

# survBootOutliers: An R package for outlier detection in survival analysis

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May 27, 2018

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## 1 Introduction

This package provides three new outlier detection methods to perform outlier detection in a survival analysis context. The first method OSD, for One Step Deletion, is a sequential procedure that maximizes the  $c$ -index of a fitted Cox regression using a greedy one-step-ahead search, in each step the observation that when removed maximizes the concordance increase is permanently deleted from the dataset, the algorithm ends until  $k$  observations are removed, these are considered the most outlying ones. The second and third methods are based on bootstrap methods. The second method BHT, for Bootstrap Hypothesis Testing, is based on creating  $B$  bootstrap samples for each observation that is removed from the dataset, then an hypothesis test is made for the  $B$  concordance variations to be larger than zero, the observations with the lowest  $p$ -values are considered the most outlying. The last method DBHT, for Dual Bootstrap Hypothesis Testing, draws  $2B$  bootstrap samples for each observation,  $B$  samples with each observation absent, just like with BHT, the other  $B$  bootstrap samples are drawn with the observation under test being deliberately inserted in each of the bootstrap samples. The hypothesis test is different, the two histograms are tested for inequality, for non-outlying observations the histograms are expected to be similar but for outlying observations the histograms drawn when the observation is absent is expected to have higher concordance on average.

The package still provides three other methods considered more traditional based on Martingale-based residuals, Deviance residuals and Cox likelihood displacement.

These methods are based on the Master Thesis at Instituto Superior Técnico, named "Outlier detection in survival analysis" evaluated in May 2015. The link for the full text is left here for more detail: .

## 2 Example data

The well-known Worcester Heart Attack Study data is given as example and provided within the package;

```
> library(survBootOutliers)
> whas100_data <- get.whas100.dataset()
> summary(whas100_data)
```

X	los	age	gender
Min. : 1.00	Min. : 1.00	Min. :32.00	Min. :0.00
1st Qu.: 25.75	1st Qu.: 4.00	1st Qu.:59.75	1st Qu.:0.00
Median : 50.50	Median : 5.00	Median :71.00	Median :0.00
Mean : 50.50	Mean : 6.84	Mean :68.25	Mean :0.35
3rd Qu.: 75.25	3rd Qu.: 7.00	3rd Qu.:80.25	3rd Qu.:1.00
Max. :100.00	Max. :56.00	Max. :92.00	Max. :1.00

  

bmi	times	status
Min. :14.92	Min. : 6	Min. :0.00
1st Qu.:23.54	1st Qu.: 715	1st Qu.:0.00
Median :27.19	Median :1878	Median :1.00
Mean :27.04	Mean :1505	Mean :0.51
3rd Qu.:30.35	3rd Qu.:2076	3rd Qu.:1.00
Max. :39.94	Max. :2719	Max. :1.00

## 3 Examples

### 3.1 OSD

```
> whass <- get.whas100.dataset()
> outliers_osd <- survBootOutliers(
+   surv.object=survival::Surv(time = whass$times,event = whass$status ),
+   covariate.data = whass[,2:5] , sod.method = "osd",
+   max.outliers = 10)

[1] "BiocParallel detected"

> print(outliers_osd)
```

```

removed_indexes
1          1
2         67
3         97
4         51
5         23
6         31
7         93
8         52
9         56
10        57

```

### 3.2 BHT

```

> whas <- get.whas100.dataset()
> outliers_bht <- survBootOutliers(
+   surv.object=survival::Surv(time = whas$times,event = whas$status ),
+   covariate.data = whas[,2:5],
+   sod.method = "bht",
+   B = 10,
+   B.N = 100)

```

```
[1] "BiocParallel detected"
```

```
> print(outliers_bht)
```

```

$outlier_set
      obs_id   avg_delta max_delta pvalue
[1,]      1 0.0228882665 0.06713828  0.2
[2,]     10 0.0151567649 0.05082190  0.2
[3,]     25 0.0367989099 0.06596956  0.2
[4,]     31 0.0384871611 0.07973449  0.2
[5,]     37 0.0240461856 0.05075686  0.2
[6,]     45 0.0262288471 0.06293951  0.2
[7,]     57 0.0234731413 0.06142603  0.2
[8,]     58 0.0218413167 0.06683253  0.2
[9,]     80 0.0319311629 0.08493756  0.2
[10,]    90 0.0119627961 0.05339804  0.2
[11,]      2 0.0287497394 0.08883801  0.3
[12,]    13 0.0139773374 0.07022296  0.3
[13,]    22 0.0252606565 0.07240813  0.3
[14,]    40 0.0228250738 0.07309210  0.3
[15,]    43 0.0122705571 0.04567416  0.3
[16,]    44 0.0155225179 0.04967062  0.3
[17,]    56 0.0282742146 0.06769422  0.3
[18,]    67 0.0362065684 0.10510587  0.3
[19,]    73 0.0210088388 0.06595285  0.3

```

[20,]	92	0.0225493535	0.08233639	0.3
[21,]	3	0.0240852251	0.08094883	0.4
[22,]	4	0.0116104099	0.04618208	0.4
[23,]	5	0.0200502754	0.06232495	0.4
[24,]	6	0.0118481983	0.08182962	0.4
[25,]	7	0.0165037902	0.07241954	0.4
[26,]	8	0.0256227938	0.08314286	0.4
[27,]	16	0.0145114498	0.04757229	0.4
[28,]	17	0.0001923257	0.02891952	0.4
[29,]	28	0.0355611941	0.11391406	0.4
[30,]	29	0.0198057562	0.07341776	0.4
[31,]	33	0.0153880025	0.07814124	0.4
[32,]	34	0.0274931984	0.08240392	0.4
[33,]	35	0.0142842306	0.04912932	0.4
[34,]	39	0.0100925856	0.04442768	0.4
[35,]	41	0.0199507291	0.07966840	0.4
[36,]	46	0.0162644220	0.04473568	0.4
[37,]	48	0.0137918797	0.04437974	0.4
[38,]	52	0.0099682917	0.07666534	0.4
[39,]	55	0.0229807767	0.10386769	0.4
[40,]	68	0.0105553497	0.05170491	0.4
[41,]	69	0.0215783818	0.06849011	0.4
[42,]	71	0.0032996379	0.04928200	0.4
[43,]	77	0.0117751892	0.04570803	0.4
[44,]	78	0.0044954795	0.05339958	0.4
[45,]	79	0.0109296883	0.03893209	0.4
[46,]	81	0.0135689388	0.05247424	0.4
[47,]	82	0.0078488894	0.05456053	0.4
[48,]	83	0.0221527935	0.08748815	0.4
[49,]	86	0.0259461495	0.08673299	0.4
[50,]	87	0.0057479616	0.09412678	0.4
[51,]	88	0.0279409729	0.07797704	0.4
[52,]	97	0.0288924425	0.08035391	0.4
[53,]	98	0.0077423285	0.04694964	0.4
[54,]	100	0.0165595142	0.06410812	0.4
[55,]	9	0.0066869847	0.06081395	0.5
[56,]	11	0.0109261753	0.09477397	0.5
[57,]	12	0.0082795623	0.05569420	0.5
[58,]	20	0.0068920626	0.06002420	0.5
[59,]	26	0.0075555839	0.04108842	0.5
[60,]	27	0.0082433385	0.06815612	0.5
[61,]	36	0.0083329981	0.04540567	0.5
[62,]	42	0.0049779050	0.03874023	0.5
[63,]	47	0.0096794474	0.07405648	0.5
[64,]	53	-0.0202603727	0.06646056	0.5
[65,]	54	0.0082145276	0.09377121	0.5

[66,]	59	0.0045334796	0.05638833	0.5
[67,]	61	-0.0016305616	0.03298293	0.5
[68,]	63	0.0074650107	0.05073514	0.5
[69,]	64	-0.0004529911	0.03772110	0.5
[70,]	66	0.0125110064	0.08717584	0.5
[71,]	74	0.0205229297	0.08137046	0.5
[72,]	75	0.0135499565	0.08795050	0.5
[73,]	76	0.0020760581	0.05226372	0.5
[74,]	84	0.0149024571	0.07263230	0.5
[75,]	85	0.0193898860	0.05677242	0.5
[76,]	89	0.0130880587	0.07185640	0.5
[77,]	93	0.0109015228	0.04488910	0.5
[78,]	14	0.0061401529	0.09324174	0.6
[79,]	15	0.0019340883	0.07667105	0.6
[80,]	18	0.0101873446	0.04667603	0.6
[81,]	21	0.0088498740	0.07810077	0.6
[82,]	23	0.0095195917	0.08513788	0.6
[83,]	38	0.0053664051	0.05489936	0.6
[84,]	49	0.0161805091	0.06450463	0.6
[85,]	51	0.0042641740	0.04714229	0.6
[86,]	65	0.0110666554	0.12432301	0.6
[87,]	91	0.0014560366	0.07602879	0.6
[88,]	94	0.0093001880	0.08764973	0.6
[89,]	95	0.0066797075	0.05545272	0.6
[90,]	99	0.0078397142	0.06674801	0.6
[91,]	24	0.0015619710	0.06346213	0.7
[92,]	30	0.0039964400	0.05656281	0.7
[93,]	50	-0.0001669053	0.04974442	0.7
[94,]	60	0.0076611253	0.07784722	0.7
[95,]	62	-0.0063252076	0.03155129	0.7
[96,]	72	-0.0115255131	0.02729684	0.7
[97,]	19	-0.0184322140	0.03124048	0.8
[98,]	32	-0.0087383857	0.03497425	0.8
[99,]	70	-0.0121135186	0.03951453	0.8
[100,]	96	-0.0131622931	0.03699267	0.8

