Road_condition_Defect_based.R

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2021-12-12

```
library("dplyr")
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
#install.packages('purrr')
#install.packages("janitor")
library(janitor)
```

```
##
## Attaching package: 'janitor'
```

```
## The following objects are masked from 'package:stats':
##
##     chisq.test, fisher.test
```

```
library('purrr')
library(ggplot2)
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v tibble  3.1.3     v stringr 1.4.0
## v tidyr   1.1.4     v forcats 0.5.1
## v readr   1.4.0
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```r
library("reshape2")
```

```
##
## Attaching package: 'reshape2'
```

```
## The following object is masked from 'package:tidyr':
##
##     smiths
```

```r
setwd("C://Users//shaun//OneDrive//Desktop//Academics//Sem-5//Foundation of Data Analytics 3505//J-comp/
road_condition = read.csv("Road_condition.csv")
road_condition =  road_condition[1:36,2:98]
road_condition = road_condition %>% arrange(State..UT)
road_condition = road_condition[-c(9,6,10,8),]
#View(road_condition)
sum(is.na(road_condition))
```

```
## [1] 0
```

```r
dim(road_condition)
```

```
## [1] 32 97
```

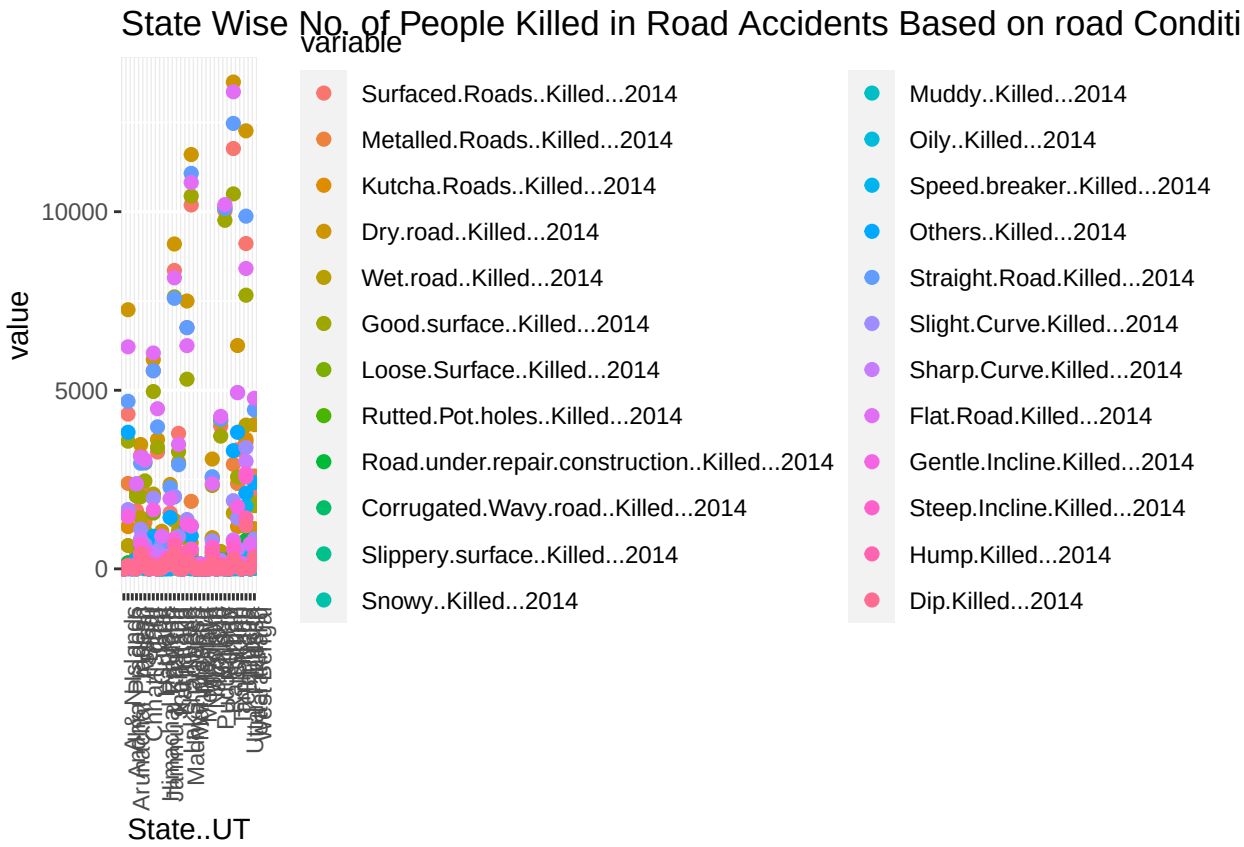
```r
