

EFFECT OF ATYPICAL POPULATIONS IN META-ANALYSIS

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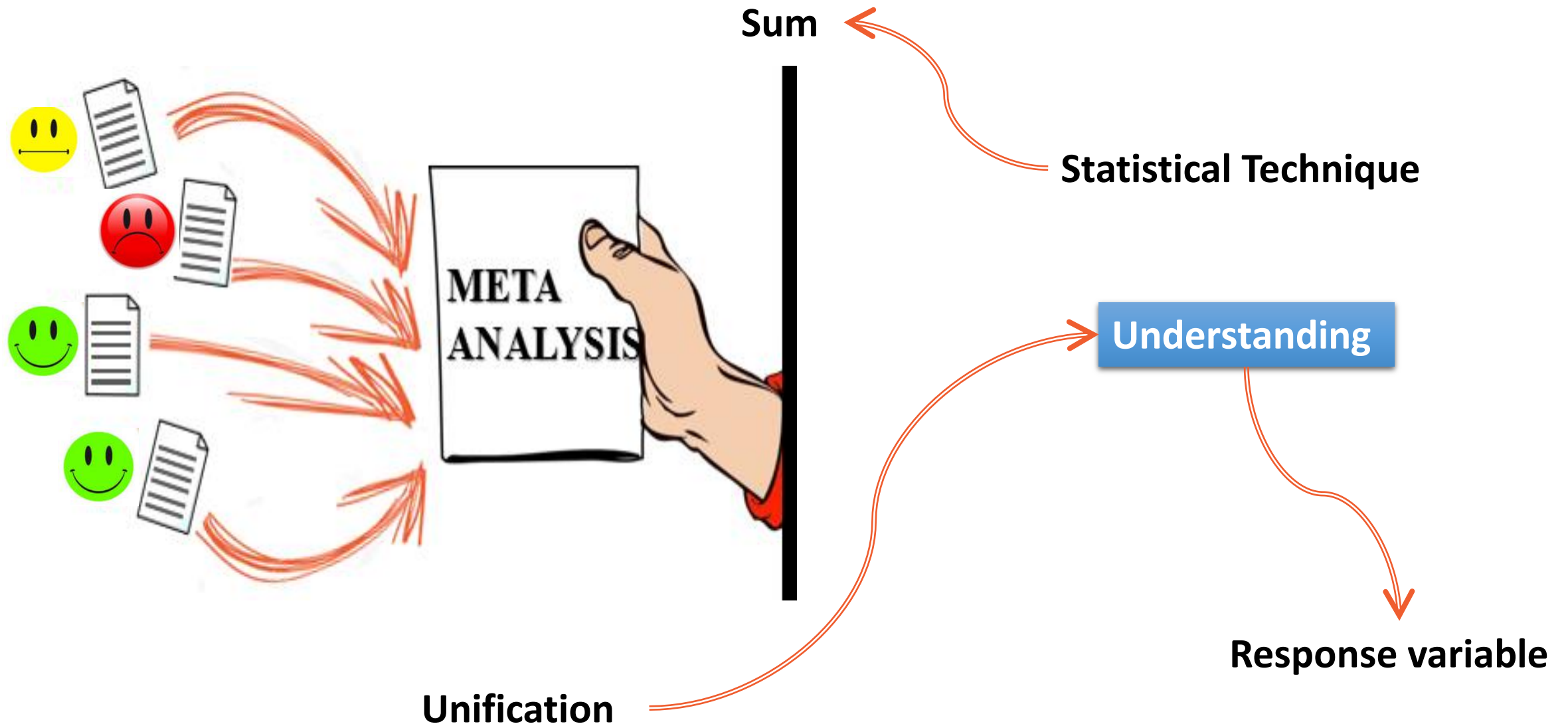
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AGENDA

- Contextualization
- Problem
- Design and methods
- Data/results
- Next steps.....



