# Lici_Díaz.Rmd

## Lici Díaz

## 5/12/2022

```
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
```

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

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

```r
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 objects are masked from 'package:stats':
##
##     filter, lag
```

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

```r
library(magrittr)
```

*Dataframe from csv files:*

```r
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 XH0DUqel1R  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))) #@lici, you should save
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_diagnose
 "trauma", "infective_endocarditis",  "severity_score", "icu_los","insurance", "proning",  "il_6_blocker
```

*Review patient IDs and address repeated patients:*

#@lici, in the lab data we have multiple rows for the same patient, each row corresponding to a different exam. These are not duplicated rows since they have information on different lab exams. Since it is not duplicated

information, you should not remove it. Only remove duplicated patients from the synthetic_data/Answ: @Aline, I fix it, just drop the synthetic_data duplicates

*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  Oshbw3gvsR  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  5uOXu0Tdc0  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  10dDAKKGyk  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
```

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```
## 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  Kfx0Ql50T8  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  Kfx0Ql50T8  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
```

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```
## 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 7TZZyY0yMi 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 uDONxQpQ5F 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 Oshbw3gvsR 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 uDONxQpQ5F 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 5uOXu0Tdc0 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 7TZZyYOyMi 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
```

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```
## 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
```

15

```
## 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 systemic_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>
```

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## 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>
##
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## 31
## 34
## 35
## 36
## 39                                      (On-ECLS, Blood, Bacteria, Enterobacter cloacae), (On-ECLS, I
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## 40
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## 69
## 71
## 72
## 74
## 75                                                          (Pre-ECLS, Urine, Bacteria, En
## 76
## 77
## 79
## 82
## 83
## 84
## 85                                 (Pre-ECLS, Respiratory Tract, Bacteria, Serratia marse
## 86
## 88
## 89
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## 103
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## 105
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## 107
## 108
## 109
## 111
## 112
## 113
## 116                         (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Ba
## 117
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## 121
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## 149
## 151
## 152
## 156
## 157                                                                    (On-ECLS, Respiratory tract, Fungus
## 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
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## 207
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## 214
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## 223
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## 235
## 236
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## 238
## 239
## 240                                                    (Pre-ECLS, Urine, Bacteria, En
## 242
## 244
## 245
## 246
## 247
## 249
## 250
## 251
## 252
## 253                            (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Ba
## 254
## 255
## 256                            (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Ba
## 257
## 259
## 260
## 261
## 262
## 263
## 264
## 265
## 268
## 269
## 270
## 271                            (Pre-ECLS, Blood, Bacteria, E. coli), (Pre-ECLS, Blood, Ba
## 272
## 273
## 274
## 275
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## 411
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## 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
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## 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   3O5IFWMOIc  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   5uOXuOTdc0  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 7TZZyYOyMi  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 Eg09gedBMk  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 GOkUJJkRSU  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  KfxOQl50T8  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  NmcBGj7RfO 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 oa74Ed90gm 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 pOsjiHw6uc 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 TeelIO19by 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 uDONxQpQ5F 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 XjRrihOzHr 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 xMwONWlcYS 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  YBjyOMIrGw  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 zEn8g076bg  80 Female   Black      79.0   190.50  45.75000
## 125 ZQ30PJdeIu  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 zT0OGWyh7s  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
```

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```
## 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
```

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```
## 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, Bacter
## 208
## 33
## 118
## 188
## 14
## 250
## 22
## 366
## 181
## 309
## 421
## 216
## 199
## 360                                                                (Pre-ECL
## 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, Bacter
## 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, Bac
## 38
## 274
## 321
## 154
## 79
## 390
## 104
## 218
## 211
## 318
## 167
## 52
## 119
## 76
## 115
## 394
## 164
## 110
## 81
## 413
## 370
## 272                                                                           (On-ECLS, 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 Fl
## 316
## 258
## 324
## 12
## 290
## 42
## 338
## 225
## 269                                                                        (On-ECLS, Re
## 198
## 35
## 358
## 275
## 67
## 401                                                                        (Pre-ECl
## 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+/ Stapl

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

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

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

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

#for example\_lab\_data:

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

*Evaluate categorical variables:*

#for that, first convert to factors:

```r
#@lici, these are categorical variables, why are they under the heading "Evaluate the distribution of n
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).
```
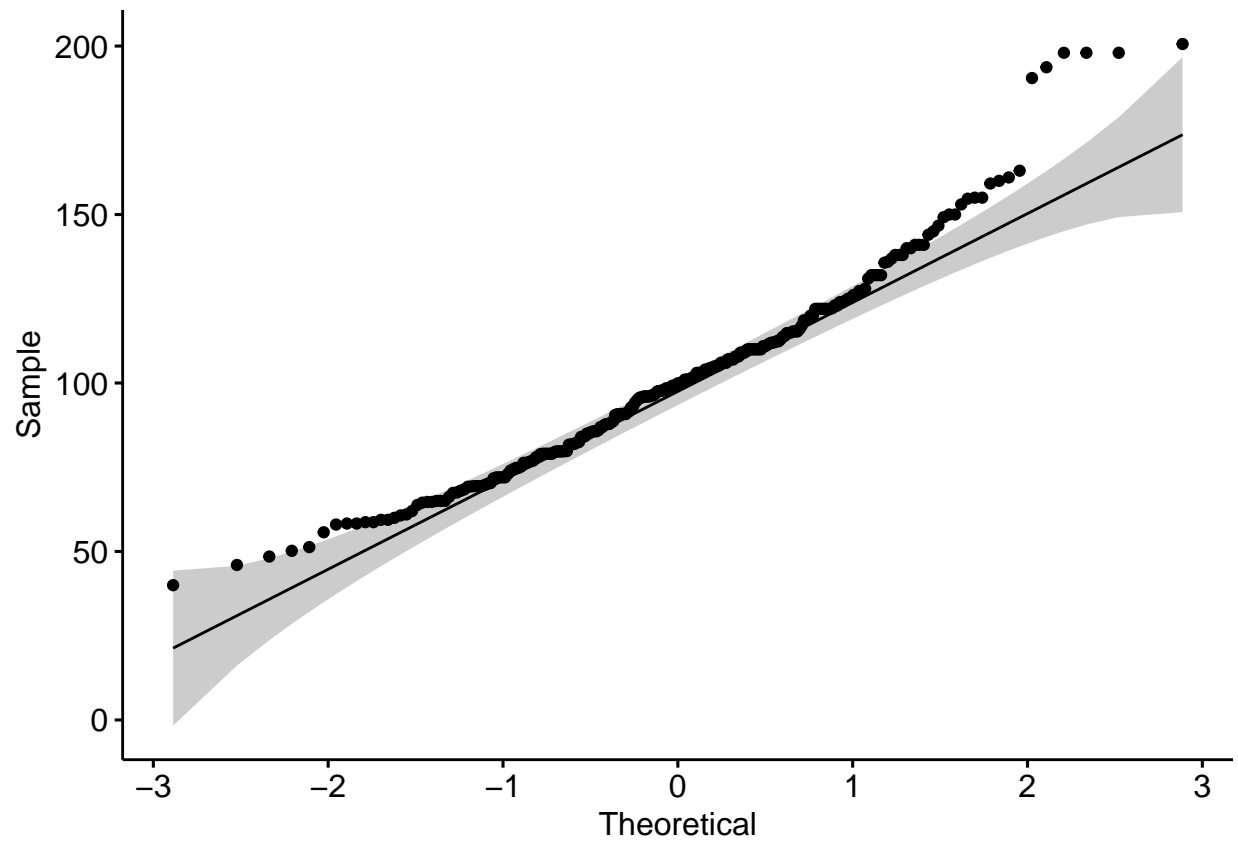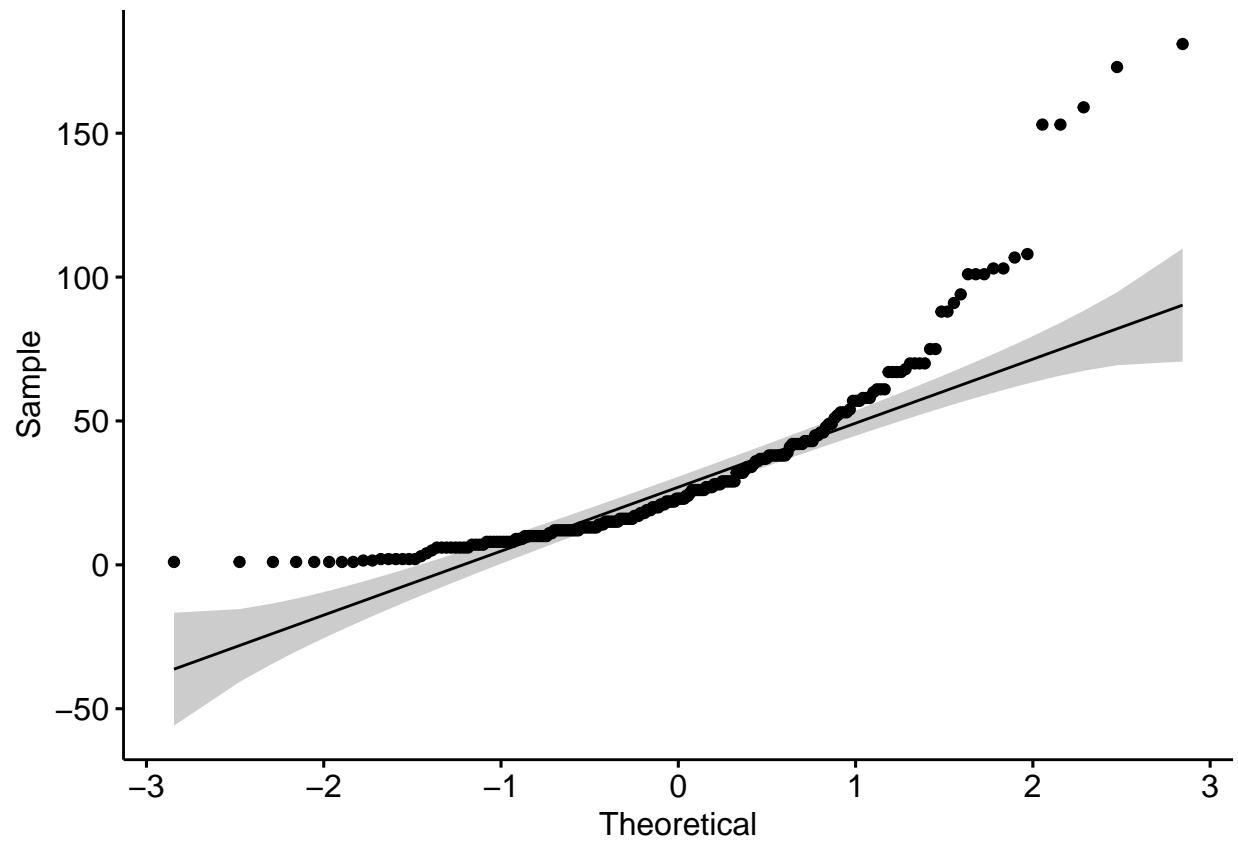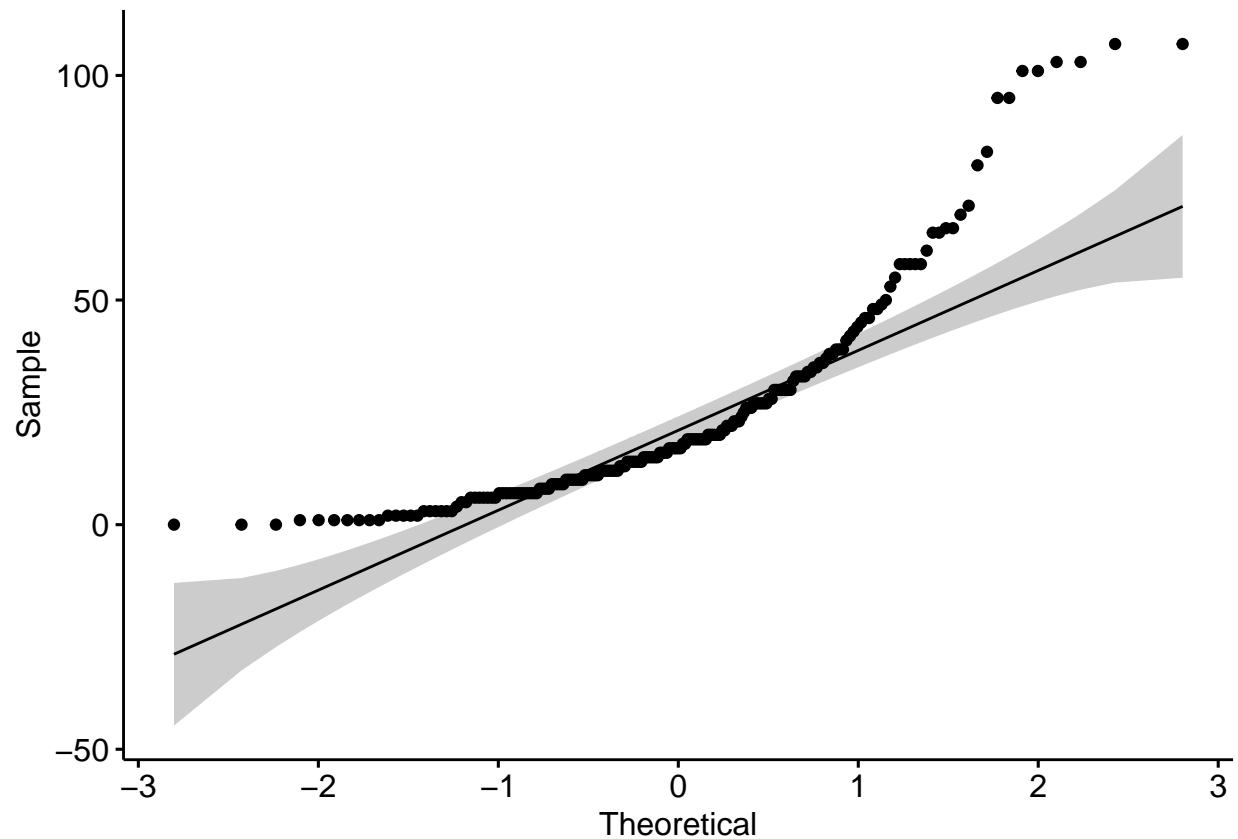
