALSE       NA 2018               71     2020-06-10
## 102         <NA>    FALSE FALSE       NA 2020                8     2020-02-04
```

```
## 103         <NA>    FALSE FALSE       NA 2021               NA     2020-05-25
## 104         <NA>    FALSE FALSE       NA 2020               NA     2020-01-11
## 105         <NA>    FALSE FALSE       NA 2020               NA     2020-07-22
## 106      Cardiac    FALSE  TRUE       NA 2019               58     2021-02-08
## 107         <NA>    FALSE FALSE       NA 2019               NA     2020-02-11
## 108         <NA>    FALSE FALSE       NA 2019               48     2021-07-13
## 109         <NA>    FALSE FALSE       NA 2018               35     2020-03-07
## 111         <NA>    FALSE  TRUE       NA 2022               58     2020-08-18
## 112         <NA>    FALSE FALSE       NA 2018               10     2020-04-09
## 113         <NA>    FALSE FALSE       NA 2020               NA     2020-02-22
## 116         <NA>    FALSE FALSE       NA 2018               11     2020-03-16
## 117         <NA>    FALSE FALSE       NA 2022               15     2021-07-10
## 121         ECPR    FALSE FALSE       NA 2019               NA     2021-03-17
## 122         <NA>    FALSE FALSE       NA 2018               11     2020-11-19
## 123         ECPR     TRUE FALSE       NA 2018               83     2020-01-13
## 124         <NA>    FALSE FALSE       NA 2020               NA     2020-05-02
## 126      Cardiac    FALSE  TRUE       NA 2018                3     2020-12-12
## 127         <NA>    FALSE FALSE       NA 2022                8     2020-12-31
## 128         <NA>    FALSE FALSE       NA 2021               55     2021-08-07
## 129         <NA>    FALSE FALSE       NA 2018               32     2021-11-09
## 134    Pulmonary    FALSE FALSE       NA 2021               26     2020-08-21
## 135         <NA>    FALSE  TRUE       NA 2019               NA     2020-08-14
## 136         <NA>    FALSE  TRUE       NA 2021               35     2021-07-09
## 137         ECPR    FALSE  TRUE       NA 2018                0     2021-05-19
## 139         <NA>    FALSE FALSE       NA 2020               NA     2021-05-04
## 140    Pulmonary    FALSE FALSE       NA 2021                2     2020-04-30
## 141    Pulmonary    FALSE FALSE       NA 2021               14     2020-03-18
## 142         ECPR    FALSE FALSE       NA 2021               58     2021-10-23
## 144    Pulmonary    FALSE FALSE       NA 2019               13     2021-03-03
## 145         <NA>    FALSE  TRUE       NA 2019                2     2021-02-03
## 148         <NA>    FALSE FALSE       NA 2017               NA     2021-06-17
## 149         <NA>    FALSE FALSE       NA 2020               54     2021-05-10
## 151         <NA>    FALSE  TRUE       NA 2021               88     2021-11-20
## 152         ECPR    FALSE FALSE       NA 2018               NA     2021-11-22
## 156         ECPR    FALSE FALSE       NA 2020               45     2020-11-20
## 157         <NA>    FALSE FALSE       NA 2020               NA     2021-06-16
## 158         <NA>    FALSE FALSE       NA 2018               44     2021-08-03
## 159         <NA>    FALSE FALSE       NA 2018                3     2020-09-11
## 160    Pulmonary    FALSE  TRUE       NA 2019               NA     2021-03-26
## 162         <NA>    FALSE FALSE     TRUE 2020               NA     2021-05-02
## 164         <NA>    FALSE  TRUE       NA 2019               12     2020-02-08
## 165      Cardiac    FALSE FALSE       NA 2020               11     2021-03-27
## 166         <NA>    FALSE FALSE       NA 2019               11     2021-03-15
## 168         <NA>    FALSE FALSE       NA 2021               12     2021-03-29
## 169      Cardiac    FALSE FALSE       NA 2020               19     2020-10-19
## 171    Pulmonary    FALSE  TRUE       NA 2018               NA     2021-06-09
## 172         <NA>    FALSE FALSE       NA 2018               10     2020-12-09
## 174    Pulmonary    FALSE  TRUE       NA 2019               71     2020-09-10
## 176         <NA>    FALSE  TRUE       NA 2020               24     2021-12-24
## 177         <NA>    FALSE FALSE       NA 2020                8     2020-06-29
## 178         <NA>    FALSE FALSE       NA 2019               69     2020-09-14
## 179         <NA>    FALSE FALSE       NA 2017               58     2020-08-17
## 183         <NA>    FALSE FALSE       NA 2019               NA     2021-06-13
## 184         <NA>    FALSE  TRUE       NA 2019               29     2021-08-09
```

```
## 185        <NA>    FALSE  TRUE       NA 2020              107     2021-03-20
## 188        <NA>    FALSE  TRUE       NA 2019                1     2020-01-05
## 189        <NA>    FALSE FALSE       NA 2020               40     2021-05-07
## 193        <NA>    FALSE FALSE       NA 2018               42     2020-02-14
## 194        <NA>    FALSE FALSE       NA 2020               39     2020-11-18
## 195     Cardiac    FALSE FALSE       NA 2019               NA     2021-02-02
## 199        <NA>    FALSE FALSE       NA 2020               NA     2020-07-24
## 200        ECPR    FALSE FALSE       NA 2019                4     2021-02-15
## 201        <NA>    FALSE FALSE       NA 2018               69     2021-09-05
## 202        <NA>    FALSE FALSE       NA 2020               NA     2021-12-09
## 204        <NA>    FALSE FALSE       NA 2018               NA     2020-08-06
## 206        <NA>    FALSE  TRUE       NA 2020               NA     2020-12-18
## 207        <NA>    FALSE  TRUE       NA 2019               34     2020-09-17
## 209        <NA>    FALSE  TRUE       NA 2017               NA     2021-04-21
## 210        <NA>    FALSE  TRUE       NA 2020                5     2021-03-19
## 214        <NA>    FALSE  TRUE       NA 2020               20     2020-07-14
## 216     Cardiac    FALSE  TRUE       NA 2021                6     2020-12-21
## 217        <NA>    FALSE  TRUE     TRUE 2020                3     2020-05-06
## 220        ECPR    FALSE FALSE       NA 2021               39     2021-07-19
## 223     Cardiac    FALSE FALSE       NA 2019                2     2021-08-30
## 226     Cardiac    FALSE FALSE       NA 2020               NA     2021-11-27
## 229     Cardiac    FALSE FALSE       NA 2020               NA     2020-02-28
## 230     Cardiac    FALSE FALSE       NA 2021                0     2020-06-16
## 231   Pulmonary    FALSE FALSE     TRUE 2020               16     2020-12-22
## 234        <NA>    FALSE  TRUE       NA 2019               12     2021-10-29
## 235        <NA>    FALSE FALSE       NA 2019               40     2021-03-04
## 236        <NA>    FALSE  TRUE       NA 2020               13     2020-09-09
## 237   Pulmonary    FALSE FALSE       NA 2019               33     2020-02-03
## 238        <NA>    FALSE FALSE       NA 2020                7     2020-03-22
## 239        <NA>    FALSE FALSE       NA 2018                9     2021-03-10
## 240        <NA>    FALSE FALSE       NA 2020               NA     2020-07-13
## 242        <NA>    FALSE FALSE       NA 2021                8     2021-06-06
## 244        <NA>    FALSE FALSE       NA 2020                6     2020-04-22
## 245        <NA>    FALSE  TRUE       NA 2018               18     2021-09-15
## 246        <NA>    FALSE FALSE       NA 2020               NA     2021-02-16
## 247   Pulmonary    FALSE  TRUE       NA 2019               34     2021-10-15
## 249        <NA>    FALSE FALSE       NA 2019                1     2021-02-01
## 250     Cardiac    FALSE FALSE       NA 2019                5     2020-09-24
## 251        <NA>    FALSE FALSE       NA 2019               NA     2021-08-25
## 252        <NA>    FALSE FALSE       NA 2020               75     2021-02-28
## 253        <NA>    FALSE  TRUE       NA 2020               NA     2020-03-01
## 254        <NA>    FALSE FALSE       NA 2021                6     2020-01-04
## 255        <NA>    FALSE  TRUE       NA 2020                3     2020-07-06
## 256   Pulmonary    FALSE  TRUE     TRUE 2019                7     2021-09-08
## 257        <NA>    FALSE FALSE       NA 2020               NA     2021-08-01
## 259        <NA>    FALSE FALSE       NA 2018               NA     2021-08-15
## 260     Cardiac    FALSE FALSE       NA 2019               NA     2021-11-05
## 261        <NA>    FALSE FALSE       NA 2021               NA     2020-10-20
## 262     Cardiac    FALSE  TRUE       NA 2019              107     2021-04-23
## 263     Cardiac    FALSE  TRUE       NA 2019                2     2021-02-22
## 264   Pulmonary    FALSE  TRUE       NA 2020               13     2021-09-01
## 265        <NA>    FALSE FALSE       NA 2020               12     2020-03-28
## 268   Pulmonary    FALSE  TRUE       NA 2020                2     2020-04-16
## 269     Cardiac    FALSE  TRUE       NA 2018               NA     2020-07-02
```

```
## 270        <NA>    FALSE  TRUE       NA 2021              16     2021-01-06
## 271        <NA>    FALSE  TRUE       NA 2021              NA     2021-10-19
## 272     Cardiac    FALSE FALSE       NA 2018              20     2020-08-12
## 273        <NA>    FALSE FALSE       NA 2019               1     2020-06-04
## 274     Cardiac    FALSE FALSE       NA 2021              30     2020-02-15
## 275        <NA>    FALSE FALSE       NA 2018              NA     2020-06-06
## 276        <NA>    FALSE  TRUE       NA 2021              75     2020-10-18
## 277        <NA>    FALSE  TRUE       NA 2022              70     2021-11-30
## 278        <NA>    FALSE FALSE       NA 2020               1     2020-06-25
## 279     Cardiac    FALSE  TRUE       NA 2020              38     2020-11-26
## 280        <NA>    FALSE FALSE       NA 2020              15     2021-01-27
## 282   Pulmonary    FALSE FALSE       NA 2020              NA     2021-09-27
## 286        <NA>    FALSE FALSE       NA 2019              NA     2021-10-16
## 287     Cardiac    FALSE FALSE       NA 2018              25     2021-03-23
## 289        <NA>    FALSE FALSE       NA 2018              NA     2020-06-17
## 290        <NA>    FALSE FALSE       NA 2018              14     2020-06-07
## 293        <NA>    FALSE  TRUE       NA 2019              63     2021-03-21
## 294        <NA>    FALSE FALSE       NA 2019              17     2021-06-20
## 296     Cardiac     TRUE FALSE       NA 2018              15     2020-12-01
## 297        <NA>    FALSE  TRUE       NA 2021              86     2021-10-06
## 298        <NA>    FALSE  TRUE       NA 2021              22     2020-06-14
## 299     Cardiac    FALSE FALSE       NA 2020              11     2020-06-15
## 300        <NA>    FALSE FALSE     TRUE 2019               7     2021-12-06
## 301        <NA>     TRUE FALSE       NA 2017              38     2020-06-21
## 302        <NA>    FALSE FALSE       NA 2018              NA     2021-02-21
## 303        <NA>    FALSE  TRUE       NA 2019              39     2021-07-04
## 305        <NA>    FALSE FALSE       NA 2018              NA     2020-01-24
## 308        <NA>    FALSE FALSE       NA 2019              NA     2021-09-20
## 314        <NA>    FALSE FALSE       NA 2020              NA     2021-05-11
## 315   Pulmonary    FALSE  TRUE       NA 2019              NA     2020-11-08
## 316     Cardiac    FALSE FALSE       NA 2019               1     2021-02-27
## 319        <NA>    FALSE FALSE     TRUE 2019              26     2021-07-25
## 320        <NA>    FALSE  TRUE       NA 2020               6     2020-02-21
## 323        <NA>    FALSE FALSE       NA 2019             160     2021-04-11
## 324        <NA>    FALSE  TRUE     TRUE 2020              25     2020-04-24
## 326        <NA>    FALSE  TRUE     TRUE 2020              76     2020-04-07
## 328     Cardiac    FALSE FALSE       NA 2017              69     2021-06-02
## 330        <NA>    FALSE FALSE     TRUE 2021              NA     2020-08-30
## 332        <NA>    FALSE FALSE       NA 2021              NA     2021-03-07
## 333        <NA>    FALSE FALSE       NA 2021              23     2020-10-07
## 334     Cardiac    FALSE FALSE       NA 2019              58     2020-05-04
## 336        <NA>    FALSE FALSE       NA 2019              19     2021-01-24
## 337        <NA>    FALSE FALSE       NA 2019              20     2020-03-13
## 342   Pulmonary    FALSE  TRUE       NA 2019               7     2020-04-27
## 344   Pulmonary    FALSE  TRUE       NA 2019              NA     2021-04-16
## 345        <NA>    FALSE  TRUE       NA 2021              13     2021-04-30
## 346        <NA>    FALSE FALSE       NA 2021              19     2021-10-17
## 347     Cardiac    FALSE FALSE       NA 2020               7     2020-03-26
## 348   Pulmonary     TRUE FALSE       NA 2021              NA     2021-01-02
## 350        <NA>    FALSE  TRUE       NA 2019              15     2020-10-24
## 352        <NA>    FALSE FALSE       NA 2020               7     2020-06-27
## 353        <NA>    FALSE FALSE       NA 2018              33     2020-10-03
## 355        <NA>    FALSE FALSE       NA 2019              15     2021-01-18
## 357        <NA>       NA    NA       NA   NA              NA           <NA>
```

```
## 359         <NA>    FALSE FALSE       NA 2020               NA     2020-06-22
## 361         <NA>    FALSE FALSE       NA 2020                4     2021-04-06
## 363         <NA>       NA    NA       NA   NA               NA           <NA>
## 364         <NA>    FALSE FALSE       NA 2021               NA     2021-07-05
## 365      Cardiac    FALSE  TRUE       NA 2020               11     2021-07-07
## 368         <NA>    FALSE FALSE       NA 2020               NA     2020-08-26
## 369         <NA>    FALSE FALSE       NA 2019               61     2020-05-18
## 372         <NA>    FALSE FALSE       NA 2018               76     2020-11-14
## 374         <NA>    FALSE FALSE       NA 2021               22     2020-05-12
## 375         <NA>    FALSE FALSE       NA 2020               NA     2021-11-26
## 376         <NA>    FALSE FALSE       NA 2020               NA     2021-08-02
## 378         <NA>    FALSE FALSE       NA 2020               NA     2021-11-10
## 379         <NA>    FALSE    NA       NA 2019               NA     2020-09-25
## 380      Cardiac    FALSE FALSE       NA 2018               NA     2021-10-01
## 381         <NA>    FALSE  TRUE       NA 2019               28     2021-08-18
## 382         <NA>     TRUE FALSE       NA 2021               26     2021-05-05
## 383         <NA>    FALSE  TRUE       NA 2019               20     2021-09-07
## 384      Cardiac    FALSE FALSE       NA 2020               50     2020-06-20
## 385      Cardiac    FALSE FALSE       NA 2021               NA     2021-10-24
## 386      Cardiac    FALSE FALSE       NA 2021                6     2020-12-30
## 387         <NA>    FALSE  TRUE       NA 2021               27     2021-01-25
## 389         <NA>    FALSE FALSE       NA 2021                2     2021-03-14
## 391         <NA>    FALSE FALSE       NA 2021                4     2021-06-27
## 393    Pulmonary    FALSE FALSE       NA 2020                6     2020-12-20
## 397    Pulmonary    FALSE FALSE       NA 2018               NA     2020-12-27
## 398         <NA>    FALSE FALSE       NA 2019               23     2020-08-29
## 399    Pulmonary     TRUE FALSE       NA 2021               NA     2020-04-03
## 400         <NA>    FALSE FALSE       NA 2019               NA     2021-08-23
## 403         <NA>    FALSE FALSE       NA 2020               18     2020-02-02
## 404         <NA>    FALSE  TRUE       NA 2018               22     2021-11-18
## 406         <NA>    FALSE  TRUE       NA 2020              103     2020-08-09
## 407    Pulmonary    FALSE  TRUE       NA 2020                3     2021-01-28
## 408         <NA>    FALSE  TRUE       NA 2019               95     2021-01-30
## 409         <NA>    FALSE  TRUE       NA 2018               NA     2021-09-06
## 411         <NA>    FALSE FALSE       NA 2019                7     2021-02-12
## 414         <NA>    FALSE FALSE       NA 2019                1     2021-04-10
## 416         ECPR    FALSE  TRUE     TRUE 2021               42     2021-07-03
## 417    Pulmonary    FALSE FALSE       NA 2019               25     2020-08-16
## 418         <NA>    FALSE FALSE       NA 2018               NA     2021-11-04
## 419      Cardiac    FALSE FALSE       NA 2020               10     2020-06-28
## 422      Cardiac    FALSE  TRUE       NA 2019               27     2020-03-25
## 423      Cardiac    FALSE  TRUE       NA 2017               39     2021-10-21
##     discharge_date death_date
## 1       2021-09-28       <NA>
## 2       2020-11-16       <NA>
## 3       2022-02-03       <NA>
## 4       2020-02-25 2020-02-25
## 5       2021-08-09       <NA>
## 6       2021-07-24       <NA>
## 7       2020-05-31       <NA>
## 8       2021-10-13       <NA>
## 9       2021-08-22       <NA>
## 10      2021-11-11       <NA>
## 11      2021-06-06       <NA>
```

```
## 12      2021-05-20       <NA>
## 13      2022-02-04       <NA>
## 20      2020-03-30 2020-03-30
## 21      2021-08-25       <NA>
## 23      2020-05-30       <NA>
## 24      2020-03-09 2020-03-09
## 25      2021-11-02       <NA>
## 28      2021-01-10       <NA>
## 29      2020-11-18       <NA>
## 30      2020-08-05 2020-08-05
## 31      2020-06-27       <NA>
## 34      2020-11-14       <NA>
## 35      2020-07-13       <NA>
## 36      2020-12-29 2020-12-29
## 39      2020-05-25       <NA>
## 40      2021-12-05       <NA>
## 42      2020-09-21       <NA>
## 43      2020-12-30       <NA>
## 44      2021-08-31       <NA>
## 46      2020-08-10 2020-08-10
## 47      2021-04-11 2021-04-11
## 48      2020-03-16       <NA>
## 49      2020-10-01 2020-10-01
## 50      2020-04-20       <NA>
## 52      2020-03-21 2020-03-21
## 53      2020-10-03       <NA>
## 54      2022-01-13       <NA>
## 55      2020-09-21 2020-09-21
## 57      2020-02-24       <NA>
## 59      2021-08-22       <NA>
## 61      2020-11-06       <NA>
## 64      2021-10-26       <NA>
## 66      2021-01-17       <NA>
## 69      2021-08-08       <NA>
## 71      2020-05-01 2020-05-01
## 72      2021-09-03       <NA>
## 74      2020-09-13 13/09/2020
## 75      2022-01-08       <NA>
## 76      2020-04-13       <NA>
## 77      2021-12-31       <NA>
## 79      2020-07-29 2020-07-29
## 82      2021-08-13       <NA>
## 83      2021-01-03       <NA>
## 84      2021-08-09       <NA>
## 85      2021-10-18       <NA>
## 86      2021-12-24       <NA>
## 88      2020-05-10       <NA>
## 89      2020-09-19       <NA>
## 91      2020-09-24       <NA>
## 92      2021-07-19 2021-07-19
## 93      2022-01-06 2022-01-06
## 95      2021-07-30       <NA>
## 96      2020-03-15       <NA>
## 97      2020-11-02       <NA>
```

```
## 98      2021-05-02 2021-05-02
## 100     2020-07-25       <NA>
## 102     2020-02-18       <NA>
## 103     2020-06-30 2020-06-30
## 104     2020-01-29       <NA>
## 105     2020-08-22 2020-08-22
## 106     2021-03-14       <NA>
## 107     2020-03-05       <NA>
## 108     2021-08-29       <NA>
## 109     2020-03-15       <NA>
## 111     2020-09-20       <NA>
## 112     2020-05-21       <NA>
## 113     2020-03-31       <NA>
## 116     2020-03-23       <NA>
## 117     2021-08-23       <NA>
## 121     2021-03-30       <NA>
## 122     2020-12-16       <NA>
## 123     2020-02-05       <NA>
## 124     2020-05-10 2020-05-10
## 126     2021-01-12 2021-01-12
## 127     2021-01-05       <NA>
## 128     2021-08-11 2021-08-11
## 129     2021-11-28 2021-11-28
## 134     2020-09-11       <NA>
## 135     2020-08-25       <NA>
## 136     2021-08-10 2021-08-10
## 137     2021-06-23       <NA>
## 139     2021-06-19       <NA>
## 140     2020-05-25       <NA>
## 141     2020-05-04 2020-05-04
## 142     2021-11-12       <NA>
## 144     2021-03-14       <NA>
## 145     2021-03-08       <NA>
## 148     2021-07-09       <NA>
## 149     2021-06-04       <NA>
## 151     2021-12-16       <NA>
## 152     2021-12-15 2021-12-15
## 156     2020-12-24       <NA>
## 157     2021-07-17       <NA>
## 158     2021-08-06 2021-08-06
## 159     2020-10-08       <NA>
## 160     2021-04-06       <NA>
## 162     2021-05-17       <NA>
## 164     2020-03-18       <NA>
## 165     2021-04-11 2021-04-11
## 166     2021-03-22       <NA>
## 168     2021-04-06       <NA>
## 169     2020-10-28 2020-10-28
## 171     2021-07-15 2021-07-15
## 172     2021-01-03 2021-01-03
## 174     2020-10-05       <NA>
## 176     2022-01-26       <NA>
## 177     2020-07-07       <NA>
## 178     2020-10-21 2020-10-21
```

```
## 179     2020-08-23       <NA>
## 183     2021-06-18 2021-06-18
## 184     2021-08-27       <NA>
## 185     2021-04-30       <NA>
## 188     2020-01-12       <NA>
## 189     2021-06-17       <NA>
## 193     2020-04-01       <NA>
## 194     2020-12-23       <NA>
## 195     2021-02-13 2021-02-13
## 199     2020-08-16       <NA>
## 200     2021-03-20       <NA>
## 201     2021-09-15       <NA>
## 202     2022-01-27       <NA>
## 204     2020-08-19       <NA>
## 206     2020-12-31       <NA>
## 207     2020-09-18       <NA>
## 209     2021-05-21       <NA>
## 210     2021-03-27       <NA>
## 214     2020-07-30       <NA>
## 216     2021-01-17 2021-01-17
## 217     2020-06-04 2020-06-04
## 220     2021-09-03       <NA>
## 223     2021-09-27 2021-09-27
## 226     2022-01-01       <NA>
## 229     2020-04-09       <NA>
## 230     2020-07-31 2020-07-31
## 231     2021-01-09       <NA>
## 234     2021-11-21       <NA>
## 235     2021-04-16       <NA>
## 236     2020-10-23 2020-10-23
## 237     2020-02-14       <NA>
## 238     2020-04-21       <NA>
## 239     2021-03-15       <NA>
## 240     2020-07-23       <NA>
## 242     2021-06-07       <NA>
## 244     2020-05-08 2020-05-08
## 245     2021-10-21       <NA>
## 246     2021-02-26 2021-02-26
## 247     2021-11-10       <NA>
## 249     2021-02-27 2021-02-27
## 250     2020-10-07       <NA>
## 251     2021-09-27       <NA>
## 252     2021-04-18       <NA>
## 253     2020-04-04 2020-04-04
## 254     2020-02-23       <NA>
## 255     2020-07-24       <NA>
## 256     2021-09-17       <NA>
## 257     2021-08-13       <NA>
## 259     2021-09-15       <NA>
## 260     2021-12-15 2021-12-15
## 261     2020-11-01       <NA>
## 262     2021-05-18       <NA>
## 263     2021-03-11       <NA>
## 264     2021-10-16       <NA>
```

```
## 265     2020-04-06       <NA>
## 268     2020-05-10 2020-05-10
## 269     2020-07-22       <NA>
## 270     2021-02-15       <NA>
## 271     2021-11-18 2021-11-18
## 272     2020-09-07       <NA>
## 273     2020-07-05       <NA>
## 274     2020-02-19 2020-02-19
## 275     2020-06-07 2020-06-07
## 276     2020-11-08       <NA>
## 277     2022-01-02 2022-01-02
## 278     2020-06-30 2020-06-30
## 279     2021-01-10 2021-01-10
## 280     2021-03-11 2021-03-11
## 282     2021-10-20       <NA>
## 286     2021-12-03       <NA>
## 287     2021-05-07       <NA>
## 289     2020-07-31       <NA>
## 290     2020-06-25       <NA>
## 293     2021-05-06       <NA>
## 294     2021-06-28       <NA>
## 296     2020-12-28       <NA>
## 297     2021-11-08       <NA>
## 298     2020-08-01       <NA>
## 299     2020-06-25       <NA>
## 300     2021-12-30       <NA>
## 301     2020-07-20       <NA>
## 302     2021-04-04       <NA>
## 303     2021-07-06       <NA>
## 305     2020-02-28       <NA>
## 308     2021-11-08       <NA>
## 314     2021-06-06       <NA>
## 315     2020-11-11       <NA>
## 316     2021-03-03       <NA>
## 319     2021-07-27       <NA>
## 320     2020-02-26 2020-02-26
## 323     2021-05-16 2021-05-16
## 324     2020-06-07       <NA>
## 326     2020-05-14       <NA>
## 328     2021-06-28 2021-06-28
## 330     2020-09-24 2020-09-24
## 332     2021-04-03       <NA>
## 333     2020-10-17 2020-10-17
## 334     2020-05-16       <NA>
## 336     2021-01-29 2021-01-29
## 337     2020-04-27       <NA>
## 342     2020-04-29 2020-04-29
## 344     2021-04-24 2021-04-24
## 345     2021-05-26       <NA>
## 346     2021-11-01       <NA>
## 347     2020-03-30 2020-03-30
## 348     2021-01-26 2021-01-26
## 350     2020-11-02       <NA>
## 352     2020-07-23 2020-07-23
```

```
## 353     2020-10-06 2020-10-06
## 355     2021-02-13 2021-02-13
## 357           <NA>
## 359     2020-07-29       <NA>
## 361     2021-05-05       <NA>
## 363           <NA>
## 364     2021-07-13       <NA>
## 365     2021-07-23       <NA>
## 368     2020-10-15 2020-10-15
## 369     2020-06-22       <NA>
## 372     2020-12-20       <NA>
## 374     2020-05-25       <NA>
## 375     2021-12-18       <NA>
## 376     2021-08-20       <NA>
## 378     2021-11-18       <NA>
## 379     2020-10-30       <NA>
## 380     2021-10-30       <NA>
## 381     2021-09-25 2021-09-25
## 382     2021-06-18 2021-06-18
## 383     2021-10-07       <NA>
## 384     2020-08-04       <NA>
## 385     2021-10-29       <NA>
## 386     2021-01-07       <NA>
## 387     2021-03-12 2021-03-12
## 389     2021-03-17 2021-03-17
## 391     2021-08-12 2021-08-12
## 393     2021-01-22       <NA>
## 397     2021-02-10       <NA>
## 398     2020-09-14       <NA>
## 399     2020-05-12 2020-05-12
## 400     2021-09-20       <NA>
## 403     2020-03-23       <NA>
## 404     2021-12-07       <NA>
## 406     2020-08-13 2020-08-13
## 407     2021-02-23       <NA>
## 408     2021-02-12       <NA>
## 409     2021-09-08 2021-09-08
## 411     2021-02-17 2021-02-17
## 414     2021-05-09       <NA>
## 416     2021-07-21 2021-07-21
## 417     2020-10-02 2020-10-02
## 418     2021-12-14 2021-12-14
## 419     2020-07-08 2020-07-08
## 422     2020-05-10       <NA>
## 423     2021-11-02 2021-11-02
```

drop duplicate patient_id, use only the first (oldest) visit:

#For synthetic_data, Sort dataframe by patient_id and admission_date:

```
synthetic_data <- synthetic_data[order(synthetic_data$patient_id,synthetic_data$admission_date ),]
```

#Drop duplicates dataframe by patient_id:

```
synthetic_data <- synthetic_data[!duplicated(synthetic_data$patient_id), ]
```

Ensure that columns with numeric variables don't have characters

#Fill empty values with NA:

```
example_lab_data[example_lab_data == ''] <- NA
synthetic_data[synthetic_data == ''] <- NA
example_lab_data[example_lab_data == 'UTC'] <- NA
synthetic_data[synthetic_data == 'UTC'] <- NA
example_lab_data[example_lab_data == 'NDA'] <- NA
synthetic_data[synthetic_data == 'NDA'] <- NA
example_lab_data[example_lab_data == 'N/A'] <- NA
synthetic_data[synthetic_data == 'N/A'] <- NA
```

#find character on numeric columns:

```
synthetic_data[synthetic_data == 'Not Available' ] <- NA
synthetic_data[synthetic_data == 'no info from OSH' ] <- NA
synthetic_data[synthetic_data == 'No data avail' ] <- NA
synthetic_data[synthetic_data == 'Not Measured, pt coded' ] <- NA
synthetic_data[synthetic_data == 'not measured' ] <- NA

synthetic_data$ph <- parse_number(synthetic_data$ph)
```

```
## Warning: 1 parsing failure.
## row col expected actual
## 137  -- a number      N
```

```
synthetic_data
```

```
##     patient_id age    sex     race weight_kg height_cm       bmi
## 357       <NA>  NA   <NA>     <NA>        NA        NA        NA
## 292 09eGkKQQLs  50      F    White      55.7    160.00  39.20000
## 227 0HTVt952AR  43   Male    White      90.8    177.80  25.28000
## 40  0shbw3gvsR  49   Male    White     155.0    177.80  37.51850
## 94  1fA9JingfV  25   Male    Black     101.0    178.00  37.33000
## 96  1P5kPzvd9t  27   Male Hispanic      90.8    185.00  24.94000
## 414 1uksyaSHeL  44 Female    White     105.3    160.00  21.40290
## 192 2llPclNASV  74   Male    White     114.8    195.60  22.80852
## 208 2nb07U2Jjq  57      M    White     101.0    175.30  19.71000
## 33  2qAEFXFqb6  63      M    White     110.0    165.10  39.89000
## 118 2ZXsa2N6Jd  46      F    White      78.9    183.00  28.23000
## 188 3KSfMkioqd  52      M    White     107.0    165.10  36.35000
## 14  3mBGPKDDW1  36      F    Other     109.0    170.00  34.25000
## 250 3NQYqtSjUW  67      F    White     122.0    160.54  28.90000
## 22  3O5IFWM0Ic  37      M    White     115.3    182.90  39.97000
## 366 3pZ2TqnNyn  40      M    White      67.4    188.00  28.38000
## 181 41JVmRtPjM  62      M    White      93.0    162.60  28.72738
## 309 4AAZ92PAwu  59   Male    Other     122.0    172.70  46.20000
## 421 4WtxRYlnFr  33      M    White     122.0    157.00  34.58000
## 216 4Zz1llngXL  37      M    White     122.0    175.30  33.04000
```