colnames(road_condition)
```

```
##  [1] "State..UT"
##  [2] "Surfaced.Roads.Accident...2014"
##  [3] "Surfaced.Roads..Killed...2014"
##  [4] "Surfaced.Roads.Injured...2014"
##  [5] "Metalled.Roads.Accident...2014"
##  [6] "Metalled.Roads..Killed...2014"
##  [7] "Metalled.Roads.Injured...2014"
##  [8] "Kutcha.Roads.Accident...2014"
##  [9] "Kutcha.Roads..Killed...2014"
## [10] "Kutcha.Roads.Injured...2014"
## [11] "Dry.road.Accident...2014"
## [12] "Dry.road..Killed...2014"
## [13] "Dry.road.Injured...2014"
## [14] "Wet.road.Accident...2014"
## [15] "Wet.road..Killed...2014"
## [16] "Wet.road.Injured...2014"
## [17] "Good.surface.Accident...2014"
## [18] "Good.surface..Killed...2014"
## [19] "Good.surface.Injured...2014"
## [20] "Loose.Surface.Accident...2014"
## [21] "Loose.Surface..Killed...2014"
## [22] "Loose.Surface.Injured...2014"
## [23] "Rutted.Pot.holes.Accident...2014"
## [24] "Rutted.Pot.holes..Killed...2014"
## [25] "Rutted.Pot.holes.Injured...2014"
```

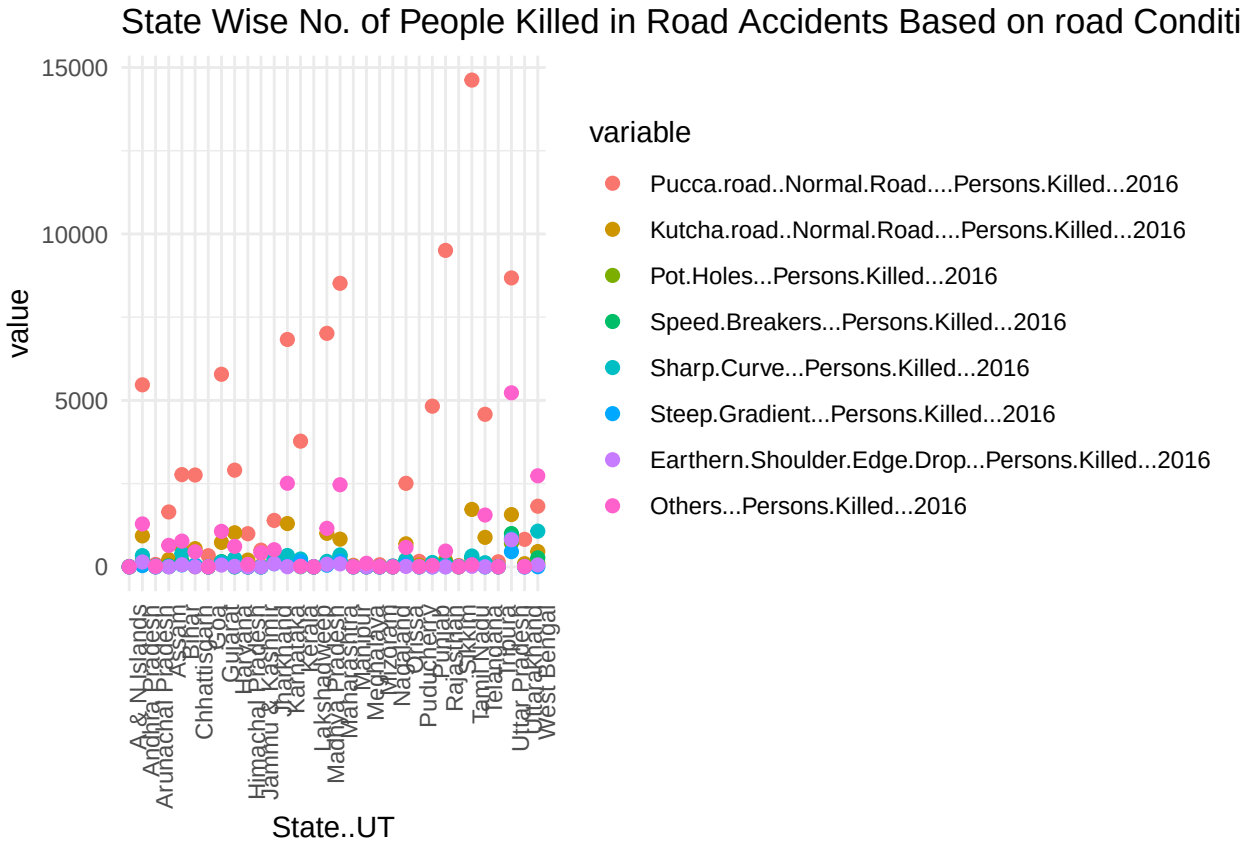
```
## [26] "Road.under.repair.construction.Accident...2014"
## [27] "Road.under.repair.construction..Killed...2014"
## [28] "Road.under.repair.construction.Injured...2014"
## [29] "Corrugated.Wavy.road.Accident...2014"
