

```
In [2]: import psmatching2 as psm

path = "data-rhc.csv"
control="swang1"
cov = ["age", "sex", "race", "edu", "income", "ninsclas", "das2d3pc", "dnr1", "ca", "surv2md1", "aps1", "scoma1",
       "wtkilo1", "temp1", "meanbp1", "resp1", "hrt1", "paf1", "paco21", "ph1", "wb1c1", "hemal1", "sod1", "pot1",
       "creal", "bili1", "alb1", "resp", "card", "neuro", "gastr", "renal", "meta", "hema", "seps", "trauma", "ortho",
       "cardiohx", "chf hx", "dementhx", "psychhx", "chrpulhx", "renalhx", "liverhx", "gibledhx", "malighx", "immunhx",
       "transhx", "amihx"]
dep=["death"]

m=psm.PSMatch(path, control, cov, dep)
m.df.replace({"RHC":1, "No RHC":0}, inplace=True)
m.calculate_proprnsity_scores()
m.match(caliper=0.2)
m.weighted_process(method="IPTW-P")
```

Calculating propensity scores Done!

Matching [1] controls to each case ... DONE!

Weighted processing ... Done!

```
In [2]: print(m.evaluate_dependent(m.df))
```

	Treat	Control	smd
Num	2184	3551	
age	60.75 (15.631)	61.761 (17.288)	0.061
sex			0.188
.. Male	1278 (0.585)	1914 (0.539)	
.. Female	906 (0.415)	1637 (0.461)	
...
transhx	0.15 (0.357)	0.094 (0.292)	0.17
amihx	0.043 (0.204)	0.03 (0.169)	0.074
death			
.. Yes	1486 (0.68)	2236 (0.63)	
.. No	698 (0.32)	1315 (0.37)	

[93 rows x 3 columns]

In [3]:

```
print(m.evaluate_dependent(m.matched_data))
```

	Treat	Control	smd
Num	1729	1729	
age	60.666 (15.693)	60.428 (17.303)	0.014
sex			0.007
.. Male	1004 (0.581)	1007 (0.582)	
.. Female	725 (0.419)	722 (0.418)	
...
transhx	0.122 (0.327)	0.113 (0.316)	0.029
amihx	0.032 (0.177)	0.034 (0.18)	0.006
death			
.. Yes	1187 (0.687)	1095 (0.633)	
.. No	542 (0.313)	634 (0.367)	

[93 rows x 3 columns]

In [4]:

```
print(m.evaluate_dependent(m.weighted_df))
```

	Treat	Control	smd
Num	1412.008226	1220.442038	
age	60.779 (15.774)	60.212 (17.097)	0.034
sex			0.396
.. Male	808.26 (0.527)	724.559 (0.473)	
.. Female	603.749 (0.549)	495.883 (0.451)	
...
transhx	0.112 (0.315)	0.116 (0.338)	0.013
amihx	0.028 (0.165)	0.033 (0.185)	0.028
death			
.. Yes	1187 (0.687)	1095 (0.633)	
.. No	542 (0.313)	634 (0.367)	

[93 rows x 3 columns]

In [5]:

```
m.evaluate_p_value(m.df)
```

age: p_value = 0.6104 PASSED
sex: p_value = 0.0007 FAILED
race: p_value = 0.4253 PASSED
edu: p_value = 0.0013 FAILED
income: p_value = 0.0 FAILED

ninsclas: p_value = 0.0 FAILED
das2d3pc: p_value = 0.005 FAILED
dnr1: p_value = 0.0 FAILED
ca: p_value = 0.0005 FAILED
surv2md1: p_value = 0.2579 PASSED
aps1: p_value = 0.0 FAILED
scomal: p_value = 0.0 FAILED
wtkilo1: p_value = 0.0145 PASSED
temp1: p_value = 0.3734 PASSED
meanbp1: p_value = 0.0 FAILED
resp1: p_value = 0.0 FAILED
hrt1: p_value = 0.0 FAILED
pafil1: p_value = 0.0 FAILED
paco21: p_value = 0.0151 PASSED
ph1: p_value = 0.0044 FAILED
wblc1: p_value = 0.1419 PASSED
hemal1: p_value = 0.0 FAILED
sod1: p_value = 0.3283 PASSED
pot1: p_value = 0.5584 PASSED
creal: p_value = 0.0 FAILED
bili1: p_value = 0.0 FAILED
alb1: p_value = 0.0 FAILED
resp: p_value = 0.0 FAILED
card: p_value = 0.0 FAILED
neuro: p_value = 0.0 FAILED
gastr: p_value = 0.0 FAILED
renal: p_value = 0.0 FAILED
meta: p_value = 0.3367 PASSED
hema: p_value = 0.0291 PASSED
seps: p_value = 0.0 FAILED
trauma: p_value = 0.0001 FAILED
ortho: p_value = 0.5158 PASSED
cardiohx: p_value = 0.0 FAILED
chf hx: p_value = 0.0112 PASSED
dementhx: p_value = 0.0 FAILED
psychhx: p_value = 0.0 FAILED
chrpulhx: p_value = 0.0 FAILED
renalhx: p_value = 0.2683 PASSED
liverhx: p_value = 0.0839 PASSED
gibledhx: p_value = 0.0141 PASSED
malighx: p_value = 0.0002 FAILED
immunhx: p_value = 0.0033 FAILED
transhx: p_value = 0.0 FAILED
amihx: p_value = 0.0066 FAILED

