```
-------------------------------------------------------------------------------
      log:  d:\ssizeprglog.log
  log type:  text
 opened on:  15 Feb 2007, 13:00:12

. clear

. quietly do ssizeprg

. ssizeprgdoc

 * SSIZEPRG contains 4 `immediate form' programs that estimate
 * 2-sample sample sizes and power to detect NMB differences
 * that are greater than 0.  Two programs -- cess1i and cepow1i --
 * assume standard deviations for cost and effect that are common
 * between the 2 treatment groups (SD, not SE for the difference).
 * Two programs -- cess2i and cepow2i -- assume standard
 * deviations for cost and effect that differ between the two
 * treatment groups.  All 4 programs presume two arm trials and a
 * common sample size for both treatment groups

 * These programs yield results that are identical to those
 * derived from the NHB formula in: Willan AR. Analysis, sample
 * size, and power for estimating incremental net health benefit
 * from clinical trial data. Control Clin Trials 2001;22:228-237.

 * Glick, sampsizedoc last revised 02/13/07



 * PROGRAM:  CESS1I

 * cess1i is used to estimate sample size when one assumes
 * there are common standard deviations for cost and effect
 * between the 2 treatment groups (SDs, not SEs for the difference
 * in cost and effect).

 * COMMAND LINE: cess1i [diffc] [diffe] [sdc] [sde] [corr] [wtp] [alpha]
[beta]

 * The 8 arguments are all numbers
 ** `1'  Difference in costs
 ** `2'  Difference in effects
 ** `3'  Standard deviation, costs (assumed the same for both groups)
 ** `4'  Standard deviation, effects (assumed the same for both groups)
 ** `5'  Correlation, difference in costs and effects
 ** `6'  Maximum willingness to pay
 ** `7'  Two-tailed alpha level (e.g., 0.05)
 ** `8'  One-tailed beta level (e.g., 0.80)

 * Saved results (scalars)

 * r(diffc)
 * r(diffq)
 * r(sd_c)
 * r(sd_e)
 * r(rho)
 * r(wtp)
 * r(alpha)
 * r(beta)
 * r(nmb)
```

```
 * r(sampsize)



 * PROGRAM:  CEPOW1i

 * cepow1i is used to assess power when one assumes
 * that the 2 treatment groups have common standard
 * deviations for costs and effects (SDs, not SEs for
 * the difference in cost and effect)

 * COMMAND LINE:  cepow1i [diffc] [diffe] [sdc] [sde] [corr] [wtp] [alpha]
[sampsize]

 * The 8 arguments are all numbers
 * `1'  Difference in costs
 * `2'  Difference in effects
 * `3'  Standard deviation, costs (assumed the same for both groups)
 * `4'  Standard deviation, effects (assumed the same for both groups)
 * `5'  Correlation, difference in costs and effects
 * `6'  Willingness to pay
 * `7'  Two-tailed  level (e.g., 0.05)
 * `8'  Sample size per group

 * Saved results (scalars)

 * r(diffc)
 * r(diffq)
 * r(sd_c)
 * r(sd_e)
 * r(rho)
 * r(wtp)
 * r(alpha)
 * r(sampsize)
 * r(nmb)
 * r(power)


 * PROGRAM:  CESS2I

 * cess2i is used to assess sample size when one
 * assumes there are Rx-specific standard deviations
 * for the 2 treatment groups' costs and effects (SDs,
 * not SEs for the difference in costs and effects)

 * COMMAND LINE:  cess2i [diffc] [diffe] [sdc0] 9sdc1 [sde0] [sde1] [corr]
[wtp] [alpha] [beta]

 * The 10 arguments are all numbers
 * `1'   Difference in costs
 * `2'   Difference in effects
 * `3'   Standard deviation, costs, group 0
 * `4'   Standard deviation, costs, group 1
 * `5'   Standard deviation, effects, group 0
 * `6'   Standard deviation, effects, group 1
 * `7'   Correlation, difference in costs and effects
 * `8'   Willingness to pay
 * `9'   Two-tailed alpha level (e.g., 0.05)
 * `10'  One-tailed beta level (e.g., 0.80)

 * Saved results (scalars)
```

```
 * r(diffc)
 * r(diffq)
 * r(sd_c0)
 * r(sd_c1)
 * r(sd_e0)
 * r(sd_e1)
 * r(rho)
 * r(wtp)
 * r(alpha)
 * r(beta)
 * r(nmb)
 * r(sampsize)


 * PROGRAM:  CEPOW2I

 * cepow2i is used to assess power when one assumes
 * there are Rx-specific standard deviations for for the
 * 2 treatment groups' costs and effects (SDs, not SEs
 * for the difference in costs and effects)

 * COMMAND LINE:  cepow2i [diffc] [diffe] [sdc0] 9sdc1 [sde0] [sde1] [corr]
[wtp] [alpha] [sampl
> e size]

 * The 10 arguments are all numbers
 * 1   Difference in costs
 * 2   Difference in effects
 * 3   Standard deviation, costs, group 0
 * 4   Standard deviation, costs, group 1
 * 5   Standard deviation, effects, group 0
 * 6   Standard deviation, effects, group 1
 * 7   Correlation, difference in costs and effects
 * 8   Willingness to pay
 * 9   Two-tailed alpha level (e.g., 0.05)
 * 10  Sample size

 * Saved results (scalars)

 * r(diffc)
 * r(diffq)
 * r(sd_c0)
 * r(sd_c1)
 * r(sd_e0)
 * r(sd_e1)
 * r(rho)
 * r(wtp)
 * r(alpha)
 * r(sampsize)
 * r(nmb)
 * r(power)


* EXAMPLE 1:  ASSUME
* Cost difference = 1000
* Effect difference = 0.05
* SD cost = 1000
* SE effect = 0.5
* Correlation of the difference in C&E = 0.1
* Willingness to pay = 75,000
* Two-tailed alpha = 0.05
