

Sources of data sets

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Data are defined by how they are collected

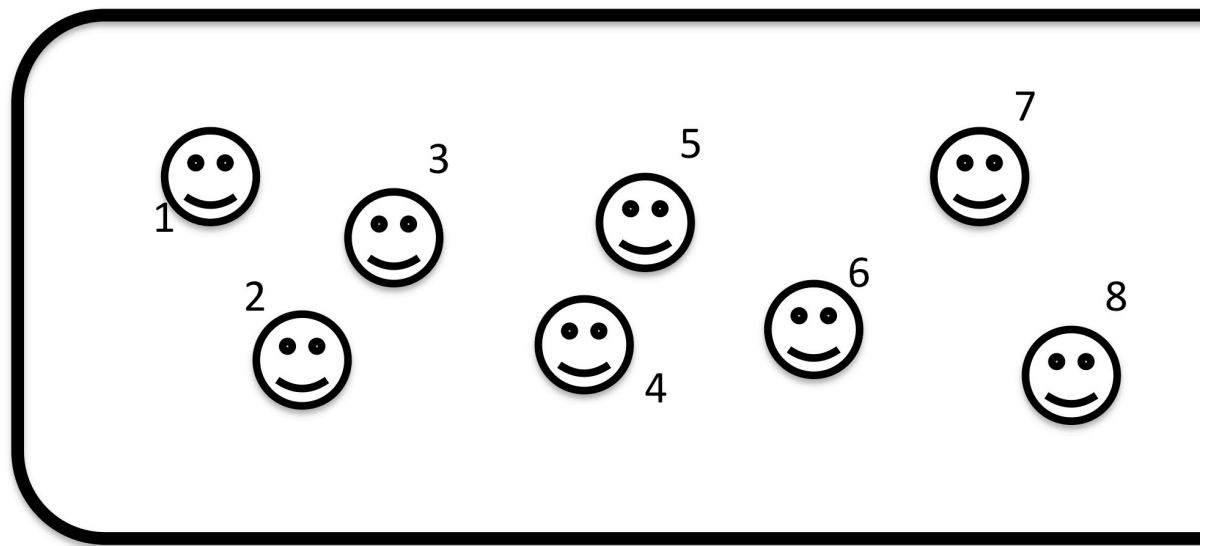
Main types

- Census (descriptive)
- Observational study (inferential)
- Convenience sample (all types - may be biased)
- Randomized trial (causal)