\$histograms

\$histograms\$histogram

[1]	0.002767301	0.067138277	-0.033301634	0.007368238	0.058805882
[6]	0.037634995	0.008020854	0.017794517	0.022948992	0.039705241

\$histograms\$histogram

[1]	-0.0304625357	0.0282661712	0.0192327324	-0.0207705762	0.0430489796
[6]	0.0597605825	0.0460266363	0.0888380084	0.0530755718	0.0004818238

\$histograms\$histogram

[1]	-0.001856122	0.057868027	0.028571926	0.060187953	0.005849765
[6]	-0.017594011	-0.036913514	0.027979642	0.035809755	0.080948831
\$histograms\$histogram					
[1]	0.025514110	0.046182079	0.033939338	0.008272145	-0.009656029
[6]	0.041271496	-0.030916484	-0.060589256	0.045219335	0.016867366
\$histograms\$histogram					
[1]	0.062324955	0.028229908	-0.041145685	-0.006404544	0.025975772
[6]	0.011069516	0.033910953	-0.002891882	0.042223793	0.047209970
\$histograms\$histogram					
[1]	-0.082044725	0.040352305	0.023655928	0.010755745	0.081829620
[6]	0.001784712	-0.003032337	-0.061114319	0.042857571	0.063437483
\$histograms\$histogram					
[1]	0.019653740	0.032236546	0.040167045	0.029676326	-0.011987329
[6]	-0.007887600	0.014005896	0.008328615	0.072419536	-0.031574873
\$histograms\$histogram					
[1]	-0.008377719	-0.013223000	0.008064752	0.041479001	0.083142861
[6]	0.026309720	0.033534772	-0.023071651	0.070950419	0.037418784
\$histograms\$histogram					
[1]	0.004642704	0.059056842	-0.040411088	0.060813952	-0.012165931
[6]	0.019650989	-0.013939970	0.008751598	0.011966600	-0.031495850
\$histograms\$histogram					
[1]	0.011396834	0.050821903	0.006666417	-0.037687160	0.014159829
[6]	0.023446437	0.002919257	0.031700710	0.017647958	0.030495463
\$histograms\$histogram					
[1]	0.0188581072	0.0052539511	-0.0025456816	0.0947739717	0.0343282070
[6]	0.0366089372	0.0350959946	-0.0711091479	-0.0416655130	-0.0003370734
\$histograms\$histogram					
[1]	0.055694200	-0.012548802	-0.015792365	0.026699608	0.002893812
[6]	0.040959970	-0.007333994	0.041964192	-0.052769934	0.003028935
\$histograms\$histogram					
[1]	0.008458404	0.027138831	0.004707962	-0.081229669	0.070222961
[6]	0.004035777	-0.029082224	0.041389234	0.034469737	0.059662360
\$histograms\$histogram					
[1]	0.09324174	-0.05910364	0.04537384	-0.01801160	-0.06303406
[7]	0.07508783	-0.02376409	-0.04049095	0.02269425	0.02940821

```

$histograms$histogram
[1] 0.011237048 -0.032414118 0.076671051 -0.026741894 0.016746133
[6] -0.021452165 -0.005026425 -0.014853545 0.006837682 0.008337116

$histograms$histogram
[1] 0.034899364 0.009903344 -0.038527210 0.046246313 0.022407601
[6] 0.047572288 0.045954162 -0.008241181 0.013311233 -0.028411416

$histograms$histogram
[1] 0.008797308 0.012969324 0.009302614 -0.017870651 0.017771564
[6] -0.026765234 -0.081933023 0.028400396 0.028919520 0.022331440

$histograms$histogram
[1] -0.010054711 -0.013041182 -0.016201709 -0.001416384 0.036793303
[6] 0.021358641 0.001175023 0.046676031 -0.008647084 0.045231518

$histograms$histogram
[1] 0.031240484 -0.056382742 -0.026292520 -0.016390831 -0.052865073
[6] -0.015255486 -0.032174098 -0.050546441 0.008370131 0.025974436

$histograms$histogram
[1] -0.026277962 0.025944446 -0.006626693 0.060024195 0.008407451
[6] 0.016639512 -0.042262376 0.001595559 0.056704127 -0.025227632

$histograms$histogram
[1] 0.017780482 0.053283144 0.021226156 0.078100774 -0.003711654
[6] 0.006544906 -0.006093142 -0.032700339 -0.021183089 -0.024748498

$histograms$histogram
[1] 0.065397897 -0.020944792 0.002653599 0.011270361 -0.005571793
[6] 0.036960735 0.044692978 0.072408127 0.019165098 0.026574355

$histograms$histogram
[1] -0.013721042 0.085137881 -0.049642867 -0.001459126 0.025121722
[6] 0.044857224 0.038549100 -0.003606789 0.040875688 -0.070915874

$histograms$histogram
[1] -0.016387033 -0.026999072 0.033996293 -0.006217097 0.043501568
[6] -0.078318391 -0.001617978 0.063462131 0.007626636 -0.003427348

$histograms$histogram
[1] 0.036126783 0.032769791 -0.006640507 0.053634915 0.039711853
[6] 0.001953733 0.043993106 0.060679139 0.065969559 0.039790727

$histograms$histogram

```

[1] 0.020746536 0.026662634 0.015512410 -0.039253280 -0.012694219  
[6] 0.005146298 0.041088422 -0.004770961 -0.009453571 0.032571570

\$histograms\$histogram

[1] 0.01238011 0.04156637 0.05356216 0.01083681 -0.04312349 0.01917562  
[7] 0.06815612 -0.03971045 -0.03729083 -0.00311904

\$histograms\$histogram

[1] -0.0006506377 0.0364051042 0.0578520646 0.1001132195 0.1139140615  
[6] -0.0015048912 0.0442120022 -0.0747093821 0.0231691583 0.0568112417

\$histograms\$histogram

[1] -0.0085234453 0.0485516949 -0.0079546977 0.0010380565 0.0461808532  
[6] 0.0628185809 0.0205594567 -0.0386135433 0.0005828506 0.0734177558

\$histograms\$histogram

[1] -0.009729171 -0.035545695 0.048403335 -0.026075633 -0.020980799  
[6] -0.004118698 0.056562807 -0.010583240 0.004055208 0.037976287

\$histograms\$histogram

[1] 0.07973449 0.07627244 0.02444307 0.03132892 -0.03982538 0.03915226  
[7] 0.02440083 0.04750249 0.06070293 0.04115957

\$histograms\$histogram

[1] 0.034974248 -0.004328532 -0.043174341 0.023707756 -0.001827425  
[6] -0.012464170 -0.007975298 -0.051571041 -0.037069220 0.012344167

\$histograms\$histogram

[1] 0.0511690717 0.0015354211 0.0082521948 0.0008747608 0.0306463067  
[6] -0.0067651398 0.0193247495 -0.0007501664 0.0781412399 -0.0285484134

\$histograms\$histogram

[1] 0.06008186 -0.02985888 0.02228547 -0.03150655 0.06724480 0.02252944  
[7] -0.02742491 0.03094208 0.08240392 0.07823474

\$histograms\$histogram

[1] 0.012933017 -0.002707617 0.045744659 0.027639164 0.023464724  
[6] -0.061182326 0.023458842 0.030976890 0.049129320 -0.006614365

\$histograms\$histogram

[1] 0.027359078 0.032345737 -0.029177886 -0.010450413 0.001807159  
[6] -0.020086423 0.045405670 0.026834659 -0.022330720 0.031623120

\$histograms\$histogram

[1] 0.04518320 0.01057448 0.01852711 0.05075686 -0.04385989 0.03676280  
[7] 0.01063093 0.03322282 0.03620681 0.04245673



\$histograms\$histogram  
[1] 0.05489936 -0.02710516 -0.02195897 0.04753419 0.01328936 -0.01424667  
[7] 0.04643971 0.04469445 -0.05636228 -0.03351993

\$histograms\$histogram  
[1] -0.009620651 0.024560781 0.003055035 0.002238988 0.044427677  
[6] -0.001281847 0.012780682 0.012643158 0.024413740 -0.012291707

\$histograms\$histogram  
[1] 0.073092102 0.048263864 0.015798917 0.021800276 -0.021126006  
[6] 0.057338949 0.009200486 0.014655168 -0.019691520 0.028918502

\$histograms\$histogram  
[1] -0.012916929 0.033721106 0.018223253 0.046614732 0.014833844  
[6] -0.005915335 0.013866721 -0.006405226 0.079668400 0.017816727

\$histograms\$histogram  
[1] -0.051395920 0.032868632 0.030169989 0.038740235 -0.008655153  
[6] -0.041066817 0.021866738 0.032137450 0.024194043 -0.029080147

