Final Project Summary

Ali Nemati

Last compiled on 05 May, 2022 , 21:19:06

Contents

Report

Instructor: DR. Kourosh Ravvaz

By : Ali Nemati

UWM

Spring 2022

This app illustrates some fundamental concepts in logistic regression. We use Pus Cell, Age, and Blood Pressure to estimate the effect on the Chronic Kidney disease database.

1- Age

2- Blood Pressure:

Blood Pressure: Low : 80 or less

Blood Pressure: Mid : 80- 120

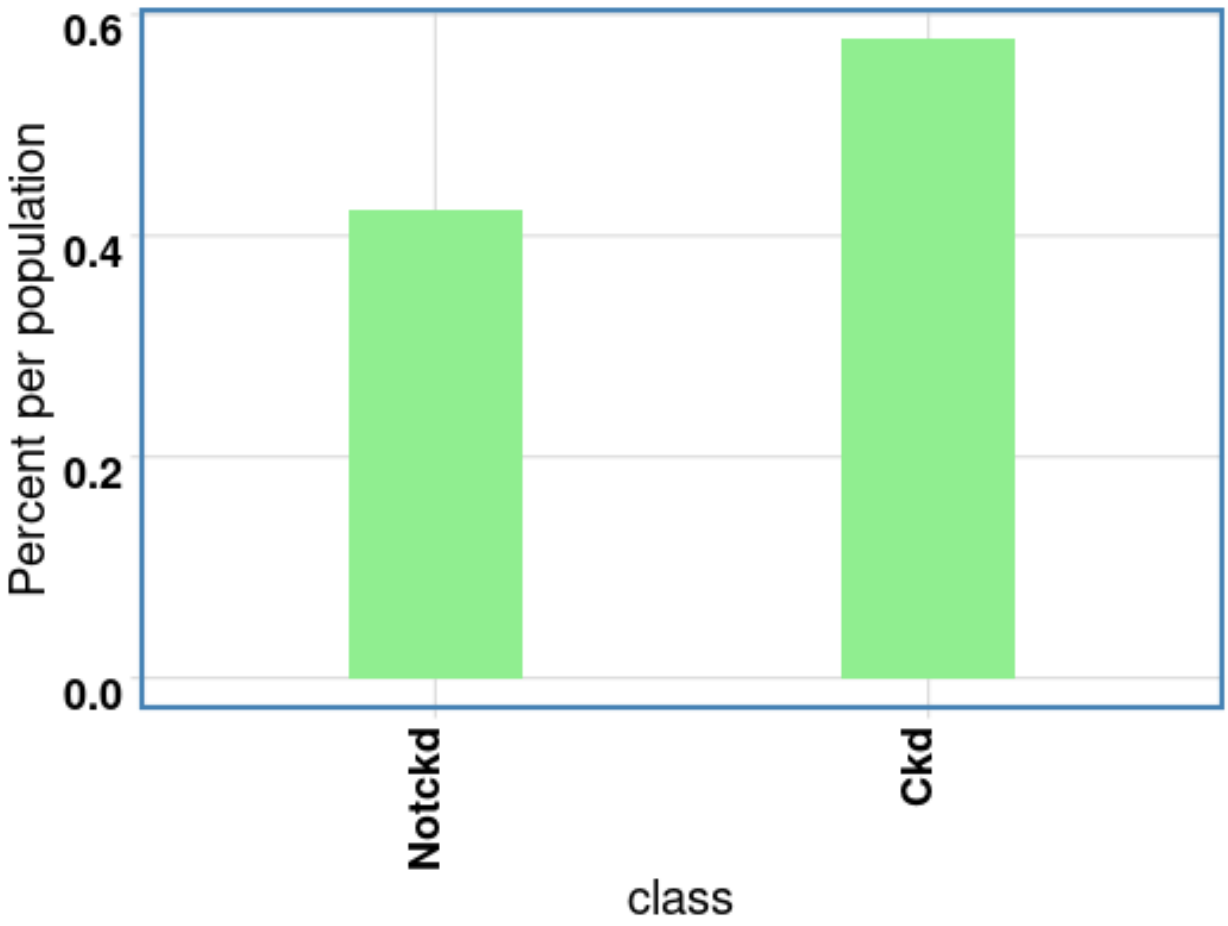
Blood Pressure: High : 120 or Above

3- Pus Cell: It consists of a buildup of dead, white blood cells that form when the body's immune system responds to the infection