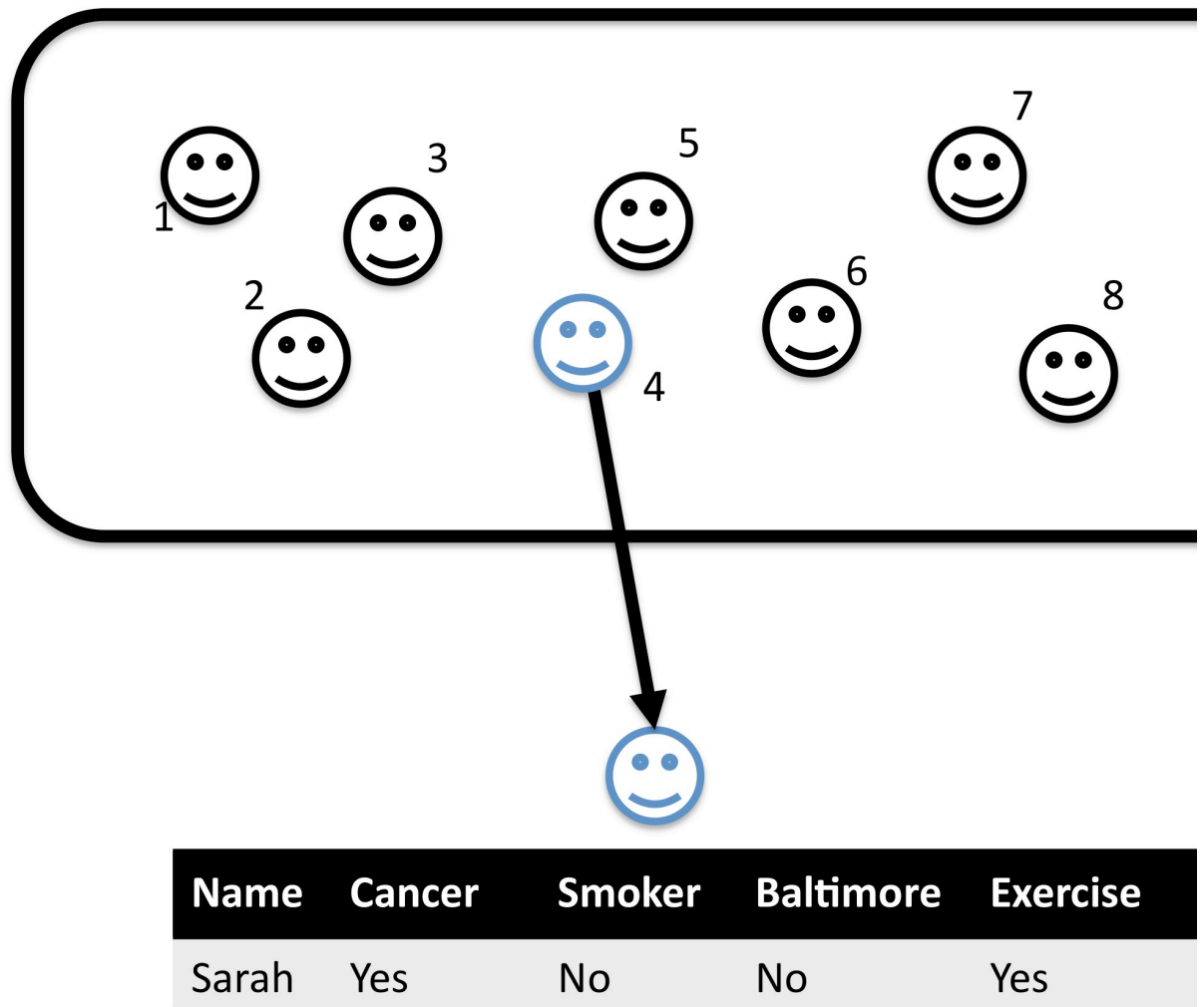
Other types

- Prediction study (prediction)
- Studies over time
 - Cross sectional (inferential)
 - Longitudinal (inferential, predictive)
- Retrospective (inferential)