## [30] "Corrugated.Wavy.road..Killed...2014"
## [31] "Corrugated.Wavy.road.Injured...2014"
## [32] "Slippery.surface.Accident...2014"
## [33] "Slippery.surface..Killed...2014"
## [34] "Slippery.surface.Injured...2014"
## [35] "Snowy.Accident...2014"
## [36] "Snowy..Killed...2014"
## [37] "Snowy.Injured...2014"
## [38] "Muddy.Accident...2014"
## [39] "Muddy..Killed...2014"
## [40] "Muddy.Injured...2014"
## [41] "Oily.Accident...2014"
## [42] "Oily..Killed...2014"
## [43] "Oily.Injured...2014"
## [44] "Speed.breaker.Accident...2014"
## [45] "Speed.breaker..Killed...2014"
## [46] "Speed.breaker.Injured...2014"
## [47] "Others.Accident...2014"
## [48] "Others..Killed...2014"
## [49] "Others.Injured...2014"
## [50] "Straight.Road.Accidents...2014"
## [51] "Straight.Road.Killed...2014"
## [52] "Straight.Road.Injured...2014"
## [53] "Slight.Curve.Accidents...2014"
## [54] "Slight.Curve.Killed...2014"
## [55] "Slight.Curve.Injured...2014"
## [56] "Sharp.Curve.Accidents...2014"
## [57] "Sharp.Curve.Killed...2014"
## [58] "Sharp.Curve.Injured...2014"
## [59] "Flat.Road.Accidents...2014"
## [60] "Flat.Road.Killed...2014"
## [61] "Flat.Road.Injured...2014"
## [62] "Gentle.Incline.Accidents...2014"
## [63] "Gentle.Incline.Killed...2014"
## [64] "Gentle.Incline.Injured...2014"
