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1  # KIDS EVALUATION
2  # =====

3  # Load libraries
4  # =====

5  library(epiDisplay)
6  library(readstata13)
7  library(PSW)
8  library(tableone)
9  library(rbounds)
10 library(dplyr)
11 library(ggplot2)

12 # Import data
13 # =====

14 p <- read.csv('KidsDataFinal.csv')
15 # variables of interest
16 # =====

17 p <- p[,
18 c("outcome","exposure","agegp","age.child.months","age.mother.years","q301","q302","job","q304","own.house
19 ","q502","delivery",
20      "q506","q517","q600","q604","q700", "asset_index", "diarrh_fever","diarrh_cough",
21      "diarrh_breath","dia_breat_diff","dia_cough")]

22 # Create Table 1
23 # =====

24 dput(names(p))

25 myvariables <-
26 c("outcome","agegp","age.mother.years","q301","q302","job","q304","own.house","q502","delivery",
27      "q506","q517","q600","q604","q700", "asset_index","diarrh_fever","diarrh_cough",
28      "diarrh_breath","dia_breat_diff","dia_cough")

29 myfactors <- c("agegp","age.mother.years","q302","job","q304","own.house","q502","delivery","q506",
30      "q517","q600","q604","q700", "asset_index","diarrh_fever","diarrh_cough",
31      "diarrh_breath","dia_breat_diff","dia_cough","outcome")

32 Table1 <- CreateTableOne(vars = myvariables,
33      strata = "exposure",
34      factorVars = myfactors,
35      includeNA = TRUE,

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36         data = p,
37         test = TRUE,
38         testExact = TRUE,
39         addOverall = TRUE)
40 Table1 <- print(Table1, noSpaces = TRUE, showAllLevels = TRUE, smd = TRUE)
41 write.csv(Table1, file = "Table 1 Characteristics.csv")
42
43 # Generate propensity scores
44 # =====
45 levels(p$exposure)
46 # Generate numeric data
47 dput(names(p))
48 p$q301.numeric <- as.numeric(p$q301)
49 p$q302.numeric <- as.numeric(p$q302)
50 p$q304.numeric <- as.numeric(p$q304)
51 p$q502.numeric <- as.numeric(p$q502)
52 p$q506.numeric <- as.numeric(p$q506)
53 p$q517.numeric <- as.numeric(p$q517)
54 p$q600.numeric <- as.numeric(p$q600)
55 p$q604.numeric <- as.numeric(p$q604)
56 p$asset_index.numeric <- as.numeric(p$asset_index)
57 p$age.child.months.numeric <- as.numeric(p$age.child.months)
58
59 # Generate PS
60 # =====
61 ps.model<- glm(exposure~q301.numeric+q302.numeric+q304.numeric+q502.numeric+q506.numeric+
62               q517.numeric+q600.numeric+asset_index.numeric+age.child.months.numeric+
63               job,data = p, family = binomial(link = 'logit'))
64 summary(ps.model)
65 set.seed(456783)
66 p$pscore <- predict(ps.model, type = 'response')
67 min(p$pscore); max(p$pscore)
68
69
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70 # Weight the two groups
71 # =====
72 levels(p$exposure)
73 p$ps.wt <- ifelse(p$exposure=="KIDS", 1/p$pscore, 1/(1-p$pscore))
74
75 # Measure impact
76 # =====
77 impact.ps.wt <- glm(outcome~exposure+ps.wt, data = p, family = binomial())
78 ShowRegTable(impact.ps.wt, exp = TRUE, digit=2)
79 write.csv(ShowRegTable(impact.ps.wt, exp = TRUE, digit=2), file = 'Table 3 Impact.csv')
80
81 # Adjusted analyses results for comparison
82 #=====
83 adjusted.analysis <-
84 glm(outcome~exposure+q302+q304+q502+q517+q600+job+asset_index+age.mother.years+job+age.child.mo
85 nths, data = p, family = binomial())
86 ShowRegTable(adjusted.analysis, exp = TRUE, digit=2)
87 write.csv(ShowRegTable(adjusted.analysis, exp = TRUE, digit=2), file = 'Table 4 adjusted.csv')
88
89 # Assess model specification
90 # =====
91 data1 <- p[,var.names <- c("q301.numeric","q302.numeric","q304.numeric","q502.numeric",
92 "q517.numeric","q600.numeric","q604.numeric","asset_index.numeric","job", "exposure",
93 "outcome", "age.child.months.numeric")]
94 write.csv(data1, file = 'data1.csv')
95 rm(list = ls())
96
97 ##Assess model fit and conduct additional covariate balance checks
98 ### =====
99 # bring in data1 for robustness checks
100 rm(list = ls())
101 data <- read.csv(file = 'data.csv')
102 dput(names(data))
103
104

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105 pscore.model<- glm(exposure~q301.numeric+q302.numeric+q304.numeric+q502.numeric+
106     q517.numeric+q600.numeric+asset_index.numeric+
107     job+age.child.months.numeric,data = data, family = binomial(link = 'logit'))
108 summary(pscore.model)
109 var.names <- c("q301.numeric","q302.numeric","q304.numeric", "q502.numeric",
110     "q517.numeric","q600.numeric","asset_index.numeric",
111     "job", "age.child.months.numeric")
112 transformed <- c("identity","identity","identity","identity","identity",
113     "identity","identity","identity","identity")
114 model.spe.test <- psw.spec.test(data = data,
115     form.ps = pscore.model,
116     weight = 'MW',
117     V.name = var.names,
118     trans.type = transformed,
119     K=4)
120 print(model.spe.test)
121 psw.mirror.hist(data = data,
122     form.ps=pscore.model,
123     weight="MW",
124     add.weight = TRUE,
125     nclass = 140,
126     K = 4)
127 balance <- psw.balance(data = data,
128     form.ps = pscore.model,
129     weight = 'MW',
130     V.name = var.names,
131     K=4)
132 print(balance)
133 bal.data <- cbind(balance$std.diff.before, balance$std.diff.after)
134 bal.data <- as.data.frame(bal.data)
135 bal.data <- write.csv(bal.data, file = 'Table 2 Balance of SMD.csv')
136 # clear
137 rm(list = ls())

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