Analisi di sistema dal 01 giugno al 30 settembre 2019
UOC di Medicina Trasfusionale di Agrigento

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Library utilizzate

```
> library(xtable)
> library(data.table)
> library(dplyr)
> library(ggplot2)
> library(mgcv)
> library(nlme)
> library(animint2)
> library(GGally)
> library(ggdendro)
> library(ggfortify)
> library(ggthemes)
> library(LabRS)
> library(reshape2)
> library(RGraphics)
> library(gridExtra)
> donazioni <- read.csv("~/Scrivania/Report Statistici Sweave /trasfusionale/rsdonazione.csv
> mydata <- donazioni
> ix <- 1:14
```

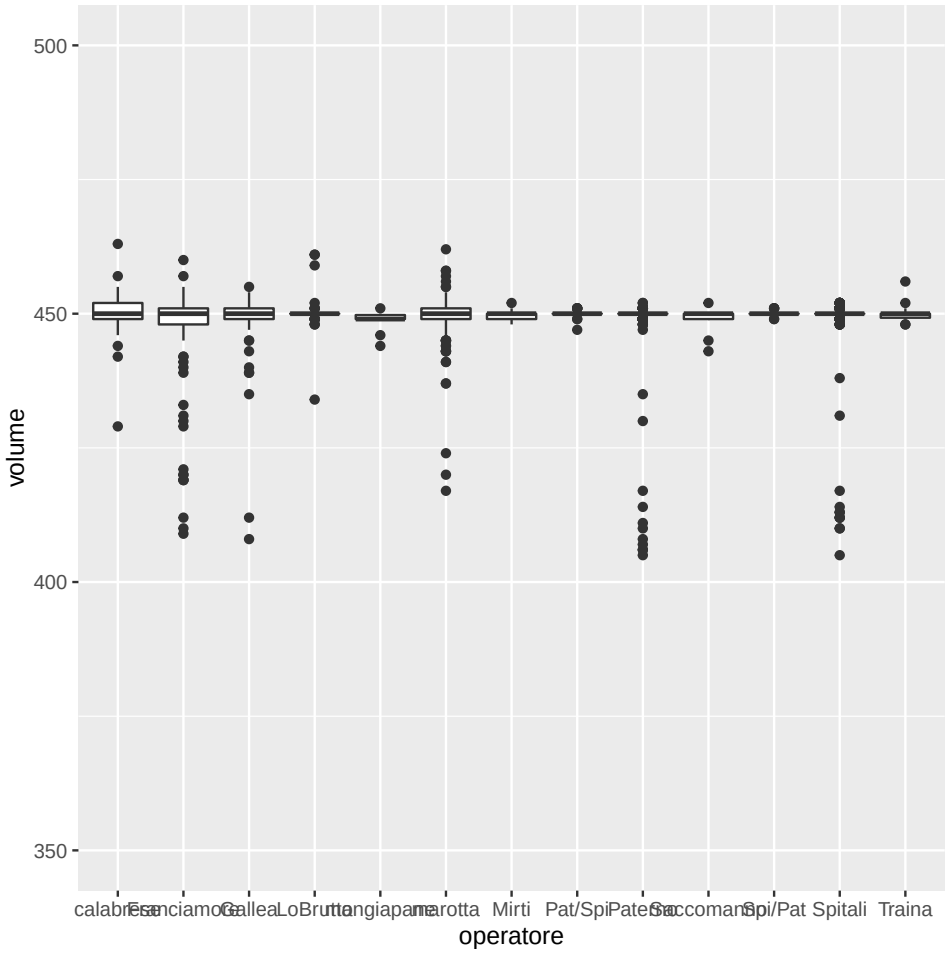
1 Raccolta di Sangue Intero

Valutazione degli operatori

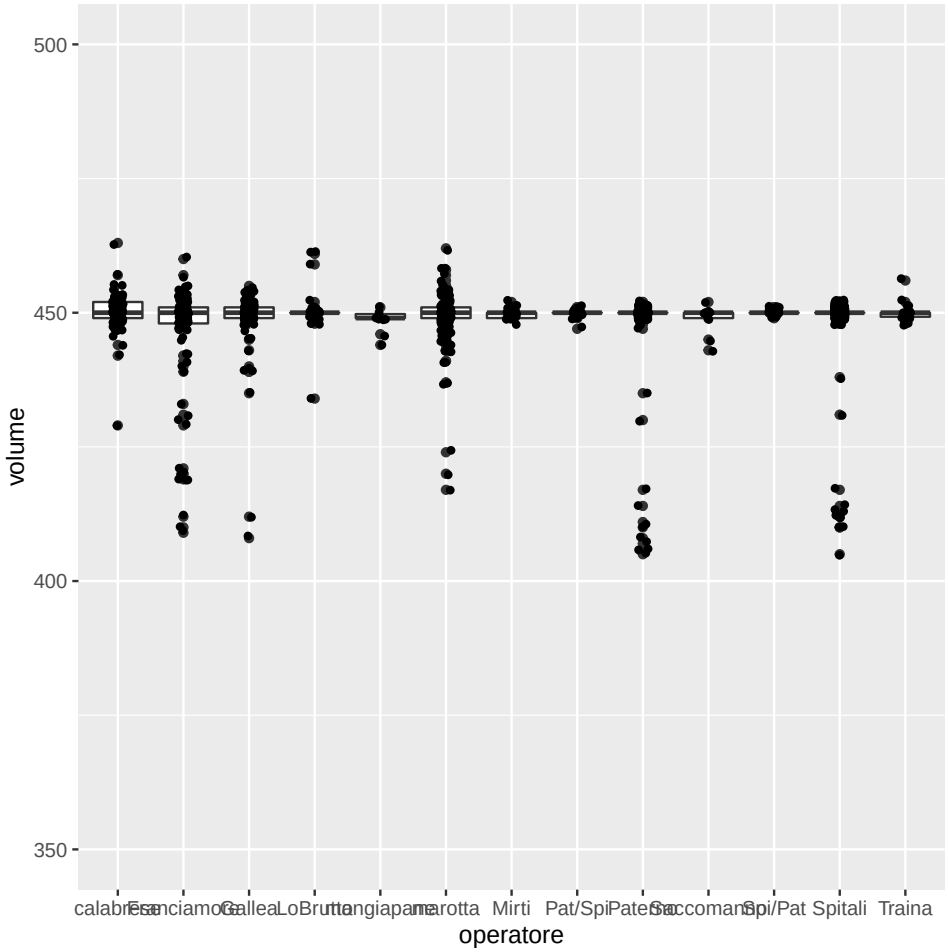
```
> summary(mydata)
> summary(mydata$operatore)
> xtable(table((mydata$operatore)))
```

Operatore Apertura	Operatore Chiusura	Tipo Sacca	Numero raccolte di SI
Antonino mangiapane	antonino mangiapane	CQ31555	11
Antonio marotta	antonio marotta	C3974	162
Carmelo calabrese	carmelo calabrese	C3974	111
Concetta lobrutto	concetta lobrutto	CQ31555	33
Crocetta traina	crocetta traina	CQ31555	19
Elio franciamore	bilance	C3974	6
Elio franciamore	elio franciamore	C3974	91
Enzo saccomanno	enzo saccomanno	CQ31555	10
Francesco mirti	francesco mirti	CQ31555	44
Giovanni gallea	giovanni gallea	C3974	151
Pietro Paternò	bilance	C3974	8
Pietro Paternò	Pietro paternò	C3974	3
Pietro Paternò	Roberto spitali	C3974	1
Pietro Paternò	bilance	CQ31555	3
Pietro Paternò	Pietro paternò	C3974	207
Pietro Paternò	Pietro paternò	CQ31555	133
Pietro Paternò	Roberto spitali	C3974	23
Pietro Paternò	Roberto spitali	CQ31555	12
Roberto Spitali	bilance	C3974	3
Roberto Spitali	bilance	CQ31555	1
Roberto Spitali	Roberto spitali	CQ31555	1
Roberto Spitali	Pietro paternò	C3974	14
Roberto Spitali	Pietro paternò	CQ31555	13
Roberto Spitali	Roberto spitali	C3974	280
Roberto Spitali	Roberto spitali	CQ31555	154
NA	NA	NA	1
		Totale	1.495

