

# PROJECT PROGRESS REPORT



TOPIC:

PATIENTS REVIEWS ON SPECIFIC DRUGS

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# PROJECT SUMMARY

- UNDERSTANDING AND EXPLORING THE DATA
- CLEANING AND PRE-PROCESSING THE DATASET
- OBTAIN VALUABLE INSIGHTS USING DATA MINING APPROACHES SUCH AS SENTIMENT ANALYSIS
- EXAMINE USER REVIEWS WITHIN THE PHARMACEUTICAL FIELD
- INTERPRET THE RESULTS AND PROVIDE CONCLUSION

# UNDERSTANDING THE DATA

- PATIENT REVIEWS ON SPECIFIC DRUGS ALONG WITH RELATED CONDITIONS AND A 10 STAR PATIENT RATING REFLECTING OVERALL PATIENT SATISFACTION.

## ATTRIBUTES INFORMATION

- **DRUG NAME** (CATEGORICAL): NAME OF DRUG
- **CONDITION** (CATEGORICAL): NAME OF CONDITION
- **REVIEW** (TEXT): PATIENT REVIEW
- **RATING** (NUMERICAL): 10 STAR PATIENT RATING
- **DATE** (DATE): DATE OF REVIEW ENTRY
- **USEFUL COUNT** (NUMERICAL): NUMBER OF USERS WHO FOUND A REVIEW USEFUL

# UNDERSTANDING THE DATA

## SNAPSHOT OF DATASET AND ATTRIBUTES

	i..	drugName	condition	review	rating	date	usefulCount
1	206461	Valsartan	Left Ventricular Dysfunction	"It has no side effect, I take it in combination of Bystolic 5 M...	9	May 20, 2012	27
2	95260	Guanfacine	ADHD	"My son is halfway through his fourth week of Intuniv. We be...	8	April 27, 2010	192
3	92703	Lybrel	Birth Control	"I used to take another oral contraceptive, which had 21 pill ...	5	December 14, 2009	17
4	138000	Ortho Evra	Birth Control	"This is my first time using any form of birth control. I&#039;...	8	November 3, 2015	10
5	35696	Buprenorphine / naloxone	Opiate Dependence	"Suboxone has completely turned my life around. I feel healt...	9	November 27, 2016	37
6	155963	Cialis	Benign Prostatic Hyperplasia	"2nd day on 5mg started to work with rock hard erections h...	2	November 28, 2015	43
7	165907	Levonorgestrel	Emergency Contraception	"He pulled out, but he cummed a bit in me. I took the Plan B ...	1	March 7, 2017	5
8	102654	Aripiprazole	Bipolar Disorde	"Abilify changed my life. There is hope. I was on Zoloft and ...	10	March 14, 2015	32
9	74811	Keppra	Epilepsy	" I Ve had nothing but problems with the Keppera : constant...	1	August 9, 2016	11
10	48928	Ethinyl estradiol / levonorgestrel	Birth Control	"I had been on the pill for many years. When my doctor cha...	8	December 8, 2016	1
11	29607	Topiramate	Migraine Prevention	"I have been on this medication almost two weeks, started o...	9	January 1, 2015	19
12	75612	L-methylfolate	Depression	"I have taken anti-depressants for years, with some improve...	10	March 9, 2017	54
13	191290	Pentasa	Crohn's Disease	"I had Crohn&#039;s with a resection 30 years ago and have...	4	July 6, 2013	8
14	221320	Dextromethorphan	Cough	"Have a little bit of a lingering cough from a cold. Not givin...	4	September 7, 2017	1
15	98494	Nexplanon	Birth Control	"Started Nexplanon 2 months ago because I have a minimal ...	3	August 7, 2014	10

# EXPLORING THE DATA

## Preliminary Data Exploration

### Common Conditions

	condition	conditionCount
1	Birth Control	38436
2	Depression	12164
3	Pain	8245
4	Anxiety	7812
5	Acne	7435
6	Bipolar Disorder	5604
7	Insomnia	4904
8	Weight Loss	4857
9	Obesity	4757
10	ADHD	4509
11	Diabetes, Type 2	3362
12	Emergency Contraception	3290
13	High Blood Pressure	3104
14	Vaginal Yeast Infection	3085
15	Abnormal Uterine Bleeding	2744
16	Bowel Preparation	2498
17	Smoking Cessation	2440
18	fibromyalgia	2370
19	Migraine	2277
20	Anxiety and Stress	2236

