

- 1 Plan of analysis
- 2 Data importing
- 3 Missing values analysis
- 4 Population
- 5 Objectif et critère de jugement principal
- 6 Secondary objectives

Code ▼

2023-06-12

1 Plan of analysis

1.1 Datasets

The datasets given by the data collection manager were in *.xlsx and were converted to .Rdata. The are available in the GAMEOVER.Rdata file.

- Datasets with the intensive care related data : "reanimation"
- Datasets with the patient related data : "patient"
- Datasets with the nurse survey : "Q_inf"
- Dataset with the cost of drugs from 3 differents hospitals : "prix_medoc"

1.2 Statistics

The statistics were performed in RStudio 2023.06.0 Build 421 using the R version 4.1.1 (2021-08-10).

We used the *visdat* package version 0.6 to visualize the missing data

The main result is given as a percentage and 95% confidence interval established by the bootstrap method using the R *boot* package version 1.3-28.1

CompareGroups package version 4.6.0 was used to create table and univariate statistics. The standard method used by this package for quantitative variables is to test the distribution with a Shapiro–Wilk normality test before doing the univariate statistics (Quantitative variables were compared by Student's t-tests or Wilcoxon–Mann–Whitney tests depending their normality). The authors preferes use median (IQR) for their quantitative variable. Qualitative variables were described by their percentage and frequency. Qualitatives variables were compared by a semi-parametric Chi-square test using a Yates adjustment if necessary.

Multivariate models to search for risk factors for medication waste according to patients or intensive care units were performed using a backward stepwise logistic regression model after selecting variables with a p -value < 0.2 . The validity of the model was tested by a Hosmer-Lemeshow test and the Area under the curve were computed. We used the *car* package version 3.1-2 to help us to see the results of the multivariate analysis. We present the results of the multivariate logistic regression model using Forest plot produce with the *ForestModel* 0.6.2 Package. We conducted a multiple linear regression to explore the risk factors associated with discarded containers. We include the main cofounders.

If necessary, for the pertinence of clinical comprehension, the optimal categorization of the continuous variable into separate categories was obtained with the CatPredi function of the R package *CatPredi* version 1.3 using the genetic algorithm (Barrio et al. 2017).

We use the R package `ggplot2` 3.4.2 to do the graphics

The code to do reproduce the statistics is fully available in the *stat_plan_GAMEOVER.Rmd* File with the datasets (Rmarkdown format)

Show

3 Missing values analysis

Show





Summary descriptives table		
	[ALL]	N
	N=81	
Date_recueil	04-Jan-2023 [12-Dec-2022;24-Jan-2023]	81
Structure_exercice:		81
CHU	44 (54.3%)	
CH	25 (30.9%)	
Privé	7 (8.64%)	
HIA	5 (6.17%)	
Activite:		81
Polyvalent	45 (55.6%)	
Chirurgical	29 (35.8%)	
Médical	5 (6.17%)	
Brûlé	2 (2.47%)	
Nombre_de_lit	15.0 [12.0;16.0]	81
Nombre_de_lit_ouvert	13.0 [10.0;16.0]	81
Nombre_total_de_patient	12.0 [9.00;15.0]	81
Nombre_entree_sur_24h	2.00 [0.00;3.00]	81
Nombre_de_sortie_sur_24h	2.00 [1.00;3.00]	81
Nombre_infirmier_le_jour	6.00 [4.00;8.00]	81
Nombre_infirmier_la_nuit	5.00 [4.00;7.00]	81
Nombre_etudiants_infirmiers_presents_la_journee	1.00 [0.00;2.00]	80
Nombre_de_medecin_senior_le_jour	3.00 [2.00;4.00]	81
Nombre_interne_presents_la_journee	3.00 [2.00;4.00]	81
Filiere_DASND:		81
incinéré	53 (65.4%)	
enfouis	27 (33.3%)	
NSP	1 (1.23%)	
Filiere_DIMED:		81
non	67 (82.7%)	
oui	14 (17.3%)	
Filiere_Verre:		81
non	75 (92.6%)	
oui	6 (7.41%)	
Filiere_Metal:		81
non	49 (60.5%)	
oui	32 (39.5%)	
Filiere_Plastique:		81
non	54 (66.7%)	
oui	27 (33.3%)	
Filiere_Papier:		81
non	28 (34.6%)	
oui	53 (65.4%)	
ratio_lits_ouverts_lits	1.00 [0.95;1.00]	81
Mouvement_tot	4.00 [1.00;6.00]	81
ratio_lit_inf_jour	2.40 [2.00;2.67]	81
ratio_lit_inf_nuit	2.67 [2.40;3.00]	81
ratio_lit_medecin	5.00 [4.00;6.67]	81
ratio_lit_interne	4.33 [3.75;6.00]	77

	[ALL]	N
Etudiant_inf:		80
non	36 (45.0%)	
oui	44 (55.0%)	
Internes:		81
non	4 (4.94%)	
oui	77 (95.1%)	

[Show](#)

somme_inf_nuit	somme_inf_jour
450	538

4.2 Population description

[Show](#)

Summary descriptives table

	[ALL]	N
	<i>N=1076</i>	
Visit: Données patients	1076 (100%)	1076
Opposition:		1076
non	1048 (97.4%)	
oui	28 (2.60%)	
Age	63.0 [51.0;71.0]	1047
Sex:		1047
Homme	670 (64.0%)	
Femme	377 (36.0%)	
Poids	75.0 [65.0;90.0]	1042
Taille	170 [163;177]	1019
BMI	25.9 [22.4;29.8]	1019
Motif_principal_entree:		1044
Chir réglée	165 (15.8%)	
Chir urgente	246 (23.6%)	
Medicale	546 (52.3%)	
Trauma	87 (8.33%)	
Score_SOFA	4.00 [2.00;7.00]	1076
SOFA_Neuro	0.00 [0.00;2.00]	1046
SOFA_Cardio	0.00 [0.00;3.00]	1047
SOFA_Respiration	1.00 [0.00;2.00]	1017
SOFA_hepatique	0.00 [0.00;0.00]	972
SOFA_plaquettes	0.00 [0.00;0.00]	1037
SOFA_Renal	0.00 [0.00;1.00]	1043
quant_SOFA_Neuro:		1046
inf2	699 (66.8%)	
sup2	347 (33.2%)	
quant_SOFA_Cardio:		1047
inf2	726 (69.3%)	
sup2	321 (30.7%)	
quant_SOFA_Respiration:		1017
inf2	534 (52.5%)	
sup2	483 (47.5%)	
quant_SOFA_hepatique:		972
inf2	897 (92.3%)	
sup2	75 (7.72%)	
quant_SOFA_plaquettes:		1037
inf2	941 (90.7%)	
sup2	96 (9.26%)	
quant_SOFA_Renal:		1043
inf2	860 (82.5%)	
sup2	183 (17.5%)	
Sedation:		1045
non	697 (66.7%)	
oui	348 (33.3%)	
Acces_VAS:		1047
IOT	443 (42.3%)	
Tracheotomie	64 (6.11%)	
Néant	540 (51.6%)	
Mode_oxygenation:		1076
VM	490 (45.5%)	
VNI	70 (6.51%)	
OHD	57 (5.30%)	
Oxy simple	244 (22.7%)	
Neant	215 (20.0%)	
Epuration_extra_renale:		1045
non	920 (88.0%)	
oui	125 (12.0%)	
Voie_enterale_accessible:		1045
non	172 (16.5%)	
oui	873 (83.5%)	
Voie_enterale_utilisee:		872
non	161 (18.5%)	
oui	711 (81.5%)	
Administration_paracetamol:		1076
IV	360 (33.5%)	
PO	351 (32.6%)	
Non prescrit	365 (33.9%)	
Administration_IPP:		1076
IV	312 (29.0%)	
PO	312 (29.0%)	

	[ALL]	N
Non prescrit	452 (42.0%)	
Sortie_de_reanimation:		1046
non	905 (86.5%)	
oui	141 (13.5%)	
Date_recueil.x	10-Jan-2023 [08-Dec-2022;24-Jan-2023]	1076
jour_rea	5.00 [1.00;14.0]	1041
quant_jour_rea:		1041
J1J2	367 (35.3%)	
supJ2	674 (64.7%)	
Date_recueil.y	10-Jan-2023 [08-Dec-2022;24-Jan-2023]	1076

5 Objectif et critère de jugement principal

5.1 Main judgement criteria

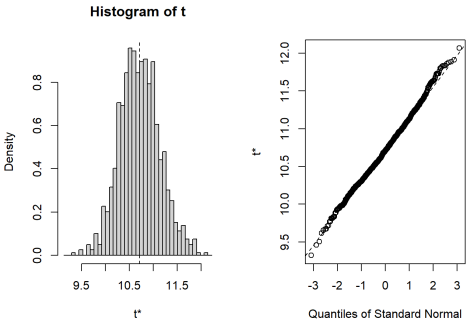
Ratio of overall wastage in milliliter (mL) of prepared and discarded IV drugs to overall volume in milliliter (mL) of prepared IV drugs.