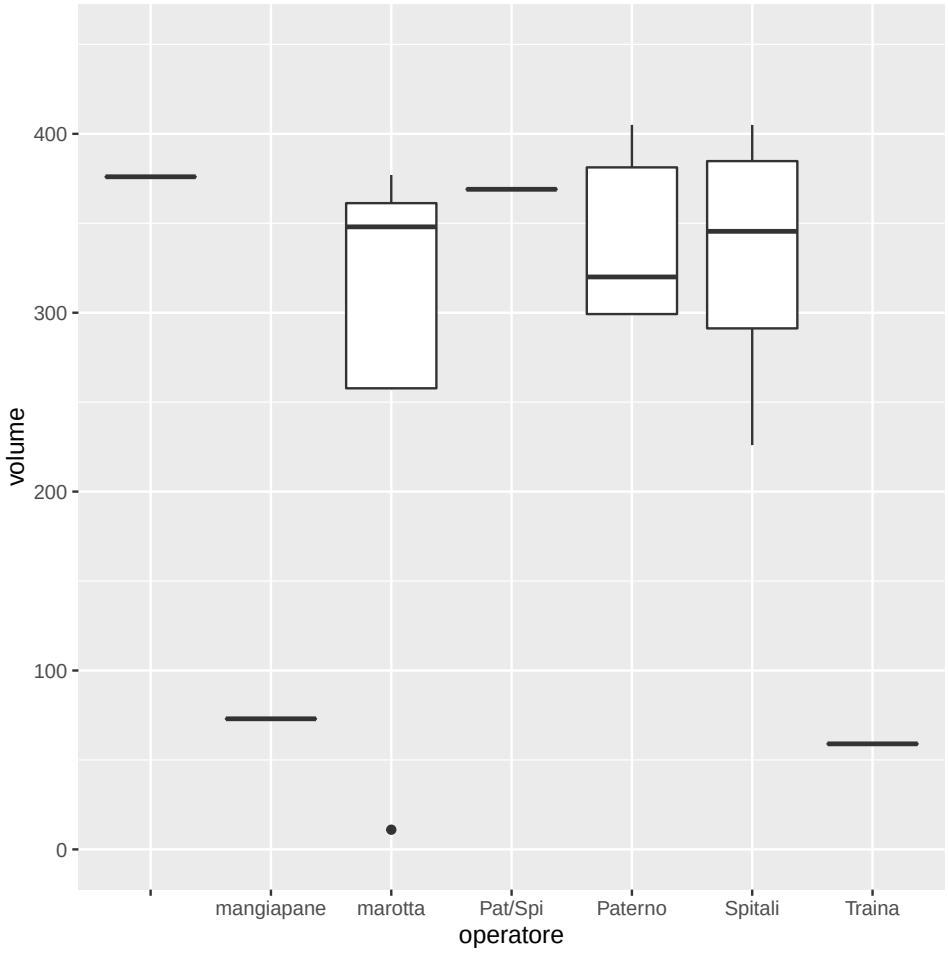
```
> DF_RI <- filter(mydata, mydata$volume>= "405")
> slideinf <- ggplot(DF_RI, aes(operatore, volume)) + geom_boxplot() + ylim(350, 500)

> slideinf
```




```
> summary(mydata$operatore)
> sopra405 <- (xtable(filter(mydata,mydata$volume>=405)))

> summary(sopra405$operatore)

> slideinf2 <- slideinf + geom_jitter(shape=16, position=position_jitter(0.2))

> slideinf2
```




```
> xtable(table((DF_RI$operatore)))

> DF_RNI <- filter(mydata, volume<=405)
> slideinfni <- ggplot(DF_RNI, aes(x=operatore, y=volume)) + geom_boxplot() + ylim(0, 450)

> slideinfni
```




```
> summary(DF_RNI$operatore)
```

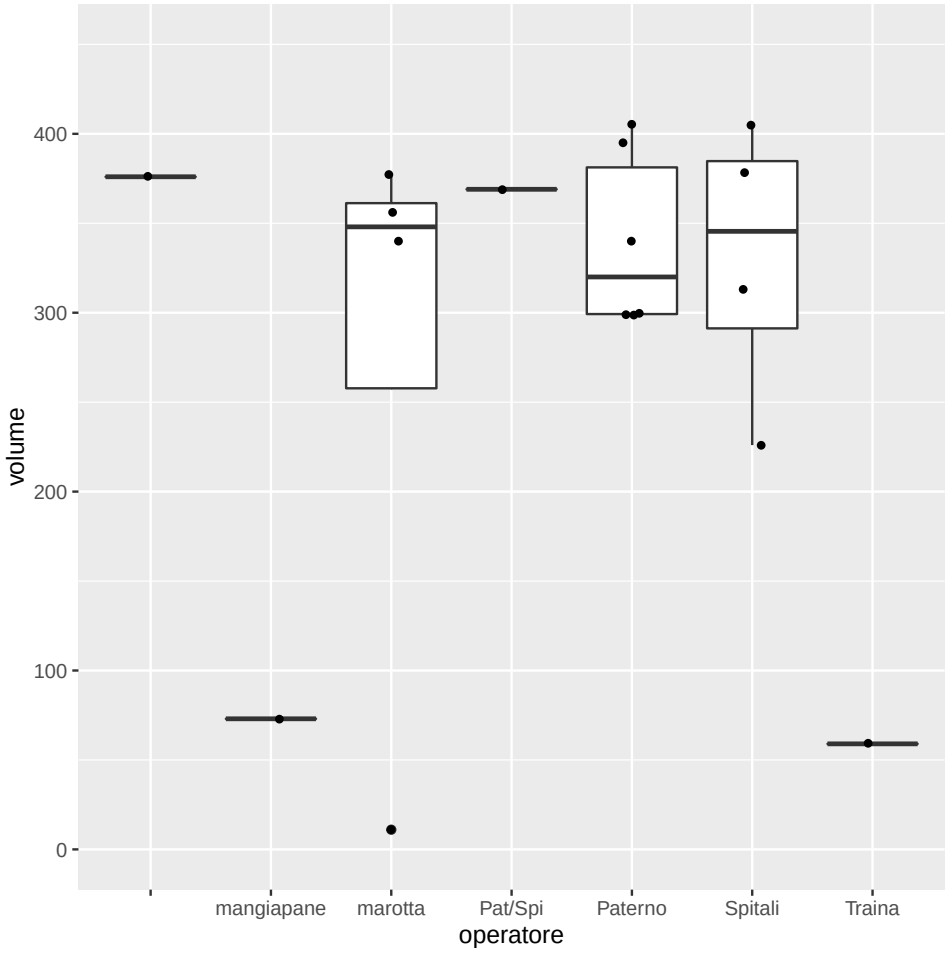
```
            calabrese Franciamore      Gallea    LoBrutto  mangiapane
                    1           0           0           0           1
     marotta       Mirti     Pat/Spi     Paterno  Saccomanno     Spi/Pat
                    4           0           1           6           0           0
     Spitali      Traina
                    4           1
```

```
> sotto405 <- (xtable(filter(mydata,mydata$volume<=405)))
> sotto405$cdm
```

```
 [1] I211119860217 I211119500217 I211119500278 I211119500315 I211119500360
 [6] I211119500234 I211119860276 I211119103545 I211119102799 I211119103483
[11] I211119103022 I211119103148 I211119103714 I211119103422 I211119102812
[16] I211119102967 I211119102976 I211119103427
1495 Levels: I211119102787 I211119102788 I211119102789 ... I211119860345
```

```
> slideinfni2 <- slideinfni + geom_jitter(shape=16, position=position_jitter(0.2))
```

```
> slideinfni2
```



1.1 Valutazione Lotti

```
> summary(mydata$lotto)
> xtable(table((mydata$lotto)))
```

	Unità
NA	1
41MC17FB00	3
41ML26FA00	191
41MM07FC00	33
41NB11FA0&	1
41NB11FA00	550
41NC23FA00	477
85MM27FA00	171
85MM29FB00	68

1.2 Valutazione volumi e tempi

1.2.1 Volume delle unità di sangue intero

```
>     summary(mydata$vol)
>     racidonee <-(mydata$vol>=410)
>     summary(racidonee)
>     racidonee450 <-(mydata$vol>=450)
>     summary(racidonee450)
>     racidoneeA450 <-(mydata$vol<450)
>     summary(racidoneeA450)
>     racidoneeS490 <-(mydata$vol>490)
>     summary(racidoneeS490)

> xtable(table(mydata$vol))
```

	Volume sacche
Min	11
1st Qu.	449
Median	450
Mean	447.2
3rd Qu.	450
Max	463

Vol $<$ 410 ml	Vol $>$ 410 ml
24	1471

1.2.2 Tempo di raccolta delle unità di Sangue Intero

```
>     summary(mydata$durata.1)
>     tempoidonee <-(mydata$durata.1 <= 12)
>     summary(tempoidonee)
```

	Tempo di raccolta
Min	0
1st Qu.	4
Median	5
Mean	4.99
3rd Qu.	6
Max	13

Secondi <= 12 ml	Secondi > 12
1494	1

1.3 Sedi di Raccolta

```
>     summary(mydata$punto)
>     round(prop.table(table(mydata$punto))*100, digits=2)
```

Sede	N.unità	%
Sicu	5	0.4
Frates Cammarata	117	7.8
Emoteca 1(12)	174	11.6
Emoteca 2(13)	324	21.7
UOC Trasfusionale	851	56.9
NA	24	1.6
Totale	1.495	100

1.3.1 Sede di raccolta ADAS1

```
>     library(dplyr)
>     ADAS1<- filter(mydata, punto == 12)
>     summary(ADAS1)
>     summary(ADAS1)
>     summary(ADAS1$note.1)
>     xtable(table(summary(ADAS1$note.1)))
```

ADAS1: Valutazione degli operatori

Operatore Apertura	Operatore Chiusura	Tipo Sacca	Numero raccolte di SI	ADAS1
Antonino mangiapane	antonino mangiapane	CQ31555	11	0
Antonio marotta	antonio marotta	C3974	162	142
Carmelo calabrese	carmelo calabrese	C3974	111	9
Concetta lobrutto	concetta lobrutto	CQ31555	33	0
Crocetta traina	crocetta traina	CQ31555	19	0
Elio franciamore	bilance	C3974	6	0
Elio franciamore	elio franciamore	C3974	91	11
Enzo saccomanno	enzo saccomanno	CQ31555	10	0
Francesco mirti	francesco mirti	CQ31555	44	0
Giovanni gallea	giovanni gallea	C3974	151	11
Pietro Paternò	bilance	C3974	8	0
Pietro Paternò	Pietro paternò	C3974	3	0
Pietro Paternò	Roberto spitali	C3974	1	0
Pietro Paternò	bilance	CQ31555	3	0
Pietro Paternò	Pietro paternò	C3974	207	0
Pietro Paternò	Pietro paternò	CQ31555	133	0
Pietro Paternò	Roberto spitali	C3974	23	0
Pietro Paternò	Roberto spitali	CQ31555	12	0
Roberto Spitali	bilance	C3974	3	0
Roberto Spitali	bilance	CQ31555	1	0
Roberto Spitali	Roberto spitali	CQ31555	1	0
Roberto Spitali	Pietro paternò	C3974	14	0
Roberto Spitali	Pietro paternò	CQ31555	13	0
Roberto Spitali	Roberto spitali	C3974	280	0
Roberto Spitali	Roberto spitali	CQ31555	154	0
NA	NA	NA	1	1
		Totale	1.495	174

