SciLifeLab

Hypothesis Testing

CB2030

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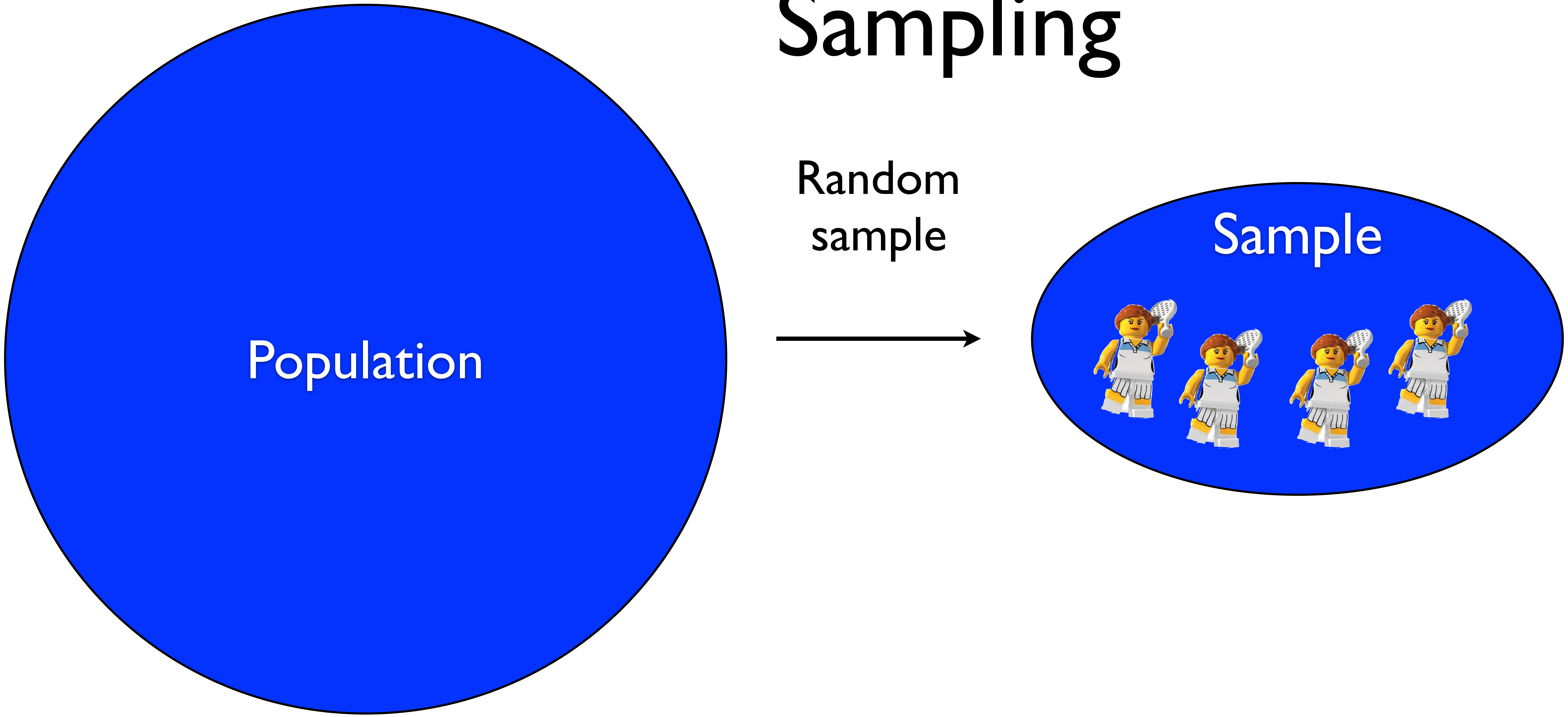
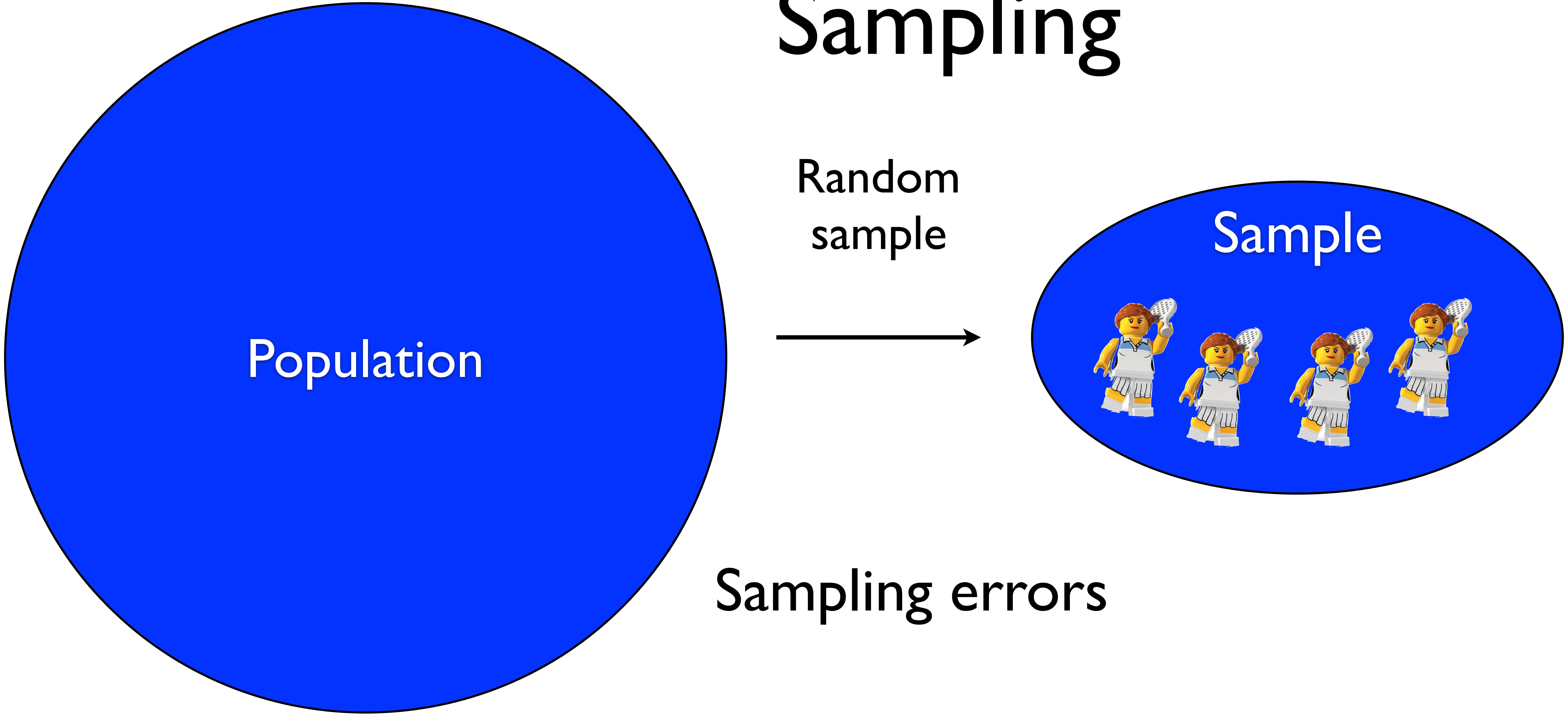
KTH VETENSKAP OCH KONST