33 variable failed to match!

```
Out[5]: {'age': 0.6104,  
'sex': 0.0007,  
'race': 0.4253,  
'edu': 0.0013,  
'income': 0.0,  
'ninsclas': 0.0,  
'das2d3pc': 0.005,  
'dnr1': 0.0,  
'ca': 0.0005,  
'surv2mdl': 0.2579,  
'aps1': 0.0,  
'scomal': 0.0,  
'wtkilo1': 0.0145,  
'temp1': 0.3734,  
'meanbp1': 0.0,  
'resp1': 0.0,  
'hrt1': 0.0,  
'pafi1': 0.0,  
'paco21': 0.0151,  
'ph1': 0.0044,  
'wblc1': 0.1419,  
'hemal': 0.0,  
'sod1': 0.3283,  
'pot1': 0.5584,  
'creal': 0.0,  
'bili1': 0.0,  
'alb1': 0.0,  
'resp': 0.0,  
'card': 0.0,  
'neuro': 0.0,  
'gastr': 0.0,  
'renal': 0.0,  
'meta': 0.3367,  
'hema': 0.0291,  
'seps': 0.0,  
'trauma': 0.0001,  
'ortho': 0.5158,  
'cardiohx': 0.0,  
'chf hx': 0.0112,  
'dementhx': 0.0,  
'psychhx': 0.0,  
'chrpulhx': 0.0,
```

```
'renalhx': 0.2683,  
'liverhx': 0.0839,  
'gibledhx': 0.0141,  
'malighx': 0.0002,  
'immunhx': 0.0033,  
'transhx': 0.0,  
'amihx': 0.0066,  
'fail': 33}
```

In [6]: `m.evaluate_p_value(m.matched_data)`

```
age: p_value = 0.5017 PASSED  
sex: p_value = 0.945 PASSED  
race: p_value = 0.8899 PASSED  
edu: p_value = 0.7055 PASSED  
income: p_value = 0.9928 PASSED  
ninsclas: p_value = 0.9812 PASSED  
das2d3pc: p_value = 0.1219 PASSED  
dnr1: p_value = 0.8502 PASSED  
ca: p_value = 0.6747 PASSED  
surv2md1: p_value = 0.8025 PASSED  
aps1: p_value = 0.5442 PASSED  
scomal: p_value = 0.0709 PASSED  
wtkilo1: p_value = 0.4441 PASSED  
temp1: p_value = 0.2757 PASSED  
meanbp1: p_value = 0.0072 FAILED  
resp1: p_value = 0.0023 FAILED  
hrt1: p_value = 0.0057 FAILED  
paf11: p_value = 0.5248 PASSED  
paco21: p_value = 0.4616 PASSED  
ph1: p_value = 0.1868 PASSED  
wblc1: p_value = 0.011 PASSED  
hemal1: p_value = 0.0003 FAILED  
sod1: p_value = 0.6479 PASSED  
pot1: p_value = 0.2733 PASSED  
creal: p_value = 0.0002 FAILED  
bili1: p_value = 0.118 PASSED  
alb1: p_value = 0.0009 FAILED  
resp: p_value = 0.3468 PASSED  
card: p_value = 0.5289 PASSED  
neuro: p_value = 0.4229 PASSED  
gaster: p_value = 0.9306 PASSED  
renal: p_value = 0.3156 PASSED
```

```
meta: p_value = 1.0 PASSED
hema: p_value = 0.7772 PASSED
seps: p_value = 0.5876 PASSED
trauma: p_value = 1.0 PASSED
ortho: p_value = 1.0 PASSED
cardiohx: p_value = 1.0 PASSED
chf hx: p_value = 0.7966 PASSED
dementhx: p_value = 0.3299 PASSED
psychhx: p_value = 1.0 PASSED
chrpulhx: p_value = 0.7782 PASSED
renalhx: p_value = 0.8773 PASSED
liverhx: p_value = 0.5987 PASSED
gibledhx: p_value = 0.9207 PASSED
malighx: p_value = 0.4382 PASSED
immunhx: p_value = 0.4069 PASSED
transhx: p_value = 0.4281 PASSED
amihx: p_value = 0.9241 PASSED
```