```
## 199 5dVrn2ayfY  23      F    White      96.0    180.30  44.74000
## 360 5eklKVY8eb  67      F    Black      96.0    188.00  16.00043
## 65  5G43p1Sef3  30      F    Black     110.0    177.80  42.58000
## 68  5GPrpvezkX  18      M    White      86.9    180.30  25.62000
## 312 5lbmb0qHv8  41   Male    White     102.0    182.30  19.71000
## 101 5mJUoGAF63  41      M    White     125.0    170.20  33.13000
## 285 5mtxXH3jRH  54      F    White     115.0    149.86  53.52000
## 91  5TLquRFvBi  41      F     <NA>        NA    185.00  28.96000
## 46  5u0Xu0Tdc0  41   Male    White      48.5    178.00  41.26000
## 203 5Yyz9ENIDU  41      M    White     138.0    177.80  30.74572
## 424 62TUhJfVNx  65      M    White     118.6    165.10  41.54000
## 99  6FXhotFYnY  59      M    White        NA    172.00  25.51000
## 310 6GFH21TmRM  46 Female    White     119.0    152.40  31.26370
## 412 6GhDk8AVNM  41   Male    White     103.4    180.30  35.31250
## 143 6lqNTiCBkx  48      F    White      58.3    182.90  33.94000
## 311 6oRe3fwXqu  39   Male    White      81.9    152.00  33.95201
## 175 76nhLlQkv2  45   Male    White      98.4    183.00  33.95201
## 379 7kQUZ43oC8  53   Male    White      90.7        NA  24.68372
## 170 7kyadngjaW  59      F Hispanic     115.3    180.30  22.30000
## 377 7ouuSHr6gZ  40      M    Other     138.0    170.20  30.72000
## 342 7TZZyY0yMi  50   Male    White      96.4    150.00  26.57000
## 159 7VN31dBvdO  29      F    White      95.3    152.00        NA
## 335 8B9lw2QlBK  63      M    White      97.8    160.00  36.00000
## 265 8NReDzROyU  56      M    White      97.5    154.90  31.01507
## 349 8X6ukclcYx  42      M    White     138.0    180.00  33.95201
## 291 9eYaDYosSZ  61      F    White      85.4    193.00  31.47755
## 415 9L2XCccHyS  46 Female    White     150.0    157.00  27.60000
## 7   9RJXcM3JN2  23      M    White     104.8    154.90  28.75295
## 217 9wMC9Rqblr  77   Male    White      58.0    175.30  24.63531
## 197 a5oybzT4hg  45      M    White      85.6    175.30  28.70000
## 121 A85a96UqL3  30   Male    White     124.0    170.20  26.01000
## 241 AcBGmRWasV  54      F    White     104.2    156.00  25.50000
## 240 aCmgyoBDAU  61      M    White      99.9    182.90  23.20312
## 322 ahyMwvXeTc  81   Male    White      46.0    154.90  26.60000
## 109 AQXGYHxdC0  59      M    White      72.0    177.80  50.58000
## 116 ar1fphuqKw  30   Male Hispanic      79.7    177.80  27.02979
## 214 argAUZmnvn  40      M    Other      65.0    177.80  52.64000
## 313 ATxZLWCuMl  46      F    White      96.1    188.00  31.00000
## 190 aWyCq5N29m  22 Female    White     200.6    168.00  30.75000
## 371 axPHpa6Utq  51      M Hispanic      99.9    185.00  31.38000
## 337 bGRYJRCGmT  53      F    White      79.7    170.20  33.82641
## 29  bpjYMzIhem  30 Female    White      88.7    177.80  36.78670
## 37  bUVJGLenVs  67      F    White     109.6    172.00  34.32992
## 346 C2DRgzRqj7  61   Male    White      92.8    172.70  24.82459
## 339 CaLjSyXZmA  77      M    White     160.0    165.10  32.41000
## 229 cCnBeL4FBu  67   Male    White     107.0    189.00  23.84620
## 395 cdLZYtILc9  40      F Hispanic     103.0    160.00  37.20000
## 16  cePCOQrw8s  26   <NA>    White      71.7    147.30  18.79425
## 114 ch5bQDOkFI  14      M    White      97.8    175.30  25.41000
## 58  clCgxK8oYw  24      M    Other      90.8    152.40  37.97000
## 135 CUkgYtax4B  59 Female    White      84.0    177.80  43.51834
## 196 cvP8nUYmD5  44   Male    White     111.9    177.80  26.55000
## 30  Cwy6w4MuKf  63      M    White      60.0    159.00  32.11000
## 50  CxsoWMlPJ7  53   Male    White      66.2    188.00  33.55795
```

```
## 356 CZV4Am96WI  65      M    White      69.7    161.90  22.79000
## 193 d1KObvMArw  22   Male    White     136.0    182.90  53.52000
## 134 d5YupdnG8g  39      M    White     101.0    167.60  27.60000
## 173 D76F1NdzPh  34      M    Black      60.7    196.00  27.08995
## 112 DjjRrZGNhd  35   Male    White     155.0    185.00  36.02736
## 48  ds8kizHdyF  55      M    White     126.1    170.20  42.14943
## 289 dt1qZYVvWv  44      M    White     107.0    170.20  56.78000
## 51  dTTfpgOYcA  23      M    White      98.4    177.80  28.34000
## 215 E19tSTGK2g  48   Male    White     198.0    170.20  30.60000
## 270 e2XxEm3acg  67      M    White     101.0    170.20  22.48000
## 374 EePz5z5OfK  62      F Hispanic      96.0    172.70  21.81000
## 244 EgO9gedBMk  69      M    White     113.7        NA  34.81000
## 387 ekDtKmOTAg  55 Female    White      78.2    131.30  18.53688
## 222 ENTDqRsfvq  35   Male    Black      72.0    177.80  35.80000
## 90  ePV7YZsSGh  48      M    White     144.0    182.90  32.28650
## 406 erG5SEIJWp  40   Male    White     114.0    167.00  35.19692
## 420 esqwneZenZ  42      F    White     110.0    160.00  26.84000
## 368 eTIP4hpddm  30      F    Black     110.9    180.30  40.13841
## 179 EtsodwhqNO  73      M    White     109.0    182.90  28.47001
## 280 eWV175w6O4  57      F    White     123.0    185.40  22.48000
## 284 f0yv9tOlOC  47      F    Black      69.3    160.00  20.90000
## 373 f9AMZUlNJL  61   Male    White     141.0    168.00  29.30000
## 306 F9kweE4QrM  79      M     <NA>     141.0    157.00  34.73591
## 183 fbbgoc1RTa  65      M    White      65.0    157.00  32.98000
## 62  feAVr7Hlrv  53      M    White      87.5    157.50  53.52000
## 131 FG7WUotlDJ  19      F    White      40.0    190.00  21.40851
## 224 fkvZOztOQL  28   <NA>     <NA>      79.4    172.70  31.77000
## 4   FlV8vFIekH  45      M    White      61.0    152.40  21.75507
## 39  fxfMuneuZ4  52   Male    White     149.2    162.60  33.96000
## 327 fzGmCWwgYZ  36      F    White     104.5    175.30  26.60000
## 138 G0kUJJkRSU  65      F    White      84.2    175.30  26.63000
## 15  G5zjyy1NHl  35   Male    White     125.2    167.00  24.20000
## 279 ghGLxbqUot  29 Female     <NA>     136.9    170.20  32.29000
## 341 gHwXGHYluU  50   Male    White      90.8    167.00  26.90644
## 266 gIUeePx8E3  NA   Male    White     113.0    177.80  48.44000
## 273 gJ2ERPGGQc  62   Male    White      59.4    172.70  50.58000
## 24  GMM5IIMsks  53      M    White      87.8    180.30  44.25000
## 405 GOO9ECYMCi  52      M    White      96.9    185.40  24.47165
## 113 GRgi1BcRFF  78   Male    White     106.0    165.10  29.70341
## 6   gvQFBONZVL  60   Male    White     190.5    177.80  42.86250
## 88  GW3gmyWKj7  40      F    White      68.4    182.30  21.53000
## 71  h0AW4YaVS6  56      F    White     161.0    182.90  43.61000
## 298 HDHj5t6h8Q  31      M    White      99.2    183.00  34.76000
## 340 hPe6cM9zyo  48 Female    Black      64.7    180.30  24.82459
## 19  hQly7wVB6P  57 Female    White      58.7        NA  40.84000
## 127 I4zTRqpHco  73      F    White      76.3    180.00  35.18232
## 367 I9ioR5P3Fm  49 Female    White     110.0    175.30  21.24000
## 20  IcjCW6rMOW  65      M    Other      91.4    173.00  22.68000
## 120 iM1W2qB6nx  29      F    White     106.0    168.00  29.45337
## 331 IpAgw7Fonc  59      M    White      74.8    163.00  29.90000
## 303 IqbiKaQrSQ  39      M    White      98.5    182.90  31.67000
## 140 IqkI11WYK7  31 Female    White     104.5    189.00  26.84000
## 80  irBybe9T47  87      F    White     106.0    170.20  33.95201
## 238 isLH4ZYjDV  65      M    White     154.7    175.30  36.56337
```

```
## 253 IwoGIkuRxW  40      F    Black     110.0    172.70  38.19000
## 133 iwp8UUS8du  53      M    White      98.9    167.60  44.74000
## 388 jcZ9OrMPOD  45   Male    White        NA    185.40  36.02736
## 38  jdVKTQaIPT  31   Male    White     112.1    177.80  21.53000
## 274 JibNJxmh9o  59   Male    Black     123.0    182.90  32.04000
## 321 jkZdcBdnd2  25   Male    White      67.5    170.20  35.01000
## 154 JuneBiGLRI  65      F    White      76.3    156.70  33.13000
## 79  KfxOQl5OT8  55      M    White      79.8    162.60  41.16000
## 390 kKxSSHlZXd  35      M    White     111.6    180.30  31.00000
## 104 KL9bwQLGY3  64      M    White     127.3    162.60  15.54000
## 218 KLSBVjhEPV  40   Male    White     117.0    176.00  31.77000
## 211 KmzCovpqvj  81      F    White      70.3    154.90  29.44000
## 318 KMztMzeZnq  54 Female    White        NA    185.00  39.79000
## 167 krAuOxufmO  78      M    White     120.0    170.00  46.20000
## 52  l0dDAKKGyk  67      M    White      79.0    172.70  36.00000
## 119 L4Ez4yJnC3  44      F    White     132.0    188.00  52.64000
## 76  LBRVzQu5w9  40   Male    White      86.0    157.50        NA
## 115 LDrhnkYqRh  49      M    White      96.0    182.30  33.11000
## 394 lflTgnORgy  27   Male    White     112.0    175.30  33.24000
## 164 lgwsTbQ9bX  46      F    White      72.0    180.00  22.48000
## 110 LHlSeS6iJe  22   Male    White      90.5    157.50  31.00000
## 81  lnbgczEuk6  45   Male    White     141.0    150.00  57.25000
## 413 LQ95Zjbttz  40      F    White      69.2    177.80  22.68000
## 370 maAIIZT5cK  60 Female    White      99.4    177.80  41.33000
## 272 mcVVfHOKEn  47      F    White     105.0    185.40  46.87297
## 182 NAr7sQBANj  65      M    White      69.4    165.10  29.42508
## 31  nDyAOtpdsa  71   Male    White        NA    182.90  37.68000
## 17  NJWGmEdBvk  57      M    Other      72.0    180.30  37.47000
## 78  NmcBGj7Rf0  45      M    White     103.0    172.70  35.99104
## 410 nNOkW9deWT  39   Male    White     140.0    180.30  31.44437
## 161 NOA8aC1S9d  40      F    White      79.0    180.30  22.80852
## 254 nY6IQYyUNJ  30      F    White     110.0    160.54  48.44000
## 100 oa74Ed9Ogm  61 Female    White      79.7    177.80  25.41000
## 87  oGQkr8IPAi  47   Male    White      79.0    162.50  26.90644
## 155 OGY8WsxqAd  29   Male Hispanic      82.4    167.00  18.79425
## 60  OnyNJW3DE6  54      F    White      79.7    167.60  34.25000
## 63  OoNNGRSXf6  32   Male    Black     132.0    168.90  31.99000
## 153 OSI63TKEAK  81   Male    White     116.0    157.00  21.40290
## 102 owdrTVqd26  53      M    White      95.7    162.60  53.20000
## 359 OwwryljbEQ  44   Male    White     193.7    177.00  34.22041
## 307 p0sjiHw6uc  28      M    White     135.7    162.60  28.47001
## 126 p3uCdY5XSk  52      M    White      74.8    180.30  25.51000
## 304 PBg8B1Rhsi  63      M    White      73.0    180.00  26.90644
## 186 PFVvnpzUj1  63   Male    White      51.3    170.00  27.59013
## 66  pL7cjkuchS  60 Female    White     126.1    165.10  23.71094
## 296 PlSf6mx953  52      M    White      85.7    162.60  26.08525
## 103 pNzvrqNfXv  62      M    White     106.0    175.30  33.44000
## 163 PsoF9yzccf  76      M    White      59.4    160.00  48.48000
## 281 pwwBLaBRys  20      F    White      76.5    170.20  28.47001
## 212 Q5kLek4x6d  75      F    White      81.7    180.30  43.27000
## 123 q6danf6ZhC  57      F    White      91.7    170.20  21.53000
## 422 qapZgo14KS  67      M    Black     132.0    175.30  27.04000
## 172 qBAgaxacbM  57      M    White      58.7    131.30  36.50000
## 56  qcsBOie7Ye  49   Male Hispanic      86.9    172.00  20.90000
```

```
## 205 QZ8bbgDR1F  29 Female    White     146.7    188.00  24.55510
## 351 r8TuDLDLOT  33      M Hispanic     120.0    165.10  36.12000
## 325 rBFQvEvA6n  59      F    White     124.4    177.80  24.39600
## 150 RcNvBXXLro  59 Female    White     131.0    170.00 347.88167
## 111 RLIZJgcVd8  64      M    White      69.4    180.00  32.03000
## 107 rPjBoa86kB  56   Male    White      64.5    170.20  27.65000
## 194 RPKFkP3mF7  59      M    White     118.6    184.00  45.75000
## 343 Rr92Ghb3JV  55      M    White      63.8    182.90  22.12963
## 301 RUJwtKyHR6  17      M    White     115.3    162.60  38.71000
## 73  S3wn1QyzPR  40      F    White     107.9    162.60  25.19000
## 141 S65F25Nb7v  57      M    Black      62.0    182.60  21.70000
## 213 sdezrCNI9N  63      M Hispanic     122.0    188.00  29.22000
## 419 sdfifHRB6T  59      F    White     159.2    162.90  32.06000
## 57  SHVAA5chqV  67   Male    White     103.0    173.50  37.67000
## 237 sMJ8f6IKAW  65      M    White     110.0    175.30  42.21000
## 2   sT8IH3ZooD  56      M    White     104.0    172.00  25.62000
## 221 Svsjxue25F  57      M    White      84.1    198.10  27.52000
## 180 swEuLBRzZt  68      M    White     101.5    165.10  31.77671
## 105 SzCWauSPpe  52      M    White     112.4    177.80  26.84000
## 41  T3W1ZMT5J1  40      M    White     110.0    185.00  36.78670
## 403 TeelI019by  18      M    White      82.0    188.00  31.59750
## 187 tjDd3ibIMV  55      M    White      79.8    175.00  29.96000
## 132 TliygaYgAf  56      M    Other     101.6    193.00  30.05286
## 137 TqQ4YnODN5  23   Male    Black      85.7    188.00  28.52043
## 45  TwcCgEsgee  57 Female    White      76.8    162.00  33.53012
## 369 TXgFTizXwY  39   <NA>    Black      75.2    185.40  27.70000
## 23  U5z4u340s9  28      F    White     104.0    160.00  37.33000
## 320 u8FjkVujGh  29 Female    White      88.4    198.10  53.20000
## 329 U8qTwGIXza  27      F    White     110.9    185.00  27.60000
## 171 uD0NxQpQ5F  67      M    White      68.0    190.50  36.49000
## 191 ug7L5EgQ8i  60      F Hispanic      79.0    175.00  21.78000
## 283 uJh48i14lp  30   Male    White      74.4    170.20  24.55510
## 411 uQKbY0aHUh  25   Male    White     100.0    182.90  37.51850
## 294 usAagb3Ys8  63      F    White      64.7    177.80  42.58000
## 267 UtfCc9UaEM  67      M    White     107.9    170.20  32.06000
## 317 uxKCjHTfLv  64 Female    White     127.3    175.00  23.71094
## 392 uxtNRaXsa1  36   Male    Black      82.5    160.00  24.82459
## 347 v9PAyt2zS6  14   Male    White     124.0    182.90  38.59000
## 316 vlb0gzZhmX  81      M    White      50.2    170.20  43.27000
## 258 vLGvYHMIN8  50      M    White     105.0    167.60  29.32000
## 324 vSewHcBXnT  61      F    White     132.0    188.00  25.51000
## 12  VVxY2ojz0G  23   Male    White     122.0    188.00  36.49000
## 290 W07O9mDWf5  27   Male    Black     140.0    180.00  19.57000
## 42  w1d5gKl9AF  72      F    White     145.0    175.30  50.58000
## 338 w6Peq50ZP0  31      M    White     122.2    172.70  33.95062
## 225 W9IYIAle7a  29 Female    White      85.0    175.30  30.30000
## 269 wExoR3npUK  53      M    White      81.7    157.50  25.51000
## 198 wftV2Qbvcb  47      F    Black      97.7    177.80  32.29000
## 35  wfzftPR62C  59      F Hispanic      70.1    147.30  31.59750
## 358 wGgofnmuro  49      M    White     150.0    185.40  22.25945
## 275 WpXIJg30L2  27      M    White     114.8    172.70  31.88000
## 67  x09FN6h0qT  33      M    Black     111.2    158.00  51.80590
## 401 x6t4C3jccS  29 Female    White      87.8    158.00  24.30000
## 402 X9F8aKOJ1G  41      F    White      90.7    175.30  32.85000
```

```
## 5   XHODUqel1R  54      F    White        NA    170.00  26.01070
## 243 xH3pHj8yGl  41      M    Black     128.0    188.00  23.11000
## 255 XjRrih0zHr  56      M    White      94.1    184.00  26.01000
## 27  Xl5d5UcCYD  23      M    White      87.9    162.00  34.25000
## 231 XLquXLGSRi  64      M    White     107.0    162.60  32.72000
## 354 xMrYeOf7uG  22      M    White     107.8    188.00  28.32000
## 130 xMw0NWlcYS  59      M    White      77.0    167.60  39.36000
## 399 xPNg98Rj2c  49      F    White      58.3    175.00  26.11877
## 98  xxah5hoZVX  46   Male    Black      96.4    177.80        NA
## 233 y6790Htf4g  44      M    White     109.0    157.50  30.12000
## 146 y85GhLhQvu  48 Female    White      99.2    188.00  28.23000
## 18  YBjy0MIrGw  22      F    White     163.0    182.90  68.95751
## 295 Yd22y1lT2U  56      F    White     198.0    170.20  41.66000
## 228 yDWpxdI3XG  35   Male    White      85.0    188.00  39.20000
## 70  YhxGHvKVSR  29   Male    White     103.0    171.50  31.77671
## 26  YOPSkNhVT1  27      M    White     100.0    152.00  28.47656
## 350 ysIXFTGIsU  83      M    White      65.0    160.00  37.17000
## 382 Yx4YroY44a  39      M    Black      94.7    172.70        NA
## 362 zAcDJH255Z  57      F    White     112.4    188.00  39.20000
## 232 zbFUKiRnqH  60      F    White     198.0    188.00  32.90000
## 396 zDfCEn0BQv  60      F    White     153.0    185.40  26.89000
## 219 zEn8gO76bg  80 Female    Black      79.0    190.50  45.75000
## 125 ZQ3OPJdeIu  47 Female    White      69.4    170.00  27.08995
## 288 ZQCekg01zT  74   Male    White      77.9    179.60  39.79000
## 32  zRlHFeTD3y  29   Male    White      97.6    156.70  29.44000
## 334 zsEXlQoxFm  49      F    White     122.0    183.00  41.54000
## 248 zTOOGWyh7s  29   Male    White      74.0    162.60  21.05025
## 147 ZVLZlCpyfh  62      F    White      95.7    165.10  34.69136
##                        diagnosis reintubation trached    ph   co2    o2
## 357                        <NA>           NA      NA    NA    NA    NA
## 292                       Other        FALSE   FALSE 7.200  38.0 118.0
## 227    Cardiovascular condition        FALSE   FALSE    NA    NA  19.0
## 40  Other respiratory infection         TRUE      NA 7.390  30.0 116.0
## 94     Cardiovascular condition        FALSE    TRUE 7.460  41.5  71.0
## 96  Other respiratory condition        FALSE    TRUE 7.080  41.0    NA
## 414 Other respiratory condition           NA   FALSE 7.030  53.0  45.8
## 192                    COVID-19           NA   FALSE    NA    NA  54.0
## 208                    COVID-19           NA   FALSE 7.380  35.3 360.0
## 33  Other respiratory condition        FALSE   FALSE    NA  53.0  63.0
## 118                        <NA>        FALSE    TRUE    NA  59.5  46.0
## 188 Other respiratory condition        FALSE    TRUE    NA  81.0 330.4
## 14  Other respiratory condition           NA   FALSE 7.110  44.3  70.0
## 250                    COVID-19           NA   FALSE 7.110  86.0  87.0
## 22  Other respiratory condition        FALSE    TRUE 7.040    NA 317.0
## 366    Cardiovascular condition           NA   FALSE 7.360  20.8  73.0
## 181    Cardiovascular condition        FALSE   FALSE 7.440  56.0 266.0
## 309 Other respiratory condition        FALSE    TRUE 7.170  59.0  79.0
## 421                    COVID-19        FALSE      NA    NA    NA  42.0
## 216    Cardiovascular condition           NA    TRUE 7.380  63.0 221.0
## 199                    COVID-19        FALSE    TRUE 7.490  49.0  83.0
## 360 Other respiratory condition        FALSE   FALSE 7.480  34.0 112.9
## 65  Other respiratory infection           NA   FALSE 7.400    NA  42.0
## 68                         <NA>         TRUE    TRUE 7.450    NA    NA
## 312 Other respiratory infection        FALSE    TRUE 7.270  72.8  60.0
```

```
## 101                    COVID-19        TRUE   FALSE 7.400    NA  91.3
## 285                    COVID-19          NA    TRUE 6.780    NA  49.0
## 91                     COVID-19       FALSE   FALSE 7.330  56.0  46.0
## 46                     COVID-19          NA   FALSE 7.140  38.0 208.0
## 203                    COVID-19       FALSE    TRUE 7.400  37.0    NA
## 424    Cardiovascular condition       FALSE    TRUE 7.190  68.0  73.0
## 99                     COVID-19       FALSE   FALSE 7.230  59.0  38.0
## 310 Other respiratory infection       FALSE   FALSE 7.340    NA    NA
## 412    Cardiovascular condition       FALSE    TRUE    NA  48.0  58.0
## 143    Cardiovascular condition        TRUE      NA 7.290  73.9    NA
## 311                        <NA>       FALSE      NA    NA  58.0  47.0
## 175 Other respiratory condition          NA   FALSE 7.120  48.0  82.0
## 379    Cardiovascular condition       FALSE   FALSE 7.350  57.0 221.0
## 170    Cardiovascular condition        TRUE   FALSE 7.400  89.1  53.8
## 377    Cardiovascular condition       FALSE    TRUE 7.320  38.4  74.8
## 342                        Other          NA   FALSE 7.230  39.4    NA
## 159    Cardiovascular condition       FALSE    TRUE    NA  45.0  80.0
## 335    Cardiovascular condition       FALSE   FALSE 7.250  39.0 118.9
## 265 Other respiratory condition          NA    TRUE 7.150  56.0  69.0
## 349 Other respiratory condition       FALSE   FALSE 7.320  39.0  54.0
## 291                    COVID-19          NA   FALSE 7.240  45.0  70.5
## 415 Other respiratory condition       FALSE   FALSE 7.220  43.2  42.0
## 7                          Other       FALSE   FALSE 7.340  44.3    NA
## 217 Other respiratory condition        TRUE      NA 7.370    NA  65.0
## 197                        Other       FALSE   FALSE    NA  34.0    NA
## 121    Cardiovascular condition       FALSE    TRUE 7.240  57.0 179.3
## 241 Other respiratory condition       FALSE   FALSE 7.050  50.7    NA
## 240 Other respiratory infection          NA    TRUE 7.210  56.3  94.5
## 322                        <NA>       FALSE   FALSE 7.450  33.0    NA
## 109    Cardiovascular condition       FALSE   FALSE 7.160  79.0  57.0
## 116                    COVID-19       FALSE   FALSE 7.220  57.0  69.0
## 214                    COVID-19       FALSE      NA 7.490  44.3 106.0
## 313    Cardiovascular condition       FALSE   FALSE    NA  43.0 412.0
## 190 Other respiratory condition       FALSE      NA 7.360  28.0  60.0
## 371    Cardiovascular condition       FALSE   FALSE 7.440    NA    NA
## 337                        Other       FALSE   FALSE 7.240  42.7 208.0
## 29  Other respiratory condition       FALSE    TRUE 7.350  38.0 130.0
## 37                         <NA>          NA      NA 7.460  33.0  65.0
## 346    Cardiovascular condition          NA   FALSE 7.120  43.9  59.0
## 339                    COVID-19          NA   FALSE 7.150  57.0  76.0
## 229                    COVID-19       FALSE   FALSE 7.300  43.0  63.0
## 395                        Other          NA   FALSE 7.320  46.4  83.0
## 16  Other respiratory condition          NA   FALSE 7.190  39.0  70.5
## 114                        <NA>       FALSE   FALSE 7.150  50.2    NA
## 58  Other respiratory condition          NA   FALSE 6.920  57.0  99.2
## 135    Cardiovascular condition          NA   FALSE 7.090  39.4    NA
## 196 Other respiratory condition       FALSE   FALSE    NA    NA  73.0
## 30                     COVID-19       FALSE   FALSE 7.020  36.0  76.1
## 50  Other respiratory condition       FALSE    TRUE    NA  37.0 208.0
## 356 Other respiratory infection       FALSE   FALSE 7.220  39.5 139.0
## 193 Other respiratory condition          NA   FALSE 7.430  24.2    NA
## 134 Other respiratory condition          NA   FALSE 7.100  48.0  67.0
## 173    Cardiovascular condition       FALSE      NA 7.080  43.0  91.3
## 112    Cardiovascular condition       FALSE   FALSE    NA  62.0  44.0
```

```
## 48                         Other        FALSE   FALSE 6.950    NA  36.0
## 289 Other respiratory condition        FALSE    TRUE    NA  37.3  91.1
## 51                         Other           NA   FALSE    NA  27.0  60.0
## 215    Cardiovascular condition           NA    TRUE 7.330  39.0  83.0
## 270 Other respiratory condition           NA      NA 7.260 125.0 116.0
## 374                         <NA>        FALSE      NA    NA  39.0 118.9
## 244                     COVID-19        FALSE   FALSE 7.250  48.0 287.0
## 387                     COVID-19           NA   FALSE 7.120  86.0 117.6
## 222    Cardiovascular condition         TRUE    TRUE 6.950    NA  76.0
## 90  Other respiratory condition           NA      NA 7.030  28.0  37.3
## 406 Other respiratory condition        FALSE    TRUE 7.430  40.0    NA
## 420                     COVID-19           NA      NA 7.440  56.0 123.0
## 368    Cardiovascular condition           NA    TRUE 7.240  41.0 208.0
## 179    Cardiovascular condition         TRUE      NA 7.310  31.0 102.6
## 280    Cardiovascular condition        FALSE   FALSE    NA  51.0    NA
## 284                     COVID-19        FALSE    TRUE 7.240  30.0  92.0
## 373    Cardiovascular condition        FALSE    TRUE 7.470  59.0  44.0
## 306    Cardiovascular condition        FALSE   FALSE 7.400  69.0    NA
## 183                     COVID-19        FALSE    TRUE 7.140    NA  67.0
## 62                          <NA>        FALSE   FALSE    NA  56.7 113.0
## 131    Cardiovascular condition           NA   FALSE    NA    NA 370.0
## 224                     COVID-19        FALSE    TRUE 7.370  83.0  70.5
## 4                       COVID-19           NA   FALSE 7.180  72.0 109.0
## 39                          <NA>           NA   FALSE 7.490  41.6  45.8
## 327                     COVID-19        FALSE    TRUE 7.110  71.8  83.0
## 138    Cardiovascular condition           NA   FALSE 7.450  48.0    NA
## 15     Cardiovascular condition           NA   FALSE    NA    NA  42.0
## 279                         <NA>        FALSE      NA 7.200  63.0    NA
## 341    Cardiovascular condition        FALSE   FALSE 7.100  68.0 394.4
## 266                         <NA>           NA   FALSE 7.300  52.0 323.0
## 273 Other respiratory condition           NA   FALSE 7.350  39.5    NA
## 24                      COVID-19        FALSE   FALSE 7.320  72.0  62.0
## 405    Cardiovascular condition        FALSE   FALSE    NA  53.0  43.0
## 113                        Other           NA   FALSE    NA    NA    NA
## 6                       COVID-19        FALSE   FALSE 7.420    NA  49.0
## 88                      COVID-19        FALSE      NA 7.110  35.0 207.0
## 71                          <NA>         TRUE   FALSE    NA  48.0  27.0
## 298                        Other           NA    TRUE 7.270  44.0  36.0
## 340                     COVID-19           NA   FALSE 7.440  68.0  70.0
## 19     Cardiovascular condition         TRUE   FALSE 7.210  40.6 112.9
## 127    Cardiovascular condition        FALSE    TRUE 7.220    NA  87.0
## 367 Other respiratory condition           NA      NA 7.340  57.0    NA
## 20                          <NA>           NA    TRUE 7.080    NA  80.0
## 120                     COVID-19         TRUE      NA 7.350  42.0 222.0
## 331    Cardiovascular condition        FALSE    TRUE 7.270  45.0  75.0
## 303    Cardiovascular condition           NA    TRUE 7.310  51.0  58.0
## 140                     COVID-19           NA   FALSE    NA  12.0 525.6
## 80                      COVID-19        FALSE   FALSE 7.480    NA  52.7
## 238                     COVID-19        FALSE    TRUE 7.200  44.3 232.0
## 253                     COVID-19        FALSE   FALSE 7.420  39.0  37.9
## 133 Other respiratory condition        FALSE    TRUE 7.270    NA 232.0
## 388    Cardiovascular condition           NA    TRUE 7.380  57.0  59.0
## 38                      COVID-19        FALSE      NA 7.480  63.7  74.0
## 274    Cardiovascular condition        FALSE      NA 7.100  48.0  88.0
```