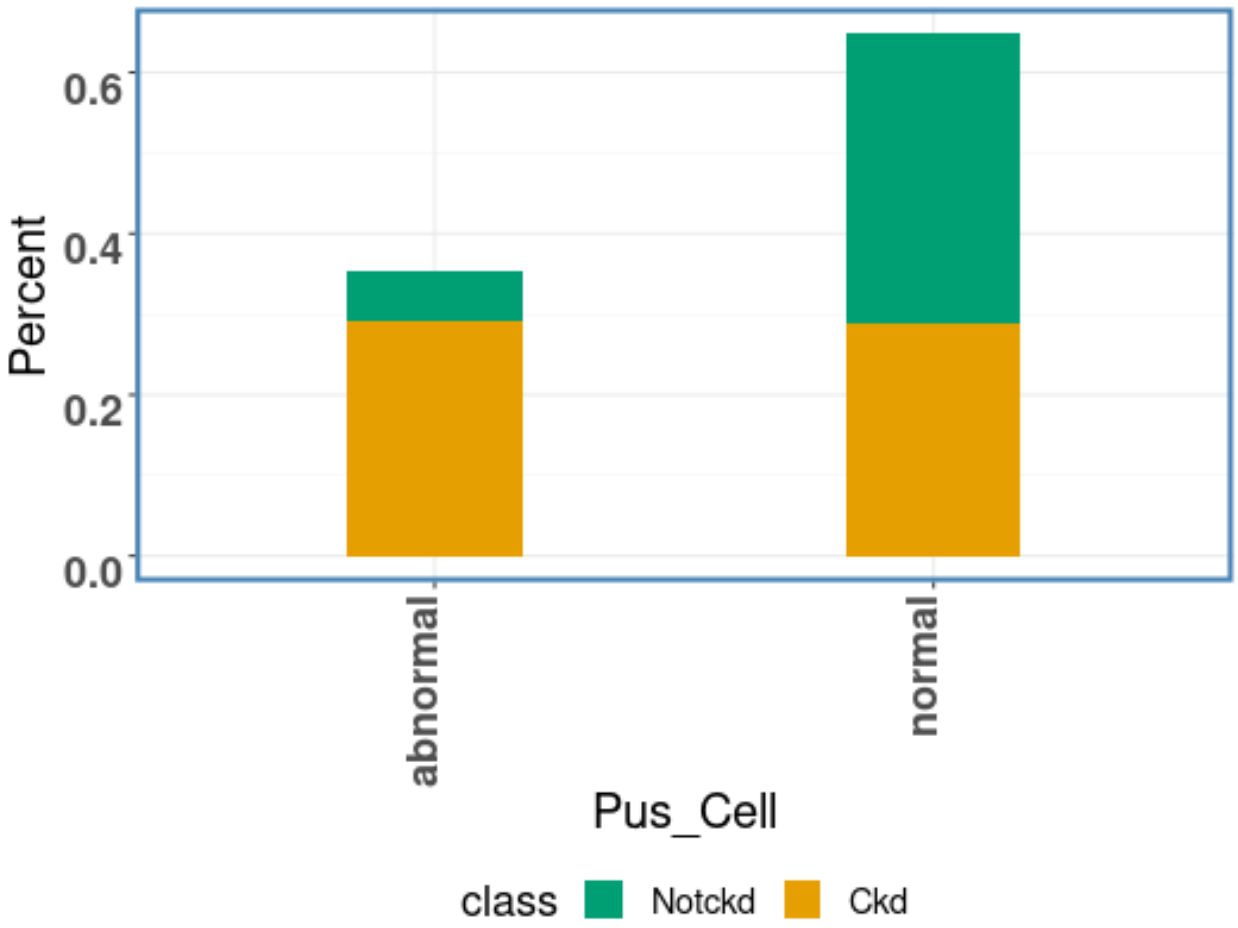
4- Class: CKD =1, NotCKD=0

	index	class	Age	Pus_Cell	blood_pressure
1	1	Ckd	59	abnormal	Low
2	2	Ckd	34	abnormal	Low
3	3	Ckd	54	abnormal	Low
4	4	Ckd	34	abnormal	Low
5	5	Ckd	57	abnormal	Low
6	6	Ckd	59	abnormal	Low
7	7	Ckd	62	abnormal	Low
8	8	Ckd	65	abnormal	Low
9	9	Ckd	69	abnormal	Low