### Least Common Conditions

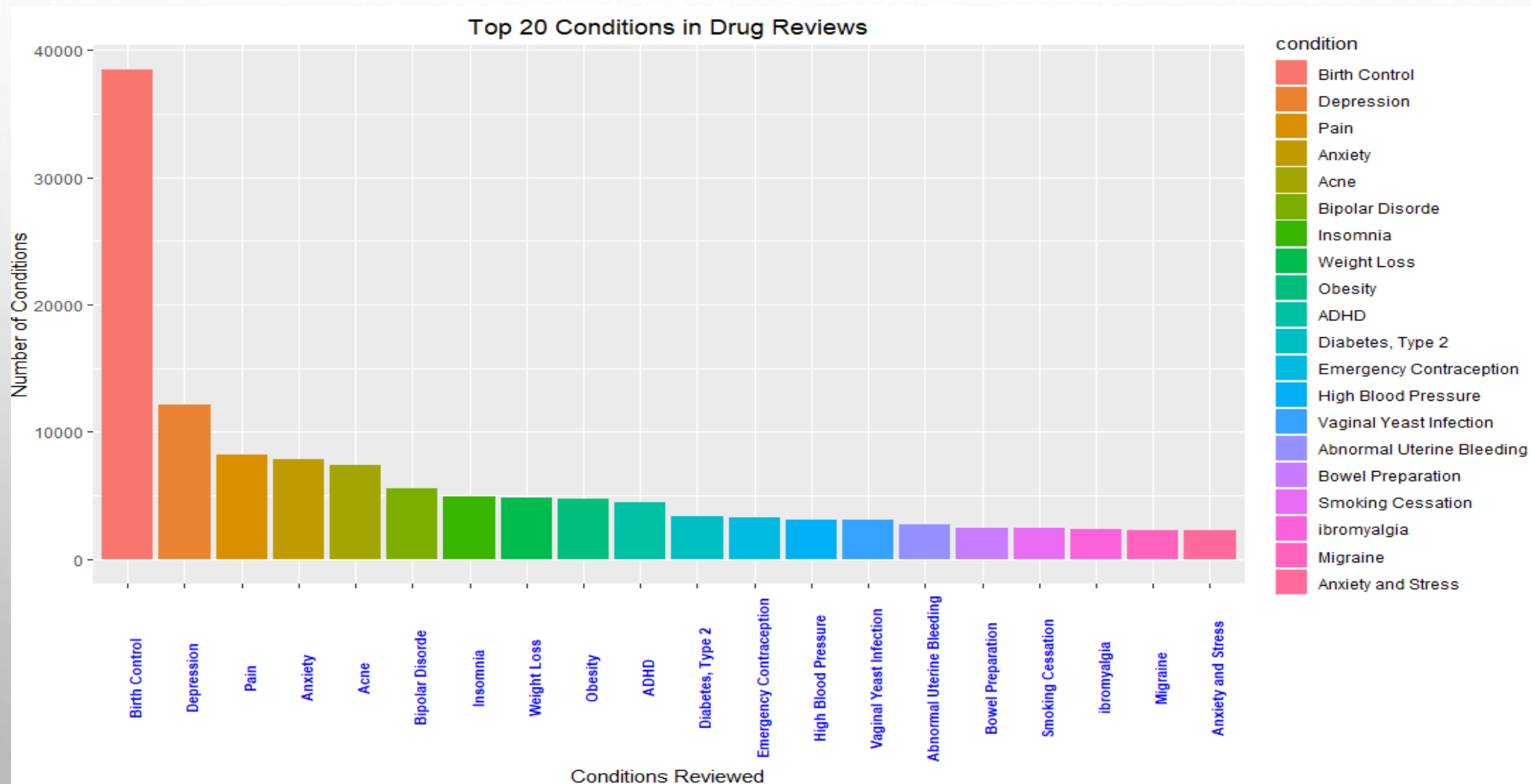
	condition	conditionCount
898	Short Stature for Age	1
899	Somat	1
900	Somatoform Pain Disorder	1
901	Sporotrichosis	1
902	Steroid Responsive Inflammatory Conditions	1
903	Systemic Candidiasis	1
904	Thyroid Suppression Test	1
905	Tinea Barbae	1
906	Transverse Myelitis	1
907	Tuberculosis, Active	1
908	Tympanostomy Tube Placement Surgery	1
909	Uveitis, Posterior	1
910	Wilson's Disease	1
911	Women (minoxidil)	1
912	Wound Cleansing	1
913	Yellow Fever Prophylaxis	1
914	Licellar Lymphoma	1
915	functional Gastric Disorder	1
916	ungal Infection Prophylaxis	1
917	ungal Pneumonia	1