```
## 321                    COVID-19        TRUE   FALSE 7.270  42.0 113.0
## 154    Cardiovascular condition       FALSE   FALSE    NA  84.0    NA
## 79     Cardiovascular condition       FALSE   FALSE 7.430  61.0 253.6
## 390 Other respiratory condition       FALSE    TRUE    NA  39.0    NA
## 104 Other respiratory condition       FALSE   FALSE    NA  74.0  99.0
## 218    Cardiovascular condition          NA   FALSE 7.310  70.8  77.0
## 211                       Other       FALSE      NA 7.110  47.0  64.0
## 318 Other respiratory infection       FALSE    TRUE 7.370    NA  90.0
## 167    Cardiovascular condition       FALSE   FALSE 7.230  54.0    NA
## 52  Other respiratory condition          NA    TRUE 7.260    NA  54.0
## 119                    COVID-19          NA    TRUE    NA  75.0  77.0
## 76  Other respiratory condition       FALSE    TRUE 7.490    NA 351.0
## 115                        <NA>          NA    TRUE    NA  42.0  63.0
## 394                       Other       FALSE    TRUE 7.270  43.0  36.0
## 164 Other respiratory condition          NA   FALSE 7.420  60.0    NA
## 110                        <NA>          NA   FALSE 7.460  60.0  74.8
## 81     Cardiovascular condition          NA    TRUE 7.370    NA    NA
## 413    Cardiovascular condition          NA      NA 7.210  35.3 394.4
## 370                        <NA>       FALSE    TRUE 7.410  46.0 113.8
## 272 Other respiratory infection          NA    TRUE 7.300  53.0 124.0
## 182    Cardiovascular condition       FALSE    TRUE 7.480    NA    NA
## 31                         <NA>          NA   FALSE 7.450  47.3    NA
## 17  Other respiratory condition          NA   FALSE 7.400  33.1 103.0
## 78                         <NA>       FALSE    TRUE    NA  42.0 130.0
## 410                       Other       FALSE    TRUE 7.110  58.8 253.7
## 161 Other respiratory condition       FALSE   FALSE    NA  86.0    NA
## 254    Cardiovascular condition          NA      NA 7.330  57.0  56.0
## 100    Cardiovascular condition          NA   FALSE 7.370  33.8  39.0
## 87  Other respiratory condition       FALSE    TRUE 7.140  56.0  58.0
## 155    Cardiovascular condition          NA      NA 7.420    NA    NA
## 60                         <NA>       FALSE   FALSE 7.321  56.0    NA
## 63  Other respiratory condition          NA   FALSE 7.110  62.0  73.0
## 153    Cardiovascular condition          NA      NA 7.400  40.0  75.0
## 102    Cardiovascular condition       FALSE   FALSE    NA  56.3  88.0
## 359 Other respiratory infection       FALSE   FALSE 7.120    NA 121.0
## 307    Cardiovascular condition       FALSE   FALSE 7.370 115.0  83.0
## 126                    COVID-19       FALSE   FALSE    NA    NA  56.0
## 304                    COVID-19          NA   FALSE 7.260  77.0 222.0
## 186 Other respiratory condition          NA    TRUE    NA  81.0 376.0
## 66     Cardiovascular condition       FALSE      NA 7.280  51.0  59.0
## 296    Cardiovascular condition          NA    TRUE 7.090  77.0    NA
## 103                    COVID-19       FALSE      NA 6.780  43.0 116.0
## 163 Other respiratory condition       FALSE      NA 7.310  49.0  78.0
## 281 Other respiratory condition       FALSE   FALSE    NA  38.0    NA
## 212 Other respiratory infection          NA   FALSE 7.470  79.0  66.0
## 123 Other respiratory condition       FALSE   FALSE 7.240  75.0  64.0
## 422    Cardiovascular condition       FALSE      NA 7.370  72.0 146.0
## 172                    COVID-19          NA      NA    NA  61.0    NA
## 56     Cardiovascular condition       FALSE   FALSE 7.180  37.8 101.0
## 205 Other respiratory condition          NA   FALSE 7.220  33.1  59.8
## 351                    COVID-19       FALSE   FALSE 7.240  36.0 108.0
## 325                    COVID-19       FALSE   FALSE 7.130  49.0  53.0
## 150                    COVID-19          NA   FALSE 7.150  30.0 108.0
## 111    Cardiovascular condition          NA   FALSE 7.420  41.9 175.0
```

```
## 107                    COVID-19          NA   FALSE 7.110  71.9  68.9
## 194 Other respiratory condition          NA      NA 7.120  60.0 102.6
## 343    Cardiovascular condition          NA   FALSE    NA  68.0  81.0
## 301                    COVID-19       FALSE    TRUE 7.400  30.0  47.0
## 73                     COVID-19          NA   FALSE 7.150  48.0 128.0
## 141    Cardiovascular condition       FALSE   FALSE    NA  38.4  69.5
## 213 Other respiratory condition          NA    TRUE    NA  91.0  80.0
## 419    Cardiovascular condition          NA   FALSE 7.230 118.0 324.0
## 57     Cardiovascular condition        TRUE   FALSE 7.210    NA 253.6
## 237                    COVID-19       FALSE    TRUE 7.340  64.0 109.0
## 2                      COVID-19       FALSE   FALSE 7.410    NA 542.0
## 221                       Other       FALSE      NA 7.520    NA    NA
## 180 Other respiratory condition          NA   FALSE 7.350  37.0 137.8
## 105    Cardiovascular condition          NA    TRUE 7.480  39.0  41.8
## 41                     COVID-19          NA   FALSE 7.210    NA    NA
## 403                    COVID-19       FALSE   FALSE    NA    NA  87.0
## 187    Cardiovascular condition          NA    TRUE 7.150  40.0 159.0
## 132                    COVID-19       FALSE      NA 7.110  64.0    NA
## 137                    COVID-19        TRUE      NA 7.310    NA  73.0
## 45  Other respiratory condition          NA      NA 7.200  38.0  25.0
## 369                        <NA>          NA    TRUE 7.440  35.3  84.0
## 23  Other respiratory condition       FALSE    TRUE 7.240  44.0  69.2
## 320 Other respiratory condition        TRUE    TRUE 7.110  51.0 113.0
## 329                    COVID-19          NA   FALSE 7.110  34.9  54.0
## 171 Other respiratory condition          NA    TRUE 7.400  41.0 124.0
## 191                    COVID-19          NA   FALSE 7.200  50.7  27.0
## 283                        <NA>       FALSE      NA 7.160 115.0 134.0
## 411                    COVID-19          NA   FALSE 6.920  49.0 124.0
## 294    Cardiovascular condition          NA   FALSE 7.300  35.7 207.0
## 267 Other respiratory condition       FALSE   FALSE 7.430    NA  24.0
## 317                    COVID-19       FALSE    TRUE 7.350    NA  86.0
## 392                        <NA>          NA   FALSE 7.150  37.0 207.0
## 347                    COVID-19       FALSE      NA 7.260  63.0    NA
## 316    Cardiovascular condition        TRUE    TRUE    NA  45.0  90.0
## 258    Cardiovascular condition       FALSE   FALSE 7.250    NA  56.0
## 324                       Other       FALSE   FALSE 7.170  48.0 232.0
## 12                     COVID-19       FALSE   FALSE    NA  59.0  49.0
## 290    Cardiovascular condition          NA   FALSE 7.020    NA  72.0
## 42                        Other       FALSE    TRUE 7.110    NA  51.0
## 338                    COVID-19       FALSE      NA 7.460  20.8    NA
## 225 Other respiratory condition          NA      NA 7.270  37.0 266.0
## 269    Cardiovascular condition       FALSE   FALSE 7.040  70.0 266.0
## 198                    COVID-19       FALSE   FALSE 7.080    NA 283.0
## 35  Other respiratory condition        TRUE   FALSE 7.390  37.0 125.0
## 358                        <NA>       FALSE    TRUE 7.200  81.0  69.2
## 275 Other respiratory infection       FALSE   FALSE 7.210  61.0  52.0
## 67                     COVID-19          NA   FALSE 7.220  44.9 253.7
## 401                    COVID-19       FALSE   FALSE 7.370  33.6 378.0
## 402                       Other       FALSE    TRUE 7.350    NA    NA
## 5      Cardiovascular condition       FALSE    TRUE 7.440  62.0    NA
## 243                       Other       FALSE   FALSE    NA 128.0    NA
## 255                    COVID-19       FALSE    TRUE 7.120  52.0  73.0
## 27  Other respiratory condition          NA   FALSE 7.330  40.0 282.0
## 231                    COVID-19          NA      NA 7.330  39.4  54.0
```

```
## 354                        <NA>         TRUE      NA 7.320    NA    NA
## 130    Cardiovascular condition           NA   FALSE 7.370  75.0 282.0
## 399                        <NA>           NA   FALSE 7.420  39.0  88.0
## 98  Other respiratory condition        FALSE    TRUE 7.270  63.4    NA
## 233                    COVID-19           NA   FALSE 7.500  46.7  62.0
## 146 Other respiratory condition           NA   FALSE 7.530  37.8  74.8
## 18  Other respiratory condition           NA      NA    NA  62.0  67.0
## 295    Cardiovascular condition         TRUE      NA 7.140  42.7  64.0
## 228                    COVID-19           NA   FALSE    NA  27.1 132.0
## 70     Cardiovascular condition           NA      NA    NA  57.0 119.0
## 26                         <NA>           NA   FALSE 7.470    NA  76.1
## 350                    COVID-19        FALSE   FALSE 7.350    NA  56.0
## 382 Other respiratory condition        FALSE    TRUE 7.320  42.0 518.0
## 362 Other respiratory condition        FALSE   FALSE 7.220  62.0 523.0
## 232 Other respiratory condition           NA    TRUE 7.400  43.3  90.0
## 396                    COVID-19           NA    TRUE 7.390  22.0  91.1
## 219                    COVID-19        FALSE   FALSE 7.410  48.0  86.0
## 125                    COVID-19        FALSE    TRUE 7.520  59.0    NA
## 288                    COVID-19           NA   FALSE 7.290  57.0  62.0
## 32                     COVID-19        FALSE   FALSE    NA  63.0  61.0
## 334    Cardiovascular condition           NA   FALSE 7.330  77.0    NA
## 248                    COVID-19        FALSE   FALSE 7.390  77.0  83.0
## 147                    COVID-19        FALSE      NA    NA    NA 101.0
##     lactate_peak creatinine_peak total_bilirubin_peak mechanical_vent_days
## 357           NA              NA                   NA                 <NA>
## 292         11.6              NA                   NA                 <NA>
## 227           NA            2.31                  0.4            12h - 24h
## 40           1.9            1.90                   NA            12h - 24h
## 94          17.5              NA                  1.7               <= 12h
## 96           4.4            4.09                  0.9            12h - 24h
## 414          8.9            6.02                  3.0                 <NA>
## 192          2.1              NA                  4.7                 <NA>
## 208          1.9            1.08                  1.3                 <NA>
## 33           1.5            0.17                  8.9            12h - 24h
## 118          4.3            0.71                  5.6      2 days - 7 days
## 188          1.6              NA                 19.1      2 days - 7 days
## 14           2.0            0.68                  0.8      2 days - 7 days
## 250           NA            0.71                  6.1            12h - 24h
## 22           0.5              NA                   NA               <= 12h
## 366          7.7            0.90                  1.3            >= 7 days
## 181          6.4              NA                 12.6                 <NA>
## 309           NA              NA                  1.1               <= 12h
## 421          9.5            2.90                  0.9               <= 12h
## 216          3.2              NA                   NA                 <NA>
## 199           NA            2.66                   NA            12h - 24h
## 360          6.9              NA                   NA               <= 12h
## 65          12.4            0.40                  4.7                 <NA>
## 68           1.6            1.39                  1.8               <= 12h
## 312           NA            2.01                  1.0      2 days - 7 days
## 101          1.5            1.11                  1.2            12h - 24h
## 285           NA              NA                  8.1               <= 12h
## 91           3.9            0.60                   NA            12h - 24h
## 46           3.3            0.90                  4.9               <= 12h
## 203         15.3            2.66                  0.7               <= 12h
```

```
## 424         1.6           0.95              0.8     2 days - 7 days
## 99           NA           1.98              1.1           12h - 24h
## 310         11.6           3.48              5.7                <NA>
## 412          1.2           2.87              0.8           12h - 24h
## 143          3.9             NA              3.1              <= 12h
## 311          2.2             NA              2.7                <NA>
## 175          1.6             NA              2.0                <NA>
## 379         17.5           1.00               NA              <= 12h
## 170           NA             NA              4.0     2 days - 7 days
## 377           NA           3.91              2.1           12h - 24h
## 342          3.1           1.46              1.3                <NA>
## 159          2.0           1.27              1.7              <= 12h
## 335         14.9           1.66               NA           12h - 24h
## 265          0.8           0.63              1.4                <NA>
## 349          2.6             NA              1.4     2 days - 7 days
## 291          2.7             NA              1.0                <NA>
## 415         15.4             NA               NA              <= 12h
## 7             NA           3.34              1.0     2 days - 7 days
## 217          2.8             NA               NA                <NA>
## 197          1.9             NA               NA                <NA>
## 121          9.5           1.56              3.6                <NA>
## 241          3.6             NA              6.1                <NA>
## 240         10.2             NA              1.8     2 days - 7 days
## 322          9.6           1.80               NA                <NA>
## 109          4.8           1.35              0.7           12h - 24h
## 116          2.5           0.97               NA              <= 12h
## 214          6.4             NA              3.4              <= 12h
## 313         15.3           1.67              8.1           12h - 24h
## 190          6.8           0.47              3.4           12h - 24h
## 371          9.6           0.71               NA     2 days - 7 days
## 337          9.0           1.80             27.3                <NA>
## 29           2.6           1.90              1.5                <NA>
## 37          13.5           2.70              1.4           12h - 24h
## 346          4.5           0.79              6.7                <NA>
## 339          6.2           1.18               NA           12h - 24h
## 229          3.6           2.70              1.6                <NA>
## 395          2.1           1.56              1.3           12h - 24h
## 16           1.3             NA              0.4              <= 12h
## 114          2.0             NA              0.8              <= 12h
## 58           9.0             NA              1.0              <= 12h
## 135          9.4           5.12               NA                <NA>
## 196           NA           1.84              3.1           12h - 24h
## 30           6.8           0.40               NA              <= 12h
## 50           9.7           0.74              0.9                <NA>
## 356          7.3           1.72              7.6                <NA>
## 193          3.0           1.19              0.8              <= 12h
## 134           NA           3.00              2.2              <= 12h
## 173          2.0             NA               NA              <= 12h
## 112          1.5           2.97               NA              <= 12h
## 48           8.5           2.91              5.4           12h - 24h
## 289          2.7           0.88               NA           12h - 24h
## 51           2.0           0.17              2.2           12h - 24h
## 215          2.4           2.87              4.7              <= 12h
## 270          3.9           3.05               NA                <NA>
```

```
## 374          3.5          6.09           0.9            <= 12h
## 244          3.5          2.15           2.2          12h - 24h
## 387         17.5            NA           1.6          12h - 24h
## 222          3.0            NA           1.7     2 days - 7 days
## 90            NA          4.00           1.3          12h - 24h
## 406          3.8            NA           2.0          >= 7 days
## 420          2.3          1.71           0.7            <= 12h
## 368         15.0            NA           1.1     2 days - 7 days
## 179          3.8            NA            NA               <NA>
## 280          3.2          2.01           5.3     2 days - 7 days
## 284         17.5          1.07          13.5               <NA>
## 373          2.1          1.39           2.0          12h - 24h
## 306          2.1          2.00            NA               <NA>
## 183          2.9          0.69            NA     2 days - 7 days
## 62          11.0          1.04           1.8          >= 7 days
## 131          3.5          0.64           1.2          12h - 24h
## 224          9.4            NA            NA          12h - 24h
## 4            2.9          0.57           0.9     2 days - 7 days
## 39            NA          0.81            NA               <NA>
## 327          9.4          2.64            NA     2 days - 7 days
## 138           NA          2.42            NA          12h - 24h
## 15            NA          1.67            NA          12h - 24h
## 279          2.1            NA            NA          >= 7 days
## 341          5.4          2.96           1.7     2 days - 7 days
## 266          1.9            NA           5.7          12h - 24h
## 273          1.9            NA            NA          12h - 24h
## 24          13.3          2.80           3.5          12h - 24h
## 405           NA          0.90           0.3          12h - 24h
## 113           NA          3.00            NA          12h - 24h
## 6            2.3          2.08           0.5          12h - 24h
## 88           2.1            NA           0.2               <NA>
## 71          12.0            NA            NA             <= 12h
## 298          7.8          0.81            NA               <NA>
## 340          6.9          2.50           5.9               <NA>
## 19           2.5          1.10           1.8               <NA>
## 127          2.0          1.33            NA             <= 12h
## 367          2.5          5.52           2.0            <= 12h
## 20           7.3          0.64           4.4          12h - 24h
## 120           NA          3.07           2.2               <NA>
## 331           NA          2.50           3.7            <= 12h
## 303         17.5            NA           1.3            <= 12h
## 140          3.9          3.41            NA          12h - 24h
## 80           7.7          0.86            NA             <= 12h
## 238          2.9            NA           0.4               <NA>
## 253          4.8            NA            NA             <= 12h
## 133          2.3          0.95          26.1            <= 12h
## 388          7.7          1.26            NA          12h - 24h
## 38           3.3            NA            NA          12h - 24h
## 274          3.5            NA           1.6               <NA>
## 321          3.4            NA            NA             <= 12h
## 154          6.1          1.53           2.4               <NA>
## 79           2.7            NA           1.4          12h - 24h
## 390          5.2          1.38           1.5          12h - 24h
## 104          1.3          2.10            NA     2 days - 7 days
```

```
## 218          NA            NA             5.7            <= 12h
## 211          NA            NA             4.2            <= 12h
## 318         1.8          0.82             6.8            <= 12h
## 167        17.5          2.30             2.8         12h - 24h
## 52         17.5            NA             3.0  2 days - 7 days
## 119          NA          1.14              NA            <NA>
## 76          1.7          0.87              NA            <NA>
## 115         1.7          3.85              NA            <= 12h
## 394        10.2            NA              NA         12h - 24h
## 164         2.3          2.88             0.8         12h - 24h
## 110        11.6          1.26             2.9         12h - 24h
## 81          8.1            NA            26.1         12h - 24h
## 413         2.4            NA              NA            <NA>
## 370         7.8          1.52             0.7            <NA>
## 272         8.4            NA              NA            <NA>
## 182         2.7            NA             0.5            <= 12h
## 31           NA          2.97              NA  2 days - 7 days
## 17          2.4            NA              NA            <= 12h
## 78          2.7            NA              NA            <= 12h
## 410        11.6            NA             1.3  2 days - 7 days
## 161         2.0          1.35              NA  2 days - 7 days
## 254          NA          1.57             0.3            <= 12h
## 100         2.6          1.86             1.0            <= 12h
## 87          1.7          0.73             3.6  2 days - 7 days
## 155         3.4            NA             8.5            <= 12h
## 60         11.7            NA             2.3         12h - 24h
## 63          2.2          0.81             2.0            <NA>
## 153        16.7            NA             2.0            <NA>
## 102          NA            NA             1.4            <NA>
## 359         3.2            NA             1.7            <NA>
## 307         1.7            NA             0.8         12h - 24h
## 126         2.0            NA              NA         >= 7 days
## 304         2.1          2.31             1.1            <NA>
## 186         7.6          1.10              NA         12h - 24h
## 66          5.0          0.82             5.4            <= 12h
## 296         4.7          2.71              NA            <NA>
## 103         0.9            NA             2.9            <NA>
## 163         4.3            NA             0.5            <= 12h
## 281         9.6            NA             0.9         12h - 24h
## 212          NA            NA              NA            <NA>
## 123         1.4          2.23             0.5         12h - 24h
## 422         5.2            NA             2.4            <NA>
## 172          NA          0.87              NA            <= 12h
## 56          4.5          3.30             1.2         12h - 24h
## 205         1.3          1.52             2.5            <= 12h
## 351         5.2          2.50             2.1         12h - 24h
## 325         8.4          1.66             5.6  2 days - 7 days
## 150         3.0            NA              NA  2 days - 7 days
## 111        11.4          0.90            12.1         12h - 24h
## 107          NA            NA             1.9         12h - 24h
## 194         2.4          5.10             1.8            <= 12h
## 343         2.0          2.62             3.8            <NA>
## 301         1.3          0.83             2.2  2 days - 7 days
## 73          1.6          6.09              NA            <= 12h
```

```
## 141         1.2          0.95               1.0              <NA>
## 213         3.8          0.62               4.9         12h - 24h
## 419         3.5            NA               4.3            <= 12h
## 57          8.7            NA                NA    2 days - 7 days
## 237          NA          1.35                NA              <NA>
## 2            NA          1.67                NA              <NA>
## 221        12.0            NA               0.7            <= 12h
## 180         4.7          1.15               2.5              <NA>
## 105         4.0          1.90               6.7            <= 12h
## 41          2.4          1.80                NA    2 days - 7 days
## 403         4.8          1.38               2.0            <= 12h
## 187         2.1          5.13               4.6              <NA>
## 132         2.9          1.15               0.4    2 days - 7 days
## 137         2.1          2.70               1.2          >= 7 days
## 45          3.5          1.69                NA         12h - 24h
## 369         1.7          3.30               1.3            <= 12h
## 23          2.6            NA               3.4            <= 12h
## 320         8.1            NA               2.0         12h - 24h
## 329         2.1          0.90                NA            <= 12h
## 171         0.8          1.72               0.7            <= 12h
## 191         3.3            NA               1.3         12h - 24h
## 283         8.4          1.52               3.2              <NA>
## 411         7.9            NA               2.1            <= 12h
## 294        11.8          0.81               2.2         12h - 24h
## 267          NA          1.73               0.9         12h - 24h
## 317         2.3          1.82               5.7         12h - 24h
## 392         3.4            NA               0.5              <NA>
## 347         3.9          1.73                NA            <= 12h
## 316         3.3            NA               0.4         12h - 24h
## 258         4.3          2.42                NA            <= 12h
## 324          NA            NA               4.7            <= 12h
## 12          3.7            NA               4.4              <NA>
## 290         6.1          2.50                NA              <NA>
## 42          2.4          6.09               2.5         12h - 24h
## 338         3.0          1.32               8.5         12h - 24h
## 225         5.0          3.48               1.5            <= 12h
## 269          NA            NA                NA          >= 7 days
## 198         3.5          2.65               1.1            <= 12h
## 35          9.0            NA               0.7         12h - 24h
## 358         2.8            NA               3.4          >= 7 days
## 275        10.9          1.67                NA            <= 12h
## 67          3.0          4.17               6.8            <= 12h
## 401         1.7          0.69               0.7            <= 12h
## 402         7.3          1.85               1.7            <= 12h
## 5           2.3          1.04               8.9              <NA>
## 243         2.6          1.08               2.4         12h - 24h
## 255        12.9            NA                NA    2 days - 7 days
## 27         13.1          0.64               0.4            <= 12h
## 231         9.0            NA                NA            <= 12h
## 354         4.2          0.63               0.4              <NA>
## 130         1.3          2.46               7.9              <NA>
## 399        17.5          1.67                NA              <NA>
## 98          1.2          1.57               1.6              <NA>
## 233          NA          0.86               4.8            <= 12h
```

```
## 146         8.1           2.13                 1.1               <NA>
## 18          9.5           0.57                  NA          12h - 24h
## 295         1.6           1.00                 1.2             <= 12h
## 228        15.4           2.64                  NA          12h - 24h
## 70          3.0             NA                 1.7               <NA>
## 26          7.9           0.90                 1.8             <= 12h
## 350         2.7           3.75                  NA               <NA>
## 382         2.3           1.20                11.7          12h - 24h
## 362         1.6             NA                 0.4             <= 12h
## 232         2.5           0.51                 0.7               <NA>
## 396        17.5           1.67                  NA               <NA>
## 219         4.6           0.81                  NA             <= 12h
## 125         2.5           1.00                  NA             <= 12h
## 288          NA           1.60                 6.7    2 days - 7 days
## 32          4.8           2.62                 3.4               <NA>
## 334         6.2           0.79                  NA          12h - 24h
## 248         5.1           1.02                 1.1          12h - 24h
## 147         1.8             NA                 5.6               <NA>
##               systemic_anticoagulation_type acute_kidney_injury hospital_los
## 357                                  <NA>                  NA           NA
## 292                           Heparin only                  NA         88.0
## 227                       No anticoagulant               FALSE         27.0
## 40                        No anticoagulant               FALSE          7.0
## 94                            Heparin only               FALSE         67.0
## 96                        Bivalirudin only                TRUE         33.0
## 414                       Bivalirudin only               FALSE         29.0
## 192                                  <NA>                TRUE          2.0
## 208                           Heparin only                TRUE         34.0
## 33                  Heparin and bivalirudin               FALSE         10.0
## 118                       Bivalirudin only               FALSE           NA
## 188                           Heparin only                TRUE           NA
## 14                        Bivalirudin only                TRUE         43.0
## 250                       Bivalirudin only               FALSE        108.0
## 22                            Heparin only                TRUE         26.0
## 366                                  <NA>                TRUE         39.0
## 181                       Bivalirudin only               FALSE         21.0
## 309                       Bivalirudin only                TRUE        153.0
## 421                 Heparin and bivalirudin                TRUE         13.0
## 216                           Heparin only                  NA         61.0
## 199                           Heparin only               FALSE         52.0
## 360                           Heparin only               FALSE         10.0
## 65                        No anticoagulant               FALSE         23.0
## 68                            Heparin only                  NA          6.0
## 312                           Heparin only                TRUE         38.0
## 101                           Heparin only                TRUE         68.0
## 285                       Bivalirudin only                TRUE         10.0
## 91                        No anticoagulant                  NA         38.0
## 46                        Bivalirudin only                  NA          8.0
## 203                       Bivalirudin only               FALSE          2.0
## 424                           Heparin only               FALSE         53.0
## 99                        No anticoagulant               FALSE        159.0
## 310                                  <NA>               FALSE         22.0
## 412                           Heparin only                TRUE         45.0
## 143                       Bivalirudin only                  NA         28.0
```

```
## 311                    No anticoagulant             FALSE         26.0
## 175                        Heparin only              TRUE          6.0
## 379                        Heparin only              TRUE         60.0
## 170                        Heparin only             FALSE         91.0
## 377                        Heparin only             FALSE         13.0
## 342                    Bivalirudin only              TRUE         35.0
## 159                    No anticoagulant             FALSE         28.0
## 335                        Heparin only             FALSE         48.0
## 265                                <NA>              TRUE         36.0
## 349                        Heparin only             FALSE           NA
## 291                    No anticoagulant              TRUE         17.0
## 415                        Heparin only              TRUE         26.0
## 7                          Heparin only             FALSE         34.0
## 217                                <NA>             FALSE         36.8
## 197                                <NA>              TRUE           NA
## 121                                <NA>             FALSE         27.0
## 241                        Heparin only             FALSE        103.0
## 240                        Heparin only              TRUE           NA
## 322                        Heparin only             FALSE          1.0
## 109                                <NA>             FALSE           NA
## 116                                <NA>                NA         19.0
## 214                        Heparin only                NA         29.0
## 313                    Bivalirudin only                NA         26.0
## 190                    Bivalirudin only             FALSE         28.0
## 371                    No anticoagulant              TRUE         32.0
## 337                    Bivalirudin only             FALSE          2.0
## 29                         Heparin only             FALSE         29.0
## 37           Heparin and bivalirudin                FALSE         13.0
## 346                    Bivalirudin only              TRUE         49.0
## 339          Heparin and bivalirudin                 TRUE          1.0
## 229                        Heparin only             FALSE         94.0
## 395                    Bivalirudin only                NA         12.0
## 16                         Heparin only             FALSE          8.0
## 114                        Heparin only             FALSE         45.0
## 58                         Heparin only              TRUE         54.0
## 135                        Heparin only              TRUE          8.0
## 196                        Heparin only             FALSE         15.0
## 30                         Heparin only             FALSE         26.0
## 50                         Heparin only             FALSE        101.0
## 356                        Heparin only             FALSE           NA
## 193          Heparin and bivalirudin                 TRUE         42.0
## 134                    No anticoagulant             FALSE         20.0
## 173                    No anticoagulant             FALSE         15.0
## 112                        Heparin only             FALSE         17.0
## 48                     Bivalirudin only             FALSE         36.8
## 289                    No anticoagulant                NA         25.0
## 51           Heparin and bivalirudin                 TRUE         75.0
## 215                                <NA>              TRUE         67.0
## 270                        Heparin only              TRUE         12.0
## 374                    Bivalirudin only                NA           NA
## 244                        Heparin only              TRUE        101.0
## 387                        Heparin only             FALSE         14.0
## 222                        Heparin only              TRUE         13.0
## 90                         Heparin only             FALSE          5.0
```

```
## 406                              Heparin only              TRUE          1.5
## 420                                      <NA>                NA           NA
## 368                           No anticoagulant                NA          2.0
## 179                              Heparin only              TRUE         16.0
## 280                           Bivalirudin only              TRUE           NA
## 284                              Heparin only              TRUE           NA
## 373                              Heparin only             FALSE          1.5
## 306                              Heparin only              TRUE         46.0
## 183                              Heparin only             FALSE           NA
## 62                               Heparin only              TRUE         22.0
## 131                              Heparin only              TRUE         20.0
## 224                              Heparin only             FALSE         18.0
## 4                       Heparin and bivalirudin              TRUE         49.0
## 39                      Heparin and bivalirudin                NA          6.0
## 327                           Bivalirudin only              TRUE           NA
## 138                           Bivalirudin only              TRUE         29.0
## 15                               Heparin only             FALSE         61.0
## 279                              Heparin only              TRUE           NA
## 341                           No anticoagulant             FALSE         12.0
## 266 Heparin and anticoagulant sodium citrate               FALSE         75.0
## 273                              Heparin only             FALSE           NA
## 24                               Heparin only              TRUE         34.0
## 405                           Bivalirudin only              TRUE         10.0
## 113                           Bivalirudin only                NA          8.0
## 6                             No anticoagulant              TRUE         29.0
## 88                               Heparin only             FALSE           NA
## 71                               Heparin only                NA         13.0
## 298                              Heparin only             FALSE         14.0
## 340                              Heparin only             FALSE         20.0
## 19                                       <NA>              TRUE           NA
## 127                                      <NA>             FALSE          4.0
## 367                              Heparin only              TRUE           NA
## 20                                       <NA>             FALSE         12.0
## 120                              Heparin only             FALSE         24.0
## 331                           Bivalirudin only             FALSE         26.0
## 303                                      <NA>                NA         23.0
## 140                           Bivalirudin only             FALSE           NA
## 80                      Heparin and bivalirudin                NA           NA
## 238                                      <NA>             FALSE         46.0
## 253                           No anticoagulant              TRUE           NA
## 133                              Heparin only              TRUE         70.0
## 388                              Heparin only             FALSE        181.0
## 38                               Heparin only             FALSE         32.0
## 274                                      <NA>              TRUE         11.0
## 321                              Heparin only             FALSE         42.0
## 154                              Heparin only              TRUE          8.0
## 79                               Heparin only             FALSE          6.0
## 390                                      <NA>              TRUE         42.0
## 104                              Heparin only                NA         67.0
## 218                              Heparin only             FALSE         61.0
## 211                              Heparin only             FALSE          1.0
## 318                              Heparin only             FALSE         21.0
## 167                              Heparin only              TRUE         16.0
## 52                                       <NA>             FALSE         12.0
```

