

Mapping Mirena© users in the US

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ABSTRACT

A mapping tool was developed to locate Mirena© (a levonorgestrel-releasing intrauterine system) users who were identified using the open source MEDICAID prescription dataset. The data was uploaded into an R-based environment and displayed by state. An interactive display is presented, that can be maximized (and minimized) as needed. This mapping tool has the potential to locate possible subjects for clinical studies and research.

INTRODUCTION

Mirena © is a T-shaped IUD containing levonorgestrel, which is a known FDA-approved contraceptive. Levonorgestrel is slowly released from the device. Safety studies are ongoing, estimating the occurrence of adverse events in Mirena © users. Recruitment for these studies would be enhanced if Mirena © users could be somehow identified.

DATA PREPROCESSING

Medicaid prescription data by year and state are provided in their webpage They are available for download on csv format. The R environment has several tools for data manipulation (selection, for example). The R library dplyr is used to manipulate the uploaded files.

```
d2012a <- select(d2012, State, Product.Name,  
Number.of.Prescriptions, Longitude, Latitude, Quarter) %>%  
  filter (Product.Name == "MIRENA", !is.na(Number.of.Prescriptions), Quarter > 2);  
  
d2013a <- select(d2013, State, Product.Name,  
Number.of.Prescriptions, Longitude, Latitude, Quarter) %>%  
  filter (Product.Name == "MIRENA", !is.na(Number.of.Prescriptions), Quarter < 3)  
  
dmir <- union(d2012a, d2013a)  
  
d1213exp <- dmir[rep(row.names(dmir), dmir$Number.of.Prescriptions), 1:6]
```

SHINY

Shiny is an R-based application which is able to display interactive outputs. Shiny has two components : a ui section, which provides and interphase between the user and the data.

```
ui <- fluidPage(  
  titlePanel("Visualization Tools - Mirena prescriptions 3Q 2012 to 2Q 2013 -  
MEDICAID"),  
  leafletOutput("mymap", width="80%", height=600)  
)
```

The second component is the server section, which contains the parameters needed for creating the map.

```
server <- function(input, output, session)  
{addTiles2<-function (map, urlTemplate =  
"http://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png",  
  attribution = NULL, layerId = NULL, group = NULL, opt2ions = tileOptions())
```

The renderLeaflet function renders the graph and sends it to the screen:

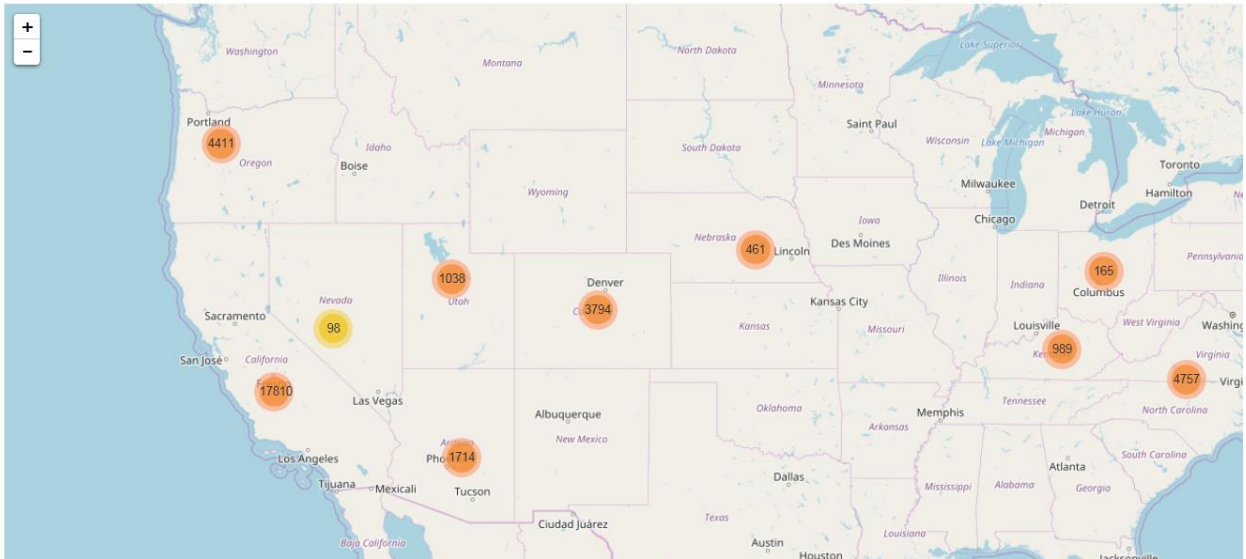
```
output$mymap <- renderLeaflet({  
  leaflet() %>%
```

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```
addTiles2() %>%  
addMarkers(d1213exp,  
            lng = d1213exp$Longitude, # we feed the longitude coordinates  
            lat = d1213exp$Latitude,
```

SHINY APPLICATION

Visualization Tools - Mirena prescriptions 3Q 2012 to 2Q 2013 - MEDICAID



CONCLUSION

A visualization tool to map Mirena© users is presented. Full code is available from the author.

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CONTACT INFORMATION

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