Note for Class

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Contents

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```r
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Example - Mediation and confounder

Among important concept in disease causation is bias and confounding. Confounders can be due to a noncausal association between a given exposure and an outcome observed as a result of the influence of third variable

```
grid.newpage()
exposure <-
  "Exposure
  (e.g. Coffee)"
expbox <- boxGrob(exposure, x=.2, y=.8)
outcome <-
  "Outcome
  (e.g. Lung Ca)"
outbox <- boxGrob(outcome, x=.8, y=.8)
confounder <-
  "Confounder
  (e.g. Smoking)"
confbox <- boxGrob(confounder, x=.5, y=.2)
connectGrob(expbox, outbox, "horizontal")
connectGrob(expbox, confbox, "vertical")
connectGrob(confbox, expbox, "vertical")
```

```
connectGrob(confbox, outbox, "vertical")

expbox
outbox
confbox
```

```
┌─────────────────┐                      ┌─────────────────┐
│    Exposure     │ ───────────────────▶ │     Outcome     │
│  (e.g. Coffee)  │                      │ (e.g. Lung Ca)  │
└─────────────────┘                      └─────────────────┘
             ▲                              ▲
              ╲                            ╱
               ╲                          ╱
                ▼                        ╱
              ┌─────────────────┐
              │   Confounder    │
              │ (e.g. Smoking)  │
              └─────────────────┘
```