# EXPLORING THE DATA

## Preliminary Data Exploration

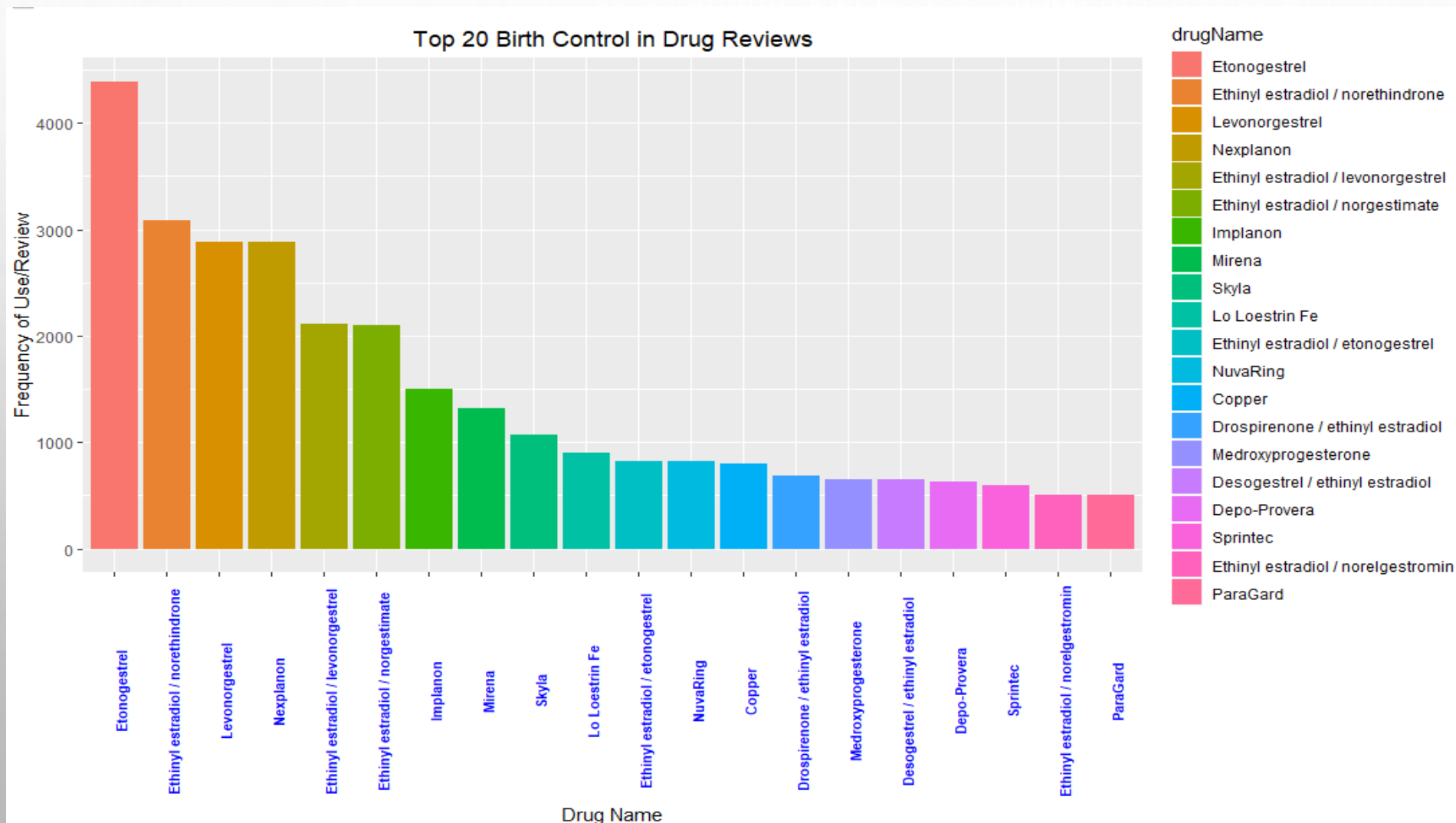
### Common Conditions



# EXPLORING THE DATA

## Preliminary Data Exploration

### Common Birth Control Drugs

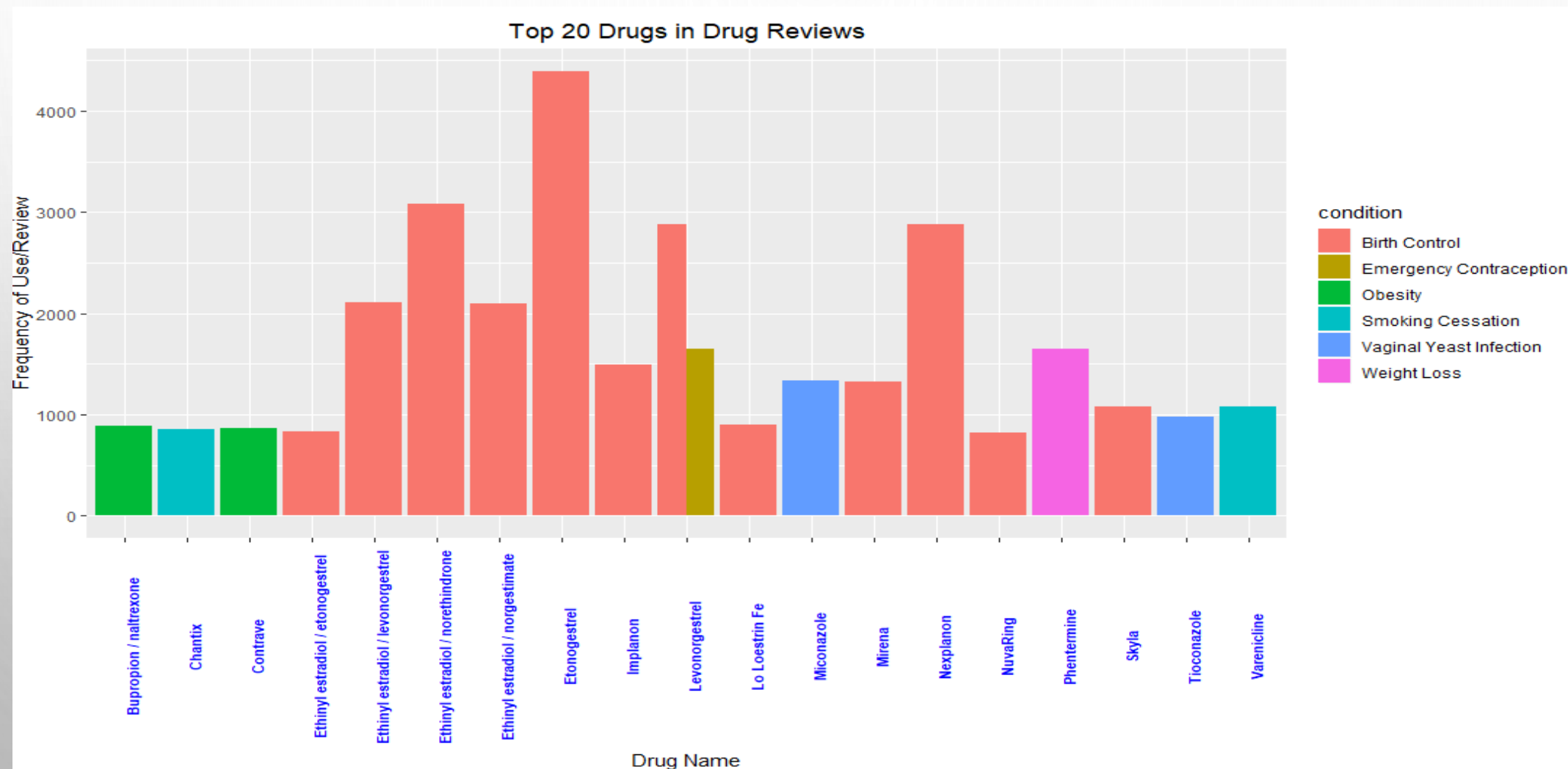


	condition	drugName	drugCount
1	Birth Control	Etonogestrel	4394
2	Birth Control	Ethinyl estradiol / norethindrone	3081
3	Birth Control	Levonorgestrel	2884
4	Birth Control	Nexplanon	2883
5	Birth Control	Ethinyl estradiol / levonorgestrel	2107
6	Birth Control	Ethinyl estradiol / norgestimate	2097
7	Birth Control	Implanon	1496
8	Birth Control	Mirena	1320
9	Birth Control	Skyla	1074
10	Birth Control	Lo Loestrin Fe	896
11	Birth Control	Ethinyl estradiol / etonogestrel	827
12	Birth Control	NuvaRing	824
13	Birth Control	Copper	800
14	Birth Control	Drospirenone / ethinyl estradiol	685
15	Birth Control	Medroxyprogesterone	656
16	Birth Control	Desogestrel / ethinyl estradiol	655
17	Birth Control	Depo-Provera	633
18	Birth Control	Sprintec	598
19	Birth Control	Ethinyl estradiol / norelgestromin	508
20	Birth Control	ParaGard	508