Sampling



- We observe a population through a selected sample

Sampling



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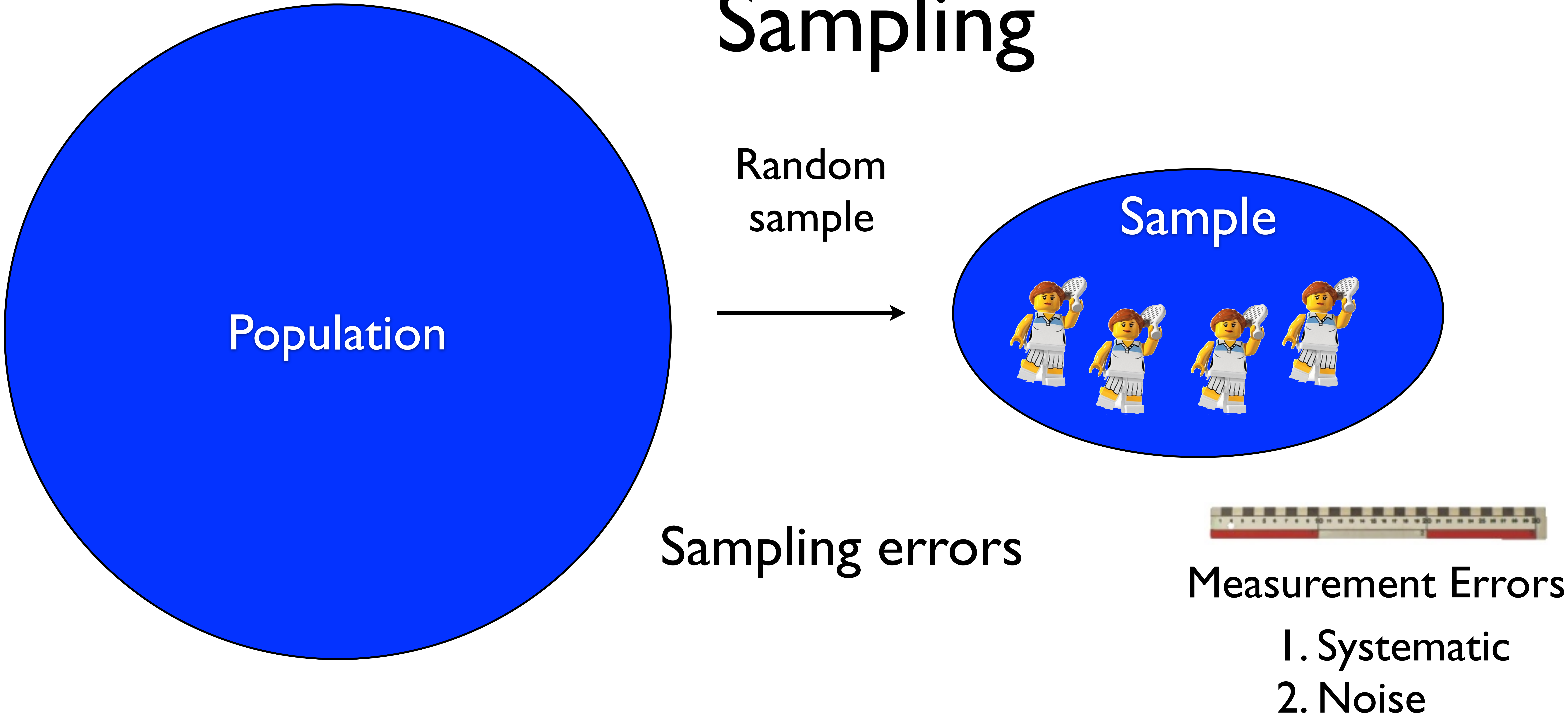
Sampling



