MLW / KUHeS Statistics and R short course

Session 3 - Practical
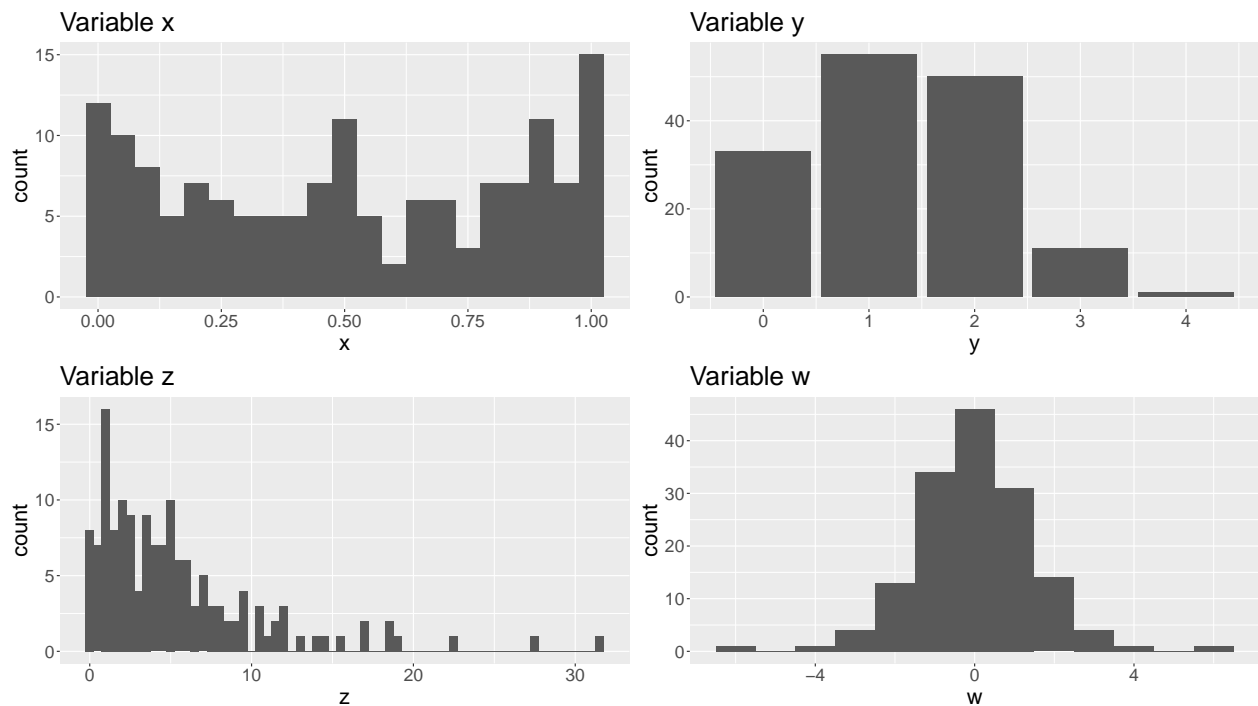
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01 November 2022

Session 3 - Practical

Exercise 1 - Distributions

Which distributions do you think gave rise to each of the variables displayed below?

Exercise 2 - Central Limit Theorem

In the lecture we saw how to empirically prove the CLT for the normal, beta and negative binomial distributions. Do the same now for the exponential and the Poisson distributions.

Exercise 3 - study design

Decide what design could be used to answer the following research questions:

1. What is the prevalence of HIV in urban Blantyre in 2018?
2. Do men experience higher mortality compared to women once they start ART?
3. Does smoking increase the chance of having lung cancer?
4. What is the effect of providing oral HIV self-test kits on the uptake of HIV testing?

5. What interventions may improve linkage to ART following community based HIV testing?

Exercise 4 - sample size calculation

Researchers want to estimate the effect of malnutrition in early childhood on body height at adult age. For this, the researchers recruit former participants of a childhood malnutrition cohort study. Recruited participants are known to have been malnourished or not at any point in the previous cohort study.

Assume a standard deviation of 6cm for height, power of 90%, significance level of 5% and equal group sizes (malnourished and non-malnourished groups). How many former cohort study participants will need to be recruited, if the researchers want to be powered to detect an average difference in height of 2cm or more?