## [65] "Steep.Incline.Accidents...2014"
## [66] "Steep.Incline.Killed...2014"
## [67] "Steep.Incline.Injured...2014"
## [68] "Hump.Accidents...2014"
## [69] "Hump.Killed...2014"
## [70] "Hump.Injured...2014"
## [71] "Dip.Accidents...2014"
## [72] "Dip.Killed...2014"
## [73] "Dip.Injured...2014"
## [74] "Pucca.road..Normal.Road....Number.of.Accidents...2016"
## [75] "Pucca.road..Normal.Road....Persons.Killed...2016"
## [76] "Pucca.road..Normal.Road....Persons.Injured...2016"
## [77] "Kutcha.road..Normal.Road....Number.of.Accidents...2016"
## [78] "Kutcha.road..Normal.Road....Persons.Killed...2016"
## [79] "Kutcha.road..Normal.Road....Persons.Injured...2016"
```

```
## [80] "Pot.Holes...Number.of.Accidents...2016"
## [81] "Pot.Holes...Persons.Killed...2016"
## [82] "Pot.Holes...Persons.Injured...2016"
## [83] "Speed.Breakers...Number.of.Accidents...2016"
## [84] "Speed.Breakers...Persons.Killed...2016"
## [85] "Speed.Breakers...Persons.Injured...2016"
## [86] "Sharp.Curve...Number.of.Accidents...2016"
## [87] "Sharp.Curve...Persons.Killed...2016"
## [88] "Sharp.Curve...Persons.Injured...2016"
## [89] "Steep.Gradient...Number.of.Accidents...2016"
## [90] "Steep.Gradient...Persons.Killed...2016"
## [91] "Steep.Gradient...Persons.Injured...2016"