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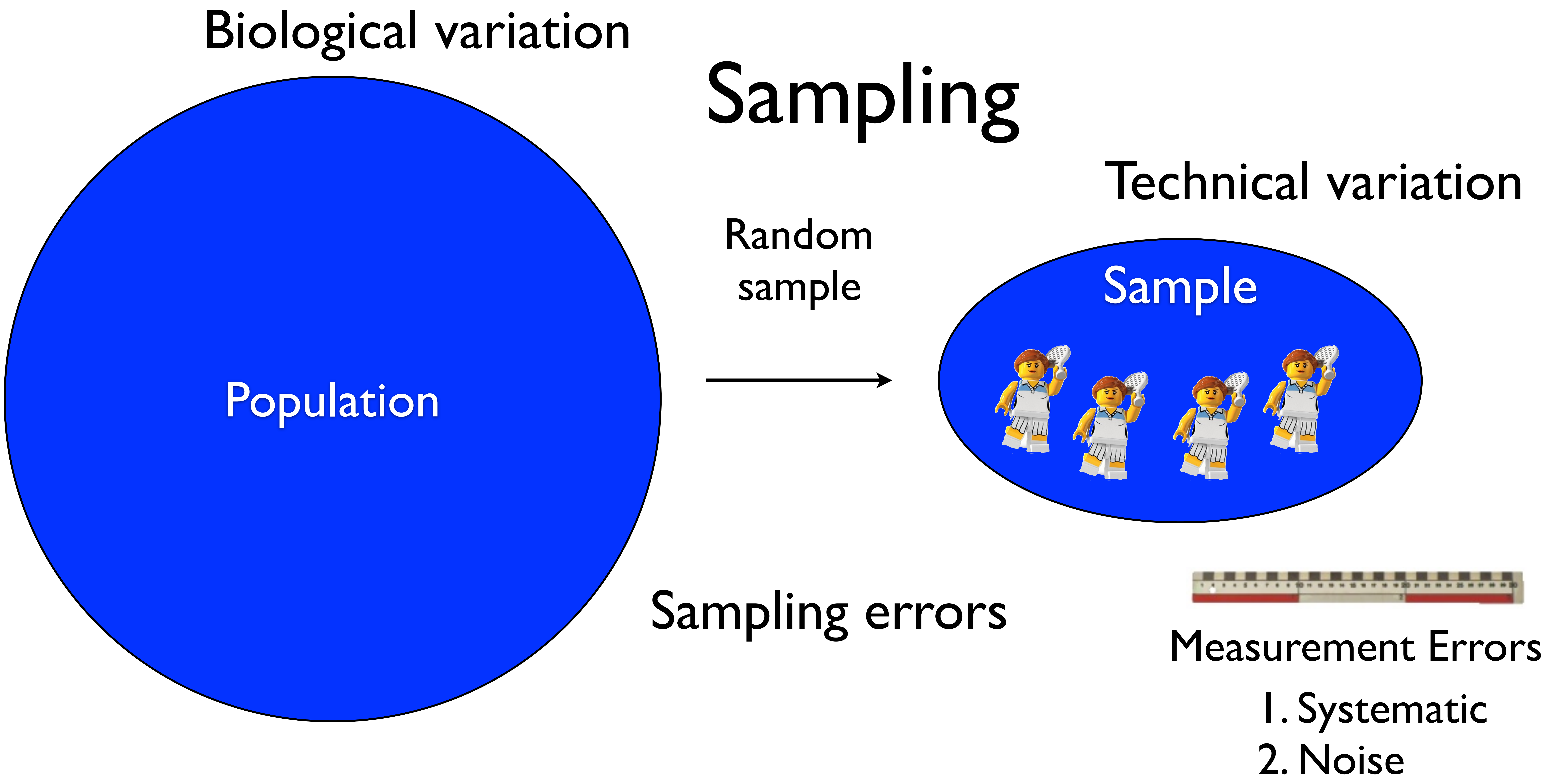
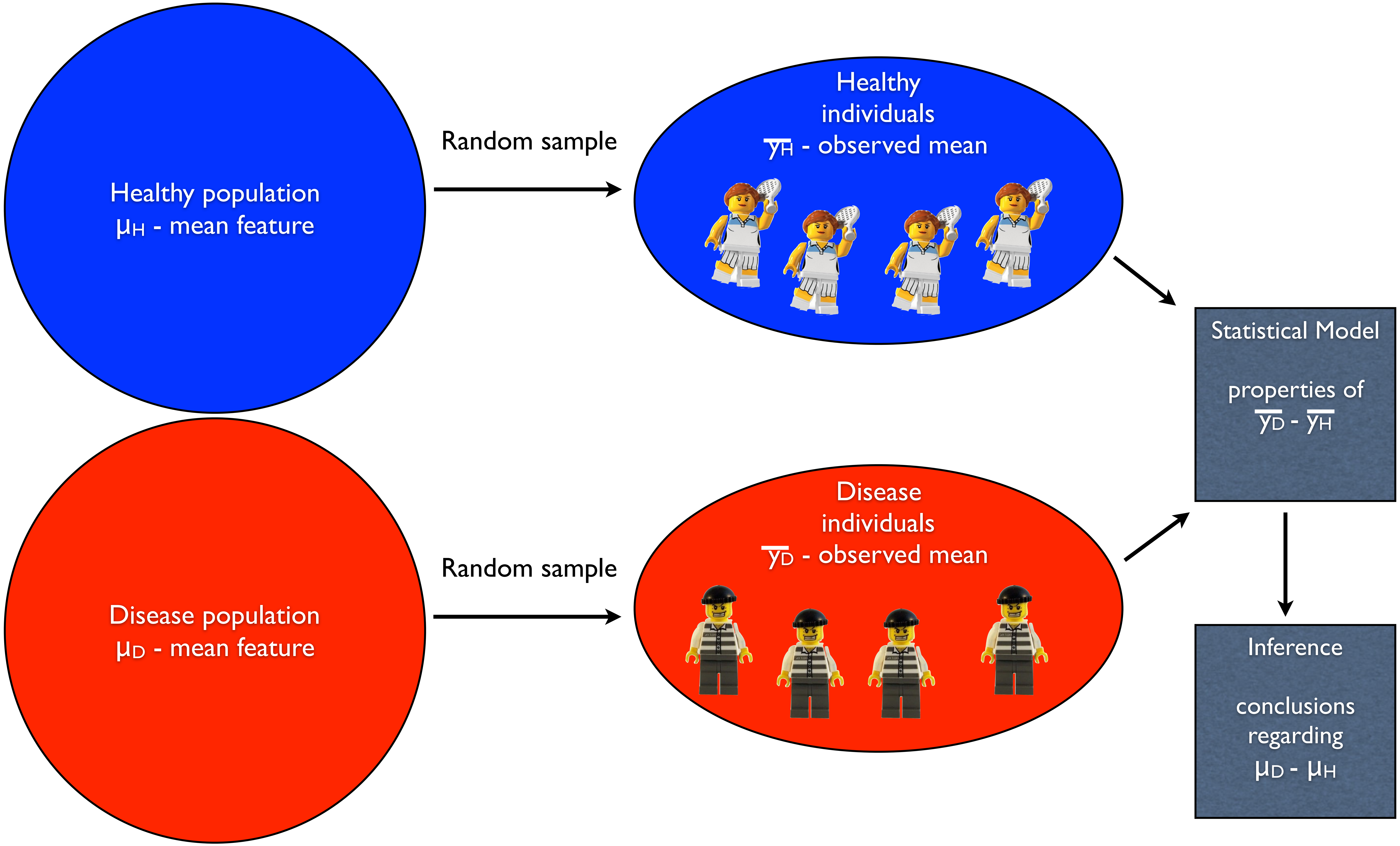
Sampling



