Statistics with SpaRRows

Lecture 4

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Outline

- Precision of sampling
- Standard error of mean
- How to improve statistical precision
- Square-root law of sample size
- 95CI

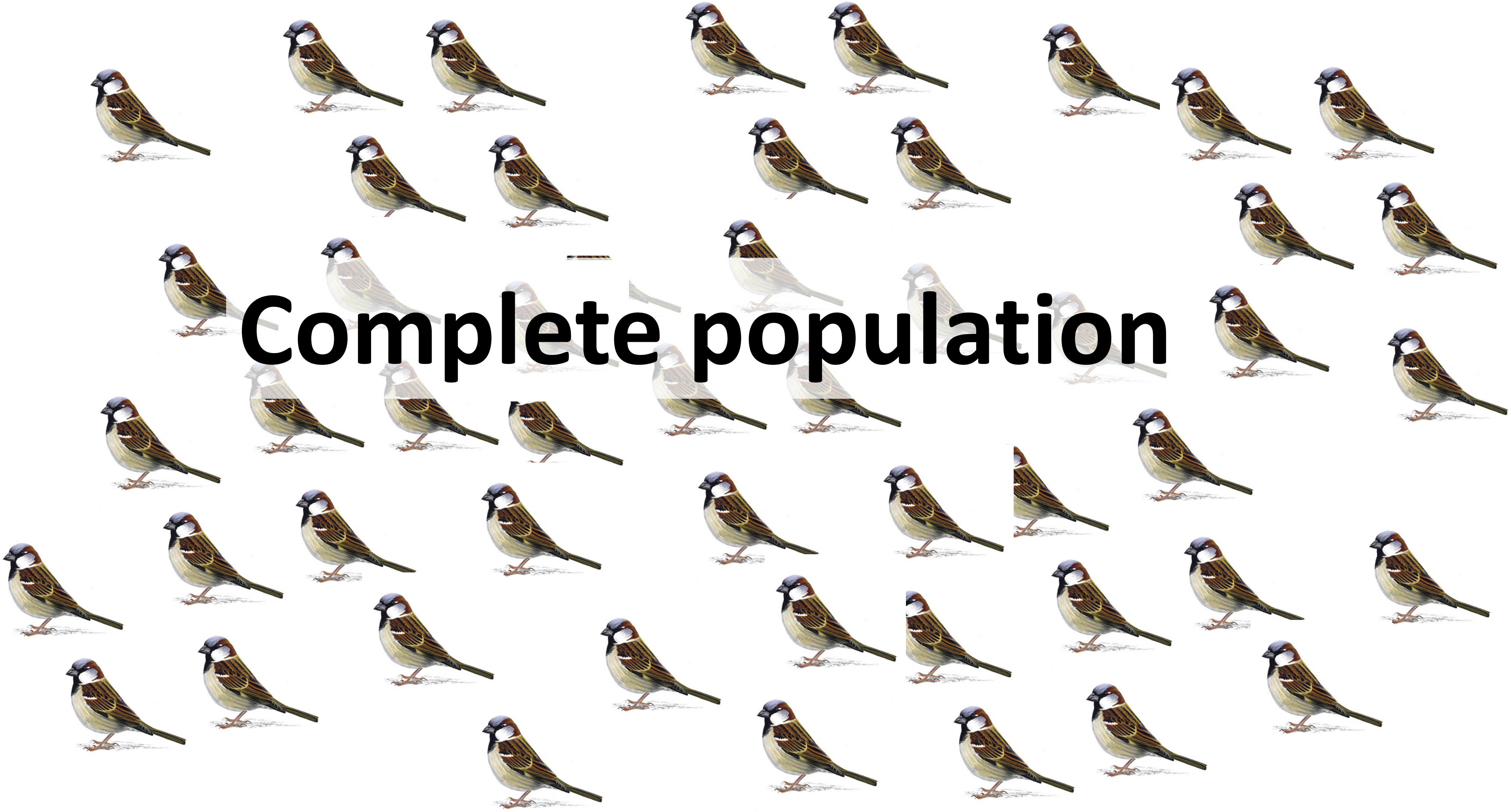
So what’s the standard error then?