Show

```
##
## Attachement du package : 'boot'
```

```
## L'objet suivant est masqué depuis 'package:car':
##
##      logit
```

Show



Prepared volume 408.8668Liters , Wasted volume : 43.811Liters. percentage of wasted/prepared volume 10.72% CI95 9.8901717 - 11.533603.

5.1.1 Syringe full at 90% thrown to garbage

Show

Show

Nbr_contenant_total	Nbr_contenant_avec_residu	Nbe_contenant_90	pct90oresidu	pctResidu_total
6519	2007	429	21.38	30.79

5.2 Syringe used by patient

5.2.1 total number

Show

moy	sd	med	min	max	Q1	Q3
7.171617	5.684358	6	0	35	3	10

Show

percentage of patients

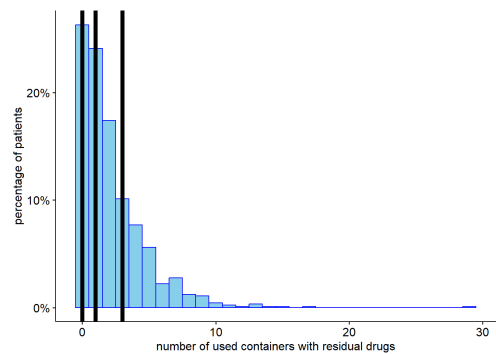
number of used containers

number with residual drugs

Show

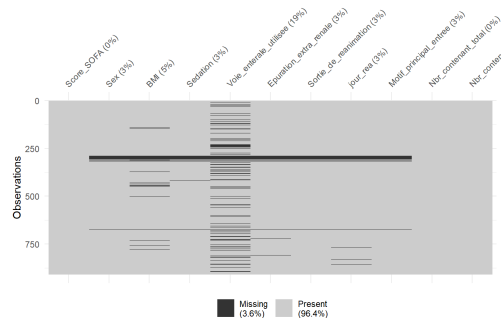
moy	sd	med	min	max	Q1	Q3
2.207921	2.558932	1	0	29	0	3

Show

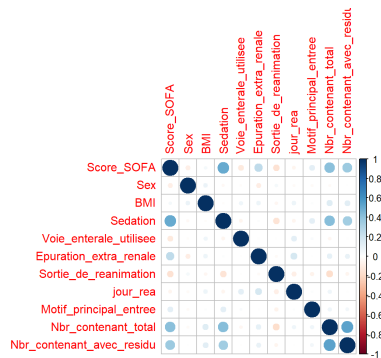


5.2.2 serynge used and patients characteristics

```
## Joining with `by = join_by(ident_pat)`
```

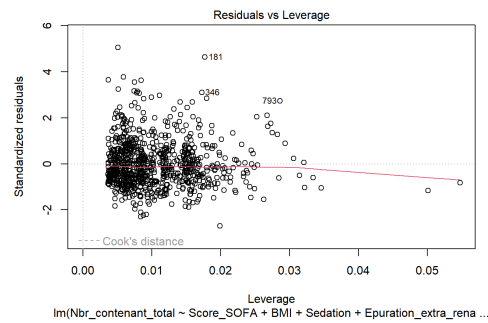
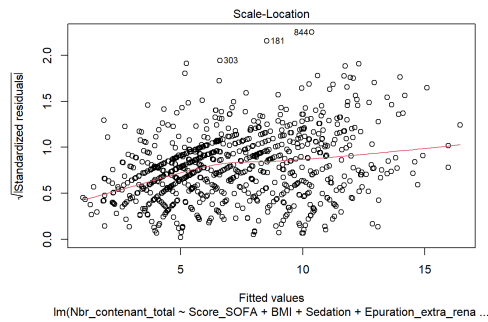
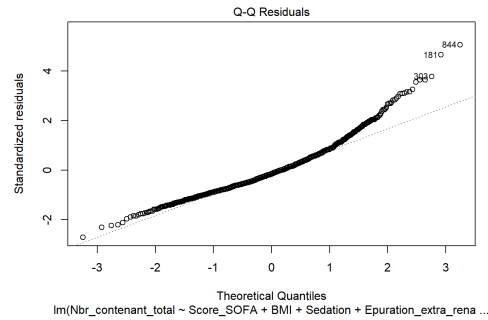
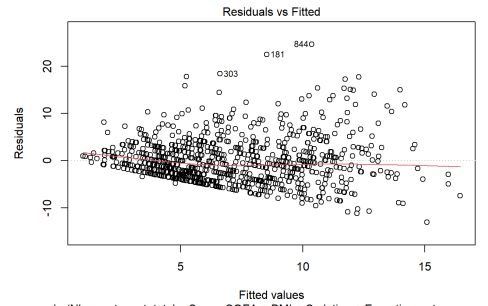


	Score_SOFA	Sex	BMI	Sedation	Voie_enterale_utilisee	Epuration_extra_renale	Sortie_de_reanimation	jour_rea	Motif_principal_entree	Nbr_cont
Score_SOFA	1.0000000	-0.0875323	0.0443782	0.5076150	-0.1132034	0.2502041	-0.1558049	-0.0500027	0.1193505	
Sex	-0.0875323	1.0000000	0.0830381	-0.0345598	-0.0175341	-0.0924346	0.0439128	-0.0274344	-0.0279194	
BMI	0.0443782	0.0830381	1.0000000	-0.0128070	0.0605572	0.0784194	-0.0402294	0.0724832	0.0154980	
Sedation	0.5076150	-0.0345598	-0.0128070	1.0000000	-0.0511890	0.0133831	-0.1498188	-0.0585683	0.1154572	
Voie_enterale_utilisee	-0.1132034	-0.0175341	0.0605572	-0.0511890	1.0000000	-0.0069878	-0.0069878	0.1164420	0.0273984	
Epuration_extra_renale	0.2502041	-0.0924346	0.0784194	0.0133831	-0.0069878	1.0000000	-0.0261677	0.1792524	0.0057947	
Sortie_de_reanimation	-0.1558049	0.0439128	-0.0402294	-0.1498188	-0.0069878	-0.0261677	1.0000000	-0.0872584	-0.0647930	
jour_rea	-0.0500027	-0.0274344	0.0724832	-0.0585683	0.1164420	0.1792524	-0.0872584	1.0000000	0.0157051	
Motif_principal_entree	0.1193505	-0.0279194	0.0154980	0.1154572	0.0273984	0.0057947	-0.0647930	0.0157051	1.0000000	
Nbr_contenant_total	0.4120786	-0.0281798	0.1340486	0.4292061	-0.0445381	0.1010436	-0.1761757	0.0651110	0.0649402	
Nbr_contenant_avec_residu	0.3646547	0.0020548	0.1254726	0.3412807	-0.0066583	0.0903092	-0.0547496	-0.0043449	0.0579116	