```
ggqqplot(synthetic_data$height_cm)
```

```
## 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).
```
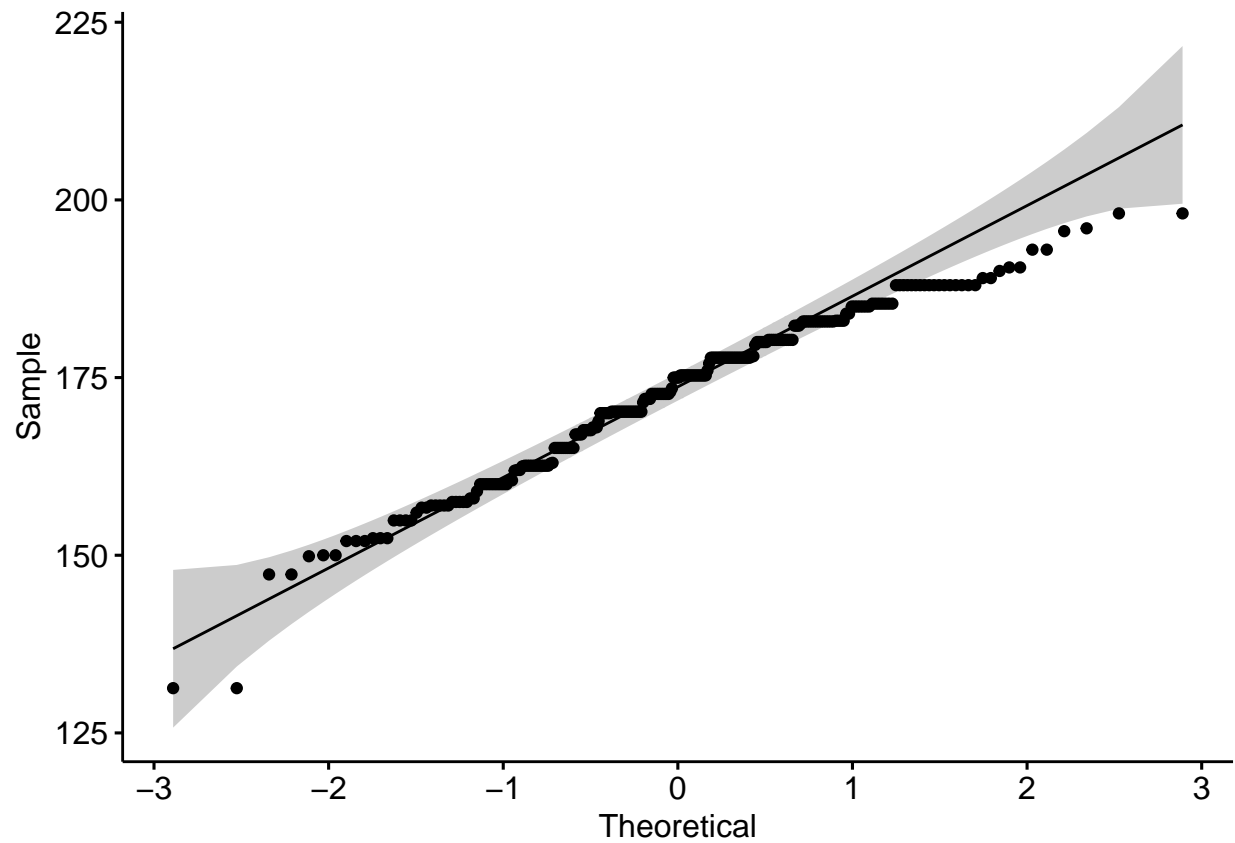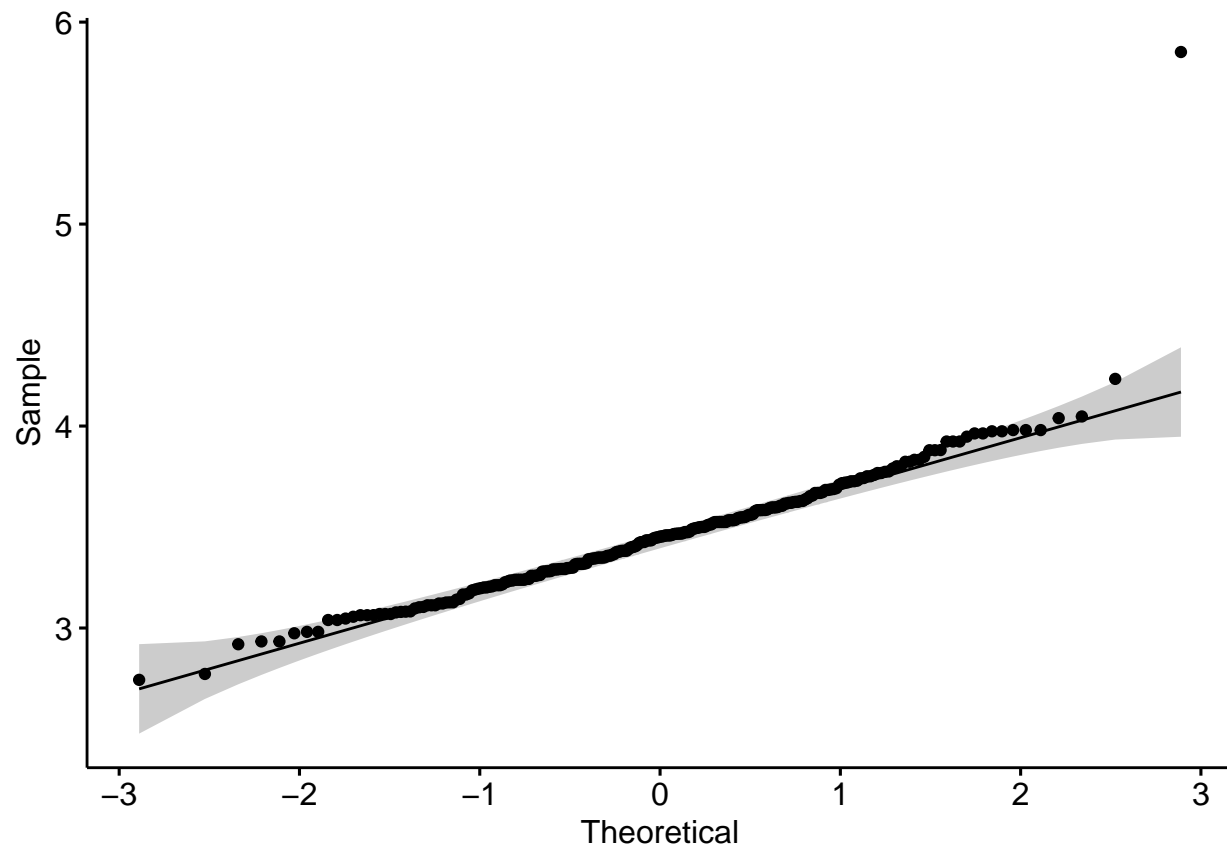
```
ggqqplot(synthetic_data$bmi)
```

```
## 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).
```
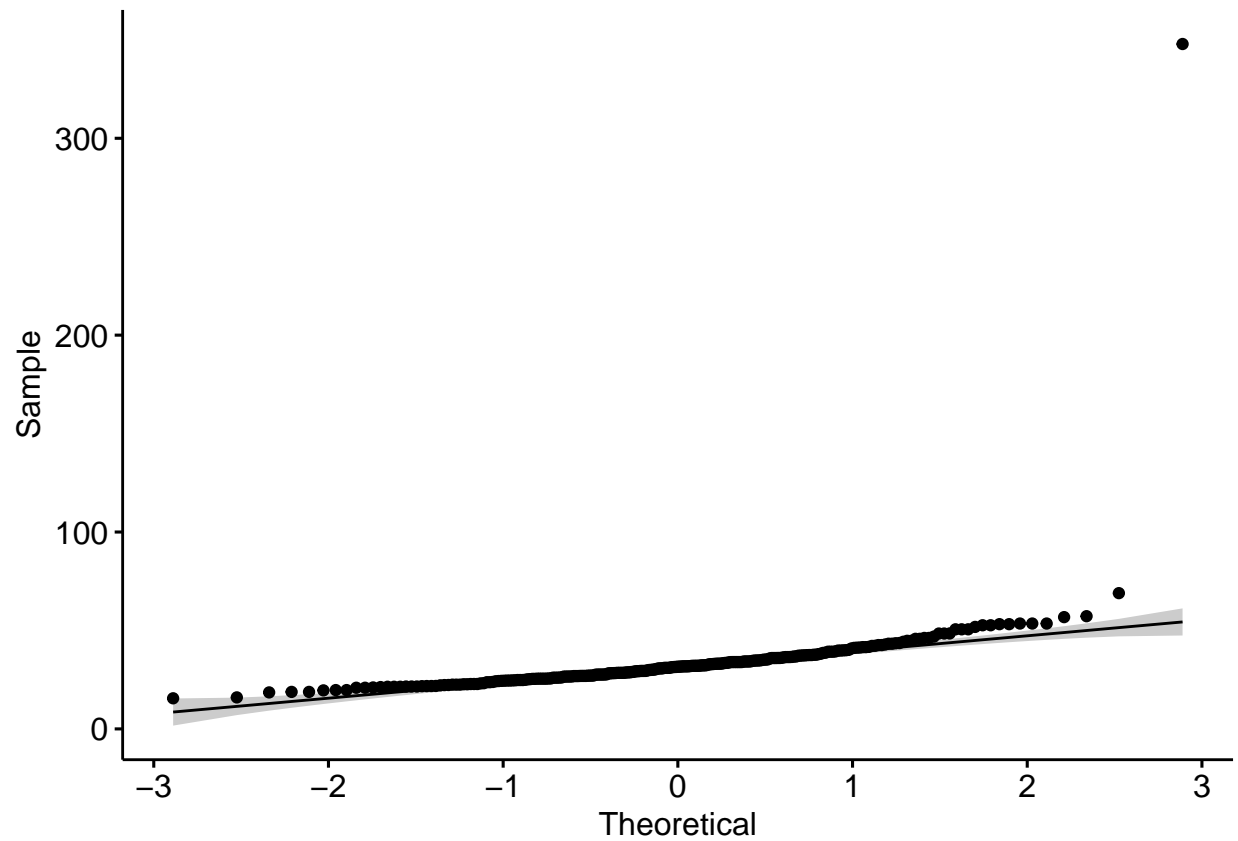
```
ggqqplot(synthetic_data$ph)
```

```