- Standard deviation describes the spread and variability of a distribution

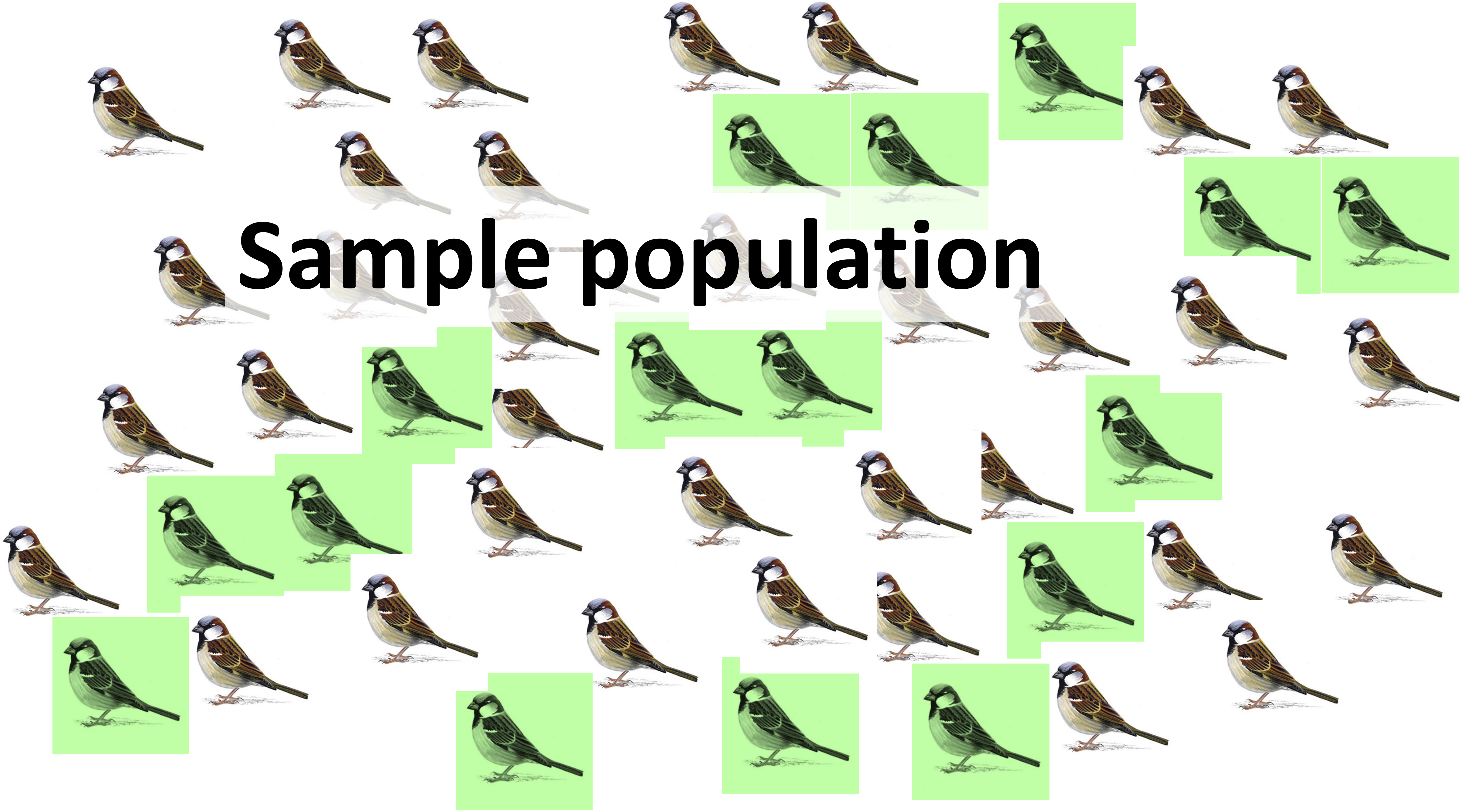
- Standard errors describe the precision of the data!