# EXPLORING THE DATA

## Preliminary Data Exploration

### Top 20 Drugs by conditions

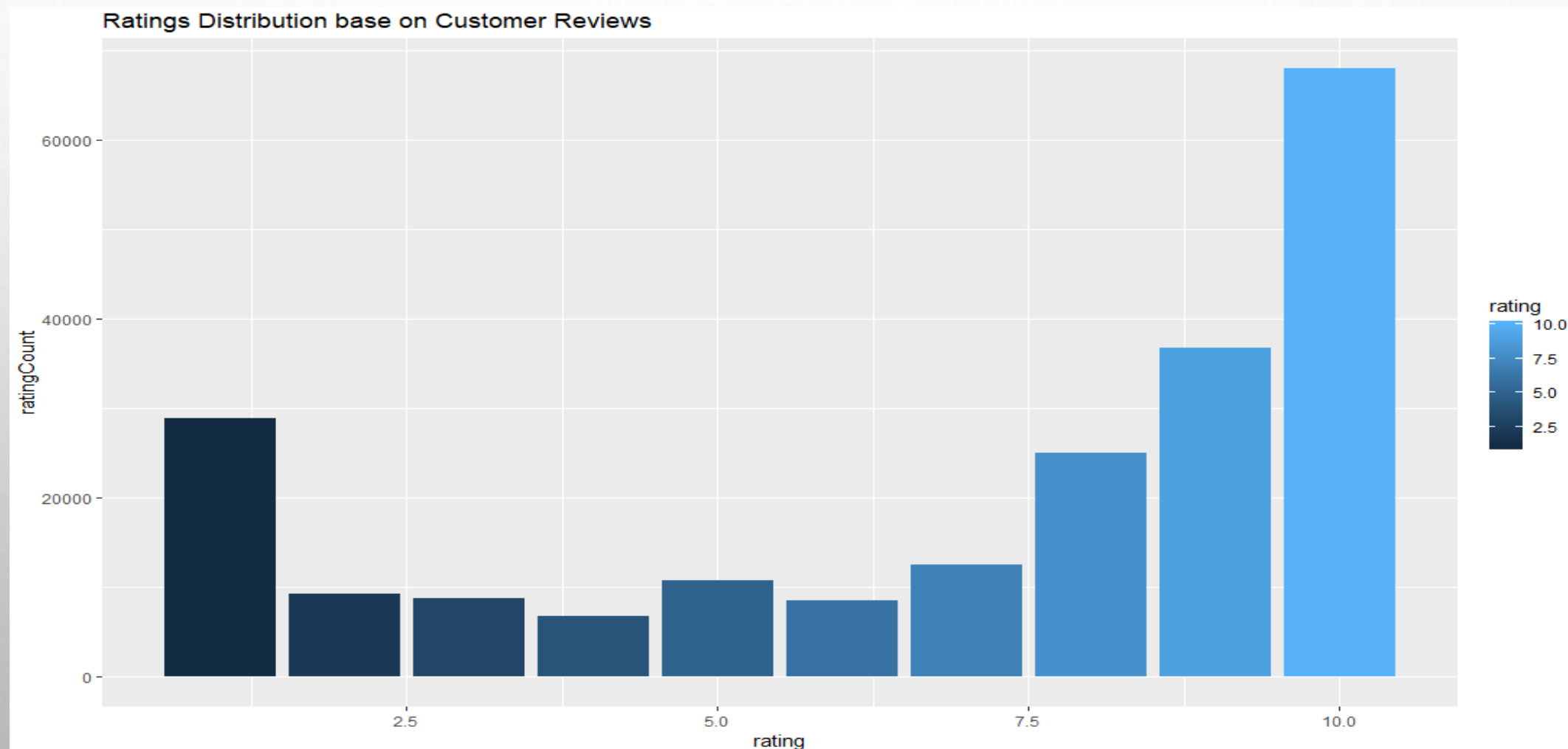




# EXPLORING THE DATA

## Preliminary Data Exploration

### *Customers Rating Distribution*

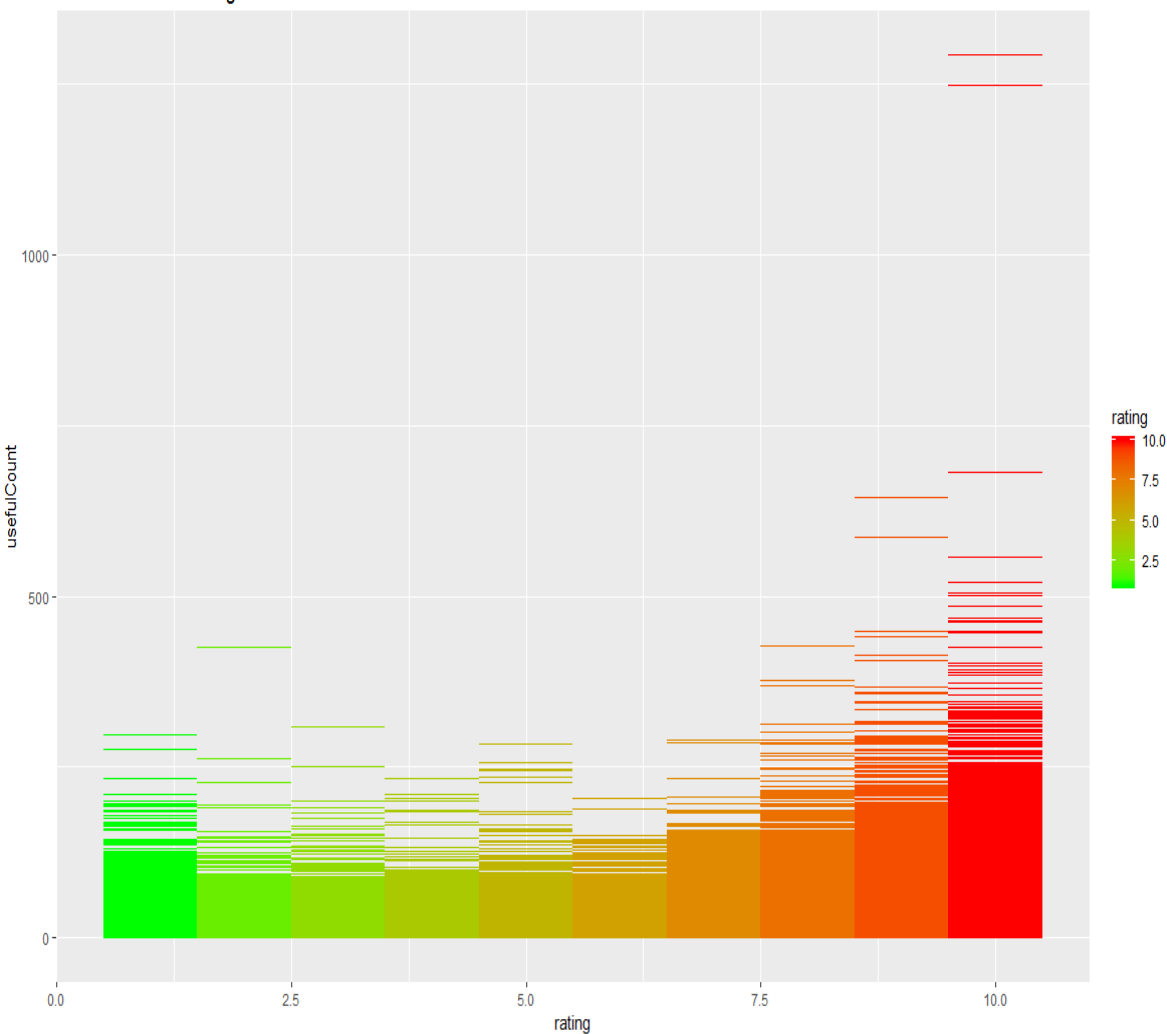


# EXPLORING THE DATA

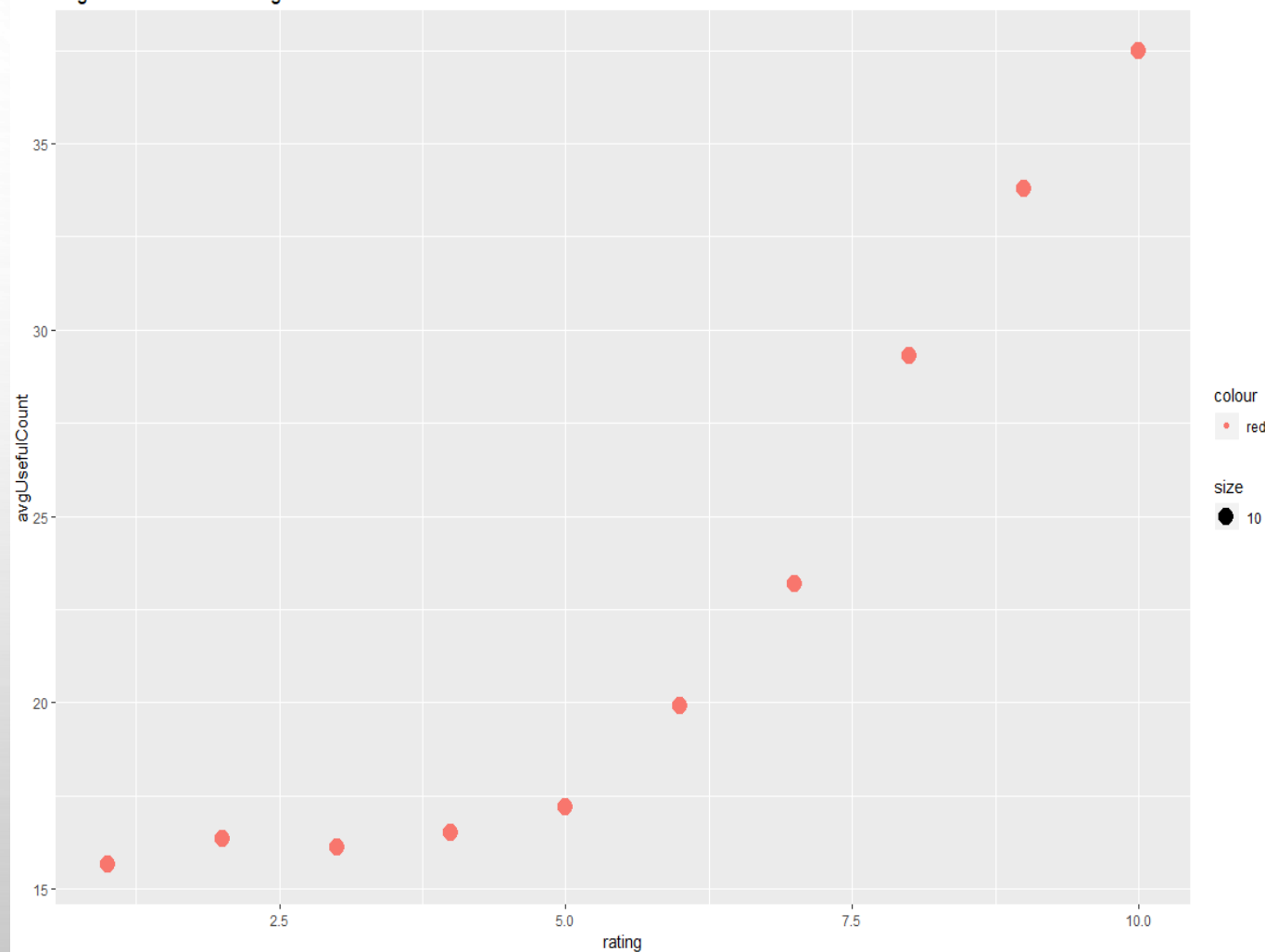
## Preliminary Data Exploration

### Customers Rating Distribution

UsefulCount vs Rating Distribution



