

Waterfall plots

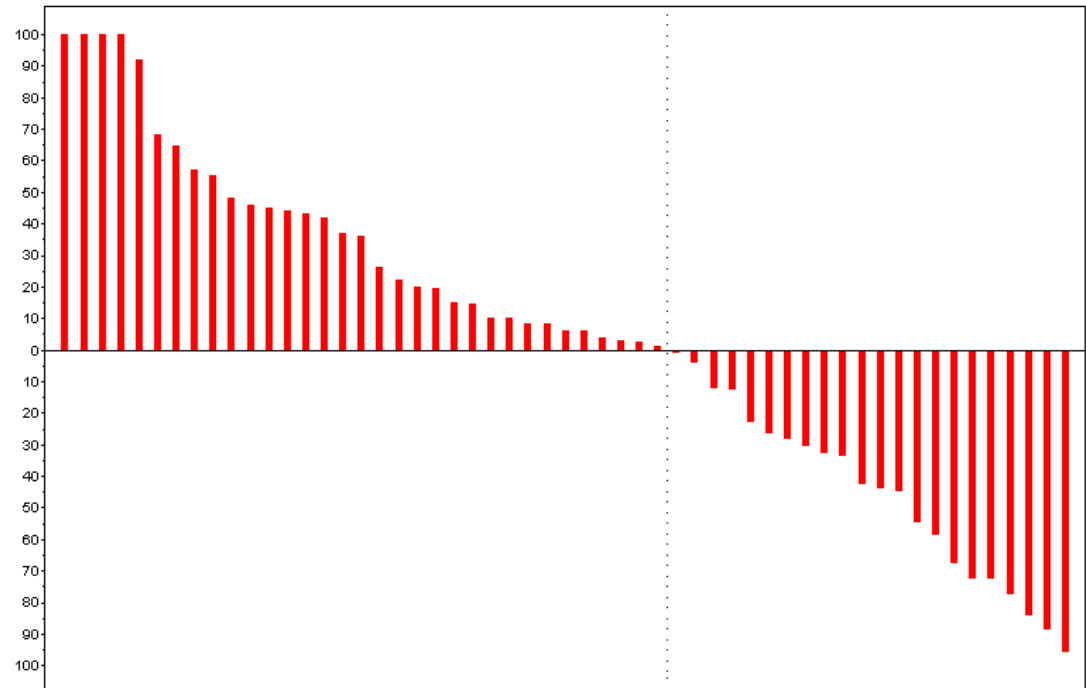
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Definition

Waterfall plot:

A graph of ordered vertical bars representing the maximum change of a variable during a given time period



Purpose

- A very useful tool:
 - Comprehensive - entire population in one graph
 - Easy to understand
- Displays variations in:
 - Tumor reduction/increase in the sum of longest diameters in solid tumors
 - PSA values in prostate cancer trials
 - CA125 values in ovarian cancer trials
 - etc.

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- Edition process
- Annotate dataset
- Plot
- Removal of the auxiliary datasets



Edition of titles, axes and reference lines

- Sorting data *in descending order*
- Auxiliary variables:
 - # subjects and percentages
 - ***X axis coordinate for the reference line***
- Y axis format [100 ----- 0 ----- 100]