```
## 119                    Bivalirudin only              TRUE         38.0
## 76                         Heparin only              TRUE         15.0
## 115                    Bivalirudin only              TRUE         32.0
## 394                        Heparin only             FALSE         13.0
## 164                    Bivalirudin only              TRUE         37.0
## 110                    Bivalirudin only              TRUE         10.0
## 81                         Heparin only              TRUE         57.0
## 413                                <NA>             FALSE         38.0
## 370                    Bivalirudin only                NA         38.0
## 272                    Bivalirudin only             FALSE         36.0
## 182                        Heparin only             FALSE         23.0
## 31                     No anticoagulant             FALSE         20.0
## 17                         Heparin only              TRUE         29.0
## 78                     Bivalirudin only             FALSE           NA
## 410                        Heparin only              TRUE          9.0
## 161                        Heparin only              TRUE         16.0
## 254                    Bivalirudin only              TRUE         32.0
## 100                    No anticoagulant              TRUE         22.0
## 87                     Bivalirudin only             FALSE         23.0
## 155                                <NA>              TRUE         15.0
## 60           Heparin and bivalirudin                 TRUE          8.0
## 63                         Heparin only             FALSE         58.0
## 153                    Bivalirudin only             FALSE         19.0
## 102                        Heparin only             FALSE        103.0
## 359                                <NA>              TRUE          7.0
## 307                    No anticoagulant              TRUE           NA
## 126                    Bivalirudin only                NA         27.0
## 304                    Bivalirudin only              TRUE         12.0
## 186                        Heparin only                NA         16.0
## 66                                 <NA>             FALSE         51.0
## 296                        Heparin only              TRUE         10.0
## 103                    Bivalirudin only              TRUE         12.0
## 163                    Bivalirudin only             FALSE          3.0
## 281                        Heparin only             FALSE          1.0
## 212                    Bivalirudin only              TRUE         58.0
## 123                    No anticoagulant              TRUE         38.0
## 422                    No anticoagulant             FALSE          8.0
## 172          Heparin and bivalirudin                 FALSE         43.0
## 56                     No anticoagulant              TRUE           NA
## 205                        Heparin only              TRUE           NA
## 351                                <NA>             FALSE         18.0
## 325                        Heparin only             FALSE         57.0
## 150                                <NA>             FALSE         10.0
## 111                        Heparin only             FALSE          1.0
## 107                    Bivalirudin only                NA         70.0
## 194                        Heparin only             FALSE           NA
## 343                        Heparin only             FALSE          6.0
## 301                        Heparin only              TRUE         17.0
## 73                     Bivalirudin only              TRUE         22.0
## 141                                <NA>             FALSE         12.0
## 213                        Heparin only              TRUE           NA
## 419                        Heparin only              TRUE         53.0
## 57                         Heparin only             FALSE           NA
## 237          Heparin and bivalirudin                 FALSE         70.0
```

```
## 2                      Heparin only            FALSE         15.0
## 221                    Heparin only            FALSE          9.0
## 180                            <NA>             TRUE         15.0
## 105                            <NA>            FALSE          7.0
## 41                  Bivalirudin only               NA         38.0
## 403                    Heparin only             TRUE          1.0
## 187                    Heparin only            FALSE         16.0
## 132                 Bivalirudin only            FALSE           NA
## 137                            <NA>               NA           NA
## 45                  Bivalirudin only               NA         13.0
## 369                    Heparin only            FALSE        173.0
## 23                     Heparin only             TRUE         88.0
## 320                    Heparin only               NA         10.0
## 329                 Bivalirudin only               NA         12.0
## 171                    Heparin only               NA         13.0
## 191                            <NA>            FALSE         57.0
## 283                 Bivalirudin only            FALSE          6.0
## 411                 Bivalirudin only               NA         38.0
## 294                            <NA>            FALSE        106.8
## 267                 Bivalirudin only            FALSE         14.0
## 317                 Bivalirudin only            FALSE         18.0
## 392                 Bivalirudin only            FALSE           NA
## 347                    Heparin only               NA          1.0
## 316                    Heparin only             TRUE         12.0
## 258                            <NA>             TRUE           NA
## 324                            <NA>             TRUE        153.0
## 12                  Bivalirudin only               NA           NA
## 290                    Heparin only            FALSE         12.0
## 42                  No anticoagulant             TRUE          8.0
## 338                    Heparin only             TRUE         19.0
## 225                    Heparin only               NA         42.0
## 269                 Bivalirudin only            FALSE         27.0
## 198                 Bivalirudin only             TRUE         28.0
## 35                  Bivalirudin only             TRUE          2.0
## 358                            <NA>               NA         16.0
## 275                 Bivalirudin only             TRUE         23.0
## 67                     Heparin only             TRUE         15.0
## 401                 No anticoagulant            FALSE         16.0
## 402                    Heparin only             TRUE         22.0
## 5                      Heparin only            FALSE          1.0
## 243                    Heparin only            FALSE         42.0
## 255                    Heparin only             TRUE           NA
## 27                  Bivalirudin only             TRUE         36.8
## 231                    Heparin only               NA         21.0
## 354                    Heparin only            FALSE         29.0
## 130                    Heparin only            FALSE         24.0
## 399                            <NA>               NA          8.0
## 98                  Bivalirudin only             TRUE           NA
## 233                            <NA>             TRUE          7.0
## 146                    Heparin only             TRUE          6.0
## 18                  Bivalirudin only             TRUE         70.0
## 295                    Heparin only            FALSE           NA
## 228                    Heparin only             TRUE         11.0
## 70                     Heparin only            FALSE           NA
```

```
## 26                                    <NA>              TRUE          9.0
## 350                       Bivalirudin only              TRUE         41.0
## 382                           Heparin only              TRUE         26.0
## 362                           Heparin only              TRUE         43.0
## 232                           Heparin only                NA         10.0
## 396                           Heparin only             FALSE          6.0
## 219                           Heparin only             FALSE          2.0
## 125                           Heparin only                NA         43.0
## 288                           Heparin only                NA           NA
## 32                                    <NA>             FALSE         67.0
## 334                           Heparin only              TRUE         58.0
## 248                       Bivalirudin only              TRUE         53.0
## 147                           Heparin only             FALSE        101.0
##     discharge_location steroids
## 357               <NA>     <NA>
## 292              Death      Unk
## 227        LTAC/rehab      Yes
## 40                <NA>       No
## 94               Death     <NA>
## 96               Death     <NA>
## 414               Home     <NA>
## 192              Death     <NA>
## 208               <NA>     <NA>
## 33         LTAC/rehab     <NA>
## 118               <NA>     <NA>
## 188               <NA>     <NA>
## 14         LTAC/rehab      Yes
## 250               <NA>       No
## 22                Home      Yes
## 366        LTAC/rehab      Yes
## 181               <NA>      Yes
## 309               <NA>     <NA>
## 421               <NA>     <NA>
## 216               <NA>      Yes
## 199              Death     <NA>
## 360               <NA>      Yes
## 65               Death     <NA>
## 68                Home     <NA>
## 312               Home     <NA>
## 101        LTAC/rehab      Yes
## 285               <NA>     <NA>
## 91               Death     <NA>
## 46                <NA>      Yes
## 203              Death       No
## 424               Home     <NA>
## 99                Home     <NA>
## 310              Death     <NA>
## 412               Home       No
## 143        LTAC/rehab     <NA>
## 311              Death       No
## 175               Home      Yes
## 379              Death     <NA>
## 170              Death     <NA>
## 377               <NA>     <NA>
```

```
## 342              <NA>     <NA>
## 159              Home      Yes
## 335             Death     <NA>
## 265       LTAC/rehab       No
## 349             Other      Yes
## 291             Death     <NA>
## 415             Death       No
## 7                Home     <NA>
## 217             Death      Yes
## 197       LTAC/rehab       No
## 121             Death     <NA>
## 241             Death      Yes
## 240              Home       No
## 322       LTAC/rehab     <NA>
## 109             Death     <NA>
## 116       LTAC/rehab     <NA>
## 214       LTAC/rehab      Yes
## 313             Death      unk
## 190       LTAC/rehab     <NA>
## 371             Death       No
## 337              Home     <NA>
## 29        LTAC/rehab     <NA>
## 37               Home     <NA>
## 346              Home     <NA>
## 339              Home       No
## 229             Death     <NA>
## 395              <NA>     <NA>
## 16               Home     <NA>
## 114              <NA>     <NA>
## 58               <NA>     <NA>
## 135              <NA>      Yes
## 196       LTAC/rehab     <NA>
## 30              Death       No
## 50              Death     <NA>
## 356              <NA>     <NA>
## 193             Death     <NA>
## 134             Death       No
## 173              <NA>     <NA>
## 112             Death     <NA>
## 48               Home     <NA>
## 289              <NA>     <NA>
## 51        LTAC/rehab     <NA>
## 215              <NA>     <NA>
## 270              <NA>     <NA>
## 374              <NA>     <NA>
## 244       LTAC/rehab       No
## 387              <NA>     <NA>
## 222              Home      Yes
## 90              Death     <NA>
## 406             Death      Yes
## 420              <NA>      Yes
## 368             Death       No
## 179              Home     <NA>
## 280       LTAC/rehab       No
```

```
## 284            Death     <NA>
## 373             Home       No
## 306            Death     <NA>
## 183             Home     <NA>
## 62         LTAC/rehab     <NA>
## 131            Death     <NA>
## 224             <NA>     <NA>
## 4               <NA>     <NA>
## 39              Home     <NA>
## 327             Home      Yes
## 138            Death     <NA>
## 15              Home     <NA>
## 279            Death     <NA>
## 341             Home     <NA>
## 266        LTAC/rehab      Yes
## 273        LTAC/rehab     <NA>
## 24              Home     <NA>
## 405            Death     <NA>
## 113             <NA>     <NA>
## 6               Home      Yes
## 88         LTAC/rehab      Yes
## 71             Death      Yes
## 298             <NA>      Yes
## 340            Death     <NA>
## 19         LTAC/rehab     <NA>
## 127             Home       No
## 367             Home     <NA>
## 20              Home     <NA>
## 120             <NA>     <NA>
## 331            Death     <NA>
## 303             <NA>     <NA>
## 140        LTAC/rehab     <NA>
## 80             Death      Yes
## 238             <NA>     <NA>
## 253             <NA>      Yes
## 133             Home       No
## 388             <NA>     <NA>
## 38         LTAC/rehab     <NA>
## 274        LTAC/rehab       No
## 321        LTAC/rehab      Yes
## 154            Death     <NA>
## 79              <NA>       No
## 390             <NA>     <NA>
## 104            Death     <NA>
## 218             <NA>       No
## 211             Home     <NA>
## 318        LTAC/rehab      Yes
## 167             Home     <NA>
## 52         LTAC/rehab     <NA>
## 119            Death     <NA>
## 76         LTAC/rehab       No
## 115            Death     <NA>
## 394            Death     <NA>
## 164        LTAC/rehab      Yes
```

```
## 110         LTAC/rehab     <NA>
## 81               Death     <NA>
## 413               <NA>     <NA>
## 370               Home      Yes
## 272               Home     <NA>
## 182               <NA>     <NA>
## 31                <NA>      Yes
## 17          LTAC/rehab     <NA>
## 78                Home     <NA>
## 410              Death     <NA>
## 161              Other     <NA>
## 254               <NA>      Yes
## 100              Death     <NA>
## 87                Home     <NA>
## 155              Death     <NA>
## 60                <NA>       No
## 63                <NA>     <NA>
## 153         LTAC/rehab     <NA>
## 102               Home      Yes
## 359               <NA>     <NA>
## 307              Death     <NA>
## 126         LTAC/rehab     <NA>
## 304               <NA>     <NA>
## 186               <NA>     <NA>
## 66                <NA>     <NA>
## 296               <NA>     <NA>
## 103               Home     <NA>
## 163         LTAC/rehab       No
## 281              Death     <NA>
## 212               <NA>     <NA>
## 123               Home     <NA>
## 422               <NA>       No
## 172               <NA>       No
## 56                <NA>     <NA>
## 205              Death      Yes
## 351              Death     <NA>
## 325              Death      Yes
## 150         LTAC/rehab     <NA>
## 111         LTAC/rehab       No
## 107               <NA>      Yes
## 194              Death      Yes
## 343               <NA>     <NA>
## 301              Death      Yes
## 73               Death      Yes
## 141               Home      Yes
## 213         LTAC/rehab     <NA>
## 419               <NA>     <NA>
## 57                <NA>     <NA>
## 237              Death     <NA>
## 2                 Home      Yes
## 221               <NA>     <NA>
## 180              Death      Yes
## 105               Home       No
## 41               Death       No
```

```
## 403            Death      Yes
## 187        LTAC/rehab     <NA>
## 132        LTAC/rehab       No
## 137              <NA>     <NA>
## 45               Home     <NA>
## 369             Death      Yes
## 23               <NA>      Yes
## 320             Death     <NA>
## 329              Home     <NA>
## 171             Death       No
## 191              Home       No
## 283             Death     <NA>
## 411              <NA>     <NA>
## 294              <NA>     <NA>
## 267             Death     <NA>
## 317              Home     <NA>
## 392             Death     <NA>
## 347              Home     <NA>
## 316             Death       No
## 258        LTAC/rehab     <NA>
## 324              <NA>     <NA>
## 12               <NA>     <NA>
## 290              <NA>     <NA>
## 42              Death       No
## 338        LTAC/rehab     <NA>
## 225              <NA>       No
## 269              <NA>     <NA>
## 198              <NA>       No
## 35              Death       No
## 358             Death      Yes
## 275             Other     <NA>
## 67              Death     <NA>
## 401             Death     <NA>
## 402             Death     <NA>
## 5               Death     <NA>
## 243             Death       No
## 255             Death     <NA>
## 27               <NA>     <NA>
## 231              Home      Yes
## 354              Home     <NA>
## 130              Home     <NA>
## 399              <NA>     <NA>
## 98               Home     <NA>
## 233              <NA>     <NA>
## 146             Death     <NA>
## 18              Death     <NA>
## 295              Home     <NA>
## 228        LTAC/rehab     <NA>
## 70               Home     <NA>
## 26              Death     <NA>
## 350              <NA>     <NA>
## 382              <NA>     <NA>
## 362        LTAC/rehab      Unk
## 232             Death     <NA>
```

```
## 396              <NA>     <NA>
## 219             Death     <NA>
## 125             Other     <NA>
## 288             Death     <NA>
## 32         LTAC/rehab     <NA>
## 334              Home     <NA>
## 248             Death     <NA>
## 147              Home      Unk
##
## 357
## 292
## 227
## 40
## 94
## 96
## 414
## 192                                                                (On-ECLS, Stool, Bacte
## 208
## 33
## 118
## 188
## 14
## 250
## 22
## 366
## 181
## 309
## 421
## 216
## 199
## 360                                                                          (Pre-EC
## 65
## 68
## 312
## 101
## 285
## 91
## 46
## 203
## 424
## 99
## 310
## 412
## 143
## 311
## 175
## 379
## 170
## 377
## 342
## 159
## 335
## 265
## 349
```

```
## 291
## 415
## 7
## 217
## 197
## 121
## 241
## 240                                (Pre-ECLS, Urine, Bacteria, Enterococcus), (Pre-ECLS, Blood, Bacte
## 322
## 109
## 116   (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Respira
## 214
## 313
## 190
## 371
## 337
## 29
## 37
## 346
## 339
## 229
## 395
## 16
## 114
## 58
## 135
## 196
## 30
## 50
## 356
## 193                                                                          (Pre-ECLS, Skin/Soft Tis
## 134
## 173
## 112
## 48
## 289
## 51
## 215
## 270
## 374
## 244
## 387
## 222
## 90
## 406
## 420
## 368
## 179
## 280
## 284
## 373
## 306
## 183
## 62
```

```
## 131
## 224
## 4
## 39  (On-ECLS, Blood, Bacteria, Enterobacter cloacae), (On-ECLS, Respiratory Tract, Bacteria, Enteroba
## 327 (On-ECLS, Blood, Bacteria, Enterobacter cloacae), (On-ECLS, Respiratory Tract, Bacteria, Enteroba
## 138
## 15  (On-ECLS, Blood, Bacteria, Enterobacter cloacae), (On-ECLS, Respiratory Tract, Bacteria, Enteroba
## 279
## 341
## 266
## 273
## 24
## 405
## 113
## 6
## 88
## 71
## 298                                                                                 (On-ECLS, Blood, Ba
## 340
## 19
## 127
## 367
## 20
## 120
## 331
## 303
## 140
## 80
## 238
## 253   (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Respirat
## 133
## 388                                                                               (Pre-ECLS, Blood, Ba
## 38
## 274
## 321
## 154
## 79
## 390
## 104
## 218
## 211
## 318
## 167
## 52
## 119
## 76
## 115
## 394
## 164
## 110
## 81
## 413
## 370
## 272                                                                                 (On-ECLS, Blood, Ba
```

```
## 182
## 31
## 17
## 78
## 410
## 161
## 254
## 100
## 87
## 155
## 60
## 63                                (Pre-ECLS, Urine, Bacteria, Enterococcus), (Pre-ECLS, Blood, Bacte
## 153
## 102
## 359
## 307
## 126
## 304
## 186
## 66
## 296
## 103
## 163
## 281
## 212
## 123
## 422
## 172
## 56
## 205
## 351
## 325
## 150
## 111
## 107
## 194
## 343
## 301
## 73
## 141
## 213
## 419
## 57
## 237
## 2
## 221
## 180
## 105
## 41
## 403
## 187
## 132
## 137
## 45
```

```
## 369
## 23
## 320
## 329
## 171                                                                         (On-ECLS, Stool, Bacte
## 191
## 283
## 411
## 294
## 267
## 317
## 392
## 347                                                                        (Pre-ECLS, Peritoneal F
## 316
## 258
## 324
## 12
## 290
## 42
## 338
## 225
## 269                                                                                  (On-ECLS, Re
## 198
## 35
## 358
## 275
## 67
## 401                                                                                       (Pre-EC
## 402
## 5
## 243
## 255
## 27
## 231
## 354
## 130
## 399
## 98
## 233
## 146
## 18
## 295                                  (On-ECLS, Blood, Bacteria, Klebsiella pneumoniae), (On-ECLS,
## 228
## 70
## 26
## 350
## 382
## 362
## 232
## 396
## 219
## 125
## 288
## 32
```

```
## 334
## 248
## 147
##     support_type transfer covid pregnant year days_to_discharge admission_date
## 357         <NA>       NA    NA       NA   NA                NA           <NA>
## 292    Pulmonary    FALSE FALSE       NA 2021                36     2021-02-09
## 227         <NA>    FALSE FALSE       NA 2021                20     2020-10-06
## 40       Cardiac    FALSE FALSE       NA 2021                14     2021-10-25
## 94          <NA>    FALSE  TRUE       NA 2020                 9     2021-05-25
## 96          <NA>    FALSE  TRUE       NA 2019                NA     2020-03-09
## 414         <NA>    FALSE FALSE       NA 2019                 1     2021-04-10
## 192         <NA>    FALSE  TRUE       NA 2019                19     2021-10-22
## 208         <NA>    FALSE FALSE       NA 2020                48     2020-10-21
## 33          <NA>    FALSE FALSE       NA 2021                33     2021-06-11
## 118         <NA>    FALSE FALSE       NA 2018                NA     2021-10-11
## 188         <NA>    FALSE  TRUE       NA 2019                 1     2020-01-05
## 14          <NA>    FALSE FALSE       NA 2020                 0     2020-03-15
## 250      Cardiac    FALSE FALSE       NA 2019                 5     2020-09-24
## 22          <NA>    FALSE  TRUE       NA 2020                55     2020-05-26
## 366    Pulmonary    FALSE  TRUE       NA 2018                95     2021-05-01
## 181         <NA>    FALSE FALSE       NA 2019                35     2020-10-12
## 309         <NA>    FALSE FALSE       NA 2020                NA     2021-03-09
## 421         <NA>    FALSE FALSE       NA 2021                30     2021-07-28
## 216      Cardiac    FALSE  TRUE       NA 2021                 6     2020-12-21
## 199         <NA>    FALSE FALSE       NA 2020                NA     2020-07-24
## 360         ECPR    FALSE FALSE       NA 2020                NA     2021-05-27
## 65          <NA>    FALSE FALSE       NA 2018                NA     2021-04-13
## 68       Cardiac    FALSE FALSE       NA 2020                10     2021-02-07
## 312         <NA>    FALSE FALSE       NA 2018                27     2021-05-21
## 101      Cardiac    FALSE FALSE       NA 2018                50     2021-09-23
## 285         <NA>    FALSE  TRUE       NA 2020                NA     2021-08-28
## 91     Pulmonary    FALSE FALSE       NA 2022                12     2020-08-15
## 46          ECPR    FALSE FALSE       NA 2020                19     2020-07-03
## 203         <NA>    FALSE FALSE       NA 2020                NA     2020-11-05
## 424         <NA>    FALSE FALSE       NA 2020                NA     2021-05-29
## 99          <NA>    FALSE FALSE       NA 2020                12     2020-10-25
## 310    Pulmonary    FALSE FALSE       NA 2020                37     2020-08-27
## 412         <NA>    FALSE FALSE       NA 2020                14     2020-01-20
## 143         <NA>    FALSE FALSE     TRUE 2018                14     2021-03-12
## 311      Cardiac     TRUE FALSE       NA 2019                 7     2021-11-24
## 175         <NA>    FALSE  TRUE       NA 2021                 7     2020-09-28
## 379         <NA>    FALSE    NA       NA 2019                NA     2020-09-25
## 170      Cardiac    FALSE FALSE       NA 2020                 7     2020-08-19
## 377         <NA>    FALSE FALSE       NA 2020                26     2020-01-26
## 342    Pulmonary    FALSE  TRUE       NA 2019                 7     2020-04-27
## 159         <NA>    FALSE FALSE       NA 2018                 3     2020-09-11
## 335      Cardiac    FALSE FALSE       NA 2018                 8     2020-02-05
## 265         <NA>    FALSE FALSE       NA 2020                12     2020-03-28
## 349      Cardiac    FALSE FALSE       NA 2020                30     2021-10-13
## 291         <NA>    FALSE  TRUE     TRUE 2020                17     2021-02-19
## 415         ECPR    FALSE FALSE       NA 2019                 1     2020-12-07
## 7           <NA>    FALSE  TRUE       NA 2020                NA     2020-05-10
## 217         <NA>    FALSE  TRUE     TRUE 2020                 3     2020-05-06
## 197         <NA>    FALSE FALSE       NA 2019                 9     2021-06-08
```

```
## 121         ECPR    FALSE FALSE       NA 2019               NA     2021-03-17
## 241    Pulmonary    FALSE  TRUE       NA 2018               15     2021-05-08
## 240         <NA>    FALSE FALSE       NA 2020               NA     2020-07-13
## 322         ECPR    FALSE FALSE       NA 2020               23     2020-09-23
## 109         <NA>    FALSE FALSE       NA 2018               35     2020-03-07
## 116         <NA>    FALSE FALSE       NA 2018               11     2020-03-16
## 214         <NA>    FALSE  TRUE       NA 2020               20     2020-07-14
## 313         <NA>    FALSE FALSE       NA 2019                4     2021-01-15
## 190    Pulmonary    FALSE  TRUE       NA 2020               19     2021-01-11
## 371         <NA>    FALSE FALSE       NA 2020               11     2021-03-01
## 337         <NA>    FALSE FALSE       NA 2019               20     2020-03-13
## 29          <NA>    FALSE FALSE       NA 2018              101     2020-10-05
## 37          <NA>    FALSE FALSE       NA 2019               10     2021-12-05
## 346         <NA>    FALSE FALSE       NA 2021               19     2021-10-17
## 339         ECPR    FALSE FALSE       NA 2020              103     2021-11-07
## 229      Cardiac    FALSE FALSE       NA 2020               NA     2020-02-28
## 395         <NA>    FALSE  TRUE       NA 2019               12     2021-02-13
## 16     Pulmonary    FALSE FALSE       NA 2018                9     2020-10-14
## 114         <NA>     TRUE  TRUE       NA 2019               NA     2021-04-02
## 58       Cardiac    FALSE  TRUE       NA 2020               15     2020-11-28
## 135         <NA>    FALSE  TRUE       NA 2019               NA     2020-08-14
## 196      Cardiac    FALSE FALSE       NA 2020               58     2020-11-06
## 30       Cardiac    FALSE  TRUE       NA 2019               NA     2020-07-16
## 50     Pulmonary    FALSE FALSE       NA 2019               NA     2020-03-21
## 356    Pulmonary    FALSE FALSE       NA 2020               10     2020-09-27
## 193         <NA>    FALSE FALSE       NA 2018               42     2020-02-14
## 134    Pulmonary    FALSE FALSE       NA 2021               26     2020-08-21
## 173         ECPR    FALSE FALSE       NA 2018               NA     2020-01-07
## 112         <NA>    FALSE FALSE       NA 2018               10     2020-04-09
## 48          <NA>    FALSE FALSE       NA 2019                9     2020-02-06
## 289         <NA>    FALSE FALSE       NA 2018               NA     2020-06-17
## 51          <NA>    FALSE  TRUE       NA 2019               27     2021-08-31
## 215         <NA>    FALSE FALSE     TRUE 2019               33     2021-12-15
## 270         <NA>    FALSE  TRUE       NA 2021               16     2021-01-06
## 374         <NA>    FALSE FALSE       NA 2021               22     2020-05-12
## 244         <NA>    FALSE FALSE       NA 2020                6     2020-04-22
## 387         <NA>    FALSE  TRUE       NA 2021               27     2021-01-25
## 222         <NA>    FALSE FALSE       NA 2020               16     2021-10-20
## 90     Pulmonary    FALSE FALSE       NA 2022               65     2020-03-10
## 406         <NA>    FALSE  TRUE       NA 2020              103     2020-08-09
## 420         <NA>    FALSE  TRUE       NA 2019               NA     2021-04-17
## 368         <NA>    FALSE FALSE       NA 2020               NA     2020-08-26
## 179         <NA>    FALSE FALSE       NA 2017               58     2020-08-17
## 280         <NA>    FALSE FALSE       NA 2020               15     2021-01-27
## 284         <NA>    FALSE FALSE       NA 2022               NA     2021-10-09
## 373         <NA>    FALSE  TRUE       NA 2019               58     2021-07-21
## 306         <NA>    FALSE FALSE       NA 2020               NA     2021-12-20
## 183         <NA>    FALSE FALSE       NA 2019               NA     2021-06-13
## 62          <NA>    FALSE FALSE       NA 2020               NA     2020-05-27
## 131         <NA>    FALSE  TRUE       NA 2019               NA     2021-05-13
## 224         <NA>    FALSE  TRUE       NA 2019               23     2021-11-28
## 4           <NA>    FALSE FALSE       NA 2020               NA     2020-01-29
## 39     Pulmonary    FALSE FALSE       NA 2021               27     2020-04-14
## 327         <NA>    FALSE  TRUE       NA 2020                6     2021-04-04
```

```
## 138         <NA>    FALSE FALSE       NA 2020               28     2020-12-03
## 15          <NA>    FALSE FALSE       NA 2020               NA     2020-06-11
## 279      Cardiac    FALSE  TRUE       NA 2020               38     2020-11-26
## 341         <NA>    FALSE FALSE       NA 2021                6     2020-05-28
## 266         <NA>    FALSE FALSE       NA 2021               13     2020-05-20
## 273         <NA>    FALSE FALSE       NA 2019                1     2020-06-04
## 24          <NA>    FALSE FALSE       NA 2021               NA     2020-02-12
## 405         <NA>    FALSE FALSE       NA 2019               24     2020-02-13
## 113         <NA>    FALSE FALSE       NA 2020               NA     2020-02-22
## 6           <NA>    FALSE  TRUE       NA 2020               NA     2021-06-18
## 88          <NA>    FALSE FALSE       NA 2021               41     2020-04-28
## 71     Pulmonary    FALSE FALSE       NA 2019               NA     2020-03-14
## 298         <NA>    FALSE  TRUE       NA 2021               22     2020-06-14
## 340      Cardiac    FALSE FALSE       NA 2019                7     2020-08-22
## 19          <NA>     TRUE FALSE       NA 2020               19     2020-06-18
## 127         <NA>    FALSE FALSE       NA 2022                8     2020-12-31
## 367         <NA>    FALSE FALSE       NA 2019                7     2021-09-11
## 20     Pulmonary    FALSE FALSE       NA 2020               36     2020-02-19
## 120         <NA>    FALSE FALSE       NA 2018               28     2021-07-17
## 331      Cardiac    FALSE  TRUE       NA 2018               NA     2020-07-08
## 303         <NA>    FALSE  TRUE       NA 2019               39     2021-07-04
## 140    Pulmonary    FALSE FALSE       NA 2021                2     2020-04-30
## 80          <NA>    FALSE FALSE       NA 2019               NA     2020-11-11
## 238         <NA>    FALSE FALSE       NA 2020                7     2020-03-22
## 253         <NA>    FALSE  TRUE       NA 2020               NA     2020-03-01
## 133         <NA>    FALSE FALSE       NA 2021               11     2021-05-30
## 388         <NA>    FALSE FALSE       NA 2021               NA     2020-07-07
## 38          <NA>    FALSE FALSE       NA 2019              107     2020-01-03
## 274      Cardiac    FALSE FALSE       NA 2021               30     2020-02-15
## 321         <NA>    FALSE FALSE       NA 2017               30     2020-07-27
## 154         <NA>     TRUE FALSE       NA 2019               21     2021-05-24
## 79     Pulmonary    FALSE  TRUE       NA 2020               19     2020-07-25
## 390         <NA>    FALSE FALSE       NA 2020               46     2021-02-18
## 104         <NA>    FALSE FALSE       NA 2020               NA     2020-01-11
## 218         <NA>    FALSE FALSE       NA 2020                2     2021-07-15
## 211      Cardiac    FALSE FALSE       NA 2020               30     2020-01-18
## 318         <NA>    FALSE  TRUE       NA 2019               27     2020-12-06
## 167      Cardiac    FALSE FALSE       NA 2019               NA     2021-06-10
## 52          <NA>    FALSE  TRUE       NA 2021               45     2020-03-20
## 119         <NA>    FALSE FALSE       NA 2020                3     2021-02-14
## 76     Pulmonary    FALSE FALSE       NA 2020               11     2020-04-10
## 115      Cardiac    FALSE  TRUE     TRUE 2018                7     2021-01-29
## 394         <NA>    FALSE FALSE       NA 2017               NA     2021-10-04
## 164         <NA>    FALSE  TRUE       NA 2019               12     2020-02-08
## 110      Cardiac    FALSE FALSE       NA 2020               NA     2020-07-31
## 81          <NA>    FALSE FALSE       NA 2019               NA     2021-04-19
## 413         <NA>    FALSE FALSE       NA 2019               NA     2020-01-30
## 370      Cardiac    FALSE FALSE       NA 2018               NA     2020-11-07
## 272      Cardiac    FALSE FALSE       NA 2018               20     2020-08-12
## 182      Cardiac    FALSE FALSE     TRUE 2020               15     2021-01-10
## 31          ECPR    FALSE FALSE       NA 2018               12     2020-05-08
## 17          <NA>    FALSE  TRUE       NA 2019               32     2021-03-13
## 78          <NA>    FALSE FALSE       NA 2018              101     2021-12-13
## 410         ECPR    FALSE FALSE       NA 2019               11     2021-04-22
```

