April 2010

Hi All,

It was great to see everyone at the meeting this week.

I wanted to follow-up for some potential FSCPE peer-review on how I think Census ACS could control their GQ estimates to both the GQType and GQCounty using simple two-dimensional data raking and currently available data, and still get characteristic data (age, race, sex, etc.).

Unless I am misunderstanding the problem, I think it could be pretty straight-forward to fix, following the small example shown in the next four slides.

In any case, I think this issue is an important one, since the GQ estimates directly affect the total population estimates, which are used so often.

Best,

Eddie

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Initial data that we have to work with (just made up for example):

		GQType1County1	GQType1County2	GQType1County3	GQType2County1	GQType2County2	GQType2County3
		5600	504	0	5489	106	58
GQType1Age0	0	0	0	0	0	0	0
GQType1Age5	0	0	0	0	0	0	0
GQType1Age10	0	0	0	0	0	0	0
GQType1Age15	0	0	0	0	0	0	0
GQType1Age20	0	0	0	0	0	0	0
GQType1Age25	0	0	0	0	0	0	0
GQType1Age30	0	0	0	0	0	0	0
GQType1Age35	0	0	0	0	0	0	0
GQType1Age40	0	0	0	0	0	0	0
GQType1Age45	0	0	0	0	0	0	0
GQType1Age50	0	0	0	0	0	0	0
GQType1Age55	506	0	16	0	0	0	0
GQType1Age60	1050	0	32	0	0	0	0
GQType1Age65	1822	0	55	0	0	0	0
GQType1Age70	2037	0	61	0	0	0	0
GQType1Age75	203	0	6	0	0	0	0
GQType1Age80	305	0	9	0	0	0	0
GQType1Age85	102	0	3	0	0	0	0
GQType1Age90	71	0	2	0	0	0	0
GQType1Age95	8	0	0	0	0	0	0
GQType2Age0	0	0	0	0	0	0	0
GQType2Age5	0	0	0	0	0	0	0
GQType2Age10	0	0	0	0	0	0	0
GQType2Age15	0	0	0	0	0	0	0
GQType2Age20	630	0	0	0	0	2	14
GQType2Age25	1140	0	0	0	0	18	11
GQType2Age30	1613	0	0	0	0	32	9
GQType2Age35	790	0	0	0	0	12	8
GQType2Age40	760	0	0	0	0	10	9
GQType2Age45	280	0	0	0	0	0	7
GQType2Age50	240	0	0	0	0	0	6
GQType2Age55	180	0	0	0	0	0	5
GQType2Age60	20	0	0	0	0	0	0
GQType2Age65	0	0	0	0	0	0	0
GQType2Age70	0	0	0	0	0	0	0
GQType2Age75	0	0	0	0	0	0	0
GQType2Age80	0	0	0	0	0	0	0
GQType2Age85	0	0	0	0	0	0	0
GQType2Age90	0	0	0	0	0	0	0
GQType2Age95	0	0	0	0	0	0	0

<u>Problem:</u>

Zeroes in the marginals will not work with data raking, and zero cells in the seed/bestguess
will not adjust by data raking. The data appears too sparse and clustered to reasonably adjust at all.

		GQType1County1	GQType1County2	GQType1County3	GQType2County1	GQType2County2	GQType2County3
		5600	504	0	5489	106	58
GQType1Age0	0	0	0	0	0	0	0
GQType1Age5	0	0	0	0	0	0	0
GQType1Age10	0	0	0	0	0	0	0
GQType1Age15	0	0	0	0	0	0	0
GQType1Age20	0	0	0	0	0	0	0
GQType1Age25	0	0	0	0	0	0	0
GQType1Age30	0	0	0	0	0	0	0
GQType1Age35	0	0	0	0	0	0	0
GQType1Age40	0	0	0	0	0	0	0
GQType1Age45	0	0	0	0	0	0	0
GQType1Age50	0	0	0	0	0	0	0
GQType1Age55	506	0	16	0	0	0	0
GQType1Age60	1050	0	32	0	0	0	0
GQType1Age65	1822	0	55	0	0	0	0
GQType1Age70	2037	0	61	0	0	0	0
GQType1Age75	203	0	6	0	0	0	0
GQType1Age80	305	0	9	0	0	0	0
GQType1Age85	102	0	3	0	0	0	0
GQType1Age90	71	0	2	0	0	0	0
GQType1Age95	8	0	0	0	0	0	0
GQType2Age0	0	0	0	0	0	0	0
GQType2Age5	0	0	0	0	0	0	0
GQType2Age10	0	0	0	0	0	0	0
GQType2Age15	0	0	0	0	0	0	0
GQType2Age20	630	0	0	0	0	2	14
GQType2Age25	1140	0	0	0	0	18	11
GQType2Age30	1613	0	0	0	0	32	9
GQType2Age35	790	0	0	0	0	12	8
GQType2Age40	760	0	0	0	0	10	9
GQType2Age45	280	0	0	0	0	0	7
GQType2Age50	240	0	0	0	0	0	6
GQType2Age55	180	0	0	0	0	0	5
GQType2Age60	20	0	0	0	0	0	0
GQType2Age65	0	0	0	0	0	0	0
GQType2Age70	0	0	0	0	0	0	0
GQType2Age75	0	0	0	0	0	0	0
GQType2Age80	0	0	0	0	0	0	0
GQType2Age85	0	0	0	0	0	0	0
GQType2Age90	0	0	0	0	0	0	0
GQType2Age95	0	0	0	0	0	0	0

Solution Steps:

(1) Replace all of the non-structural zeroes with a non-significant, uniform, positive number, so that the values can adjust, but won't affect the shape of the best fit (I learned this from Nels Tomlinson in AK).

(2) Then run simple two-dimensional data raking on this.