Contextualization



Problem

• Effect → Atypical Study

↓
Results

• Recommendations

• Mean, proportions

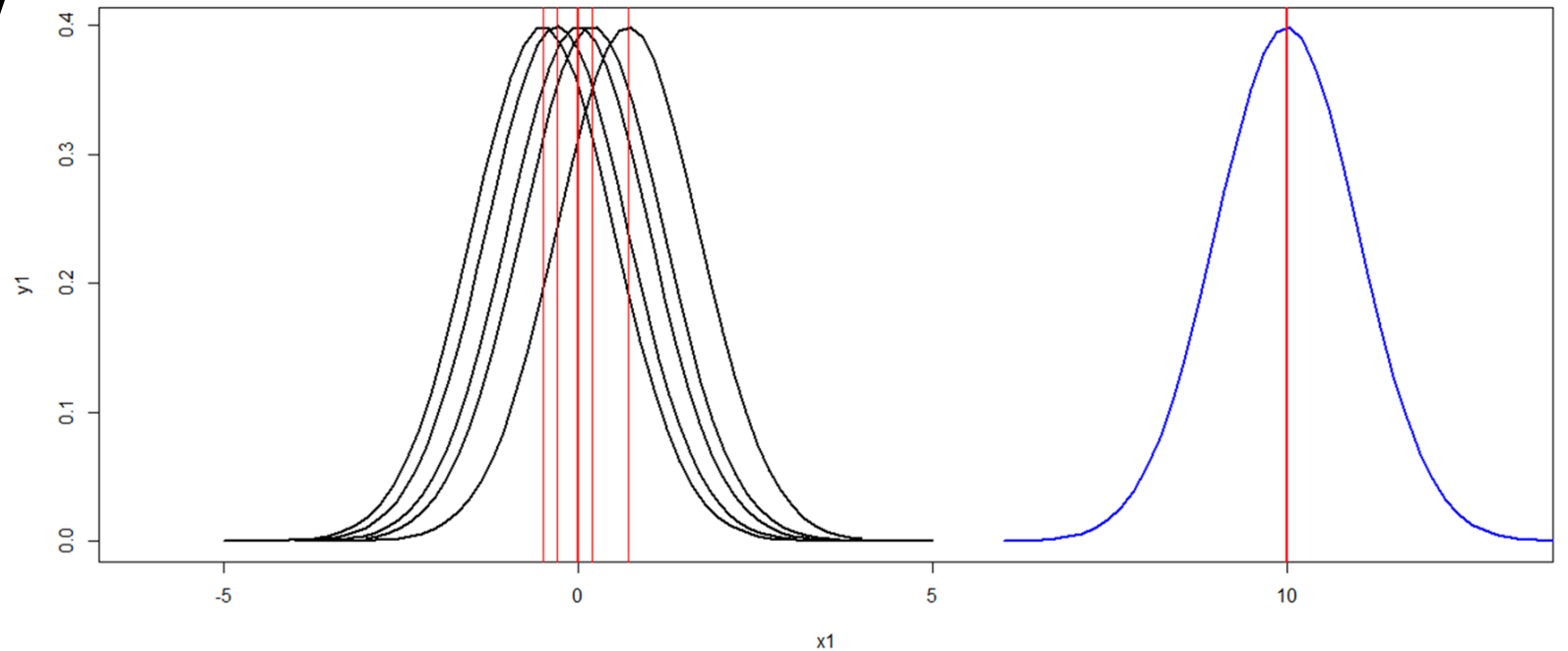


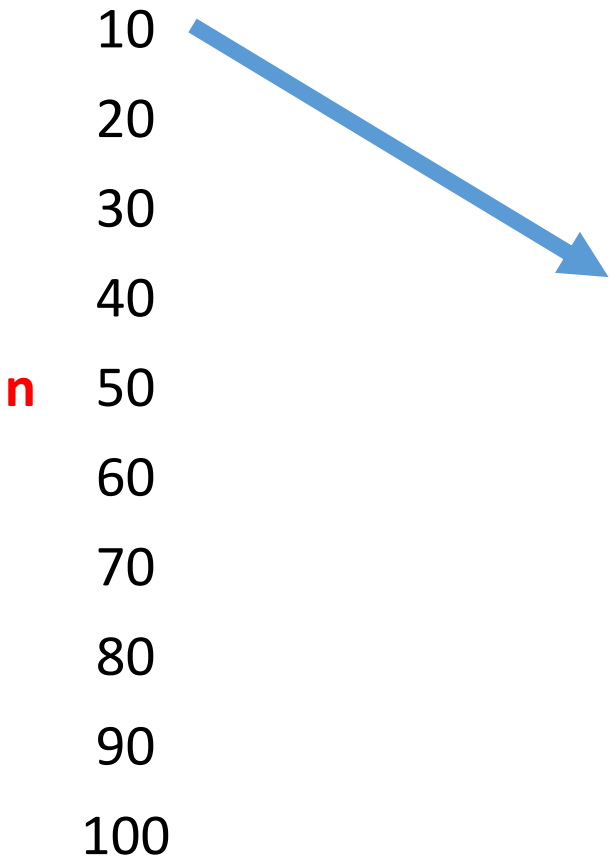
Figure 1: A Meta-analysis simulation with 5 studies with near means (black normal distributions), and an atypical study (blue normal distribution).

Design and methods

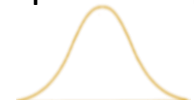
Studies



Sample Size = n



$$\mu_p + k \sigma_p$$



Mean	1
Location	0,9
Outlier	0,8
Study	0,7
	0,6
	0,5
	0,4
	0,3
	0,2
	0,1

Meta-analysis

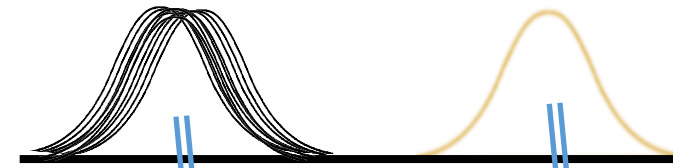
size = $N = 10 \text{ Studies} + \text{Outlier study}$

$N = 11$

1.000 simulations

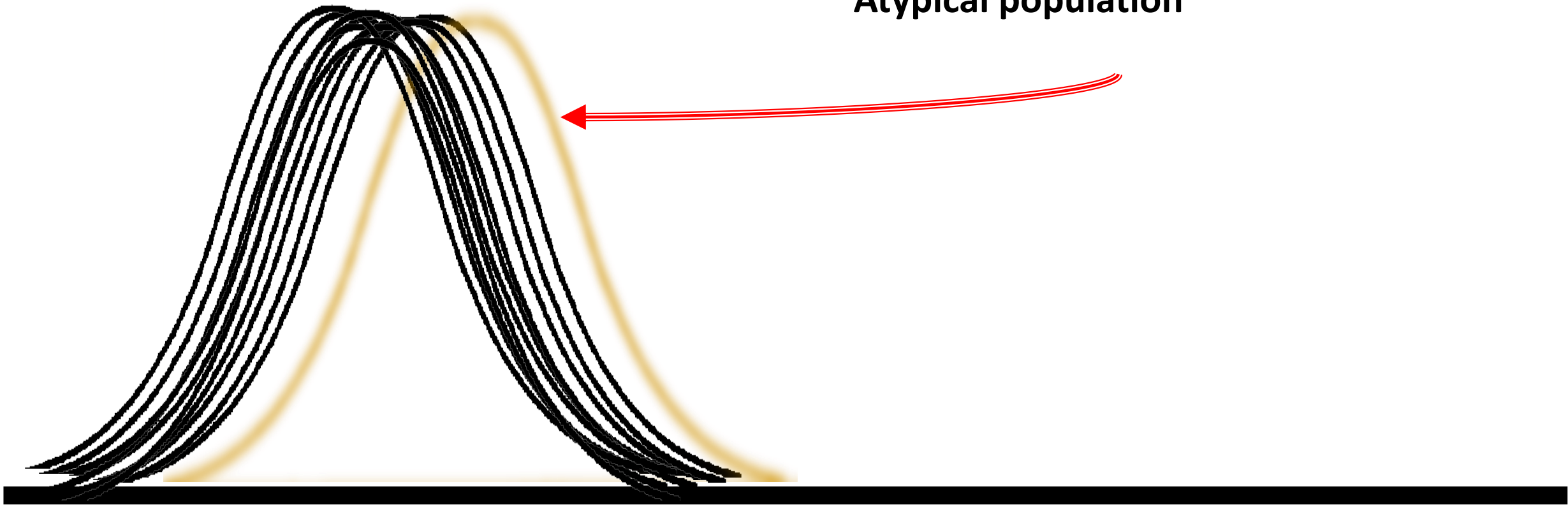
Proportion (%) = $\frac{\# \text{ No Heterogeneity}}{1.000 \text{ Simulations}}$