\$histograms\$histogram  
[1] -0.0088461795 0.0196888931 0.0325518877 0.0003875791 0.0456741599  
[6] -0.0158155002 0.0237850098 0.0165798416 0.0065113947 0.0021884847

\$histograms\$histogram  
[1] 0.01251749 -0.02177868 0.03389417 0.00582979 -0.02675282 0.03925802  
[7] 0.02024079 0.04967062 0.01866647 0.02367934

\$histograms\$histogram  
[1] -0.046251124 0.058040315 0.028137322 0.007295610 0.033635360  
[6] 0.029983866 0.061689807 0.023553367 0.003264442 0.062939505

\$histograms\$histogram  
[1] -0.018785324 0.002224792 0.034398073 0.032740792 0.037693587  
[6] -0.013016046 0.027626636 0.038905527 -0.023879498 0.044735681

\$histograms\$histogram  
[1] -0.0004499665 0.0740564765 0.0221860233 0.0123433541 -0.0331805386  
[6] 0.0278701675 -0.0159505995 -0.0454926853 0.0113875843 0.0440246578

\$histograms\$histogram  
[1] 0.022832822 0.031832986 -0.009124937 -0.025978806 0.044379737  
[6] 0.028577085 -0.008986875 0.035940875 0.008881866 0.009564043

\$histograms\$histogram

[1] 0.062575647 -0.039207945 -0.008590364 0.020376711 0.044452710  
[6] -0.002682374 0.041628406 0.064504627 -0.001692597 -0.019559729

\$histograms\$histogram

[1] 0.031693636 -0.006005926 -0.015463794 -0.031351550 0.049744423  
[6] -0.008201766 -0.034809776 0.026492234 0.014484691 -0.028251226

\$histograms\$histogram

[1] -0.017463667 -0.041314610 0.041317432 0.034874667 -0.022727933  
[6] 0.047142289 -0.024909964 0.029673201 -0.007188179 0.003238503

\$histograms\$histogram

[1] 0.005718978 0.010517429 0.076665338 -0.012444623 0.032619671  
[6] 0.003636932 0.038455093 -0.037869748 -0.032665114 0.015048961

\$histograms\$histogram

[1] 0.016538056 0.001632945 0.032102903 0.015191973 -0.101933385  
[6] -0.095265411 -0.106572759 -0.055616882 0.024858275 0.066460559

\$histograms\$histogram

[1] 0.050372172 -0.054767460 0.042955623 -0.063902499 0.035589660  
[6] 0.009737243 0.022070466 0.093771215 -0.041777068 -0.011904075

\$histograms\$histogram

[1] 0.032876914 0.060824311 0.050545439 0.002117454 0.009760783  
[6] -0.014936038 0.103867686 -0.008440089 0.004753859 -0.011562553

\$histograms\$histogram

[1] 0.046680486 0.055897313 0.009204087 0.009611540 0.062924650  
[6] 0.067694223 0.018607603 0.045230578 -0.021189985 -0.011918348

\$histograms\$histogram

[1] 0.013101967 0.010041010 0.025795846 0.043940999 0.007938811  
[6] 0.041483530 0.039994862 -0.025322672 0.016331032 0.061426028

\$histograms\$histogram

[1] 0.019135430 0.009634386 0.026506592 0.006982198 0.001249825  
[6] 0.025944778 0.060827399 -0.009362115 0.010662146 0.066832528

\$histograms\$histogram

[1] 0.01474772 0.00721268 -0.01275888 -0.01452101 0.05638833 0.00417641  
[7] -0.05667456 -0.01270843 0.01570517 0.04376736

\$histograms\$histogram

[1] -9.678014e-03 -7.617718e-02 6.746804e-02 -2.224881e-05 -3.172698e-02  
[6] 7.784722e-02 -3.945233e-03 -6.898827e-03 2.258727e-02 3.715720e-02

```

$histograms$histogram
[1] 0.018843154 0.005308756 -0.057277489 0.031343018 -0.054538542
[6] -0.019336022 0.010353909 0.032982931 -0.009697073 0.025711743

$histograms$histogram
[1] -0.030050103 0.007299304 -0.018178927 -0.013839332 -0.036123364
[6] 0.031551292 -0.014735985 0.008111105 0.009694039 -0.006980105

$histograms$histogram
[1] -0.020952629 0.011299190 0.010032494 0.029435294 0.028243747
[6] -0.001800632 0.020569288 -0.049351597 0.050735141 -0.003560189

$histograms$histogram
[1] -0.013310406 0.037721103 -0.047185311 -0.071003192 0.025316572
[6] 0.032004170 0.010881950 -0.020379651 0.004195131 0.037229723

$histograms$histogram
[1] -0.034264816 -0.007437361 0.007823321 0.006506188 -0.020041978
[6] 0.124323012 -0.003961091 0.010861517 -0.021164683 0.048022445

$histograms$histogram
[1] 0.01038608 -0.01566033 0.08717584 -0.05127515 0.02954563 -0.01861863
[7] 0.05785509 0.03851453 0.01647353 -0.02928653

$histograms$histogram
[1] 0.0454611862 -0.0196663662 0.0418512352 0.0536301887 0.1051058686
[6] 0.0389833299 0.0357115051 0.0362999601 0.0254837792 -0.0007950034

$histograms$histogram
[1] 0.0190830653 0.0091932159 0.0004156709 -0.0063464277 0.0401089058
[6] -0.0183884013 0.0189404009 0.0517049061 0.0277026338 -0.0368604728

$histograms$histogram
[1] -0.026566912 0.065281171 0.046624191 0.068490107 0.009925830
[6] 0.023876987 -0.012543818 0.058204004 -0.022270271 0.004762529

$histograms$histogram
[1] -2.858522e-02 3.951453e-02 -7.229859e-02 -4.139777e-05 -6.159119e-02
[6] -3.848596e-02 -1.657287e-02 3.255417e-02 3.714661e-02 -1.277526e-02

$histograms$histogram
[1] 0.003317309 0.043012121 0.015326868 0.017002496 -0.019755951
[6] 0.049281996 -0.061132081 0.013491022 -0.047414065 0.019866664

$histograms$histogram

```

[1] 0.00842861 -0.05791469 -0.01421244 0.01217836 0.02729684 -0.04185433  
[7] -0.01001262 -0.02375790 -0.02752158 0.01211463

\$histograms\$histogram

[1] 0.065952853 0.011809604 0.030857126 0.064492783 -0.017405789  
[6] 0.055056112 -0.057774448 0.034396839 0.003922933 0.018780377

\$histograms\$histogram

[1] -0.008903558 0.048889485 -0.031635018 -0.022781836 -0.016103687  
[6] 0.033519018 0.026905719 0.043172675 0.050796035 0.081370464

\$histograms\$histogram

[1] 0.0879504982 0.0321049217 -0.0646544568 0.0127585586 0.0428696919  
[6] 0.0251591038 -0.0006283271 -0.0188536268 0.0392915651 -0.0204983637

\$histograms\$histogram

[1] 0.040645504 0.018487838 0.008988210 0.052263721 -0.003202064  
[6] -0.030119989 0.023457216 -0.051844729 -0.046370492 0.008455366

\$histograms\$histogram

[1] 0.03145233 0.01218609 -0.03148820 0.03788786 -0.03010254 0.02371829  
[7] 0.01553844 0.04570803 -0.02015898 0.03301056

\$histograms\$histogram

[1] 0.0211777555 -0.0758575266 0.0533995832 -0.0387180544 0.0212022809  
[6] 0.0003045325 0.0174049194 0.0177467049 -0.0037920488 0.0320866480

\$histograms\$histogram

[1] 0.018760291 0.028231659 0.011066731 0.025721874 -0.025395171  
[6] -0.023826114 0.036787376 0.004855334 -0.005837183 0.038932086

\$histograms\$histogram

[1] 0.0306548611 0.0211891197 0.0159959202 0.0849375607 0.0331391648  
[6] 0.0357051422 0.0294400010 0.0341761888 0.0350566911 -0.0009830205

\$histograms\$histogram

[1] -0.008024624 0.048417171 0.009719147 0.040165439 0.007464386  
[6] -0.048193805 0.037901866 -0.005572469 0.001338034 0.052474242

\$histograms\$histogram

[1] -0.060371289 0.038905360 0.015142060 0.026524493 0.019993590  
[6] 0.047318081 0.002850057 -0.027882873 0.054560528 -0.038551114