	Score_SOFA	Sex	BMI	Sedation	Voie_enterale_utilisee	Epuration_extra_renale	Sortie_de_reanimation	jour_rea	Motif_principal_entree	Nbr_conte
Score_SOFA	0.0000000	0.6881625	1.0000000	0.0000000	0.0983224	0.0000000	0.0014028	1.0000000	0.0605902	
Sex	0.0196618	0.0000000	0.8886652	1.0000000	1.0000000	0.5084600	1.0000000	1.0000000	1.0000000	
BMI	0.2376058	0.0269292	0.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	
Sedation	0.0000000	0.3578203	0.7333561	0.0000000	1.0000000	1.0000000	0.0027597	1.0000000	0.0824279	
Voie_enterale_utilisee	0.0025211	0.6409134	0.1069112	0.1730519	0.0000000	1.0000000	1.0000000	0.0772780	1.0000000	
Epuration_extra_renale	0.0000000	0.0137422	0.0367000	0.7218479	0.8525469	0.0000000	1.0000000	0.0000736	1.0000000	
Sortie_de_reanimation	0.0000305	0.2425665	0.2843987	0.0000613	0.8525469	0.4863353	0.0000000	0.6881625	1.0000000	
jour_rea	0.1832394	0.4654754	0.0535434	0.1189518	0.0018848	0.0000015	0.0200500	0.0000000	1.0000000	
Motif_principal_entree	0.0014426	0.4576209	0.6801534	0.0020607	0.4660602	0.8775037	0.0844854	0.6761190	0.0000000	
Nbr_contenant_total	0.0000000	0.4534353	0.0003413	0.0000000	0.2359176	0.0070485	0.0000023	0.0829680	0.0837801	
Nbr_contenant_avec_residu	0.0000000	0.9564140	0.0008061	0.0000000	0.8594258	0.0160822	0.1450137	0.9079931	0.1231517	

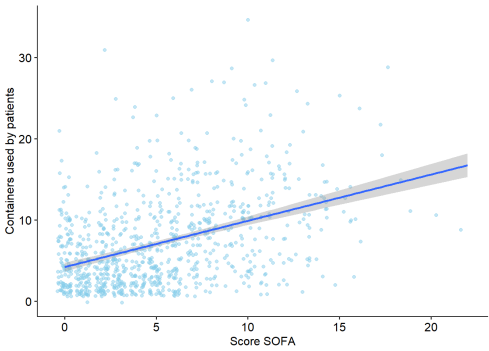
```
## Joining with `by = join_by(ident_pat)`
```



```
## Call: lm(formula = Nbr_contenant_total ~ Score_SOFA + BMI + Sedation +
##           Eputation_extra_renale + Sortie_de_reanimation + Motif_principal_entree, data =
##           used_syr_patchcharacteristics)
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.29311    0.72571   1.782 0.075128 .
## Score_SOFA        0.32913    0.05280   6.329 3.98e-10 ***
## BMI              0.09076    0.02338   3.881 0.000112 ***
## Sedationoui       3.17827    0.41039   7.744 2.72e-14 ***
## Eputation_extra_renaleoui 1.34780    0.53301   2.529 0.011629 *
## Sortie_de_reanimationoui -1.55423    0.53101  -2.927 0.003514 **
## Motif_principal_entreeChir reglée -0.28411    0.47626  -0.597 0.550962
## Motif_principal_entreeChir urgente 1.67650    0.41404   4.049 5.61e-05 ***
## Motif_principal_entreeTrauma 1.19726    0.61107   1.959 0.050406 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard deviation: 4.881 on 852 degrees of freedom
## (48 observations effacées parce que manquantes)
## Multiple R-squared:  0.2723
## F-statistic: 39.85 on 8 and 852 DF,  p-value: < 2.2e-16
##      AIC      BIC
## 5184.42 5232.01
```

```
##               GVIF Df GVIF^(1/(2*Df))
## Score_SOFA      1.587666 1      1.260026
## BMI              1.010363 1      1.005168
## Sedation         1.421283 1      1.1192176
## Eputation_extra_renale 1.135139 1      1.065429
## Sortie_de_reanimation 1.045989 1      1.022736
## Motif_principal_entree 1.050670 3      1.008272
```

```
## 'geom_smooth()' using formula = 'y ~ x'
```

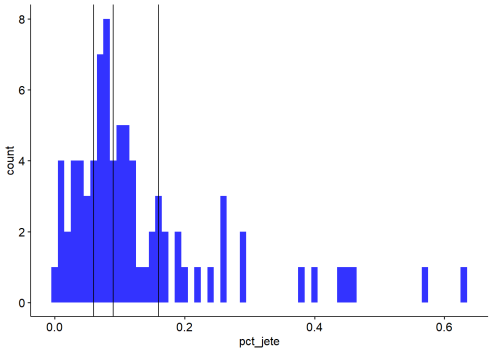


5.3 Risk factor for drug wastage depending ICU characteristics

Show

median	Q1	Q3	min	max
0.0915	0.0612	0.1628	0	0.6346

Show



5.3.1 Multivariate RF ICU

Univariate analysis of the RF (ICU which waste less vs more than the median ICU's wastage)

Show

Summary descriptives table by groups of 'pct_jete_catmax'			
	[0,0.0915]	[0.0915,0.6346]	p-overall
	N=40	N=41	
Structure_exercee:			0.164
CHU	18 (45.0%)	26 (63.4%)	
CH	13 (32.5%)	12 (29.3%)	
Privé	6 (15.0%)	1 (2.44%)	
HIA	3 (7.50%)	2 (4.88%)	
Activite:			0.787
Polyvalent	24 (60.0%)	21 (51.2%)	
Chirurgical	12 (30.0%)	17 (41.5%)	
Médical	3 (7.50%)	2 (4.88%)	
Brûlé	1 (2.50%)	1 (2.44%)	
Nombre_de_lit_ouvert	12.0 [10.0;16.0]	15.0 [12.0;17.0]	0.067
Nombre_total_de_patient	10.5 [8.00;13.0]	13.0 [10.0;17.0]	0.028
Mouvement_tot	2.00 [1.00;4.00]	4.00 [3.00;6.00]	0.003
ratio_lit_inf_jour	2.40 [2.00;2.67]	2.40 [1.89;2.50]	0.448
ratio_lit_inf_nuit	2.67 [2.50;3.00]	2.50 [2.14;3.00]	0.113
ratio_lit_medecin	5.00 [4.00;6.75]	5.00 [4.00;6.67]	0.398
Etudiant_inf:			0.261
non	21 (52.5%)	15 (37.5%)	
oui	19 (47.5%)	25 (62.5%)	
Internes:			0.055
non	4 (10.0%)	0 (0.00%)	
oui	36 (90.0%)	41 (100%)	
pct_jete	0.06 [0.03;0.08]	0.16 [0.11;0.26]	<0.001
pct_jete_ratiopat	0.01 [0.00;0.01]	0.01 [0.01;0.02]	<0.001
pct_jete_cat:			<0.001
[0,0.0612]	20 (50.0%)	0 (0.00%)	
[0.0612,0.0915]	20 (50.0%)	0 (0.00%)	
[0.0915,0.1628]	0 (0.00%)	20 (48.8%)	
[0.1628,0.6346]	0 (0.00%)	21 (51.2%)	

Show

variable	pvalue	sign
Structure_exercee	0.1637214	•
Nombre_de_lit_ouvert	0.0673295	**
Nombre_total_de_patient	0.0282254	***
Mouvement_tot	0.0034289	***
ratio_lit_inf_nuit	0.1133963	•
Internes	0.0549305	**
pct_jete	0.0000000	****
pct_jete_ratiopat	0.0000000	****
pct_jete_cat	0.0000000	****

