# simulation to study strategies to handle small strata

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Version history

- sim_strata_1b: use simsurv to replace rpact as the engine to simulate survival data. The simulation cannot handle ramp up enrollment or dropoff; but it can simulate data with high EPR easily
- sim_strata_1: code is modified from C:/Users/zouw2/aPDL1/impower010/natera/programs/sim_collapsibility4_test_st

## prevalence 0.5 , prognostic HR .63

```
## [1] "finding 100 input files when looking for r1"
## [1] "modification interval: 0.7 min"
## [1] "will add file name to the returned data"
```

| var | n | mean | sd | min | 25% | 50% | 75% | max |
|---|---|---|---|---|---|---|---|---|
| n | 4000 | 120.000 | 0.000 | 120.000 | 120.000 | 120.000 | 120.000 | 120.000 |
| nevent | 4000 | 90.000 | 0.000 | 90.000 | 90.000 | 90.000 | 90.000 | 90.000 |
| p_s | 4000 | 0.356 | 0.299 | 0.000 | 0.084 | 0.286 | 0.588 | 1.000 |
| delta_p | 4000 | 0.008 | 0.078 | -0.494 | -0.018 | 0.003 | 0.035 | 0.528 |
| O-E_M2 | 4000 | 2.600 | 3.514 | -10.575 | 0.264 | 2.667 | 5.039 | 13.654 |
| O-E_M1 | 4000 | 2.202 | 3.164 | -8.633 | 0.137 | 2.203 | 4.328 | 12.119 |

The mean prognostic effect in arm A and B is 0.63, 0.637, respectively; the mean stratified HR is 0.807

## prevalence 0.1 , prognostic HR .63

```
## [1] "finding 100 input files when looking for r1"
## [1] "modification interval: 0.6 min"
## [1] "will add file name to the returned data"
```

| var | n | mean | sd | min | 25% | 50% | 75% | max |
|---|---|---|---|---|---|---|---|---|
| n | 4000 | 120.000 | 0.000 | 120.000 | 120.000 | 120.000 | 120.000 | 120.000 |
| nevent | 4000 | 98.000 | 0.000 | 98.000 | 98.000 | 98.000 | 98.000 | 98.000 |
| p_s | 4000 | 0.343 | 0.294 | 0.000 | 0.074 | 0.268 | 0.567 | 1.000 |
| delta_p | 4000 | 0.003 | 0.053 | -0.368 | -0.018 | 0.001 | 0.022 | 0.402 |
| O-E_M2 | 4000 | 4.884 | 4.620 | -10.263 | 1.723 | 4.855 | 8.138 | 20.956 |
| O-E_M1 | 4000 | 0.442 | 1.361 | -3.919 | -0.477 | 0.470 | 1.409 | 3.919 |

The mean prognostic effect in arm A and B is 0.617, 0.635, respectively; the mean stratified HR is 0.804

### more mature read at 115 events

```
## [1] "finding 100 input files when looking for r1"
## [1] "modification interval: 0.7 min"
## [1] "will add file name to the returned data"
```

| var | n | mean | sd | min | 25% | 50% | 75% | max |
|---|---|---|---|---|---|---|---|---|
| n | 4000 | 120.000 | 0.000 | 120.000 | 120.000 | 120.000 | 120.000 | 120.000 |
| nevent | 4000 | 115.000 | 0.000 | 115.000 | 115.000 | 115.000 | 115.000 | 115.000 |
| p_s | 4000 | 0.333 | 0.293 | 0.000 | 0.074 | 0.247 | 0.551 | 1.000 |
| delta_p | 4000 | 0.004 | 0.082 | -0.445 | -0.028 | 0.000 | 0.034 | 0.409 |
| O-E_M2 | 4000 | 5.337 | 4.859 | -12.990 | 2.093 | 5.454 | 8.679 | 20.091 |
| O-E_M1 | 4000 | 0.501 | 1.481 | -3.753 | -0.554 | 0.564 | 1.598 | 3.919 |

The mean prognostic effect in arm A and B is 0.669, 0.684, respectively; the mean stratified HR is 0.815

## prevalence 0.5 , prognostic HR .4

```
## [1] "finding 100 input files when looking for r1"
## [1] "modification interval: 0.7 min"
## [1] "will add file name to the returned data"
```

| var | n | mean | sd | min | 25% | 50% | 75% | max |
|---|---|---|---|---|---|---|---|---|
| n | 4000 | 120.000 | 0.000 | 120.000 | 120.000 | 120.000 | 120.000 | 120.000 |
| nevent | 4000 | 90.000 | 0.000 | 90.000 | 90.000 | 90.000 | 90.000 | 90.000 |
| p_s | 4000 | 0.355 | 0.299 | 0.000 | 0.084 | 0.275 | 0.587 | 1.000 |
| delta_p | 4000 | 0.032 | 0.128 | -0.628 | -0.021 | 0.019 | 0.088 | 0.630 |
| O-E_M2 | 4000 | 2.846 | 3.533 | -10.035 | 0.436 | 2.913 | 5.294 | 13.873 |
| O-E_M1 | 4000 | 1.994 | 2.966 | -9.182 | 0.016 | 2.015 | 3.993 | 11.711 |

The mean prognostic effect in arm A and B is 0.412, 0.418, respectively; the mean stratified HR is 0.806

## prevalence 0.1 , prognostic HR .4

```
## [1] "finding 100 input files when looking for r1"
## [1] "modification interval: 0.7 min"
## [1] "will add file name to the returned data"
```

| var | n | mean | sd | min | 25% | 50% | 75% | max |
|---|---|---|---|---|---|---|---|---|
| n | 4000 | 120.000 | 0.000 | 120.000 | 120.000 | 120.000 | 120.000 | 120.000 |
| nevent | 4000 | 103.000 | 0.000 | 103.000 | 103.000 | 103.000 | 103.000 | 103.000 |
| p_s | 4000 | 0.338 | 0.295 | 0.000 | 0.073 | 0.254 | 0.555 | 1.000 |
| delta_p | 4000 | 0.013 | 0.078 | -0.390 | -0.017 | 0.006 | 0.043 | 0.413 |
| O-E_M2 | 4000 | 5.161 | 4.709 | -12.642 | 1.988 | 5.195 | 8.394 | 21.754 |
| O-E_M1 | 4000 | 0.378 | 1.282 | -3.919 | -0.497 | 0.398 | 1.272 | 3.919 |

The mean prognostic effect in arm A and B is 0.401, 0.411, respectively; the mean stratified HR is 0.806