1.4 ADAS: Valutazione Lotti

```
> summary(ADAS1$lotto)
> xtable(table(summary(ADAS1$lotto)))
```

Lotto	Numero sacche
41NB11FA0&	0
41MC17FB00	0
41MM07FC00	13
85MM29FB00	0
85MM27FA00	0
41ML26FA00	0
41NC23FA00	87
41NB11FA00	74
Totale	174

1.5 ADAS1: Valutazione volumi e tempi

1.5.1 ADAS1: Volume delle unità di sangue intero

```
>     summary(ADAS1$vol)
>     Aracidonee <-(ADAS1$vol>=410)
>     summary(Aracidonee)
>     Aracidonee450 <-(ADAS1$vol>=450)
>     summary(Aracidonee450)
>     AracidoneeA450 <-(ADAS1$vol<450)
>     summary(AracidoneeA450)
>     AracidoneeS490 <-(ADAS1$vol>490)
>     summary(AracidoneeS490)

>     xtable(table(ADAS1$vol))
```

	Volume sacche	ADAS1
Min	11	11
1st Qu.	449	448
Median	450	450
Mean	447.2	444.4
3rd Qu.	450	451
Max	463	462

1.5.2 ADAS1: Tempo di raccolta delle unità di Sangue Intero

```
>     summary(ADAS1$durata.1)
>     Atempoidonee <-(ADAS1$durata.1 <= 12)
>     summary(Atempoidonee)
```

	Tempo di raccolta	ADAS1
Min	0	0
1st Qu.	4	4
Median	5	5
Mean	4.99	5
3rd Qu.	6	6
Max	13	12

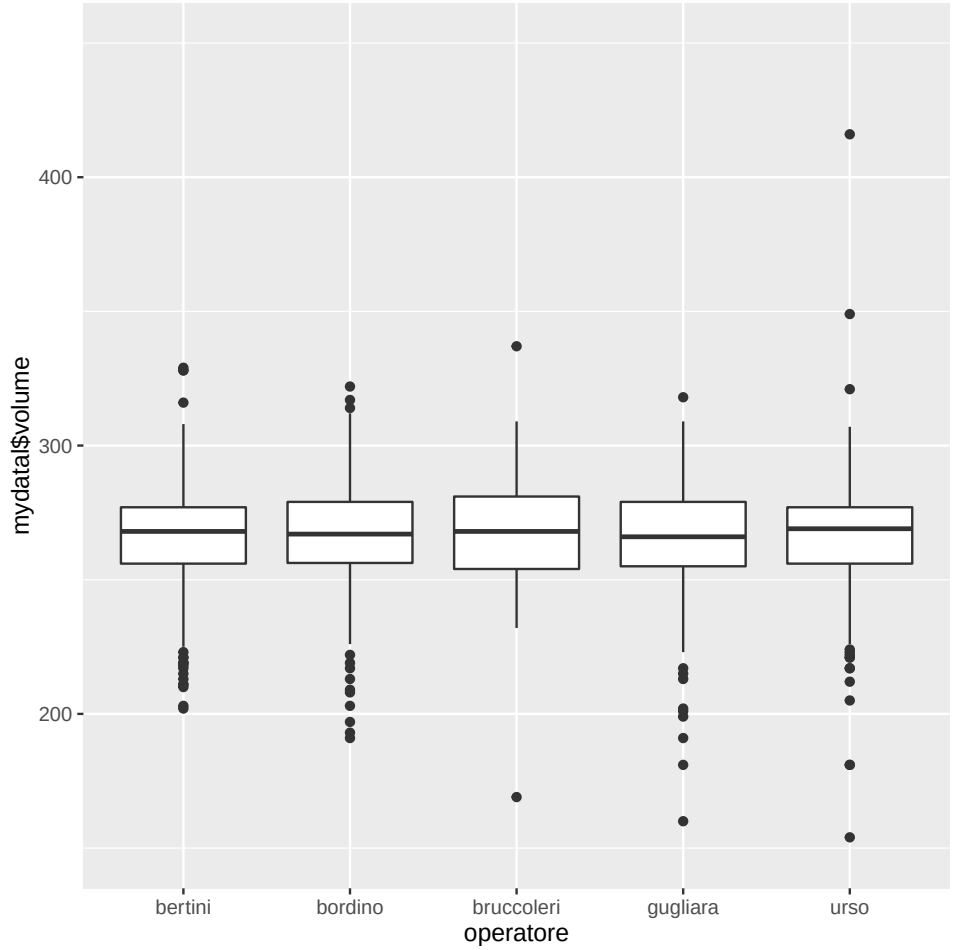
Secondi <= 12 ml	Secondi > 12
174	0

2 Raccolta di Sangue Intero

```
>     library(data.table)
>     library(xtable)
>     library(dplyr)
>     lavorazioni <- read.csv("~/Scrivania/Report Statistici Sweave /trasfusionale/lavplasma
>     mydatal <- (lavorazioni)
```

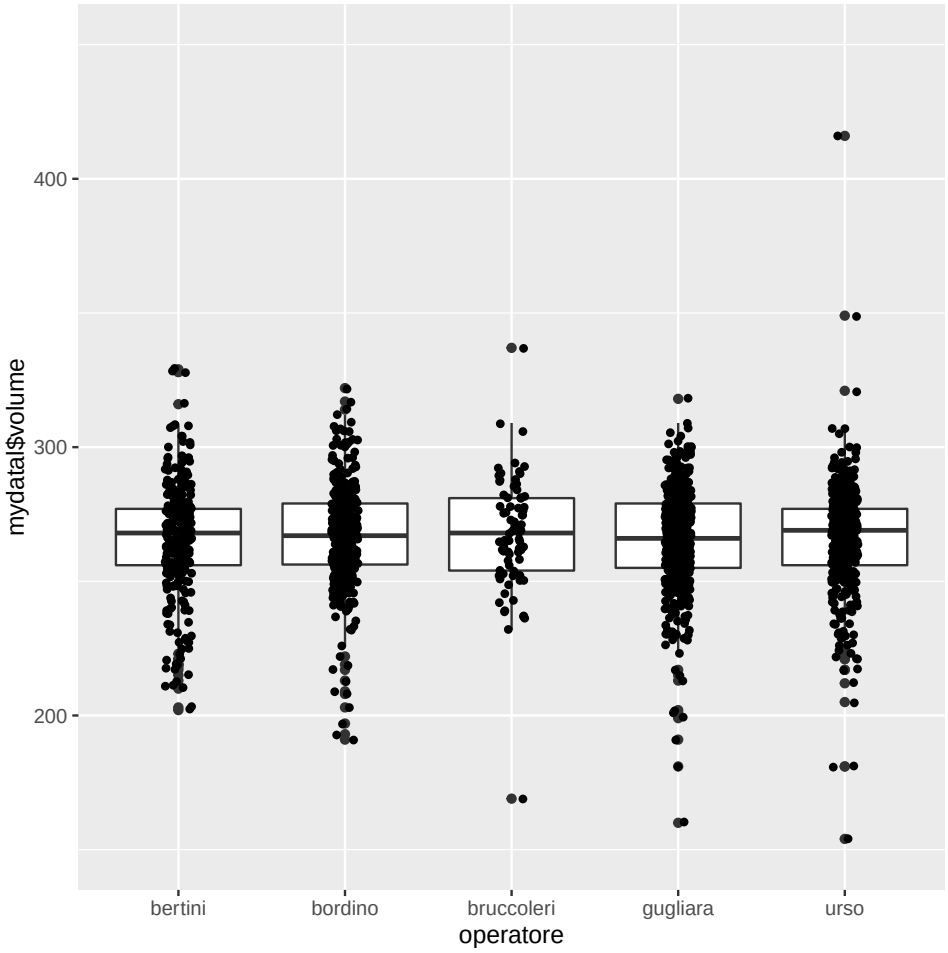
Lavorazione sangue: operatori

```
> summary(mydatal)
> summary(mydatal$operatore)
> xtable(table(summary(mydatal$operatore)))

> slideope <- ggplot(mydatal, aes(operatore, mydatal$volume)) + geom_boxplot() + ylim(150, 4

> slideope
```




```
> summary(mydatal$operatore)

   bertini     bordino bruccoleri    gugliara       urso
       287         335          79         464         385

> slideope2 <- slideope + geom_jitter(shape=16, position=position_jitter(0.2))
```

```
> slideope2
```



