**Themes:**

4 – 1 ½ hour sessions

Audience engagement is pivotal

Explain what is going on after interactions and demonstrations of code

Focus on skills they want to learn

Review structure of code with audience when possible

# R Session 1

## Why R

## Showcase R products developed at ICPI to wet appetite/entice

## How to Use the Interface

* 1. Open up RStudio
  2. 4 panes console, script, etc.
  3. Wow factor showcase; run code and it produces something amazing

## Import MSD data

* 1. Base R – read.csv
  2. TidyVerse – read\_tsv
  3. Discussion on base R vs. packages
  4. Discuss syntax and coding structure after looking at import step and review syntax for next steps as well

## Explore imported dataset

* 1. Ways to view dataset (view, summarise, click on dataset)
  2. Exploring data (table function)
  3. Tidy vs non-tidy discussion – show example of clean, tidy data, and example of unclean data
  4. What is bad about untidy/unclean data?
  5. How to cleanup:
     1. Remove N/A
     2. Filtering columns and rows (subsetting for values)
     3. Exporting
     4. Renaming column headers (not essential)
     5. Reordering columns (not essential)

# R Session 2

## Recap of Session 1

1. Ask audience to name packages, how to load one
2. Ask audience to load a package: tidyverse
3. Ask someone to demonstrate importing the MSD into R, and subsetting by OU/indicator
4. Recap tidy vs. non-tidy datasets??

Manipulating the Imported Dataset (continued)

Develop scenarios to demonstrate each concept, ideally a single unifying scenario)

1. Creating new variables (mutate)
2. Logical operators (AND, OR, GT, LT) in the context of filtering
3. Ifelse and case\_when using logical operators
4. Mathematical operators
5. Rowwise  (check with Aaron or Anu about variable sums without rowwise)
6. Mathematical operators using ‘sum’ even for differences
7. Summarize() including group\_by(), working with NAs (na.rm=T)

Combining/Merging Datasets

1. Stacking (bind\_rows)
2. Joins (simple one using SNUprioritization scenario)

Creating basic graph (first visual in plotly or excel format)

Session 3:

Advanced data shaping, like going from wide to long and long to wide. Use melt, reshape, cast, or using Tidy. Nested datasets. Also advanced joins.

Iterating: intro to functions.

End with a visualization exercise.

Session 4: Data visualization, graphs, tables, maps and advanced iterating (functions)