[Show](#)[Show](#)

```
## Start: AIC=112.82
## pct_jete_catmax ~ Structure_exercice + Mouvement_tot + ratio_lit_inf_nuit +
##   Nombre_total_de_patient + Nombre_de_lit_ouvert
##
##               Df Deviance   AIC
## - Structure_exercice      3 100.525 110.53
## - Nombre_de_lit_ouvert    1  97.008 111.01
## - ratio_lit_inf_nuit      1  97.254 111.25
## - Nombre_total_de_patient 1  97.270 111.27
## <none>                      96.818 112.82
## - Mouvement_tot          1 102.672 116.67
##
## Step: AIC=110.53
## pct_jete_catmax ~ Mouvement_tot + ratio_lit_inf_nuit + Nombre_total_de_patient +
##   Nombre_de_lit_ouvert
##
##               Df Deviance   AIC
## - Nombre_de_lit_ouvert    1 100.65 108.65
## - Nombre_total_de_patient 1 101.15 109.15
## - ratio_lit_inf_nuit      1 101.39 109.39
## <none>                      100.53 110.53
## - Mouvement_tot          1 105.46 113.46
##
## Step: AIC=108.65
## pct_jete_catmax ~ Mouvement_tot + ratio_lit_inf_nuit + Nombre_total_de_patient
##
##               Df Deviance   AIC
## - ratio_lit_inf_nuit      1 101.66 107.66
## - Nombre_total_de_patient 1 102.31 108.31
## <none>                      100.65 108.65
## - Mouvement_tot          1 105.52 111.52
##
## Step: AIC=107.66
## pct_jete_catmax ~ Mouvement_tot + Nombre_total_de_patient
##
##               Df Deviance   AIC
## - Nombre_total_de_patient 1 103.34 107.34
## <none>                      101.66 107.66
## - Mouvement_tot          1 107.29 111.29
##
## Step: AIC=107.34
## pct_jete_catmax ~ Mouvement_tot
##
##               Df Deviance   AIC
## <none>                      103.34 107.34
## - Mouvement_tot          1 112.28 114.28
```

[Show](#)

```
## Call: glm(formula = pct_jete_catmax ~ Mouvement_tot, family = binomial(link =
##   "logit"), data = FDR_reanimation)
##
## Coefficients:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)   -0.89687    0.40636  -2.207  0.02731 *
## Mouvement_tot  0.24162    0.09184   2.631  0.00852 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 112.28  on 80  degrees of freedom
## Residual deviance: 103.34  on 79  degrees of freedom
##
## logLik   df    AIC    BIC
## -51.67    2 107.34 112.13
##
## Number of Fisher Scoring iterations: 4
##
## Exponentiated Coefficients and Confidence Bounds
##               Estimate    2.5 %    97.5 %
## (Intercept)  0.4078458 0.1763998 0.8766904
## Mouvement_tot 1.2733046 1.0795334 1.5482297
```

[Show](#)

```
## Call: glm(formula = pct_jete_catmax ~ Mouvement_tot, family = binomial(link =
##   "logit"), data = FDR_reanimation)
##
## Coefficients:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)   -0.89687    0.40636  -2.207  0.02731 *
## Mouvement_tot  0.24162    0.09184   2.631  0.00852 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 112.28  on 80  degrees of freedom
## Residual deviance: 103.34  on 79  degrees of freedom
##
## logLik   df    AIC    BIC
## -51.67    2 107.34 112.13
##
## Number of Fisher Scoring iterations: 4
##
## Exponentiated Coefficients and Confidence Bounds
##               Estimate    2.5 %    97.5 %
## (Intercept)  0.4078458 0.1763998 0.8766904
## Mouvement_tot 1.2733046 1.0795334 1.5482297
```

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Characteristic	OR ¹	95% CI ¹	p-value
Mouvement_tot	1.27	1.08, 1.55	0.009
¹ OR = Odds Ratio, CI = Confidence Interval			

[Show](#)

```
##
## The Hosmer-Lemeshow goodness-of-fit test
##
## Group Size Observed Expected
## 1 5 0 1.448075
## 2 17 7 5.810724
## 3 9 3 3.582367
## 4 8 3 3.656807
## 5 16 11 8.278272
## 6 12 7 7.444664
## 7 9 6 6.396277
## 8 5 4 4.382413
##
## Statistic = 5.0628
## degrees of freedom = 6
## p-value = 0.53578
```

[Show](#)

```
##
## Area Under ROC Curve = 0.687, 95% CI: (0.572, 0.802)
## Gini Coefficient = 0.374, 95% CI: (0.144, 0.603)
## K-S Statistic = 0.333
```

[Show](#)

```
##
## Area Under ROC Curve = 0.687, 95% CI: (0.572, 0.802)
## Gini Coefficient = 0.374, 95% CI: (0.144, 0.603)
## K-S Statistic = 0.333

## [1] 0.6868902
```

Show

5.4 Wastage RF patients related

Show

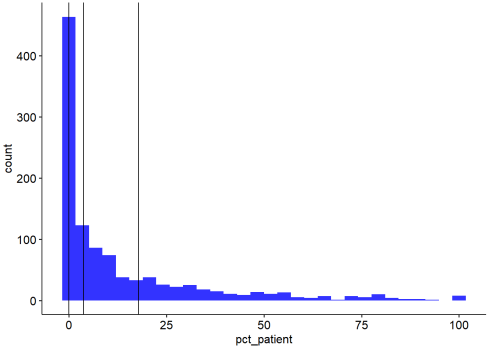
```
## `summarise()` has grouped output by 'reanimation'. You can override using the
## `.groups` argument.
```

Show

```
## # A tibble: 1 × 5
##   min max  Q1 med  Q3
##   <dbl> <dbl> <dbl> <dbl> <dbl>
## 1     0 Inf    0  3.80 17.8
```

Show

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



Summary descriptives table

	[ALL]	N
N=1076		
Opposition:		1076
non	1048 (97.4%)	
oui	28 (2.60%)	
Age	59.6 (16.5)	1047
Sex:		1047
Homme	670 (64.0%)	
Femme	377 (36.0%)	
Taille	170 (11.8)	1019
Poids	77.9 (21.6)	1042
BMI	26.9 (7.07)	1019
Motif_principal_entree:		1044
Chir réglée	165 (15.8%)	
Chir urgente	246 (23.6%)	
Medicale	546 (52.3%)	
Trauma	87 (8.33%)	
Score_SOFA	4.00 [2.00;7.00]	1076
SOFA_Neuro	0.00 [0.00;2.00]	1046
SOFA_Cardio	0.00 [0.00;3.00]	1047
SOFA_Respiration	1.00 [0.00;2.00]	1017
SOFA_hepatique	0.00 [0.00;0.00]	972
SOFA_plaquettes	0.00 [0.00;0.00]	1037
SOFA_Renal	0.00 [0.00;1.00]	1043
quant_SOFA_Neuro:		1046
inf2	699 (66.8%)	
sup2	347 (33.2%)	
quant_SOFA_Cardio:		1047
inf2	726 (69.3%)	
sup2	321 (30.7%)	
quant_SOFA_Respiration:		1017
inf2	534 (52.5%)	
sup2	483 (47.5%)	
quant_SOFA_hepatique:		972
inf2	897 (92.3%)	
sup2	75 (7.72%)	
quant_SOFA_plaquettes:		1037
inf2	941 (90.7%)	
sup2	96 (9.26%)	
quant_SOFA_Renal:		1043
inf2	860 (82.5%)	
sup2	183 (17.5%)	
quant_jour_rea:		1041
J1J2	367 (35.3%)	
supJ2	674 (64.7%)	
Sedation:		1045
non	697 (66.7%)	
oui	348 (33.3%)	
Acces_VAS:		1047
IOT	443 (42.3%)	
Tracheotomie	64 (6.11%)	

	[ALL]	N
Néant	540 (51.6%)	
Mode_oxygenation:		1076
VM	490 (45.5%)	
VNI	70 (6.51%)	
OHD	57 (5.30%)	
Oxy simple	244 (22.7%)	
Neant	215 (20.0%)	
Epuration_extra_renale:		1045
non	920 (88.0%)	
oui	125 (12.0%)	
Voie_enterale_accessible:		1045
non	172 (16.5%)	
oui	873 (83.5%)	
jour_rea	5.00 [1.00;14.0]	1041
Sortie_de_reanimation:		1046
non	905 (86.5%)	
oui	141 (13.5%)	
vol_total	380 (413)	1076
vol_total_jete	40.7 (67.5)	1076
pct_patient	3.80 [0.00;17.8]	1076
pct_patient_quantQ3:		1076
infQ3	807 (75.0%)	
supQ3	269 (25.0%)	
pct_patient_quantMed:		1076
infMed	538 (50.0%)	
supMed	538 (50.0%)	

