Session 9: Measurement Practicum Example

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Manta Trust: Theory of Change

Oceanic Manta Ray

Conservation Strategies

Fish Landings in the Phillipines

Release

Measurement Goal & Measure

Goal: Assess the level of knowledge about safe release techniques over time.

"In general, how likely will a manta ray survive if it is lifted by a brailer or piece of canvas and returned to the sea?"

a. Very Likely
b. Somewhat Likely
c. Somewhat Unlikely
d. Very Unlikely
e. Don't Know

Source & Rationale & Unit

Source: Indepedent survey firm sampling from landing sites at regular intervals.

Rationale: The best way to test knowledge is to measure it directly. The answer to the question is not obvious and it does not lead the respondent in a particular direction.

Unit: individual survey respondent

Responsibility & Frequency

Responsibility: Manta Trust will directly hire survey firm, but will coordinate with the PFDA to expand the monitoring in the future.

Frequency: The intention is to track changes in attitudes over time. Annual surveys will allow tracking and matches the time period over which it is feasible for attitudes to change.

Declaring the population

Using administrative data, I found the approximate number of vessel visits per month that land tuna.

Landing site	Approximate vessels per month
General Santos	700
Navotas	670
Iloilo	150
Lucena	140
Zamboanga	40
Davao	30
Sual	8

Target Population & Challenges

Target Population: fishing vessel captains who use purse seine techniques

Challenge of drawing a representative sample: sampling effort must be done in landing site clusters, but clusters are of unequal size. It is unclear how often captains return to the same port over the course of the year.

Sampling procedure: Cluster-based sampling at ports with unequal effort according to potential sample size.

DeclareDesign()

```
set.seed(228)
population <- declare_population(
  port = add_level(N=7,
        baseline=c(0.6,0.6,0.4,0.4,0.1,0.1,0.1)),
  captain = add_level(N=c(700,670,150,140,40,30,8),
                  know=draw_binary(baseline))
)
pop <- population()
pop.vector <- c(700,670,150,140,40,30,8)

my_estimand <- declare_estimands(mean(know),
                                 label = "Ybar")
#PH: ok, similar to the examples in previous lectures, we'r
```

DeclareDesign()

```
reporting <- declare_assignment(prob=0.8,
                  assignment_variable = "R")
#PH: declaring the assignment (or in this case, sampling) p

sampling <- declare_sampling(strata=port,
               strata_n=c(80,80,80,80,8,8,8))
#PH: saying that we want to sample by port, our strata. We
```

DeclareDesign()

```
strata_weighted_mean <- function(data){
  data.frame(
  estimator_label = "strata_w_mean",
  estimand_label = "Ybar",
  n = nrow(data),
  stringsAsFactors = FALSE,

  estimate = data %>% filter(R==1) %>% #PH: subset out uni
    group_by(port) %>%
    summarise(mean=mean(know)) %>%
    mutate(prop=pop.vector/sum(pop.vector)) %>% #PH: 'prop
    mutate(sub.mean=mean*prop) %>% pull(sub.mean) %>%  #PH
    sum()) #PH: sums all the weighed averages of knowledge
} #just use this function, custom

#PH: here, we're declaring a second estimator that will es
```

DeclareDesign()

```
answer <- declare_estimator(
  handler = tidy_estimator(strata_weighted_mean), #PH: this
  estimand = my_estimand) #PH: 'my_estimand' is the true po

design <- population + my_estimand + reporting +
          sampling + answer
diagnosis <- diagnose_design(design, sims = 1000)

diagnosis$diagnosands_df[,c(4,5,12,14)] %>%
  kable()
```

bias	se(bias)	mean_estimate	sd_estimate
0.0003717	0.001004	0.5443935	0.0349789