Meta-Analysis



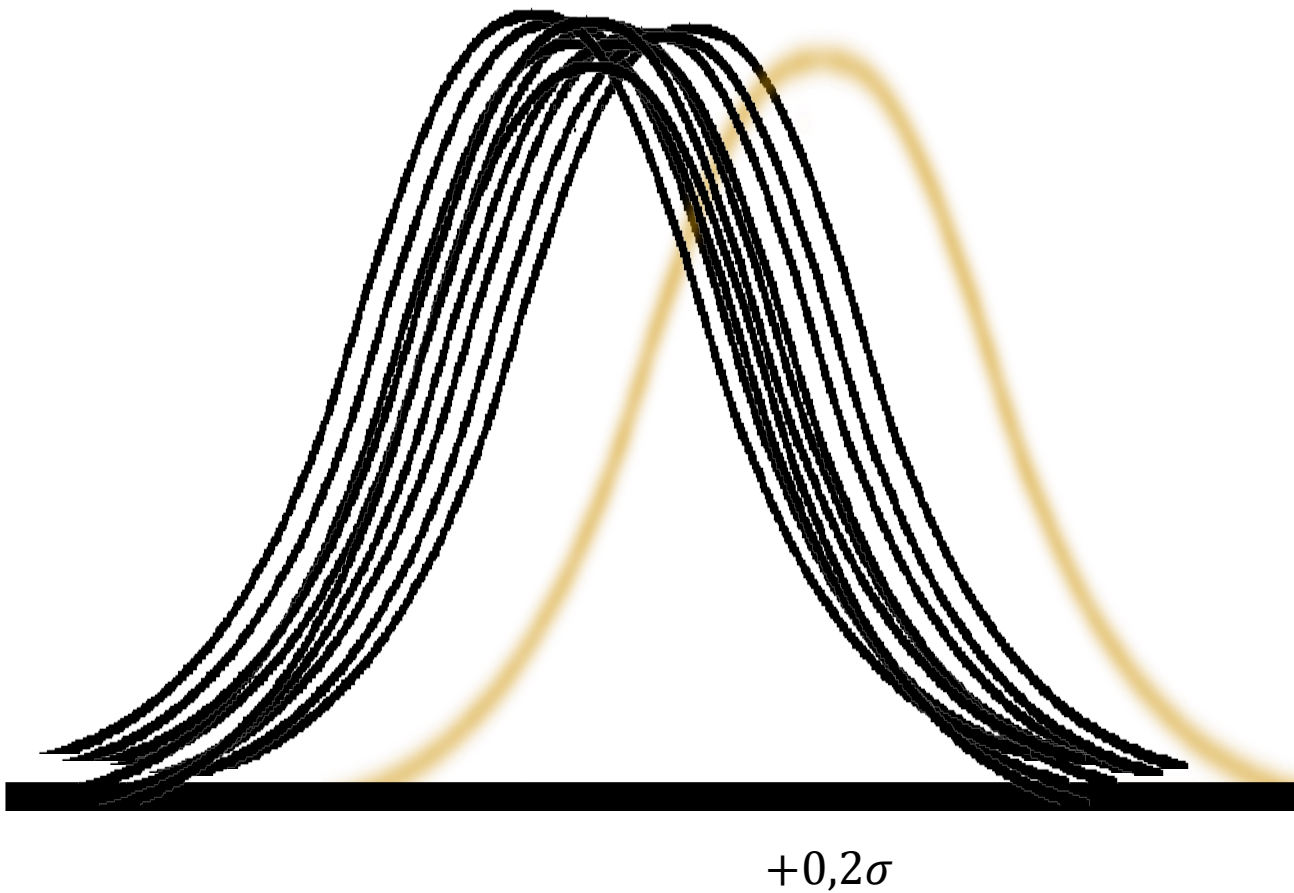
Design and Methods

Atypical population

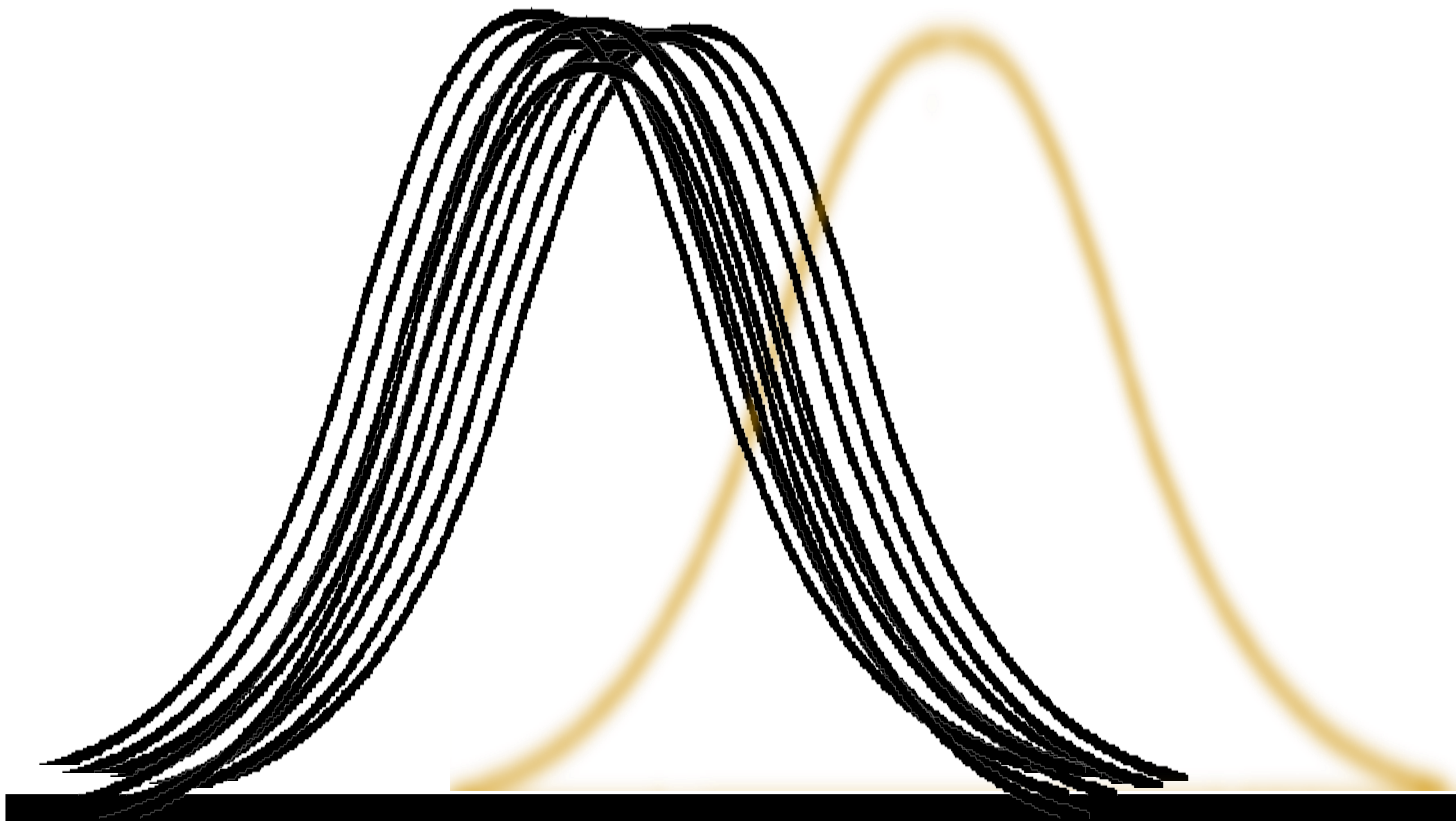


+ 0,1σ

