simulation to study strategies to handle small strata: replicate and extend the work of Akazawa

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Version history

- reproduce part of the table II in the paper
- 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

table II, 400 pts, 320 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"
```

Table 1: homogeneous: power of stratified: 77.5 unstratified: 77.5

var	n	mean	sd	min	25%	50%	75%	max
n	4000	400.000	0.000	400.000	400.000	400.000	400.000	400.000
nevent	4000	320.000	0.000	320.000	320.000	320.000	320.000	320.000
qad_hr	4000	0.744	0.084	0.482	0.686	0.740	0.797	1.115
p_s	4000	0.055	0.131	0.000	0.001	0.007	0.042	0.999
delta_p	4000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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

Table 2: 8 strata: power of stratified: 74.7 unstratified: 26.2

var	n	mean	sd	min	25%	50%	75%	max
n	4000	400.000	0.000	400.000	400.000	400.000	400.000	400.000
nevent	4000	320.000	0.000	320.000	320.000	320.000	320.000	320.000
qad_hr_s	4000	0.756	0.082	0.490	0.699	0.752	0.808	1.104
p_s	4000	0.059	0.128	0.000	0.001	0.008	0.051	0.990
delta_p	4000	0.147	0.160	-0.495	0.036	0.098	0.210	0.927

```
## [1] "finding 200 input files when looking for r1"
## [1] "modification interval: 1.6 min"
```

```
## [1] "will add file name to the returned data"
```

Table 3: 16 strata: power of stratified: 74.6 unstratified: 29.8

var	n	mean	sd	min	25%	50%	75%	max
n	4000	400.000	0.000	400.000	400.000	400.000	400.000	400.000
nevent	4000	320.000	0.000	320.000	320.000	320.000	320.000	320.000
qad_hr_s	4000	0.761	0.081	0.512	0.705	0.755	0.812	1.109
p_s	4000	0.062	0.133	0.000	0.001	0.009	0.052	0.991
delta_p	4000	0.128	0.152	-0.406	0.026	0.081	0.186	0.904

```
## [1] "finding 200 input files when looking for r1"
## [1] "modification interval: 0.4 min"
## [1] "will add file name to the returned data"
```

Table 4: 16 strata simulated but 8 strata analyzed: power of stratified: 75.3 unstratified: 29.8

var	n	mean	sd	min	25%	50%	75%	max
n	4000	400.000	0.000	400.000	400.000	400.000	400.000	400.000
nevent	4000	320.000	0.000	320.000	320.000	320.000	320.000	320.000
qad_hr_s	4000	0.755	0.081	0.530	0.699	0.749	0.807	1.092
p_s	4000	0.059	0.130	0.000	0.001	0.008	0.049	0.996
delta_p	4000	0.130	0.151	-0.454	0.027	0.082	0.188	0.911

```
## [1] "finding 200 input files when looking for r1"
## [1] "modification interval: 1.6 min"
## [1] "will add file name to the returned data"
```

Table 5: 16 strata: power of stratified: 70.1 unstratified: 30.2

var	n	mean	sd	min	25%	50%	75%	max
n	4000	400.000	0.000	400.000	400.000	400.000	400.000	400.000
nevent	4000	320.000	0.000	320.000	320.000	320.000	320.000	320.000
qad_hr_s	4000	0.777	0.081	0.528	0.720	0.771	0.828	1.133
p_s	4000	0.075	0.147	0.000	0.002	0.012	0.071	0.989
delta_p	4000	0.117	0.150	-0.598	0.022	0.074	0.173	0.857

```
## [1] "finding 200 input files when looking for r1"
## [1] "modification interval: 0.4 min"
## [1] "will add file name to the returned data"
```

Table 6: 32 strata simulated but 16 strata analyzed: power of stratified: 72.4 unstratified: 30.2

var	n	mean	sd	min	25%	50%	75%	max
n	4000	400.000	0.000	400.000	400.000	400.000	400.000	400.000
nevent	4000	320.000	0.000	320.000	320.000	320.000	320.000	320.000
qad_hr_s	4000	0.765	0.082	0.521	0.707	0.758	0.818	1.138
p_s	4000	0.067	0.139	0.000	0.001	0.010	0.061	0.984
delta_p	4000	0.124	0.150	-0.446	0.025	0.079	0.183	0.842