## [92] "Earthern.Shoulder.Edge.Drop...Number.of.Accidents...2016"
## [93] "Earthern.Shoulder.Edge.Drop...Persons.Killed...2016"
## [94] "Earthern.Shoulder.Edge.Drop...Persons.Injured...2016"
## [95] "Others...Number.of.Accidents...2016"
## [96] "Others...Persons.Killed...2016"
## [97] "Others...Persons.Injured...2016"
```

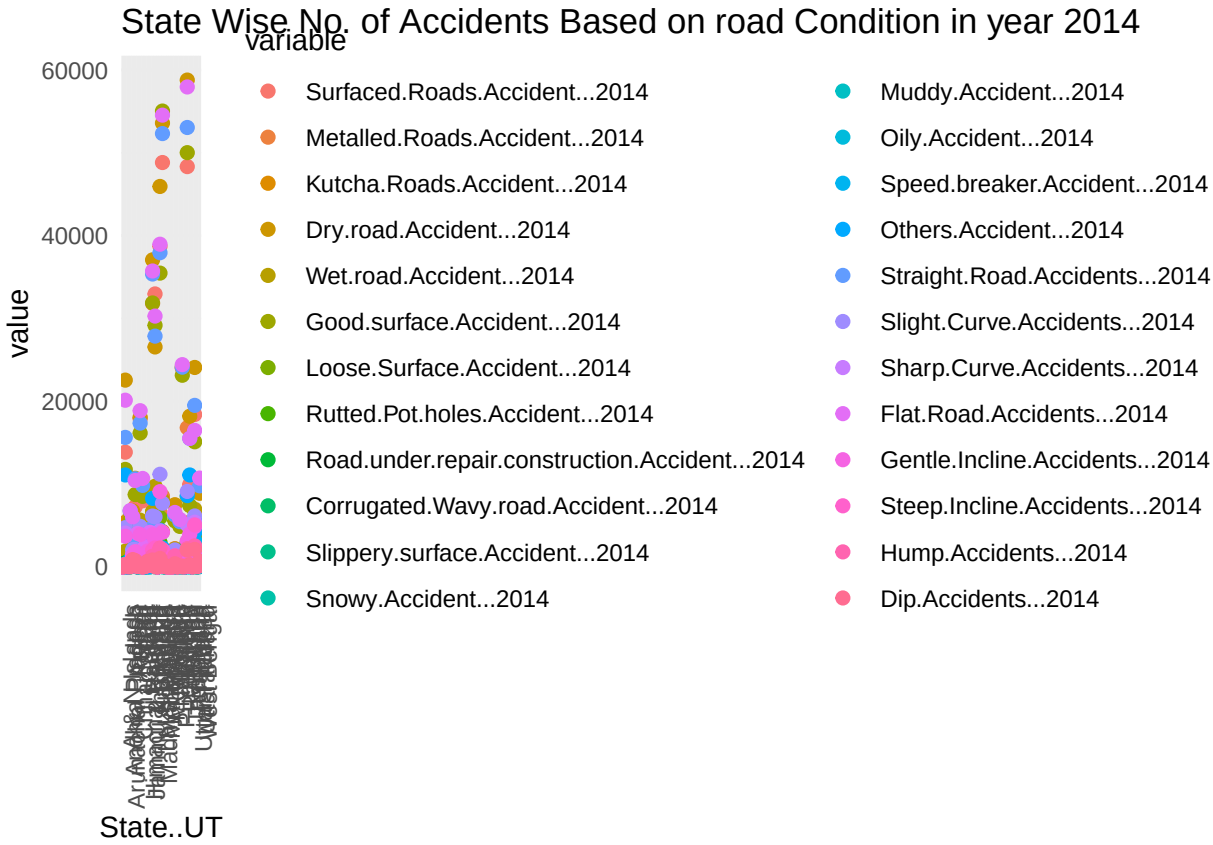
```
#Selection based on Accident, Killed and Injured
#Killed
rck1<- road_condition%>%dplyr:: select (matches('State..UT|Killed'))
#2014
rck14<- road_condition%>%dplyr:: select (matches('State..UT|2014'))
rck114<- rck14%>%dplyr:: select (matches('State..UT|Killed'))
#View(rck114)
dlrck114 <- melt(rck114, id = "State..UT")
Scatplrck14 <- ggplot(dlrck114,aes(x = State..UT,y = value,color = variable , group = 1)) +  geom_point
Scatplrck14
```



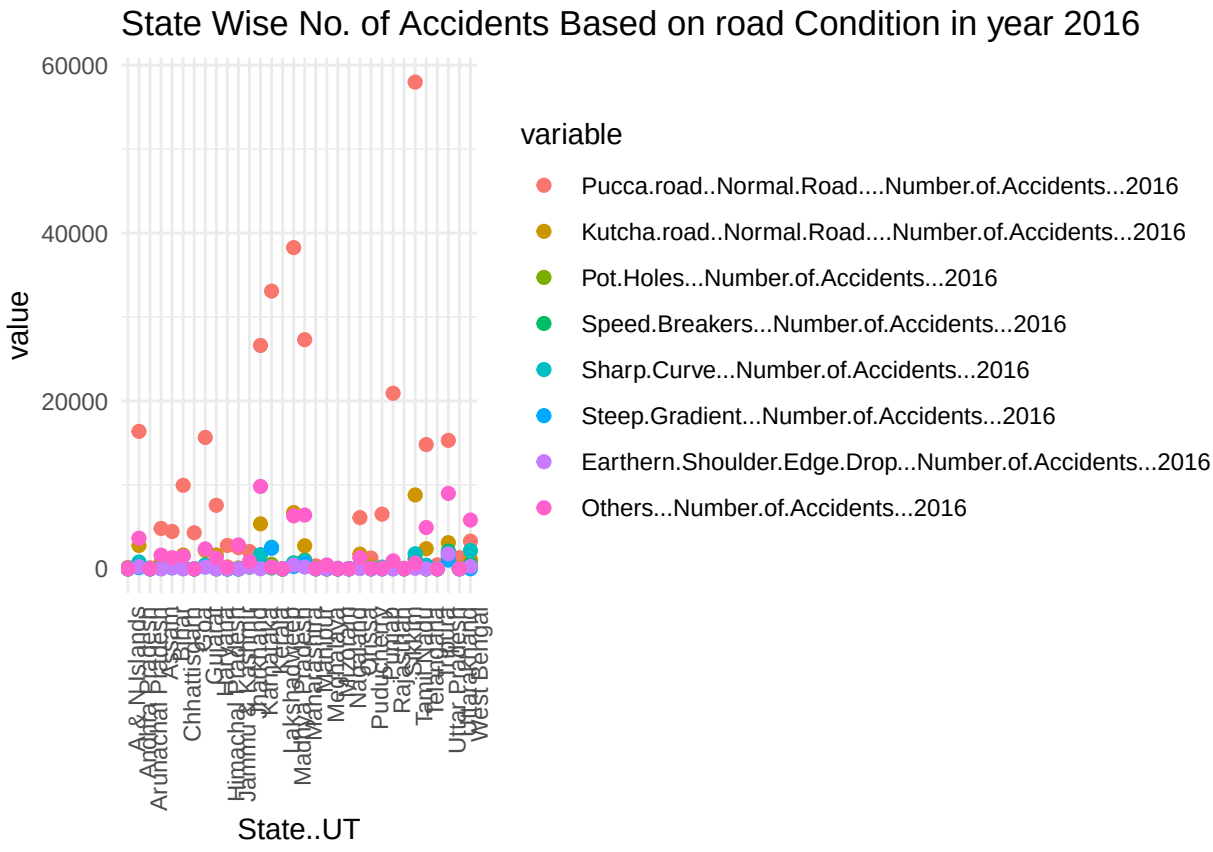

```
#2016
rck16<- road_condition%>%dplyr:: select (matches('State..UT|2016'))
rck116<- rck16%>%dplyr:: select (matches('State..UT|Killed'))
#View(rck116)
dlrck116 <- melt(rck116, id = "State..UT")
Scatplrck16 <- ggplot(dlrck116,aes(x = State..UT,y = value,color = variable , group = 1)) +  geom_point
Scatplrck16
```



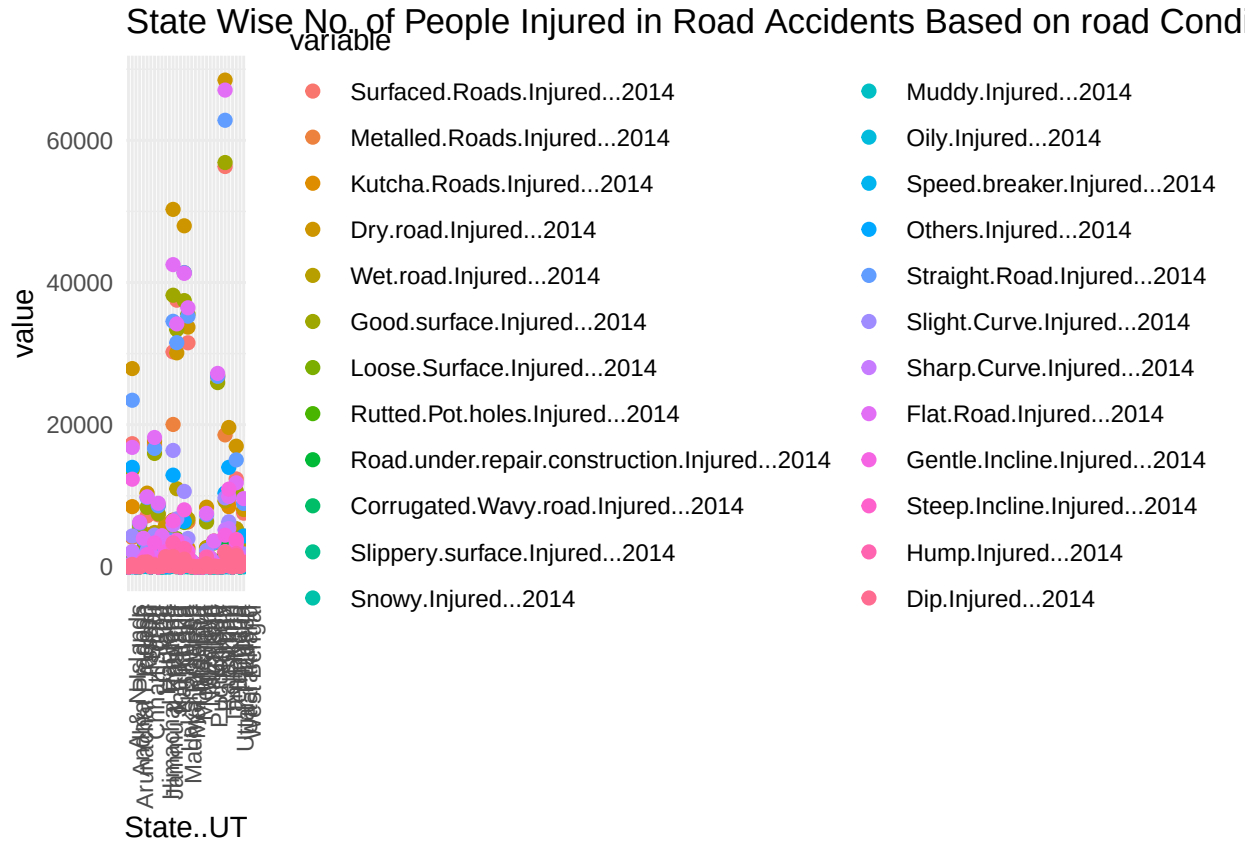

```
#Accident