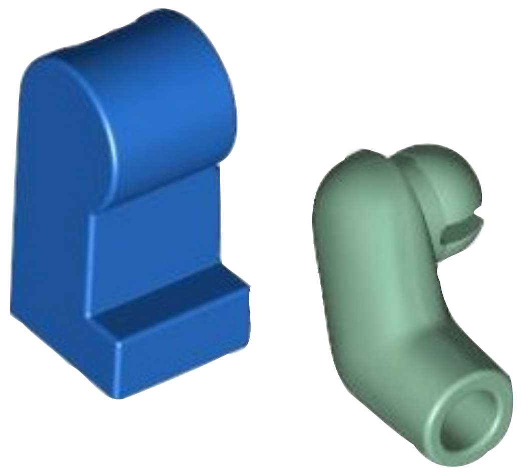
- We observe a population through a selected sample

Statistical inference procedure



Our Hypotheses

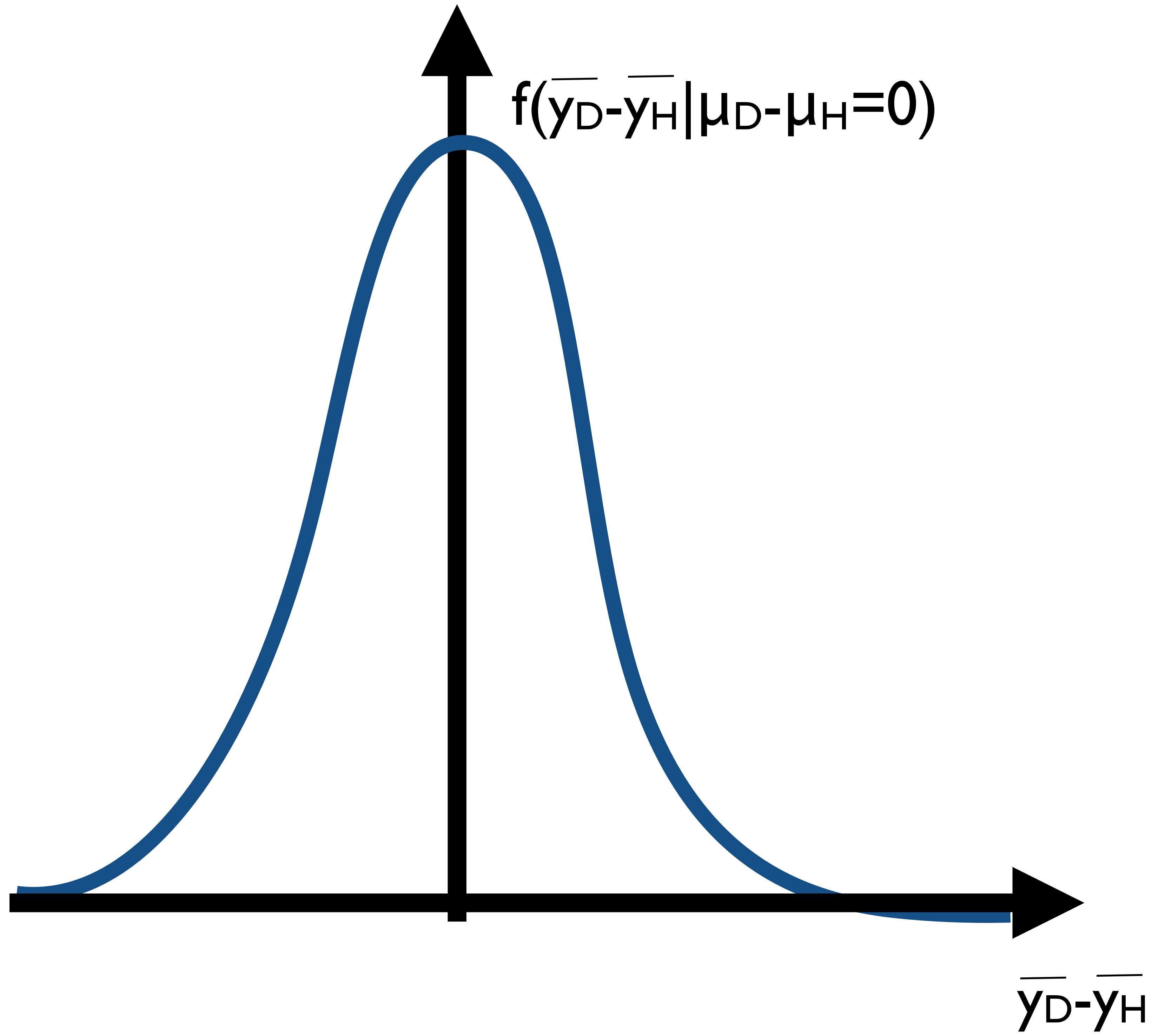
- *H_0*: The *null* hypothesis. The situation we are not interested in (typically $\mu_D - \mu_H = 0$)