5.4.1 univariate analysis

Patients with less wastage vs more wastage than the median

Show

Summary descriptives table by groups of 'pct_patient_quantMed'

	infMed	supMed	p-overall
	N=538	N=538	
Opposition:			0.085
non	519 (96.5%)	529 (98.3%)	
oui	19 (3.53%)	9 (1.67%)	
Age	58.9 (16.7)	60.3 (16.4)	0.178
Sex:			1.000
Homme	332 (64.0%)	338 (64.0%)	
Femme	187 (36.0%)	190 (36.0%)	
Taille	169 (11.6)	170 (12.0)	0.806
Poids	76.2 (19.8)	79.5 (23.2)	0.012
BMI	26.5 (6.64)	27.4 (7.44)	0.040
Motif_principal_entree:			0.039
Chir réglée	67 (13.0%)	98 (18.6%)	
Chir urgente	133 (25.8%)	113 (21.4%)	
Medicale	277 (53.7%)	269 (50.9%)	
Trauma	39 (7.56%)	48 (9.09%)	
Score_SOFA	3.00 [1.00;6.00]	5.00 [2.00;8.00]	<0.001
SOFA_Neuro	0.00 [0.00;2.00]	1.00 [0.00;3.00]	0.001
SOFA_Cardio	0.00 [0.00;1.00]	0.00 [0.00;3.00]	<0.001
SOFA_Respiration	1.00 [0.00;2.00]	2.00 [0.00;3.00]	<0.001
SOFA_hepatique	0.00 [0.00;0.00]	0.00 [0.00;0.00]	0.157
SOFA_plaquettes	0.00 [0.00;0.00]	0.00 [0.00;0.00]	0.024
SOFA_Renal	0.00 [0.00;0.00]	0.00 [0.00;1.00]	<0.001
quant_SOFA_Neuro:			0.032
inf2	363 (70.1%)	336 (63.6%)	
sup2	155 (29.9%)	192 (36.4%)	
quant_SOFA_Cardio:			<0.001
inf2	414 (79.9%)	312 (59.0%)	
sup2	104 (20.1%)	217 (41.0%)	
quant_SOFA_Respiration:			<0.001
inf2	294 (59.3%)	240 (46.1%)	
sup2	202 (40.7%)	281 (53.9%)	
quant_SOFA_hepatique:			0.275
inf2	448 (93.3%)	449 (91.3%)	
sup2	32 (6.67%)	43 (8.74%)	
quant_SOFA_plaquettes:			0.684
inf2	467 (91.2%)	474 (90.3%)	
sup2	45 (8.79%)	51 (9.71%)	
quant_SOFA_Renal:			0.004
inf2	443 (86.0%)	417 (79.0%)	
sup2	72 (14.0%)	111 (21.0%)	
quant_jour_rea:			0.051
J1J2	166 (32.2%)	201 (38.2%)	
supJ2	349 (67.8%)	325 (61.8%)	
Sedation:			<0.001
non	394 (76.4%)	303 (57.3%)	
oui	122 (23.6%)	226 (42.7%)	
Acces_VAS:			<0.001
IOT	161 (31.1%)	282 (53.3%)	
Tracheotomie	39 (7.53%)	25 (4.73%)	
Néant	318 (61.4%)	222 (42.0%)	
Mode_oxygenation:			<0.001
VM	187 (34.8%)	303 (56.3%)	
VNI	35 (6.51%)	35 (6.51%)	

	infMed	supMed	p-overall
OHD	33 (6.13%)	24 (4.46%)	
Oxy simple	137 (25.5%)	107 (19.9%)	
Neant	146 (27.1%)	69 (12.8%)	
Epuration_extra_renale:			0.002
non	473 (91.3%)	447 (84.8%)	
oui	45 (8.69%)	80 (15.2%)	
Voie_enterale_accessible:			0.082
non	74 (14.3%)	98 (18.5%)	
oui	442 (85.7%)	431 (81.5%)	
jour_rea	6.00 [2.00;15.5]	4.00 [1.00;11.0]	0.004
Sortie_de_reanimation:			0.111
non	438 (84.7%)	467 (88.3%)	
oui	79 (15.3%)	62 (11.7%)	
vol_total	315 (405)	445 (411)	<0.001
vol_total_jete	2.99 (8.12)	78.4 (78.7)	<0.001
pct_patient	0.00 [0.00;0.08]	17.8 [8.64;35.7]	<0.001
pct_patient_quantQ3:			<0.001
infQ3	538 (100%)	269 (50.0%)	
supQ3	0 (0.00%)	269 (50.0%)	

Show

variable	pvalue	sign
Opposition	0.0848141	**
Age	0.1780088	•
Poids	0.0121713	***
BMI	0.0398722	***
Motif_principal_entree	0.0390993	***
Score_SOFA	0.0000000	****
SOFA_Neuro	0.0013795	***
SOFA_Cardio	0.0000000	****
SOFA_Respiration	0.0000063	****
SOFA_hepatique	0.1568015	•
SOFA_plaquettes	0.0239042	***
SOFA_Renal	0.0002726	****
quant_SOFA_Neuro	0.0318457	***
quant_SOFA_Cardio	0.0000000	****
quant_SOFA_Respiration	0.0000327	****
quant_SOFA_Renal	0.0036369	***
quant_jour_rea	0.0506768	**
Sedation	0.0000000	****
Acces_VAS	0.0000000	****
Mode_oxygenation	0.0000000	****
Epuration_extra_renale	0.0016978	***
Voie_enterale_accessible	0.0817947	**
jour_rea	0.0041763	***
Sortie_de_reanimation	0.1106741	•
vol_total	0.0000002	****
vol_total_jete	0.0000000	****
pct_patient	0.0000000	****
pct_patient_quantQ3	0.0000000	****

5.4.2 multivariate analysis

first multivariate analysis with quantitative global SOFA, we choose to not include the organ's SOFA wich is redundant