rca1<- road_condition%>%dplyr:: select (matches('State..UT|Accident'))
#2014
rca14<- road_condition%>%dplyr:: select (matches('State..UT|2014'))
rca114<- rca14%>%dplyr:: select (matches('State..UT|Accident'))
#View(rca114)
dlrca114 <- melt(rca114, id = "State..UT")
Scatplrca14 <- ggplot(dlrca114,aes(x = State..UT,y = value,color = variable , group = 1)) +  geom_point
Scatplrca14
```



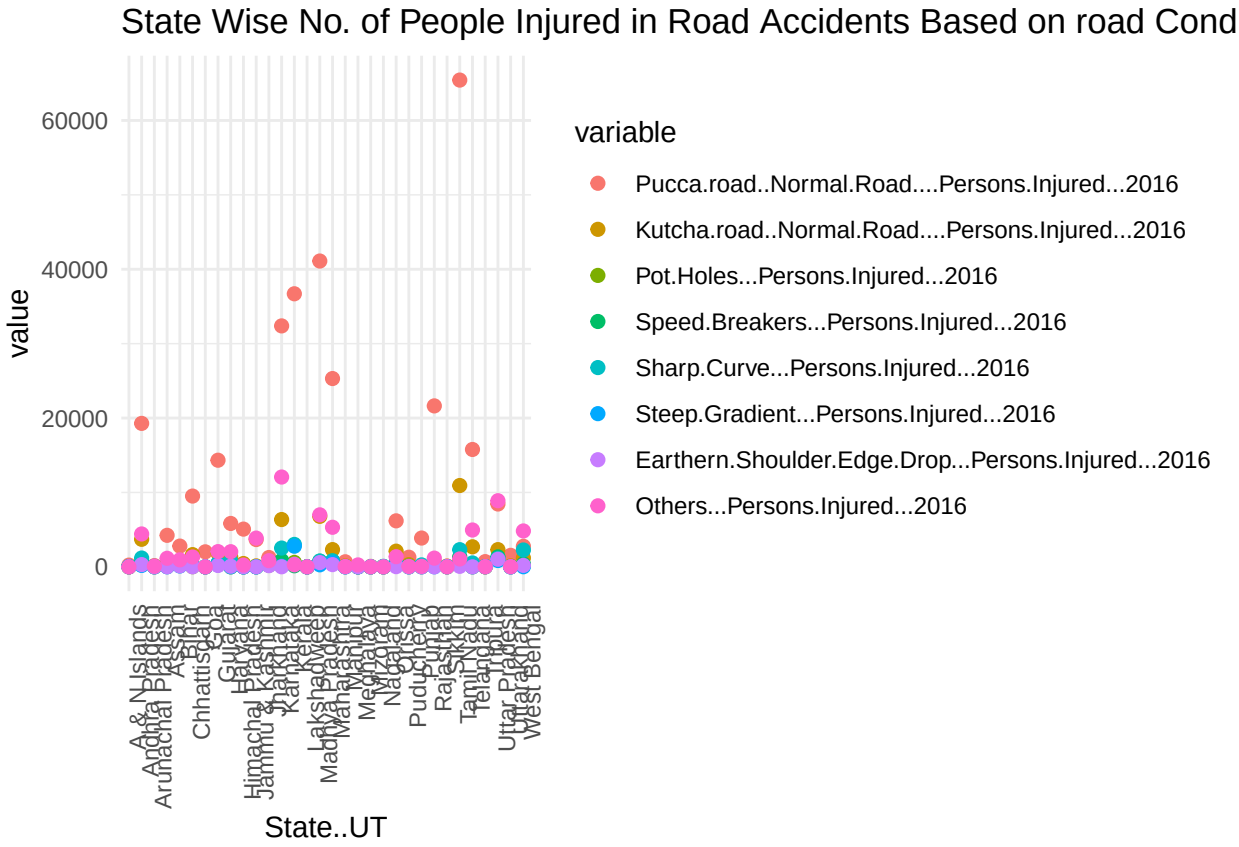

```
#2016
rca16<- road_condition%>%dplyr:: select (matches('State..UT|2016'))
rca116<- rca16%>%dplyr:: select (matches('State..UT|Accident'))
#View(rca116)
dlrca116 <- melt(rca116, id = "State..UT")
Scatplrca16 <- ggplot(dlrca116,aes(x = State..UT,y = value,color = variable , group = 1)) +  geom_point
Scatplrca16
```




```
#injured
rci1<- road_condition%>%dplyr:: select (matches('State..UT|Injured'))
#View(rci1)
#2014
rci14<- rci1%>%dplyr:: select (matches('State..UT|2014'))
rci114<- rci14%>%dplyr:: select (matches('State..UT|Injured'))
#View(rci114)
dlrci114 <- melt(rci114, id = "State..UT")
Scatplrci14 <- ggplot(dlrci114,aes(x = State..UT,y = value,color = variable , group = 1)) +  geom_point
Scatplrci14
```

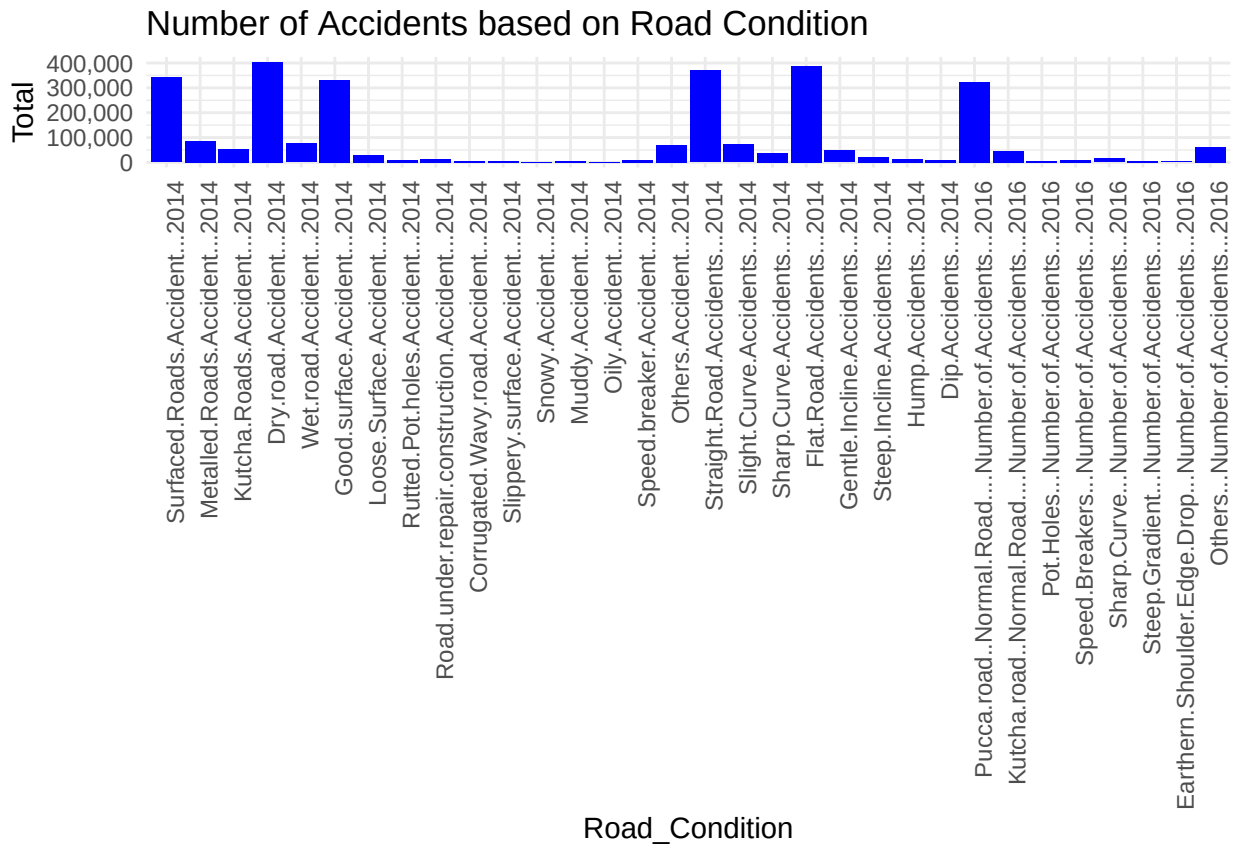



```
#2016
rci16<- rci1%>%dplyr:: select (matches('State..UT|2016'))
