Ordinal variables

MSc Further Statistical Methods, Lecture 3
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Ordinal variables

Centre	Status	Treatment	Response		
			Poor	Moderate	Excellent
1	1	Active	3	20	5
		Placebo	11	14	8
	2	Active	3	14	12
		Placebo	6	13	5
2	1	Active	12	12	0
		Placebo	11	10	0
	2	active	3	9	4
		Placebo	6	9	3

Multicentre analgesic trial. Here are four variables C: Centre, S: Status, T: Treatment, and R: Response.

Wilcoxon test-statistic compares distribution of *ranks* between two distributions. Ranks are well-defined for ordinal data.

Several categories

	Response		
Drug regimen	None	Partial	Complete
1	2	0	0
2	1	1	0
3	3	0	0
4	2	2	0
5	1	1	4

Two variables D: Drug regimen, R: response.
Kruskal-Wallis test statistic measure deviations from independence in direction of at *least one distrubution stochastically larger* than the others.

Kruskal-Wallis test specializes to Wilcoxon test for binary variables

Two ordinal variables

	Job satisfaction			
Income	Very diss.	Little diss.	Mod. sat.	Very sat.
$< 15,000$	1	3	10	6
$15,000$–$25,000$	2	3	10	7
$25,000$–$40,000$	1	6	14	12
$> 40,000$	0	1	9	11

Two ordinal variables: J: Job satisfaction, I: Income. *Jonckheere-Terpstra* test measures deviations from independence in direction of *all distributions being stochastically ordered.*

The Jonckheere–Terpstra test specializes to the Wilcoxon test if one of the two ordinal variables are binary.