6 variable failed to match!

```
Out[6]: {'age': 0.5017,
'sex': 0.945,
'race': 0.8899,
'edu': 0.7055,
'income': 0.9928,
'ninsclas': 0.9812,
'das2d3pc': 0.1219,
'dnr1': 0.8502,
'ca': 0.6747,
'surv2md1': 0.8025,
'aps1': 0.5442,
'scomal': 0.0709,
'wtkilo1': 0.4441,
'temp1': 0.2757,
'meanbp1': 0.0072,
'resp1': 0.0023,
'hrt1': 0.0057,
'pafi1': 0.5248,
'paco21': 0.4616,
'ph1': 0.1868,
'wblc1': 0.011,
'hema1': 0.0003,
'sod1': 0.6479,
'pot1': 0.2733,
'creal': 0.0002,
```

```
'bili1': 0.118,  
'alb1': 0.0009,  
'resp': 0.3468,  
'card': 0.5289,  
'neuro': 0.4229,  
'gastr': 0.9306,  
'renal': 0.3156,  
'meta': 1.0,  
'hema': 0.7772,  
'seps': 0.5876,  
'trauma': 1.0,  
'ortho': 1.0,  
'cardiohx': 1.0,  
'chfhx': 0.7966,  
'dementhx': 0.3299,  
'psychhx': 1.0,  
'chrpulhx': 0.7782,  
'renalhx': 0.8773,  
'liverhx': 0.5987,  
'gibledhx': 0.9207,  
'malighx': 0.4382,  
'immunhx': 0.4069,  
'transhx': 0.4281,  
'amihx': 0.9241,  
'fail': 6}
```

In [7]: `m.evaluate_p_value(m.weighted_df)`

```
age: p_value = 0.4726 PASSED  
sex: p_value = 0.2875 PASSED  
race: p_value = 0.7891 PASSED  
edu: p_value = 0.0827 PASSED  
income: p_value = 0.4058 PASSED  
ninsclas: p_value = 0.5386 PASSED  
das2d3pc: p_value = 0.1987 PASSED  
dnrl1: p_value = 0.0455 PASSED  
ca: p_value = 0.7744 PASSED  
surv2md1: p_value = 0.3426 PASSED  
aps1: p_value = 0.0072 FAILED  
scoma1: p_value = 0.102 PASSED  
wtkilo1: p_value = 0.2437 PASSED  
temp1: p_value = 0.0399 PASSED  
meanbp1: p_value = 0.0197 PASSED
```

```
resp1: p_value = 0.0365 PASSED
hrt1: p_value = 0.0278 PASSED
pafi1: p_value = 0.1425 PASSED
paco21: p_value = 0.0872 PASSED
ph1: p_value = 0.0312 PASSED
wblc1: p_value = 0.0454 PASSED
hemal1: p_value = 0.0461 PASSED
sod1: p_value = 0.0715 PASSED
pot1: p_value = 0.0601 PASSED
creal: p_value = 0.0319 PASSED
bili1: p_value = 0.0459 PASSED
alb1: p_value = 0.0459 PASSED
resp: p_value = 0.0059 FAILED
card: p_value = 0.0168 PASSED
neuro: p_value = 0.001 FAILED
gastr: p_value = 0.2995 PASSED
renal: p_value = 0.4972 PASSED
meta: p_value = 0.6913 PASSED
hema: p_value = 0.4651 PASSED
seps: p_value = 0.0378 PASSED
trauma: p_value = 0.4152 PASSED
ortho: p_value = 1.0 PASSED
cardiohx: p_value = 0.3735 PASSED
chf hx: p_value = 0.249 PASSED
dementhx: p_value = 0.0954 PASSED
psychhx: p_value = 0.0225 PASSED
chrpulhx: p_value = 0.0391 PASSED
renalthx: p_value = 0.4547 PASSED
liverhx: p_value = 0.0682 PASSED
gibledhx: p_value = 0.0567 PASSED
malighx: p_value = 0.122 PASSED
immunhx: p_value = 0.375 PASSED
transhx: p_value = 0.4981 PASSED
amihx: p_value = 0.5079 PASSED
```