rci116<- rci16%>%dplyr:: select (matches('State..UT|Injured'))
#View(rci116)
dlrci116 <- melt(rci116, id = "State..UT")
Scatplrci16 <- ggplot(dlrci116,aes(x = State..UT,y = value,color = variable , group = 1)) +  geom_point
Scatplrci16
```



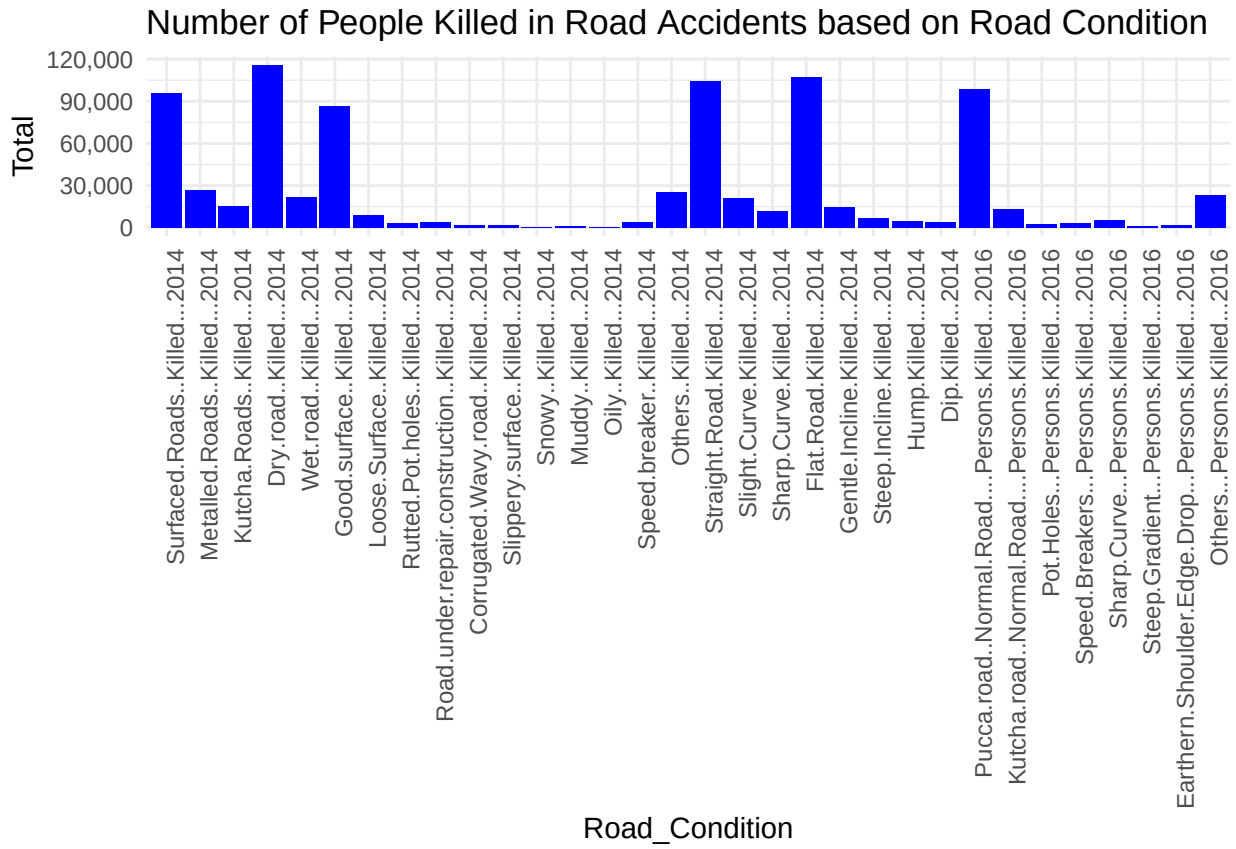

```
#Adding all the columns to get total in a new column
rca1<- rca1%>% mutate(Total_Accidents = rca1%>%select(contains('Accident'))%>%rowSums)
#View(rca1)
rck1<- rck1%>% mutate(Total_Killed = rck1%>%select(contains('Killed'))%>%rowSums)
#View(rck1)
rci1<- rci1%>% mutate(Total_Injured = rci1%>%select(contains('Injured'))%>%rowSums)
#View(rci1)

##Accidents
#Col total
rca1<- rca1%>% adorn_totals("row")
#View(rca1)
rcat<-t(rca1)
#View(rcat)
#transpose and changing col names
my.names <- rcat[1,]

colnames(rcat) <- my.names
rcat<-rcat[-1,]
#View(rcat)

rcat <- cbind(Road_Condition = rownames(rcat), rcat)
rownames(rcat) <- NULL
#View(rcat)
#ggplot visualisation
rcat<- transform(rcat, Total = as.numeric(Total))
```

```
###sapply(rcat,mode)
rcat1<-head(rcat,-1)
#View(rcat1)
rcat1$Road_Condition<-factor(rcat1$Road_Condition, levels = rcat1$Road_Condition)
pa1<-ggplot(data=rcat1, aes(x=Road_Condition, y=Total))+ geom_bar(stat="identity", fill="blue")+ggtitle

pa1
```




```
##Killed