Design and Methods

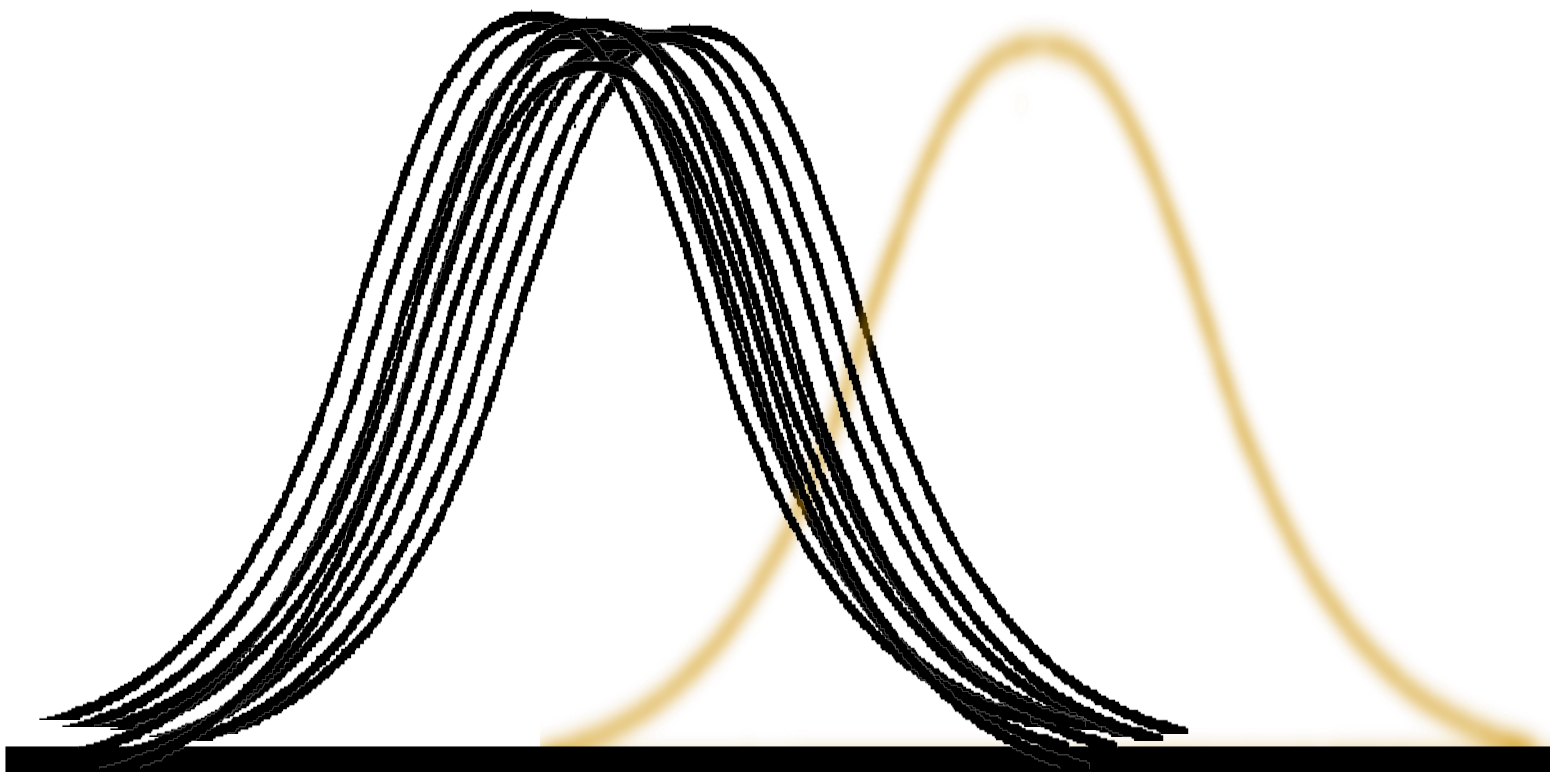


Design and methods



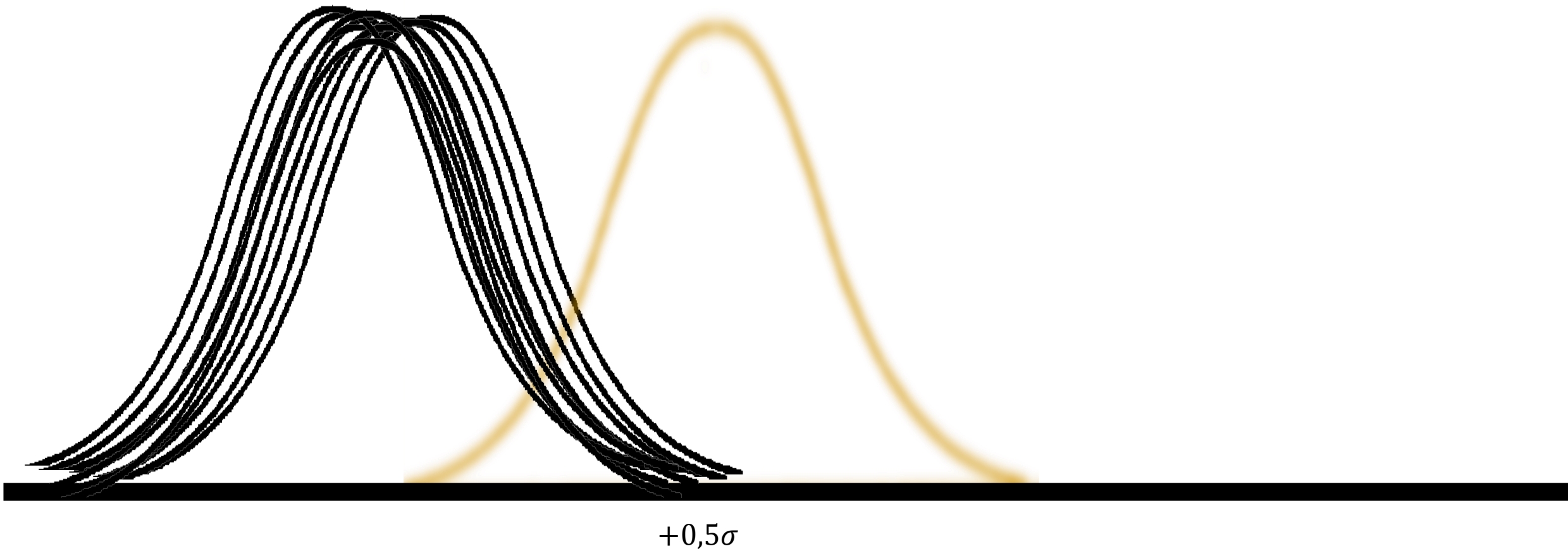
+0,3σ

Design and methods