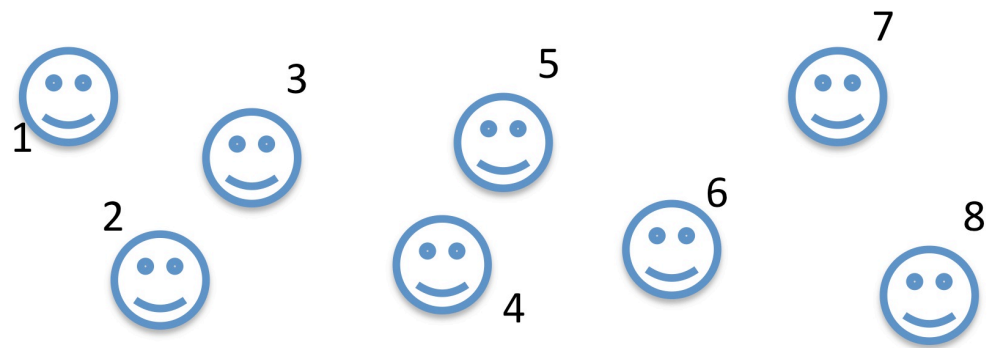
A population



Pick a person and measure



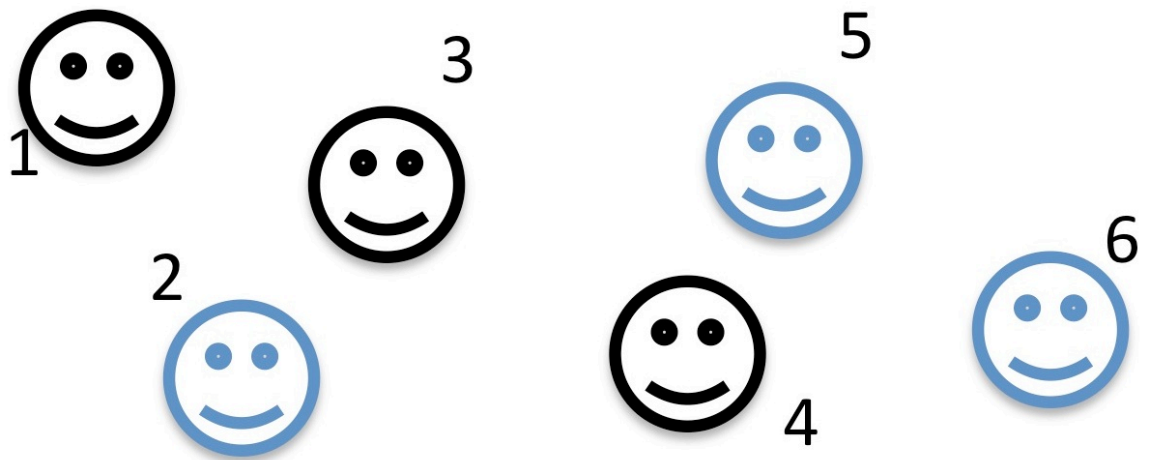
Census



Observational study

```
set.seed(5)  
sample(1:8,size=4,replace=FALSE)
```

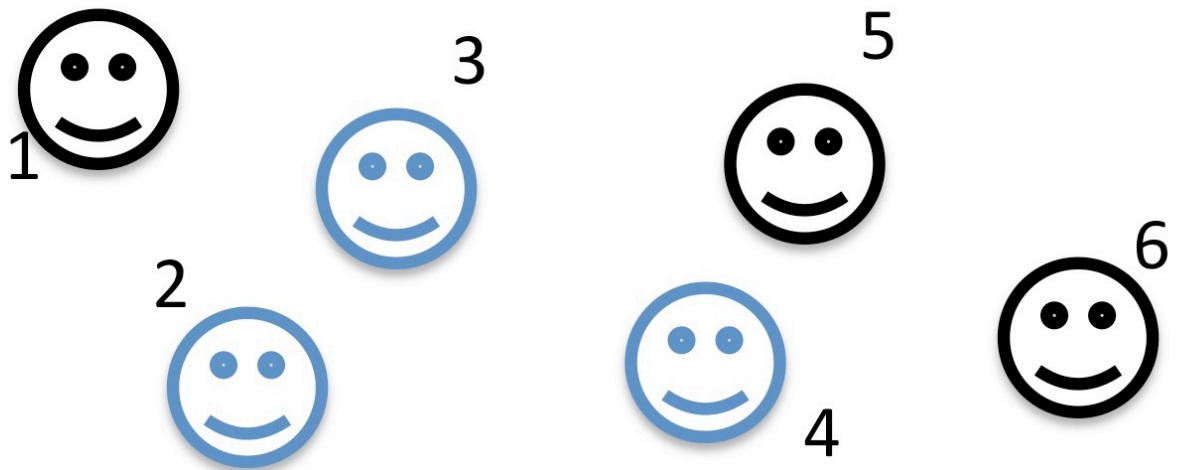
```
[1] 2 5 6 8
```



Convenience sample

