```
                                                      ___  ____  ____  ____  ____(R)
                                                     /__    /    ____/   /    ____/
                                                    ___/   /   /___/   /   /___/
                                                      Statistics/Data Analysis

                                                         User: all results

      ___  ____  ____  ____  ____ (R)
     /__    /    ____/   /    ____/
    ___/   /   /___/   /   /___/   13.0   Copyright 1985-2013 StataCorp LP
      Statistics/Data Analysis             StataCorp
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          MP - Parallel Edition            College Station, Texas 77845 USA
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                                           979-696-4601 (fax)

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                           IDRE-UCLA

    Notes:
          1.  (/v# option or -set maxvar-) 5000 maximum variables

  1 . use "C:\Users\pddes\Desktop\ae project 2\WHO Africa Panel Data.dta"

  2 . drop country_code doctors

  3 . save "C:\Users\pddes\Desktop\ae project 2\WHO Africa Panel Data.dta", replace
    file C:\Users\pddes\Desktop\ae project 2\WHO Africa Panel Data.dta saved

  4 . keep doctors
    variable doctors not found
    r(111);

  5 . do "C:\Users\pddes\Desktop\ae project 2\WHO Africa Panel Data.do"

  6 . *cleaning data
  7 . drop region doctors life_exp60 age519thinness age519obesity hospitals une_infant une_life une_in
    > ne_literacy une_school
    variable region not found
    r(111);

    end of do-file

    r(111);

  8 . xtset country_num year
           panel variable:  country_num (strongly balanced)
            time variable:  year, 2000 to 2016
                    delta:  1 unit

  9 .
 10 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
    >  doctors gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, fe
    variable doctors not found
    r(111);

 11 .
 12 . estimates store fixed
    last estimation results not found, nothing to store
    r(301);
```

```
13 .
14 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
>  doctors gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, re
variable doctors not found
r(111);

15 .
16 . estimates store random
last estimation results not found, nothing to store
r(301);

17 .
18 . hausman fixed random, sigmamore
estimation result fixed not found
r(111);

19 . xtset country_num year
       panel variable:  country_num (strongly balanced)
        time variable:  year, 2000 to 2016
                delta:  1 unit

20 .
21 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
>  gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, fe

Fixed-effects (within) regression               Number of obs      =       890
Group variable: country_num                     Number of groups   =       111

R-sq:  within  = 0.9797                         Obs per group: min =         1
       between = 0.9308                                        avg =       8.0
       overall = 0.9262                                        max =        14

                                                F(30,749)          =   1203.04
corr(u_i, Xb)  = 0.7189                         Prob > F           =    0.0000
```

life_expect	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adult_mortality	-.038614	.0005538	-69.72	0.000	-.0397012	-.0375268
infant_mort	-42.77758	4.505838	-9.49	0.000	-51.62315	-33.932
age14mort	-152.8186	16.16631	-9.45	0.000	-184.5553	-121.0819
alcohol	.0137867	.0109787	1.26	0.210	-.007766	.0353393
bmi	-.2467772	.0776584	-3.18	0.002	-.3992313	-.0943232
hepatitis	-.0014865	.0009053	-1.64	0.101	-.0032638	.0002907
measles	.0100405	.0024414	4.11	0.000	.0052477	.0148332
polio	.0011732	.0030074	0.39	0.697	-.0047307	.0070771
diphtheria	-.0048754	.0032838	-1.48	0.138	-.0113219	.0015711
basic_water	.0041906	.0058338	0.72	0.473	-.007262	.0156432
gni_capita	3.42e-06	.0000225	0.15	0.879	-.0000408	.0000476
gghed	-.0826417	.0305164	-2.71	0.007	-.1425495	-.0227338
che_gdp	-.045382	.0157202	-2.89	0.004	-.0762429	-.014521
une_pop	-3.73e-06	3.54e-06	-1.06	0.292	-.0000107	3.21e-06
une_hiv	-.0570253	.024641	-2.31	0.021	-.1053988	-.0086517
une_gni	9.48e-06	.0000209	0.45	0.650	-.0000315	.0000505
une_edu_spend	.0430417	.0131566	3.27	0.001	.0172135	.06887
year						
2001	.2582378	.0540812	4.77	0.000	.1520689	.3644066
2002	.3151027	.0548009	5.75	0.000	.2075211	.4226842
2003	.3997189	.058494	6.83	0.000	.2848872	.5145505
2004	.5701967	.0621744	9.17	0.000	.4481398	.6922536
2005	.736396	.0696175	10.58	0.000	.5997273	.8730647
2006	.9053688	.0763755	11.85	0.000	.7554333	1.055304
2007	1.046454	.0820833	12.75	0.000	.8853131	1.207595
2008	1.169585	.0890231	13.14	0.000	.994821	1.34435
2009	1.32254	.0968737	13.65	0.000	1.132364	1.512717
2010	1.448559	.1030297	14.06	0.000	1.246298	1.65082