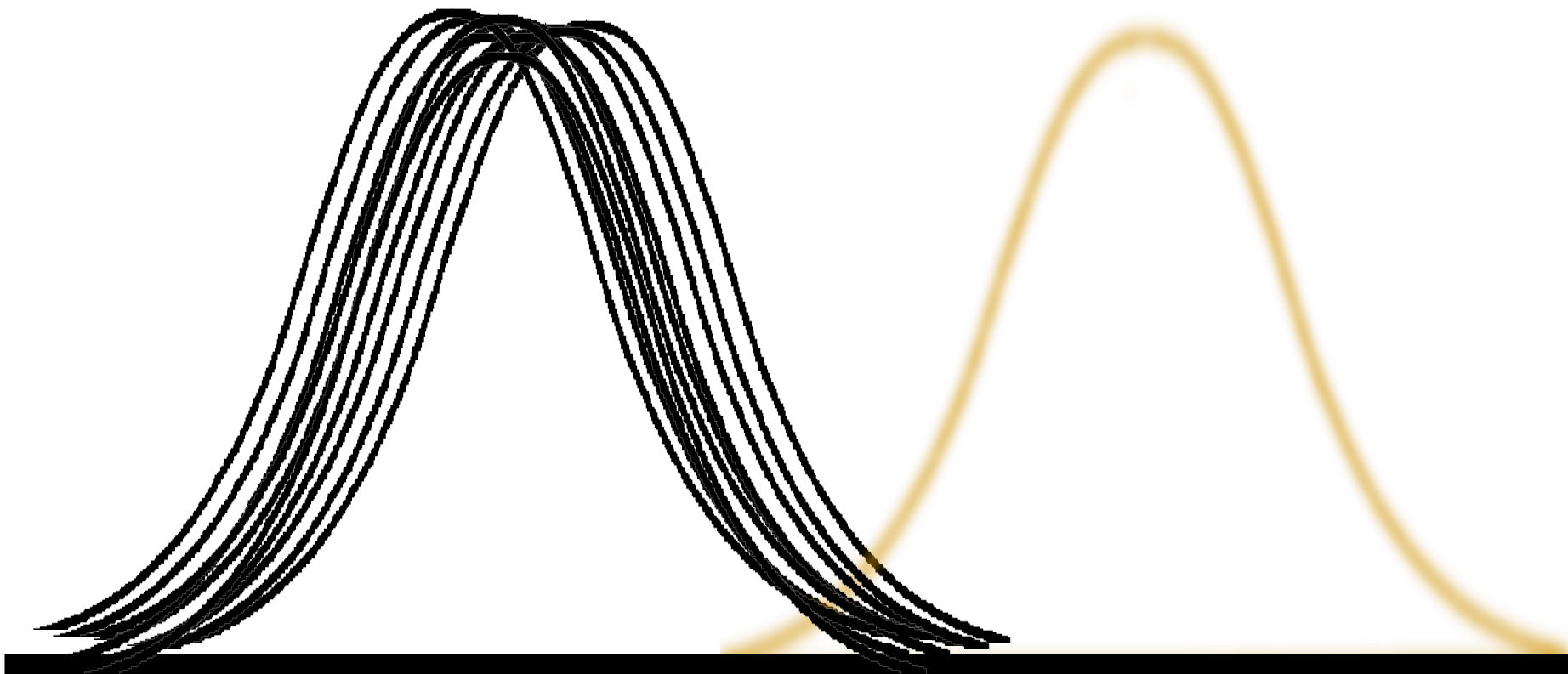


$+0,4\sigma$

Design and methods



Design and methods



+0,6 σ

Design and methods



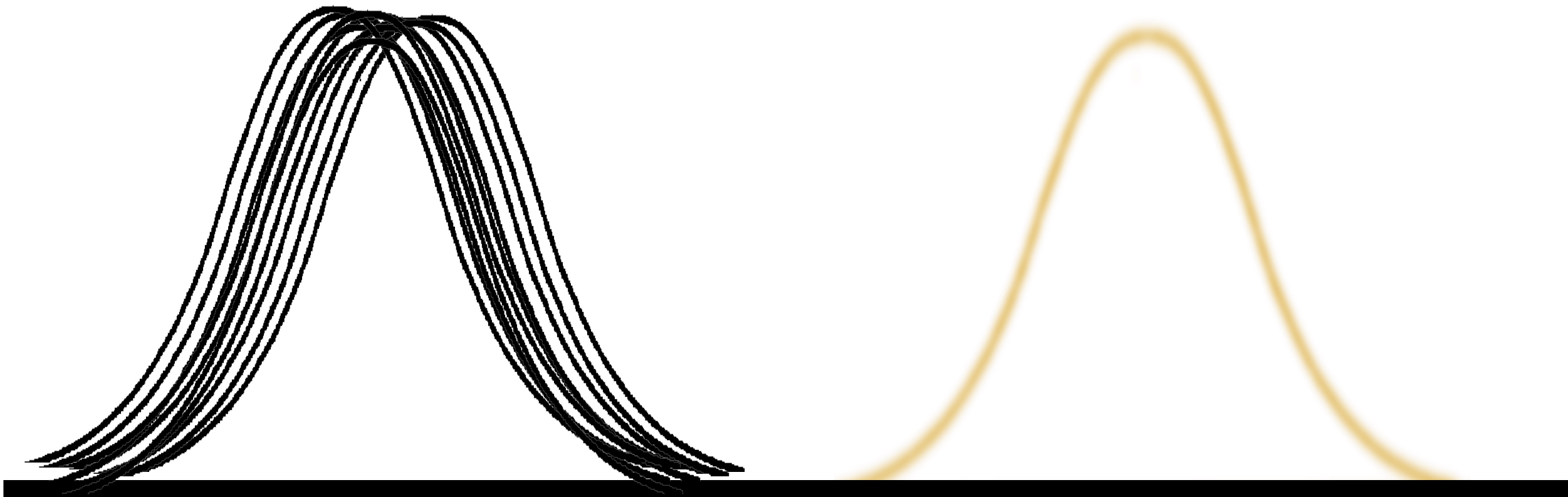