```
## 161         <NA>    FALSE FALSE       NA 2019               10     2021-07-18
## 254         <NA>    FALSE FALSE       NA 2021                6     2020-01-04
## 100         <NA>    FALSE FALSE       NA 2018               71     2020-06-10
## 87          <NA>    FALSE FALSE       NA 2020               34     2020-05-14
## 155      Cardiac    FALSE FALSE       NA 2019               NA     2021-05-28
## 60       Cardiac    FALSE FALSE       NA 2019               17     2020-11-22
## 63          <NA>    FALSE FALSE       NA 2019               12     2020-10-15
## 153         <NA>    FALSE FALSE       NA 2018                1     2021-01-05
## 102         <NA>    FALSE FALSE       NA 2020                8     2020-02-04
## 359         <NA>    FALSE FALSE       NA 2020               NA     2020-06-22
## 307      Cardiac    FALSE FALSE       NA 2019               15     2021-01-03
## 126      Cardiac    FALSE  TRUE       NA 2018                3     2020-12-12
## 304         <NA>    FALSE FALSE       NA 2020               23     2020-04-18
## 186         <NA>    FALSE FALSE       NA 2019               80     2021-09-09
## 66     Pulmonary    FALSE FALSE       NA 2019                8     2020-12-29
## 296      Cardiac     TRUE FALSE       NA 2018               15     2020-12-01
## 103         <NA>    FALSE FALSE       NA 2021               NA     2020-05-25
## 163         ECPR    FALSE FALSE       NA 2021               11     2020-03-11
## 281      Cardiac    FALSE FALSE       NA 2021              107     2021-04-26
## 212         <NA>    FALSE FALSE       NA 2019               95     2020-03-02
## 123         ECPR     TRUE FALSE       NA 2018               83     2020-01-13
## 422      Cardiac    FALSE  TRUE       NA 2019               27     2020-03-25
## 172         <NA>    FALSE FALSE       NA 2018               10     2020-12-09
## 56     Pulmonary    FALSE  TRUE     TRUE 2020               33     2021-05-06
## 205         <NA>    FALSE FALSE       NA 2019               14     2021-12-02
## 351      Cardiac    FALSE FALSE       NA 2018               14     2020-09-29
## 325         <NA>    FALSE FALSE       NA 2021               NA     2020-10-22
## 150         <NA>    FALSE  TRUE       NA 2019               NA     2021-01-20
## 111         <NA>    FALSE  TRUE       NA 2022               58     2020-08-18
## 107         <NA>    FALSE FALSE       NA 2019               NA     2020-02-11
## 194         <NA>    FALSE FALSE       NA 2020               39     2020-11-18
## 343         <NA>    FALSE  TRUE       NA 2018               17     2021-11-16
## 301         <NA>     TRUE FALSE       NA 2017               38     2020-06-21
## 73          <NA>    FALSE FALSE       NA 2019               13     2020-07-11
## 141    Pulmonary    FALSE FALSE       NA 2021               14     2020-03-18
## 213         <NA>    FALSE  TRUE       NA 2021                1     2020-01-06
## 419      Cardiac    FALSE FALSE       NA 2020               10     2020-06-28
## 57          <NA>    FALSE  TRUE       NA 2021               69     2020-02-17
## 237    Pulmonary    FALSE FALSE       NA 2019               33     2020-02-03
## 2           <NA>    FALSE  TRUE       NA 2018                7     2020-10-17
## 221         <NA>    FALSE  TRUE       NA 2018               44     2021-11-13
## 180    Pulmonary    FALSE FALSE       NA 2021                3     2021-04-01
## 105         <NA>    FALSE FALSE       NA 2020               NA     2020-07-22
## 41     Pulmonary    FALSE FALSE       NA 2020               19     2021-12-18
## 403         <NA>    FALSE FALSE       NA 2020               18     2020-02-02
## 187      Cardiac    FALSE FALSE       NA 2019               NA     2020-10-28
## 132         <NA>    FALSE FALSE       NA 2022               34     2021-07-24
## 137         ECPR    FALSE  TRUE       NA 2018                0     2021-05-19
## 45          <NA>    FALSE FALSE       NA 2020               NA     2021-06-05
## 369         <NA>    FALSE FALSE       NA 2019               61     2020-05-18
## 23       Cardiac    FALSE FALSE       NA 2020               66     2020-05-15
## 320         <NA>    FALSE  TRUE       NA 2020                6     2020-02-21
## 329         <NA>    FALSE FALSE       NA 2017               16     2020-10-27
## 171    Pulmonary    FALSE  TRUE       NA 2018               NA     2021-06-09
```

```
## 191         <NA>    FALSE FALSE       NA 2020              43     2021-09-19
## 283    Pulmonary    FALSE  TRUE       NA 2021              NA     2020-02-18
## 411         <NA>    FALSE FALSE       NA 2019               7     2021-02-12
## 294         <NA>    FALSE FALSE       NA 2019              17     2021-06-20
## 267      Cardiac    FALSE FALSE       NA 2020              49     2020-11-21
## 317      Cardiac    FALSE FALSE       NA 2020               5     2021-07-26
## 392         ECPR    FALSE  TRUE       NA 2020              19     2021-04-07
## 347      Cardiac    FALSE FALSE       NA 2020               7     2020-03-26
## 316      Cardiac    FALSE FALSE       NA 2019               1     2021-02-27
## 258      Cardiac    FALSE FALSE       NA 2019              66     2020-07-15
## 324         <NA>    FALSE  TRUE     TRUE 2020              25     2020-04-24
## 12       Cardiac    FALSE FALSE       NA 2018              NA     2021-05-15
## 290         <NA>    FALSE FALSE       NA 2018              14     2020-06-07
## 42          <NA>    FALSE FALSE       NA 2018              48     2020-08-23
## 338         <NA>    FALSE  TRUE       NA 2020              65     2020-03-06
## 225         <NA>    FALSE FALSE       NA 2019              NA     2021-02-23
## 269      Cardiac    FALSE  TRUE       NA 2018              NA     2020-07-02
## 198         <NA>    FALSE FALSE       NA 2019               2     2020-06-01
## 35          <NA>    FALSE FALSE       NA 2022               9     2020-06-09
## 358         <NA>    FALSE  TRUE       NA 2019              21     2021-03-22
## 275         <NA>    FALSE FALSE       NA 2018              NA     2020-06-06
## 67       Cardiac     TRUE  TRUE       NA 2019              12     2021-01-07
## 401         <NA>    FALSE FALSE       NA 2019              17     2021-11-12
## 402         <NA>    FALSE FALSE       NA 2019               6     2021-06-07
## 5           <NA>    FALSE FALSE     TRUE 2022              NA     2021-07-02
## 243         <NA>    FALSE  TRUE       NA 2020              18     2021-02-05
## 255         <NA>    FALSE  TRUE       NA 2020               3     2020-07-06
## 27          <NA>    FALSE  TRUE       NA 2020               2     2020-04-26
## 231    Pulmonary    FALSE FALSE     TRUE 2020              16     2020-12-22
## 354         <NA>    FALSE FALSE       NA 2018              NA     2021-04-09
## 130         <NA>    FALSE FALSE       NA 2021              39     2021-07-31
## 399    Pulmonary     TRUE FALSE       NA 2021              NA     2020-04-03
## 98          <NA>    FALSE FALSE       NA 2021              13     2021-04-14
## 233         <NA>    FALSE  TRUE       NA 2018              30     2020-04-17
## 146         <NA>    FALSE FALSE       NA 2021               7     2020-04-21
## 18       Cardiac    FALSE FALSE       NA 2021              NA     2020-02-27
## 295         <NA>    FALSE FALSE       NA 2020              NA     2020-04-04
## 228         <NA>    FALSE FALSE       NA 2018              20     2020-11-29
## 70          <NA>    FALSE FALSE       NA 2021              19     2021-08-16
## 26          <NA>    FALSE FALSE       NA 2021              17     2020-05-11
## 350         <NA>    FALSE  TRUE       NA 2019              15     2020-10-24
## 382         <NA>     TRUE FALSE       NA 2021              26     2021-05-05
## 362    Pulmonary     TRUE FALSE       NA 2018              NA     2020-08-07
## 232    Pulmonary    FALSE FALSE     TRUE 2019               0     2021-12-26
## 396         <NA>    FALSE FALSE       NA 2022              53     2020-03-23
## 219         <NA>    FALSE  TRUE       NA 2018              30     2021-11-14
## 125         <NA>    FALSE FALSE       NA 2021              NA     2021-04-20
## 288      Cardiac    FALSE  TRUE       NA 2019              46     2020-05-16
## 32          ECPR    FALSE  TRUE       NA 2018              20     2020-03-04
## 334      Cardiac    FALSE FALSE       NA 2019              58     2020-05-04
## 248      Cardiac    FALSE FALSE       NA 2020              22     2021-12-12
## 147      Cardiac    FALSE FALSE       NA 2019               2     2020-11-30
##     discharge_date death_date
## 357           <NA>       <NA>
```

```
## 292     2021-02-10       <NA>
## 227     2020-11-20 2020-11-20
## 40      2021-12-05       <NA>
## 94      2021-05-29       <NA>
## 96      2020-03-15       <NA>
## 414     2021-05-09       <NA>
## 192     2021-11-06       <NA>
## 208     2020-10-28 2020-10-28
## 33      2021-06-30       <NA>
## 118     2021-11-05       <NA>
## 188     2020-01-12       <NA>
## 14      2020-04-21 2020-04-21
## 250     2020-10-07       <NA>
## 22      2020-07-14       <NA>
## 366     2021-05-15       <NA>
## 181     2020-11-21       <NA>
## 309     2021-03-15 2021-03-15
## 421     2021-09-11 2021-09-11
## 216     2021-01-17 2021-01-17
## 199     2020-08-16       <NA>
## 360     2021-06-26       <NA>
## 65      2021-05-18       <NA>
## 68      2021-03-08       <NA>
## 312     2021-06-26       <NA>
## 101     2021-10-07       <NA>
## 285     2021-09-07       <NA>
## 91      2020-09-24       <NA>
## 46      2020-08-10 2020-08-10
## 203     2020-12-17       <NA>
## 424     2021-06-21 2021-06-21
## 99      2020-11-01 2020-11-01
## 310     2020-09-25       <NA>
## 412     2020-02-07       <NA>
## 143     2021-04-09       <NA>
## 311     2022-01-03       <NA>
## 175     2020-10-26       <NA>
## 379     2020-10-30       <NA>
## 170     2020-09-11       <NA>
## 377     2020-03-04       <NA>
## 342     2020-04-29 2020-04-29
## 159     2020-10-08       <NA>
## 335     2020-03-02       <NA>
## 265     2020-04-06       <NA>
## 349     2021-10-20       <NA>
## 291     2021-04-05       <NA>
## 415     2021-01-14 2021-01-14
## 7       2020-05-31       <NA>
## 217     2020-06-04 2020-06-04
## 197     2021-07-05       <NA>
## 121     2021-03-30       <NA>
## 241     2021-06-01       <NA>
## 240     2020-07-23       <NA>
## 322     2020-11-02       <NA>
## 109     2020-03-15       <NA>
```

```
## 116     2020-03-23       <NA>
## 214     2020-07-30       <NA>
## 313     2021-02-28 2021-02-28
## 190     2021-01-23       <NA>
## 371     2021-03-13       <NA>
## 337     2020-04-27       <NA>
## 29      2020-11-18       <NA>
## 37      2022-01-11       <NA>
## 346     2021-11-01       <NA>
## 339     2021-11-23 2021-11-23
## 229     2020-04-09       <NA>
## 395     2021-03-24       <NA>
## 16      2020-11-18       <NA>
## 114     2021-04-18       <NA>
## 58      2020-12-28 2020-12-28
## 135     2020-08-25       <NA>
## 196     2020-12-19 2020-12-19
## 30      2020-08-05 2020-08-05
## 50      2020-04-20       <NA>
## 356     2020-10-15       <NA>
## 193     2020-04-01       <NA>
## 134     2020-09-11       <NA>
## 173     2020-02-18 2020-02-18
## 112     2020-05-21       <NA>
## 48      2020-03-16       <NA>
## 289     2020-07-31       <NA>
## 51      2021-09-20       <NA>
## 215     2021-12-30       <NA>
## 270     2021-02-15       <NA>
## 374     2020-05-25       <NA>
## 244     2020-05-08 2020-05-08
## 387     2021-03-12 2021-03-12
## 222     2021-12-06       <NA>
## 90      2020-03-30       <NA>
## 406     2020-08-13 2020-08-13
## 420     2021-05-12 2021-05-12
## 368     2020-10-15 2020-10-15
## 179     2020-08-23       <NA>
## 280     2021-03-11 2021-03-11
## 284     2021-11-11       <NA>
## 373     2021-08-18       <NA>
## 306     2022-02-07       <NA>
## 183     2021-06-18 2021-06-18
## 62      2020-05-28 2020-05-28
## 131     2021-05-28       <NA>
## 224     2021-12-02 2021-12-02
## 4       2020-02-25 2020-02-25
## 39      2020-05-25       <NA>
## 327     2021-05-14       <NA>
## 138     2021-01-01       <NA>
## 15      2020-06-17       <NA>
## 279     2021-01-10 2021-01-10
## 341     2020-06-02       <NA>
## 266     2020-07-03 2020-07-03
```

```
## 273     2020-07-05       <NA>
## 24      2020-03-09 2020-03-09
## 405     2020-02-24       <NA>
## 113     2020-03-31       <NA>
## 6       2021-07-24       <NA>
## 88      2020-05-10       <NA>
## 71      2020-05-01 2020-05-01
## 298     2020-08-01       <NA>
## 340     2020-08-28       <NA>
## 19      2020-07-16       <NA>
## 127     2021-01-05       <NA>
## 367     2021-09-15 2021-09-15
## 20      2020-03-30 2020-03-30
## 120     2021-07-23       <NA>
## 331     2020-08-23       <NA>
## 303     2021-07-06       <NA>
## 140     2020-05-25       <NA>
## 80      2020-12-11 2020-12-11
## 238     2020-04-21       <NA>
## 253     2020-04-04 2020-04-04
## 133     2021-06-20       <NA>
## 388     2020-08-26       <NA>
## 38      2020-01-04       <NA>
## 274     2020-02-19 2020-02-19
## 321     2020-09-02 2020-09-02
## 154     2021-06-02       <NA>
## 79      2020-07-29 2020-07-29
## 390     2021-03-19       <NA>
## 104     2020-01-29       <NA>
## 218     2021-08-21 2021-08-21
## 211     2020-01-21 2020-01-21
## 318     2020-12-19 2020-12-19
## 167     2021-07-28 2021-07-28
## 52      2020-03-21 2020-03-21
## 119     2021-02-27 2021-02-27
## 76      2020-04-13       <NA>
## 115     2021-02-19       <NA>
## 394     2021-11-07 2021-11-07
## 164     2020-03-18       <NA>
## 110     2020-09-03 2020-09-03
## 81      2021-04-21       <NA>
## 413     2020-03-04 2020-03-04
## 370     2020-12-01       <NA>
## 272     2020-09-07       <NA>
## 182     2021-01-17 2021-01-17
## 31      2020-06-27       <NA>
## 17      2021-03-14       <NA>
## 78      2022-01-30 2022-01-30
## 410     2021-06-04       <NA>
## 161     2021-07-30 2021-07-30
## 254     2020-02-23       <NA>
## 100     2020-07-25       <NA>
## 87      2020-05-15 2020-05-15
## 155     2021-07-02 2021-07-02
```

```
## 60      2021-01-04       <NA>
## 63      2020-11-21       <NA>
## 153     2021-01-26 2021-01-26
## 102     2020-02-18       <NA>
## 359     2020-07-29       <NA>
## 307     2021-02-10 2021-02-10
## 126     2021-01-12 2021-01-12
## 304     2020-05-07 2020-05-07
## 186     2021-09-21 2021-09-21
## 66      2021-01-17       <NA>
## 296     2020-12-28       <NA>
## 103     2020-06-30 2020-06-30
## 163     2020-04-22       <NA>
## 281     2021-04-29       <NA>
## 212     2020-04-12       <NA>
## 123     2020-02-05       <NA>
## 422     2020-05-10       <NA>
## 172     2021-01-03 2021-01-03
## 56      2021-05-23 2021-05-23
## 205     2021-12-18       <NA>
## 351     2020-10-18       <NA>
## 325     2020-10-25       <NA>
## 150     2021-03-04 2021-03-04
## 111     2020-09-20       <NA>
## 107     2020-03-05       <NA>
## 194     2020-12-23       <NA>
## 343     2021-12-04       <NA>
## 301     2020-07-20       <NA>
## 73      2020-08-26       <NA>
## 141     2020-05-04 2020-05-04
## 213     2020-02-17       <NA>
## 419     2020-07-08 2020-07-08
## 57      2020-02-24       <NA>
## 237     2020-02-14       <NA>
## 2       2020-11-16       <NA>
## 221     2021-12-07       <NA>
## 180     2021-05-09 2021-05-09
## 105     2020-08-22 2020-08-22
## 41      2022-02-06 2022-02-06
## 403     2020-03-23       <NA>
## 187     2020-11-29       <NA>
## 132     2021-07-26       <NA>
## 137     2021-06-23       <NA>
## 45      2021-07-04       <NA>
## 369     2020-06-22       <NA>
## 23      2020-05-30       <NA>
## 320     2020-02-26 2020-02-26
## 329     2020-11-04       <NA>
## 171     2021-07-15 2021-07-15
## 191     2021-10-25       <NA>
## 283     2020-03-08       <NA>
## 411     2021-02-17 2021-02-17
## 294     2021-06-28       <NA>
## 267     2021-01-07       <NA>
```

```
## 317     2021-07-31       <NA>
## 392     2021-05-27       <NA>
## 347     2020-03-30 2020-03-30
## 316     2021-03-03       <NA>
## 258     2020-08-27       <NA>
## 324     2020-06-07       <NA>
## 12      2021-05-20       <NA>
## 290     2020-06-25       <NA>
## 42      2020-09-21       <NA>
## 338     2020-04-05       <NA>
## 225     2021-04-08       <NA>
## 269     2020-07-22       <NA>
## 198     2020-07-07       <NA>
## 35      2020-07-13       <NA>
## 358     2021-04-26 2021-04-26
## 275     2020-06-07 2020-06-07
## 67      2021-01-19       <NA>
## 401     2021-12-02       <NA>
## 402     2021-06-21 2021-06-21
## 5       2021-08-09       <NA>
## 243     2021-03-16       <NA>
## 255     2020-07-24       <NA>
## 27      2020-06-09       <NA>
## 231     2021-01-09       <NA>
## 354     2021-05-05       <NA>
## 130     2021-09-16       <NA>
## 399     2020-05-12 2020-05-12
## 98      2021-05-02 2021-05-02
## 233     2020-05-05 2020-05-05
## 146     2020-05-17       <NA>
## 18      2020-04-02       <NA>
## 295     2020-04-10       <NA>
## 228     2020-12-13 2020-12-13
## 70      2021-08-24       <NA>
## 26      2020-06-28       <NA>
## 350     2020-11-02       <NA>
## 382     2021-06-18 2021-06-18
## 362     2020-09-08       <NA>
## 232     2022-01-09 2022-01-09
## 396     2020-04-18 2020-04-18
## 219     2021-12-04       <NA>
## 125     2021-06-03       <NA>
## 288     2020-05-27       <NA>
## 32      2020-03-14       <NA>
## 334     2020-05-16       <NA>
## 248     2021-12-28 2021-12-28
## 147     2020-12-26       <NA>
```

#Some variables will have more than one value in the same cell, separated by a comma.

Use average for mechanical_vent_days in days not hours

#drop first row (just NA values)

```
synthetic_data = synthetic_data[-1,]
```

Evaluate if categorical variables have any category with a low frequency:

#Uses frecuency tables:

#standarizes sex colum:

```
synthetic_data$sex[synthetic_data$sex == 'Female'] <- "F"
synthetic_data$sex[synthetic_data$sex == 'Male'] <- "M"


table(synthetic_data$sex)
```

```
##
##   F   M
##  91 169
```

```
table(synthetic_data$race)
```

```
##
##    Black Hispanic    Other    White
##       23       12        8      216
```

```
table(synthetic_data$diagnosis)
```

```
##
##    Cardiovascular condition                    COVID-19
##                          73                          75
##                       Other Other respiratory condition
##                          18                          60
## Other respiratory infection
##                          11
```

```
table(synthetic_data$reintubation)
```

```
##
## FALSE  TRUE
##   139    19
```

```
table(synthetic_data$trached)
```

```
##
## FALSE  TRUE
##   142    76
```

```
table(synthetic_data$systemic_anticoagulation_type)
```

```
##
##                          Bivalirudin only
##                                        62
## Heparin and anticoagulant sodium citrate
##                                         1
##                   Heparin and bivalirudin
##                                        12
##                               Heparin only
##                                       126
##                          No anticoagulant
##                                        24
```

```
table(synthetic_data$acute_kidney_injury)
```

```
##
## FALSE  TRUE
##   117   106
```

```
table(synthetic_data$discharge_location)
```

```
##
##      Death       Home LTAC/rehab      Other
##         84         56         45          4
```

```
synthetic_data$steroids[synthetic_data$steroids == 'Unk'] <- "unk"
synthetic_data$steroids[synthetic_data$steroids == 'unk'] <- NA
table(synthetic_data$steroids)
```

```
##
##  No Yes
##  39  48
```

```
synthetic_data$infection[synthetic_data$infection == 'R/V/SARS CoV19'] <- 'SARS CoV19'
synthetic_data$infection[synthetic_data$infection == 'R/V/COVID-19'] <- 'SARS CoV19'
synthetic_data$infection[synthetic_data$infection == 'Hx of COVID19 - 1/2022'] <- 'SARS CoV19'
synthetic_data$infection[synthetic_data$infection == 'P/R/V/ Covid-19, P/R/GM+/ Strep sp, P/B/GM+/ Staph


synthetic_data$infection[synthetic_data$infection != 'SARS CoV19'] <- 'Other'

table(synthetic_data$infection)
```

```
##
##      Other SARS CoV19
##         57         71
```

```
table(synthetic_data$support_type)
```

```
##
##   Cardiac      ECPR Pulmonary
##        48        14        30
```

```
table(synthetic_data$transfer)
```

```
##
## FALSE  TRUE
##   252    11
```

```
table(synthetic_data$covid)
```

```
##
## FALSE  TRUE
##   192    70
```

```
table(synthetic_data$pregnant)
```

```
##
## TRUE
##   11
```

```
table(synthetic_data$mechanical_vent_days)
```

```
##
##          <= 12h       >= 7 days       12h - 24h 2 days - 7 days
##              77               8              73              31
```

#for example_lab_data:

```
table(example_lab_data$lab_exam)
```

```
##
## Cholesterol         CRP     Glucose  Hematocrit Lymphocytes   Platelets
##          80          80          80          80          80          80
```

Make sure that time variables are consistently coded: #convert char column into posixct

```
synthetic_data[['admission_date']] <- as.POSIXct(synthetic_data[['admission_date']],
                                    format = "%Y-%m-%d")


synthetic_data[['discharge_date']] <- as.POSIXct(synthetic_data[['discharge_date']],
                                    format = "%Y-%m-%d")

synthetic_data[['death_date']] <- as.POSIXct(synthetic_data[['death_date']],
                                    format = "%Y-%m-%d")
```

#for example_lab_data:

```
example_lab_data[['date']] <- as.POSIXct(example_lab_data[['date']],
                                    format = "%Y-%m-%d")
```

Evaluate categorical variables:

#for that, first convert to factors:

```
#example_lab_data$lab_exam <- as.factor(example_lab_data$lab_exam)

synthetic_data$sex <- as.factor(synthetic_data$sex)
synthetic_data$race  <- as.factor(synthetic_data$race)
synthetic_data$diagnosis  <- as.factor(synthetic_data$diagnosis)
synthetic_data$reintubation  <- as.factor(synthetic_data$reintubation)
synthetic_data$trached  <- as.factor(synthetic_data$trached)

synthetic_data$systemic_anticoagulation_type <- as.factor(synthetic_data$systemic_anticoagulation_type)

synthetic_data$acute_kidney_injury <- as.factor(synthetic_data$acute_kidney_injury)

synthetic_data$discharge_location <- as.factor(synthetic_data$discharge_location)

synthetic_data$steroids <- as.factor(synthetic_data$steroids)
synthetic_data$infection <- as.factor(synthetic_data$infection)
synthetic_data$support_type <- as.factor(synthetic_data$support_type)
synthetic_data$transfer <- as.factor(synthetic_data$transfer)
synthetic_data$covid <- as.factor(synthetic_data$covid)
synthetic_data$pregnant <- as.factor(synthetic_data$pregnant)
synthetic_data$mechanical_vent_days <- as.factor(synthetic_data$mechanical_vent_days)
```

Evaluate the distribution of numeric variables:

We can evaluate normality according to swek and kurtosis: #statistical summary number variables:

```
describe(synthetic_data$weight_kg)
```

```
##    vars   n   mean sd median trimmed   mad min   max range skew kurtosis   se
## X1    1 257 101.39 29   99.9   99.34 27.72  40 200.6 160.6 0.82     1.18 1.81
```

```
describe(synthetic_data$height_cm)
```

```
##    vars   n   mean    sd median trimmed   mad   min   max range  skew kurtosis
## X1    1 260 172.96 11.43    175  173.43 11.71 131.3 198.1  66.8 -0.49     0.24
##      se
## X1 0.71
```

```
describe(synthetic_data$bmi)
```

```
##    vars   n mean   sd median trimmed  mad   min    max  range  skew kurtosis
## X1    1 259 33.6 21.4   31.6   31.66 8.12 15.54 347.88 332.34 12.25   176.58
##      se
## X1 1.33
```

```
describe(synthetic_data$ph)
```

```
##    vars   n mean   sd median trimmed  mad  min  max range  skew kurtosis   se
## X1    1 214 7.27 0.14   7.28    7.28 0.17 6.78 7.53  0.75 -0.53     0.09 0.01
```

```
describe(synthetic_data$co2)
```

```
##    vars   n  mean    sd median trimmed   mad min max range skew kurtosis   se
## X1    1 215 52.12 18.37     48   50.26 14.83  12 128   116 1.31     2.76 1.25
```

```
describe(synthetic_data$o2)
```

```
##    vars   n   mean     sd median trimmed   mad min max range skew kurtosis   se
## X1    1 216 120.88 101.32   82.5  100.59 42.25  19 542   523 2.05     4.11 6.89
```

```
describe(synthetic_data$lactate_peak)
```

```
##    vars   n mean  sd median trimmed  mad min  max range skew kurtosis   se
## X1    1 227 5.48 4.4    3.5    4.77 2.37 0.5 17.5    17 1.25     0.65 0.29
```

```
describe(synthetic_data$creatinine_peak)
```

```
##    vars   n mean   sd median trimmed  mad  min  max range skew kurtosis   se
## X1    1 175 1.87 1.23    1.6     1.7 1.08 0.17 6.09  5.92 1.42     2.14 0.09
```

```
describe(synthetic_data$total_bilirubin_peak)
```

```
##    vars   n mean   sd median trimmed  mad min  max range skew kurtosis   se
## X1    1 182 3.27 4.12   1.85    2.45 1.56 0.2 27.3  27.1 3.56    15.71 0.31
```

```
describe(synthetic_data$hospital_los)
```

```
##    vars   n  mean    sd median trimmed   mad min max range skew kurtosis   se
## X1    1 225 32.05 31.26     23   26.65 20.76   1 181   180 2.13     5.68 2.08
```

```
describe(synthetic_data$days_to_discharge)
```

```
##    vars   n  mean    sd median trimmed   mad min max range skew kurtosis   se
## X1    1 197 24.84 23.51     17   20.82 14.83   0 107   107 1.69     2.71 1.68
```

normal graph

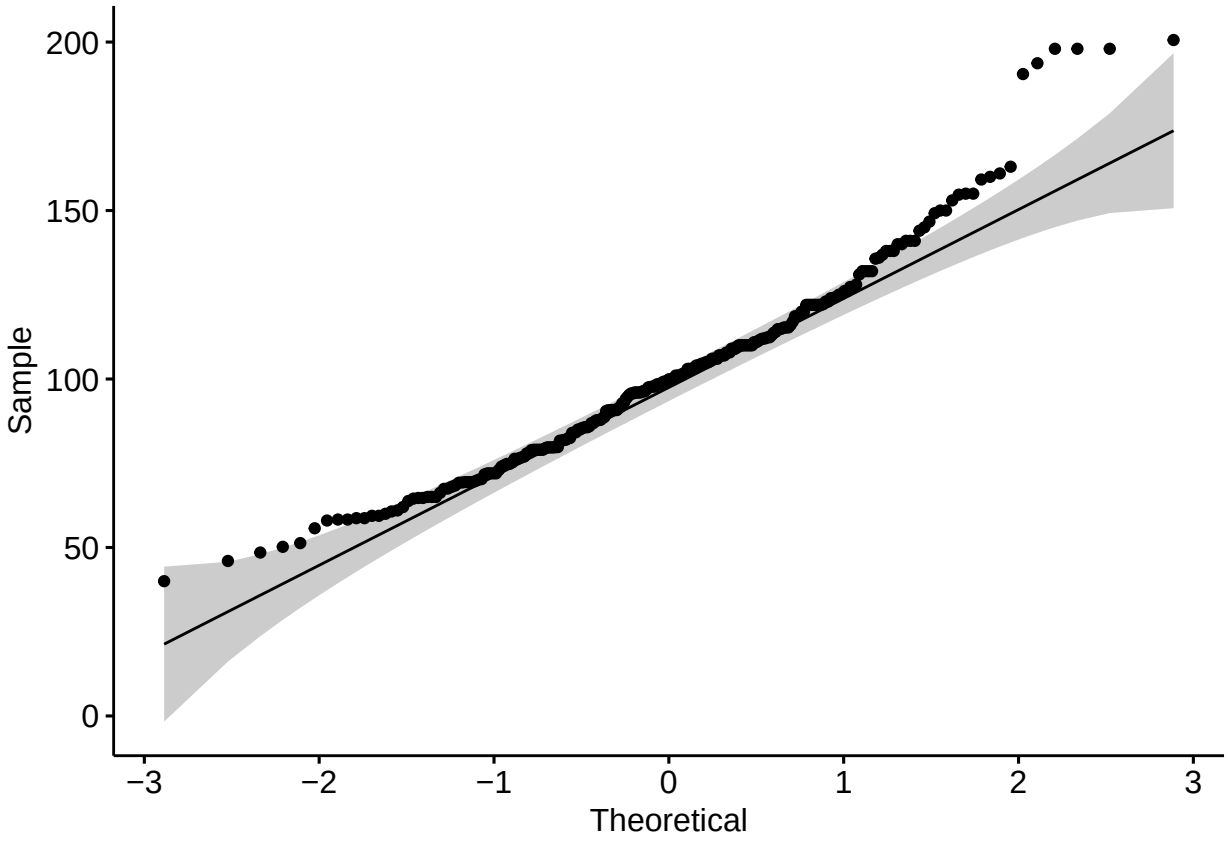
#As all the points fall approximately along this reference line, we can assume normality.

