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*title: Example data on the two hospitals
* Example data generated by -dataex-. To install: ssc install dataex

*** go to correct working path/folder

* cd "z:\Zwahlen_1\pubprojects\2016_17_evidence_based_mental_health\data_example"

* Input the data set
clear
input byte risk long(sex age) float relapse double hospital int N
1 1 0 0 0 198
1 1 0 1 0 2
1 1 0 0 1 99
1 1 0 1 1 1
2 1 0 0 0 57
2 1 0 1 0 3
2 1 0 0 1 38
2 1 0 1 1 2
1 1 1 0 0 96
1 1 1 1 0 4
1 1 1 0 1 48
1 1 1 1 1 2
2 1 1 0 0 34
2 1 1 1 0 6
2 1 1 0 1 85
2 1 1 1 1 15
1 2 0 0 0 196
1 2 0 1 0 4
1 2 0 0 1 49
1 2 0 1 1 1
2 2 0 0 0 54
2 2 0 1 0 6
2 2 0 0 1 90
2 2 0 1 1 10
1 2 1 0 0 95
1 2 1 1 0 5
1 2 1 0 1 190
1 2 1 1 1 10
2 2 1 0 0 30
2 2 1 1 0 10
2 2 1 0 1 120
2 2 1 1 1 40
end
label values risk rp_1
label def rp_1 1 "low", modify
label def rp_1 2 "high", modify
label values sex sex_1
label def sex_1 1 "female", modify
label def sex_1 2 "male", modify
label values age age_1
label def age_1 0 "<60", modify
label def age_1 1 "60+", modify
label values relapse relapse
label def relapse 0 "no relapse", modify
label def relapse 1 "relapse", modify
label values hospital hosp
label def hosp 0 "A", modify
label def hosp 1 "B", modify
label var relapse "6-month relapse"
expand N
drop N

* data set is now ready: describe now data and labelling
codebook

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tabulate hospital relapse, row

*** IPTW
*** model for being in which hospital including all interactions

logistic hospital i.sex##i.age##i.risk

cap drop p
predict p

tab p
summ p
cap drop iptw
generate iptw =1/p if hospital==1
replace iptw =1/(1-p) if hospital==0

* check that now risk factors are balanced...

foreach var of varlist sex age risk {
    tabulate `var' hospital, col
    tabulate `var' hospital [iweight=iptw], col
}

* expected relapse rate for both hospitals

tabulate hospital relapse [iweight=iptw], row

* to obtain proper 95% CI with robust standard erros for risk per hospital one needs to
svyset the data

svyset [pweight= iptw]
svy : tabulate hospital relapse , row percent ci format(%5.2f)

*** IPTW analysis with robust standard erros

* causal risk difference
binreg relapse hospital [pweight=iptw], vce(robust) rd
* causal risk ratio
binreg relapse hospital [pweight=iptw], vce(robust) rr
* causal odds ratio
binreg relapse hospital [pweight=iptw], vce(robust) or
* causal odds ratio
logistic relapse hospital [pweight=iptw], vce(robust)

* generate a table with the weights by age sex severity

preserve

** check data by collapsing data set

collapse (mean) iptw , by(sex age risk hospital)
gsort hosp -sex age risk
bysort hosp : list sex age risk iptw, clean noobs

restore

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```

/*
    sex   age   risk   iptw
  male <60   low   1.25
  male <60   high  2.67
  male 60+   low   3.0
  male 60+   high  5.0
  female <60 low   1.5
  female <60 high  1.67
  female 60+ low   1.5
  female 60+ high  3.5

```


 -> hospital = B

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    sex   age   risk   iptw
  male <60   low   5.0
  male <60   high  1.6
  male 60+   low   1.5
  male 60+   high  1.25
  female <60 low   3.0
  female <60 high  2.5
  female 60+ low   3.0
  female 60+ high  1.4

```

*/

*iptw weights without interactions

logistic hospital i.sex i.age i.risk

cap drop p

predict p

tab p

summ p

cap drop iptw

generate iptw =1/p if hospital==1

replace iptw =1/(1-p) if hospital==0

* causal odds ratio

logistic relapse hospital [pweight=iptw], vce(robust)

* naive estimates

logistic relapse hospital

logistic relapse hospital sex age risk

logistic relapse hospital i.sex##i.age##i.risk