- *H_1*: The *alternative* hypothesis. The situation we want to detect (typically $\mu_D - \mu_H \neq 0$)

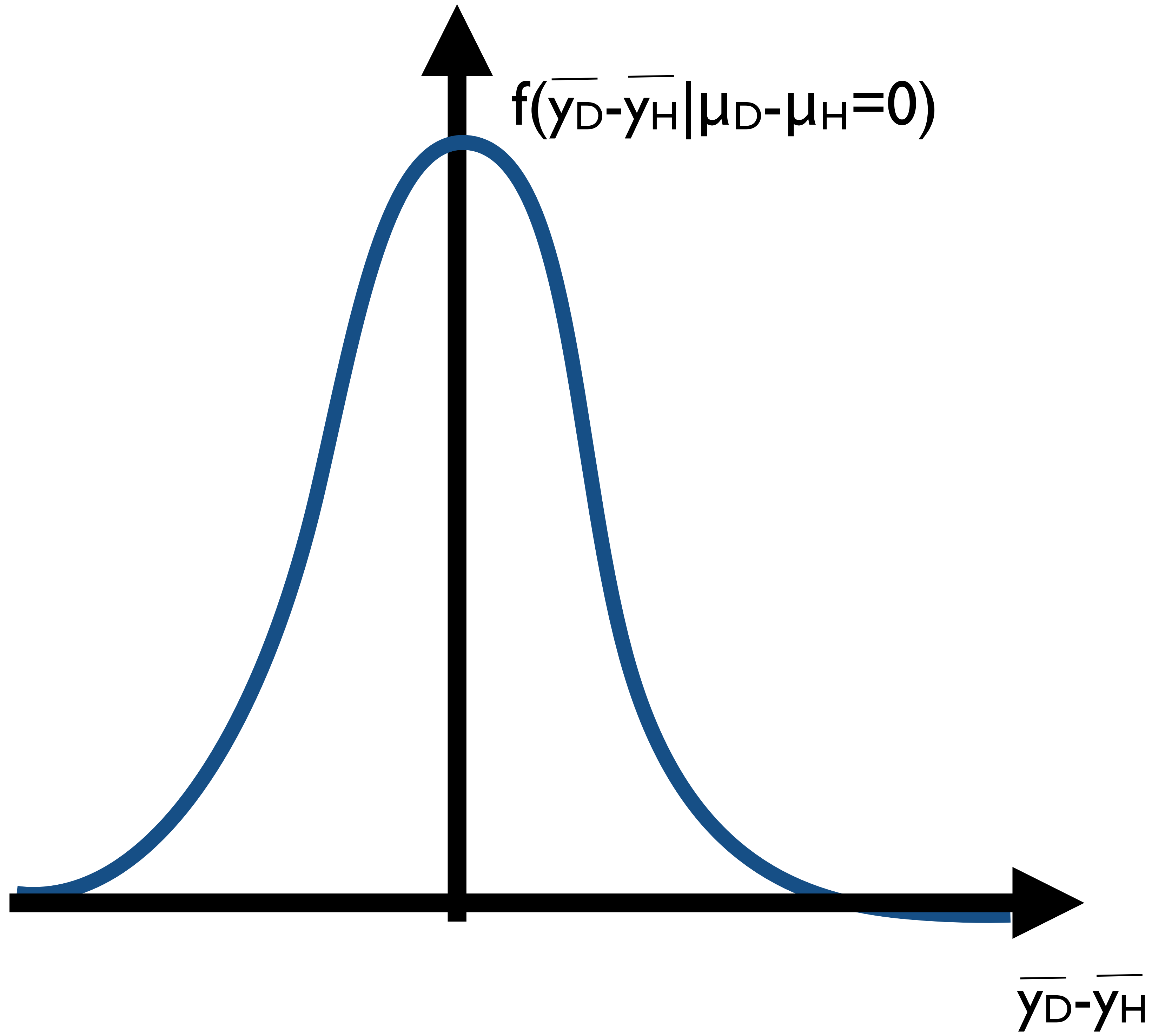
Sampling Distribution

- The distribution of any statistic of measurements in a sample, e.g. its mean, is known as a sampling distribution