- It is really called: Standard error of the sampling distribution

Complete population



Sample population



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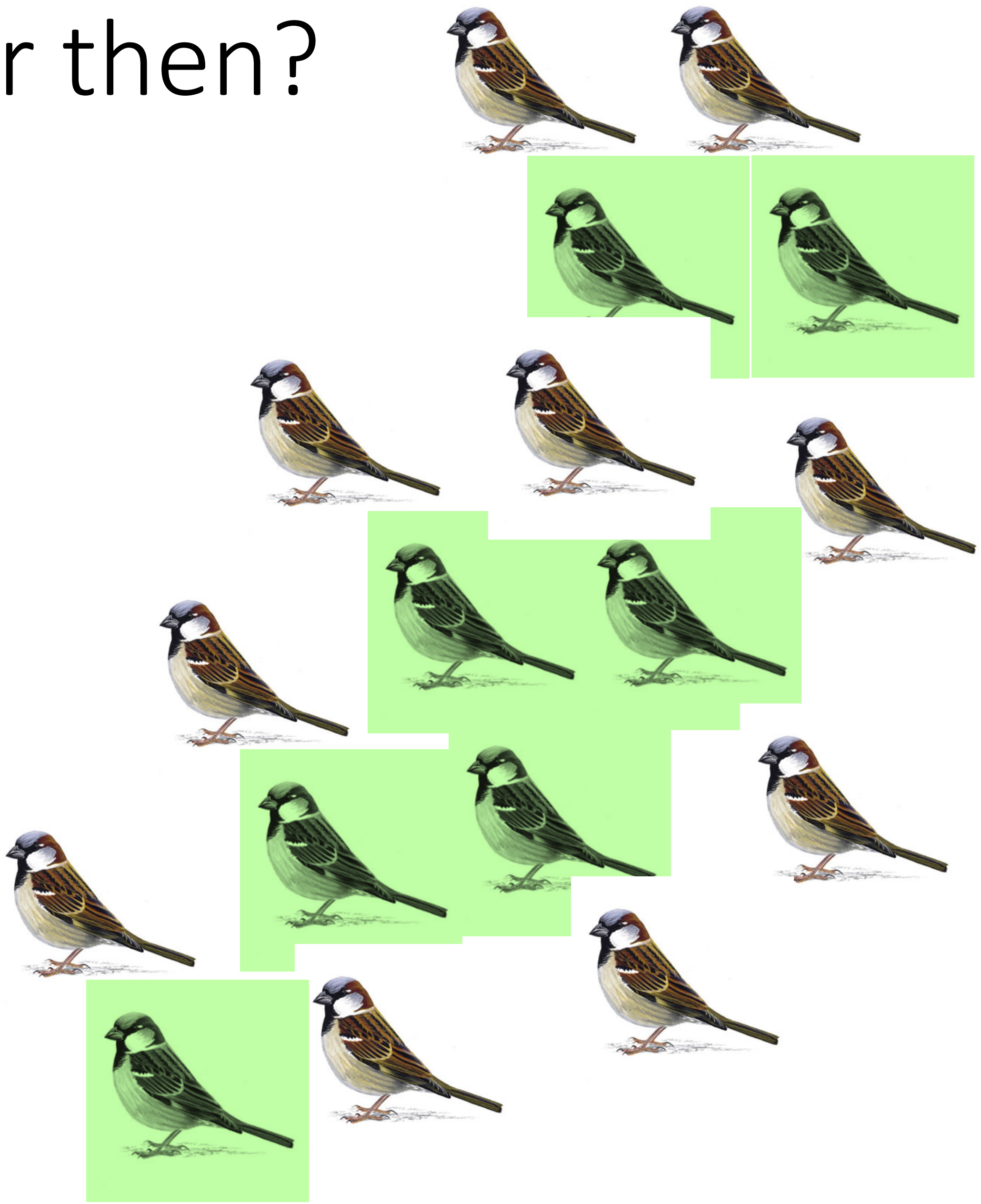
- How precise is the mean we calculate from a sample
- in comparison to the REAL mean?



