```
%macro third_stage_sampling(times=);
%do lyy=1 %to &times;
data c3_lyyerion;set c03_samplesize(firstobs=&lyy obs=&lyy);
run;
proc sql noprint;
	select f1h1,f1h2,f2h1,f2h2,f3h1,f3h2
	into :f1h1,:f1h2,:f2h1,:f2h2,:f3h1,:f3h2
	from c3_lyyerion;
quit;
data xc_population;
	set xc_population;
run;
data xc_population_h1 xc_population_h2;
	set xc_population;
	if h=1 then output xc_population_h1;
	if h=2 then output xc_population_h2;
run;
proc sql noprint;
	create table district_list as
	select distinct district from xc_population;
quit;
proc sql noprint;
	create table district_site_list as
	select distinct district,site from xc_population;
quit;
proc surveyselect data=district_list noprint
	method=srs sampsize=&f1h1 out=first_stage_sampling_h1 seed=&lyy;
run;
proc surveyselect data=district_list noprint
	method=srs sampsize=&f1h2 out=first_stage_sampling_h2 seed=&lyy;
```

```
run;
data after_first_stage_sampling_h1;
	merge district_site_list first_stage_sampling_h1 (in = yy1);
	by district;
	if yy1 = 1;
run;
data after_first_stage_sampling_h2;
	merge district_site_list first_stage_sampling_h2 (in = yy1);
	by district;
	if yy1 = 1;
run;
proc surveyselect data=after_first_stage_sampling_h1 noprint
	method=srs out=second_stage_sampling_h1 (drop=SelectionProb
	SamplingWeight) sampsize=&f2h1 seed=&lyy;
	strata district;
run;
proc surveyselect data=after_first_stage_sampling_h2 noprint
	method=srs out=second_stage_sampling_h2 (drop=SelectionProb
	SamplingWeight) sampsize=&f2h2 seed=&lyy;
	strata district;
run;
proc sort data=xc_population;
    by district site;
run;
proc sort data=second_stage_sampling_h1;
	by district site;
run;
proc sort data=second_stage_sampling_h2;
	by district site;
run;
```

```
data after_second_stage_sampling_h1;
	merge xc_population_h1 second_stage_sampling_h1 (in = yy2);
	by district site;
	if yy2 = 1;
run;
data after_second_stage_sampling_h2;
	merge xc_population_h2 second_stage_sampling_h2 (in = yy2);
	by district site;
	if yy2 = 1;
run;
proc surveyselect data=after_second_stage_sampling_h1 noprint
	method=srs out=third_stage_sampling_h1 (drop=SelectionProb
	SamplingWeight) samprate=&f3h1 seed=&lyy;
	strata district site;
run;
proc surveyselect data=after_second_stage_sampling_h2 noprint
	method=srs out=third_stage_sampling_h2 (drop=SelectionProb
	SamplingWeight) samprate=&f3h2 seed=&lyy;
	strata district site;
run;
data third_stage_sampling;
	set third_stage_sampling_h1 third_stage_sampling_h2;
run;
proc sql noprint;
	create table fcs_chosen_number as
	select h,count(h) as fcs from third_stage_sampling
	group by h;
quit;
proc sql noprint;
	create table fcs_total_number as
```

```
        select h,count(h) as total from xc_population
        group by h;
quit;
proc sql noprint;
        create table w_h as
        select h,total/sum(total)as w
        from fcs_total_number;
quit;
proc sql noprint;
        create table district_site_totalnumber as
        select h,count(distinct district) as n1,
                count(distinct site)/(calculated n1)as n2_bar
        from xc_population
        group h;
quit;
proc sql noprint;
        create table district_site_number as
        select h,count(distinct district) as nn1,
                count(distinct site)/(calculated nn1)as nn2_bar
        from third_stage_sampling
        group h;
quit;
data xc;
        merge third_stage_sampling
                fcs_chosen_number fcs_total_number
                w_h district_site_number district_site_totalnumber;
        by h;
run;
proc sql noprint;
        create table xc_rrt as
```

```
        select district,site,h,count(h) as per_rdsh from xc
        group by district,site,h;
quit;
data xc1;set xc_rrt;
        seed=1;
        do _i_=1 to per_rdsh;
                rrt_additive3=(int(0+(10-0)*ranuni(seed)))*10;
                output;
        end;
run;
data xc;
        set xc;set xcl(keep=rrt_additive3);
        c3=c3_real+rrt_additive3;
run;
proc sql noprint;
        create table rrt_mean as
        select district,site,h,mean(rrt_additive3) as rrt_mean
        from xc
        group by district,site,h;
quit;
proc sql noprint;
        create table yunni as
        select h,mean(c3)as mean,std(c3_real)as std
        from xc
        group by h;
quit;
proc sql noprint;
        create table c3_no as
        select district,site,h,sum(c3)as sum_ijz,count(c3)as chosen_fcs