```
probs = c(5,5,5,5,1,1,1,1)/16  
sample(1:8,size=4,replace=FALSE,prob=probs)
```

```
[1] 4 8 3 2
```



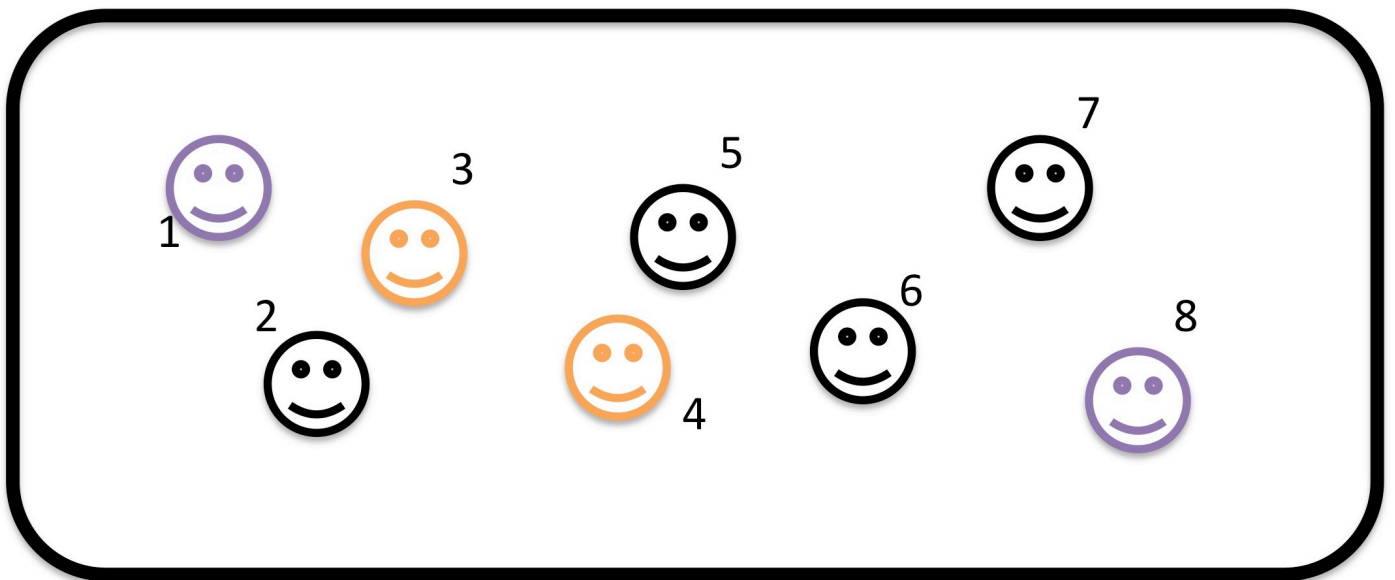
Randomized trial

```
treat1 = sample(1:8,size=2,replace=FALSE); treat2 = sample(2:7,size=2,replace=FALSE)  
c(treat1,treat2)
```

```
[1] 8 1 3 4
```