AvgUsefulCount vs Rating Distribution



# SENTIMENT ANALYSIS



## READ AND CLEAN OUR DATA



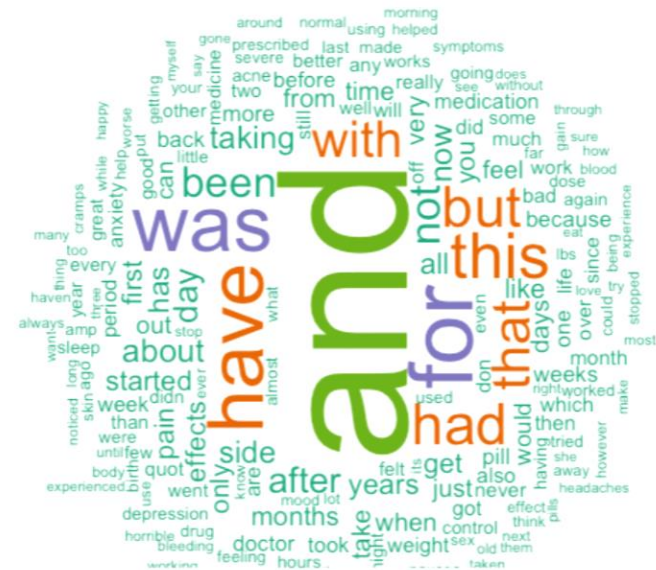
## RELIABILITY OF OUR ANALYSIS



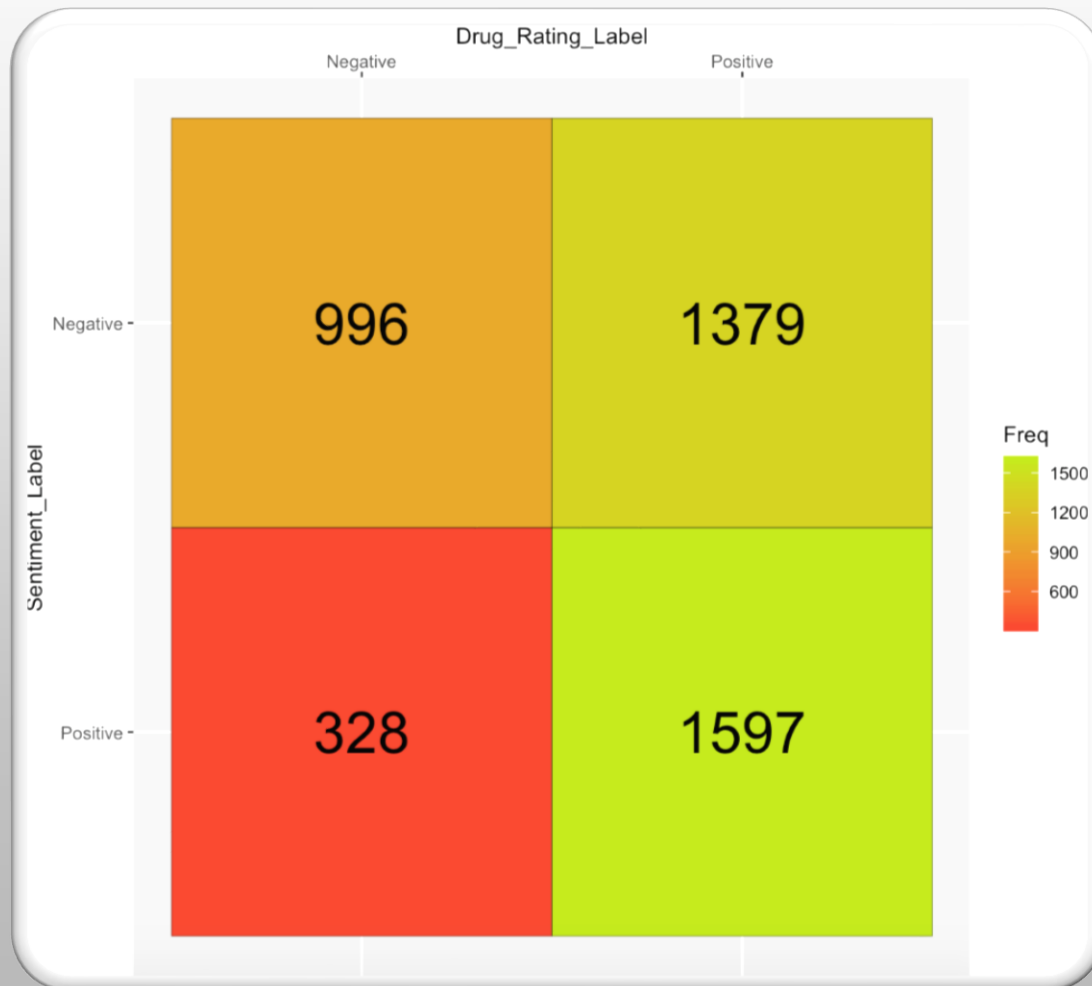
## POSITIVE AND NEGATIVE OUTCOMES FOR OUR DRUG REVIEWS



## RECOMMENDATIONS



# Confusion Matrix For Sentiment



ACCURACY : 0.6016  