2011	1.623439	.1109539	14.63	0.000	1.405622	1.841257
2012	1.74626	.1170058	14.92	0.000	1.516562	1.975958
2013	1.920876	.1245512	15.42	0.000	1.676365	2.165387
_cons	82.881	1.905433	43.50	0.000	79.14038	86.62163
sigma_u	3.4724111					
sigma_e	.22636677					
rho	.99576824	(fraction of variance due to u_i)				

F test that all u_i=0: F(110, 749) = 161.40 Prob > F = 0.0000

```
22 .
23 . estimates store fixed

24 .
25 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
>  gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, re
```

Random-effects GLS regression — Number of obs = 890
Group variable: **country_num** — Number of groups = 111

R-sq: within = 0.9756
between = 0.9716
overall = 0.9735

Obs per group: min = 1
avg = 8.0
max = 14

Wald chi2(30) = 31370.35
corr(u_i, X) = 0 (assumed) — Prob > chi2 = 0.0000

life_expect	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
adult_mortality	-.0396134	.0006323	-62.65	0.000	-.0408527	-.0383741
infant_mort	-57.91783	4.652903	-12.45	0.000	-67.03735	-48.7983
age14mort	-156.8811	18.0618	-8.69	0.000	-192.2816	-121.4806
alcohol	.0075592	.012087	0.63	0.532	-.0161309	.0312492
bmi	.2491593	.0595902	4.18	0.000	.1323646	.365954
hepatitis	-.0008642	.0010513	-0.82	0.411	-.0029248	.0011963
measles	.0102684	.0028495	3.60	0.000	.0046835	.0158533
polio	-.001255	.0035194	-0.36	0.721	-.0081529	.005643
diphtheria	-.0049315	.003838	-1.28	0.199	-.0124538	.0025909
basic_water	.0216604	.0058649	3.69	0.000	.0101653	.0331555
gni_capita	.0000324	.0000249	1.30	0.194	-.0000165	.0000812
gghed	.0705717	.0331599	2.13	0.033	.0055795	.1355639
che_gdp	-.0413348	.0176666	-2.34	0.019	-.0759608	-.0067089
une_pop	3.78e-07	2.17e-06	0.17	0.862	-3.88e-06	4.63e-06
une_hiv	-.0650407	.0206081	-3.16	0.002	-.1054319	-.0246495
une_gni	.0000248	.0000238	1.04	0.298	-.0000219	.0000716
une_edu_spend	.0241497	.0151516	1.59	0.111	-.005547	.0538464
year						
2001	.1509906	.0628093	2.40	0.016	.0278867	.2740946
2002	.1255386	.0618346	2.03	0.042	.004345	.2467322
2003	.1182394	.0630286	1.88	0.061	-.0052944	.2417732
2004	.1872846	.0631441	2.97	0.003	.0635244	.3110447
2005	.2454835	.0670738	3.66	0.000	.1140214	.3769457
2006	.2974137	.0693341	4.29	0.000	.1615214	.433306
2007	.3460705	.0706976	4.90	0.000	.2075058	.4846353
2008	.3635465	.0730178	4.98	0.000	.2204343	.5066586
2009	.4079732	.0765676	5.33	0.000	.2579035	.558043
2010	.445606	.0790484	5.64	0.000	.2906739	.6005381
2011	.5232636	.082489	6.34	0.000	.3615882	.6849391
2012	.5683583	.0854594	6.65	0.000	.400861	.7358556
2013	.646044	.0894465	7.22	0.000	.4707322	.8213559
_cons	69.72225	1.408661	49.50	0.000	66.96133	72.48318

```
       sigma_u |  1.0611028
       sigma_e |  .22636677
           rho |  .95647066   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
26 .
27 . estimates store random

28 .
29 . hausman fixed random, sigmamore

Note: the rank of the differenced variance matrix (13) does not equal the number of coefficients b
        be sure this is what you expect, or there may be problems computing the test.  Examine the
        estimators for anything unexpected and possibly consider scaling your variables so that th
        on a similar scale.
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
adult_mort~y	-.038614	-.0396134	.0009994	.0001549
infant_mort	-42.77758	-57.91783	15.14025	2.530458
age14mort	-152.8186	-156.8811	4.062509	5.906473
alcohol	.0137867	.0075592	.0062275	.0045218
bmi	-.2467772	.2491593	-.4959365	.069152
hepatitis	-.0014865	-.0008642	-.0006223	.0001649
measles	.0100405	.0102684	-.0002279	.0003405
polio	.0011732	-.001255	.0024281	.0003323
diphtheria	-.0048754	-.0049315	.0000561	.0004112
basic_water	.0041906	.0216604	-.0174698	.0035535
gni_capita	3.42e-06	.0000324	-.0000289	8.87e-06
gghed	-.0826417	.0705717	-.1532134	.0136807
che_gdp	-.045382	-.0413348	-.0040471	.0054177
une_pop	-3.73e-06	3.78e-07	-4.11e-06	3.54e-06
une_hiv	-.0570253	-.0650407	.0080155	.0203534
une_gni	9.48e-06	.0000248	-.0000154	5.87e-06
une_edu_sp~d	.0430417	.0241497	.018892	.0030986
2001bn.year	.2582378	.1509906	.1072472	.009811
2002.year	.3151027	.1255386	.189564	.0180557
2003.year	.3997189	.1182394	.2814794	.0274782
2004.year	.5701967	.1872846	.3829121	.0367985
2005.year	.736396	.2454835	.4909124	.0468808
2006.year	.9053688	.2974137	.6079551	.0570327
2007.year	1.046454	.3460705	.7003833	.0656621
2008.year	1.169585	.3635465	.8060389	.0749585
2009.year	1.32254	.4079732	.9145671	.0842869
2010.year	1.448559	.445606	1.002953	.0917528
2011.year	1.623439	.5232636	1.100176	.1010235
2012.year	1.74626	.5683583	1.177902	.1077641
2013.year	1.920876	.646044	1.274832	.1159058

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(13) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 238.87
Prob>chi2 = 0.0000