Annotate dataset

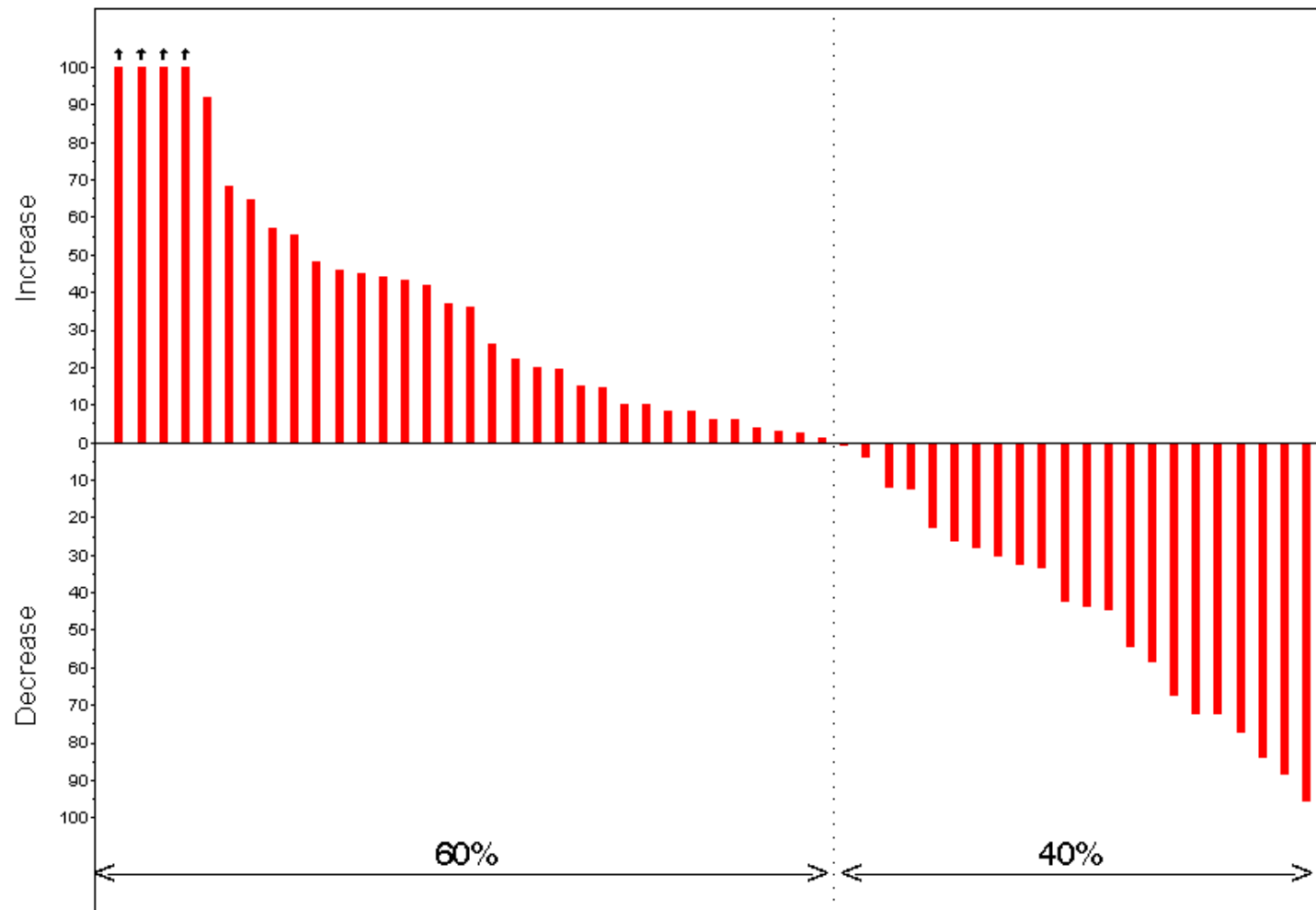
Auxiliary datasets joined in one final annotated dataset

- Vertical bars (move and draw commands)
- Summary of the increment/decrement percentage (text)
- Flag to draw an arrow in increments $>100\%$
- Cosmetic changes



Plot

Best PSA variation (%) during the treatment (n= 55)



Removal

- Elimination of the auxiliary datasets

Example (I)

- Data from a phase II study of trabectedin (Yondelis[®]) in men with advanced prostate carcinoma
- 55 patients treated with three schedules
 - 0.58 mg/m² 3-h iv d1, 8, 15 q4wk
 - 1.5 mg/m² 24-h iv d1 q3wk
 - 1.2 mg/m² 24-h iv d1 q3wk
- Waterfall plot: PSA variation

Example (II)

- PSA variation defined as:

$$\frac{(\text{Lowest PSA value during the treatment} - \text{PSA value at baseline})}{\text{PSA value at baseline}} \times 100$$

Patient id	Schedule	PSA at baseline	Minimum PSA	Variation
#1	0.58 3-h q4wk	747	34	-95.4%
#2	1.5 24-h q3wk	259	546	110.8%
...	...	...	...	...
#55	1.2 24-h q3wk	173.4	28.2	-83.7%