Show

Show

```
## Start: AIC=1327.36
## pct_patient_quantMed ~ Age + 'Admission Indication' + 'ICU length of stay < 48 h' +
##   Sortie_de_reanimation + 'SOFA Score' + 'Upper Airway Acces' +
##   'Renal replacement therapy' + 'Body Mass Index' + 'Oxygen therapy' +
##   Sedation + 'Enteral route available'
##
##
##           Df Deviance   AIC
## - 'Oxygen therapy'      4  1296.4 1324.4
## - Sortie_de_reanimation  1  1291.4 1325.4
## - Age                    1  1291.4 1325.4
## - Sedation               1  1291.8 1325.8
## - 'ICU length of stay < 48 h' 1  1292.6 1326.6
## - 'Enteral route available'  1  1293.0 1327.0
## <none>                   1  1291.4 1327.4
## - 'Upper Airway Acces'    2  1295.4 1327.4
## - 'Body Mass Index'      1  1294.5 1328.5
## - 'Renal replacement therapy' 1  1295.3 1329.3
## - 'SOFA Score'           1  1296.8 1330.8
## - 'Admission Indication'  3  1301.6 1331.6
##
## Step: AIC=1324.42
## pct_patient_quantMed ~ Age + 'Admission Indication' + 'ICU length of stay < 48 h' +
##   Sortie_de_reanimation + 'SOFA Score' + 'Upper Airway Acces' +
##   'Renal replacement therapy' + 'Body Mass Index' + Sedation +
##   'Enteral route available'
##
##
##           Df Deviance   AIC
## - Sortie_de_reanimation  1  1296.4 1322.4
## - Age                    1  1296.5 1322.5
## - Sedation               1  1297.1 1323.1
## - 'ICU length of stay < 48 h' 1  1297.8 1323.8
## - 'Enteral route available'  1  1298.1 1324.1
## <none>                   1  1296.4 1324.4
## - 'Renal replacement therapy' 1  1300.3 1326.3
## - 'Body Mass Index'      1  1300.5 1326.5
## - 'SOFA Score'           1  1302.8 1328.8
## - 'Admission Indication'  3  1307.0 1329.0
## - 'Upper Airway Acces'    2  1306.0 1330.0
##
## Step: AIC=1322.44
## pct_patient_quantMed ~ Age + 'Admission Indication' + 'ICU length of stay < 48 h' +
##   'SOFA Score' + 'Upper Airway Acces' + 'Renal replacement therapy' +
##   'Body Mass Index' + Sedation + 'Enteral route available'
##
##
##           Df Deviance   AIC
## - Age                    1  1296.6 1320.6
## - Sedation               1  1297.1 1321.1
## - 'ICU length of stay < 48 h' 1  1297.8 1321.8
## - 'Enteral route available'  1  1298.1 1322.1
## <none>                   1  1296.4 1322.4
## - 'Renal replacement therapy' 1  1300.3 1324.3
## - 'Body Mass Index'      1  1300.5 1324.5
## - 'SOFA Score'           1  1302.8 1326.8
## - 'Admission Indication'  3  1307.0 1327.0
## - 'Upper Airway Acces'    2  1306.2 1328.2
##
## Step: AIC=1320.56
## pct_patient_quantMed ~ 'Admission Indication' + 'ICU length of stay < 48 h' +
##   'SOFA Score' + 'Upper Airway Acces' + 'Renal replacement therapy' +
##   'Body Mass Index' + Sedation + 'Enteral route available'
##
##
##           Df Deviance   AIC
## - Sedation               1  1297.2 1319.2
## - 'ICU length of stay < 48 h' 1  1298.0 1320.0
## - 'Enteral route available'  1  1298.2 1320.2
## <none>                   1  1296.6 1320.6
## - 'Renal replacement therapy' 1  1300.4 1322.4
## - 'Body Mass Index'      1  1300.8 1322.8
## - 'Admission Indication'  3  1307.3 1325.3
## - 'SOFA Score'           1  1303.4 1325.4
## - 'Upper Airway Acces'    2  1306.3 1326.3
##
## Step: AIC=1319.17
## pct_patient_quantMed ~ 'Admission Indication' + 'ICU length of stay < 48 h' +
##   'SOFA Score' + 'Upper Airway Acces' + 'Renal replacement therapy' +
##   'Body Mass Index' + 'Enteral route available'
##
##
##           Df Deviance   AIC
## - 'ICU length of stay < 48 h' 1  1298.7 1318.7
## - 'Enteral route available'  1  1298.9 1318.9
## <none>                   1  1297.2 1319.2
## - 'Renal replacement therapy' 1  1300.9 1320.9
## - 'Body Mass Index'      1  1301.5 1321.5
## - 'Admission Indication'  3  1308.4 1324.4
## - 'SOFA Score'           1  1305.3 1325.3
## - 'Upper Airway Acces'    2  1314.5 1332.5
##
## Step: AIC=1318.69
## pct_patient_quantMed ~ 'Admission Indication' + 'SOFA Score' +
##   'Upper Airway Acces' + 'Renal replacement therapy' + 'Body Mass Index' +
##   'Enteral route available'
##
##
##           Df Deviance   AIC
## <none>                   1  1298.7 1318.7
## - 'Enteral route available'  1  1300.8 1318.8
## - 'Renal replacement therapy' 1  1301.9 1319.9
## - 'Body Mass Index'      1  1302.6 1320.6
## - 'SOFA Score'           1  1307.7 1325.7
## - 'Admission Indication'  3  1312.5 1326.5
## - 'Upper Airway Acces'    2  1315.7 1331.7
```

Show

```
##
## Call:
## catpredi(formula = Med ~ AI + SOFA + UPa + RRT + BMI + ERA, cat.var = "SOFA",
##   cat.points = 2, data = data, method = "genetic")
##
##
## *****
## *****
## Genetic Search Algorithm
## *****
## *****
##
## Optimal cutpoints
## 1.644
## 7.059
##
## Optimal AUC
## 0.6743
##
## Corrected AUC
## 0.6563
```

Show

We used the Catpredi function with the genetic algorithm to search a SOFA cut-off wich will be clinically pertinent. We choose to used the 7 cut-off wich separate patient with severe organ failure from less severe patient.

Show

```

## Start: AIC=1328.59
## pct_patient_quantMed ~ Age + 'Admission Indication' + 'ICU length of stay < 48 h' +
##   Sortie_de_reanimation + 'SOFA Score' + 'Upper Airway Acces' +
##   'Renal replacement therapy' + 'Body Mass Index' + 'Oxygen therapy' +
##   Sedation + 'Enteral route available'
##
##
## Df Deviance AIC
## - 'Oxygen therapy' 4 1298.3 1326.3
## - Sortie_de_reanimation 1 1292.6 1326.6
## - Age 1 1292.7 1326.7
## - Sedation 1 1293.0 1327.0
## - 'ICU length of stay < 48 h' 1 1293.9 1327.9
## - 'Enteral route available' 1 1294.5 1328.5
## <none> 1292.6 1328.6
## - 'Upper Airway Acces' 2 1297.2 1329.2
## - 'Body Mass Index' 1 1296.0 1330.0
## - 'SOFA Score' 1 1296.8 1330.8
## - 'Admission Indication' 3 1301.8 1331.8
## - 'Renal replacement therapy' 1 1298.1 1332.1
##
## Step: AIC=1326.28
## pct_patient_quantMed ~ Age + 'Admission Indication' + 'ICU length of stay < 48 h' +
##   Sortie_de_reanimation + 'SOFA Score' + 'Upper Airway Acces' +
##   'Renal replacement therapy' + 'Body Mass Index' + Sedation +
##   'Enteral route available'
##
##
## Df Deviance AIC
## - Sortie_de_reanimation 1 1298.3 1324.3
## - Age 1 1298.6 1324.6
## - Sedation 1 1299.0 1325.0
## - 'ICU length of stay < 48 h' 1 1299.7 1325.7
## - 'Enteral route available' 1 1300.3 1326.3
## <none> 1298.3 1326.3
## - 'SOFA Score' 1 1302.8 1328.8
## - 'Body Mass Index' 1 1302.8 1328.8
## - 'Admission Indication' 3 1307.8 1329.8
## - 'Renal replacement therapy' 1 1303.9 1329.9
## - 'Upper Airway Acces' 2 1311.5 1335.5
##
## Step: AIC=1324.31
## pct_patient_quantMed ~ Age + 'Admission Indication' + 'ICU length of stay < 48 h' +
##   'SOFA Score' + 'Upper Airway Acces' + 'Renal replacement therapy' +
##   'Body Mass Index' + Sedation + 'Enteral route available'
##
##
## Df Deviance AIC
## - Age 1 1298.6 1322.6
## - Sedation 1 1299.0 1323.0
## - 'ICU length of stay < 48 h' 1 1299.7 1323.7
## <none> 1298.3 1324.3
## - 'Enteral route available' 1 1300.3 1324.3
## - 'SOFA Score' 1 1302.8 1326.8
## - 'Body Mass Index' 1 1302.9 1326.9
## - 'Admission Indication' 3 1307.8 1327.8
## - 'Renal replacement therapy' 1 1304.0 1328.0
## - 'Upper Airway Acces' 2 1311.8 1333.8
##
## Step: AIC=1322.63
## pct_patient_quantMed ~ 'Admission Indication' + 'ICU length of stay < 48 h' +
##   'SOFA Score' + 'Upper Airway Acces' + 'Renal replacement therapy' +
##   'Body Mass Index' + Sedation + 'Enteral route available'
##
##
## Df Deviance AIC
## - Sedation 1 1299.2 1321.2
## - 'ICU length of stay < 48 h' 1 1300.2 1322.2
## - 'Enteral route available' 1 1300.6 1322.6
## <none> 1298.6 1322.6
## - 'SOFA Score' 1 1303.4 1325.4
## - 'Body Mass Index' 1 1303.5 1325.5
## - 'Admission Indication' 3 1308.3 1326.3
## - 'Renal replacement therapy' 1 1304.3 1326.3
## - 'Upper Airway Acces' 2 1312.3 1332.3
##
## Step: AIC=1321.25
## pct_patient_quantMed ~ 'Admission Indication' + 'ICU length of stay < 48 h' +
##   'SOFA Score' + 'Upper Airway Acces' + 'Renal replacement therapy' +
##   'Body Mass Index' + 'Enteral route available'
##
##
## Df Deviance AIC
## - 'ICU length of stay < 48 h' 1 1300.9 1320.9
## <none> 1299.2 1321.2
## - 'Enteral route available' 1 1301.3 1321.3
## - 'Body Mass Index' 1 1304.2 1324.2
## - 'Renal replacement therapy' 1 1304.8 1324.8
## - 'Admission Indication' 3 1309.2 1325.2
## - 'SOFA Score' 1 1305.3 1325.3
## - 'Upper Airway Acces' 2 1325.2 1343.2
##
## Step: AIC=1320.88
## pct_patient_quantMed ~ 'Admission Indication' + 'SOFA Score' +
##   'Upper Airway Acces' + 'Renal replacement therapy' + 'Body Mass Index' +
##   'Enteral route available'
##
##
## Df Deviance AIC
## <none> 1300.9 1320.9
## - 'Enteral route available' 1 1303.4 1321.4
## - 'Body Mass Index' 1 1305.4 1323.4
## - 'Renal replacement therapy' 1 1305.8 1323.8
## - 'SOFA Score' 1 1307.7 1325.7
## - 'Admission Indication' 3 1313.2 1327.2
## - 'Upper Airway Acces' 2 1326.6 1342.6