10	10	Ckd	80	abnormal	Low
11	11	Ckd	45	abnormal	Mid
12	12	Ckd	45	abnormal	Mid
13	13	Ckd	54	abnormal	Mid
14	14	Ckd	54	abnormal	Mid
15	15	Ckd	67	abnormal	Mid
16	16	Ckd	68	abnormal	Mid
17	17	Ckd	73	abnormal	Mid
18	18	Ckd	46	abnormal	High
19	19	Ckd	50	abnormal	High

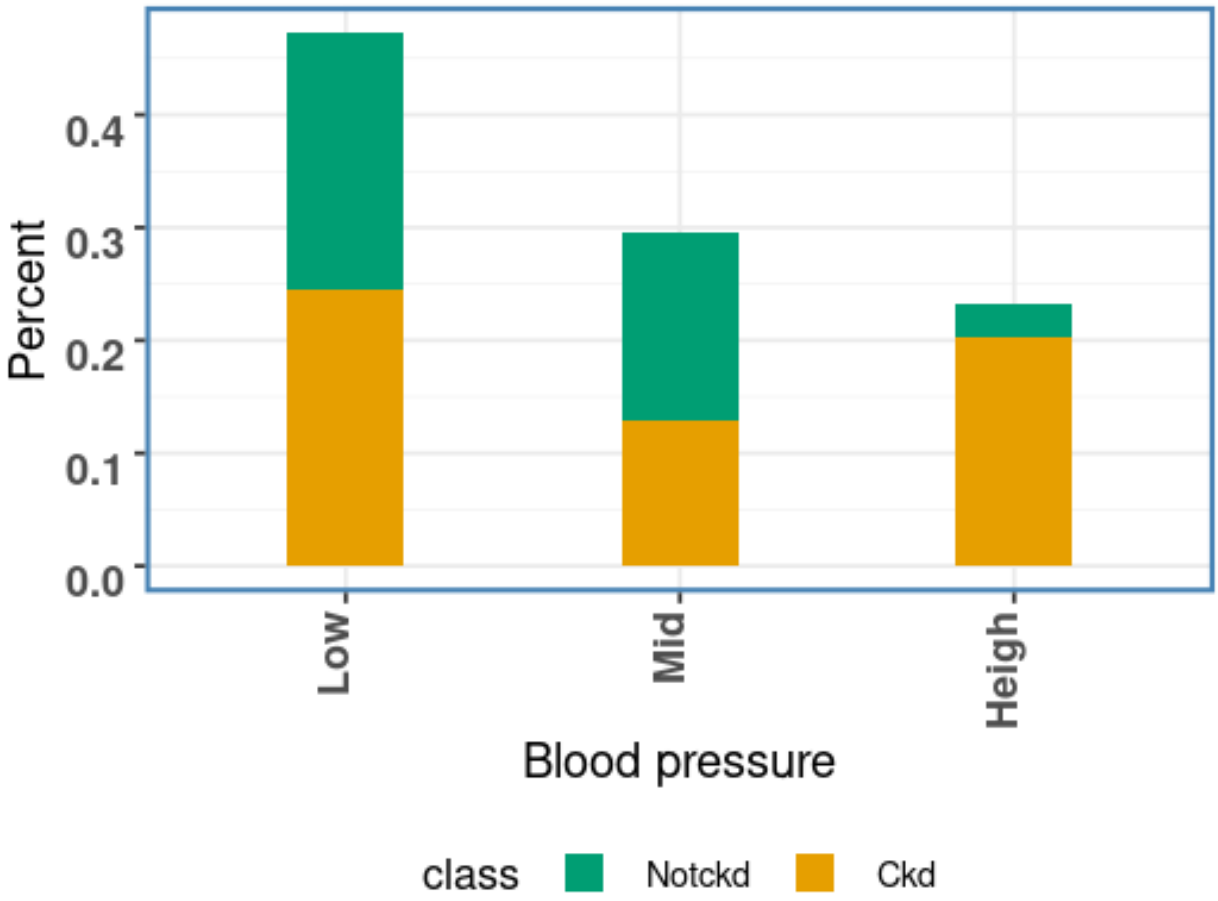
Class of the Chronic Kidney Disease :