2.0.1 Analisi statistica delle differenze

Non c'è alcuna differenza tra le unità prodotte dai singoli tecnici

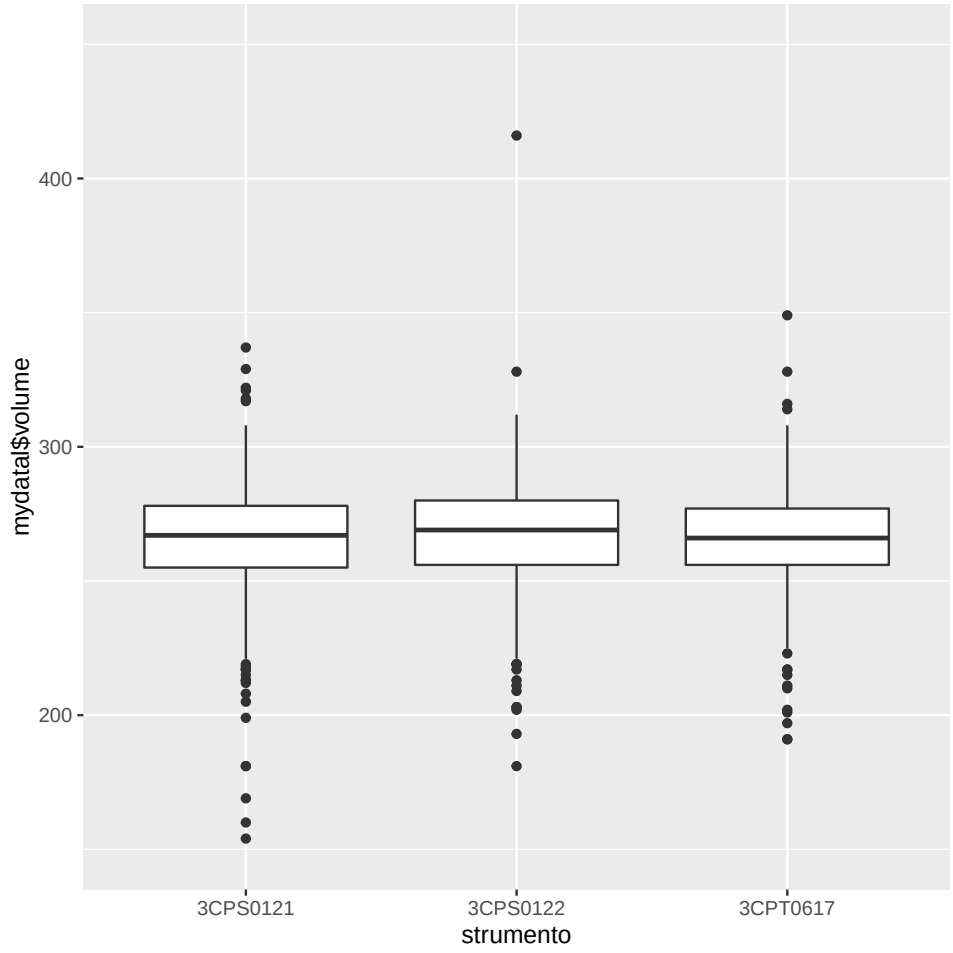
```
> DF_G <- filter(mydatal, operatore== "gugliara")
> DF_Be <- filter(mydatal, operatore== "bertini")
> DF_Bo <- filter(mydatal, operatore== "bordino")
> DF_Br <- filter(mydatal, operatore== "bruccoleri")
> DF_U <- filter(mydatal, operatore== "urso")
> shapiro.test(DF_G$volume)
> shapiro.test(DF_Be$volume)
> shapiro.test(DF_Bo$volume)
> shapiro.test(DF_Br$volume)
> wilcox.test(DF_G$volume,DF_Be$volume)
> wilcox.test(DF_G$volume,DF_Br$volume)
> wilcox.test(DF_G$volume,DF_Bo$volume)
> wilcox.test(DF_G$volume,DF_U$volume)
> wilcox.test(DF_Be$volume,DF_Bo$volume)
> wilcox.test(DF_Be$volume,DF_Br$volume)
> wilcox.test(DF_Be$volume,DF_U$volume)
```

```
> wilcox.test(DF_Bo$volume,DF_Br$volume)
> wilcox.test(DF_Bo$volume,DF_U$volume)
> wilcox.test(DF_Br$volume,DF_U$volume)
```

Lavorazione sangue: scompositori

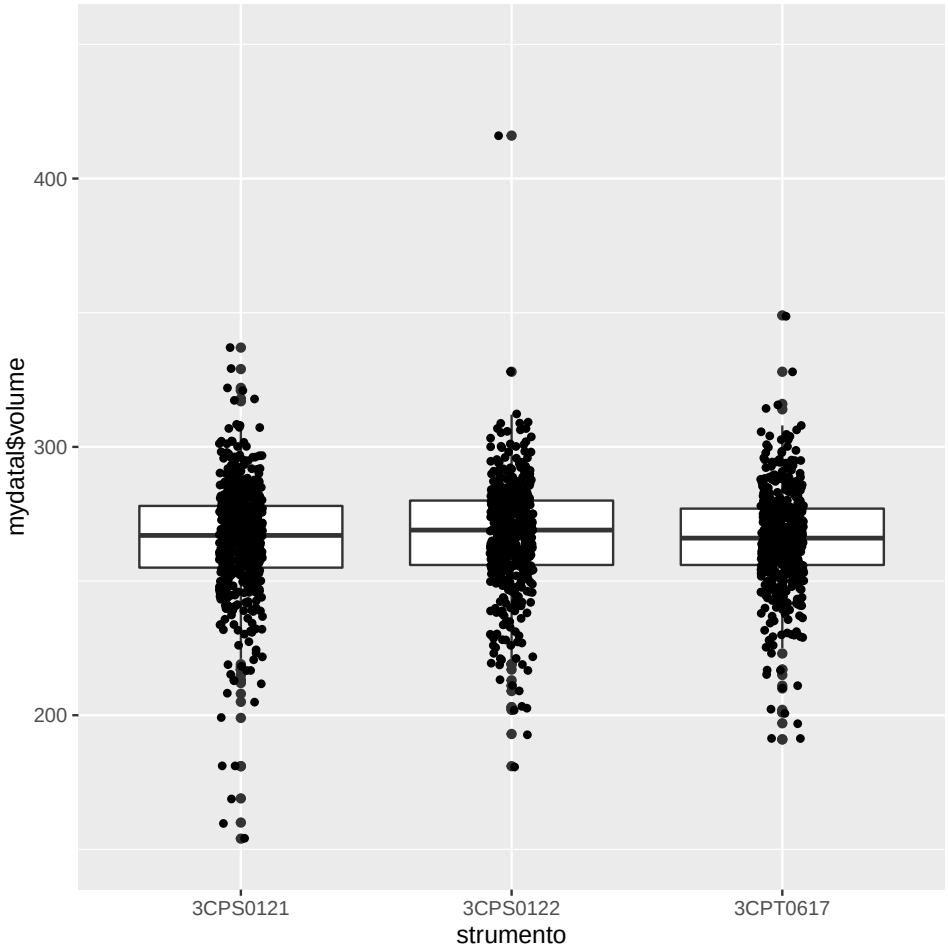
```
> slidestr <- ggplot(mydatal, aes(strumento, mydatal$volume)) + geom_boxplot() + ylim(150, 4
```

```
> slidestr
```




```
> slidestr2 <- slidestr + geom_jitter(shape=16, position=position_jitter(0.2))
```

```
> slidestr2
```




```
> summary(mydatal$strumento)

3CPS0121 3CPS0122 3CPT0617
     565      511      474
```

2.0.2 Analisi statistica delle differenze

Non c'è alcuna differenza tra le unità prodotte dai singoli scompositori

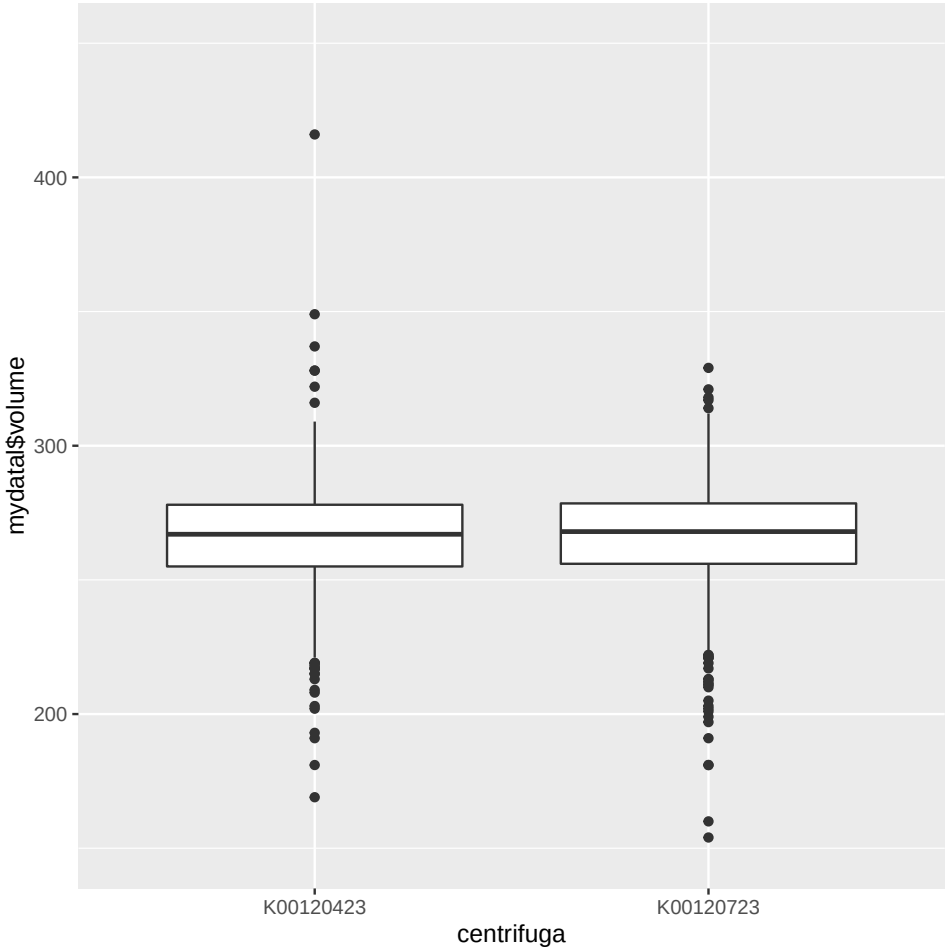
```
> DF_3CPS0121 <- filter(mydatal, strumento== "3CPS0121")
> DF_3CPS0122 <- filter(mydatal, strumento== "3CPS0122")
> DF_3CPT0617  <- filter(mydatal, strumento=="3CPT0617")
> shapiro.test(DF_3CPS0121$volume)
> shapiro.test(DF_3CPS0122$volume)
> shapiro.test(DF_3CPT0617$volume)
> wilcox.test(DF_3CPS0121$volume,DF_3CPS0122$volume)
> wilcox.test(DF_3CPS0121$volume,DF_3CPT0617$volume)
> wilcox.test(DF_3CPS0122$volume,DF_3CPT0617$volume)
```