```

Show

```
## Call: glm(formula = pct_patient_quantMed ~ `Admission Indication` + `SOFA
##      Score` + `Upper Airway Acces` + `Renal replacement therapy` + `Body Mass Index`
##      + `Enteral route available`, family = binomial(link = "logit"), data =
##      multi_patient)
##
## Coefficients:
##              Estimate Std. Error z value
## (Intercept)      -1.122397    0.283899  -3.954
## `Admission Indication` Elective surgery    0.591346    0.192566   3.071
## `Admission Indication` Emergency surgery  -0.087645    0.166583  -0.526
## `Admission Indication` Traumatology       0.293962    0.245695   1.196
## `SOFA Score` [7,22]                       0.446131    0.170825   2.612
## `Upper Airway Acces` Endotracheal intubation 0.768530    0.157960   4.815
## `Upper Airway Acces` Tracheostomy         -0.101036    0.281831  -0.359
## `Renal replacement therapy` Yes           0.480484    0.219477   2.189
## `Body Mass Index`                          0.019844    0.009414   2.108
## `Enteral route available` No               0.290718    0.183923   1.581
##
##              Pr(>|z|)
## (Intercept)      7.70e-05 ***
## `Admission Indication` Elective surgery    0.00213 **
## `Admission Indication` Emergency surgery    0.59880
## `Admission Indication` Traumatology        0.23152
## `SOFA Score` [7,22]                       0.00981 **
## `Upper Airway Acces` Endotracheal intubation 1.47e-06 ***
## `Upper Airway Acces` Tracheostomy          0.71997
## `Renal replacement therapy` Yes            0.02858 *
## `Body Mass Index`                          0.83504 *
## `Enteral route available` No               0.11396
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 1387.0  on 1000  degrees of freedom
## Residual deviance: 1300.9  on  991  degrees of freedom
##
##      logLik      df      AIC      BIC
##      -650.44    10 1320.88 1369.96
##
## Number of Fisher Scoring iterations: 4
##
## Exponentiated Coefficients and Confidence Bounds
##              Estimate      2.5 %    97.5 %
## (Intercept)    0.3254987  0.1854898  0.5652682
## `Admission Indication` Elective surgery    1.8064190  1.2415547  2.6435146
## `Admission Indication` Emergency surgery    0.9160864  0.6604539  1.2695737
## `Admission Indication` Traumatology        1.3417335  0.8301332  2.1801770
## `SOFA Score` [7,22]                       1.5622354  1.1180774  2.1855560
## `Upper Airway Acces` Endotracheal intubation 2.1394103  1.5715359  2.9204049
## `Upper Airway Acces` Tracheostomy          0.9039001  0.5150156  1.5615317
## `Renal replacement therapy` Yes            1.6168564  1.0560313  2.5013535
## `Body Mass Index`                          1.0200421  1.0015098  1.0392395
## `Enteral route available` No               1.3373881  0.9338938  1.9224967
```

Show

Characteristic	OR [†]	95% CI [†]	p-value
Admission Indication			
Medical	—	—	
Elective surgery	1.81	1.24, 2.64	0.002
Emergency surgery	0.92	0.66, 1.27	0.6
Traumatology	1.34	0.83, 2.18	0.2
SOFA Score			
[0,6]	—	—	
[7,22]	1.56	1.12, 2.19	0.009
Upper Airway Acces			
None	—	—	
Endotracheal intubation	2.14	1.57, 2.92	<0.001
Tracheostomy	0.90	0.52, 1.56	0.7
Renal replacement therapy			
No	—	—	
Yes	1.62	1.06, 2.50	0.029
Body Mass Index	1.02	1.00, 1.04	0.035
Enteral route available			
Yes	—	—	
No	1.34	0.93, 1.92	0.11

[†] OR = Odds Ratio, CI = Confidence Interval

Show

```
##
##      The Hosmer-Lemeshow goodness-of-fit test
##
##      Group Size Observed Expected
##      1 100      23 31.52795
##      2 100      36 34.37051
##      3 100      33 37.67413
##      4 100      47 42.96092
##      5 100      60 48.95473
##      6 100      52 52.42090
##      7 100      59 57.55660
##      8 100      65 63.17564
##      9 100      65 67.83096
##      10 101     74 77.52766
##
##      Statistic = 11.25824
## degrees of freedom = 8
##      p-value = 0.18749
```

Show

```
##      Area Under ROC Curve = 0.669, 95% CI: (0.636, 0.702)
##      Gini Coefficient     = 0.338, 95% CI: (0.271, 0.405)
##      K-S Statistic        = 0.275
```

Show

```
##      Area Under ROC Curve = 0.669, 95% CI: (0.636, 0.702)
##      Gini Coefficient     = 0.338, 95% CI: (0.271, 0.405)
##      K-S Statistic        = 0.275
```

Show

Show

Variable		N	Odds ratio	p
Admission Indication	Medical	525	Reference	
	Elective surgery	160	1.81 (1.24, 2.64)	0.002
	Emergency surgery	231	0.92 (0.66, 1.27)	0.599
SOFA Score	Traumatology	85	1.34 (0.83, 2.18)	0.232
	[0,6]	701	Reference	
	[7,22]	300	1.56 (1.12, 2.19)	0.009
Upper Airway Acces	None	513	Reference	
	Endotracheal intubation	425	2.14 (1.57, 2.92)	<0.001
	Tracheostomy	63	0.90 (0.52, 1.56)	0.720
Renal replacement therapy	No	883	Reference	
	Yes	118	1.62 (1.06, 2.50)	0.029
Body Mass Index		1001	1.02 (1.00, 1.04)	0.035
Enteral route available	Yes	839	Reference	
	No	162	1.34 (0.93, 1.92)	0.114

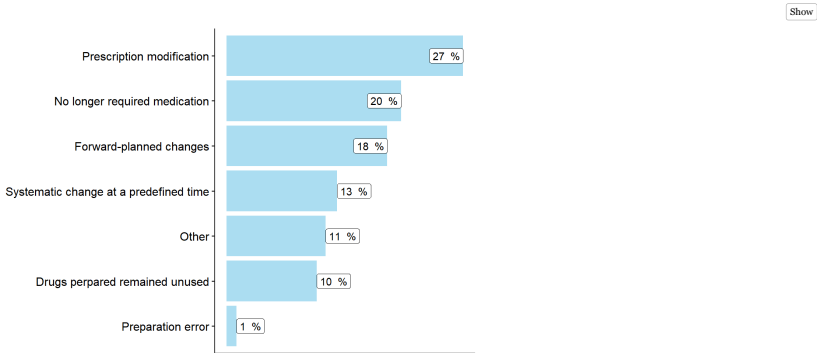
6 Secondary objectives

6.1 Secondary objective 1 : identification of causes for pharmaceutical waste,.

Categorical description of pharmaceutical waste causes :

- Adjustments made in anticipation to provide care
- Systematic change at a predefined time
- Preparation error
- No longer required medication
- Prescription modification
- Drugs perpared remained unused
- Other

name	n	pct
Other	200	11 %
Forward-planned changes	324	18 %
Systematic change at a predefined time	223	13 %
Preparation error	20	1 %
Prescription modification	477	27 %
No longer required medication	352	20 %
Drugs perpared remained unused	182	10 %



6.2 The 2nd and 3rd secondary objectives were used for ancillary studies due to the important quantity of data collected for the study

6.3 Objectif secondaire 2 : Décrire les différents circuits d'élimination des résidus médicamenteux sur une période de 24 heures.