## 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).
```
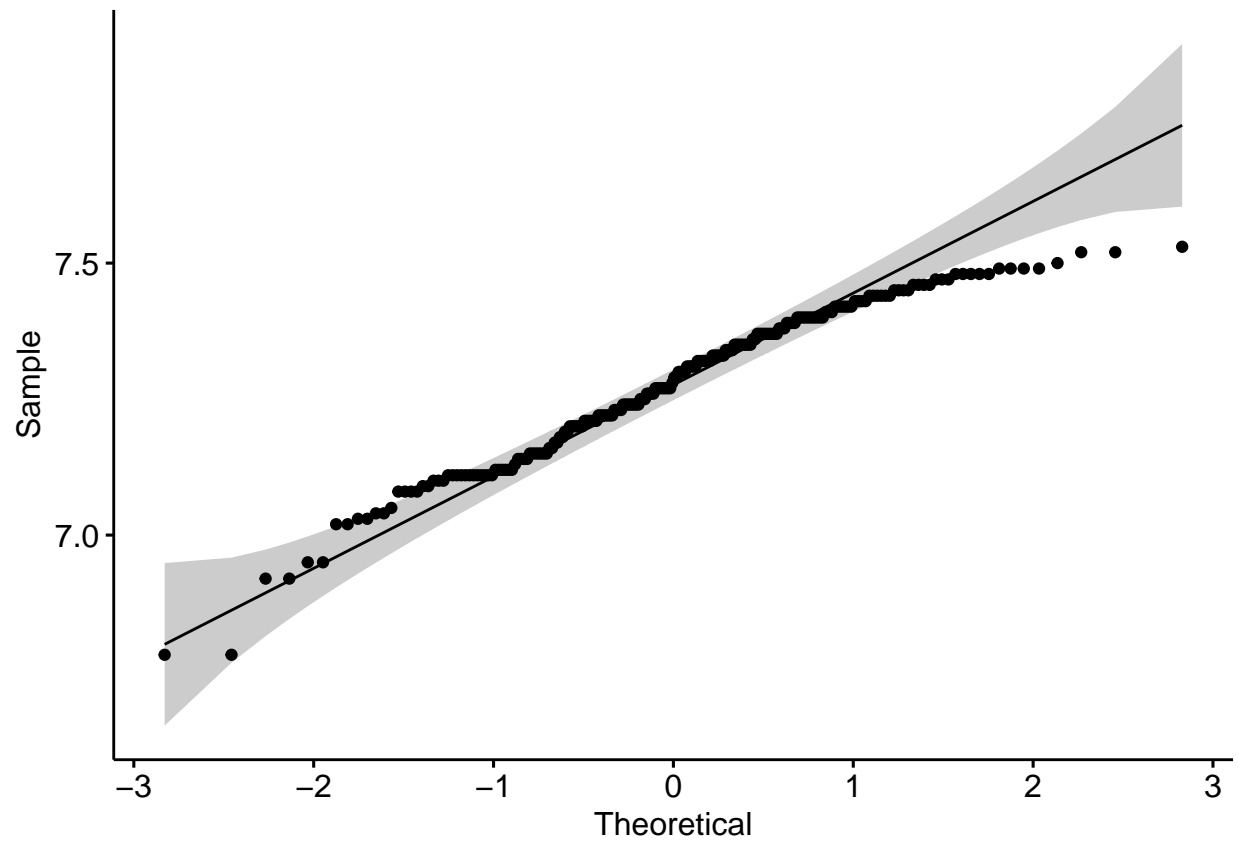
```
ggqqplot(synthetic_data$co2)
```

```
## 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).
```
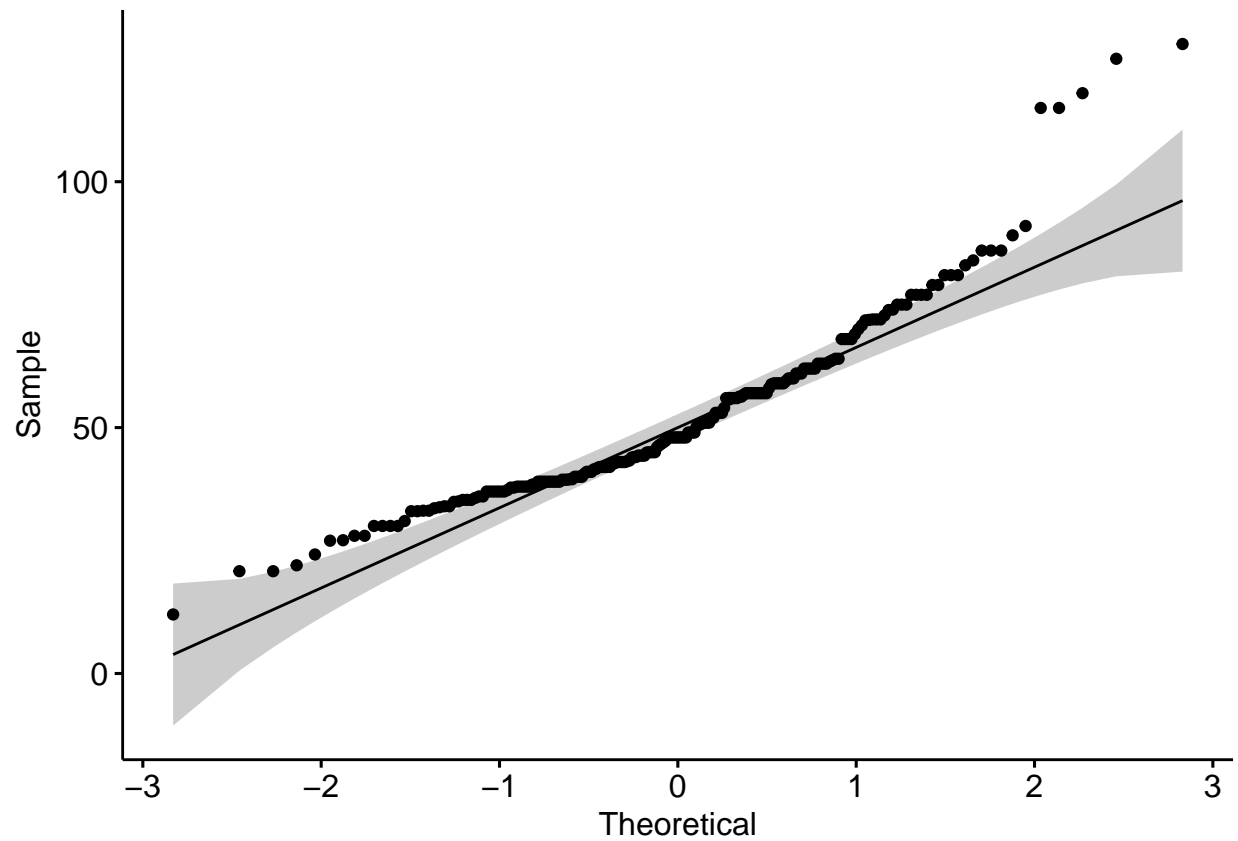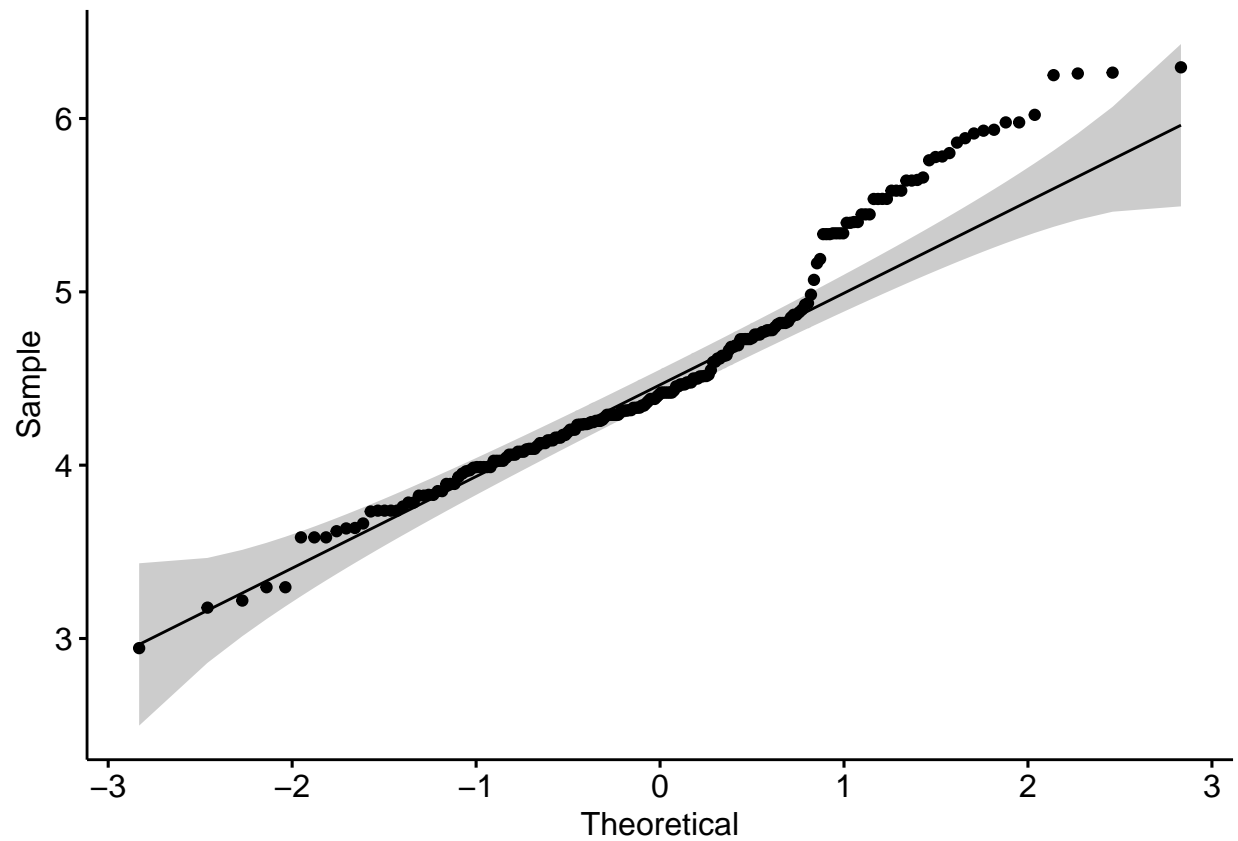
```
ggqqplot(synthetic_data$o2)
```

```
## 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).
```
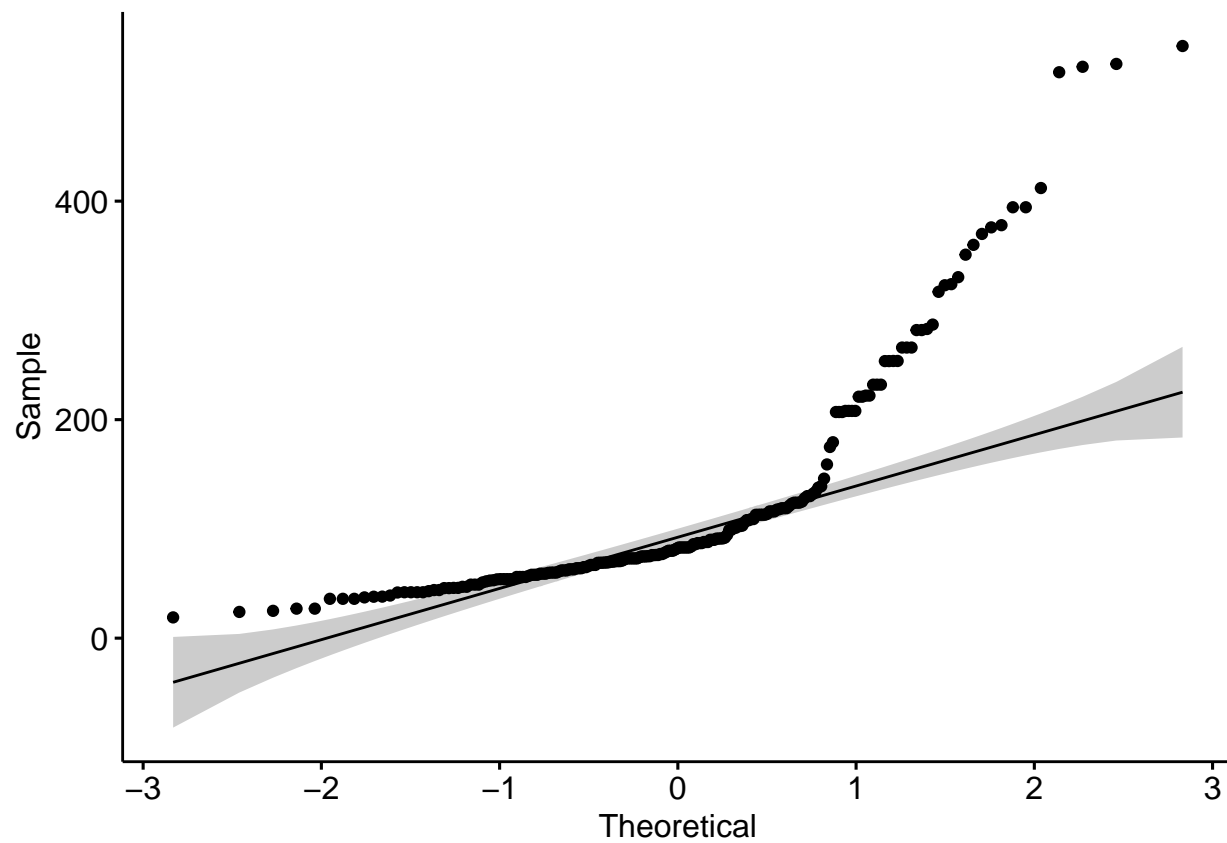