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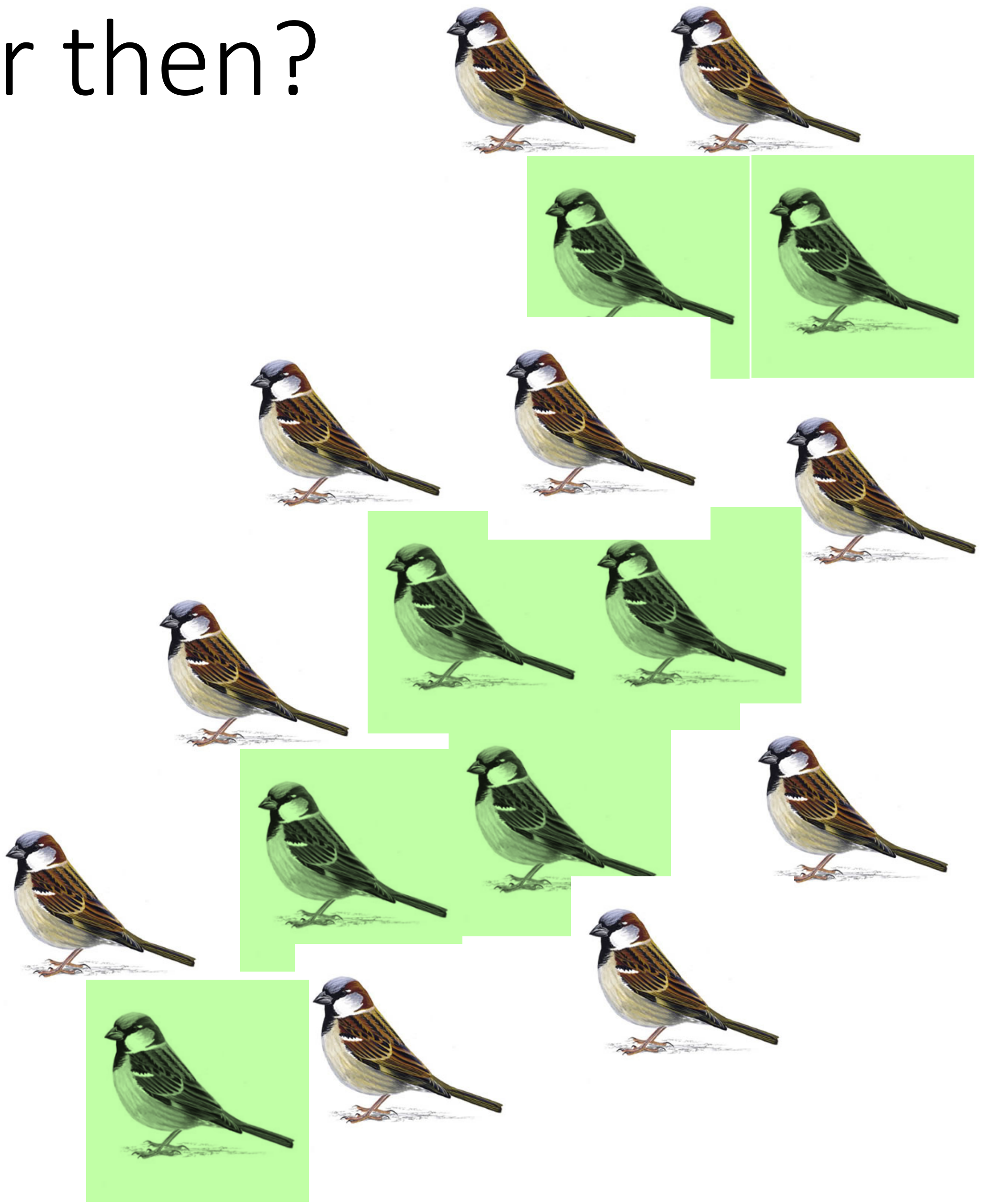

Exercise – DO IT NOW – HO 4

Exercise:

- Calculate the standard error of Tarsus, Mass, Wing and Bill length of the complete population sample (as opposed to all sparrows in this world)
- Note N of each.
- Then, subset the dataset to only 2001 data `d1<-subset(d, d$Year==2001)`
- Calculate SE for Tarsus, Tarsus, Mass, Wing and Bill length for the 2001 sample
- Present in a table on whiteboard!

- Extra points: can you find out the 95% (2.5 and 97.5 quantiles) of each variable?

```
sqrt(var(variable)/length(variable))
```

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By its squared term!

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- Guesstimate: 2 SE

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Learning aims:

- How to calculate SE
- SE is a measure of precision
- SE is dependent on sample size
- To improve precision, we have to improve sample size by the square value!
- 95CI and SE