$+0,7\sigma$

Design and methods



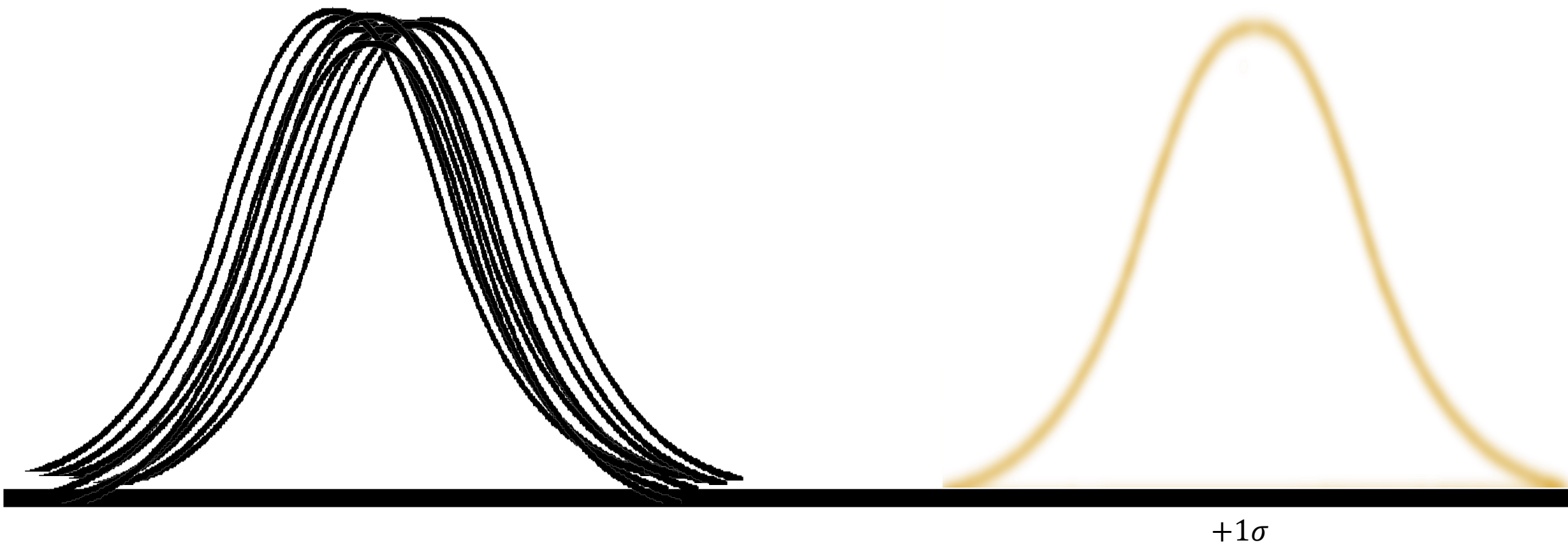
+0,8 σ

Design and methods

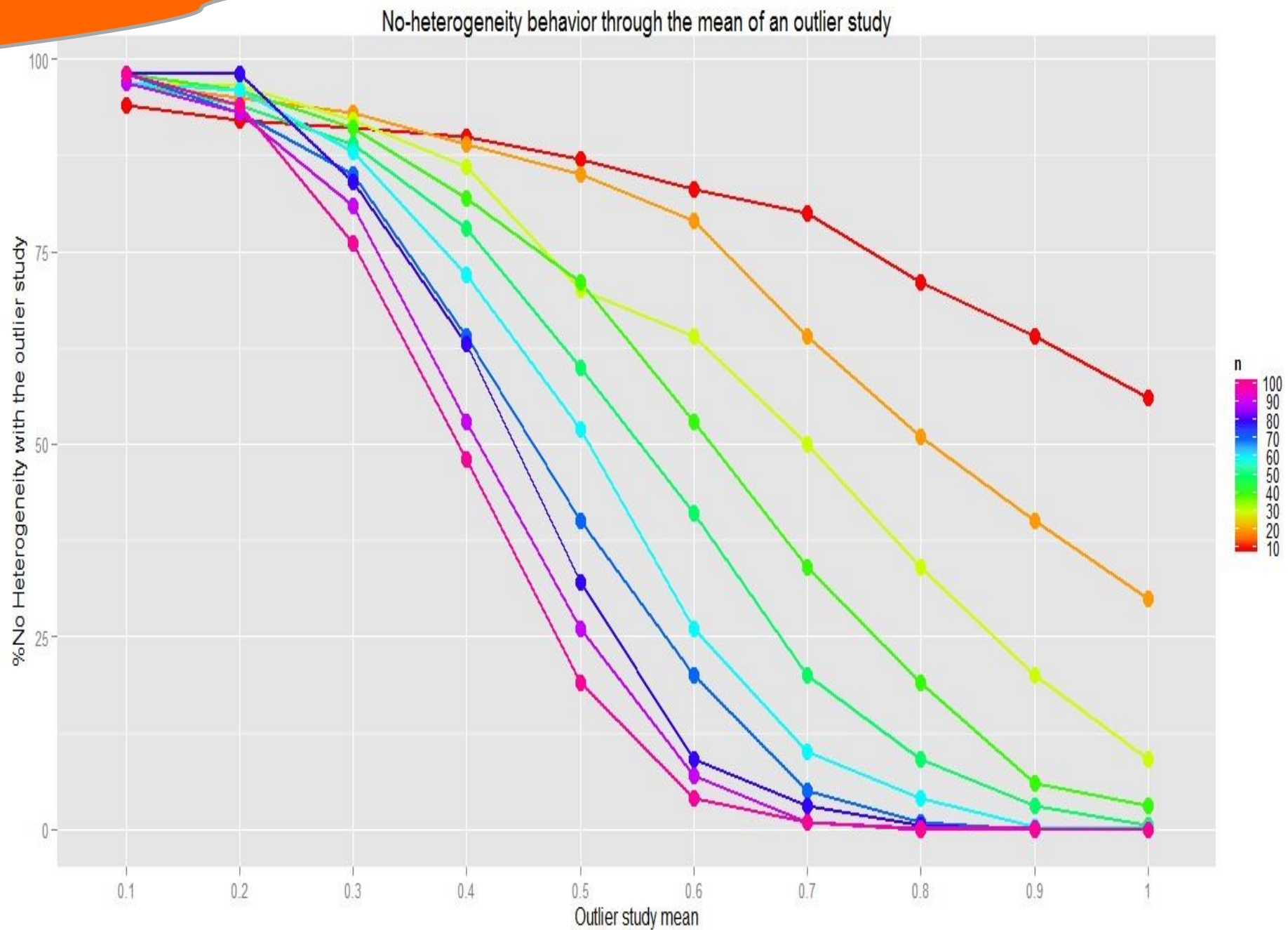