```
ggqqplot(synthetic_data$weight_kg)
```

```
## Warning: Removed 6 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 6 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 6 rows containing non-finite values (stat_qq_line).
```

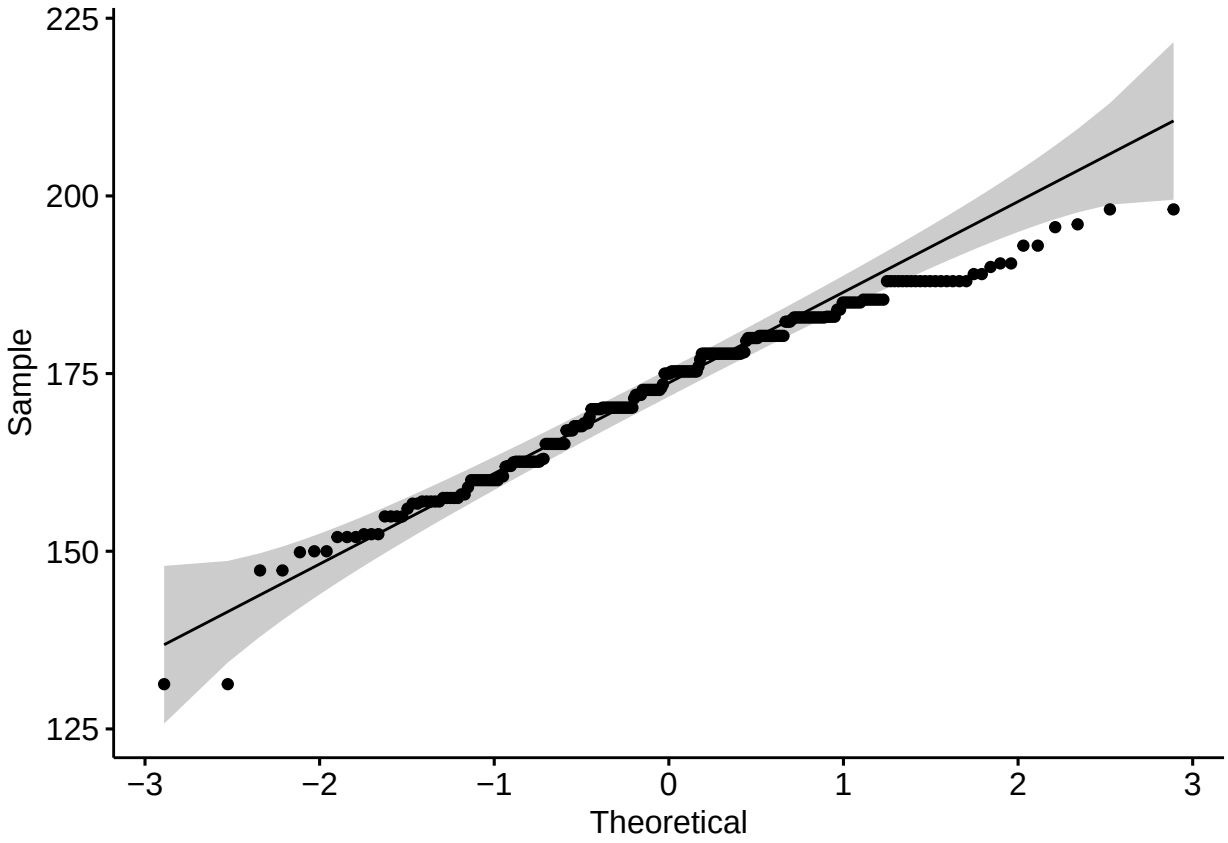



```
ggqqplot(synthetic_data$height_cm)
```

```
## Warning: Removed 3 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 3 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 3 rows containing non-finite values (stat_qq_line).
```

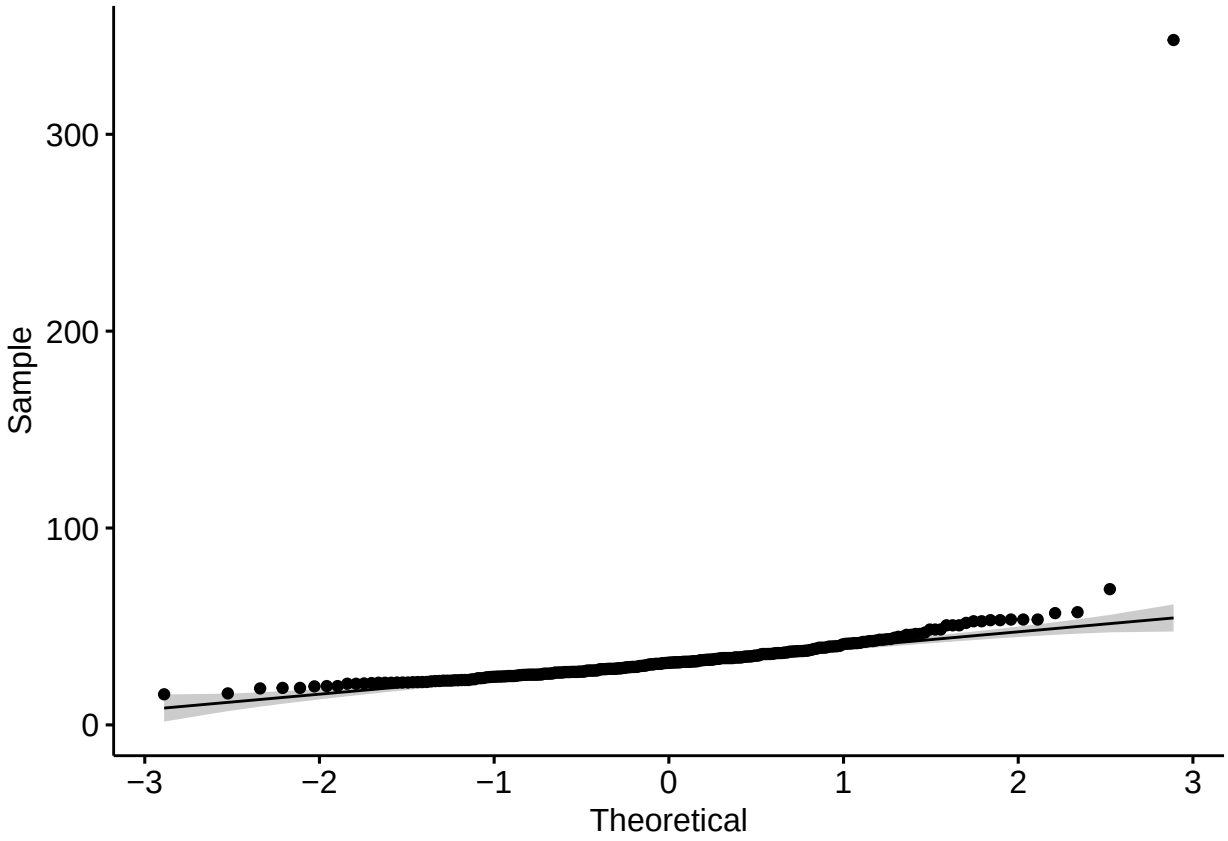



```
ggqqplot(synthetic_data$bmi)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_qq_line).
```

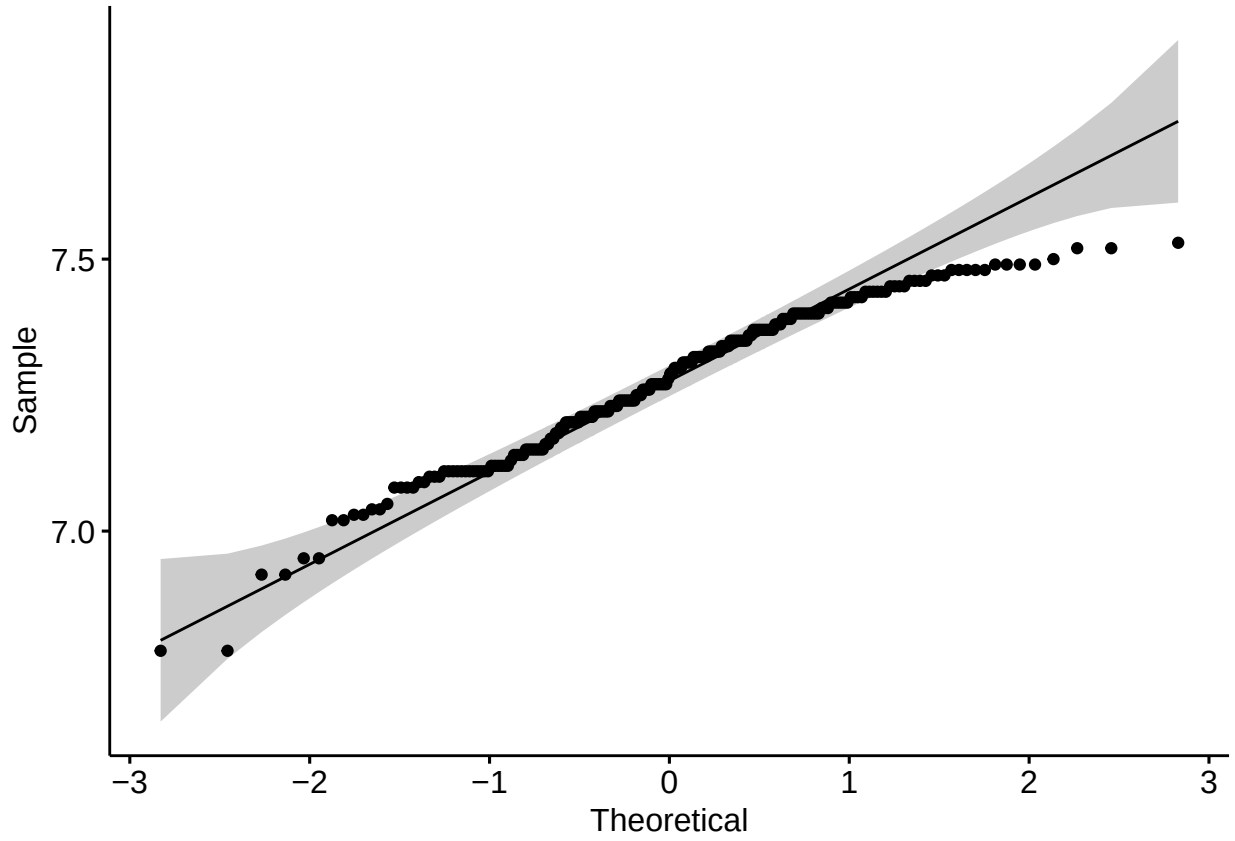



```
ggqqplot(synthetic_data$ph)
```

```
## Warning: Removed 49 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 49 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 49 rows containing non-finite values (stat_qq_line).
```

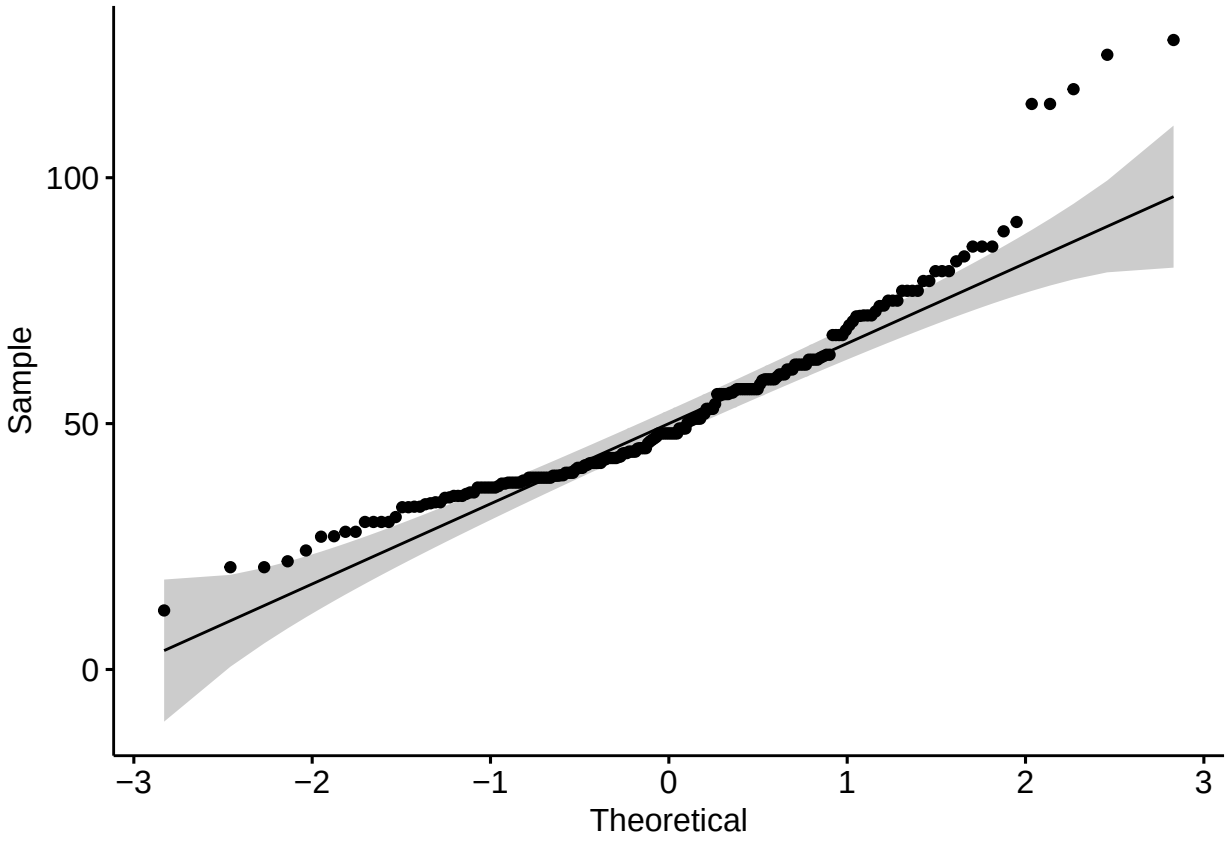



```
ggqqplot(synthetic_data$co2)
```

```
## Warning: Removed 48 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 48 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 48 rows containing non-finite values (stat_qq_line).
```

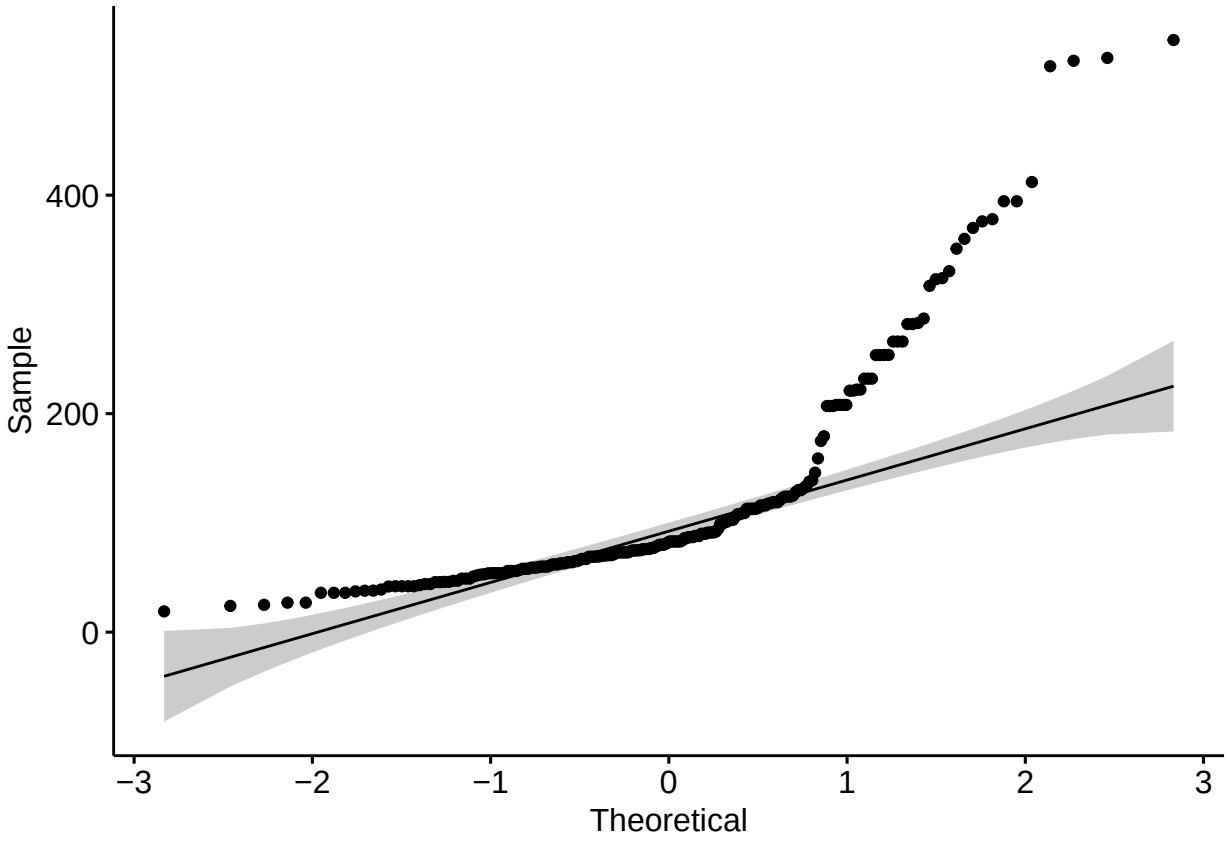



```
ggqqplot(synthetic_data$o2)
```

```
## Warning: Removed 47 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 47 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 47 rows containing non-finite values (stat_qq_line).
```

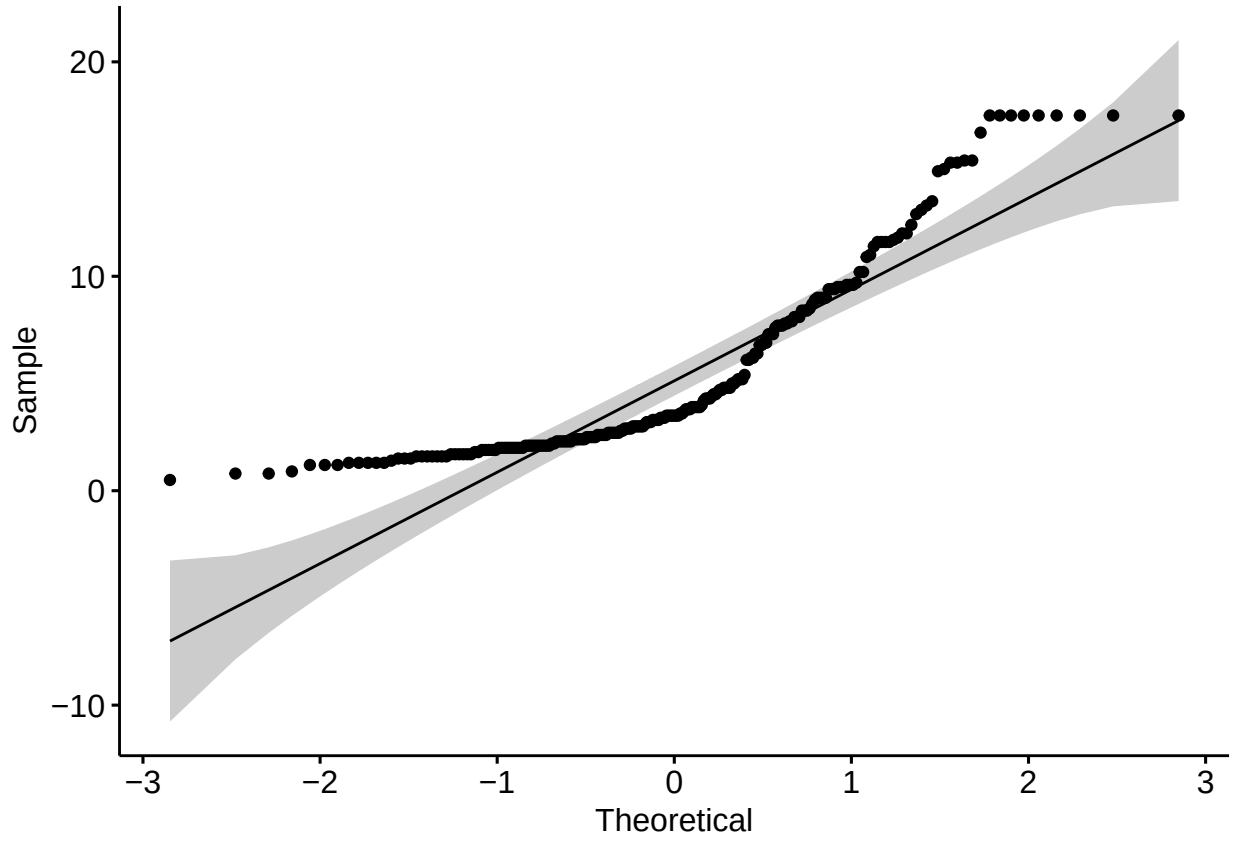



```
ggqqplot(synthetic_data$lactate_peak)
```

```
## Warning: Removed 36 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 36 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 36 rows containing non-finite values (stat_qq_line).
```

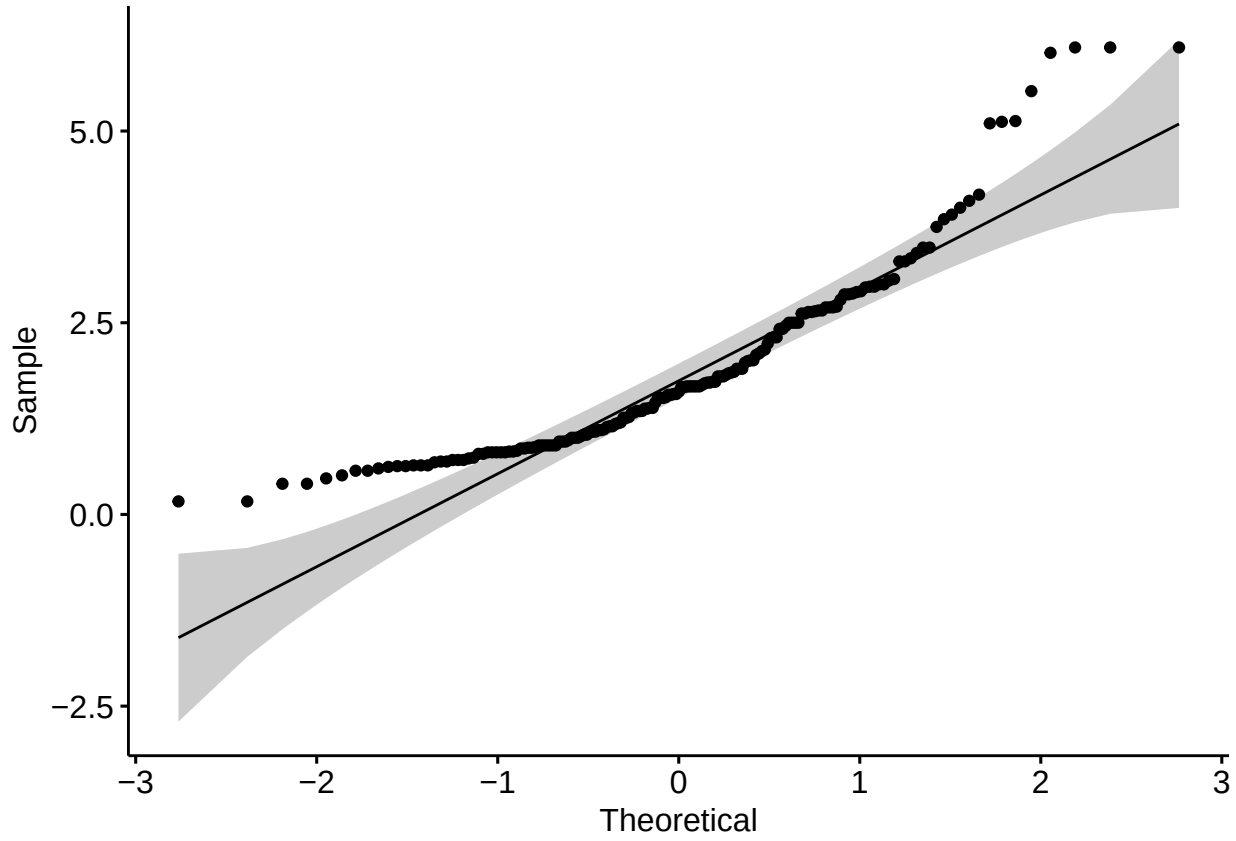



```
ggqqplot(synthetic_data$creatinine_peak)
```

```
## Warning: Removed 88 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 88 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 88 rows containing non-finite values (stat_qq_line).
```

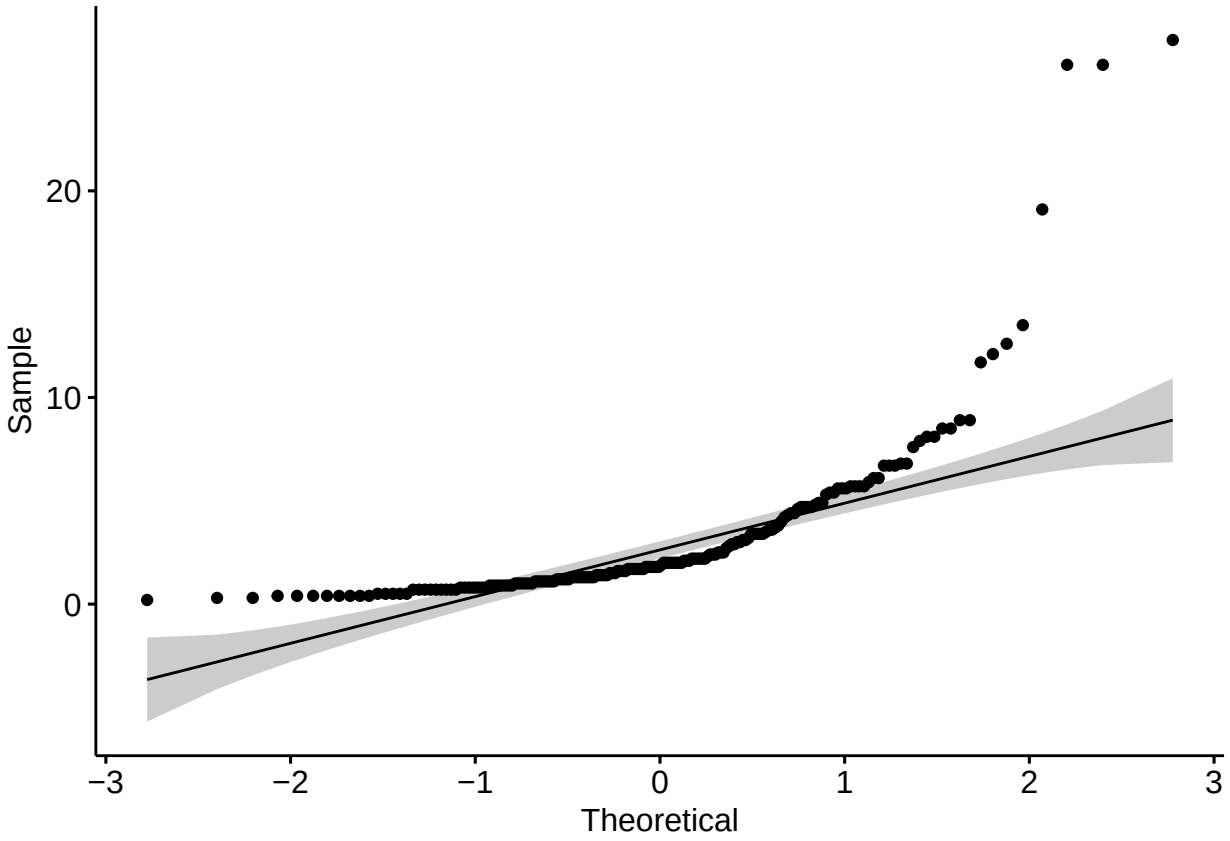



```
ggqqplot(synthetic_data$total_bilirubin_peak)
```

```
## Warning: Removed 81 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 81 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 81 rows containing non-finite values (stat_qq_line).
```

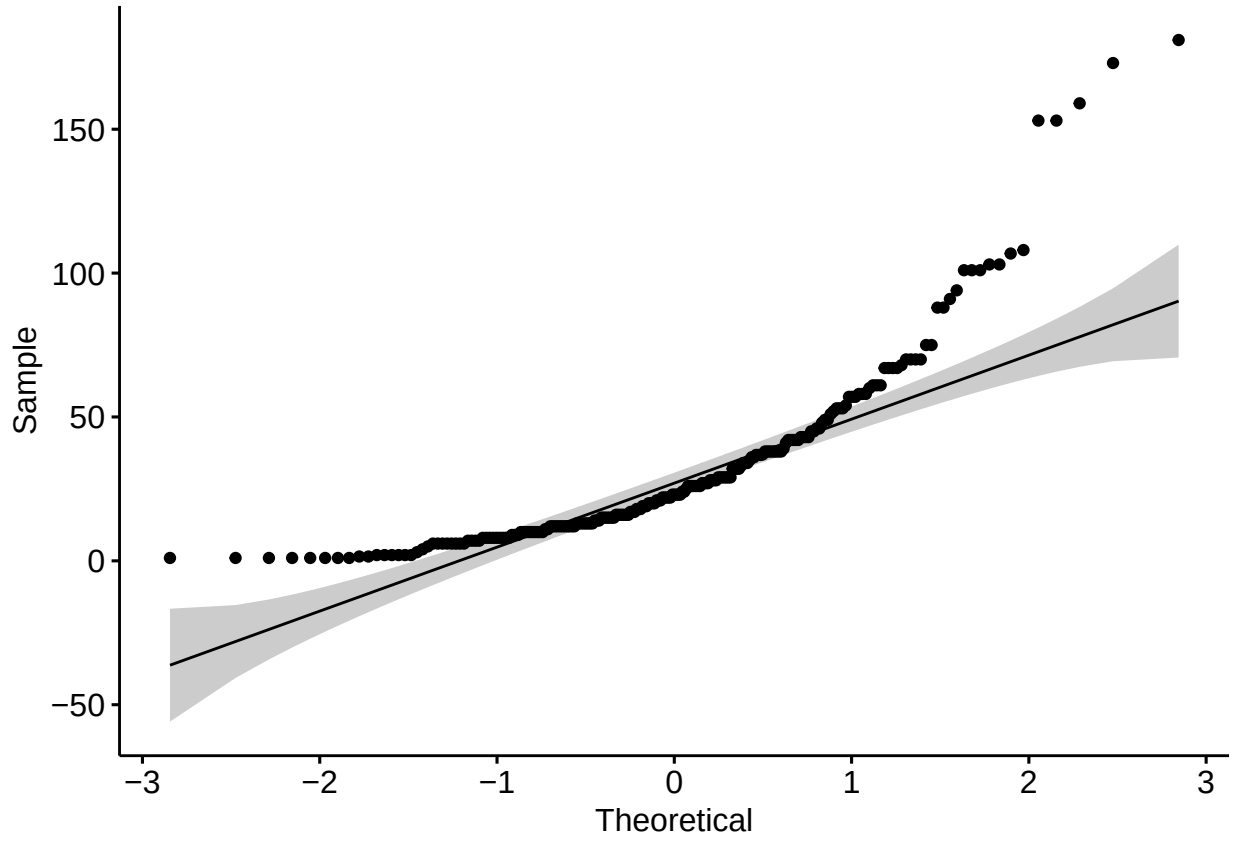