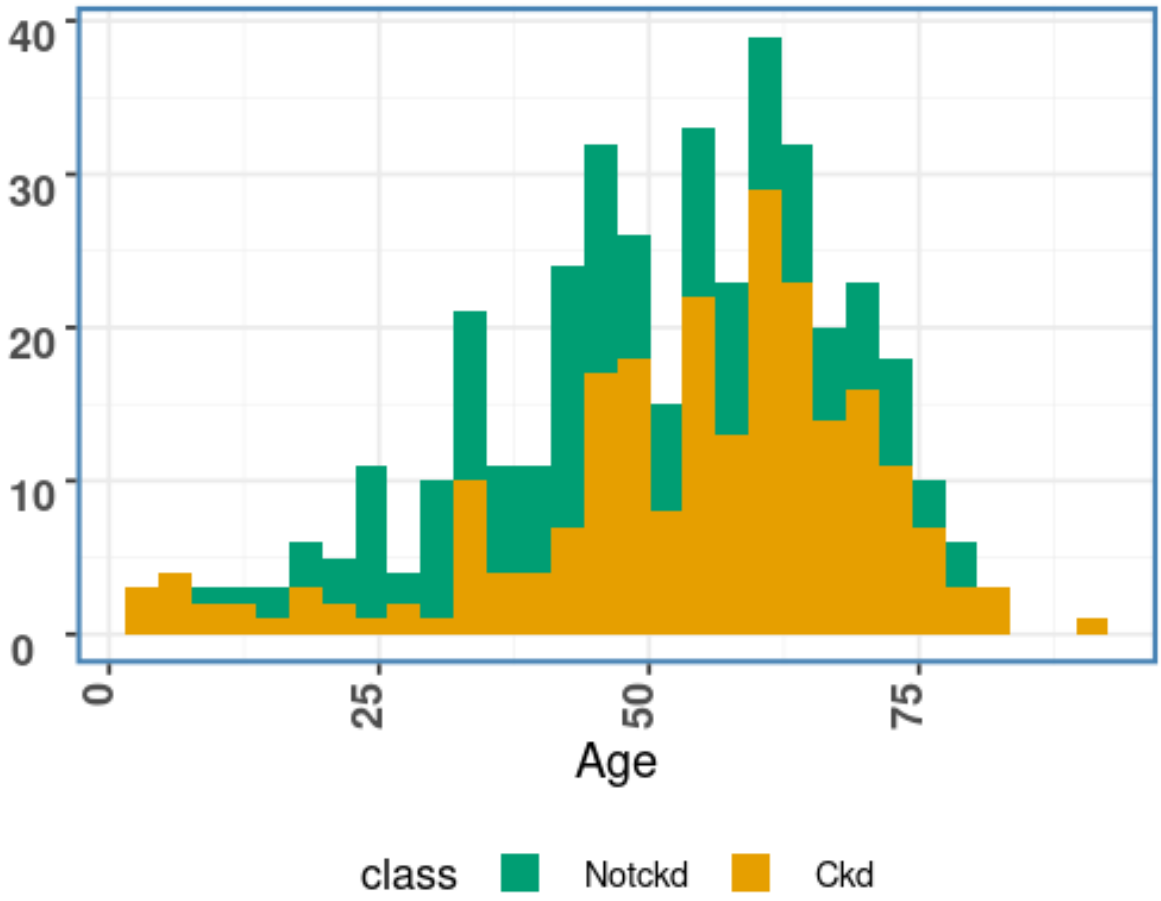
Chronic Kidney Disease Class by Pus Cell:



Blood Pressure by the Chronic Kidney Disease:



Chronic Kidney Disease by Age:



Hypertension is both a cause and result of chronic kidney disease (CKD) and affects the great majority of people with the disease. Controlling hypertension is critical in patients with CKD because it results in a slower course of the disease and a decreased risk of CVD. How many people have Chrinic Kidney diease? Who have a higher change to get Chrinic Kidney diease? what about Pus Cell & Age? On the left side you can see simple bar chart to get a first impression.