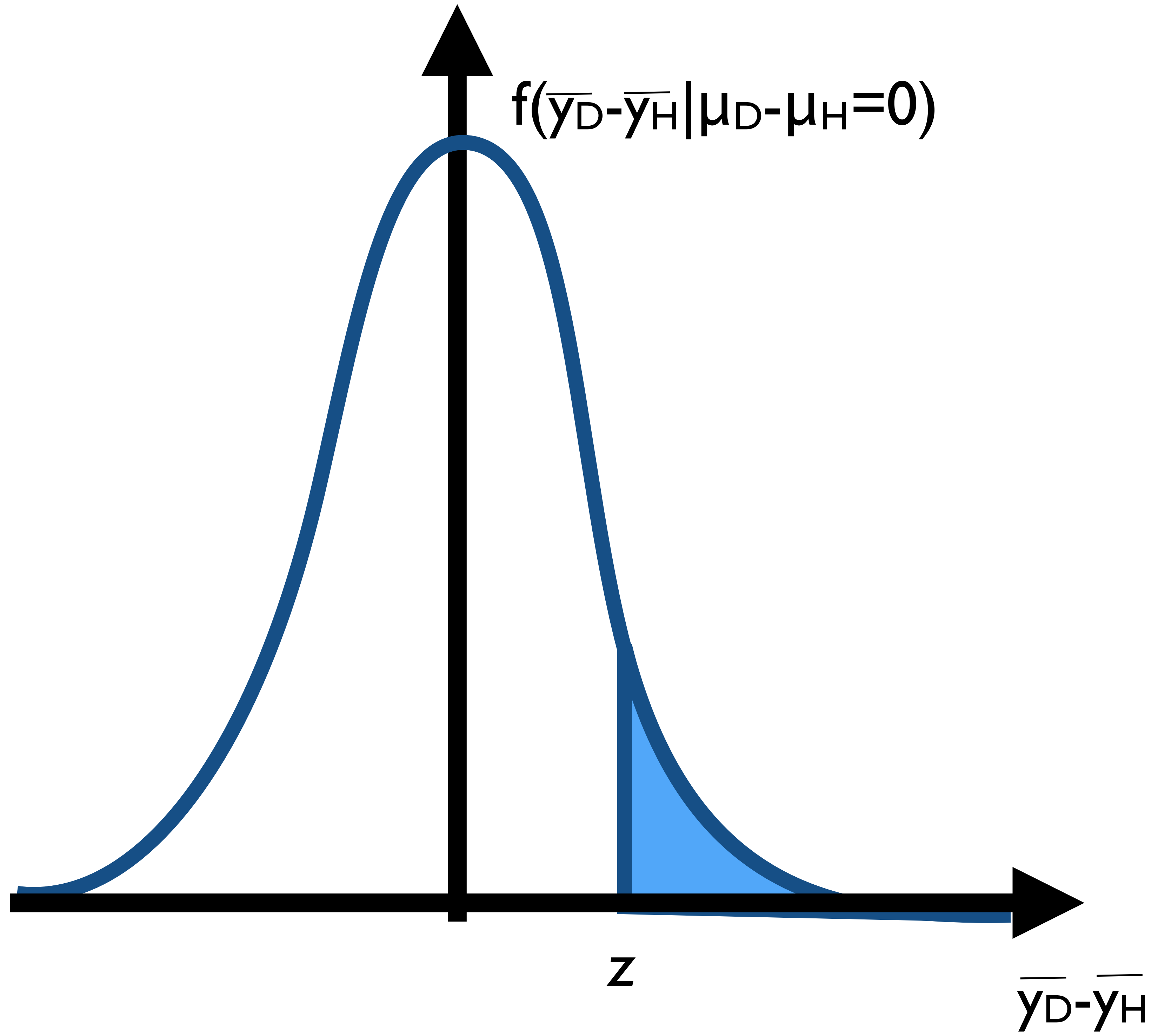


Sampling Distribution

- The distribution of any statistic of measurements in a sample, e.g. its mean, is known as a sampling distribution
- If we know the sampling distribution of the difference in sample mean under H_0 we can calculate how extreme the difference is.