95% CI : (0.5868, 0.6163)  
NO INFORMATION RATE : 0.5677  
P-VALUE [ACC > NIR] : 3.496E-06

KAPPA : 0.2419

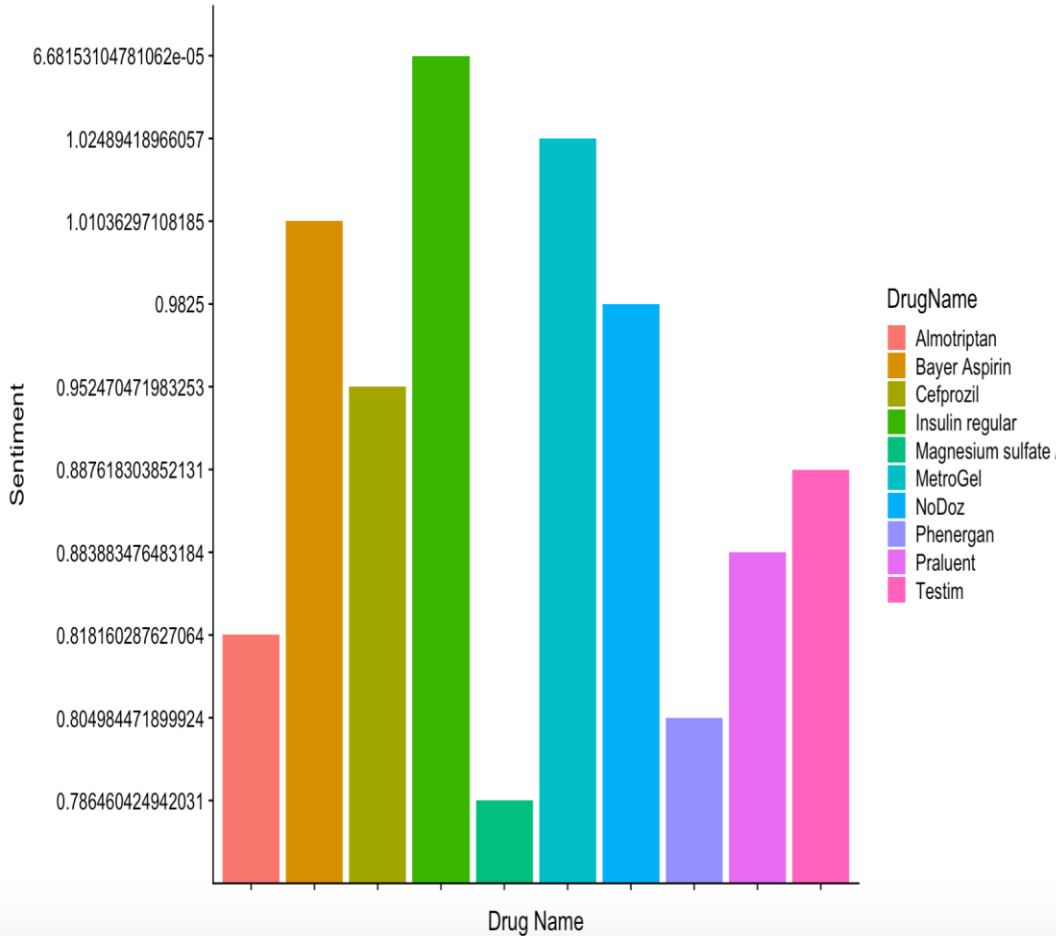
MCNEMAR'S TEST P-VALUE : < 2.2E-16

SENSITIVITY : 0.4236  
SPECIFICITY : 0.8354  
POS PRED VALUE : 0.7716  
NEG PRED VALUE : 0.5247  
PREVALENCE : 0.5677  
DETECTION RATE : 0.2405  
DETECTION PREVALENCE : 0.3116  
BALANCED ACCURACY : 0.6295