```
ggqqplot(synthetic_data$lactate_peak)
```

```
## 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).
```
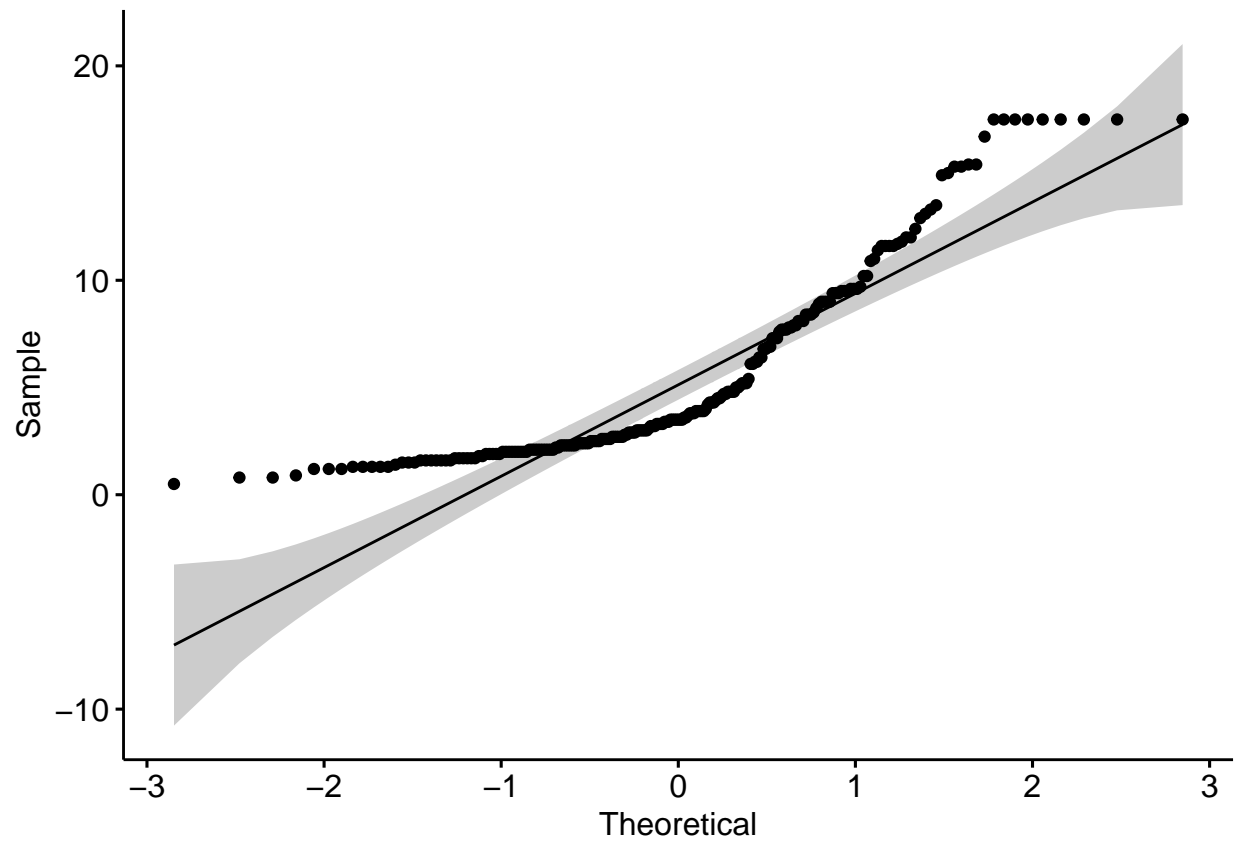
```
ggqqplot(synthetic_data$creatinine_peak)
```

```
## 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).
```
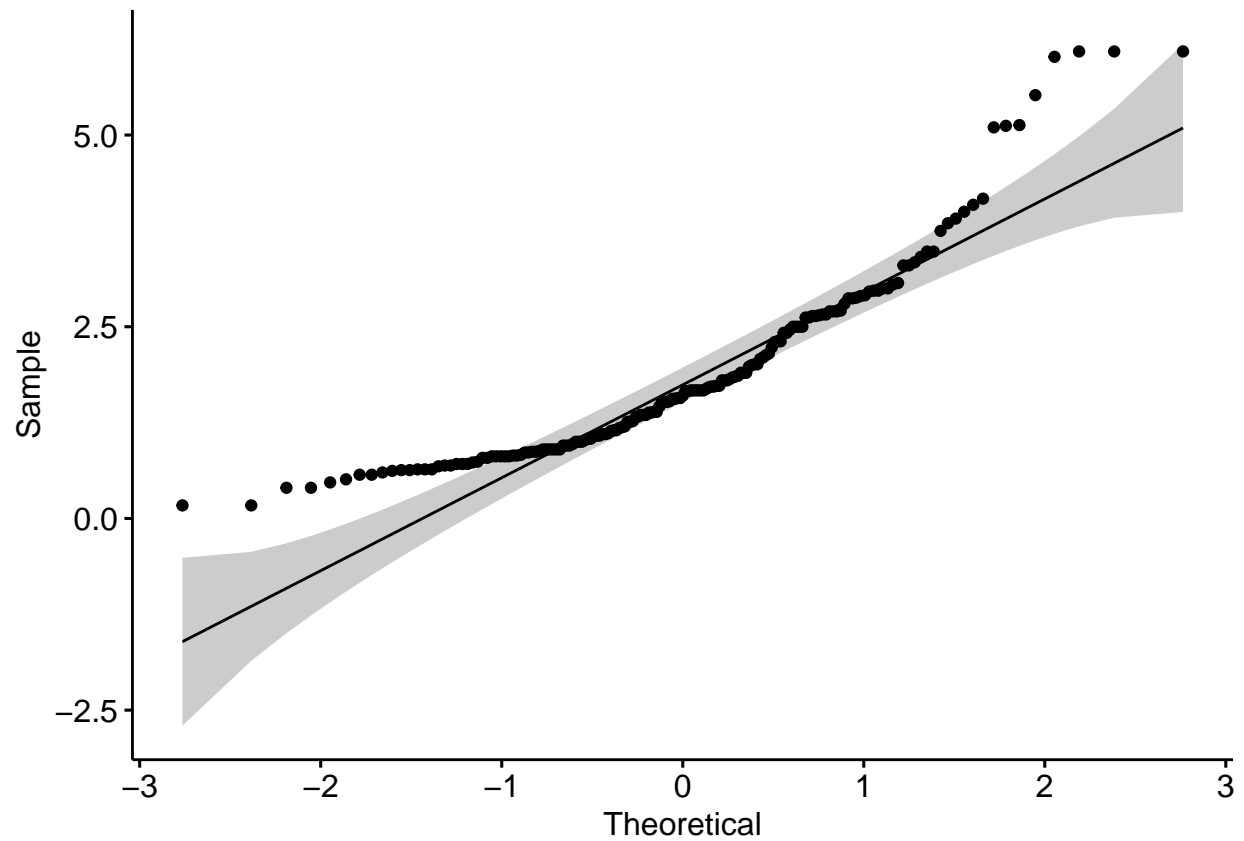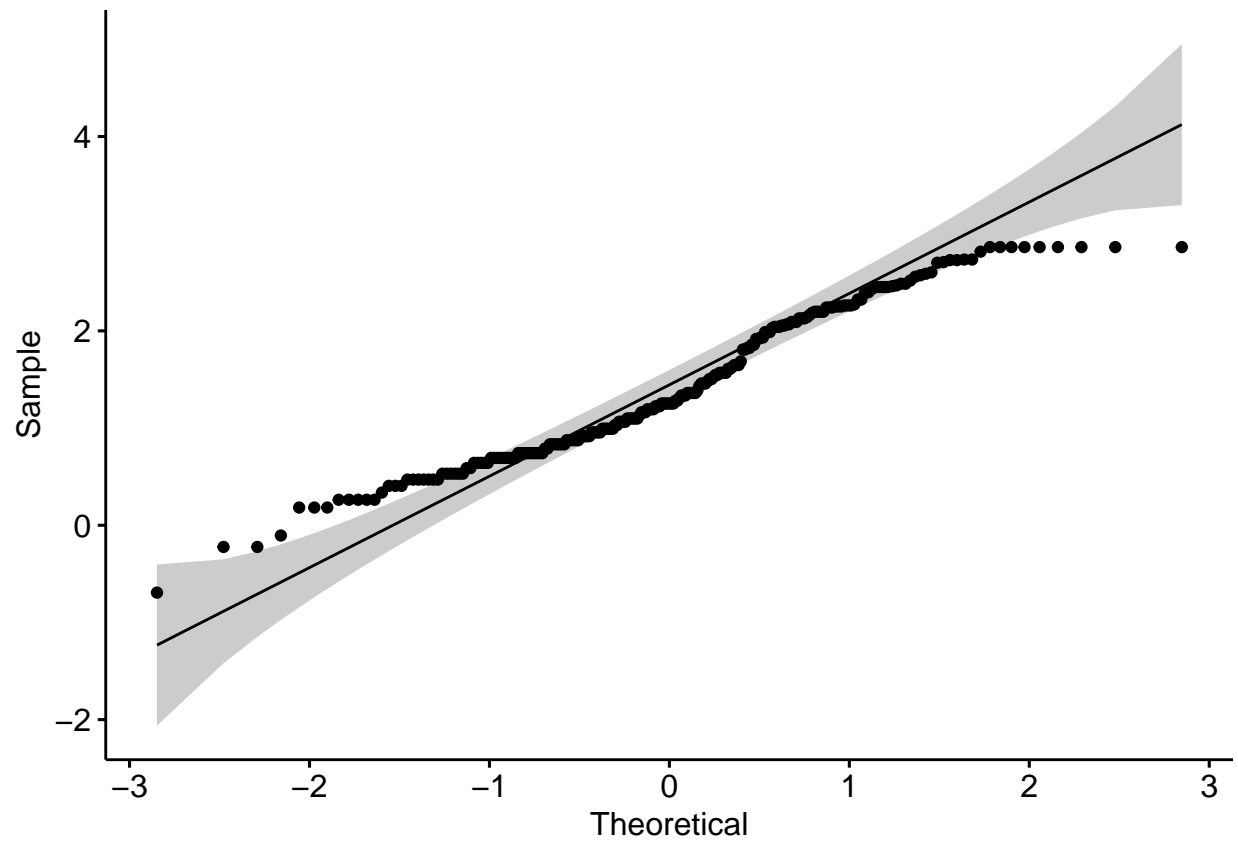
```
ggqqplot(synthetic_data$total_bilirubin_peak)
```