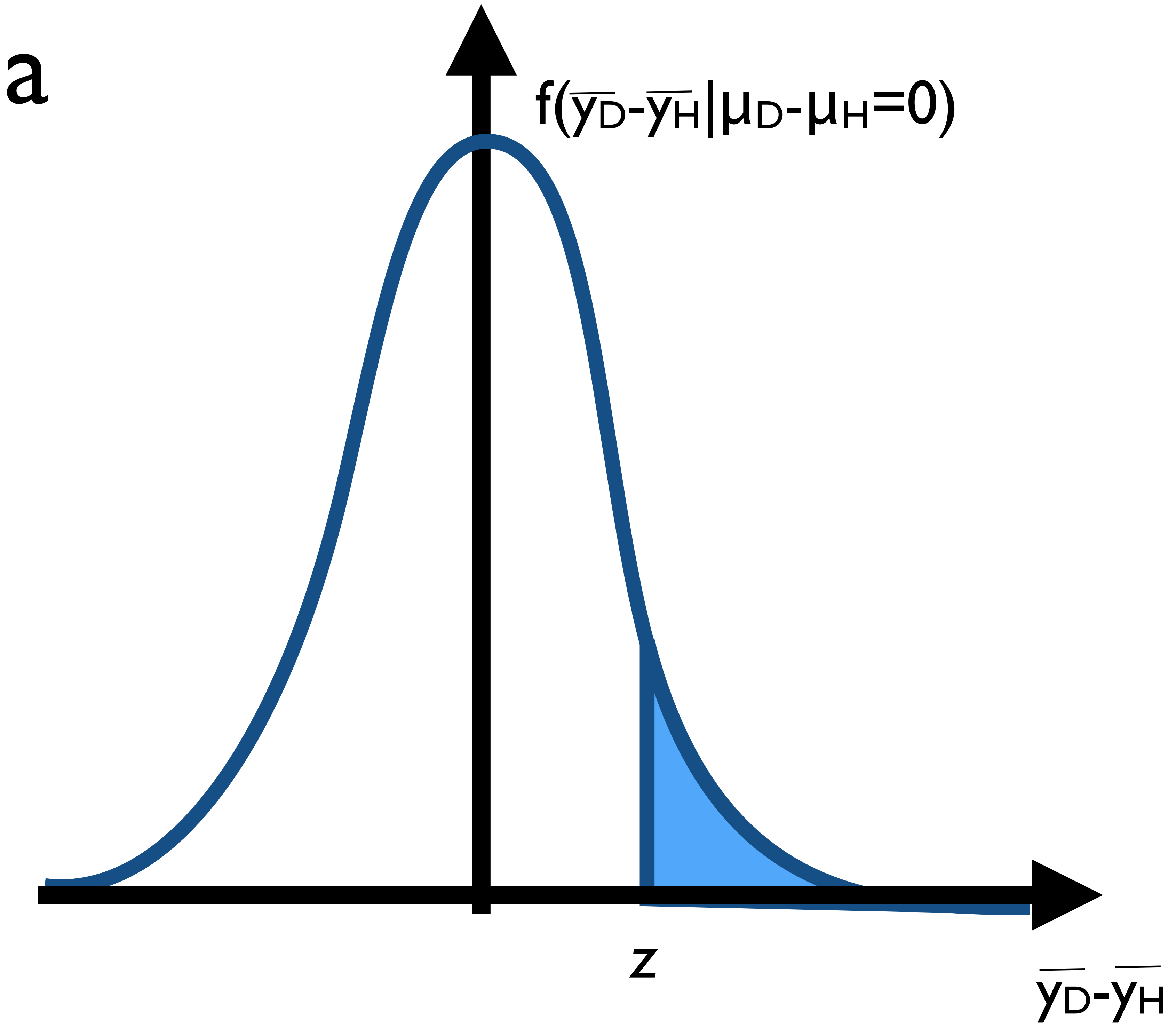


p value



p value

- $\Pr(\bar{y}_D - \bar{y}_H \geq z \mid \mu_D - \mu_H = 0)$, *i.e.* the probability of a result at least as extreme as the one that was observed, given H_0, is known as a one-sided p value.



p value

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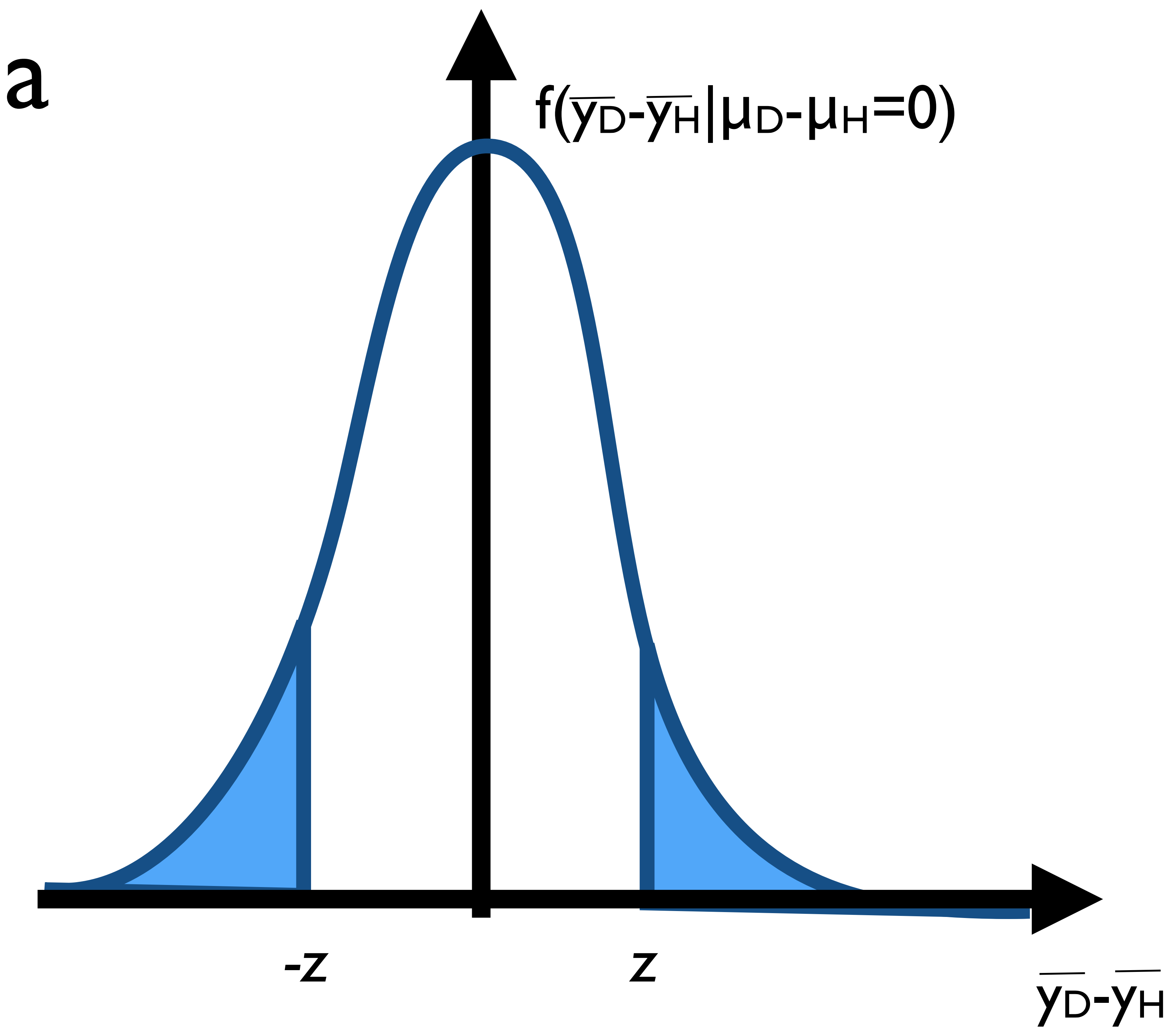
- $\Pr(|\bar{y}_D - \bar{y}_H| \geq z \mid \mu_D - \mu_H = 0)$ is known as a two-sided p value.