```
30 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
   >  gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, fe

Fixed-effects (within) regression               Number of obs      =       890
Group variable: country_num                     Number of groups   =       111

R-sq:  within  = 0.9797                         Obs per group: min =         1
       between = 0.9308                                        avg =       8.0
       overall = 0.9262                                        max =        14

                                                F(30,749)          =   1203.04
corr(u_i, Xb)  = 0.7189                         Prob > F           =    0.0000
```

life_expect	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adult_mortality	-.038614	.0005538	-69.72	0.000	-.0397012	-.0375268
infant_mort	-42.77758	4.505838	-9.49	0.000	-51.62315	-33.932
age14mort	-152.8186	16.16631	-9.45	0.000	-184.5553	-121.0819
alcohol	.0137867	.0109787	1.26	0.210	-.007766	.0353393
bmi	-.2467772	.0776584	-3.18	0.002	-.3992313	-.0943232
hepatitis	-.0014865	.0009053	-1.64	0.101	-.0032638	.0002907
measles	.0100405	.0024414	4.11	0.000	.0052477	.0148332
polio	.0011732	.0030074	0.39	0.697	-.0047307	.0070771
diphtheria	-.0048754	.0032838	-1.48	0.138	-.0113219	.0015711
basic_water	.0041906	.0058338	0.72	0.473	-.007262	.0156432
gni_capita	3.42e-06	.0000225	0.15	0.879	-.0000408	.0000476
gghed	-.0826417	.0305164	-2.71	0.007	-.1425495	-.0227338
che_gdp	-.045382	.0157202	-2.89	0.004	-.0762429	-.014521
une_pop	-3.73e-06	3.54e-06	-1.06	0.292	-.0000107	3.21e-06
une_hiv	-.0570253	.024641	-2.31	0.021	-.1053988	-.0086517
une_gni	9.48e-06	.0000209	0.45	0.650	-.0000315	.0000505
une_edu_spend	.0430417	.0131566	3.27	0.001	.0172135	.06887
year						
2001	.2582378	.0540812	4.77	0.000	.1520689	.3644066
2002	.3151027	.0548009	5.75	0.000	.2075211	.4226842
2003	.3997189	.058494	6.83	0.000	.2848872	.5145505
2004	.5701967	.0621744	9.17	0.000	.4481398	.6922536
2005	.736396	.0696175	10.58	0.000	.5997273	.8730647
2006	.9053688	.0763755	11.85	0.000	.7554333	1.055304
2007	1.046454	.0820833	12.75	0.000	.8853131	1.207595
2008	1.169585	.0890231	13.14	0.000	.994821	1.34435
2009	1.32254	.0968737	13.65	0.000	1.132364	1.512717
2010	1.448559	.1030297	14.06	0.000	1.246298	1.65082
2011	1.623439	.1109539	14.63	0.000	1.405622	1.841257
2012	1.74626	.1170058	14.92	0.000	1.516562	1.975958
2013	1.920876	.1245512	15.42	0.000	1.676365	2.165387
_cons	82.881	1.905433	43.50	0.000	79.14038	86.62163
sigma_u	3.4724111					
sigma_e	.22636677					
rho	.99576824	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(110, 749) =   161.40              Prob > F = 0.0000
```

```
31 . outreg2 using test.doc, append ctitle(Main Model)
test.doc
dir : seeout

32 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
>  gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, re

Random-effects GLS regression                   Number of obs      =       890
Group variable: country_num                     Number of groups   =       111

R-sq:  within  = 0.9756                         Obs per group: min =         1
       between = 0.9716                                        avg =       8.0
       overall = 0.9735                                        max =        14

                                                Wald chi2(30)      =  31370.35
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

life_expect	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
adult_mortality	-.0396134	.0006323	-62.65	0.000	-.0408527	-.0383741
infant_mort	-57.91783	4.652903	-12.45	0.000	-67.03735	-48.7983
age14mort	-156.8811	18.0618	-8.69	0.000	-192.2816	-121.4806