Critère de jugement secondaire 2 :

Les différents circuits d'élimination des résidus médicamenteux seront recueillis par un questionnaire des pratiques auprès du personnel infirmier indiquant :

- la filière d'élimination des Déchets d'Activité de Soins Non Dangereux (DASND) : incinérée ou enfoui
- si les seringues avec des résidus médicamenteux sont vidées avant d'être jetées (oui/non)
- le lieu où sont vidées les seringues (DASRIA, DASND, lavabo)
- le lieu où sont jetées les seringues vides et celles avec des résidus médicamenteux (DASRIA, DASND, tri plastique);
- le lieu où sont jetées les résidus de cristalloïdes (DASRIA, DASND, lavabo). l'habitude de préparer des seringues non prescrites à l'avance;
- le changement systématique des seringues à l'heure de début des traitements;

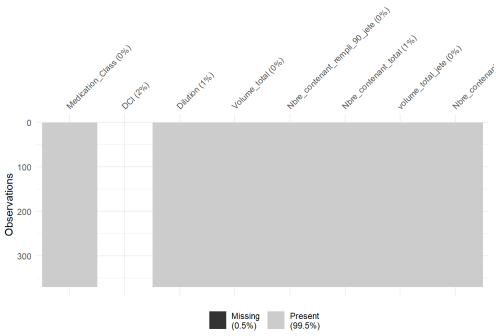
6.4 Objectif secondaire 3 : Évaluer l'utilisation des thérapeutiques par voie entérale chez les patients séjournant en réanimation durant les 24 heures de recueil.

Critère de jugement secondaire 3 : La possibilité de recourir aux thérapeutiques par voie entérale sera analysée par l'accessibilité de la voie entérale du patient, et la voie d'administration du paracétamol et de l'inhibiteur de la pompe à protons (PO, IV) en fonction du motif et de la date d'entrée en réanimation.

6.5 Secondary objective 4 : Cost of overall IV drug wastage (24 hours frame).

- Estimated cost of the 25 most wasted drugs residues will be evaluated for each drug, according to the reason for discarding, by the following formula :
 - cost = volume of discarded IV drugs x theoretical price

Show



Show

DCI	Volume_total	volume_total_jete	Nbre_contenant_rempli_90_jete	Nbre_contenant_total	Nbre_contenant_resi
NORADRENALINE / LEVOPHED	33187.0	10104	102	594	...
PROPOFOL / DIPRIVAN	39129.0	5653	39	774	...
INSULINE (UI/ML)	14852.0	4066	32	266	...
HEPARINE (UI/ML)	11236.0	2788	16	238	...
SUFENTANYL / SUFENTA	11237.0	2081	15	232	...
MIDAZOLAM / HYPNOVEL	10506.0	1635	25	213	...
URAPIDIL / EUPRESSYL	7351.0	1383	15	148	...
REMIFENTANYL / ULTIVA	8636.0	1237	8	178	...
NEFOPAM / ACUPAN	7577.0	861	6	145	...
NICARDIPINE / LOXEN	3956.0	810	7	81	...
MORPHINE	4431.0	768	8	119	...
DOBUTAMINE /	...	...	...	...	...

Show

Show

DCI	cout_jete	Prismoyen	mg_tot	mg_jete	nbr_cont	Volume_total	volume_total_jete	Nbre_contenant_re
ADRENALINE	46.016880	0.1866667	381.0200	2.465190e+02	30	548	375	...
ALBUMINE	0.040495	0.0022250	810.0000	1.820000e+01	2	6050	451	...
AMIODARONE	132.201720	0.0217080	31152.0000	6.090000e+03	17	2340	400	...
CEFEPIME	31.977652	0.0016001	162264.0800	1.998520e+04	22	4140	690	...
CISATRACURIUM	204.013370	0.0861667	13589.9800	2.367660e+03	24	3422	540	...
CLONIDINE	36.838797	3.4606667	43.0420	1.064500e+01	17	1566	398	...
DEXMEDETOMIDINE	86.765035	7.3250000	240.4046	1.184506e+01	29	5410	540	...
DOBUTAMINE	136.768586	0.0299209	16137.5000	4.571000e+03	27	2511	758	...
FUROSEMIDE	40.487672	0.0093783	30520.6400	4.317150e+03	33	3199	501	...
HEPARINE	225.981098	0.0002252	3992294.5600	1.003463e+06	129	11236	2788	...
INSULINE	1.395353	0.0003589	14587.1400	3.887980e+03	138	14852	4066	...
KETAMINE	37.229573	0.0061967	16135.0000	6.008000e+03	23	1819	437	...

Total waste cost for the 25 most wasted drugs in euros 1760.0231197

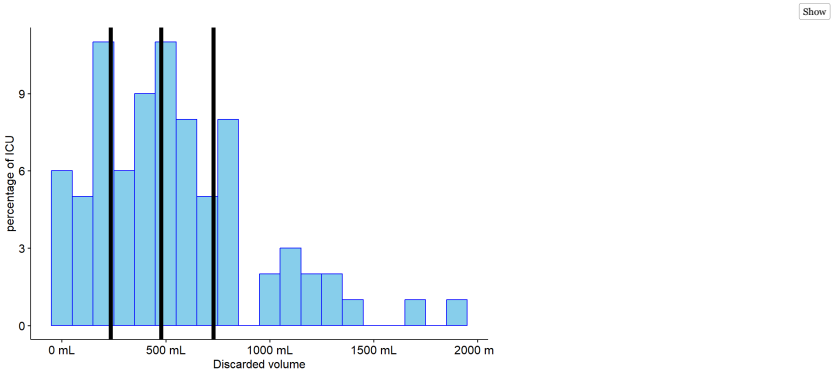
6.5.1 wastage cost by hospital

Show

```
## 'summarise()' has grouped output by 'reanimation'. You can override using the
## '.groups' argument.
```

Show

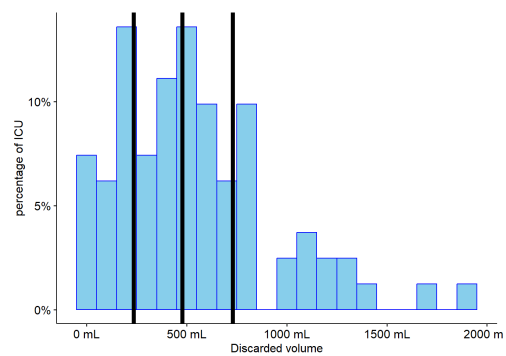
moy	sd	med	min	max	Q1	Q3
540.8765	400.5667	477	0	1924	235	729



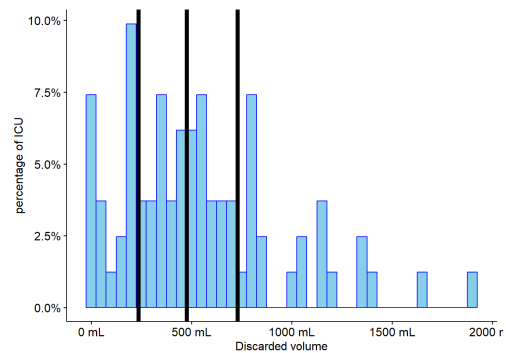
Show

moy	sd	med	min	max	Q1	Q3
540.8765	400.5667	477	0	1924	235	729

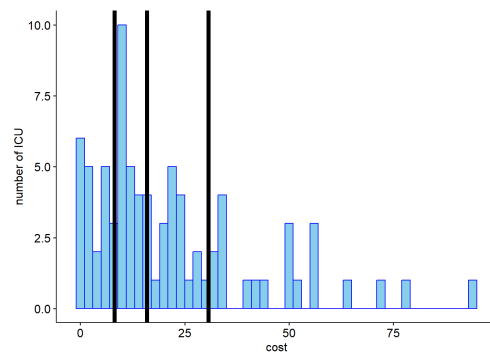
Show


[Show](#)

moy	sd	med	min	max	Q1	Q3
540.8765	400.5667	477	0	1924	235	729

[Show](#)

[Show](#)

moy	sd	med	min	max	Q1	Q3
21.72868	19.74704	15.87783	0	94.39275	8.258543	30.6974

[Show](#)

[Show](#)