        from xc
```

```
        group by district,site,h
        order by h,district,site;
quit;
data c3;
        merge c3_no fcs_total_number fcs_chosen_number
                district_site_number district_site_totalnumber w_h;
        by h;
        uijz=sum_ijz/chosen_fcs;uij=uijz-45;
        nij3=chosen_fcs/sampling_ratio;
        nij3_uij=nij3*uij;
run;
proc sql noprint;
        create table c3_u as
        select h,district,sum(nij3_uij) as sum_nij3_uij,nn1,nn2_bar,n1,n2_bar
        from c3
        group by h,district;
quit;
proc sql noprint;
        create table c3_u as
        select h,sum((n2_bar/nn2_bar)*sum_nij3_uij) as sum_ni2_ni2_sum_nij3_uij
        from c3_u
        group by h;
quit;
data c3_u;
        merge c3_u fcs_total_number
                w_h fcs_chosen_number
                district_site_number district_site_totalnumber;
        by h;
        u_h=n1/nn1/total*sum_ni2_ni2_sum_nij3_uij;
        w_u_h=w*u_h;
```

```
run;
proc sql noprint;
	create table c3_mu as
	select sum(w_u_h) as u from c3_u;
quit;
proc sql noprint;
	create table c3_v3 as
	select h,district,site,var(c3)as stdijk,
		n1,n2_bar,nn1,nn2_bar,fcs,total,w
	from xc
	group by h,district,site;
quit;
proc sql noprint;
	create table c3_v3 as
	select h,district,sum(stdijk)as sum_stdijk,
		n1,n2_bar,nn1,nn2_bar,fcs,total,w
	from c3_v3
	group by h,district;
quit;
proc sql noprint;
	create table c3_v3 as
	select h,sum(1/nn2_bar*sum_stdijk)as sum_reciprocal_ni2_sum_stdijk,
		n1,n2_bar,nn1,nn2_bar,fcs,total,w
	from c3_v3
	group by h;
quit;
proc sql noprint;
	create table c3_v3 as
	select h,(sum_reciprocal_ni2_sum_stdijk/nn1)as v3h
	from c3_v3;
```

```
quit;
proc sql noprint;
	create table c3_v2_ui as select *
	from c3;
quit;
proc sql noprint;
	create table c3_v2_ui as
	select h,district,sum(nij3)as sum_nij3,sum(nij3_uij)as sum_nij3_uij,
		(calculated sum_nij3_uij)/(calculated sum_nij3) as ui
	from c3_v2_ui
	group by h,district;
quit;
proc sort data=c3;by h district;run;
data c3_v2;
	merge c3 c3_v2_ui;
	by h district ;
	uij_ui_square=(uij-ui)**2;
run;
proc sort data=c3_v2;by district site h;run;
proc sql noprint;
	create table c3_v2 as
	select h,district,sum(uij_ui_square)as sum_uij_ui_square,
		(calculated sum_uij_ui_square)/(nn2_bar-1) as stdij,
		n1,n2_bar,nn1,nn2_bar,fcs,total,w
	from c3_v2
	group by h,district;
quit;
proc sort data=c3_v2 out=c3_v2 nodup;by h district;run;
proc sql noprint;
	create table c3_v2 as
```

```
        select h,sum(stdij)as sum_stdij,(calculated sum_stdij)/nn1 as v2h,
                n1,n2_bar,nn1,nn2_bar,fcs,total,w
        from c3_v2
        group by h;
quit;
proc sort data=c3_v2 out=c3_v2 nodup;by h;run;
data c3_v1;
        merge c3_u c3_v2_ui(keep=h district);by h;
run;
proc sql noprint;
        create table c3_v1 as
        select h,district,(ui-u_h)*(ui-u_h)as u_ui_square,
                n1,n2_bar,nn1,nn2_bar,fcs,total,w
        from c3_v1;
quit;
proc sql noprint;
        create table c3_v1 as
        select h,sum(u_ui_square)as sum_u_ui_square,
                (calculated sum_u_ui_square)/(nn1-1)as stdi,
                (calculated sum_u_ui_square)/(nn1-1)as v1h,
                n1,n2_bar,nn1,nn2_bar,fcs,total,w
        from c3_v1
        group by h;
quit;
data c3_v_u;answer_code='C03';
        if _n_=1 then set c3_mu;
        merge c3_v1(drop=sum_u_ui_square) c3_v2(keep=h v2h) c3_v3(keep=h v3h);
        by h;
        w_h_v_u=w*w*(v1h/nn1*(1-nn1/n1)+v2h/nn1/nn2_bar*(1-nn2_bar/n2_bar)+
                        v3h/fcs*((fcs/nn1/nn2_bar)/(total/n1/n2_bar)));
```

```
run;
proc sql noprint;
	create table c3_var as
	select u,sum(w_h_v_u) as v_u,
		u-1.96*sqrt(calculated v_u) as lower_limit,
		u+1.96*sqrt(calculated v_u) as upper_limit
	from c3_v_u;
quit;
data c3_ss_&lyy;
	set c3_v_u;set c3_var;var=v_u;
	c3_population_mean=213.67;sequence_number=&lyy;
	label v1h='σ 1h' v2h='σ 2h' v3h='σ 3h' u='总体均数估计值' upper_limit='95%上限'
		lower_limit='95%下限' answer_code='敏感问题编号' var='var(u)'
		c3_population_mean='总体均数';
	if c3_population_mean>lower_limit and c3_population_mean<upper_limit
		then status='no significance';
run;
proc print data=c3_ss_&lyy label;
	var sequence_number answer_code h v1h v2h v3h u var upper_limit lower_limit
		c3_population_mean fcs status;
	title "第 &lyy 次 C03：提供性服务次均收取费用";
run;
%end;
%mend third_stage_sampling;
%third_stage_sampling  (times=100);
run;
```