alcohol	.0075592	.012087	0.63	0.532	-.0161309	.0312492
bmi	.2491593	.0595902	4.18	0.000	.1323646	.365954
hepatitis	-.0008642	.0010513	-0.82	0.411	-.0029248	.0011963
measles	.0102684	.0028495	3.60	0.000	.0046835	.0158533
polio	-.001255	.0035194	-0.36	0.721	-.0081529	.005643
diphtheria	-.0049315	.003838	-1.28	0.199	-.0124538	.0025909
basic_water	.0216604	.0058649	3.69	0.000	.0101653	.0331555
gni_capita	.0000324	.0000249	1.30	0.194	-.0000165	.0000812
gghed	.0705717	.0331599	2.13	0.033	.0055795	.1355639
che_gdp	-.0413348	.0176666	-2.34	0.019	-.0759608	-.0067089
une_pop	3.78e-07	2.17e-06	0.17	0.862	-3.88e-06	4.63e-06
une_hiv	-.0650407	.0206081	-3.16	0.002	-.1054319	-.0246495
une_gni	.0000248	.0000238	1.04	0.298	-.0000219	.0000716
une_edu_spend	.0241497	.0151516	1.59	0.111	-.005547	.0538464
year						
2001	.1509906	.0628093	2.40	0.016	.0278867	.2740946
2002	.1255386	.0618346	2.03	0.042	.004345	.2467322
2003	.1182394	.0630286	1.88	0.061	-.0052944	.2417732
2004	.1872846	.0631441	2.97	0.003	.0635244	.3110447
2005	.2454835	.0670738	3.66	0.000	.1140214	.3769457
2006	.2974137	.0693341	4.29	0.000	.1615214	.433306
2007	.3460705	.0706976	4.90	0.000	.2075058	.4846353
2008	.3635465	.0730178	4.98	0.000	.2204343	.5066586
2009	.4079732	.0765676	5.33	0.000	.2579035	.558043
2010	.445606	.0790484	5.64	0.000	.2906739	.6005381
2011	.5232636	.082489	6.34	0.000	.3615882	.6849391
2012	.5683583	.0854594	6.65	0.000	.400861	.7358556
2013	.646044	.0894465	7.22	0.000	.4707322	.8213559
_cons	69.72225	1.408661	49.50	0.000	66.96133	72.48318
sigma_u	1.0611028					
sigma_e	.22636677					
rho	.95647066	(fraction of variance due to u_i)				

```
33 . outreg2 using test.doc, append ctitle(Model Estimation using Random Effects)
   test.doc
   dir : seeout

34 . huasman fixed random, sigmamore
   unrecognized command:  huasman
   r(199);

35 . hausman fixed random, sigmamore

   Note: the rank of the differenced variance matrix (13) does not equal the number of coefficients b
         be sure this is what you expect, or there may be problems computing the test.  Examine the
         estimators for anything unexpected and possibly consider scaling your variables so that th
         on a similar scale.
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
adult_mort~y	-.038614	-.0396134	.0009994	.0001549
infant_mort	-42.77758	-57.91783	15.14025	2.530458
age14mort	-152.8186	-156.8811	4.062509	5.906473
alcohol	.0137867	.0075592	.0062275	.0045218
bmi	-.2467772	.2491593	-.4959365	.069152
hepatitis	-.0014865	-.0008642	-.0006223	.0001649
measles	.0100405	.0102684	-.0002279	.0003405
polio	.0011732	-.001255	.0024281	.0003323
diphtheria	-.0048754	-.0049315	.0000561	.0004112
basic_water	.0041906	.0216604	-.0174698	.0035535
gni_capita	3.42e-06	.0000324	-.0000289	8.87e-06
gghed	-.0826417	.0705717	-.1532134	.0136807
che_gdp	-.045382	-.0413348	-.0040471	.0054177
une_pop	-3.73e-06	3.78e-07	-4.11e-06	3.54e-06
une_hiv	-.0570253	-.0650407	.0080155	.0203534
une_gni	9.48e-06	.0000248	-.0000154	5.87e-06
une_edu_sp~d	.0430417	.0241497	.018892	.0030986
2001bn.year	.2582378	.1509906	.1072472	.009811
2002.year	.3151027	.1255386	.189564	.0180557
2003.year	.3997189	.1182394	.2814794	.0274782
2004.year	.5701967	.1872846	.3829121	.0367985
2005.year	.736396	.2454835	.4909124	.0468808
2006.year	.9053688	.2974137	.6079551	.0570327
2007.year	1.046454	.3460705	.7003833	.0656621
2008.year	1.169585	.3635465	.8060389	.0749585
2009.year	1.32254	.4079732	.9145671	.0842869
2010.year	1.448559	.445606	1.002953	.0917528
2011.year	1.623439	.5232636	1.100176	.1010235
2012.year	1.74626	.5683583	1.177902	.1077641
2013.year	1.920876	.646044	1.274832	.1159058