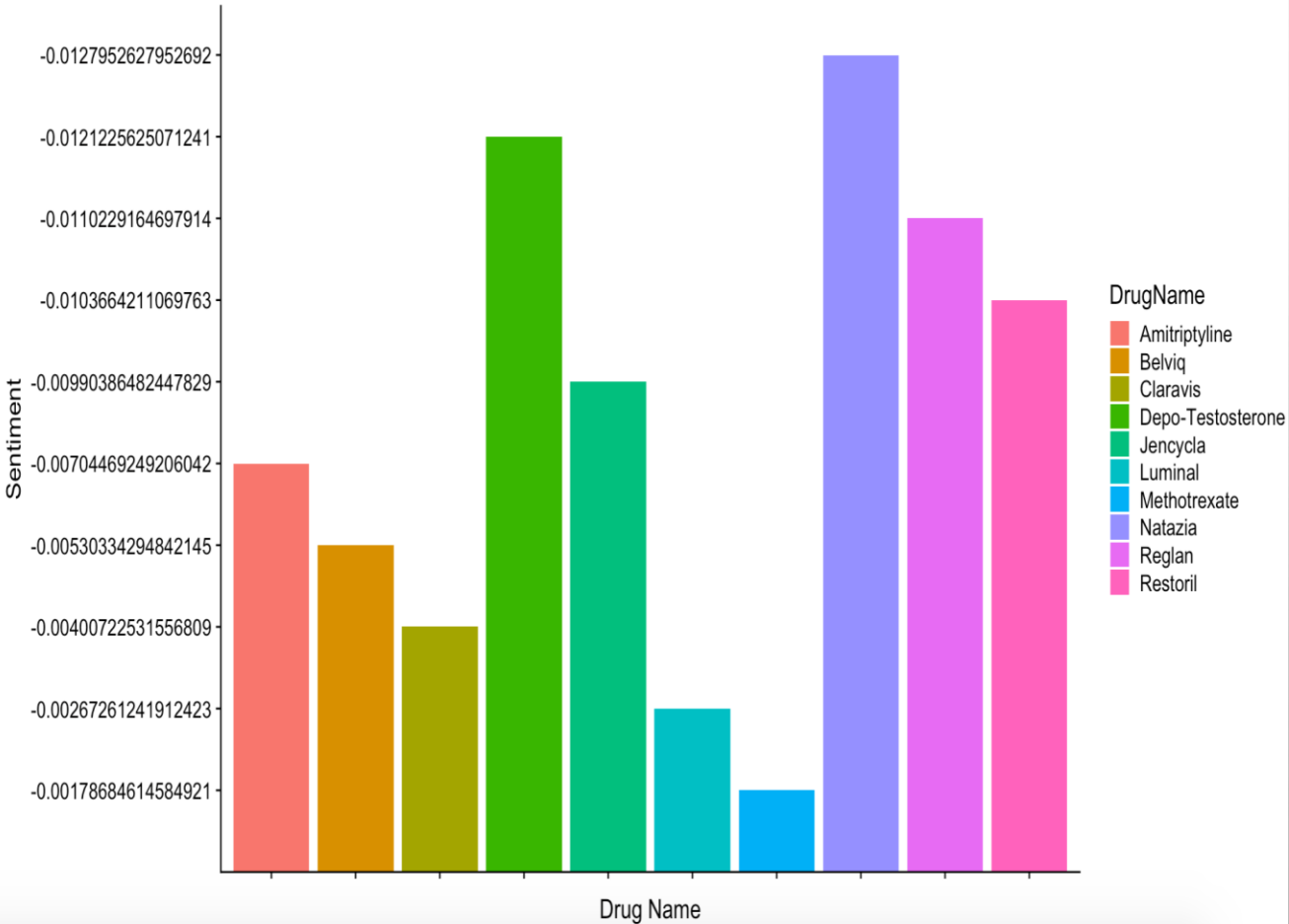
'POSITIVE' CLASS : NEGATIVE

# SENTIMENT AGAINST DRUGS

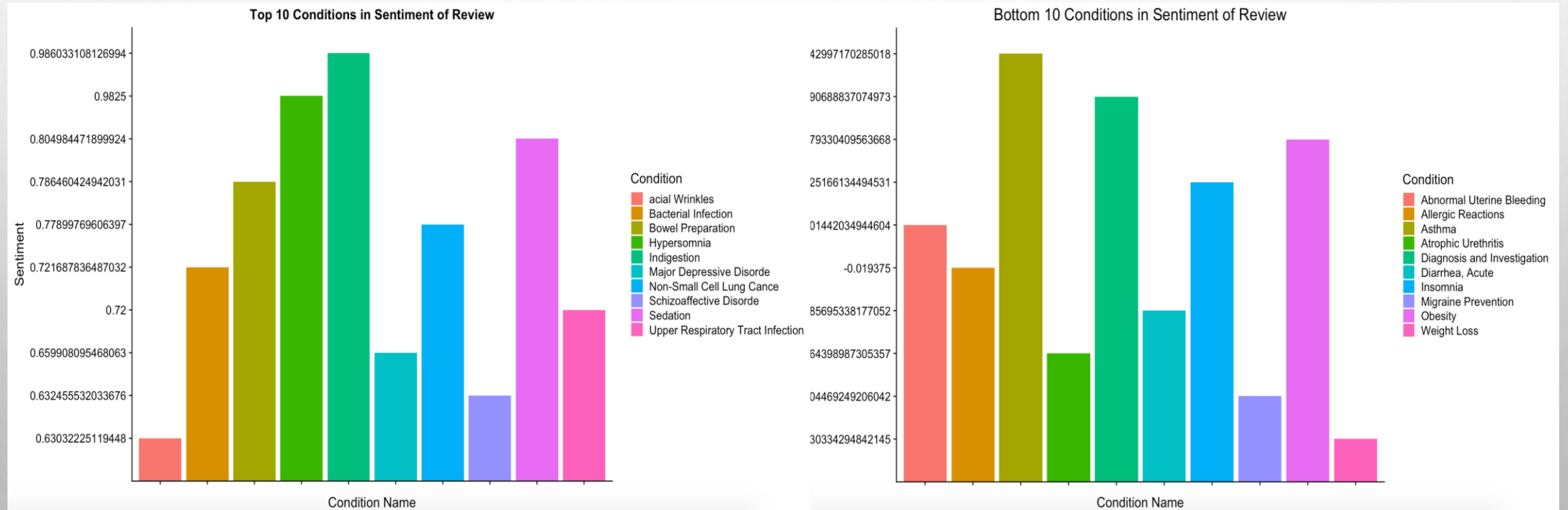
Top 10 Drugs in Sentiment of Review



Bottom 10 Drugs in Sentiment of Review