Lavorazione sangue: centrifughe

Non c'è alcuna differenza tra le unità prodotte dai singoli centrifughe

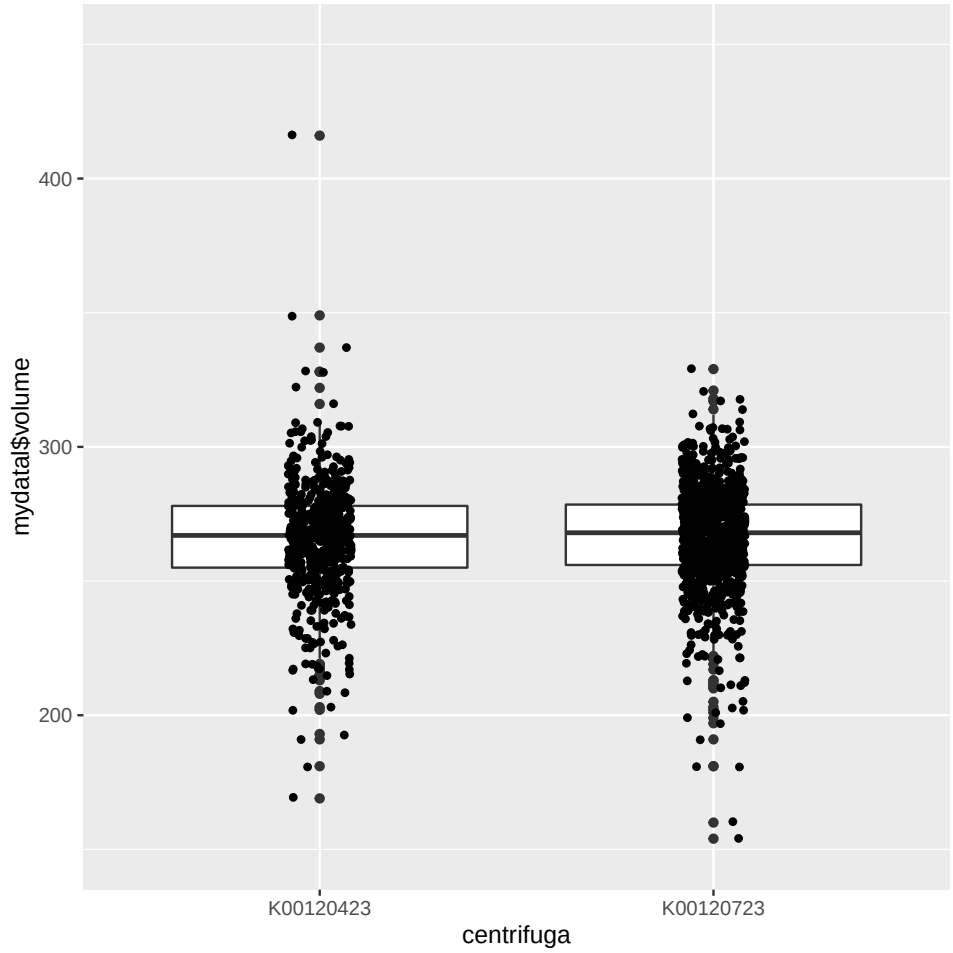
```
> slidecen <- ggplot(mydatal, aes(centrifuga, mydatal$volume)) + geom_boxplot() + ylim(150,
```

```
> slidecen
```




```
> slidecen2 <- slidecen + geom_jitter(shape=16, position=position_jitter(0.2))
```

```
> slidecen2
```

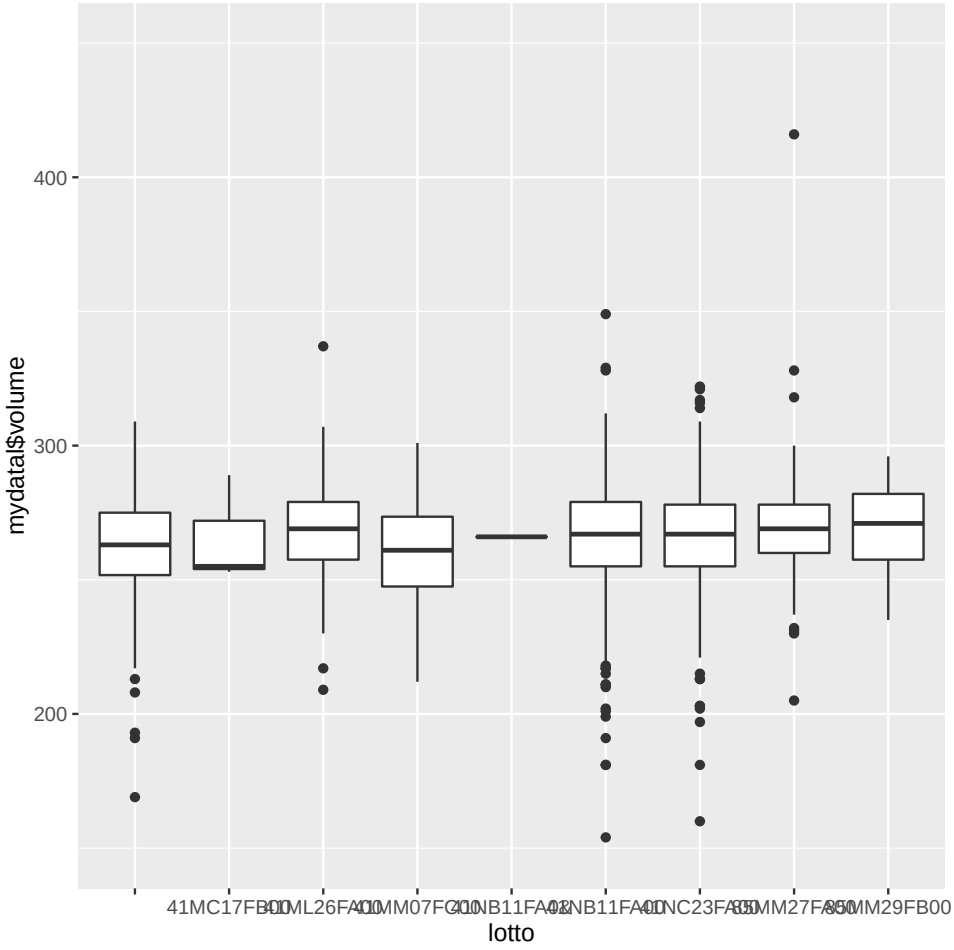



```
> summary(mydatal$centrifuga)

K00120423 K00120723
      549      1001

> DF_K00120723 <- filter(mydatal, centrifuga=="K00120723")
> DF_K00120423 <- filter(mydatal, centrifuga=="K00120423")
> shapiro.test(DF_K00120723$volume)
> shapiro.test(DF_K00120423$volume)
> wilcox.test(DF_K00120723$volume,DF_K00120423$volume)
```

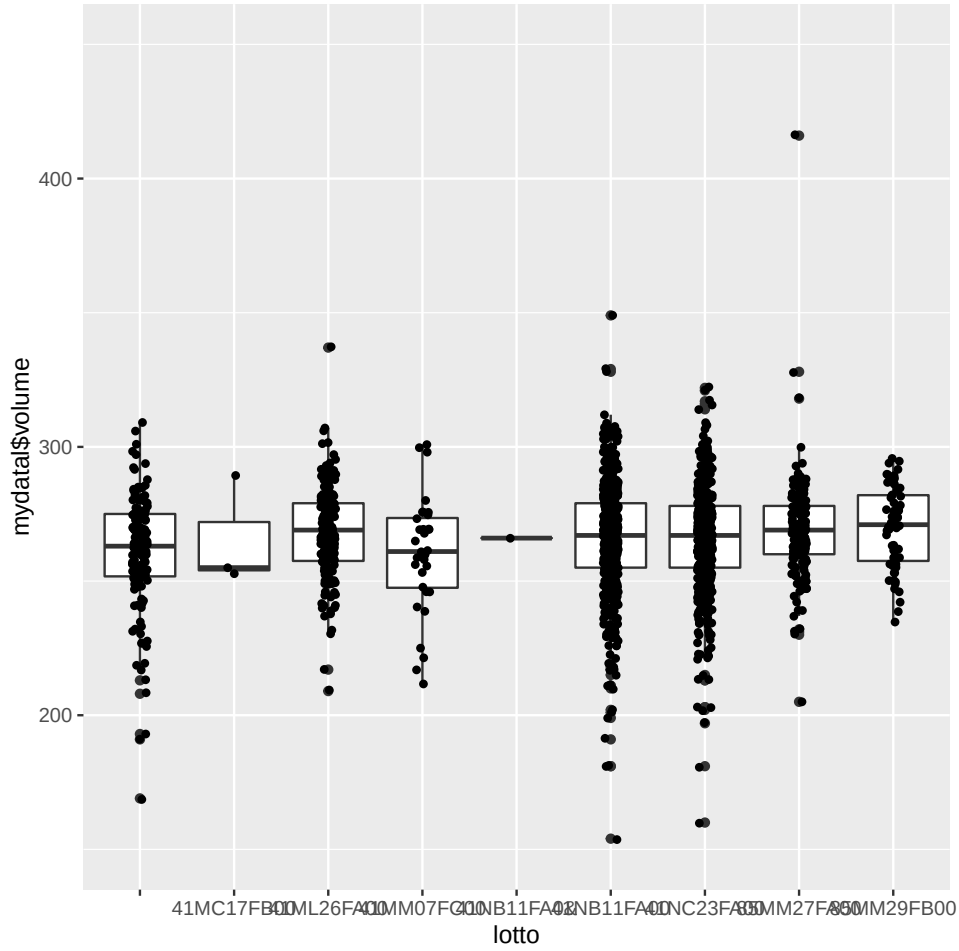
2.1 Lavorazione: valutazione Lotti

```
> xtable(table(summary(mydatal$lotto)))

> slidelot <- ggplot(mydatal, aes(lotto, mydatal$volume)) + geom_boxplot() + ylim(150, 450)

> slidelot
```