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(13) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 238.87
Prob>chi2 = 0.0000

```
36 . outreg2 using hausman.doc, replace ctitle(Results of Wu-Hausman Test)
   hausman.doc
   dir : seeout

37 . drop une_gni

38 . pwcorr adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diphtheria basi
   >  gghed che_gdp une_pop une_hiv une_edu_spend, star(0.05) sig
```

	adult_~y	infant~t	age14m~t	alcohol	bmi	hepati~s	measles
adult_mort~y	1.0000						
infant_mort	0.8132*	1.0000					
	0.0000						
age14mort	0.7562*	0.9090*	1.0000				
	0.0000	0.0000					
alcohol	-0.2465*	-0.4446*	-0.3057*	1.0000			
	0.0000	0.0000	0.0000				
bmi	-0.5171*	-0.6419*	-0.6152*	0.2728*	1.0000		
	0.0000	0.0000	0.0000	0.0000			
hepatitis	-0.2769*	-0.4257*	-0.3889*	0.1190*	0.2916*	1.0000	
	0.0000	0.0000	0.0000	0.0000	0.0000		
measles	-0.5262*	-0.7202*	-0.6986*	0.2917*	0.4688*	0.6803*	1.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
polio	-0.5380*	-0.7286*	-0.7008*	0.2898*	0.4413*	0.6932*	0.9242*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
diphtheria	-0.5300*	-0.7207*	-0.6941*	0.2943*	0.4462*	0.7221*	0.9232*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
basic_water	-0.7327*	-0.8515*	-0.8023*	0.4077*	0.6733*	0.3656*	0.6599*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
gni_capita	-0.5277*	-0.5395*	-0.4178*	0.3050*	0.4108*	0.1860*	0.3436*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
gghed	-0.4858*	-0.5768*	-0.4474*	0.5296*	0.4617*	0.1646*	0.3970*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
che_gdp	-0.1986*	-0.2384*	-0.1623*	0.3722*	0.2480*	0.0692*	0.2038*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000
une_pop	-0.0615*	-0.0040	-0.0330	-0.0378*	-0.1662*	-0.1205*	-0.0158
	0.0006	0.8260	0.0677	0.0376	0.0000	0.0000	0.3812
une_hiv	0.6806*	0.3416*	0.2920*	-0.0383	-0.1547*	-0.0476*	-0.1108*
	0.0000	0.0000	0.0000	0.0645	0.0000	0.0388	0.0000
une_edu_sp~d	-0.1471*	-0.3187*	-0.2830*	0.2160*	0.3124*	0.1498*	0.2701*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	polio	diphth~a	basic_~r	gni_ca~a	gghed	che_gdp	une_pop
polio	1.0000						
diphtheria	0.9645*	1.0000					
	0.0000						
basic_water	0.6621*	0.6517*	1.0000				
	0.0000	0.0000					
gni_capita	0.3569*	0.3557*	0.5210*	1.0000			
	0.0000	0.0000	0.0000				
gghed	0.4127*	0.4096*	0.5100*	0.4248*	1.0000		
	0.0000	0.0000	0.0000	0.0000			
che_gdp	0.2239*	0.2242*	0.2054*	0.1274*	0.6899*	1.0000	
	0.0000	0.0000	0.0000	0.0000	0.0000		
une_pop	-0.0297	-0.0282	0.0289	-0.0389	-0.0812*	-0.0710*	1.0000
	0.1008	0.1197	0.1108	0.0566	0.0000	0.0001	
une_hiv	-0.1078*	-0.0935*	-0.2871*	-0.1907*	-0.0866*	0.0249	-0.1023*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.2338	0.0000
une_edu_sp~d	0.3143*	0.2980*	0.2711*	0.2257*	0.5216*	0.3415*	-0.1008*
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	une_hiv	une_ed~d
une_hiv	1.0000	
une_edu_sp~d	0.1888*	1.0000
	0.0000	

```
39 . graph matrix adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diphtheri
   > capita gghed che_gdp une_pop une_hiv une_edu_spend, half maxis(yalbel(none) xlabel(none))
option yalbel() not allowed
r(198);

40 . graph matrix adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diphtheri
   > capita gghed che_gdp une_pop une_hiv une_edu_spend, half maxis(ylabel(none) xlabel(none))

41 . graph export "C:\Users\pddes\Desktop\ae project 2\Graph.eps", as(eps) preview(off) replace
   (note: file C:\Users\pddes\Desktop\ae project 2\Graph.eps not found)
   (file C:\Users\pddes\Desktop\ae project 2\Graph.eps written in EPS format)

42 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
   >  gni_capita gghed che_gdp une_pop une_hiv une_gni une_edu_spend i.year, fe
variable une_gni not found
r(111);
```

```
43 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
   >  gni_capita gghed che_gdp une_pop une_hiv une_edu_spend i.year, fe

Fixed-effects (within) regression               Number of obs      =       901
Group variable: country_num                     Number of groups   =       112

R-sq:  within  = 0.9792                         Obs per group: min =         1
       between = 0.9314                                        avg =       8.0
       overall = 0.9269                                        max =        14

                                                F(29,760)          =   1233.06
corr(u_i, Xb)  = 0.7242                         Prob > F           =    0.0000
```