## 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).
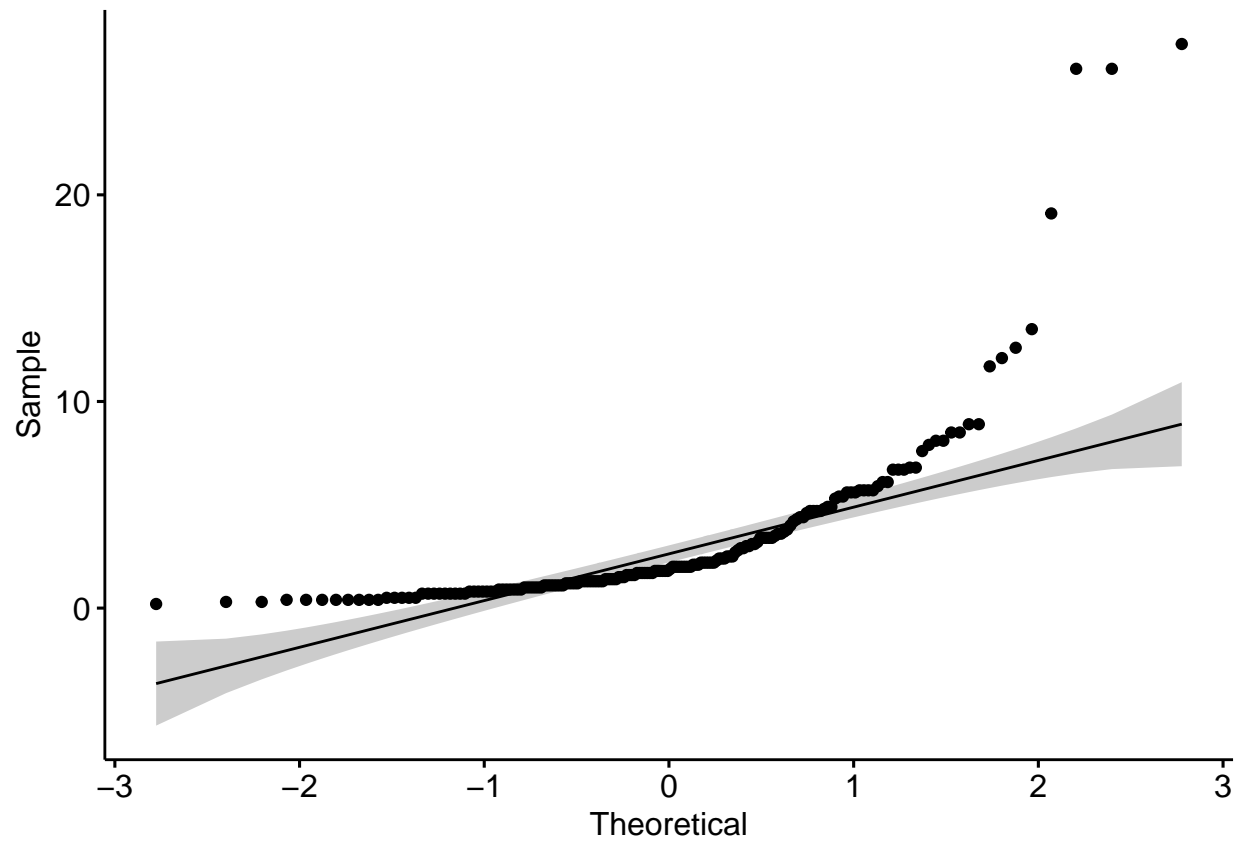
```
ggqqplot(synthetic_data$hospital_los)
```

```
## 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_data$bmi$ synthetic$_data$o2 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).
```
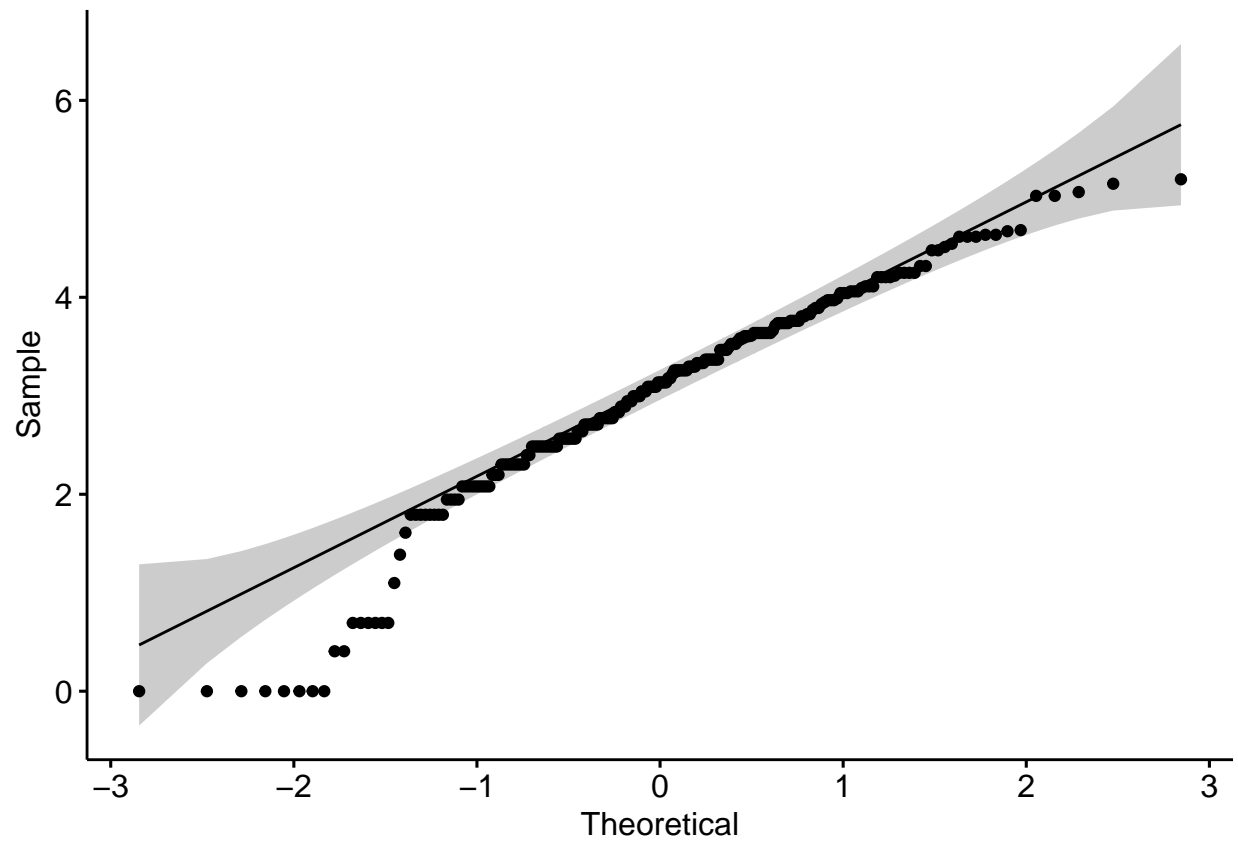
```
synthetic_data$o2_log = log(synthetic_data$o2)
ggqqplot(synthetic_data$o2_log)
```