Treatment 1

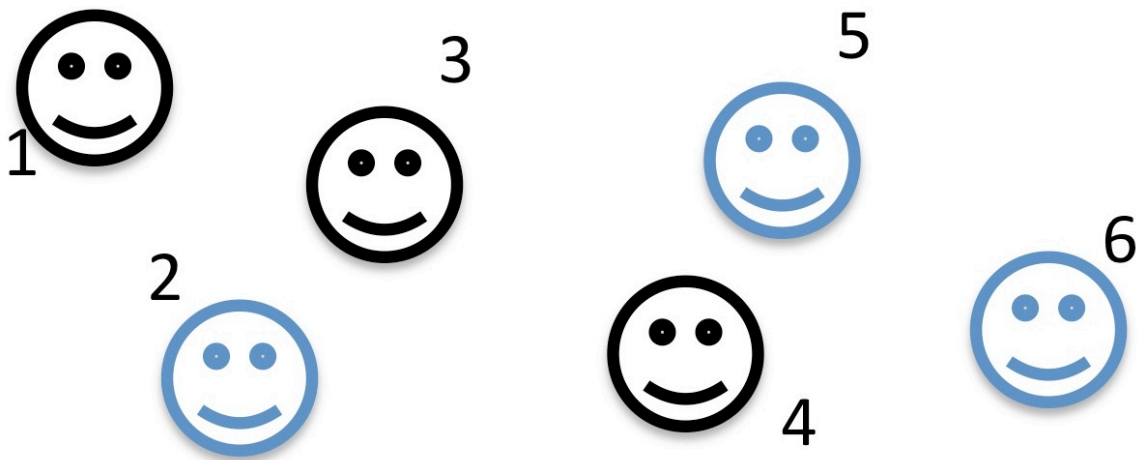
Treatment 2



Prediction study: train

```
set.seed(5)  
sample(1:8,size=4,replace=FALSE)
```

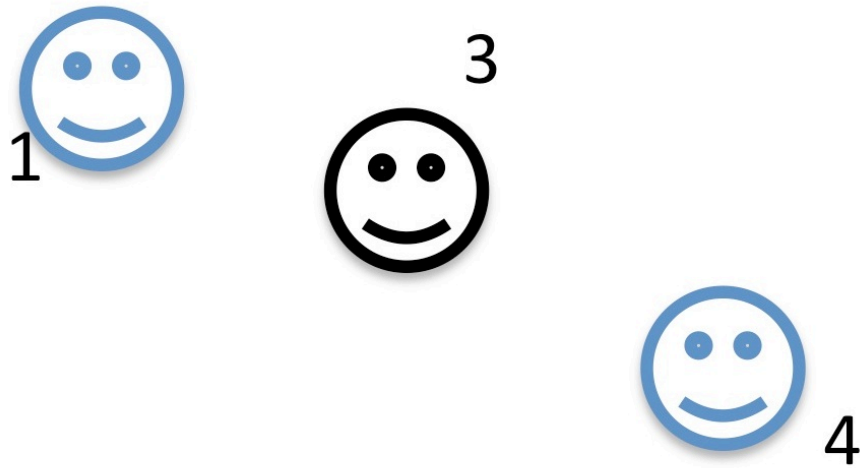
```
[1] 2 5 6 8
```



Prediction study: test

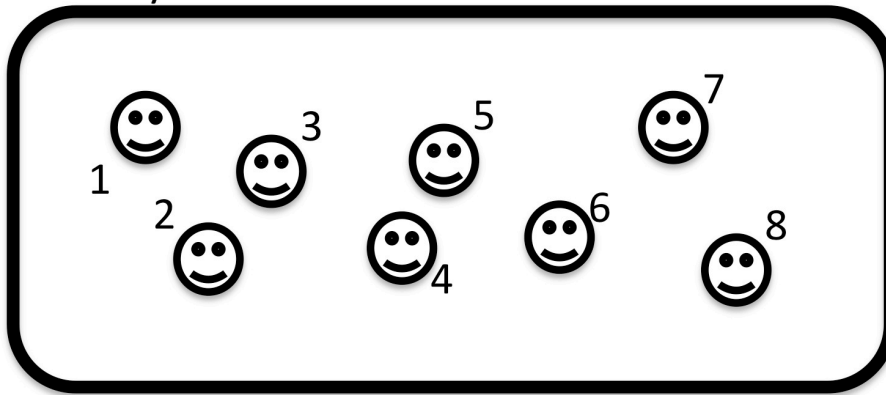
```
sample(c(1,3,4,7),size=2,replace=FALSE)
```

```
[1] 1 4
```