		GQType1County1	GQType1County2	GQType1County3	GQType2County1	GQType2County2	GQType2County3
		5600	504	0.01	5489	106	58
GQType1Age0	0.01	0.01	0.01	0.01	0	0	0
GQType1Age5	0.01	0.01	0.01	0.01	0	0	0
GQType1Age10	0.01	0.01	0.01	0.01	0	0	0
GQType1Age15	0.01	0.01	0.01	0.01	0	0	0
GQType1Age20	0.01	0.01	0.01	0.01	0	0	0
GQType1Age25	0.01	0.01	0.01	0.01	0	0	0
GQType1Age30	0.01	0.01	0.01	0.01	0	0	0
GQType1Age35	0.01	0.01	0.01	0.01	0	0	0
GQType1Age40	0.01	0.01	0.01	0.01	0	0	0
GQType1Age45	0.01	0.01	0.01	0.01	0	0	0
GQType1Age50	0.01	0.01	0.01	0.01	0	0	0
GQType1Age55	506	0.01	16	0.01	0	0	0
GQType1Age60	1050	0.01	32	0.01	0	0	0
GQType1Age65	1822	0.01	55	0.01	0	0	0
GQType1Age70	2037	0.01	61	0.01	0	0	0
GQType1Age75	203	0.01	6	0.01	0	0	0
GQType1Age80	305	0.01	9	0.01	0	0	0
GQType1Age85	102	0.01	3	0.01	0	0	0
GQType1Age90	71	0.01	2	0.01	0	0	0
GQType1Age95	8	0.01	0.01	0.01	0	0	0
GQType2Age0	0.01	0	0	0	0.01	0.01	0.01
GQType2Age5	0.01	0	0	0	0.01	0.01	0.01
GQType2Age10	0.01	0	0	0	0.01	0.01	0.01
GQType2Age15	0.01	0	0	0	0.01	0.01	0.01
GQType2Age20	630	0	0	0	0.01	2	14
GQType2Age25	1140	0	0	0	0.01	18	11
GQType2Age30	1613	0	0	0	0.01	32	9
GQType2Age35	790	0	0	0	0.01	12	8
GQType2Age40	760	0	0	0	0.01	10	9
GQType2Age45	280	0	0	0	0.01	0.01	7
GQType2Age50	240	0	0	0	0.01	0.01	6
GQType2Age55	180	0	0	0	0.01	0.01	5
GQType2Age60	20	0	0	0	0.01	0.01	0.01
GQType2Age65	0.01	0	0	0	0.01	0.01	0.01
GQType2Age70	0.01	0	0	0	0.01	0.01	0.01
GQType2Age75	0.01	0	0	0	0.01	0.01	0.01
GQType2Age80	0.01	0	0	0	0.01	0.01	0.01
GQType2Age85	0.01	0	0	0	0.01	0.01	0.01
GQType2Age90	0.01	0	0	0	0.01	0.01	0.01
GQType2Age95	0.01	0	0	0	0.01	0.01	0.01

Solution:

*Best fit for GQTypeByCountyByAge, based on the ACS Sample, and PEP data.

*This allows correct totals by type and county simultaneously, and gives maximum likelihood proportions based on the tiny, tightly clustered ACS sample by type and county.

*Could also use census data or other as a synthetic base, but that would be a departure from standards.

*It works just as well with multiple characteristic controls (eg age, sex, race...).

		GQType1County1	GQType1County2	GQType1County3	GQType2County1	GQType2County2	GQType2County3
		5600	504	0	5489	106	58
GQType1Age0	0	0	0	0	0	0	0
GQType1Age5	0	0	0	0	0	0	0
GQType1Age10	0	0	0	0	0	0	0
GQType1Age15	0	0	0	0	0	0	0
GQType1Age20	0	0	0	0	0	0	0
GQType1Age25	0	0	0	0	0	0	0
GQType1Age30	0	0	0	0	0	0	0
GQType1Age35	0	0	0	0	0	0	0
GQType1Age40	0	0	0	0	0	0	0
GQType1Age45	0	0	0	0	0	0	0
GQType1Age50	0	0	0	0	0	0	0
GQType1Age55	506	490	16	0	0	0	0
GQType1Age60	1050	985	65	0	0	0	0
GQType1Age65	1822	1636	186	0	0	0	0
GQType1Age70	2037	1809	228	0	0	0	0
GQType1Age75	203	201	2	0	0	0	0
GQType1Age80	305	299	6	0	0	0	0
GQType1Age85	102	101	1	0	0	0	0
GQType1Age90	71	71	0	0	0	0	0
GQType1Age95	8	8	0	0	0	0	0
GQType2Age0	0	0	0	0	0	0	0
GQType2Age5	0	0	0	0	0	0	0
GQType2Age10	0	0	0	0	0	0	0
GQType2Age15	0	0	0	0	0	0	0
GQType2Age20	630	0	0	0	618	2	10
GQType2Age25	1140	0	0	0	1102	24	14
GQType2Age30	1613	0	0	0	1538	60	15
GQType2Age35	790	0	0	0	772	11	7
GQType2Age40	760	0	0	0	744	9	7
GQType2Age45	280	0	0	0	278	0	2
GQType2Age50	240	0	0	0	238	0	2
GQType2Age55	180	0	0	0	179	0	1
GQType2Age60	20	0	0	0	20	0	0
GQType2Age65	0	0	0	0	0	0	0
GQType2Age70	0	0	0	0	0	0	0
GQType2Age75	0	0	0	0	0	0	0
GQType2Age80	0	0	0	0	0	0	0
GQType2Age85	0	0	0	0	0	0	0
GQType2Age90	0	0	0	0	0	0	0
GQType2Age95	0	0	0	0	0	0	0