\$histograms\$histogram

[1] 0.055189489 0.001070228 0.007992363 -0.027899679 -0.008194620  
[6] 0.087488148 0.033907989 -0.003515818 0.046630517 0.028859319

```

$histograms$histogram
[1] 0.015404414 0.072632299 0.004775945 0.037827270 0.051773322
[6] -0.009911490 0.022898422 -0.001008897 -0.003047521 -0.042319193

$histograms$histogram
[1] -0.022623132 -0.012164069 0.056019144 -0.006349114 0.056097788
[6] 0.056772422 0.047598586 0.018708431 -0.021728202 0.021567007

$histograms$histogram
[1] -0.007020742 -0.018898186 0.013451563 0.086732993 0.007325431
[6] 0.060196647 0.032681461 0.048398925 -0.001063019 0.037656422

$histograms$histogram
[1] -0.005254829 0.004448945 0.005685815 0.008435262 0.005884050
[6] 0.004896444 0.094126785 0.037679053 -0.066324160 -0.032097750

$histograms$histogram
[1] 0.04979601 0.03085896 0.07797704 0.03216854 -0.00820579 -0.01726923
[7] 0.04789713 0.06243813 0.01673750 -0.01298857

$histograms$histogram
[1] 0.029068970 -0.016179794 0.070694818 0.020287080 0.002774316
[6] -0.065453509 0.066036422 0.071856401 -0.013103481 -0.035100636

$histograms$histogram
[1] 0.012347666 0.027748588 0.032142222 0.004302899 0.025068113
[6] 0.010395366 0.006594671 -0.083326909 0.030957309 0.053398036

$histograms$histogram
[1] -0.01666398 0.02973407 -0.09450741 0.01153725 0.02924897 0.03007786
[7] -0.01686262 0.07602879 -0.02353160 -0.01050097

$histograms$histogram
[1] 0.02398915 -0.02469889 0.03405462 -0.05416441 0.01891990 0.02963535
[7] 0.02147089 0.05703492 0.08233639 0.03691561

$histograms$histogram
[1] 0.044889098 -0.029846198 0.036793303 0.023456261 -0.017478917
[6] -0.001427339 0.030805064 0.043804521 0.006484630 -0.028465195

$histograms$histogram
[1] 0.06537219 -0.01083649 -0.03019958 0.08764973 -0.07481043 0.01572303
[7] 0.01927067 -0.01666511 0.05540791 -0.01791005

$histograms$histogram

```

```
[1] -0.0302552978 -0.0003423731 0.0246285652 -0.0234653486 -0.0144667006
[6] 0.0052002932 0.0515290753 0.0101855418 -0.0116694039 0.0554527233
```

```
$histograms$histogram
```

```
[1] 0.025246904 -0.057295948 -0.020099897 -0.061420983 -0.004143099
[6] -0.031083041 -0.039578333 -0.016690151 0.036448950 0.036992665
```

```
$histograms$histogram
```

```
[1] -0.04306125 0.04554012 0.01001813 0.08035391 0.07805580 -0.01774310
[7] 0.05785343 0.07944093 -0.02241846 0.02088492
```

```
$histograms$histogram
```

```
[1] 0.036662575 -0.039956396 0.006473176 0.010222056 0.012883207
[6] -0.002010484 0.003160734 0.023652100 0.046949635 -0.020613318
```

```
$histograms$histogram
```

```
[1] -0.016593275 0.032803477 0.061014170 -0.036285655 -0.007419083
[6] -0.053936091 0.066748006 -0.025902775 0.057782984 0.000185383
```

```
$histograms$histogram
```

```
[1] -0.02616992 0.01046519 0.04552409 -0.05471022 -0.02915940 0.06260176
[7] 0.06410812 0.01395644 0.05267326 0.02630582
```

### 3.3 DBHT

```
> whas <- get.whas100.dataset()
> outliers_dbht <- survBootOutliers(
+   surv.object=Surv(time = whas$times,event = whas$status ),
+   covariate.data = whas[,2:5],
+   sod.method = "dbht",
+   B = 10,
+   B.N = 100
+ )
```

```
[1] "BiocParallel detected"
```

```
> print(outliers_dbht)
```

```
$outlier_set
```

	obs_id	pvalue
[1,]	64	0.02411466
[2,]	10	0.03546195
[3,]	8	0.03838032
[4,]	90	0.05002798
[5,]	3	0.05066510
[6,]	73	0.05301631
[7,]	84	0.05564099

[8,]	13	0.07655770
[9,]	50	0.08318709
[10,]	91	0.10238214
[11,]	1	0.10273228
[12,]	63	0.11437646
[13,]	28	0.12044954
[14,]	48	0.12101727
[15,]	88	0.12216417
[16,]	31	0.12384896
[17,]	93	0.13128277
[18,]	61	0.13721154
[19,]	26	0.15166387
[20,]	97	0.15204097
[21,]	72	0.15510355
[22,]	40	0.15578322
[23,]	16	0.16501202
[24,]	69	0.17977711
[25,]	47	0.18702901
[26,]	15	0.19307121
[27,]	57	0.19341125
[28,]	39	0.19487934
[29,]	67	0.22266394
[30,]	14	0.22419316
[31,]	80	0.23260489
[32,]	68	0.24627114
[33,]	53	0.24960358
[34,]	85	0.25375499
[35,]	17	0.25454632
[36,]	33	0.25973306
[37,]	94	0.26367720
[38,]	46	0.31367167
[39,]	52	0.34516542
[40,]	51	0.38474923
[41,]	34	0.38537683
[42,]	95	0.39830019
[43,]	11	0.41788868
[44,]	71	0.42345410
[45,]	9	0.45154556
[46,]	86	0.47570227
[47,]	74	0.49039854
[48,]	76	0.49454771
[49,]	35	0.50128848
[50,]	6	0.50895244
[51,]	59	0.52355676
[52,]	79	0.55880249
[53,]	77	0.58408752

[54,]	29	0.58754380
[55,]	83	0.58770570
[56,]	20	0.58838631
[57,]	55	0.59573186
[58,]	19	0.59580236
[59,]	81	0.61173324
[60,]	49	0.62818066
[61,]	45	0.63751159
[62,]	99	0.64289267
[63,]	42	0.64618838
[64,]	36	0.65071171
[65,]	58	0.65337852
[66,]	56	0.65548536
[67,]	30	0.65720325
[68,]	100	0.66289457
[69,]	25	0.66423054
[70,]	70	0.69915398
[71,]	89	0.74114365
[72,]	44	0.74339571
[73,]	66	0.75195399
[74,]	96	0.77556497
[75,]	27	0.81276010
[76,]	87	0.82191245
[77,]	4	0.82196479
[78,]	21	0.82419741
[79,]	12	0.83536076
[80,]	32	0.84236781
[81,]	38	0.85946522
[82,]	7	0.86275243
[83,]	78	0.87917867
[84,]	18	0.89837545
[85,]	23	0.89986712
[86,]	65	0.91496465
[87,]	54	0.91594646
[88,]	5	0.92269475
[89,]	92	0.93360180
[90,]	37	0.93589264
[91,]	22	0.93757715
[92,]	82	0.93763949
[93,]	41	0.93946072
[94,]	2	0.94417816
[95,]	43	0.94732500
[96,]	98	0.96579475
[97,]	60	0.97168782
[98,]	24	0.97673650
[99,]	62	0.99208796



[100,] 75 0.99819667

\$histograms

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.011863247 0.012866811 0.052110834 0.020688102 0.057059099  
[6] 0.017550300 -0.015656446 0.044023591 0.004779354 0.023465146

\$histograms\$histograms\$poison

[1] 0.060807298 0.003267110 -0.022506697 0.044986571 -0.061691546  
[6] -0.007876246 0.036617622 0.020279481 0.017040391 -0.063490964

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.0001521176 -0.0125809339 0.0453225395 -0.0310130164 -0.0215871423  
[6] -0.0599275772 -0.0608717475 -0.0144018898 0.0303672388 0.0182461053

\$histograms\$histograms\$poison

[1] -4.612792e-05 4.167504e-02 -6.345966e-03 -3.043331e-02 -1.354561e-02  
[6] 3.954279e-02 1.418914e-02 4.627694e-02 6.307102e-02 -1.058096e-02

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.016192272 0.025835114 -0.016505640 0.003439795 0.083566486  
[6] 0.012211164 0.006351397 -0.006707932 0.072212993 -0.013529653

\$histograms\$histograms\$poison

[1] 0.0287253384 -0.0063750207 -0.0182349496 -0.0023789848 -0.0002681005  
[6] 0.0034635097 -0.0477723066 -0.0315816066 0.0535931954 -0.0560940065

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0009078949 0.0594979976 0.0306795958 -0.0189603002 -0.0084846446  
[6] 0.0145279286 0.0265138984 -0.0100941274 0.0154416283 -0.0301097792

\$histograms\$histograms\$poison

[1] 0.037276072 -0.007264780 0.009239540 0.029607522 -0.012517249  
[6] 0.047609825 -0.024826415 -0.001778579 0.040579561 0.094106438

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.105205028 -0.049663953 -0.022426088 0.019862483 -0.009537543

[6] 0.028080553 0.004065145 -0.022704490 0.020893398 0.020772870

\$histograms\$histograms\$poison

[1] 0.063954046 0.008630334 0.021570223 0.002696457 0.083221874 0.019914075

[7] 0.021710746 0.028757589 0.040704918 0.034443679

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.025633431 0.045247581 -0.038736294 -0.015614182 -0.002417032

[6] 0.043648142 0.041376636 0.051893690 -0.026083451 0.038335790

\$histograms\$histograms\$poison

[1] -0.0147660017 -0.0169989297 0.0009944227 0.0048223404 0.1225872662

[6] -0.0268880856 0.0313038143 0.0521629624 0.0045579872 0.0094931666

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.0224770033 -0.0306718455 0.0125698356 0.0022021080 0.0756956762

[6] 0.0273338740 0.0035478740 0.0156196351 0.0002232028 -0.0434058121

\$histograms\$histograms\$poison

[1] 0.018919153 0.035913021 0.037363343 0.021248549 0.019332926

[6] -0.023299168 0.039944373 0.000948505 0.043274914 0.029597020

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.01425794 -0.00974925 0.03083041 0.01157196 0.02269249 0.01256170