```
ggqqplot(synthetic_data$hospital_los)
```

```
## Warning: Removed 38 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 38 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 38 rows containing non-finite values (stat_qq_line).
```

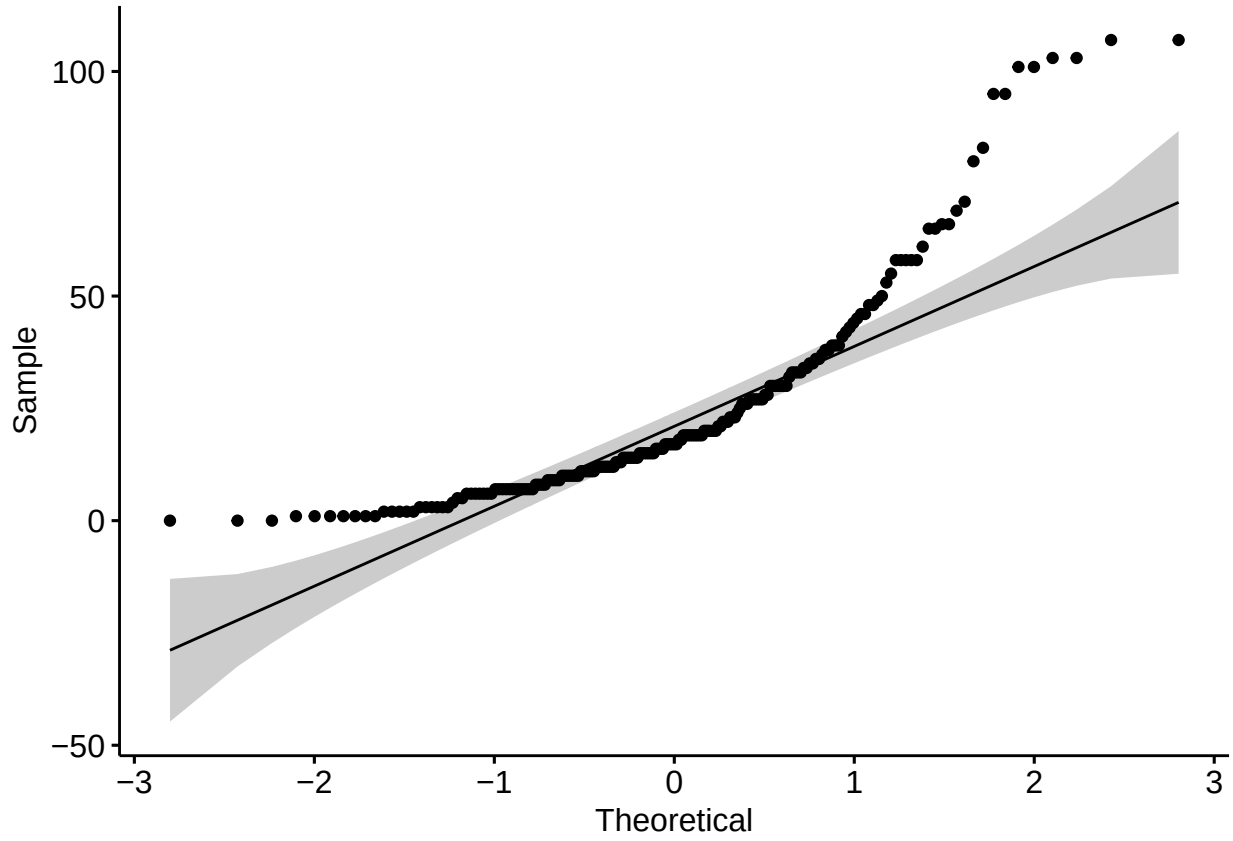



```
ggqqplot(synthetic_data$days_to_discharge)
```

```
## Warning: Removed 66 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 66 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 66 rows containing non-finite values (stat_qq_line).
```



not normal numeric variables:

synthetic_databmisynthetic_data$ao2 synthetic_data$lactate_peak$synthetic_data$total_bilirubin_peak synthetic_data$hospital_los

If a numeric variable does not have a normal distribution, you may log transform it and re-evaluate the distribuion:

#log transformation:

```
synthetic_data$bmi_log = log(synthetic_data$bmi)
```

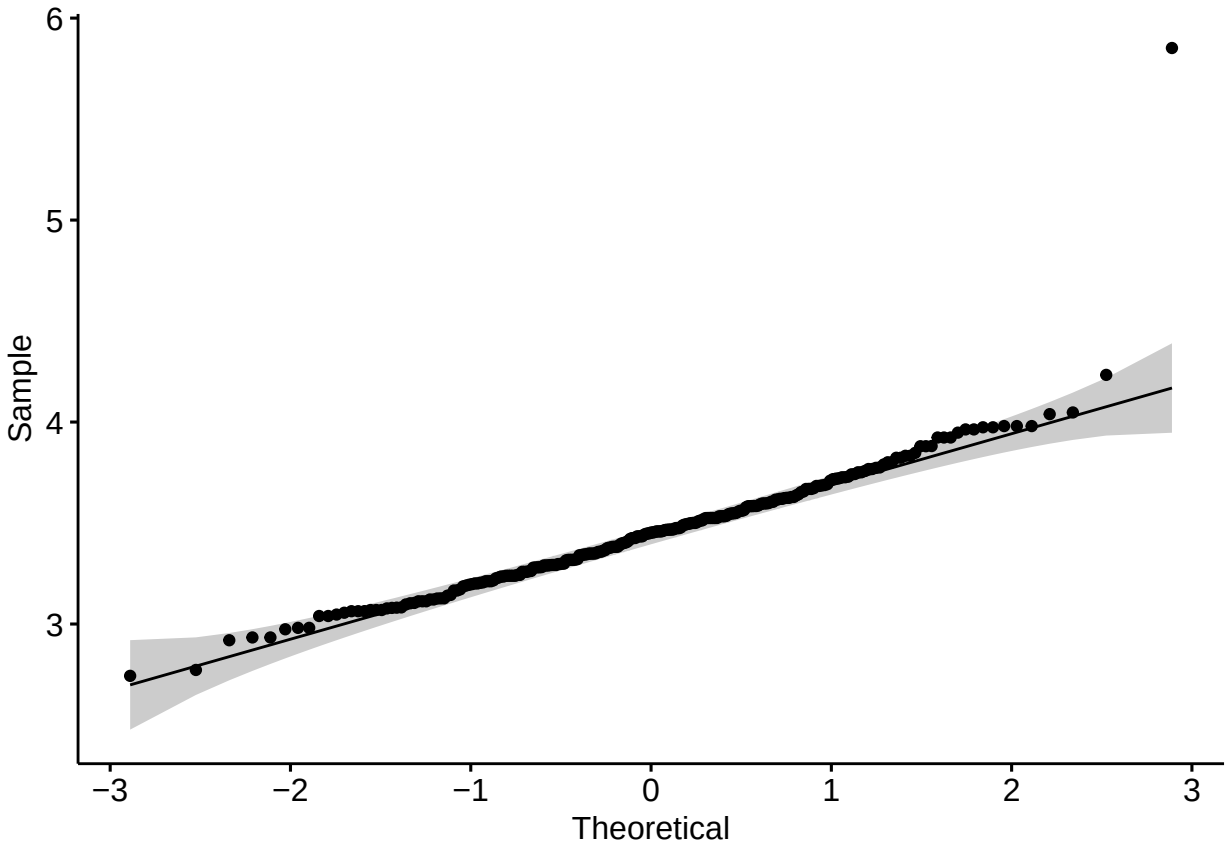
#graph to evaluate normality

```
ggqqplot(synthetic_data$bmi_log)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_qq_line).
```

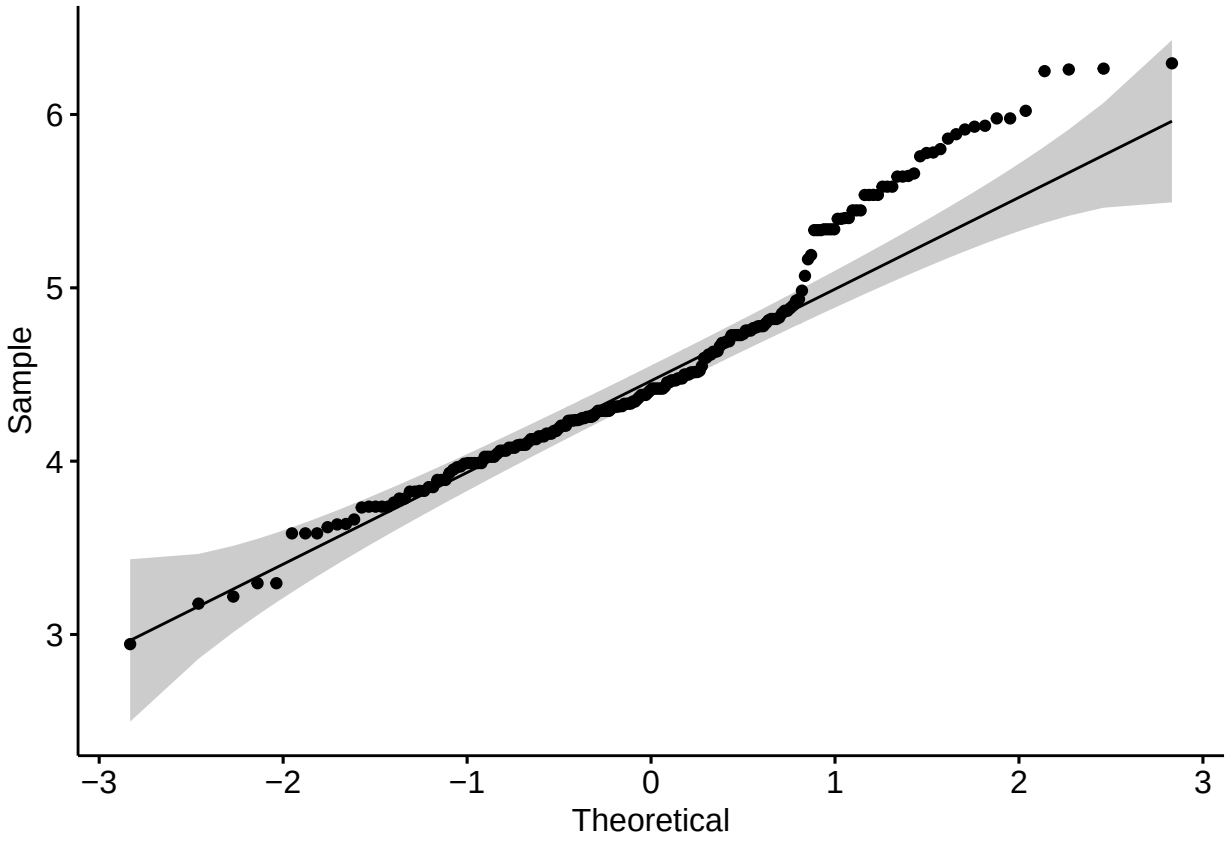



```
synthetic_data$o2_log = log(synthetic_data$o2)
ggqqplot(synthetic_data$o2_log)
```

```
## Warning: Removed 47 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 47 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 47 rows containing non-finite values (stat_qq_line).
```

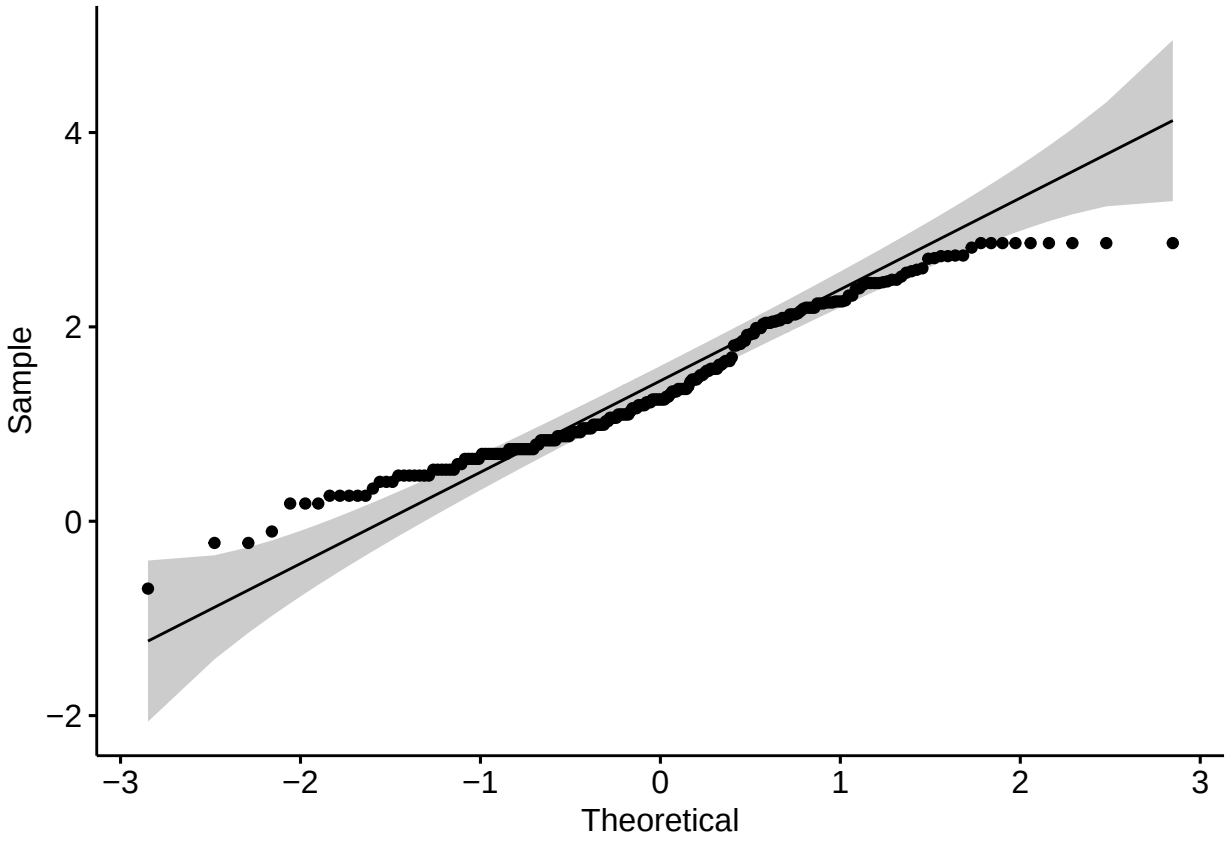



```
synthetic_data$lactate_peak_log = log(synthetic_data$lactate_peak)
ggqqplot(synthetic_data$lactate_peak_log)
```

```
## Warning: Removed 36 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 36 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 36 rows containing non-finite values (stat_qq_line).
```

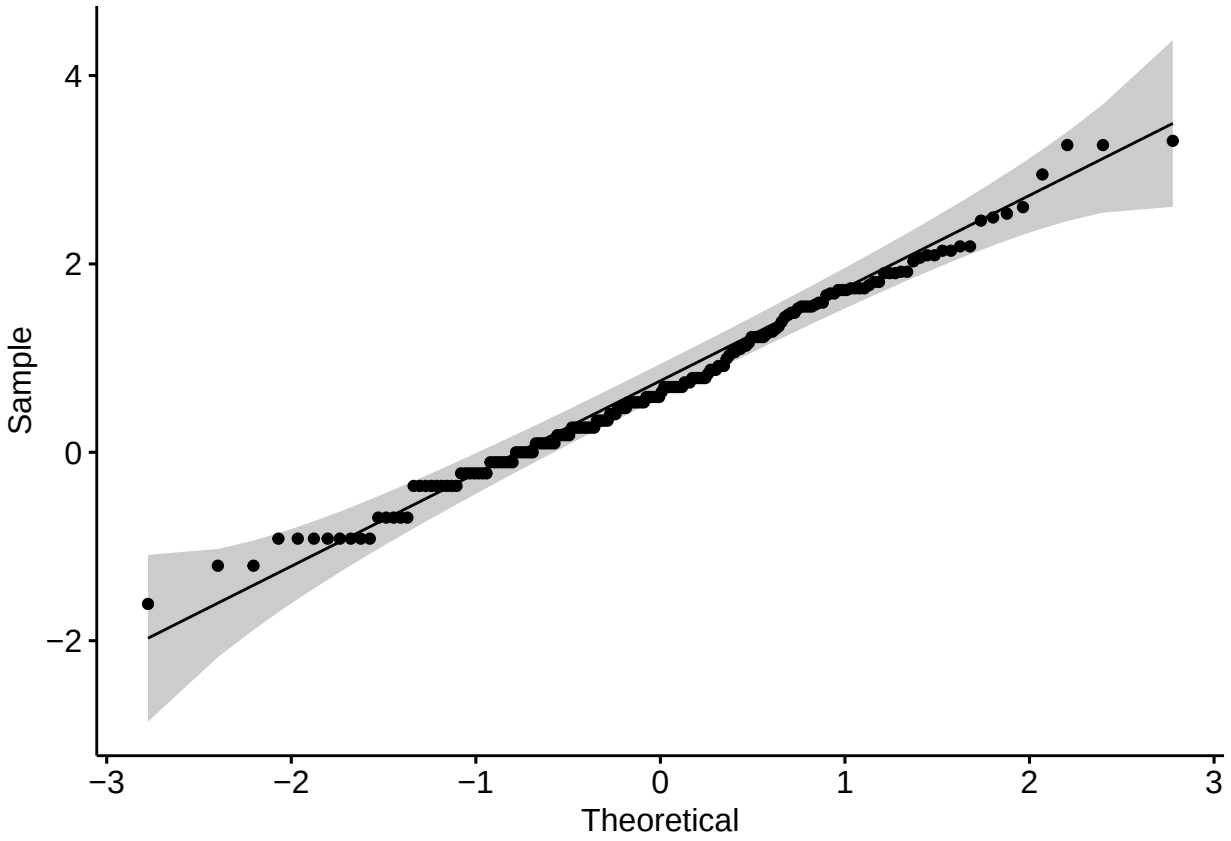



```
synthetic_data$total_bilirubin_peak_log = log(synthetic_data$total_bilirubin_peak)
ggqqplot(synthetic_data$total_bilirubin_peak_log)
```

```
## Warning: Removed 81 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 81 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 81 rows containing non-finite values (stat_qq_line).
```

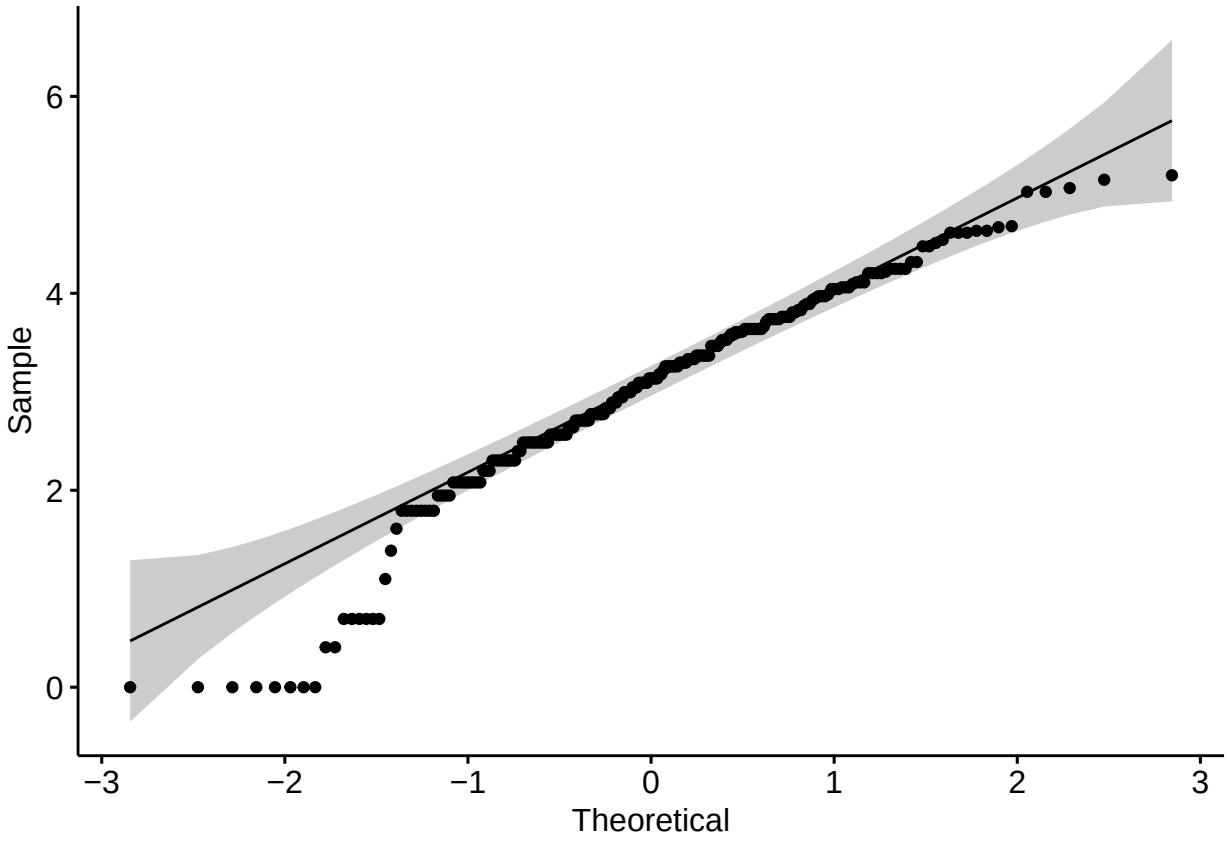



```
synthetic_data$hospital_los_log = log(synthetic_data$hospital_los)
ggqqplot(synthetic_data$hospital_los_log)
```

```
## Warning: Removed 38 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 38 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 38 rows containing non-finite values (stat_qq_line).
```

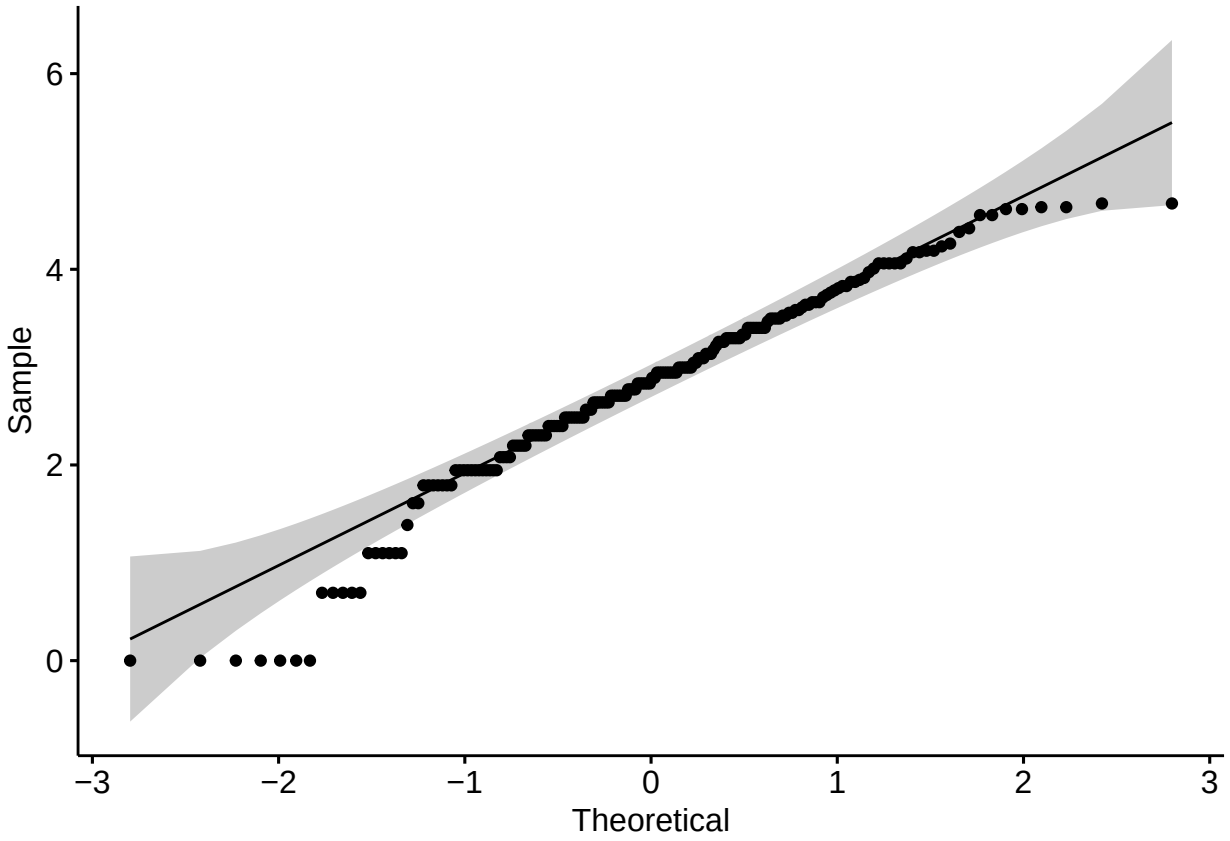



```
synthetic_data$days_to_discharge_log = log(synthetic_data$days_to_discharge)
ggqqplot(synthetic_data$days_to_discharge_log)
```

```
## Warning: Removed 69 rows containing non-finite values (stat_qq).
```

```
## Warning: Removed 69 rows containing non-finite values (stat_qq_line).
```

```
## Warning: Removed 69 rows containing non-finite values (stat_qq_line).
```



Bonus challange: Convert dataframe to tibble:

```
synthetic_data <- as.tbl(synthetic_data)
```

```
## Warning: ‘as.tbl()‘ was deprecated in dplyr 1.0.0.
## Please use ‘tibble::as_tibble()‘ instead.
## This warning is displayed once every 8 hours.
## Call ‘lifecycle::last_lifecycle_warnings()‘ to see where this warning was generated.
```

```
example_lab_data <- as.tbl(example_lab_data)
```

To link the example_lab_data with synthetic_data i decide that is not well done calculate the mean of the values, because there are taken on too many different times, and some values are not even near to each other, so I decide to link it by the year and month and patient_id

#Create a column “month” and “year” for synthetic data:

```
#synthetic_data <- synthetic_data %>%
#  add_column(month_admission = month(as.POSIXlt(synthetic_data$admission_date, #format="%d/%m/%Y")))

#synthetic_data <- synthetic_data[,!names(synthetic_data) %in% c("year_admission ","month_admission", "

synthetic_data$month_discharge = month(as.POSIXlt(synthetic_data$discharge_date, format="%d/%m/%Y"))

synthetic_data$month_admission = month(as.POSIXlt(synthetic_data$admission_date, format="%d/%m/%Y"))
```

```
synthetic_data$year_admission = year(as.POSIXlt(synthetic_data$admission_date, format="%d/%m/%Y"))

synthetic_data$year_discharge = year(as.POSIXlt(synthetic_data$discharge_date, format="%d/%m/%Y"))
```

#Create a column "year" and "month" for example_lab_data:

```
example_lab_data$month = month(as.POSIXlt(example_lab_data$date, format="%d/%m/%Y"))
example_lab_data$year = year(as.POSIXlt(example_lab_data$date, format="%d/%m/%Y"))
```

#cchange format for example_lab_data from long to wide:

```
example_lab_data_wide <- pivot_wider(
  example_lab_data,
  id_cols = NULL,
  id_expand = FALSE,
  names_from = lab_exam,
  values_from = result)
print(example_lab_data_wide)
```

```
## # A tibble: 480 x 10
##    patient_id date                month  year Hematocrit Cholesterol    CRP
##    <chr>      <dttm>              <dbl> <dbl>      <dbl>       <dbl>  <dbl>
##  1 cCnBeL4FBu 2021-03-09 00:00:00     3  2021      0.347      NA     NA
##  2 Xl5d5UcCYD 2021-02-03 00:00:00     2  2021     NA           0.376 NA
##  3 oa74Ed90gm 2020-03-05 00:00:00     3  2020     NA          NA      0.886
##  4 rPjBoa86kB 2021-04-20 00:00:00     4  2021     NA          NA     NA
##  5 uD0NxQpQ5F 2020-11-01 00:00:00    11  2020     NA          NA     NA
##  6 3pZ2TqnNyn 2021-02-24 00:00:00     2  2021     NA          NA     NA
##  7 vlb0gzZhmX 2021-07-25 00:00:00     7  2021      0.510      NA     NA
##  8 XLquXLGSRi 2020-05-22 00:00:00     5  2020     NA           0.569 NA
##  9 argAUZmnvn 2021-11-28 00:00:00    11  2021     NA          NA      0.692
## 10 zRlHFeTD3y 2020-10-04 00:00:00    10  2020     NA          NA     NA
## # ... with 470 more rows, and 3 more variables: Platelets <dbl>, Glucose <dbl>,
## #   Lymphocytes <dbl>
```

Left join synthetic_data with example_lab_data_wide:

#This join able to concate all the data, for extract coherent data for the time that the patient was on the hospital, could be based on admission_date or discharge_date:

```
linkdataset <- merge(x = synthetic_data, y = example_lab_data_wide, by = "patient_id")
```

#to obtaind coherent lab_exam values, gonna choose those lab exam who was made the year when the patient was on the hospital and drop the others.