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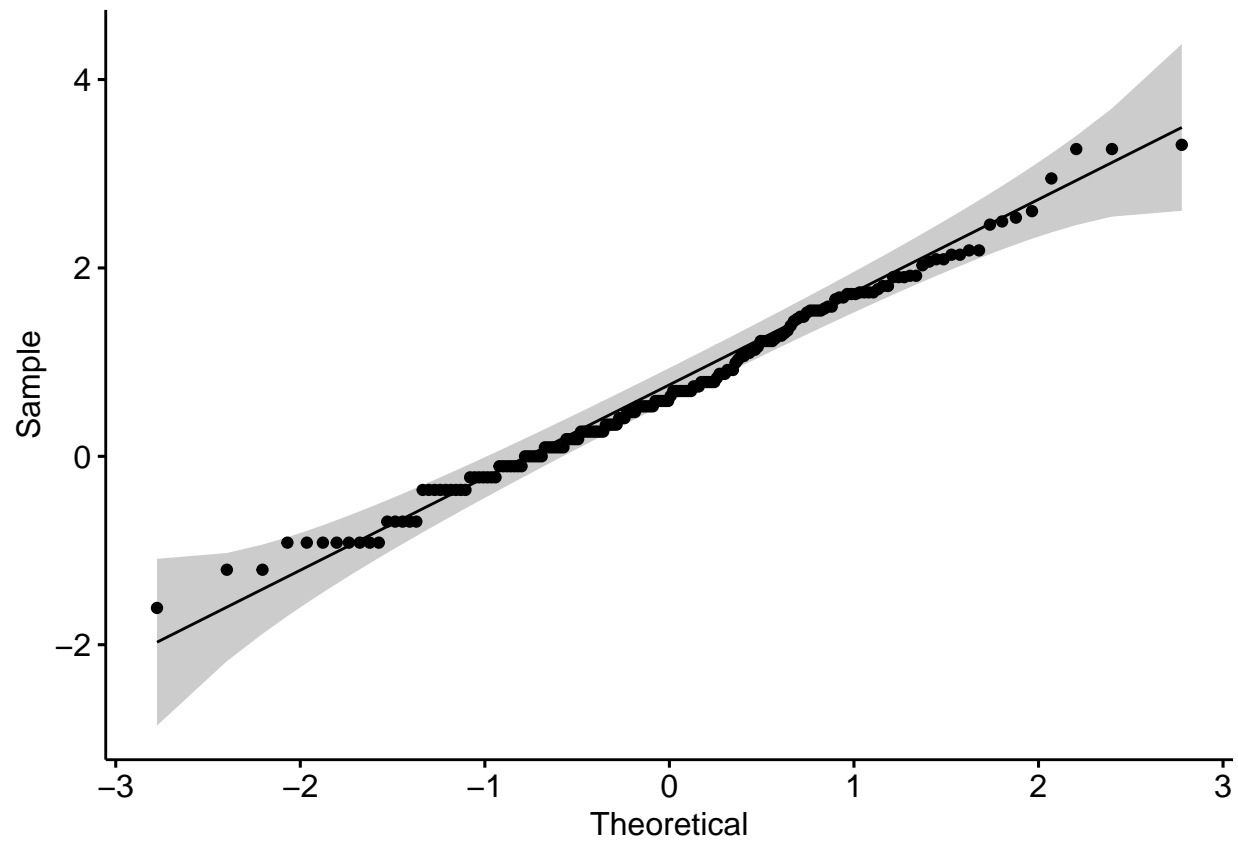
```
synthetic_data$hospital_los_log = log(synthetic_data$hospital_los)
ggqqplot(synthetic_data$hospital_los_log)
```