Operatore	Centrifuga	Numero di sacche
Carlo Gugliara	K00120723	389
Carlo Gugliara	K00120423	75
Urso Laura	K00120723	297
Urso Laura	K00120423	88
Bordino Daniela	K00120723	177
Bordino Daniela	K00120423	158
Giuseppe Bertini	K00120423	163
Giuseppe Bertini	K00120723	124
Alessandra Bruccoleri	K00120423	65
Alessandra Bruccoleri	K00120723	14




```
> slidelot2 <- slidelot + geom_jitter(shape=16, position=position_jitter(0.2))

> slidelot2
```




```
> summary(mydata1$lotto)
```

```
          41MC17FB00 41ML26FA00 41MM07FC00 41NB11FA0& 41NB11FA00 41NC23FA00
         141          3        189         32          1        499        451
85MM27FA00 85MM29FB00
         170         64
```

Lotto	Numero sacche
41NB11FA0&	1
41MC17FB00	141
41MM07FC00	32
85MM29FB00	64
85MM27FA00	170
41ML26FA00	189
41NC23FA00	451
41NB11FA00	499
Totale	1550

2.2 Valutazione volumi e tempi

2.2.1 Volume delle unità di sangue intero

```
> summary(mydata1$volume)
```

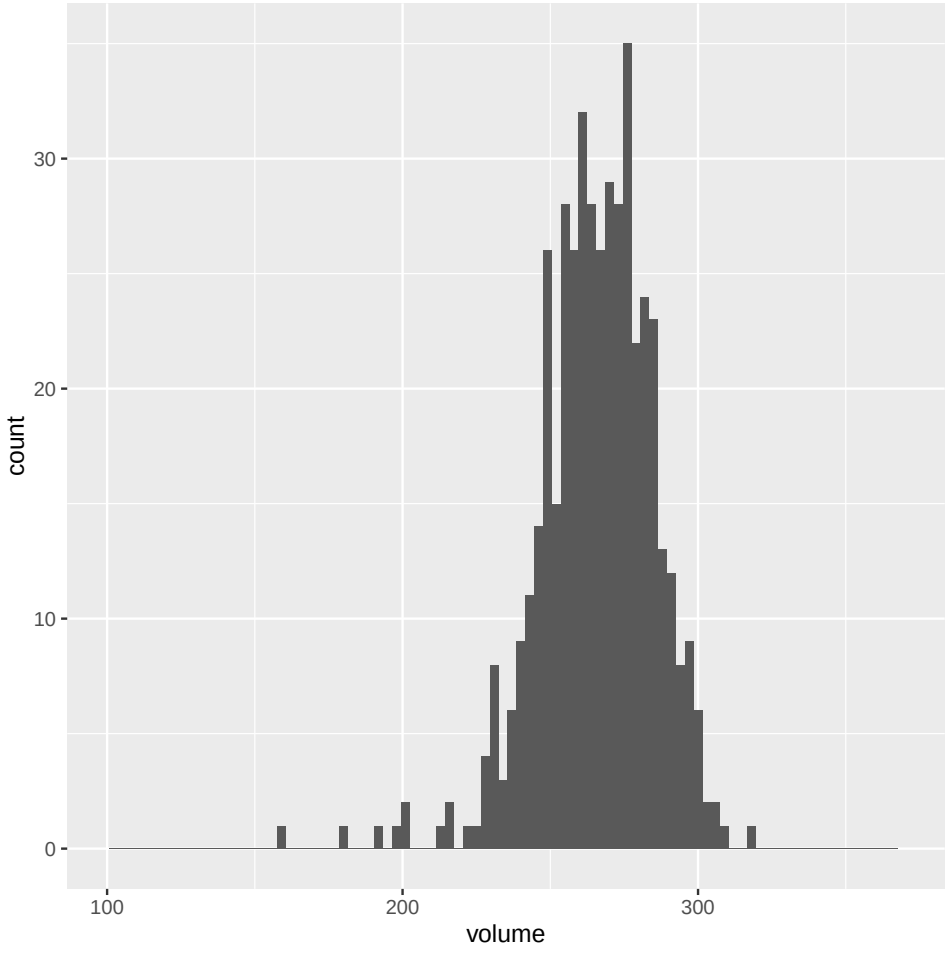
```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
    0.0   255.0   267.0   266.8   278.0   973.0       5
```

```
> xtable(table(mydata1$vol))
```

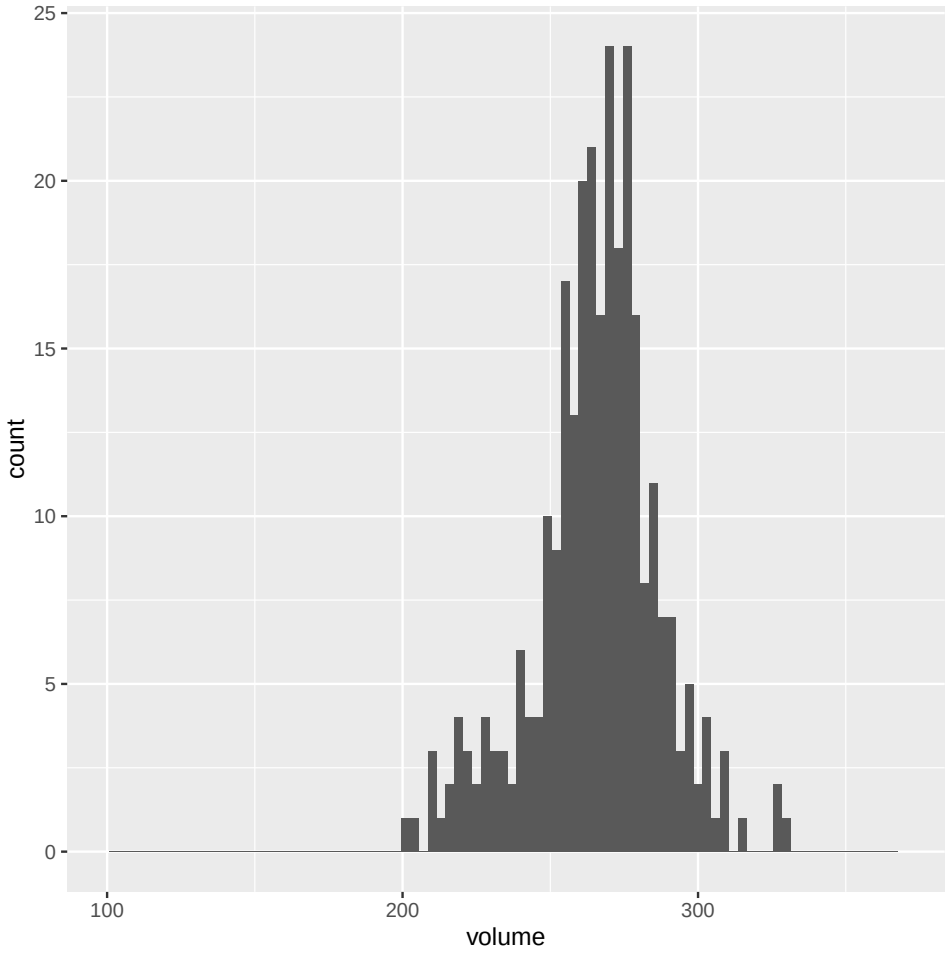
	Volume sacche
Min	0
1st Qu.	255
Median	267
Mean	266.1
3rd Qu.	278
Max	973