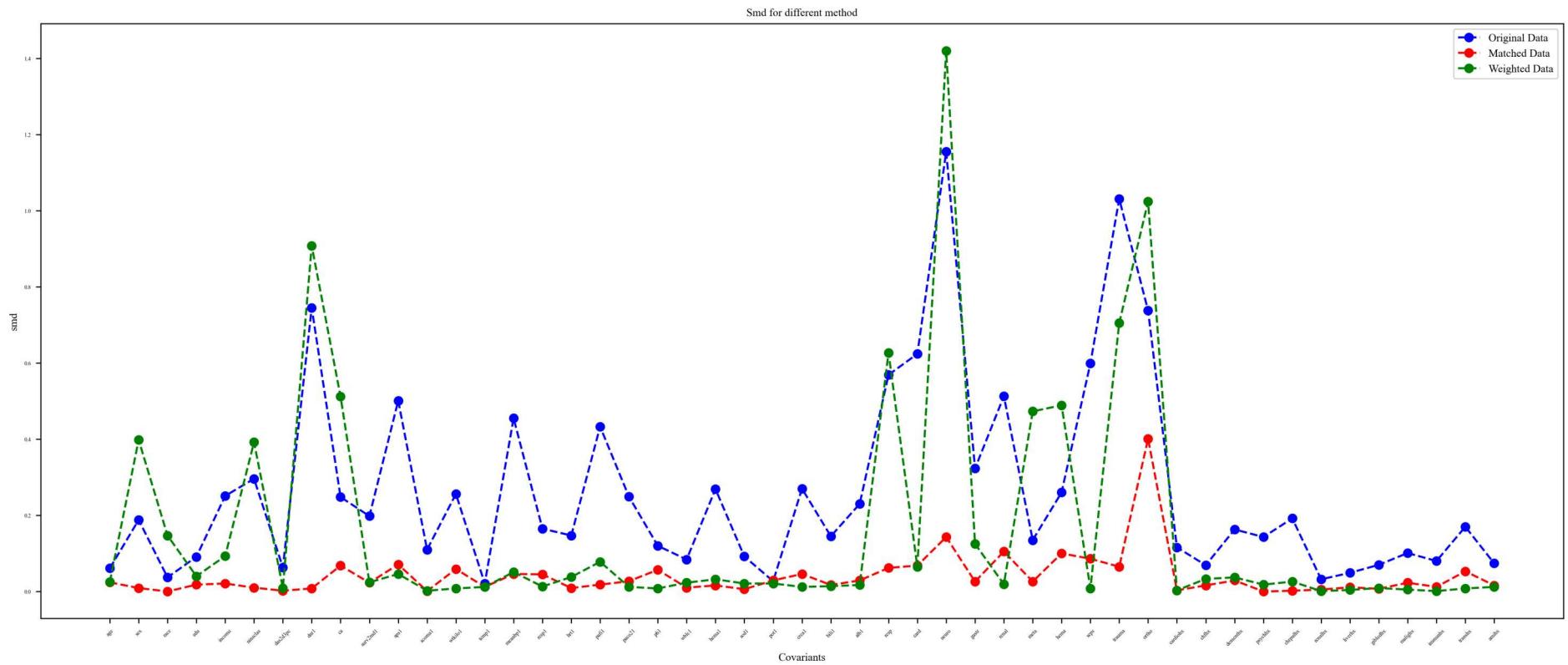
3 variable failed to match!

```
Out[7]: {'age': 0.4726,
          'sex': 0.2875,
          'race': 0.7891,
          'edu': 0.0827,
          'income': 0.4058,
          'ninsclas': 0.5386,
          'das2d3pc': 0.1987,
          'dnr1': 0.0455,
```

```
' ca' : 0.7744,  
' surv2md1' : 0.3426,  
' aps1' : 0.0072,  
' scomal' : 0.102,  
' wtkilol' : 0.2437,  
' templ' : 0.0399,  
' meanbp1' : 0.0197,  
' resp1' : 0.0365,  
' hrt1' : 0.0278,  
' paf1' : 0.1425,  
' paco21' : 0.0872,  
' ph1' : 0.0312,  
' wb1c1' : 0.0454,  
' hema1' : 0.0461,  
' sod1' : 0.0715,  
' pot1' : 0.0601,  
' crea1' : 0.0319,  
' bili1' : 0.0459,  
' albl' : 0.0459,  
' resp' : 0.0059,  
' card' : 0.0168,  
' neuro' : 0.001,  
' gastr' : 0.2995,  
' renal' : 0.4972,  
' meta' : 0.6913,  
' hema' : 0.4651,  
' seps' : 0.0378,  
' trauma' : 0.4152,  
' ortho' : 1.0,  
' cardiohx' : 0.3735,  
' chfhx' : 0.249,  
' dementhx' : 0.0954,  
' psychhx' : 0.0225,  
' chrpulhx' : 0.0391,  
' renalhx' : 0.4547,  
' liverhx' : 0.0682,  
' gibledhx' : 0.0567,  
' malighx' : 0.122,  
' immunhx' : 0.375,  
' transhx' : 0.4981,  
' amihx' : 0.5079,  
' fail' : 3}
```

In [3]:

```
m.plot_matching_efficiency()
```



```
[0.2644489795918367, 0.039591836734693873, 0.16465306122448978]  
[33, 6, 3]
```