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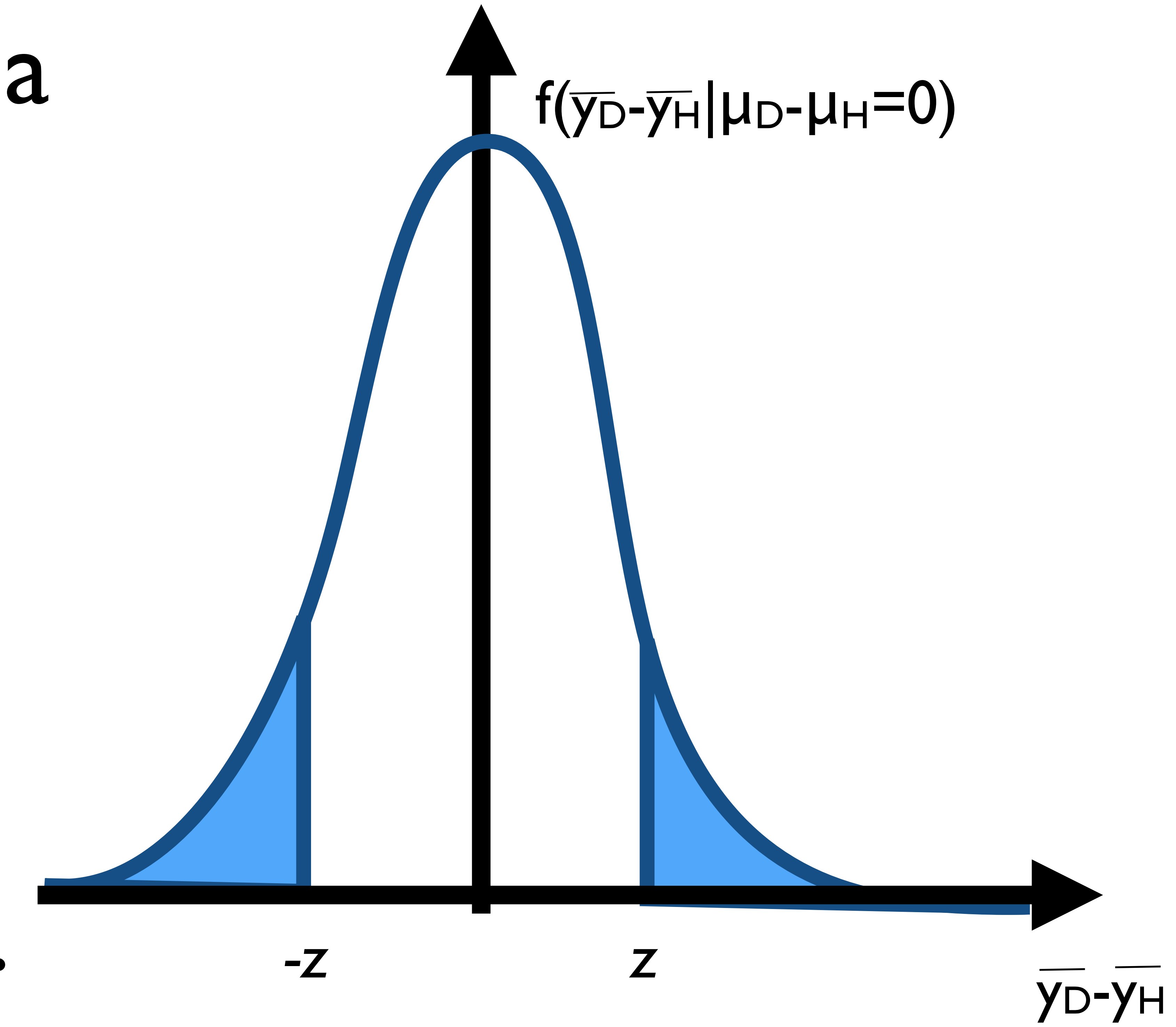
- p values are uniformly distributed under H_0.



Statistical inference procedure