+0,9 σ

Design and methods



Data/results



In or Out



In when Not

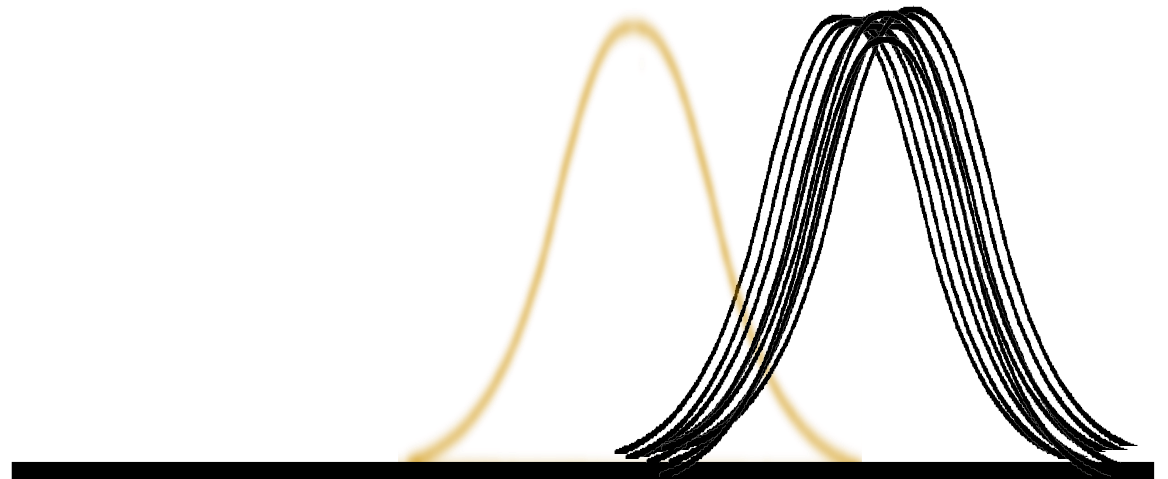
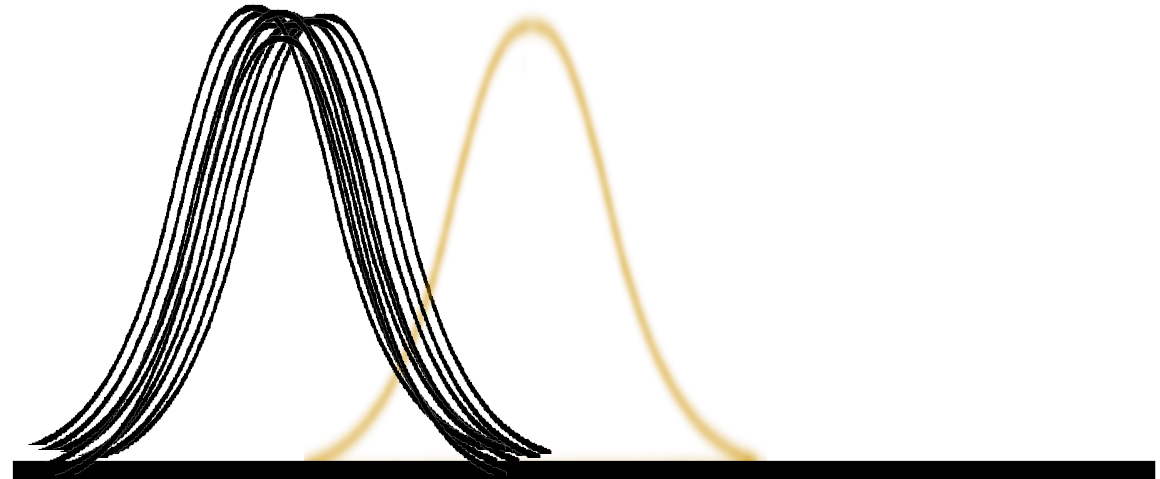