[7] 0.03292426 0.05240622 0.05332453 0.04588365

\$histograms\$histograms\$poison

[1] 0.063428596 -0.005510093 0.024482435 -0.019369561 0.050785840

[6] -0.003112130 -0.044713331 -0.027917130 -0.017480968 0.005359634

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.002537983 0.033229046 0.011269474 -0.042524173 0.014201428

[6] 0.019275268 0.004682938 -0.001609126 -0.013226198 0.070868162

\$histograms\$histograms\$poison

[1] 0.0065079290 0.0392369743 0.0511754525 0.0660029250 0.0007219369

[6] -0.0269321872 -0.0169398377 -0.0556751513 -0.0172007429 0.0277879266

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.03748446 0.01631574 0.06510263 0.06614266 0.06201757 0.02250726  
[7] -0.02946856 -0.04831059 0.09700921 0.06739286

\$histograms\$histograms\$poison  
[1] 0.031256571 0.002501487 0.009562462 -0.004726994 -0.018827935  
[6] 0.025858681 0.055812852 -0.056636506 -0.021992677 -0.008454695

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.0702925805 0.0793956556 0.0129865138 0.0338473532 -0.0586568886  
[6] -0.0180049102 0.0268067242 -0.0238112191 0.0007511386 -0.0050017004

\$histograms\$histograms\$poison  
[1] 0.010768276 0.014255691 -0.017533575 -0.006403009 0.008801379  
[6] -0.003796092 -0.004450113 0.008504626 0.001433615 0.074145061

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.022522677 -0.027717151 0.040727239 0.034255145 -0.043322269  
[6] -0.036817808 -0.001393906 0.013378234 0.021157602 -0.018453751

\$histograms\$histograms\$poison  
[1] 0.00041078 0.07543335 0.01427316 0.03519074 0.01909946 0.03644525  
[7] 0.02918809 0.01841233 -0.03837638 -0.03959559

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.029725205 -0.052395300 0.027532684 0.051114224 -0.035896843  
[6] 0.004209198 0.028644039 0.069584678 0.004803945 0.046985237

\$histograms\$histograms\$poison  
[1] -0.015760690 0.002714681 -0.003550792 0.002276842 -0.004718020  
[6] -0.007823378 0.062716972 -0.022812865 -0.004113109 -0.072475405

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.04419051 -0.06192046 -0.01039163 -0.01282990 0.05607468 0.02144333  
[7] 0.02242608 0.01770517 0.02641117 -0.06251206

\$histograms\$histograms\$poison

[1] -0.072692513 0.019104848 -0.010165942 -0.011734641 -0.009655491  
[6] -0.020093225 -0.009304139 -0.006783844 0.004121364 0.036028669

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0247791315 -0.0289224265 -0.0204983637 0.0290972245 0.0491290642  
[6] -0.0003511002 -0.0310243573 0.0829612443 0.0682518077 0.0316703522

\$histograms\$histograms\$poison

[1] 0.014345765 0.020929389 -0.014155542 -0.007348059 -0.013792190  
[6] -0.013771488 -0.013474281 -0.039475706 0.055799596 0.024137540

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.006587517 0.053286359 0.018844494 -0.007067772 0.074415060  
[6] -0.019580198 0.051570298 0.036379968 0.004001670 0.079806611

\$histograms\$histograms\$poison

[1] 0.059522628 0.010651893 0.069622798 -0.070951115 -0.022051468  
[6] 0.009919077 0.026529955 0.028783235 -0.024179834 0.037569782

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.010990922 -0.058402072 0.006349809 0.040786584 0.057551584  
[6] -0.033613718 0.057024227 -0.023246278 0.028462569 0.004619697

\$histograms\$histograms\$poison

[1] 0.023935978 0.020503840 -0.007615858 0.035398603 -0.050708978  
[6] 0.047650110 -0.033146787 -0.018138418 -0.027542325 -0.031869162

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.031923393 -0.024195410 -0.003648570 -0.004857276 -0.048871312  
[6] 0.022600034 0.009827894 -0.042798121 0.052188659 0.013939289

\$histograms\$histograms\$poison

[1] 0.0216701514 -0.0083209333 -0.0116926830 0.0150656248 0.0004370938  
[6] 0.0217889852 -0.0259301857 0.0595128812 -0.0001984500 0.0408457166

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.007894992 0.006367644 -0.019830629 0.025947863 -0.021228667  
[6] -0.003295350 0.009566672 -0.035635365 0.024242616 0.008010004

\$histograms\$histograms\$poison

[1] -0.0516601393 -0.0540754913 -0.0001121787 0.0436645710 -0.0199544407  
[6] 0.0571568377 0.0301190375 -0.0165688345 0.0248014024 0.0064460284

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.0362819191 -0.0400128487 -0.0225371249 0.0789334545 0.0047694935  
[6] 0.0671728455 -0.0231656316 0.0128202719 -0.0006397242 0.0167406408

\$histograms\$histograms\$poison

[1] 0.063710707 0.077285095 -0.041513685 0.030000236 -0.016263312  
[6] -0.041401310 -0.007393661 0.035474738 0.080510110 -0.006666463

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.028544017 0.059459097 -0.013142794 -0.062337914 0.072351145  
[6] 0.006235601 -0.034895358 -0.043079800 0.025805819 -0.025884570

\$histograms\$histograms\$poison

[1] 0.04260487 -0.01622027 0.03580069 0.03420357 -0.04178815 0.08621991  
[7] -0.02311963 -0.01143833 0.02440447 0.06735060

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0001406695 -0.0018094646 -0.0033820405 -0.0302612088 -0.0220554369  
[6] 0.0235670665 -0.0081628374 -0.0660590699 0.0207040599 0.0662364309

\$histograms\$histograms\$poison

[1] 0.030694007 0.045174529 0.006563723 -0.045246260 0.023274421  
[6] 0.056341484 -0.028432653 0.109581221 0.035476564 0.029690581

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.003313751 -0.021280694 0.035026190 0.029011338 0.009435744  
[6] -0.011456811 0.005761176 -0.086045991 -0.024746082 0.032870270

\$histograms\$histograms\$poison

[1] 0.060197531 0.025575354 0.021253833 0.047558197 0.040348349

[6] -0.009593907 -0.035607687 -0.006173539 -0.017717716 0.052664377

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0365354737 0.0570806145 -0.0237175848 -0.0370105877 0.0133800610

[6] 0.0486318547 -0.0378279091 -0.0041052073 0.0384639750 0.0006195104

\$histograms\$histograms\$poison

[1] 0.07400280 -0.02501060 0.02582563 0.03073365 0.03945705 0.03007451

[7] 0.02265554 0.02386876 0.06385329 0.04054031

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.021912351 -0.032522063 -0.021198385 -0.019198718 0.061116307

[6] -0.051850488 0.001061751 0.009979266 -0.028012461 0.048084652

\$histograms\$histograms\$poison

[1] -0.012747938 0.012199807 -0.035387732 0.004754574 0.032490520

[6] 0.039277347 -0.015483649 -0.043470542 0.052843764 0.021085832

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.00870609 -0.03887247 0.03523974 0.01791716 0.05395123 0.04745690

[7] 0.07029408 0.04434851 0.02395901 0.01283557

\$histograms\$histograms\$poison

[1] -0.002962883 -0.028992674 0.020251221 0.002341335 0.007733932

[6] -0.059285515 0.037117962 0.076767830 0.051773322 -0.018376662

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.039174255 0.003680373 0.040248349 0.011567271 -0.046110856

[6] 0.026864071 0.003303381 0.022567305 0.009097649 0.003455142

\$histograms\$histograms\$poison

[1] -0.008472435 0.066784646 -0.020537135 -0.023618023 0.020634766

[6] 0.079489754 0.017118487 0.047223515 0.022475519 0.036151758

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.028859319 0.048979637 0.018277213 -0.036527421 -0.009181812

[6] 0.003073610 0.054868361 0.050861375 -0.006935507 0.045728660

\$histograms\$histograms\$poison

[1] -0.005695732 -0.039173718 0.006914893 -0.053622673 -0.037101890

[6] 0.034541562 0.061811658 0.028772382 0.039486047 -0.032832339

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0084447923 0.0446104783 0.0542784220 -0.0085023959 0.0495431560

[6] 0.0162183104 0.0623272438 -0.0061808951 0.0006140936 0.0178213671

\$histograms\$histograms\$poison

[1] 0.022375421 0.029006357 0.006092109 -0.017476244 0.069125344

[6] 0.034302813 0.013826097 0.066703664 -0.013370950 0.040579380

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.003922659 0.006158252 0.027053202 -0.036408791 -0.014687413

[6] -0.023155677 -0.013664450 0.011802341 0.002451146 0.021392725

\$histograms\$histograms\$poison

[1] 0.016747882 -0.027984402 -0.039906996 0.010935666 0.007411235

[6] 0.033788006 -0.028461518 0.018189431 0.006643835 0.021226156

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.014005896 0.022518963 0.085404414 -0.009439491 0.055457162