#Col total
rck1<- rck1%>% adorn_totals("row")
#View(rck1)
rckt<-t(rck1)
#View(rckt)
#transpose and changing col names
my.namesrck <- rckt[1,]

colnames(rckt) <- my.namesrck
rckt<-rckt[-1,]
#View(rckt)

rckt <- cbind(Road_Condition = rownames(rckt), rckt)
rownames(rckt) <- NULL
#View(rckt)
#ggplot visualisation
```

```
rckt<- transform(rckt, Total = as.numeric(Total))
###sapply(rcat,mode)
rckt1<-head(rckt,-1)
#View(rckt1)
rckt1$Road_Condition<-factor(rckt1$Road_Condition, levels = rckt1$Road_Condition)
pk1<-ggplot(data=rckt1, aes(x=Road_Condition, y=Total))+ geom_bar(stat="identity", fill="blue")+ggtitle

pk1
```




```
##Killed
#Col total
rci1<- rci1%>% adorn_totals("row")
#View(rci1)
rcit<-t(rci1)
#View(rcit)
#transpose and changing col names
my.namesrci <- rcit[1,]

colnames(rcit) <- my.namesrci
rcit<-rcit[-1,]
#View(rcit)

rcit <- cbind(Road_Condition = rownames(rcit), rcit)
rownames(rcit) <- NULL
#View(rcit)
```

```
#ggplot visualisation
rcit<- transform(rcit, Total = as.numeric(Total))
###sapply(rcat,mode)
rcit1<-head(rcit,-1)
#View(rcit1)
rcit1$Road_Condition<-factor(rcit1$Road_Condition, levels = rcit1$Road_Condition)
pi1<-ggplot(data=rcit1, aes(x=Road_Condition, y=Total))+ geom_bar(stat="identity", fill="blue")+ggtitle

pi1
```