↑ Increase the doses

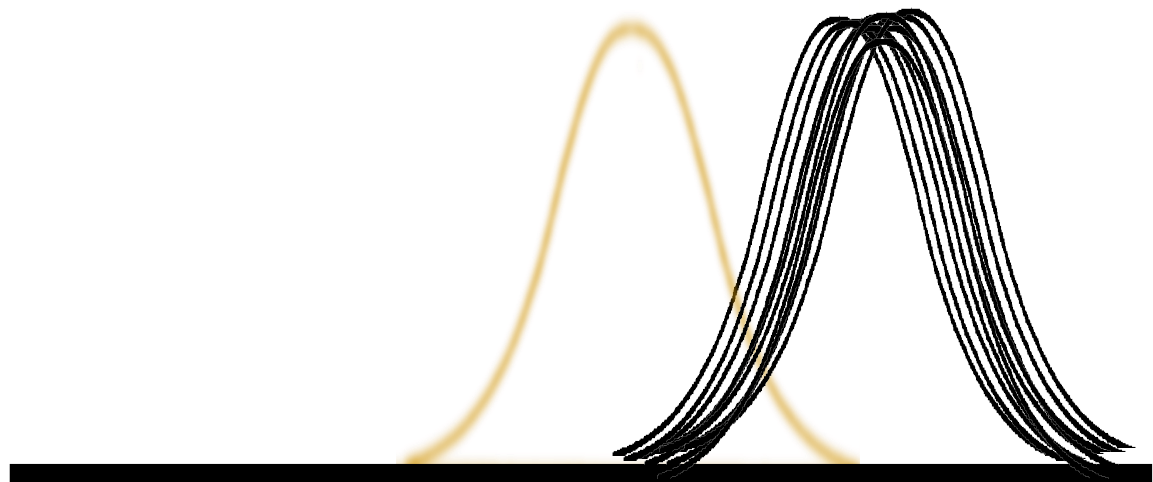
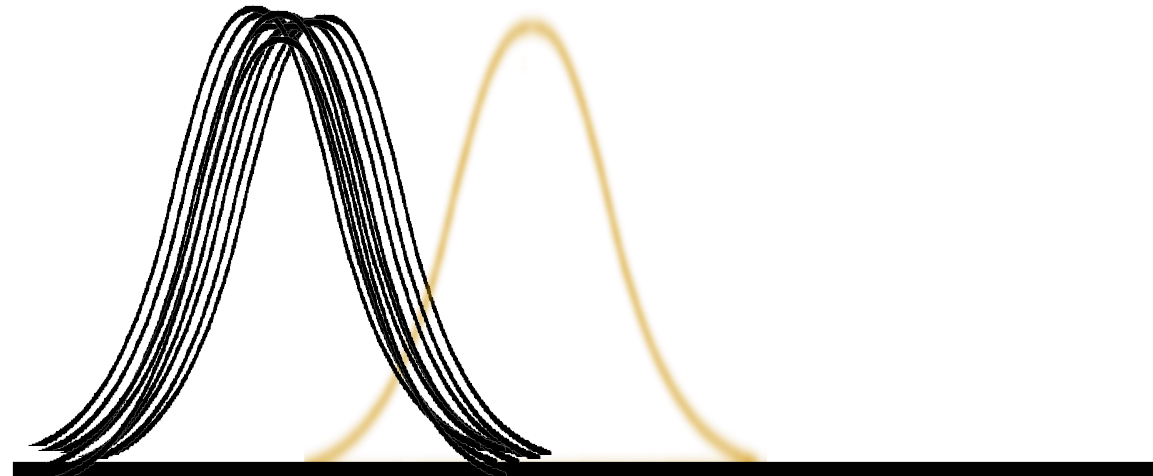
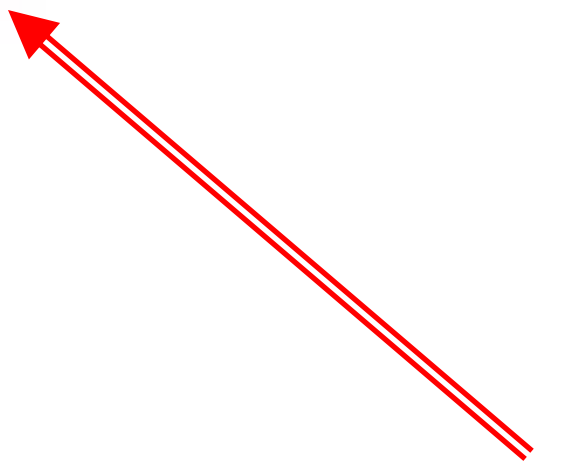
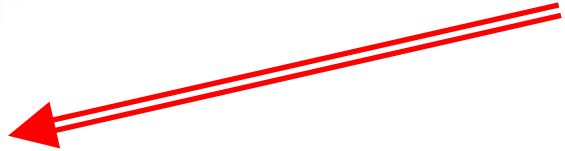
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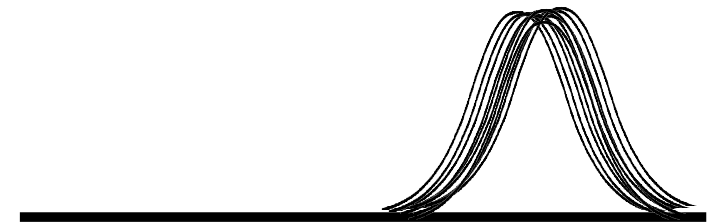
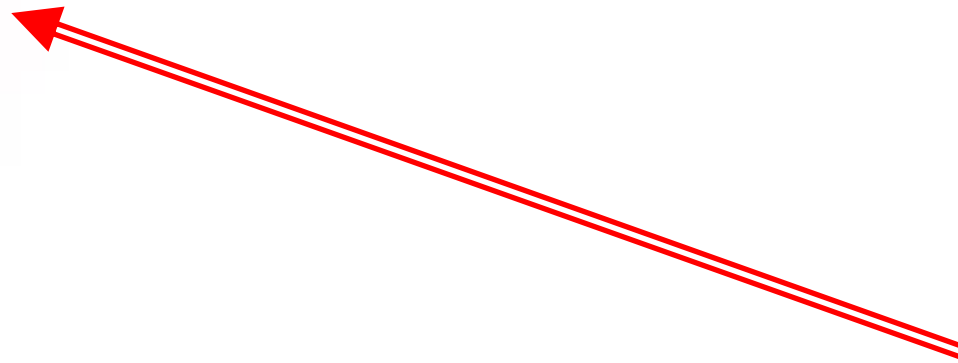
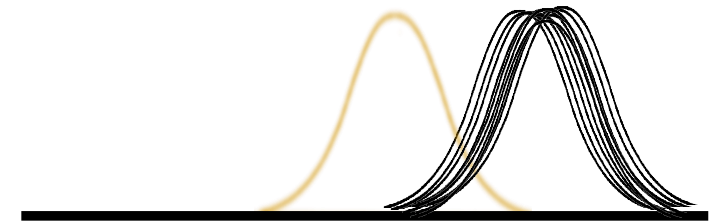
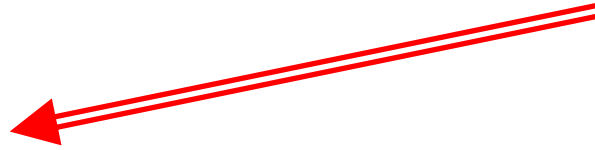
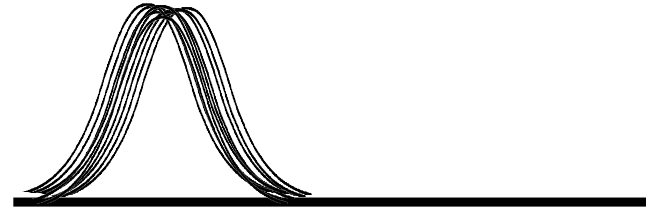
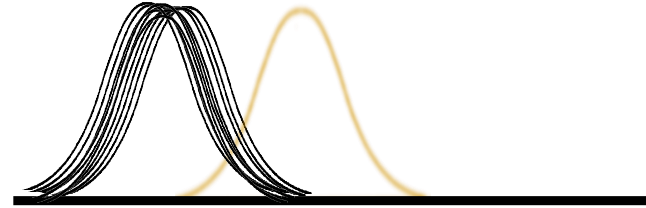
↓ Decrease the doses



In when Yes



Out when Not

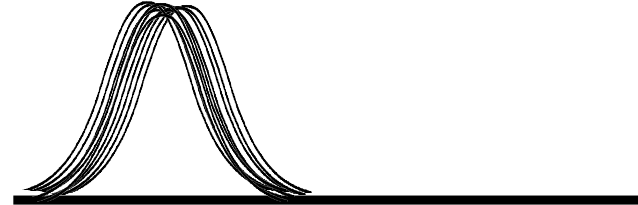
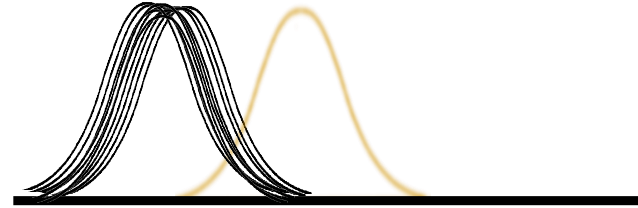


Out when Yes



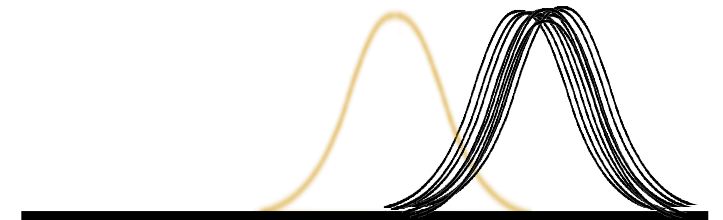
↓ Decrease the doses

~~True~~



↑ Increase the doses

~~True~~



Is that or those
atypical studies
really part
of your population



A good approach is
to use the linear regression
outlier detection
proposals



Next steps....

- Other models
 - random effects model
 - mixed effects model