Test of Independence

H0: There is no association of one unit increase in blood pressure with chronic kidney disease risk.

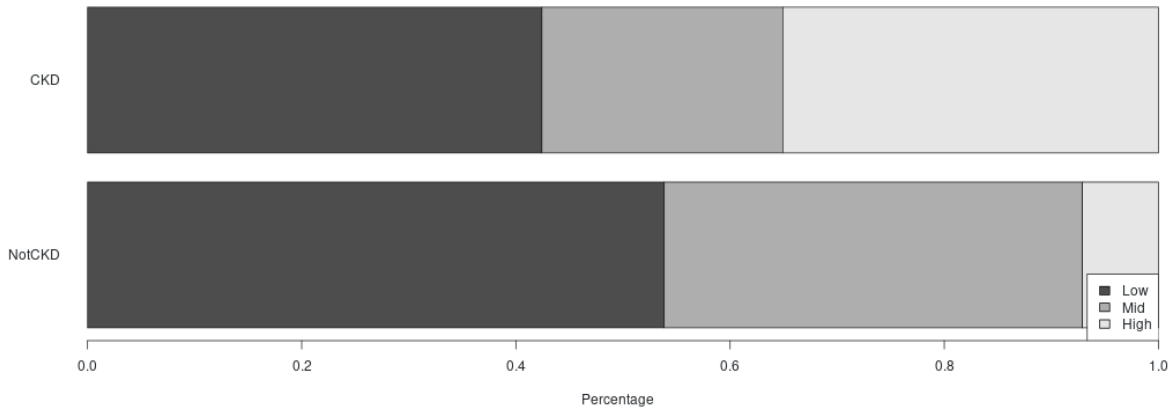
H1: There is association of one unit increase in blood pressure with chronic kidney disease risk.

Contingency table

	Low	Mid	High	Sum
CKD	98	52	81	231
NotCKD	91	66	12	169
Sum	189	118	93	400

Test result

	Test	X-squared	df	p-value
1	Pearson's Chi-squared	44.5747	2	2.092762e-10
2	Yates' Continuity Correction	44.5747	2	2.092762e-10
3	Log-likelihood Ratio (G)	49.6758	2	1.633194e-11
4	Fisher's Exact Test			2.046526e-11



Our Result is :

Because the P-value is clearly less than a = 0.05, we reject H0 and conclude that high blood pressure and Chronic Kidney disease are associated in the population.

Ref:

1. In-class Dr. Kourosh Ravvaz content, UWM, Spring 2022.
2. https://r4ds.had.co.nz/factors.html#:~:text=In%20R%2C%20factors%20are%20used,to%20work%20with%20than%20characters.
3. https://www.youtube.com/watch?v=xkRBfy8_2MU
4. https://r-coder.com/set-seed-r/
5. https://rmd4sci.njtierney.com/math.html
6. https://rpruim.github.io/s341/S19/from-class/MathinRmd.html
7. https://www.statology.org/interpret-glm-output-in-r/
8. https://bookdown.org/yihui/rmarkdown-cookbook/update-date.html
9. https://stats.oarc.ucla.edu/r/dae/logit-regression/
10. https://r-graph-gallery.com/boxplot.html
11. https://www.rdocumentation.org/packages/ggplot2/versions/1.0.1/topics/geom_bar
12. https://www.jmlr.org/papers/volume20/17-334/17-334.pdf
13. https://www.rdocumentation.org/packages/olsrr/versions/0.5.3
14. https://cran.r-project.org/web/packages/olsrr/vignettes/variable_selection.html
15. https://www.statisticshowto.com/probability-and-statistics/regression-analysis/rmse-root-mean-square-error/
16. https://www.machinelearningplus.com/machine-learning/complete-introduction-linear-regression-r/
17. https://www.machinelearningplus.com/machine-learning/complete-introduction-linear-regression-r/
18. https://www.geeksforgeeks.org/applying-a-function-over-an-object-in-r-programming-sapply-function/
19. https://www.statology.org/stepwise-regression-r/
20. https://r-statistics.co/Model-Selection-in-R.html

The best way to predict the future is to create it." Abraham Lincoln.

End of Document.