3 Esempi utili

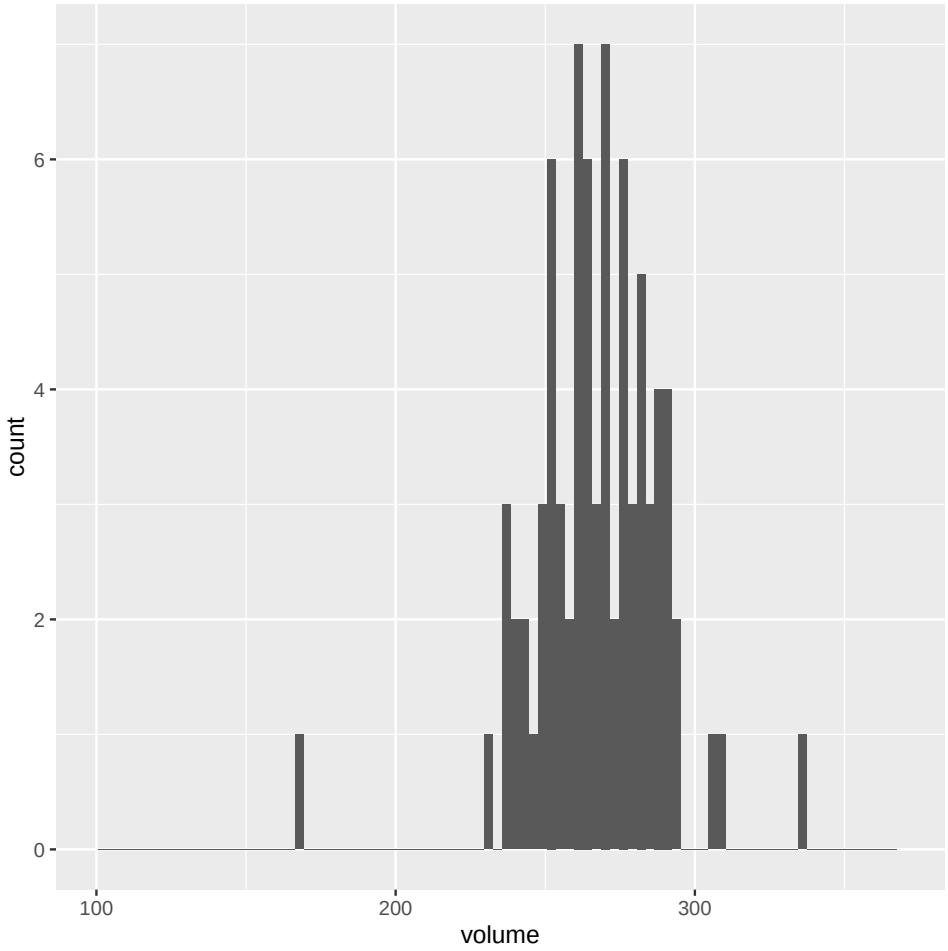
```
> ggplot(DF_G, aes(volume))+ geom_histogram(binwidth = 3) + xlim(100, 370)
```



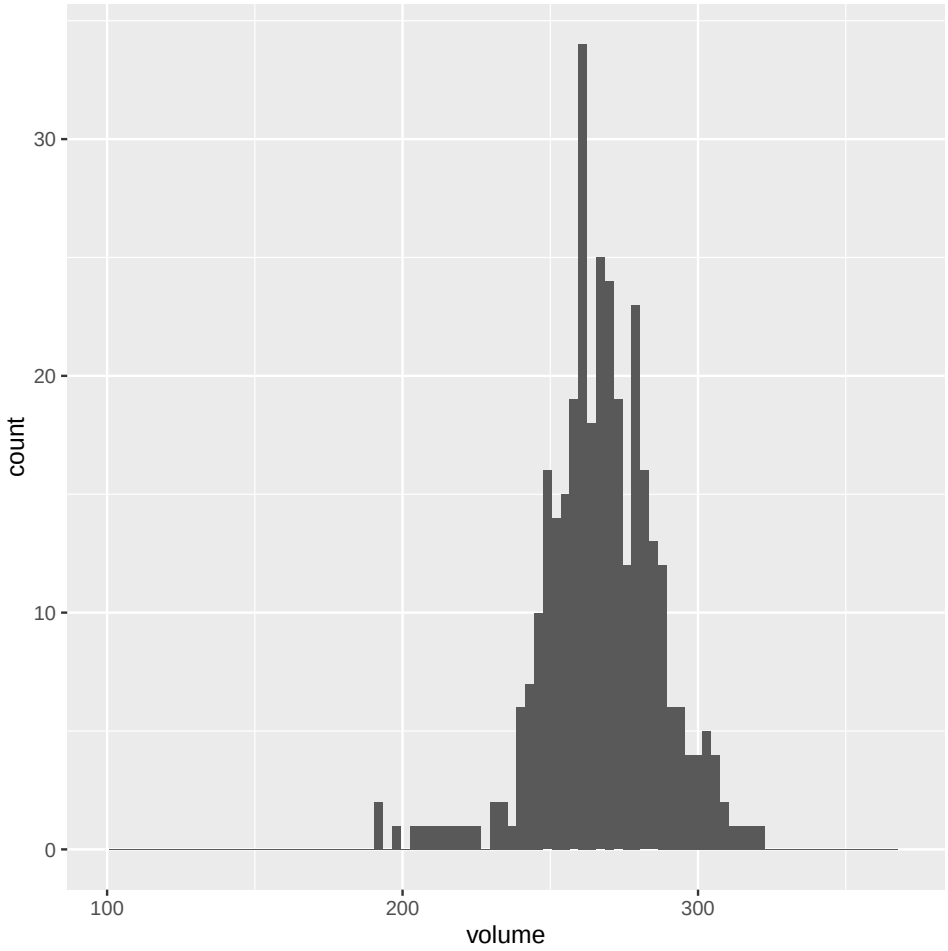
```
> ggplot(DF_Be, aes(volume))+ geom_histogram(binwidth = 3) + xlim(100, 370)
```



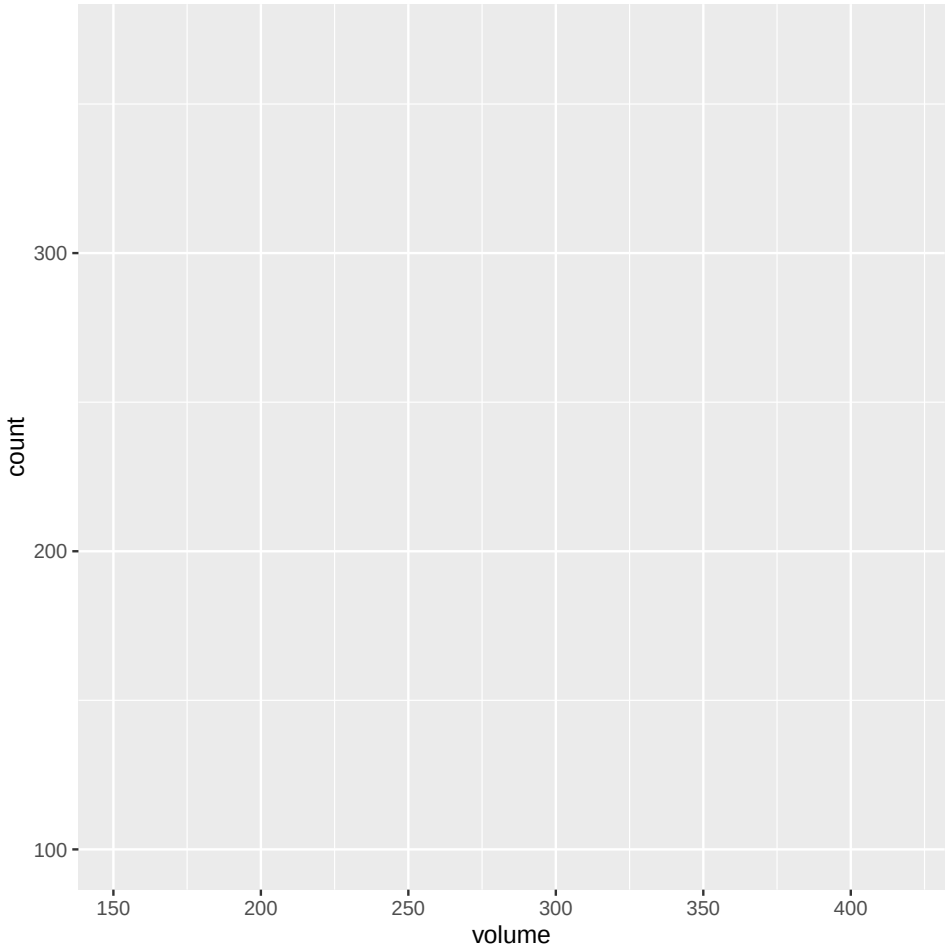

```
> ggplot(DF_Br, aes(volume))+ geom_histogram(binwidth = 3) + xlim(100, 370)
```




```
> ggplot(DF_Bo, aes(volume))+ geom_histogram(binwidth = 3) + xlim(100, 370)
```




```
> ggplot(DF_U, aes(volume))+ geom_histogram(binwidth = 3) + ylim(100, 370)
```



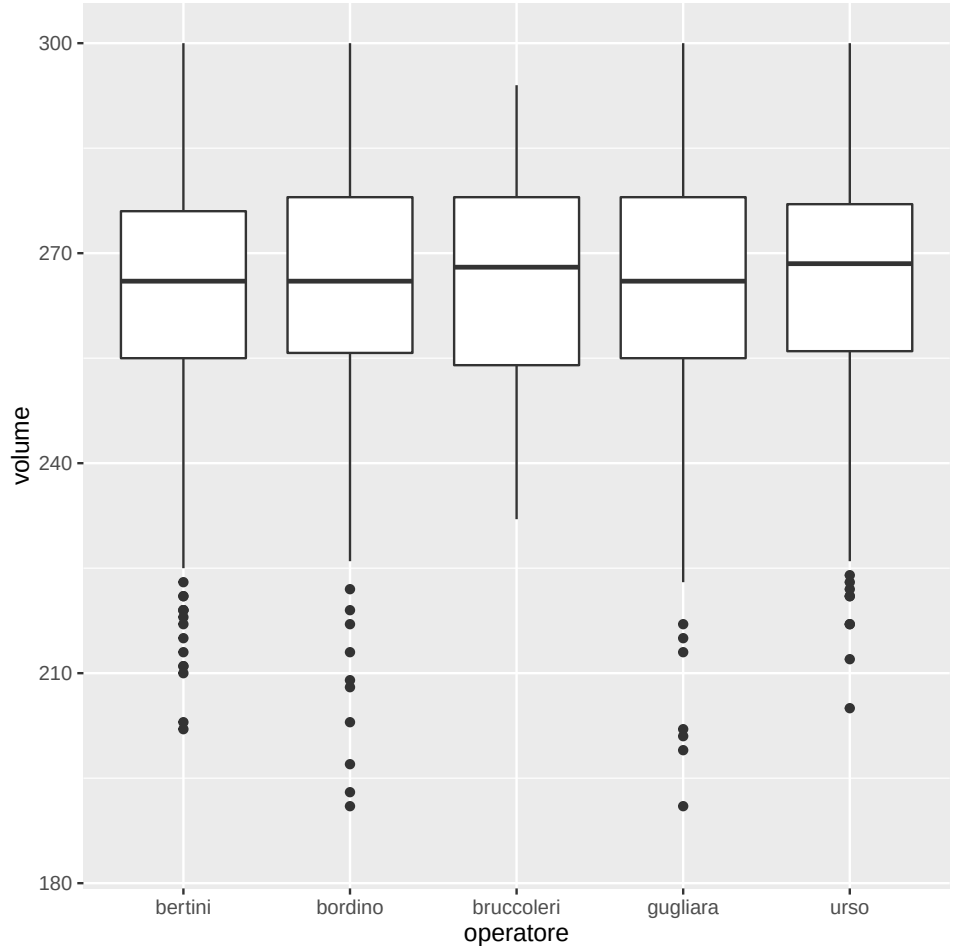
4 FATTORE PROVA

```
> mydatal$operatore <- as.factor(mydatal$operatore)
> head(mydatal)
```