life_expect	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adult_mortality	-.0386272	.0005557	-69.51	0.000	-.0397181	-.0375363
infant_mort	-43.36339	4.510012	-9.61	0.000	-52.21695	-34.50983
age14mort	-150.7627	16.20815	-9.30	0.000	-182.5807	-118.9446
alcohol	.0132166	.0110294	1.20	0.231	-.0084351	.0348682
bmi	-.2390598	.0779326	-3.07	0.002	-.3920486	-.0860711
hepatitis	-.0014477	.0009061	-1.60	0.111	-.0032264	.000331
measles	.009859	.0024384	4.04	0.000	.0050722	.0146459
polio	.0006673	.0029584	0.23	0.822	-.0051402	.0064748
diphtheria	-.0041831	.0031206	-1.34	0.180	-.0103092	.0019429
basic_water	.0037547	.0058546	0.64	0.522	-.0077384	.0152478
gni_capita	.0000126	6.08e-06	2.08	0.038	7.02e-07	.0000246
gghed	-.0888739	.0273184	-3.25	0.001	-.1425025	-.0352454
che_gdp	-.0431496	.0156852	-2.75	0.006	-.0739412	-.0123581
une_pop	-3.90e-06	3.54e-06	-1.10	0.271	-.0000108	3.05e-06
une_hiv	-.0538518	.0246159	-2.19	0.029	-.102175	-.0055286
une_edu_spend	.0391444	.0129992	3.01	0.003	.0136257	.064663
year						
2001	.2473638	.0535998	4.62	0.000	.1421425	.3525851
2002	.320939	.0543663	5.90	0.000	.214213	.4276651
2003	.3930155	.0580798	6.77	0.000	.2789997	.5070313
2004	.5580058	.0615377	9.07	0.000	.4372018	.6788098
2005	.7210019	.0690539	10.44	0.000	.5854429	.8565608
2006	.8958805	.0757431	11.83	0.000	.7471899	1.044571
2007	1.04031	.0817513	12.73	0.000	.8798246	1.200795
2008	1.157641	.0887162	13.05	0.000	.9834833	1.331799
2009	1.313367	.0963851	13.63	0.000	1.124154	1.502579
2010	1.431212	.1024769	13.97	0.000	1.230041	1.632384
2011	1.612189	.1104762	14.59	0.000	1.395314	1.829063
2012	1.735708	.1165626	14.89	0.000	1.506885	1.964531
2013	1.911012	.124195	15.39	0.000	1.667206	2.154818
_cons	82.82516	1.914145	43.27	0.000	79.06752	86.5828
sigma_u	3.4885178					
sigma_e	.22756711					
rho	.99576266	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(111, 760) =   168.59            Prob > F = 0.0000
```

```
44 . predict LE_predict
   (option xb assumed; fitted values)
   (2210 missing values generated)

45 . estat hettest
   invalid subcommand hettest
   r(321);

46 . hettest
   last estimates not found
   r(301);

47 . predict LE_predict
   LE_predict already defined
   r(110);

48 . hettest estat
   last estimates not found
   r(301);

49 . gen u_hat= life_expect-LE_predict
   (2210 missing values generated)

50 . twoway (scatter LE_predict u_hat)

51 . ssc xttest3
   ssc: xttest3: invalid subcommand
   r(198);

52 . ssc install xtest3
   ssc install: "xtest3" not found at SSC, type -findit xtest3-
   (To find all packages at SSC that start with x, type -ssc describe x-)
   r(601);

53 . ssc install xttest3
   checking xttest3 consistency and verifying not already installed...
   installing into c:\ado\plus\...
   installation complete.

