Macro 1:

Effect size ratio method for sample size re-estimation

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%Macro es(nsim=1000000,alpha=0.025, beta=0.1, sigma=50, ni=0, rx=150,
        ry=150,n1=70,  nmax=350,  n0=233,  diff=15,alpha1=0.0026,  alpha0=1,
alpha2=0.0240);
data es;keep FSP ESP nmean power nclassic; seedx=1736; seedy=6214;alpha=&alpha; ni=&ni;
 nmax=&nmax; rx=&rx; ry=&ry; sigma=&sigma;n1=&n1;
        delta= abs(&diff+ni)/sigma;
        nclassic=round(2*((probit(1-alpha)+probit(1-&beta))/delta)**2);
        FSP=0; ESP=0; nmean=0;power=0;
        Do isim= 1 to &nsim;
                rx1=rannor(seedx)*sigma/sqrt(n1)+rx;
                ry1=rannor(seedy)*sigma/sqrt(n1)+ry;
                t1=(rx1-ry1+ni)*sqrt(n1)/2**0.5/sigma;
                p1=1-probnorm(t1);
                if p1>&alpha0 then do;
                        FSP=FSP+1/&nsim; nfinal=n1;
                end;
                if p1<=&alpha1 then do;
                        power=power+1/&nsim; ESP=ESP+1/&nsim; nfinal=n1;
                end;
                if p1>&alpha1 and p1<=&alpha0 then do;
                        if &diff*(rx1-ry1+ni)<0 then nfinal=n1;
                        er=&diff/(abs(rx1-ry1)+0.0000001);
                        nfinal=min(&nmax, max(&n0, er**2*&n0));
                        if nfinal>n1 then do;
                                rx2=rannor(seedx)*sigma/sqrt(nfinal-n1)+rx;
                                ry2=rannor(seedy)*sigma/sqrt(nfinal-n1)+ry;
                                t2=(rx2-ry2+ni)*sqrt(nfinal-n1)/2**0.5/sigma;
                                z2=(t1+t2)/sqrt(2);
                                p2=1-probnorm(z2);
                                if .<p2<=&alpha2 then power=power+1/&nsim;
                        end;
                end;
                nmean=nmean+nfinal/&nsim;
        end;
        proc print data=es; run;
%Mend es;
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Macro 2:

Conditional power method for sample size re-estimation

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%Macro cp(nsim=1000000,alpha=0.025, beta=0.1, sigma=50, ni=0, rx=150,
                ry=150,n1=70,nmax=280,diff=15,alpha1=0.0026,alpha0=1,alpha2=0.0240,
w=0.70711,cP=0.9);
    data n;keep FSP ESP nmean power nclassic;
                seedx=1736; seedy=6214; alpha=&alpha; ni=&ni; rx=&rx; ry=&ry; sigma=&sigma;
n1=&n1;
                delta=abs(&diff+ni)/sigma;
                nclassic=round(2*((probit(1-alpha)+ probit(1-&beta))/delta)**2);
                FSP=0; ESP=0; nmean=0;power=0;
                Do isim= 1 to &nsim;
                        rx1=rannor(seedx)*sigma/sqrt(n1)+rx;
                        ry1=rannor(seedy)*sigma/sqrt(n1)+ry;
                        t1=(rx1-ry1+ni)*sqrt(n1)/2**0.5/sigma;
                        p1=1-probnorm(t1);
                        if p1>&alpha0 then do;
                                FSP=FSP+1/&nsim; n2=0;
                        end;
                        if p1<=&alpha1 then do;
                                power=power+1/&nsim; ESP=ESP+1/&nsim; n2=0;
                        end;
                        if p1>&alpha1 and p1<=&alpha0 then do;
                                eSize=&diff/&sigma;
                                Cfun=(probit(1-&alpha2)-&w*probit(1-p1))/&w;
                                n2=min(&nmax,2*((Cfun-probit(1-&cP))/eSize)**2);
                                rx2=rannor(seedx)*sigma/sqrt(n2)+rx;
                                ry2=rannor(seedy)*sigma/sqrt(n2)+ry;
                                t2=(rx2-ry2+ni)*sqrt(n2)/2**0.5/sigma;
                                z2=(t1+t2)/sqrt(2);
                                p2=1-probnorm(z2);
                                if .<p2<=&alpha2 then power=power+1/&nsim;
                        end;
                        nmean=nmean+(n1+n2)/&nsim;
                end;
                proc print data=n; run;
    %Mend cp;
```

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