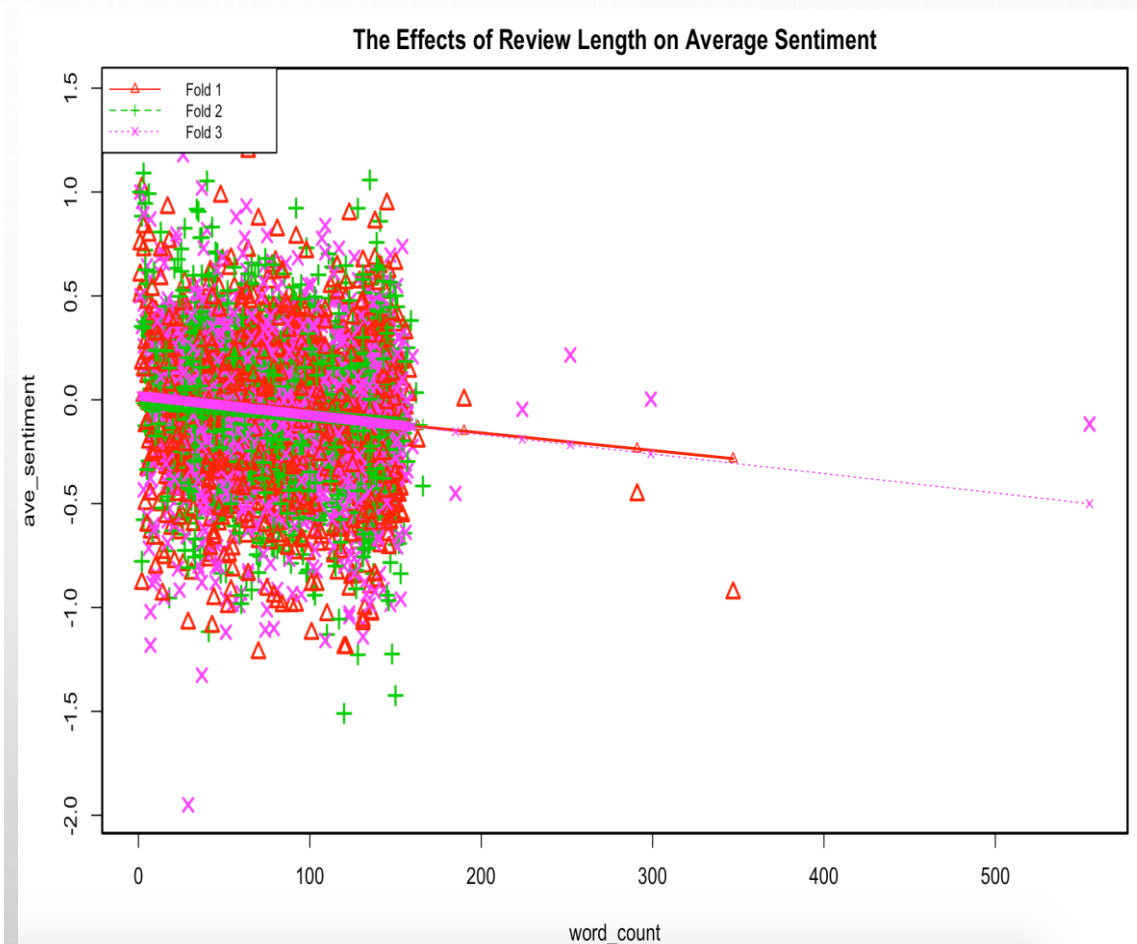
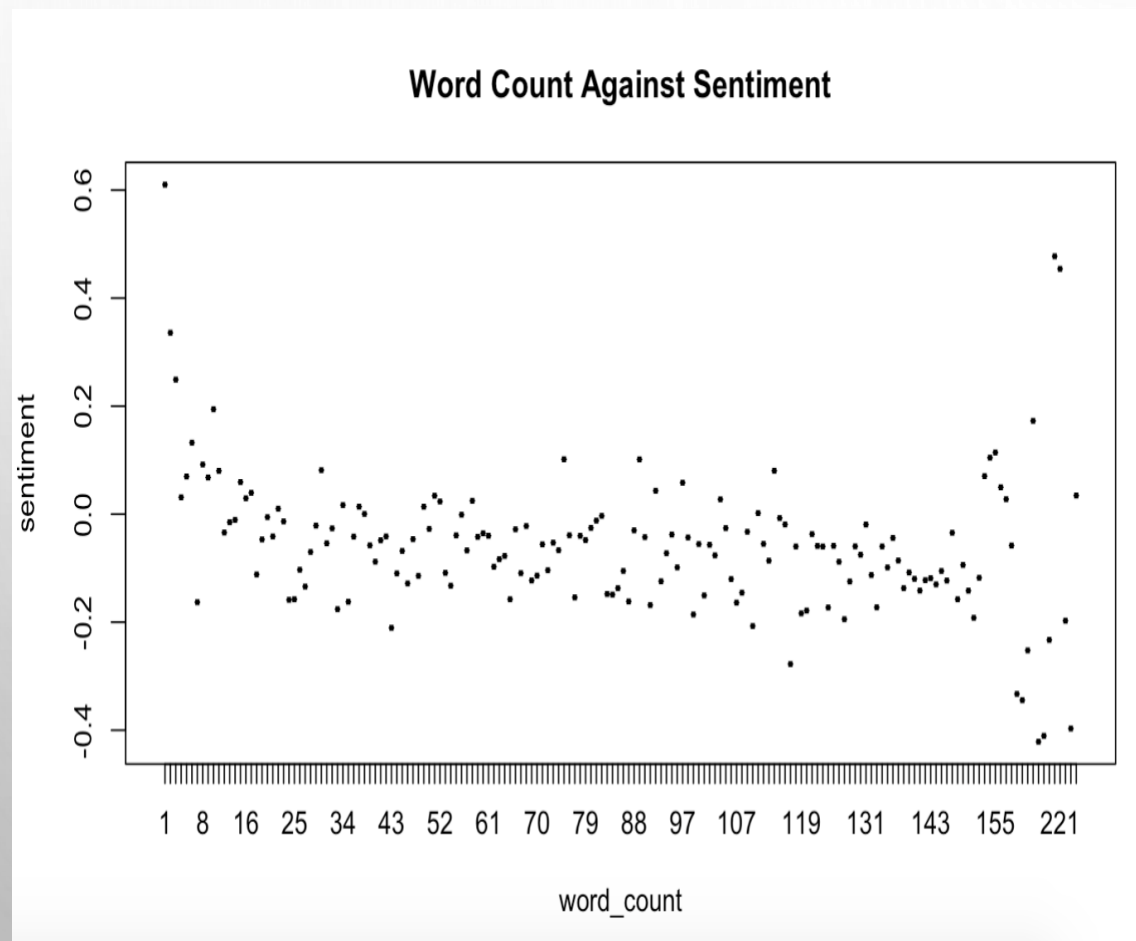
# SENTIMENT AGAINST CONDITIONS





# SENTIMENT ANALYSIS

## *Sentiment analysis plot*



# QUESTIONS