## 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).
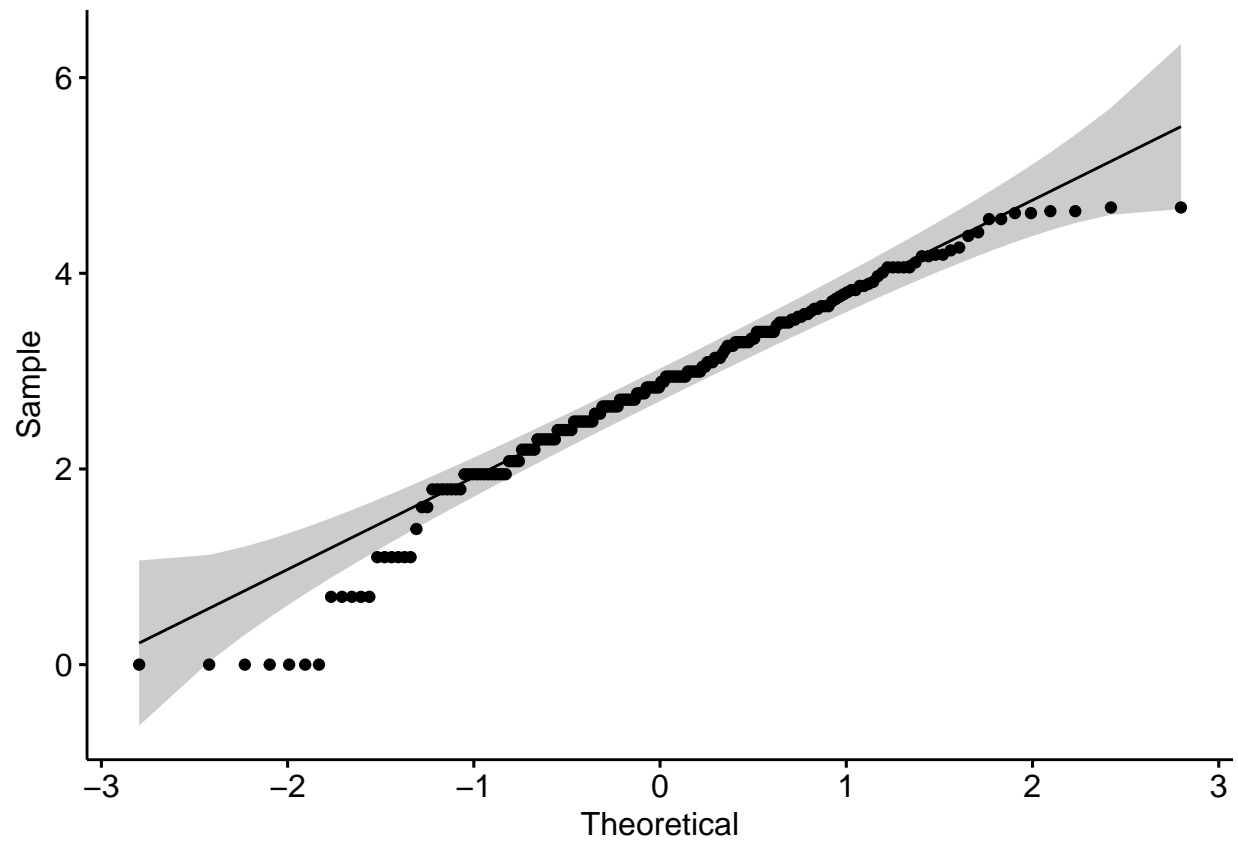
*Bonus challange: Convert dataframe to tibble:*

```
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)
```