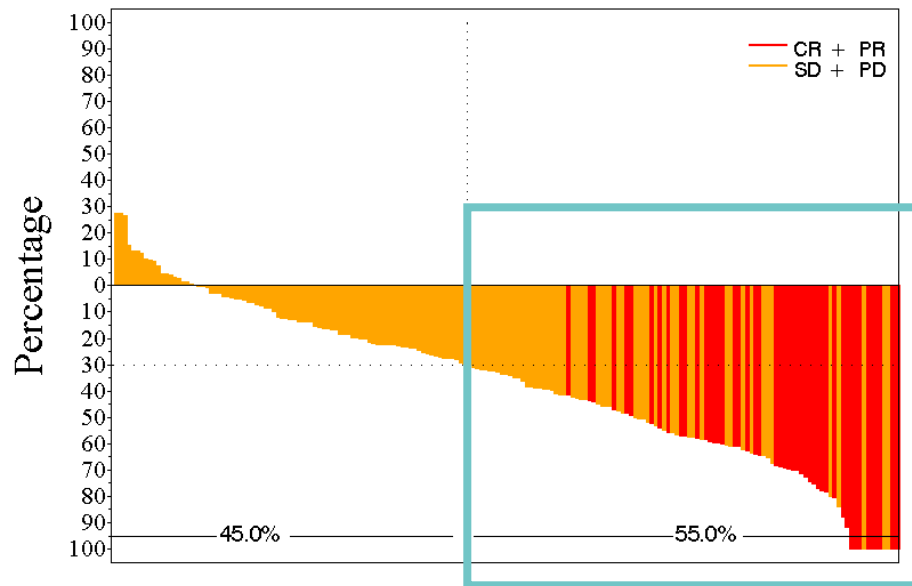
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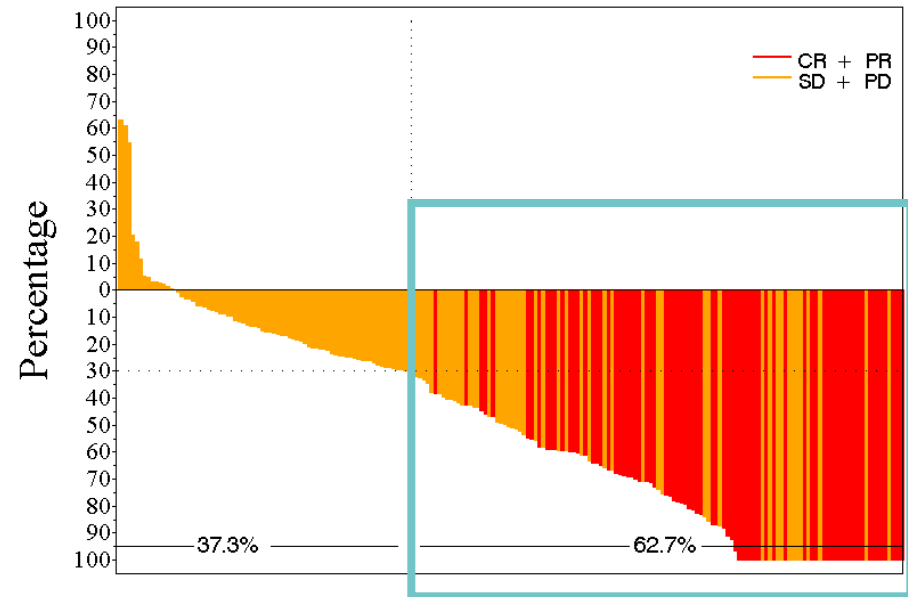


Visual comparison

Best overall tumor variation in the sum of the target lesions
Control arm: PLD (Sensitive population; n=189)



Best overall tumor variation in the sum of the target lesions
Experimental arm: Trabectedin + PLD (Sensitive population; n=204)



Better results in the experimental arm

Conclusions

Waterfall plots

- Feasible, intuitive tools capturing the magnitude of the inter and intra variation of a given variable
- Provide an easy way to illustrate the global picture in the entire population
- Allow to do visual comparisons

Questions