```

```
* Two-tailed beta = 0.80

. cess1i 1000 .05 1000 .5 .1 75000 .05 .8

 SAMPLE SIZE CALCULATION (Common SD Costs and Effects)

 Assumptions

 Difference in costs:                                1000
 Difference in effects:                              .05

 Standard deviation, costs:                          1000
 Standard deviation, effects:                        .5
 Correlation, difference in costs and effects:       .1

 Willingness to pay:                                 75000
 Two-tailed alpha level:                             .05
 One-tailed beta level:                              .8

 Expected NMB:                                       2750

 *** SAMPLE SIZE PER GROUP ***                       2906


. return list

scalars:
             r(diffc) =  1000
             r(diffq) =  .05
              r(sd_c) =  1000
              r(sd_e) =  .5
               r(rho) =  .1
               r(wtp) =  75000
             r(alpha) =  .05
              r(beta) =  .8
               r(nmb) =  2750
          r(sampsize) =  2906


. cepow1i 1000 .05 1000 .5 .1 75000 .05 2906

POWER CALCULATION (Common SD Costs and Effects)

Assumptions

Difference in costs:                               1000
Difference in effects:                             .05

Standard deviation, costs:                         1000
Standard deviation, effects:                       .5
Correlation, difference in costs and effects:      .1

Willingness to pay:                                75000
Two-tailed alpha level:                            .05
Sample size per group                              2906

 Expected NMB:                                      2750

*** POWER TO DETECT DIFFERENCE ***                 .8
```

```
. return list

scalars:
             r(diffc) =  1000
             r(diffq) =  .05
              r(sd_c) =  1000
              r(sd_e) =  .5
               r(rho) =  .1
               r(wtp) =  75000
             r(alpha) =  .05
          r(sampsize) =  2906
               r(nmb) =  2750
             r(power) =  .8


* EXAMPLE 2:  ASSUME
* Cost difference = 1000
* Effect difference = 0.05
* SD0 cost = 900
* SD1 cost = 1000
* SE0 effect = 0.45
* SE1 effect = 0.55
* Correlation of the difference in C&E = 0.1
* Willingness to pay = 75,000
* Two-tailed alpha = 0.05
* Two-tailed beta = 0.80


. cess2i 1000 .05 900 1100 .45 .55 .1 75000 .05 .8

 SAMPLE SIZE CALCULATION (Different SD, Costs and Effects)

 Assumptions

 Difference in costs:                                1000
 Difference in effects:                              .05

 Standard deviation, costs, group 0:                 900
 Standard deviation, costs, group 1:                 1100
 Standard deviation, effects, group 0:               .45
 Standard deviation, effects, group 1:               .55
 Correlation, difference in costs and effects:       .1

 Ceiling ratio:                                      75000
 Two-tailed alpha level:                             .05
 One-tailed beta level:                              .8

 Expected NMB:                                       2750

 *** SAMPLE SIZE PER GROUP ***                       2935


. return list

scalars:
             r(diffc) =  1000
             r(diffq) =  .05
             r(sd_c0) =  900
             r(sd_c1) =  1100
             r(sd_e0) =  .45
             r(sd_e1) =  .55
```

```
              r(rho) =  .1
              r(wtp) =  75000
            r(alpha) =  .05
             r(beta) =  .8
              r(nmb) =  2750
         r(sampsize) =  2935


. cepow2i 1000 .05 900 1100 .45 .55 .1 75000 .05 2935

POWER CALCULATION (Different SD, Costs and Effects)

Assumptions

Difference in costs:                                1000
Difference in effects:                              .05

Standard deviation, costs, group 0:                 900
Standard deviation, costs, group 1:                 1100
Standard deviation, effects, group 0:               .45
Standard deviation, effects, group 1:               .55
Correlation, difference in costs and effects:       .1

Ceiling ratio:                                      75000
Two-tailed alpha level:                             .05
Sample Size:                                        2935

 Expected NMB:                                       2750

*** POWER TO DETECT DIFFERENCE ***                  .8


. return list

scalars:
             r(diffc) =  1000
             r(diffq) =  .05
             r(sd_c0) =  900
             r(sd_c1) =  1100
             r(sd_e0) =  .45
             r(sd_e1) =  .55
               r(rho) =  .1
               r(wtp) =  75000
             r(alpha) =  .05
          r(sampsize) =  2935
              r(nmb) =  2750
             r(power) =  .8


. log close
      log:  d:ssizeprglog.log
  log type:  text
 closed on:  15 Feb 2007, 13:02:48
-------------------------------------------------------------------------------
```