

Harrell's C-index

A measure of the consistency of risk scores and clinical event times with censorship.

Comparison categories

Permissible:

C	Concordant	The patient with the worse outcome (e.g. earlier death) has the higher risk
T	Tie	Either both patients had events at the same time and the risks are different, or events were at different times and the risks are the same.
-	Discordant	Neither concordant nor a tie

Not permissible

Events: 0 = right censored, either loss-to-follow-up or end-of-study; 1 = positive event

TA, TB: time to event or censoring of patient A and B, respectively

RA, RB: risk for patient A and B, respectively

			Patient B					
			0			1		
			RA > RB	RA = RB	RA < RB	RA > RB	RA = RB	RA < RB
Patient A	0	TA > TB				-	T	C
		TA = TB				-	T	C
		TA < TB						
	1	TA > TB				-	T	C
		TA = TB	C	T	-	T	C	T
		TA < TB	C	T	-	C	T	-

$$\text{C-index} = \frac{\# \text{ Concordant pairs} + 0.5 * \# \text{ Tie pairs}}{\# \text{ of Permissible pairs}}$$