[6] 0.034300935 0.017253479 0.018340922 0.008586444 0.009249608

\$histograms\$histograms\$poison

[1] 0.080411049 -0.022861886 -0.001550830 -0.038292620 0.041549466

[6] -0.054632317 0.040979876 -0.021805279 0.005821823 0.034950422

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0529945798 0.0300129328 -0.0169211673 -0.0004403348 0.0388608224

[6] -0.0102796998 -0.0123151395 -0.0187418157 -0.0438948747 0.0141102812

\$histograms\$histograms\$poison

[1] -0.01588611 0.02179094 -0.02218069 -0.02905815 -0.03708881 0.04348055

[7] 0.02113210 0.02404043 0.00477628 0.05854758

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -0.0083780366 0.0008640464 0.0244667751 0.0606046927 -0.0624114279  
[6] 0.0055141395 0.0129202892 0.0284116497 0.0007522545 -0.0189978605

\$histograms\$histograms\$poison  
[1] 0.050141606 -0.026938457 0.042954599 -0.031802568 0.018819175  
[6] 0.018042721 -0.076900912 0.007835032 -0.008292233 -0.060824068

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.016733621 0.016494615 -0.016381971 0.019612325 0.040397382  
[6] 0.001747625 0.024187951 -0.004794310 0.089383771 0.041126793

\$histograms\$histograms\$poison  
[1] -0.0154282221 0.0110654259 0.0112041491 0.0656669128 0.0192861679  
[6] 0.0278818197 0.0351205536 -0.0529383041 0.0003190509 0.0809968700

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\$histograms\$histograms\$antidote  
[1] -0.031334403 0.012499283 -0.006404544 -0.003631642 0.008289724  
[6] 0.043127991 -0.056114703 0.024675134 0.019733986 0.034388782

\$histograms\$histograms\$poison  
[1] -0.037063880 0.045551223 0.032939386 0.018644096 0.015568566  
[6] -0.062531183 -0.006612758 0.007679771 0.012315783 0.019197822

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\$histograms\$histograms\$antidote  
[1] -0.0008973768 -0.0071742653 -0.0362271843 0.0038705122 0.0049089715  
[6] 0.0465412624 0.0266860423 0.0338836196 0.0222976180 -0.0116291227

\$histograms\$histograms\$poison  
[1] -0.02979493 0.02039542 0.01622392 -0.02762760 0.03205472 0.08488228  
[7] 0.05762664 -0.03558852 -0.01414169 0.03728181

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\$histograms\$histograms\$antidote  
[1] 0.053479717 -0.038967525 0.062174716 0.022885492 -0.051196893  
[6] -0.052677464 0.002772748 -0.026783703 0.005970378 0.013822319



\$histograms\$histograms\$poison  
[1] 0.0074890847 -0.0165704844 0.0261992235 0.0620968792 0.0465285055  
[6] 0.0003095631 0.0287457699 0.0504684881 0.0314163601 0.0001351197

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -0.067472912 -0.007441857 0.016990129 0.002532022 0.007881089  
[6] -0.024508734 0.057278156 0.041168956 0.032111172 -0.032643634

\$histograms\$histograms\$poison  
[1] -0.021239006 0.015820616 0.034818050 0.049199670 0.001758231  
[6] 0.004956013 0.010971950 -0.023536681 0.066756829 0.058582537

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.110980796 0.023123325 -0.054069003 -0.007380376 0.031003260  
[6] -0.025511021 0.030828023 0.015701170 0.096099966 -0.049379122

\$histograms\$histograms\$poison  
[1] 0.024863104 0.003601515 0.005301055 -0.016160623 -0.010566716  
[6] 0.048356894 -0.035120475 -0.020257979 0.040114226 -0.046550842

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\$histograms\$histograms\$antidote  
[1] 0.022437818 -0.019605129 -0.006793513 0.018405079 0.014559097  
[6] 0.027497301 0.020637575 0.035233676 0.016017283 -0.028854321

\$histograms\$histograms\$poison  
[1] 0.097318014 -0.033816775 -0.013913752 -0.034513390 -0.057486546  
[6] 0.008814154 0.012425912 -0.008575690 0.006175803 -0.036151076

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\$histograms\$histograms\$antidote  
[1] 0.027510142 0.006525374 0.016162563 0.024901314 0.027730622  
[6] -0.005864240 0.053164921 -0.077010157 0.030723749 0.017479001

\$histograms\$histograms\$poison  
[1] 0.11110543 -0.01330484 0.04308325 0.03201217 0.07944949 0.07664419  
[7] -0.01843747 0.03017618 0.04659512 0.01209515

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.041539208 0.018896428 0.059272357 0.048995123 -0.077443181  
[6] 0.049839629 0.035893303 0.028733527 0.005301055 0.047540569

\$histograms\$histograms\$poison

[1] 0.045362485 0.004643905 0.083463178 0.051980747 0.027178794  
[6] 0.049468128 0.031844867 -0.007307519 0.006135046 0.023819323

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.002935778 -0.047221245 -0.047786261 -0.023532569 -0.040420902  
[6] -0.014752505 -0.055389095 0.069101623 0.009209370 -0.030230305

\$histograms\$histograms\$poison

[1] -0.01267871 0.04083095 0.04413553 0.01098672 -0.02334682 -0.04684705  
[7] 0.03053909 -0.05227054 0.06960094 0.07190587

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.035909760 -0.025904874 0.009524370 -0.013967685 0.030622182  
[6] -0.048203268 0.002244200 0.046855661 0.009955145 -0.040533279

\$histograms\$histograms\$poison

[1] 0.085440349 -0.041903565 0.045593105 0.039467161 -0.030005251  
[6] -0.038636912 -0.023464545 -0.005660878 0.092626636 0.009285675

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.029309484 -0.006320442 0.033293303 -0.023314573 0.015785923  
[6] 0.043524814 0.048126376 0.010602655 0.019896730 0.017393562

\$histograms\$histograms\$poison

[1] 0.04315375 0.04682884 0.02998924 0.02064076 0.04490664 -0.04292281  
[7] -0.02903813 0.01985685 0.04434446 0.05582600

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.0013583674 0.0628985564 0.0879059182 0.0159350643 0.0019895253  
[6] -0.0280701185 0.0395738125 0.0075914622 0.0186739821 0.0001607546

\$histograms\$histograms\$poison

[1] -0.008443207 0.038101368 -0.076639197 -0.012611459 0.060465064

[6] 0.065255233 -0.022881838 0.077641192 -0.028373364 0.021627775

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.064153311 0.037469861 0.014950827 -0.040387181 0.044016321

[6] -0.008441417 0.013863534 0.022612450 0.046152816 0.095375924

\$histograms\$histograms\$poison

[1] 0.036635268 0.030621605 0.008451509 0.063773006 -0.002383846

[6] 0.010271163 -0.034372828 0.072599898 -0.062429861 0.005293917

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.055574091 0.019194760 0.092167111 0.022346327 0.102746957

[6] -0.003135465 -0.015240827 -0.054458378 0.088081790 -0.030685733

\$histograms\$histograms\$poison

[1] -0.054803325 -0.055508342 0.055287690 -0.019027308 0.031670352

[6] 0.041049817 -0.045216637 0.019665822 -0.001765629 0.038990149

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.0309331805 0.0626706829 0.0166633791 -0.0078983571 0.0651190751

[6] 0.0449838957 0.0003687995 0.0544695144 -0.0191939676 -0.0055874720

\$histograms\$histograms\$poison

[1] 0.1021355522 -0.0277223181 0.0690332042 0.0618688832 0.0436116034

[6] -0.0006160655 0.0363875734 0.0161041450 -0.0003559471 -0.0042113699

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.030836387 0.046383440 -0.034265633 0.068171904 0.026776902

[6] 0.072611800 0.038177555 -0.003000067 -0.016595285 0.023053018

\$histograms\$histograms\$poison

[1] 0.045286284 -0.054270638 -0.055925630 -0.018081708 -0.004322041

[6] -0.005711959 0.022856435 -0.063127079 0.035736024 0.079317331

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.004538448 0.027104735 0.009052412 -0.009095069 0.011493345

[6] 0.060219229 0.017304056 -0.037751515 0.036692084 -0.033023770

\$histograms\$histograms\$poison

[1] -0.030281681 0.005575354 -0.025087118 0.087995927 0.009349211

[6] 0.026002330 -0.030600192 -0.028292218 0.035800177 -0.009534439

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.023896478 -0.011745091 0.050602087 0.039609196 -0.018150022

[6] 0.017173562 -0.011287445 0.024585353 0.067275759 -0.004077803

\$histograms\$histograms\$poison

[1] 0.016316649 0.052347720 0.009070859 0.017521250 -0.015828773

[6] 0.038977988 0.044952459 -0.052017760 -0.015118684 0.026198493

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.010743382 0.039855552 -0.013057490 0.035671210 0.019761269

[6] -0.012362898 0.002735030 0.061562496 0.057700058 0.009772808

\$histograms\$histograms\$poison

[1] 0.024040504 0.026852086 -0.022785283 -0.006614036 0.040410821

[6] -0.030032262 0.024682959 -0.025091042 0.023634846 0.066578375

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.084398076 0.029173598 -0.016301129 0.037666690 -0.019634469