```
linkdataset_year <- subset(linkdataset, linkdataset$year.y == linkdataset$year_admission)
```

#And with linkdataset_year, gonna choose those patient_id where the month of the lab exam was taken between the months of the patients on the hospital, it means between the month of admission or discharche, that because is is not coherent take information about the lab exams about the patient where they was not on the hospital, conditions of the patient could change between months and years, some values are too far

from each other to make an average. This is an small dataset, but this information is enough trusted to realize if those lab exams results have relationship with the output variable of the model, on other way, we can take the large dataset without this lab exams, but after check correlation between the variables:

```
linkdataset_month <- subset(linkdataset_year, linkdataset$month >= linkdataset$month_admission & linkda

linkdataset_month <- subset(linkdataset_year, linkdataset_year$month >= linkdataset_year$month_admissio

linkdataset_month
```

```
##     patient_id age sex     race weight_kg height_cm      bmi
## 1   2llPclNASV  74   M    White     114.8    195.60 22.80852
## 46  6GhDk8AVNM  41   M    White     103.4    180.30 35.31250
## 51  76nhLlQkv2  45   M    White      98.4    183.00 33.95201
## 63  7VN31dBvdO  29   F    White      95.3    152.00       NA
## 77  9RJXcM3JN2  23   M    White     104.8    154.90 28.75295
## 79  9RJXcM3JN2  23   M    White     104.8    154.90 28.75295
## 87  aCmgyoBDAU  61   M    White      99.9    182.90 23.20312
## 103 ATxZLWCuMl  46   F    White      96.1    188.00 31.00000
## 117 cCnBeL4FBu  67   M    White     107.0    189.00 23.84620
## 120 cCnBeL4FBu  67   M    White     107.0    189.00 23.84620
## 149 ds8kizHdyF  55   M    White     126.1    170.20 42.14943
## 152 ds8kizHdyF  55   M    White     126.1    170.20 42.14943
## 164 ENTDqRsfvq  35   M    Black      72.0    177.80 35.80000
## 180 f9AMZUlNJL  61   M    White     141.0    168.00 29.30000
## 218 iwp8UUS8du  53   M    White      98.9    167.60 44.74000
## 226 KfxOQl50T8  55   M    White      79.8    162.60 41.16000
## 239 krAuOxufmO  78   M    White     120.0    170.00 46.20000
## 249 lgwsTbQ9bX  46   F    White      72.0    180.00 22.48000
## 252 lgwsTbQ9bX  46   F    White      72.0    180.00 22.48000
## 260 mcVVfHOKEn  47   F    White     105.0    185.40 46.87297
## 262 nDyA0tpdsa  71   M    White        NA    182.90 37.68000
## 268 nY6IQYyUNJ  30   F    White     110.0    160.54 48.44000
## 277 OGY8WsxqAd  29   M Hispanic      82.4    167.00 18.79425
## 284 owdrTVqd26  53   M    White      95.7    162.60 53.20000
## 301 q6danf6ZhC  57   F    White      91.7    170.20 21.53000
## 324 RLIZJgcVd8  64   M    White      69.4    180.00 32.03000
## 331 RPKFkP3mF7  59   M    White     118.6    184.00 45.75000
## 333 RUJwtKyHR6  17   M    White     115.3    162.60 38.71000
## 343 sdezrCNI9N  63   M Hispanic     122.0    188.00 29.22000
## 357 SzCWauSPpe  52   M    White     112.4    177.80 26.84000
## 365 U5z4u340s9  28   F    White     104.0    160.00 37.33000
## 376 ug7L5EgQ8i  60   F Hispanic      79.0    175.00 21.78000
## 418 WpXIJg30L2  27   M    White     114.8    172.70 31.88000
## 428 xH3pHj8yGl  41   M    Black     128.0    188.00 23.11000
## 439 Xl5d5UcCYD  23   M    White      87.9    162.00 34.25000
## 460 YhxGHvKVSR  29   M    White     103.0    171.50 31.77671
## 465 zDfCEn0BQv  60   F    White     153.0    185.40 26.89000
## 469 zEn8gO76bg  80   F    Black      79.0    190.50 45.75000
## 478 ZVLZlCpyfh  62   F    White      95.7    165.10 34.69136
##                        diagnosis reintubation trached   ph   co2    o2
## 1                      COVID-19         <NA>   FALSE   NA    NA  54.0
## 46     Cardiovascular condition        FALSE    TRUE   NA  48.0  58.0
## 51  Other respiratory condition         <NA>   FALSE 7.12  48.0  82.0
```

```
## 63     Cardiovascular condition        FALSE    TRUE   NA  45.0  80.0
## 77                        Other        FALSE   FALSE 7.34  44.3    NA
## 79                        Other        FALSE   FALSE 7.34  44.3    NA
## 87  Other respiratory infection         <NA>    TRUE 7.21  56.3  94.5
## 103    Cardiovascular condition        FALSE   FALSE   NA  43.0 412.0
## 117                    COVID-19        FALSE   FALSE 7.30  43.0  63.0
## 120                    COVID-19        FALSE   FALSE 7.30  43.0  63.0
## 149                       Other        FALSE   FALSE 6.95    NA  36.0
## 152                       Other        FALSE   FALSE 6.95    NA  36.0
## 164    Cardiovascular condition         TRUE    TRUE 6.95    NA  76.0
## 180    Cardiovascular condition        FALSE    TRUE 7.47  59.0  44.0
## 218 Other respiratory condition        FALSE    TRUE 7.27    NA 232.0
## 226    Cardiovascular condition        FALSE   FALSE 7.43  61.0 253.6
## 239    Cardiovascular condition        FALSE   FALSE 7.23  54.0    NA
## 249 Other respiratory condition         <NA>   FALSE 7.42  60.0    NA
## 252 Other respiratory condition         <NA>   FALSE 7.42  60.0    NA
## 260 Other respiratory infection         <NA>    TRUE 7.30  53.0 124.0
## 262                       <NA>          <NA>   FALSE 7.45  47.3    NA
## 268    Cardiovascular condition         <NA>    <NA> 7.33  57.0  56.0
## 277    Cardiovascular condition         <NA>    <NA> 7.42    NA    NA
## 284    Cardiovascular condition        FALSE   FALSE   NA  56.3  88.0
## 301 Other respiratory condition        FALSE   FALSE 7.24  75.0  64.0
## 324    Cardiovascular condition         <NA>   FALSE 7.42  41.9 175.0
## 331 Other respiratory condition         <NA>    <NA> 7.12  60.0 102.6
## 333                    COVID-19        FALSE    TRUE 7.40  30.0  47.0
## 343 Other respiratory condition         <NA>    TRUE   NA  91.0  80.0
## 357    Cardiovascular condition         <NA>    TRUE 7.48  39.0  41.8
## 365 Other respiratory condition        FALSE    TRUE 7.24  44.0  69.2
## 376                    COVID-19         <NA>   FALSE 7.20  50.7  27.0
## 418 Other respiratory infection        FALSE   FALSE 7.21  61.0  52.0
## 428                       Other        FALSE   FALSE   NA 128.0    NA
## 439 Other respiratory condition         <NA>   FALSE 7.33  40.0 282.0
## 460    Cardiovascular condition         <NA>    <NA>   NA  57.0 119.0
## 465                    COVID-19         <NA>    TRUE 7.39  22.0  91.1
## 469                    COVID-19        FALSE   FALSE 7.41  48.0  86.0
## 478                    COVID-19        FALSE    <NA>   NA    NA 101.0
##     lactate_peak creatinine_peak total_bilirubin_peak mechanical_vent_days
## 1            2.1              NA                  4.7                 <NA>
## 46           1.2            2.87                  0.8            12h - 24h
## 51           1.6              NA                  2.0                 <NA>
## 63           2.0            1.27                  1.7               <= 12h
## 77            NA            3.34                  1.0      2 days - 7 days
## 79            NA            3.34                  1.0      2 days - 7 days
## 87          10.2              NA                  1.8      2 days - 7 days
## 103         15.3            1.67                  8.1            12h - 24h
## 117          3.6            2.70                  1.6                 <NA>
## 120          3.6            2.70                  1.6                 <NA>
## 149          8.5            2.91                  5.4            12h - 24h
## 152          8.5            2.91                  5.4            12h - 24h
## 164          3.0              NA                  1.7      2 days - 7 days
## 180          2.1            1.39                  2.0            12h - 24h
## 218          2.3            0.95                 26.1               <= 12h
## 226          2.7              NA                  1.4            12h - 24h
## 239         17.5            2.30                  2.8            12h - 24h
```

```
## 249          2.3            2.88                  0.8           12h - 24h
## 252          2.3            2.88                  0.8           12h - 24h
## 260          8.4              NA                   NA               <NA>
## 262           NA            2.97                   NA     2 days - 7 days
## 268           NA            1.57                  0.3              <= 12h
## 277          3.4              NA                  8.5              <= 12h
## 284           NA              NA                  1.4               <NA>
## 301          1.4            2.23                  0.5           12h - 24h
## 324         11.4            0.90                 12.1           12h - 24h
## 331          2.4            5.10                  1.8              <= 12h
## 333          1.3            0.83                  2.2     2 days - 7 days
## 343          3.8            0.62                  4.9           12h - 24h
## 357          4.0            1.90                  6.7              <= 12h
## 365          2.6              NA                  3.4              <= 12h
## 376          3.3              NA                  1.3           12h - 24h
## 418         10.9            1.67                   NA              <= 12h
## 428          2.6            1.08                  2.4           12h - 24h
## 439         13.1            0.64                  0.4              <= 12h
## 460          3.0              NA                  1.7               <NA>
## 465         17.5            1.67                   NA               <NA>
## 469          4.6            0.81                   NA              <= 12h
## 478          1.8              NA                  5.6               <NA>
##     systemic_anticoagulation_type acute_kidney_injury hospital_los
## 1                           <NA>                TRUE          2.0
## 46                 Heparin only                TRUE         45.0
## 51                 Heparin only                TRUE          6.0
## 63              No anticoagulant               FALSE         28.0
## 77                 Heparin only               FALSE         34.0
## 79                 Heparin only               FALSE         34.0
## 87                 Heparin only                TRUE           NA
## 103             Bivalirudin only                <NA>         26.0
## 117                Heparin only               FALSE         94.0
## 120                Heparin only               FALSE         94.0
## 149             Bivalirudin only               FALSE         36.8
## 152             Bivalirudin only               FALSE         36.8
## 164                Heparin only                TRUE         13.0
## 180                Heparin only               FALSE          1.5
## 218                Heparin only                TRUE         70.0
## 226                Heparin only               FALSE          6.0
## 239                Heparin only                TRUE         16.0
## 249             Bivalirudin only                TRUE         37.0
## 252             Bivalirudin only                TRUE         37.0
## 260             Bivalirudin only               FALSE         36.0
## 262             No anticoagulant               FALSE         20.0
## 268             Bivalirudin only                TRUE         32.0
## 277                         <NA>                TRUE         15.0
## 284                Heparin only               FALSE        103.0
## 301             No anticoagulant                TRUE         38.0
## 324                Heparin only               FALSE          1.0
## 331                Heparin only               FALSE           NA
## 333                Heparin only                TRUE         17.0
## 343                Heparin only                TRUE           NA
## 357                         <NA>               FALSE          7.0
## 365                Heparin only                TRUE         88.0
```

```
## 376                          <NA>              FALSE        57.0
## 418              Bivalirudin only               TRUE        23.0
## 428                  Heparin only              FALSE        42.0
## 439              Bivalirudin only               TRUE        36.8
## 460                  Heparin only              FALSE          NA
## 465                  Heparin only              FALSE         6.0
## 469                  Heparin only              FALSE         2.0
## 478                  Heparin only              FALSE       101.0
##     discharge_location steroids  infection support_type transfer covid pregnant
## 1                Death     <NA>      Other         <NA>    FALSE  TRUE     <NA>
## 46                Home       No SARS CoV19         <NA>    FALSE FALSE     <NA>
## 51                Home      Yes SARS CoV19         <NA>    FALSE  TRUE     <NA>
## 63                Home      Yes       <NA>         <NA>    FALSE FALSE     <NA>
## 77                Home     <NA> SARS CoV19         <NA>    FALSE  TRUE     <NA>
## 79                Home     <NA> SARS CoV19         <NA>    FALSE  TRUE     <NA>
## 87                Home       No      Other         <NA>    FALSE FALSE     <NA>
## 103              Death     <NA>      Other         <NA>    FALSE FALSE     <NA>
## 117              Death     <NA> SARS CoV19      Cardiac    FALSE FALSE     <NA>
## 120              Death     <NA> SARS CoV19      Cardiac    FALSE FALSE     <NA>
## 149               Home     <NA>       <NA>         <NA>    FALSE FALSE     <NA>
## 152               Home     <NA>       <NA>         <NA>    FALSE FALSE     <NA>
## 164               Home      Yes SARS CoV19         <NA>    FALSE FALSE     <NA>
## 180               Home       No       <NA>         <NA>    FALSE  TRUE     <NA>
## 218               Home       No SARS CoV19         <NA>    FALSE FALSE     <NA>
## 226               <NA>       No      Other    Pulmonary    FALSE  TRUE     <NA>
## 239               Home     <NA>       <NA>      Cardiac    FALSE FALSE     <NA>
## 249         LTAC/rehab      Yes      Other         <NA>    FALSE  TRUE     <NA>
## 252         LTAC/rehab      Yes      Other         <NA>    FALSE  TRUE     <NA>
## 260               Home     <NA>      Other      Cardiac    FALSE FALSE     <NA>
## 262               <NA>      Yes       <NA>         ECPR    FALSE FALSE     <NA>
## 268               <NA>      Yes SARS CoV19         <NA>    FALSE FALSE     <NA>
## 277              Death     <NA>      Other      Cardiac    FALSE FALSE     <NA>
## 284               Home      Yes       <NA>         <NA>    FALSE FALSE     <NA>
## 301               Home     <NA>       <NA>         ECPR     TRUE FALSE     <NA>
## 324         LTAC/rehab       No       <NA>         <NA>    FALSE  TRUE     <NA>
## 331              Death      Yes      Other         <NA>    FALSE FALSE     <NA>
## 333              Death      Yes       <NA>         <NA>     TRUE FALSE     <NA>
## 343         LTAC/rehab     <NA>       <NA>         <NA>    FALSE  TRUE     <NA>
## 357               Home       No       <NA>         <NA>    FALSE FALSE     <NA>
## 365               <NA>      Yes       <NA>      Cardiac    FALSE FALSE     <NA>
## 376               Home       No       <NA>         <NA>    FALSE FALSE     <NA>
## 418              Other     <NA>       <NA>         <NA>    FALSE FALSE     <NA>
## 428              Death       No SARS CoV19         <NA>    FALSE  TRUE     <NA>
## 439               <NA>     <NA>       <NA>         <NA>    FALSE  TRUE     <NA>
## 460               Home     <NA> SARS CoV19         <NA>    FALSE FALSE     <NA>
## 465               <NA>     <NA>      Other         <NA>    FALSE FALSE     <NA>
## 469              Death     <NA>       <NA>         <NA>    FALSE  TRUE     <NA>
## 478               Home     <NA>      Other      Cardiac    FALSE FALSE     <NA>
##     year.x days_to_discharge admission_date discharge_date death_date  bmi_log
## 1     2019               19     2021-10-22     2021-11-06       <NA> 3.127134
## 46    2020               14     2020-01-20     2020-02-07       <NA> 3.564237
## 51    2021                7     2020-09-28     2020-10-26       <NA> 3.524948
## 63    2018                3     2020-09-11     2020-10-08       <NA>       NA
## 77    2020               NA     2020-05-10     2020-05-31       <NA> 3.358740
```

```
## 79    2020               NA     2020-05-10     2020-05-31       <NA> 3.358740
## 87    2020               NA     2020-07-13     2020-07-23       <NA> 3.144287
## 103   2019                4     2021-01-15     2021-02-28 2021-02-28 3.433987
## 117   2020               NA     2020-02-28     2020-04-09       <NA> 3.171625
## 120   2020               NA     2020-02-28     2020-04-09       <NA> 3.171625
## 149   2019                9     2020-02-06     2020-03-16       <NA> 3.741221
## 152   2019                9     2020-02-06     2020-03-16       <NA> 3.741221
## 164   2020               16     2021-10-20     2021-12-06       <NA> 3.577948
## 180   2019               58     2021-07-21     2021-08-18       <NA> 3.377588
## 218   2021               11     2021-05-30     2021-06-20       <NA> 3.800868
## 226   2020               19     2020-07-25     2020-07-29 2020-07-29 3.717467
## 239   2019               NA     2021-06-10     2021-07-28 2021-07-28 3.832980
## 249   2019               12     2020-02-08     2020-03-18       <NA> 3.112626
## 252   2019               12     2020-02-08     2020-03-18       <NA> 3.112626
## 260   2018               20     2020-08-12     2020-09-07       <NA> 3.847441
## 262   2018               12     2020-05-08     2020-06-27       <NA> 3.629129
## 268   2021                6     2020-01-04     2020-02-23       <NA> 3.880326
## 277   2019               NA     2021-05-28     2021-07-02 2021-07-02 2.933551
## 284   2020                8     2020-02-04     2020-02-18       <NA> 3.974058
## 301   2018               83     2020-01-13     2020-02-05       <NA> 3.069447
## 324   2022               58     2020-08-18     2020-09-20       <NA> 3.466673
## 331   2020               39     2020-11-18     2020-12-23       <NA> 3.823192
## 333   2017               38     2020-06-21     2020-07-20       <NA> 3.656098
## 343   2021                1     2020-01-06     2020-02-17       <NA> 3.374853
## 357   2020               NA     2020-07-22     2020-08-22 2020-08-22 3.289893
## 365   2020               66     2020-05-15     2020-05-30       <NA> 3.619797
## 376   2020               43     2021-09-19     2021-10-25       <NA> 3.080992
## 418   2018               NA     2020-06-06     2020-06-07 2020-06-07 3.461979
## 428   2020               18     2021-02-05     2021-03-16       <NA> 3.140265
## 439   2020                2     2020-04-26     2020-06-09       <NA> 3.533687
## 460   2021               19     2021-08-16     2021-08-24       <NA> 3.458733
## 465   2022               53     2020-03-23     2020-04-18 2020-04-18 3.291754
## 469   2018               30     2021-11-14     2021-12-04       <NA> 3.823192
## 478   2019                2     2020-11-30     2020-12-26       <NA> 3.546491
##       o2_log lactate_peak_log total_bilirubin_peak_log hospital_los_log
## 1   3.988984        0.7419373                1.5475625        0.6931472
## 46  4.060443        0.1823216               -0.2231436        3.8066625
## 51  4.406719        0.4700036                0.6931472        1.7917595
## 63  4.382027        0.6931472                0.5306283        3.3322045
## 77        NA               NA                0.0000000        3.5263605
## 79        NA               NA                0.0000000        3.5263605
## 87  4.548600        2.3223877                0.5877867               NA
## 103 6.021023        2.7278528                2.0918641        3.2580965
## 117 4.143135        1.2809338                0.4700036        4.5432948
## 120 4.143135        1.2809338                0.4700036        4.5432948
## 149 3.583519        2.1400662                1.6863990        3.6054978
## 152 3.583519        2.1400662                1.6863990        3.6054978
## 164 4.330733        1.0986123                0.5306283        2.5649494
## 180 3.784190        0.7419373                0.6931472        0.4054651
## 218 5.446737        0.8329091                3.2619353        4.2484952
## 226 5.535758        0.9932518                0.3364722        1.7917595
## 239       NA        2.8622009                1.0296194        2.7725887
## 249       NA        0.8329091               -0.2231436        3.6109179
## 252       NA        0.8329091               -0.2231436        3.6109179
```

```
## 260 4.820282        2.1282317                    NA        3.5835189
## 262       NA               NA                    NA        2.9957323
## 268 4.025352               NA            -1.2039728        3.4657359
## 277       NA        1.2237754             2.1400662        2.7080502
## 284 4.477337               NA             0.3364722        4.6347290
## 301 4.158883        0.3364722            -0.6931472        3.6375862
## 324 5.164786        2.4336134             2.4932055        0.0000000
## 331 4.630838        0.8754687             0.5877867               NA
## 333 3.850148        0.2623643             0.7884574        2.8332133
## 343 4.382027        1.3350011             1.5892352               NA
## 357 3.732896        1.3862944             1.9021075        1.9459101
## 365 4.237001        0.9555114             1.2237754        4.4773368
## 376 3.295837        1.1939225             0.2623643        4.0430513
## 418 3.951244        2.3887628                    NA        3.1354942
## 428       NA        0.9555114             0.8754687        3.7376696
## 439 5.641907        2.5726122            -0.9162907        3.6054978
## 460 4.779123        1.0986123             0.5306283               NA
## 465 4.511958        2.8622009                    NA        1.7917595
## 469 4.454347        1.5260563                    NA        0.6931472
## 478 4.615121        0.5877867             1.7227666        4.6151205
##     days_to_discharge_log month_discharge month_admission year_admission
## 1               2.9444390              11              10           2021
## 46              2.6390573               2               1           2020
## 51              1.9459101              10               9           2020
## 63              1.0986123              10               9           2020
## 77                     NA               5               5           2020
## 79                     NA               5               5           2020
## 87                     NA               7               7           2020
## 103             1.3862944               2               1           2021
## 117                    NA               4               2           2020
## 120                    NA               4               2           2020
## 149             2.1972246               3               2           2020
## 152             2.1972246               3               2           2020
## 164             2.7725887              12              10           2021
## 180             4.0604430               8               7           2021
## 218             2.3978953               6               5           2021
## 226             2.9444390               7               7           2020
## 239                    NA               7               6           2021
## 249             2.4849066               3               2           2020
## 252             2.4849066               3               2           2020
## 260             2.9957323               9               8           2020
## 262             2.4849066               6               5           2020
## 268             1.7917595               2               1           2020
## 277                    NA               7               5           2021
## 284             2.0794415               2               2           2020
## 301             4.4188406               2               1           2020
## 324             4.0604430               9               8           2020
## 331             3.6635616              12              11           2020
## 333             3.6375862               7               6           2020
## 343             0.0000000               2               1           2020
## 357                    NA               8               7           2020
## 365             4.1896547               5               5           2020
## 376             3.7612001              10               9           2021
## 418                    NA               6               6           2020
```

```
## 428             2.8903718              3              2          2021
## 439             0.6931472              6              4          2020
## 460             2.9444390              8              8          2021
## 465             3.9702919              4              3          2020
## 469             3.4011974             12             11          2021
## 478             0.6931472             12             11          2020
##     year_discharge       date month year.y Hematocrit Cholesterol       CRP
## 1             2021 2021-10-12    10   2021         NA          NA        NA
## 46            2020 2020-02-08     2   2020         NA          NA        NA
## 51            2020 2020-10-11    10   2020         NA  0.48488376        NA
## 63            2020 2020-10-09    10   2020         NA          NA        NA
## 77            2020 2020-05-09     5   2020 0.01230404          NA        NA
## 79            2020 2020-05-17     5   2020 0.99385283          NA        NA
## 87            2020 2020-07-19     7   2020         NA          NA        NA
## 103           2021 2021-02-11     2   2021         NA          NA        NA
## 117           2020 2020-02-02     2   2020 0.68693197          NA        NA
## 120           2020 2020-04-22     4   2020         NA          NA        NA
## 149           2020 2020-02-23     2   2020         NA          NA 0.9226450
## 152           2020 2020-02-28     2   2020         NA          NA 0.5913846
## 164           2021 2021-11-04    11   2021         NA          NA        NA
## 180           2021 2021-08-23     8   2021 0.14712859          NA        NA
## 218           2021 2021-05-10     5   2021         NA          NA 0.6349831
## 226           2020 2020-07-22     7   2020 0.13766582          NA        NA
## 239           2021 2021-06-24     6   2021         NA          NA        NA
## 249           2020 2020-03-09     3   2020         NA  0.78333567        NA
## 252           2020 2020-03-28     3   2020         NA  0.62007691        NA
## 260           2020 2020-09-05     9   2020 0.06924430          NA        NA
## 262           2020 2020-06-04     6   2020         NA          NA        NA
## 268           2020 2020-02-25     2   2020         NA          NA 0.5643724
## 277           2021 2021-07-17     7   2021         NA          NA 0.3663102
## 284           2020 2020-02-27     2   2020 0.25501733          NA        NA
## 301           2020 2020-02-24     2   2020         NA          NA        NA
## 324           2020 2020-08-17     8   2020         NA  0.96379347        NA
## 331           2020 2020-12-18    12   2020         NA          NA        NA
## 333           2020 2020-07-28     7   2020         NA          NA 0.2569303
## 343           2020 2020-01-15     1   2020         NA          NA 0.1929066
## 357           2020 2020-07-21     7   2020 0.70126371          NA        NA
## 365           2020 2020-05-18     5   2020         NA          NA 0.8984455
## 376           2021 2021-09-10     9   2021         NA          NA 0.9144553
## 418           2020 2020-06-30     6   2020         NA          NA        NA
## 428           2021 2021-03-10     3   2021         NA  0.09939283        NA
## 439           2020 2020-06-17     6   2020         NA  0.60294382        NA
## 460           2021 2021-08-11     8   2021 0.57500997          NA        NA
## 465           2020 2020-04-08     4   2020         NA          NA 0.7963609
## 469           2021 2021-12-05    12   2021         NA          NA        NA
## 478           2020 2020-12-10    12   2020 0.44041052          NA        NA
##      Platelets    Glucose Lymphocytes
## 1           NA         NA   0.2972833
## 46  0.56139269         NA          NA
## 51          NA         NA          NA
## 63  0.43509946         NA          NA
## 77          NA         NA          NA
## 79          NA         NA          NA
## 87  0.99346158         NA          NA
```

```
## 103 0.03055192         NA          NA
## 117         NA         NA          NA
## 120         NA         NA   0.7830233
## 149         NA         NA          NA
## 152         NA         NA          NA
## 164         NA 0.71980130          NA
## 180         NA         NA          NA
## 218         NA         NA          NA
## 226         NA         NA          NA
## 239 0.57087024         NA          NA
## 249         NA         NA          NA
## 252         NA         NA          NA
## 260         NA         NA          NA
## 262         NA 0.02534485          NA
## 268         NA         NA          NA
## 277         NA         NA          NA
## 284         NA         NA          NA
## 301         NA 0.29364777          NA
## 324         NA         NA          NA
## 331         NA         NA   0.8295613
## 333         NA         NA          NA
## 343         NA         NA          NA
## 357         NA         NA          NA
## 365         NA         NA          NA
## 376         NA         NA          NA
## 418         NA 0.29188242          NA
## 428         NA         NA          NA
## 439         NA         NA          NA
## 460         NA         NA          NA
## 465         NA         NA          NA
## 469         NA 0.12094705          NA
## 478         NA         NA          NA
```

Exploratory analysis

Summary table stratified by covid diagnosis:

#first have to separate variable between numeric and categorical:

first prepare the function variables:

```
# Select numeric variables:
myVars <- colnames(linkdataset_month[,!names(linkdataset_month) %in% c("covid", "sex", "race",
"diagnosis", "reintubation", "trached", "systemic_anticoagulation_type", "acute_kidney_injury", "dischar


#select categorical variables:
catVars <- colnames(linkdataset_month[,names(linkdataset_month) %in% c("sex", "race", "diagnosis", "rein



#Summary table:
tab <- CreateTableOne(vars = myVars, strata = "covid" , data = linkdataset_month, factorVars = catVars)
```

```
## Warning in ModuleReturnVarsExist(factorVars, data): These variables only have
## NA/NaN: pregnant Dropped

## Warning in CreateTableOne(vars = myVars, strata = "covid", data = linkdataset_month, : Dropping varia

## Warning in min(x, na.rm = TRUE): ningún argumento finito para min; retornando
## Inf

## Warning in max(x, na.rm = TRUE): ningun argumento finito para max; retornando
## -Inf

## Warning in min(x, na.rm = TRUE): ningún argumento finito para min; retornando
## Inf

## Warning in max(x, na.rm = TRUE): ningun argumento finito para max; retornando
## -Inf

## Warning in StdDiff(variable = var, group = strataVar): Variable has only NA's in
## at least one stratum. na.rm turned off.

## Warning in StdDiff(variable = var, group = strataVar): Variable has only NA's in
## at least one stratum. na.rm turned off.
```

```
print(tab)
```

```
##                                      Stratified by covid
##                                       FALSE          TRUE           p
##   n                                       26             13
##   age (mean (SD))                      48.77 (16.23)  49.54 (18.95)  0.896
##   weight_kg (mean (SD))               105.30 (16.79)  97.99 (23.57)  0.276
##   height_cm (mean (SD))               173.84 (10.18) 175.96 (13.87)  0.590
##   bmi (mean (SD))                      34.82 (9.77)   30.31 (7.22)   0.152
##   ph (mean (SD))                        7.25 (0.16)    7.37 (0.10)   0.033
##   co2 (mean (SD))                      49.23 (11.61)  60.46 (25.39)  0.097
##   o2 (mean (SD))                       92.75 (81.59) 132.07 (92.80)  0.266
##   lactate_peak (mean (SD))              5.90 (5.21)    4.42 (3.98)   0.411
##   creatinine_peak (mean (SD))           2.25 (1.02)    1.79 (1.17)   0.293
##   total_bilirubin_peak (mean (SD))      4.11 (5.48)    2.79 (3.28)   0.454
##   hospital_los (mean (SD))             43.59 (32.04)  19.94 (17.79)  0.024
##   days_to_discharge (mean (SD))        23.95 (23.26)  21.45 (19.88)  0.768
##   bmi_log (mean (SD))                   3.51 (0.30)    3.39 (0.23)   0.200
##   o2_log (mean (SD))                    4.32 (0.60)    4.67 (0.70)   0.183
##   lactate_peak_log (mean (SD))          1.43 (0.84)    1.22 (0.70)   0.485
##   total_bilirubin_peak_log (mean (SD))  0.90 (1.01)    0.57 (0.95)   0.369
##   hospital_los_log (mean (SD))          3.48 (0.82)    2.25 (1.50)   0.003
##   days_to_discharge_log (mean (SD))     2.70 (1.06)    2.54 (1.27)   0.706
##   Hematocrit (mean (SD))                0.45 (0.25)    0.32 (0.45)   0.565
##   Cholesterol (mean (SD))                NaN (NA)      0.59 (0.29)      NA
##   CRP (mean (SD))                       0.66 (0.24)    0.19 (NA)        NA
##   Platelets (mean (SD))                 0.52 (0.34)     NaN (NA)        NA
##   Glucose (mean (SD))                   0.33 (0.29)    0.12 (NA)        NA
##   Lymphocytes (mean (SD))               0.81 (0.03)    0.30 (NA)        NA
```

```
##                                      Stratified by covid
##                                       test
##   n
##   age (mean (SD))
##   weight_kg (mean (SD))
##   height_cm (mean (SD))
##   bmi (mean (SD))
##   ph (mean (SD))
##   co2 (mean (SD))
##   o2 (mean (SD))
##   lactate_peak (mean (SD))
##   creatinine_peak (mean (SD))
##   total_bilirubin_peak (mean (SD))
##   hospital_los (mean (SD))
##   days_to_discharge (mean (SD))
##   bmi_log (mean (SD))
##   o2_log (mean (SD))
##   lactate_peak_log (mean (SD))
##   total_bilirubin_peak_log (mean (SD))
##   hospital_los_log (mean (SD))
##   days_to_discharge_log (mean (SD))
##   Hematocrit (mean (SD))
##   Cholesterol (mean (SD))
##   CRP (mean (SD))
##   Platelets (mean (SD))
##   Glucose (mean (SD))
##   Lymphocytes (mean (SD))
```

```
print(tab,formatOptions = list(big.mark = ","))
```

```
##                                      Stratified by covid
##                                       FALSE           TRUE            p
##   n                                      26             13
##   age (mean (SD))                     48.77 (16.23)  49.54 (18.95)  0.896
##   weight_kg (mean (SD))              105.30 (16.79)  97.99 (23.57)  0.276
##   height_cm (mean (SD))              173.84 (10.18) 175.96 (13.87)  0.590
##   bmi (mean (SD))                     34.82 (9.77)   30.31 (7.22)   0.152
##   ph (mean (SD))                       7.25 (0.16)    7.37 (0.10)   0.033
##   co2 (mean (SD))                     49.23 (11.61)  60.46 (25.39)  0.097
##   o2 (mean (SD))                      92.75 (81.59) 132.07 (92.80)  0.266
##   lactate_peak (mean (SD))             5.90 (5.21)    4.42 (3.98)   0.411
##   creatinine_peak (mean (SD))          2.25 (1.02)    1.79 (1.17)   0.293
##   total_bilirubin_peak (mean (SD))     4.11 (5.48)    2.79 (3.28)   0.454
##   hospital_los (mean (SD))            43.59 (32.04)  19.94 (17.79)  0.024
##   days_to_discharge (mean (SD))       23.95 (23.26)  21.45 (19.88)  0.768
##   bmi_log (mean (SD))                  3.51 (0.30)    3.39 (0.23)   0.200
##   o2_log (mean (SD))                   4.32 (0.60)    4.67 (0.70)   0.183
##   lactate_peak_log (mean (SD))         1.43 (0.84)    1.22 (0.70)   0.485
##   total_bilirubin_peak_log (mean (SD))  0.90 (1.01)    0.57 (0.95)   0.369
##   hospital_los_log (mean (SD))         3.48 (0.82)    2.25 (1.50)   0.003
##   days_to_discharge_log (mean (SD))    2.70 (1.06)    2.54 (1.27)   0.706
##   Hematocrit (mean (SD))               0.45 (0.25)    0.32 (0.45)   0.565
##   Cholesterol (mean (SD))               NaN (NA)      0.59 (0.29)      NA
##   CRP (mean (SD))                      0.66 (0.24)    0.19 (NA)        NA
```

```
##   Platelets (mean (SD))                 0.52 (0.34)     NaN (NA)        NA
##   Glucose (mean (SD))                   0.33 (0.29)    0.12 (NA)        NA
##   Lymphocytes (mean (SD))               0.81 (0.03)    0.30 (NA)        NA
##                                      Stratified by covid
##                                       test
##   n
##   age (mean (SD))
##   weight_kg (mean (SD))
##   height_cm (mean (SD))
##   bmi (mean (SD))
##   ph (mean (SD))
##   co2 (mean (SD))
##   o2 (mean (SD))
##   lactate_peak (mean (SD))
##   creatinine_peak (mean (SD))
##   total_bilirubin_peak (mean (SD))
##   hospital_los (mean (SD))
##   days_to_discharge (mean (SD))
##   bmi_log (mean (SD))
##   o2_log (mean (SD))
##   lactate_peak_log (mean (SD))
##   total_bilirubin_peak_log (mean (SD))
##   hospital_los_log (mean (SD))
##   days_to_discharge_log (mean (SD))
##   Hematocrit (mean (SD))
##   Cholesterol (mean (SD))
##   CRP (mean (SD))
##   Platelets (mean (SD))
##   Glucose (mean (SD))
##   Lymphocytes (mean (SD))
```

tab <- CreateTableOne(vars = myVars, strata = "covid" , data = linkdataset_month, factorVars = catVars)
print(tab3, nonnormal = biomarkers, formatOptions = list(big.mark = ","))