54 . xttest3

   Modified Wald test for groupwise heteroskedasticity
   in fixed effect regression model

   H0: sigma(i)^2 = sigma^2 for all i

   chi2 (112)  =   7.8e+24
   Prob>chi2 =      0.0000


55 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
   >  gni_capita gghed che_gdp une_pop une_hiv une_edu_spend i.year, robust fe

   Fixed-effects (within) regression               Number of obs      =       901
   Group variable: country_num                     Number of groups   =       112

   R-sq:  within  = 0.9792                         Obs per group: min =         1
          between = 0.9314                                        avg =       8.0
          overall = 0.9269                                        max =        14

                                                   F(29,111)          =    582.24
   corr(u_i, Xb)  = 0.7242                         Prob > F           =    0.0000
```

(Std. Err. adjusted for **112** clusters in country_num)

life_expect	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
adult_mortality	-.0386272	.0009241	-41.80	0.000	-.0404583	-.0367961
infant_mort	-43.36339	10.78051	-4.02	0.000	-64.72569	-22.00108
age14mort	-150.7627	28.04331	-5.38	0.000	-206.3324	-95.19299
alcohol	.0132166	.0259382	0.51	0.611	-.0381818	.0646149
bmi	-.2390598	.1794094	-1.33	0.185	-.5945715	.1164518
hepatitis	-.0014477	.0015189	-0.95	0.343	-.0044576	.0015621
measles	.009859	.0051821	1.90	0.060	-.0004097	.0201277
polio	.0006673	.0037599	0.18	0.859	-.0067831	.0081177
diphtheria	-.0041831	.0044243	-0.95	0.346	-.0129502	.004584
basic_water	.0037547	.0130426	0.29	0.774	-.0220901	.0295995
gni_capita	.0000126	.0000177	0.71	0.478	-.0000225	.0000478
gghed	-.0888739	.0408411	-2.18	0.032	-.1698033	-.0079445
che_gdp	-.0431496	.0273531	-1.58	0.118	-.0973516	.0110523
une_pop	-3.90e-06	7.70e-06	-0.51	0.614	-.0000191	.0000114
une_hiv	-.0538518	.0503927	-1.07	0.288	-.1537083	.0460047
une_edu_spend	.0391444	.0252535	1.55	0.124	-.0108972	.0891859
year						
2001	.2473638	.0589211	4.20	0.000	.1306078	.3641199
2002	.320939	.0721042	4.45	0.000	.1780598	.4638182
2003	.3930155	.0878222	4.48	0.000	.21899	.5670411
2004	.5580058	.1130039	4.94	0.000	.3340809	.7819307
2005	.7210019	.1340596	5.38	0.000	.4553538	.98665
2006	.8958805	.1592313	5.63	0.000	.5803531	1.211408
2007	1.04031	.1869214	5.57	0.000	.6699126	1.410707
2008	1.157641	.2124529	5.45	0.000	.7366516	1.578631
2009	1.313367	.2330327	5.64	0.000	.851597	1.775137
2010	1.431212	.253498	5.65	0.000	.9288891	1.933535
2011	1.612189	.2762113	5.84	0.000	1.064858	2.15952
2012	1.735708	.2893191	6.00	0.000	1.162403	2.309014
2013	1.911012	.311707	6.13	0.000	1.293344	2.52868
_cons	82.82516	4.360157	19.00	0.000	74.18522	91.4651
sigma_u	3.4885178					
sigma_e	.22756711					
rho	.99576266	(fraction of variance due to u_i)				

```
56 . ovtest
last estimates not found
r(301);

57 . vif
not appropriate after regress, nocons;
use option uncentered to get uncentered VIFs
r(301);

58 . vif, uncentered
```

Variable	VIF	1/VIF
adult_mort~y	37.01	0.027018
infant_mort	29.71	0.033662
age14mort	12.54	0.079771
alcohol	5.95	0.168093
bmi	234.66	0.004262
hepatitis	61.10	0.016366
measles	347.06	0.002881
polio	827.67	0.001208
diphtheria	802.70	0.001246
basic_water	102.87	0.009721

gni_capita	**4.04**	**0.247637**
gghed	**19.90**	**0.050250**
che_gdp	**20.29**	**0.049276**
une_pop	**1.68**	**0.594446**
une_hiv	**3.63**	**0.275456**
une_edu_sp~d	**12.46**	**0.080228**
year		
2001	**2.13**	**0.470190**
2002	**2.32**	**0.431805**
2003	**2.39**	**0.419044**
2004	**2.80**	**0.356951**
2005	**2.69**	**0.371420**
2006	**2.74**	**0.364850**
2007	**2.89**	**0.345783**
2008	**3.16**	**0.316523**
2009	**3.15**	**0.317344**
2010	**3.35**	**0.298745**
2011	**3.26**	**0.306902**
2012	**3.25**	**0.307473**
2013	**3.21**	**0.311179**
Mean VIF	**88.30**	