[6] 0.039481475 -0.004651187 0.027753328 -0.060113596 0.002253829

\$histograms\$histograms\$poison

[1] 0.0001886198 -0.0069358826 0.0131205613 0.0695713136 0.0103901325

[6] 0.0358195509 0.0280394064 -0.0144707420 0.0156076088 0.0213521265

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.041885896 0.006461911 -0.033857109 0.043518284 -0.028166722

[6] 0.045417182 0.059228267 0.044966272 0.026049806 -0.031489655

\$histograms\$histograms\$poison

[1] 0.004879705 0.016468987 0.054364477 -0.025795824 0.041319359

[6] 0.027024000 0.057383839 0.045104005 -0.051014998 0.044030987

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.019308492 0.027614164 0.026500997 0.001399309 0.024970042  
[6] -0.038247534 -0.023499192 0.068933169 0.008146673 -0.007341224

\$histograms\$histograms\$poison  
[1] -0.038425995 0.031945006 -0.048547041 -0.002186827 -0.019987305  
[6] 0.040800432 0.058351274 0.026819829 0.060033053 0.065652796

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.005806132 0.016813295 0.027123492 0.025492960 0.110725410  
[6] 0.006557581 0.010362955 0.039920867 -0.021835466 0.039224193

\$histograms\$histograms\$poison  
[1] -0.012155083 -0.002758090 0.039860139 0.027739154 0.015808708  
[6] -0.034787894 0.048011252 0.033688252 -0.002065367 0.024464916

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.017272625 0.058318391 -0.045159210 -0.061217234 0.043184685  
[6] 0.004683763 0.004813778 0.015736272 0.001976744 -0.037987399

\$histograms\$histograms\$poison  
[1] -0.055044077 -0.025801529 0.033143878 0.029893197 0.005694987  
[6] 0.026191126 -0.020507068 0.028582723 0.048234865 -0.005132843

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.052987755 0.033532914 0.037833908 -0.040107503 -0.010729852  
[6] 0.073999779 0.081841296 -0.008132344 0.037051990 0.029799651

\$histograms\$histograms\$poison  
[1] 0.044542004 0.074252252 0.036345587 -0.001108778 0.006535066  
[6] 0.007115853 0.028829644 0.020978135 0.012718970 0.066651907

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -0.011130903 0.039596794 -0.078149851 0.024835939 0.035567813  
[6] 0.005816946 0.024570533 0.006567635 -0.007114400 0.017554386

\$histograms\$histograms\$poison  
[1] 0.023945135 0.045505424 0.025677076 0.050515963 -0.005218321  
[6] 0.026920115 0.074422861 0.023858864 -0.002618674 0.086435376

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.044903826 -0.009020628 0.017260651 0.059268801 0.010998607  
[6] -0.036022999 -0.012745009 0.050003736 -0.013571817 0.008500614

\$histograms\$histograms\$poison  
[1] -0.0101461421 0.0245699677 0.0174562562 0.0006498921 -0.0052756867  
[6] 0.0098184171 -0.0121185866 0.0012907128 -0.0173041968 -0.0132959337

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.033428068 -0.038102591 0.002845075 -0.044240357 0.014346454  
[6] -0.020646608 -0.008668122 0.056433821 0.001918073 -0.077157162

\$histograms\$histograms\$poison  
[1] 0.08199748 -0.01019462 -0.03348880 0.06949080 0.06736690 0.06439152  
[7] 0.05117459 0.01842707 0.03082404 0.03542538

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.0348993636 0.0232366842 -0.0595150234 0.0059996025 0.0003690515  
[6] -0.0232047725 0.0462732529 -0.0239991388 0.0305714854 -0.0092103728

\$histograms\$histograms\$poison  
[1] 0.05256477 0.02068413 -0.04811566 -0.06686009 -0.01412997 -0.01902278  
[7] -0.01264788 -0.02155108 -0.01405536 -0.03556863

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.028528673 0.035284922 0.038288851 0.086423198 0.090559247  
[6] -0.047632340 0.018943034 -0.008652433 0.013315012 0.014297559

\$histograms\$histograms\$poison  
[1] -0.022440553 -0.008223842 -0.015325470 -0.008810516 0.006741681  
[6] 0.003486509 -0.036475320 0.006152032 0.019869710 0.015649559

\$histograms\$histograms

\$histograms\$histograms\$antidote  
[1] 0.0263766363 -0.0039635093 -0.0573142753 0.0228300624 -0.0006772506  
[6] -0.0099392036 0.0239727902 0.0549747559 0.0031112178 0.0060713368

\$histograms\$histograms\$poison  
[1] 0.035174013 -0.002232519 0.061207365 0.031840646 0.012190503  
[6] 0.061222294 -0.035238596 0.067705024 0.027963161 0.004303717

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.035471119 0.003347714 -0.020761962 -0.042686843 0.062508445  
[6] 0.033767715 0.003857235 0.072721756 0.071233722 0.016305882

\$histograms\$histograms\$poison  
[1] 0.061929801 0.021301850 0.095035997 0.018696055 0.046083763  
[6] 0.065524396 0.026250662 0.018756628 -0.013639119 0.006932446

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.01006860 0.02381161 0.04200164 0.04537964 0.01386165 0.02530474  
[7] -0.00629015 0.05063267 -0.01651343 0.04521144

\$histograms\$histograms\$poison  
[1] 0.053767761 0.067451964 0.039176452 -0.025206046 0.025609561  
[6] -0.045363168 0.031011804 -0.036533264 0.002978047 0.009628690

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.009894135 0.066441869 0.082153823 0.023762632 -0.020697719  
[6] -0.035019971 0.002155094 -0.010453094 -0.014137233 -0.016172608

\$histograms\$histograms\$poison  
[1] 0.004325186 0.049439502 -0.022337075 -0.053947172 0.064420488  
[6] -0.046017330 0.059323042 -0.052534329 0.003265734 -0.055395872

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.0628888554 0.0615855806 0.0220701602 -0.0018556208 0.0002304306  
[6] -0.0453145402 0.0188158572 0.0636413547 0.0268415777 0.0645997768

\$histograms\$histograms\$poison  
[1] 0.034662278 0.019555227 -0.007292215 0.001358367 0.055217643

[6] -0.014926555 0.013183808 0.020542429 -0.016887403 0.037338890

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.017378512 0.035868199 0.030209375 -0.012784524 0.048818346

[6] -0.005283025 0.065964846 -0.043274889 0.012301049 -0.064002577

\$histograms\$histograms\$poison

[1] 0.004657675 0.023872349 0.004279998 0.021436449 0.072981437

[6] 0.024464916 0.049127058 -0.059233454 0.034995615 -0.001237630

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.036249154 0.069109758 0.039730758 0.026024262 -0.027662551

[6] 0.041378062 -0.007782441 0.013158551 0.024052678 0.066981846

\$histograms\$histograms\$poison

[1] 0.05022206 0.05246825 0.02543969 0.05092945 0.06148764 0.01137175

[7] -0.04414448 0.02031216 -0.01777267 -0.03417475

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.034702644 -0.035317218 0.019410076 -0.009886547 0.038266367

[6] 0.030653536 0.025947650 0.015818727 0.005385570 0.030439136

\$histograms\$histograms\$poison

[1] -0.069498557 0.063056820 0.011695048 -0.001869261 -0.014463494

[6] 0.058544456 -0.043055345 -0.056392301 0.013851185 0.024306193

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.027507942 0.001166552 0.097708778 0.003850413 0.023176143

[6] 0.049783792 0.064828282 0.051525401 -0.007626668 0.028835457

\$histograms\$histograms\$poison

[1] -0.018014389 -0.032990681 0.017709382 0.063083945 0.019200108

[6] 0.007419060 0.032333265 -0.047411667 0.041987470 0.004328639

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.049402473 -0.011322188 0.071833591 -0.005175296 0.055015854



[6] 0.025385308 -0.030891463 0.003752544 0.053389348 -0.005068621

\$histograms\$histograms\$poison

[1] 0.059280075 0.068432616 0.033523051 0.029733152 0.024021109

[6] 0.006329310 0.014174099 -0.024846926 -0.006618378 -0.001215603

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.029125500 -0.026069311 -0.017523664 -0.001845329 -0.023463539

[6] 0.020229376 0.032901362 0.018839713 -0.103931005 0.027220158

\$histograms\$histograms\$poison

[1] 0.057332519 0.017611733 0.035770697 0.043145762 0.034261495

[6] -0.003641384 0.043914902 0.035678028 0.085154726 0.064424681

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.022879955 -0.009189795 0.003785954 0.029338372 0.014737395

[6] 0.067695188 -0.015844203 0.039403222 -0.005742651 -0.004921676

\$histograms\$histograms\$poison

[1] -0.006532656 0.021831343 0.006327935 0.004191021 0.041378599

[6] 0.042152890 0.040238274 0.008263579 -0.062743734 0.045191901

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.01829770 -0.04961038 0.01010342 0.03626312 0.05367731 0.06410644

[7] 0.01231371 -0.02423908 -0.03142390 0.04888164

\$histograms\$histograms\$poison

[1] 0.066094506 0.034627993 -0.008010149 0.029908660 -0.057303709

[6] -0.022202909 0.103363280 0.008640613 -0.010584852 0.034848075

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.0533085899 -0.0201667669 0.0066584482 -0.0042999692 0.0013524763