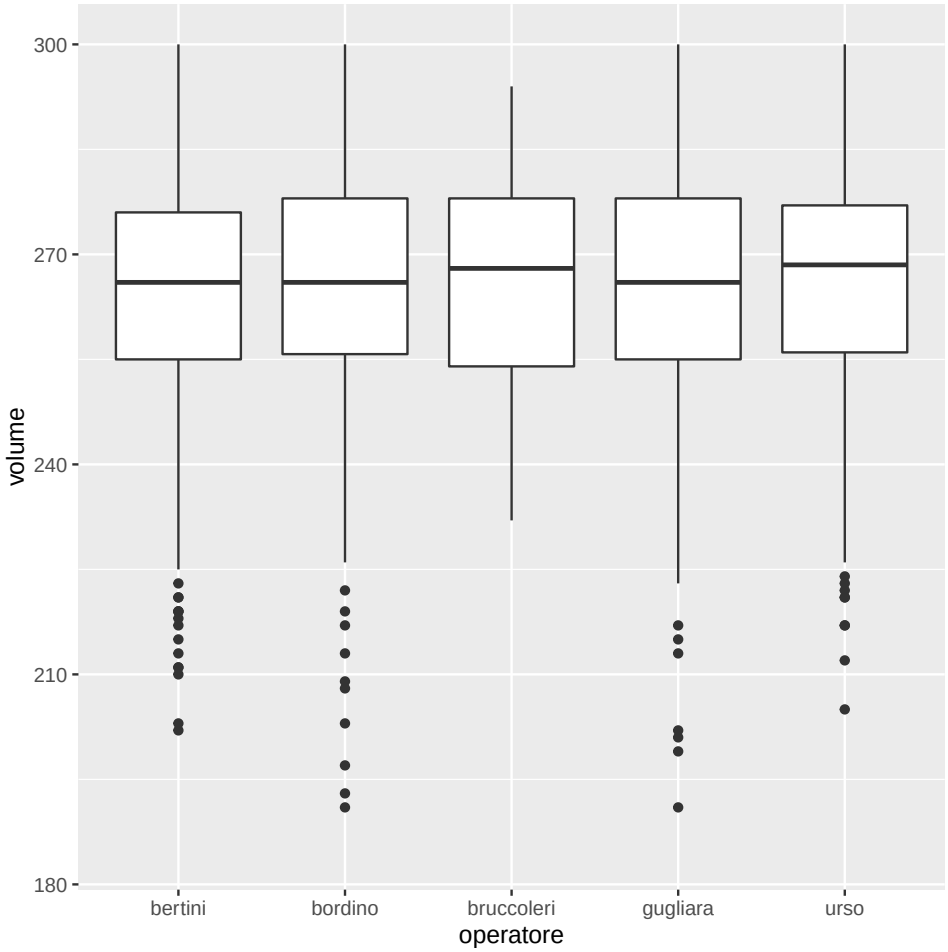
```
  tipo_att_lav           cdm   dt_attiv   da_ore
1         F-AD I211119102787 02/05/2019 13:42:49
2         F-AD I211119102788 02/05/2019 13:41:37
3         F-AD I211119102789 02/05/2019 13:48:09
4         F-AD I211119102790 03/05/2019 12:56:33
5         F-A4 I211119102791 03/05/2019 12:54:52
6         F-AD I211119102792 03/05/2019 12:55:44
                                              note centrifuga operatore
1 Op. Scomp.: giuseppe bertini, Centr.: K00120423,   K00120423   bertini
2 Op. Scomp.: giuseppe bertini, Centr.: K00120423,   K00120423   bertini
3 Op. Scomp.: giuseppe bertini, Centr.: K00120423,   K00120423   bertini
4  Op. Scomp.: bordino daniela, Centr.: K00120723,   K00120723   bordino
5  Op. Scomp.: bordino daniela, Centr.: K00120723,   K00120723   bordino
6  Op. Scomp.: bordino daniela, Centr.: K00120723,   K00120723   bordino
  cod_emc      lotto tipo_sacca   X X.1          X.2 strumento volume peso
1       7 41NB11FA00  QUINTUPLA T&B [2] Scompositore  3CPS0122    272  280
2       7 41MM07FC00  QUINTUPLA T&B [2] Scompositore  3CPT0617    273  281
```

```
3       7 41NB11FA00  QUINTUPLA T&B [2] Scompositore  3CPS0122    271  279
4       7 41NB11FA00  QUINTUPLA T&B [2] Scompositore  3CPT0617    262  269
5       7 41NB11FA00  QUINTUPLA T&B [2] Scompositore  3CPS0121    292  300
6       7 41NB11FA00  QUINTUPLA T&B [2] Scompositore  3CPS0122    252  259
  durata
1     NA
2     NA
3     NA
4     NA
5     NA
6     NA
```

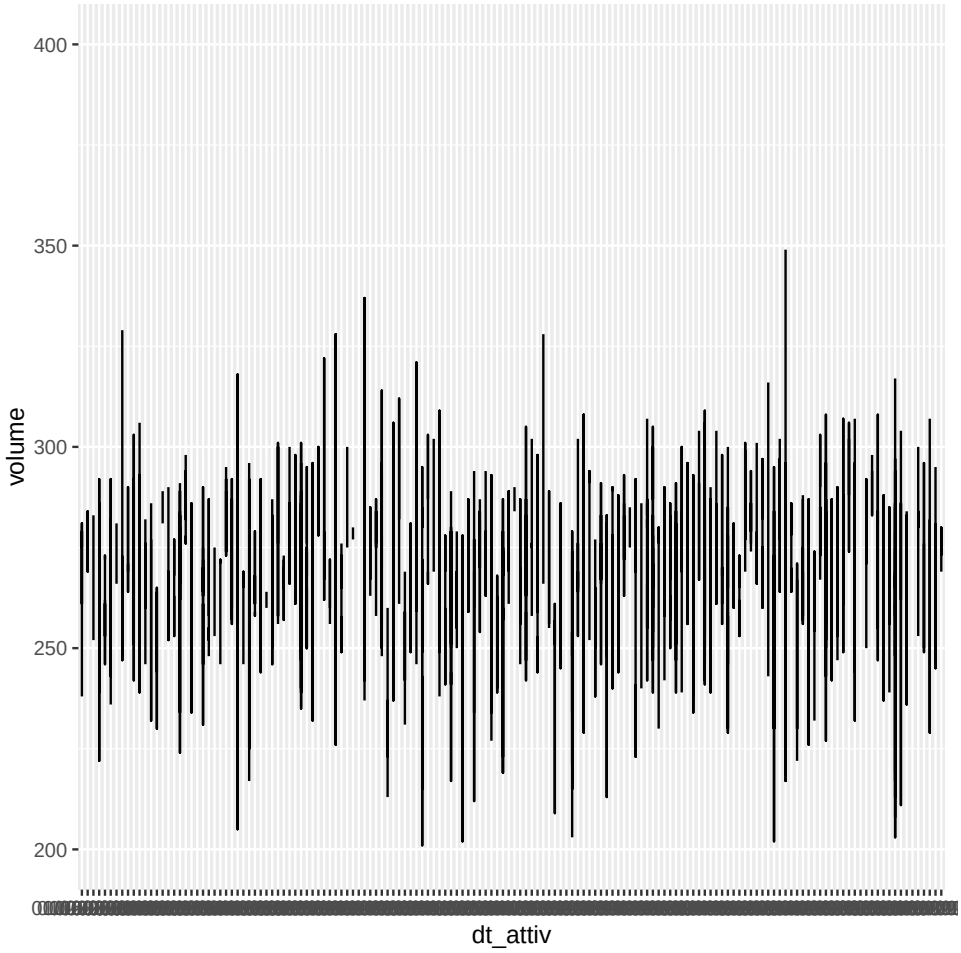
```
> q <- ggplot(mydatal, aes(x=operatore, y=volume)) + geom_boxplot() + ylim(185, 300)

> ggplot(mydatal, aes(x=operatore, y=volume)) + geom_boxplot() + ylim(185, 300)
```




```
> q
```




```
> ggplot(mydatal, aes(dt_attiv, volume)) + geom_line() + ylim(200, 400)
>
```


400
350
300
250
200
volume
dt_attiv