

Annex 3: Method for the determination of the attached points in the points-based system [1]

Step 1 : Obtain multivariate regression coefficients

Risk factors	Bootstrapped coefficients (β_i)
Obesity	0.33
Diabetes	0.32
Subclavian insertion	0.00
Jugular insertion	1.32
Femoral insertion	1.50
Dialysis catheter	0.62
First catheter inserted	-0.34
Dwell time (> 5 days)	0.63

Step 2 : definition of reference values, and referent risk profiles

Risk factors	Categories	Reference value (Wij)	Referent risk profile
Obesity	0	0.00	0.00
Obesity	1	1.00	0.00
Diabetes	0	0.00	0.00
Diabetes	1	1.00	0.00
Jugular insertion*	0	0.00	0.00
Jugular insertion*	1	1.00	0.00
Femoral insertion*	0	0.00	0.00
Femoral insertion*	1	1.00	0.00
Dialysis catheter	0	0.00	0.00
Dialysis catheter	1	1.00	0.00
First catheter inserted	0	0.00	1.00
First catheter inserted	1	1.00	1.00
Dwell time (> 5 days)	0	0.00	0.00
Dwell time (> 5 days)	1	1.00	0.00

* Site of insertion is coded as a dummy variable. Reference category is "subclavian insertion"

Step 3: Establish distance from base category

We now compute how far each category of each risk factor is from the base category in terms of regression units using distance = $\beta_i(W_{ij} - W_{iREF})$

Risk factors	Categories	Reference value (W_{ij})	Referent risk profile(W_{iREF})	Bootstrapped coefficients (β_i)	Distance from base category
Obesity	0	0.00	0.00	0.33	0.00
Obesity	1	1.00	0.00	0.33	0.33
Diabetes	0	0.00	0.00	0.32	0.00
Diabetes	1	1.00	0.00	0.32	0.32
Jugular insertion*	0	0.00	0.00	1.32	0.00
Jugular insertion*	1	1.00	0.00	1.32	1.32
Femoral insertion*	0	0.00	0.00	1.50	0.00
Femoral insertion*	1	1.00	0.00	1.50	1.50
Dialysis catheter	0	0.00	0.00	0.62	0.00
Dialysis catheter	1	1.00	0.00	0.62	0.62
First catheter inserted	0	0.00	1.00	-0.34	0.34
First catheter inserted	1	1.00	1.00	-0.34	0.00
Dwell time (> 5 days)	0	0.00	0.00	0.63	0.00
Dwell time (> 5 days)	1	1.00	0.00	0.63	0.63

* Site of insertion is coded as a dummy variable. Reference category is "subclavian insertion"

Step 5: Set the constant B

We now define the constant for the points system, namely the number of regression units that will correspond to one point. Here, we let B reflect the increase of risk associated with the presence of obesity (B=0,33)

Step 6: Determination of the points associated with each category of the risk factors

We now define the points associated with each category using $Points_{ij} = \frac{\beta_i(W_{ij}-W_{iREF})}{B}$

The result is rounded to the nearest integer to obtain the points.

<u>Risk factors</u>	<u>Categories</u>	<u>Reference (Wij)</u>	<u>Referent risk profile (WiREF)</u>	<u>Bootstrapped coefficients (β_i)</u>	<u>Distance from base category</u>	<u>Distance /B</u>	<u>Points</u>
Obesity	0	0.00	0.00	0.33	0.00	0.00	0
Obesity	1	1.00	0.00	0.33	0.33	1.00	1
Diabetes	0	0.00	0.00	0.32	0.00	0.00	0
Diabetes	1	1.00	0.00	0.32	0.32	0.97	1
Jugular insertion*	0	0.00	0.00	1.32	0.00	0.00	0
Jugular insertion*	1	1.00	0.00	1.32	1.32	4.00	4
Femoral insertion*	0	0.00	0.00	1.50	0.00	0.00	0
Femoral insertion*	1	1.00	0.00	1.50	1.50	4.55	5
Dialysis catheter	0	0.00	0.00	0.62	0.00	0.00	0
Dialysis catheter	1	1.00	0.00	0.62	0.62	1.88	2
First catheter inserted	0	0.00	1.00	-0.34	0.34	1.03	1
First catheter inserted	1	1.00	1.00	-0.34	0.00	0.00	0
Dwell time (> 5 days)	0	0.00	0.00	0.63	0.00	0.00	0
Dwell time (> 5 days)	1	1.00	0.00	0.63	0.63	1.91	2

Reference:

1. Mannan H (2017) A Practical Application of a Simple Bootstrapping Method for Assessing Predictors Selected for Epidemiologic Risk Models Using Automated Variable Selection. International Journal of Statistics and Applications 7:239-249.