```
59 . predict e, resid
option resid not allowed
r(198);

60 . predict e
(option xb assumed; fitted values)
(2210 missing values generated)

61 . kdensity e, normal

62 . swilk e
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
e	**901**	**0.88995**	**63.122**	**10.221**	**0.00000**

```
63 . ovtest
last estimates not found
r(301);

64 . ssc install xtcsd
checking xtcsd consistency and verifying not already installed...
installing into c:\ado\plus\...
installation complete.

65 . xtreg life_expect adult_mortality infant_mort age14mort alcohol bmi hepatitis measles polio diph
>  gni_capita gghed che_gdp une_pop une_hiv une_edu_spend i.year, fe

Fixed-effects (within) regression               Number of obs      =       901
Group variable: country_num                     Number of groups   =       112

R-sq:  within  = 0.9792                         Obs per group: min =         1
       between = 0.9314                                        avg =       8.0
       overall = 0.9269                                        max =        14

                                                F(29,760)          =   1233.06
corr(u_i, Xb)  = 0.7242                         Prob > F           =    0.0000
```

life_expect	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adult_mortality	-.0386272	.0005557	-69.51	0.000	-.0397181	-.0375363
infant_mort	-43.36339	4.510012	-9.61	0.000	-52.21695	-34.50983
age14mort	-150.7627	16.20815	-9.30	0.000	-182.5807	-118.9446
alcohol	.0132166	.0110294	1.20	0.231	-.0084351	.0348682
bmi	-.2390598	.0779326	-3.07	0.002	-.3920486	-.0860711
hepatitis	-.0014477	.0009061	-1.60	0.111	-.0032264	.000331
measles	.009859	.0024384	4.04	0.000	.0050722	.0146459
polio	.0006673	.0029584	0.23	0.822	-.0051402	.0064748
diphtheria	-.0041831	.0031206	-1.34	0.180	-.0103092	.0019429
basic_water	.0037547	.0058546	0.64	0.522	-.0077384	.0152478
gni_capita	.0000126	6.08e-06	2.08	0.038	7.02e-07	.0000246
gghed	-.0888739	.0273184	-3.25	0.001	-.1425025	-.0352454
che_gdp	-.0431496	.0156852	-2.75	0.006	-.0739412	-.0123581
une_pop	-3.90e-06	3.54e-06	-1.10	0.271	-.0000108	3.05e-06
une_hiv	-.0538518	.0246159	-2.19	0.029	-.102175	-.0055286
une_edu_spend	.0391444	.0129992	3.01	0.003	.0136257	.064663
year						
2001	.2473638	.0535998	4.62	0.000	.1421425	.3525851
2002	.320939	.0543663	5.90	0.000	.214213	.4276651
2003	.3930155	.0580798	6.77	0.000	.2789997	.5070313
2004	.5580058	.0615377	9.07	0.000	.4372018	.6788098
2005	.7210019	.0690539	10.44	0.000	.5854429	.8565608
2006	.8958805	.0757431	11.83	0.000	.7471899	1.044571
2007	1.04031	.0817513	12.73	0.000	.8798246	1.200795
2008	1.157641	.0887162	13.05	0.000	.9834833	1.331799
2009	1.313367	.0963851	13.63	0.000	1.124154	1.502579
2010	1.431212	.1024769	13.97	0.000	1.230041	1.632384
2011	1.612189	.1104762	14.59	0.000	1.395314	1.829063
2012	1.735708	.1165626	14.89	0.000	1.506885	1.964531
2013	1.911012	.124195	15.39	0.000	1.667206	2.154818
_cons	82.82516	1.914145	43.27	0.000	79.06752	86.5828
sigma_u	3.4885178					
sigma_e	.22756711					
rho	.99576266	(fraction of variance due to u_i)				

F test that all u_i=0: F(**111, 760**) = **168.59** Prob > F = **0.0000**

```
66 . xtcsd, pesaran abs
   Error: The panel is highly unbalanced.
   Not enough common observations across panel to perform Pesaran's test.
   insufficient observations
   r(2001);

67 . ssc install xtserial
   ssc install: "xtserial" not found at SSC, type -findit xtserial-
   (To find all packages at SSC that start with x, type -ssc describe x-)
   r(601);

68 . save "C:\Users\pddes\Desktop\ae project 2\WHO Africa Panel Data.dta", replace
   file C:\Users\pddes\Desktop\ae project 2\WHO Africa Panel Data.dta saved

69 .
```