[6] 0.0051660336 0.0731957129 -0.0811603692 -0.0219224018 0.0002309125

\$histograms\$histograms\$poison

[1] 0.008075822 -0.011904827 0.067667831 0.035214838 0.014523188

[6] 0.064383393 0.023996639 0.002536904 -0.042700517 0.061841149

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.029282897 0.025502942 -0.013505763 -0.034883725 0.010343192  
[6] -0.015679521 0.007350308 0.036886894 -0.005681348 0.059315282

\$histograms\$histograms\$poison

[1] 0.03275602 0.03115081 -0.01059431 0.04358939 -0.07946088 0.01648037  
[7] 0.06050409 0.06480103 -0.04764068 0.01323411

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.02933300 0.04902066 0.01006245 0.03121819 0.05748483 0.02085985  
[7] 0.01901333 0.02432457 0.04715366 0.02757820

\$histograms\$histograms\$poison

[1] 0.007699083 0.028225887 0.017635442 0.036929469 -0.063300682  
[6] 0.089141699 -0.045797319 0.116008051 -0.061094515 -0.024665844

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.030681391 -0.003014096 0.037732536 0.032966772 0.023565616  
[6] 0.053822288 0.002804593 0.076323862 -0.028194259 -0.050063405

\$histograms\$histograms\$poison

[1] 0.005900058 0.003027273 -0.023713402 -0.040789653 -0.013357359  
[6] 0.091240681 0.022045241 0.095909699 0.047851050 0.043031533

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.008147770 -0.025809324 0.013524477 0.049466399 -0.024287049  
[6] 0.027360292 0.008892459 0.027754247 0.047800047 -0.001130511

\$histograms\$histograms\$poison

[1] 0.052524595 0.053611647 0.060311687 0.012408897 0.037703757 0.004833632  
[7] 0.011726458 0.012085978 0.014893251 0.028665597

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.025443651 0.045156644 -0.035693449 0.016870334 -0.017477314  
[6] 0.045150940 0.004223071 0.007686986 0.070443829 -0.026322190

\$histograms\$histograms\$poison  
[1] -0.0045998008 0.0573247039 -0.0006099898 0.0137536116 0.0313887042  
[6] 0.0407582551 -0.0067008491 0.0260613658 -0.0220845447 0.0302341259

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.037196982 0.011950207 0.033171808 -0.004076396 0.020473670  
[6] -0.015287199 0.051290231 0.069979577 0.020697235 0.063573773

\$histograms\$histograms\$poison  
[1] -0.006616687 0.046335336 0.007450062 0.036018321 -0.028410130  
[6] 0.027912606 -0.009114010 0.015785005 0.020383362 -0.015894203

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.052986265 -0.001280666 -0.030446034 0.011746486 0.063782792  
[6] -0.034870500 0.012823769 -0.001242732 0.013548127 0.027626636

\$histograms\$histograms\$poison  
[1] -0.0116746237 -0.0458948764 0.0117989109 -0.0293266065 0.0287884620  
[6] 0.0288939097 0.0008902073 -0.0146960341 0.1142355204 -0.1103797946

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -1.074873e-02 -3.338012e-02 1.809729e-02 3.202423e-02 5.296321e-02  
[6] 6.122664e-02 4.520074e-05 2.257509e-03 1.096884e-02 -1.391226e-02

\$histograms\$histograms\$poison  
[1] -0.056057713 0.008450360 0.047035353 -0.006286638 0.038267305  
[6] -0.005138194 0.028932812 0.007626636 0.042988955 0.005350460

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -0.05445218 0.03361186 0.01080411 -0.02890129 0.02825327 0.01051908  
[7] 0.03348971 -0.02040458 -0.03238672 -0.01212078

\$histograms\$histograms\$poison  
[1] 0.06198114 -0.03631320 -0.02667738 -0.01672119 0.01905810 0.02628107  
[7] -0.03888372 0.05010730 0.04828084 0.02822422

\$histograms\$histograms

\$histograms\$histograms\$antidote  
[1] 4.711963e-02 5.595083e-02 -1.234642e-02 2.118239e-02 -3.646512e-02  
[6] 5.171327e-02 6.742169e-02 5.498446e-02 6.107541e-06 4.623369e-02

\$histograms\$histograms\$poison  
[1] 0.027074912 0.019624219 -0.040504205 0.039480422 0.045031743  
[6] 0.013573471 -0.032984717 0.027687427 0.017313760 0.008518287

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -0.003672141 -0.051544289 0.035060265 0.124486239 0.029897126  
[6] 0.009058682 -0.007051004 -0.031686695 -0.031597094 -0.043497720

\$histograms\$histograms\$poison  
[1] -0.044195443 0.004998415 0.002031735 0.005472287 -0.025706697  
[6] 0.049571159 0.034927728 0.022749404 0.058429087 0.050912804

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.03845070 -0.02485273 -0.05644287 0.01900451 0.04984164 0.04236412  
[7] 0.04340756 0.01215244 0.05869349 0.10856794

\$histograms\$histograms\$poison  
[1] 0.0170690572 -0.0346426904 -0.0068370690 -0.0365806808 0.0281895312  
[6] 0.0068271693 -0.0007245414 -0.0072150715 0.0434403408 -0.0084463957

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] 0.012354311 0.074655829 0.004033457 0.021748005 -0.031653389  
[6] -0.011060794 0.087945015 0.080788522 0.038440254 -0.026421785

\$histograms\$histograms\$poison  
[1] -0.009136019 0.020831988 0.081317409 0.010967039 -0.001055847  
[6] -0.047711587 -0.005871187 -0.003776872 -0.008786223 -0.015996092

\$histograms\$histograms  
\$histograms\$histograms\$antidote  
[1] -0.038825692 -0.031401839 0.071367644 -0.008659078 0.015156757  
[6] 0.011950207 0.062410671 0.007942925 -0.010806433 -0.045388047

\$histograms\$histograms\$poison  
[1] 0.0798109367 -0.0006092974 -0.0073184805 0.0073825354 -0.0208582122

[6] 0.0808950346 0.0415353909 0.0872736302 -0.0091168353 0.0656911524

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.042552009 -0.032835007 0.031284111 0.002896497 0.002211859

[6] 0.043040476 0.030889011 0.023021921 0.013732471 0.028133803

\$histograms\$histograms\$poison

[1] -0.02064171 -0.06231384 0.02379259 0.02574283 0.04267753 -0.04776750

[7] 0.03281748 0.06288837 -0.02272776 -0.02642047

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.059234353 -0.040300976 -0.010617912 -0.005685896 0.040152265

[6] -0.019532176 0.051146829 0.021669671 0.044763400 0.065269771

\$histograms\$histograms\$poison

[1] -0.015745829 0.024455565 0.031103527 0.052921111 -0.006352930

[6] 0.009146393 -0.004628540 0.040353296 0.005355689 -0.021781907

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.075561769 0.004388437 0.030088175 0.018128055 0.022937641

[6] 0.030727412 0.049506978 0.015665222 0.023929907 -0.016750638

\$histograms\$histograms\$poison

[1] 0.040493769 -0.031863249 0.001331616 -0.012614189 0.003517047

[6] 0.045049551 0.028206969 -0.006373987 0.019443977 -0.020071673

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.017460827 0.004289933 0.006081618 -0.005704635 -0.023808443

[6] 0.047117629 -0.007738743 -0.014354788 0.039488705 0.053366785

\$histograms\$histograms\$poison

[1] 0.058078716 -0.020414268 -0.022059940 0.028279493 0.042920754

[6] 0.054109725 -0.002842678 0.049125722 0.024907090 0.003278810

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.0198069920 0.0139020576 -0.0513158209 0.0657453373 0.0651938216

[6] -0.0008558996 -0.0018128917 0.0408727952 0.0435110356 0.0484144381

\$histograms\$histograms\$poison

[1] -0.029234967 0.031213860 -0.004589273 -0.016308577 0.008053379

[6] -0.003311731 0.001932686 0.037853844 -0.012426840 0.037977677

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.022162028 0.042679747 0.003572582 -0.022660570 0.063436784

[6] -0.024479819 -0.012741839 -0.011347723 -0.020944792 -0.029715516

\$histograms\$histograms\$poison

[1] 0.027321542 -0.037936726 0.035945694 0.035270188 0.025613095

[6] 0.037728176 -0.002784323 0.067959672 0.019994531 0.106842542

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] -0.034105647 -0.065082788 -0.036698517 0.022086301 0.044214483

[6] 0.073603790 0.008521992 -0.019078694 -0.051869210 0.049571834

\$histograms\$histograms\$poison

[1] -0.020701976 0.022965869 0.011553172 0.012782383 0.009589589

[6] 0.049174820 0.012483779 -0.027518291 -0.014856787 -0.002166467

\$histograms\$histograms

\$histograms\$histograms\$antidote

[1] 0.007359257 0.042455512 0.022826149 0.011074912 -0.065150381

[6] -0.024121283 -0.052282248 0.070594463 0.038455652 0.007274317

\$histograms\$histograms\$poison

[1] -0.03596762 0.03134174 0.01986971 0.11217077 0.01943627 0.05776011

[7] -0.05211467 0.02444080 0.01225015 -0.04249391