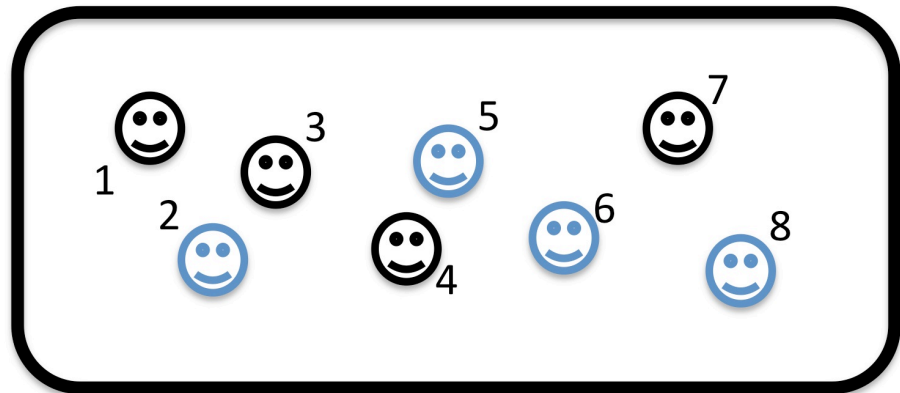


Study over time: cross-sectional

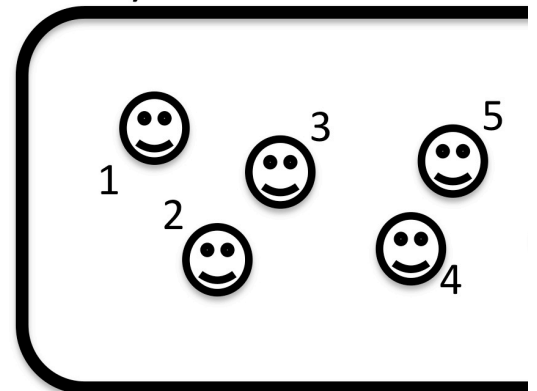
Day 1



Day 2

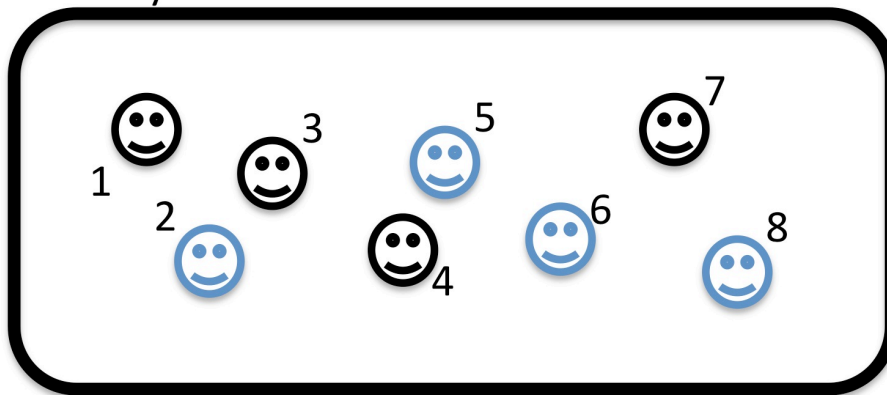


Day 3

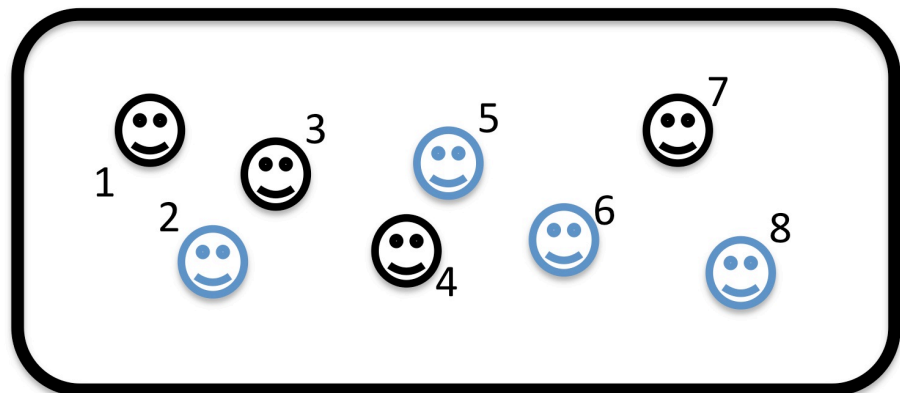


Study over time: longitudinal

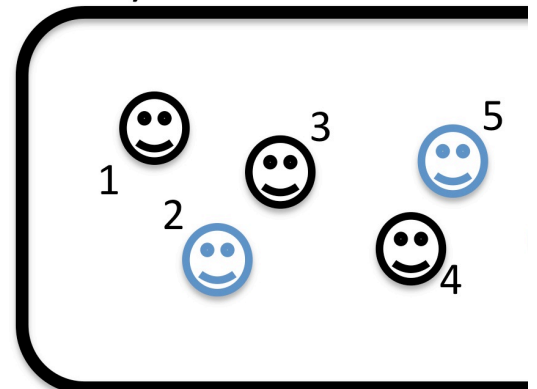
Day 1



Day 2

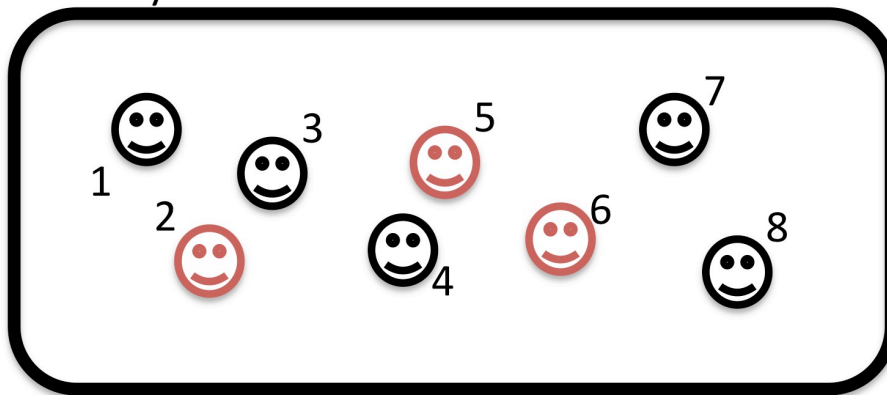


Day 3



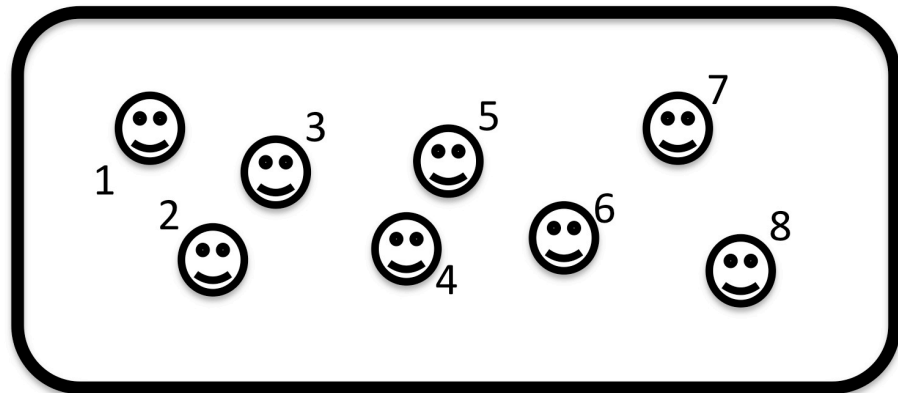
Study over time: retrospective

Day 1



Exposed

Day 2



Day 3

