

Note regarding Census 1990 population counts used in: Currie, J. and Schwandt, H., 2016. “Inequality in mortality decreased among the young while increasing for older adults, 1990–2010.” *Science*, 352(6286), pp.708-712.

Janet Currie
Princeton University

Hannes Schwandt
University of Zurich

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1. Summary

Mortality rates constructed by Currie and Schwandt (2016) are based on U.S. Census population counts. Because of reporting problems in the 1990 Census, the population counts for age <1 in 1990 is lower than what appears reasonable based on the Vital Statistics natality records (NCHS 1997). NCHS bridged population estimates (NCHS 2004) report higher counts in that age group. Consequently, using the NCHS estimates instead of the Census population counts results in smaller mortality rates in 1990 for the age group <1. Mortality rates at other age groups are not substantially affected by the use of the NCHS population estimates. Overall, the conclusions drawn in Currie and Schwandt (2016), including those with respect to the age group <1, remain unchanged.

2. Mortality rates based on NCHS bridged population estimates

Figures 1 and 3 replicate Figures 2 and 3 of Currie and Schwandt (2016) which show mortality across county groups in 1990, 2000 and 2010 by age groups based on Census population counts. Figures 2 and 4 show the same mortality rates based on NCHS bridged population estimates. Tables 1 and 2 report key magnitudes for Figures 2 and 4.

Currie and Schwandt (2016) describe the changes in mortality rates for the age group 0-1 as:

“... 3-year mortality rates for male newborns ... decreased by 4.2 per 1000 in the group of richest counties between 1990 and 2010, from 9.77 (95% CI, 9.10 to 10.44) to 5.53 (95% CI, 5.06 to 6.00). However, infant mortality in the group of poorest counties decreased by 8.49 deaths per 1000, which is more than twice as much over the same time period, from 18.28 (95% CI, 17.38 to 19.17) to 9.79 (95% CI, 9.22 to 10.37).”

The corresponding numbers for the mortality rates based on NCHS population estimates shown in Figure 2 are:

“... 3-year mortality rates for male newborns ... decreased by 2.78 per 1000 in the group of richest counties between 1990 and 2010, from 8.07 to 5.29. However, infant mortality in the group of poorest counties decreased by 5.73 deaths per 1000, which is more than twice as much over the same time period, from 14.87 to 9.14.”

The description of the changes in mortality rates for the age group 0-1 in Currie and Schwandt (2016) concludes:

“These strong reductions in mortality in the poorer county groups are reflected in a considerable flattening of the regression line in 2010 relative to 1990. The slope of the regression line through the group values decreases by more than 50%, and this change is highly significant ($P < 0.001$, table S3). This flattening indicates a marked reduction in inequality in infant mortality. “

This conclusion remains unchanged.

3. Life expectancy based on NCHS bridged population estimates

Estimates of life expectancy at birth are only marginally affected when NCHS bridged population estimates are used instead of Census counts. For completeness, we report the estimates based on the NCHS population [in brackets behind the original estimates] directly in the discussion of Currie and Schwandt (2016):

“Figure 1A shows that for men, there is a strong gradient in 1990, with those living in the richest counties enjoying 6.10 [6.09] additional years of life expectancy relative to those living in the poorest counties (74.79 versus 68.70 [74.96 versus 68.87]). For women, who have greater life expectancy overall, this gap is smaller at 3.01 [3.00] years (80.20 versus 77.19 [80.33 versus 77.33]). Between 1990 and 2010, life expectancy at birth increased across the entire poverty spectrum, both for men and for women. For men, the fitted lines in 1990 and 2010 are almost parallel, suggesting that life expectancy increased by similar amounts in rich and poor counties. In fact, residents of the poorest counties gained slightly more with 4.63 [4.54] additional years, whereas those in the richest county group gained 4.35 [4.39] years. For women, improvements were stronger for those in the richest county group (3.01 versus 2.06 [3.07 versus 2.30] years), and most of these improvements occurred between 2000 and 2010.

Figure 1B plots the changes in life expectancy between 1990 and 2010. For women, the fitted regression line is downward-sloping ($P = 0.043$ [0.039]), indicating increasing inequality in life expectancy over this period. For men, the slope of the regression line is positive but not significantly different from zero ($P = 0.103$ [0.421]), consistent with Fig. 1A’s suggestion that decreases in mortality were equally distributed across men in rich and poor counties. “

4. References

Currie, J. and Schwandt, H., 2016. Inequality in mortality decreased among the young while increasing for older adults, 1990–2010. *Science*, 352(6286), pp.708-712.

NCHS -- National Center for Health Statistics, 1997. US Decennial Life Tables for 1989-91, Vol. 1, No. 1. *Hyattsville, Maryland, US Government Printing Office*.

NCHS -- National Center for Health Statistics, 2004 “Postcensal estimates of the resident population of the United States for July 1, 1990-July 1, 1999, by year, county, single-year of age, bridged race, Hispanic origin, and sex. Prepared under a collaborative arrangement with the U.S. Census Bureau. Available from: http://www.cdc.gov/nchs/nvss/bridged_race.htm as of Feb 16, 2017

5. Figures and Tables

Figure 1: Male 3-year mortality rates by poverty percentile across age groups, based on Census population counts

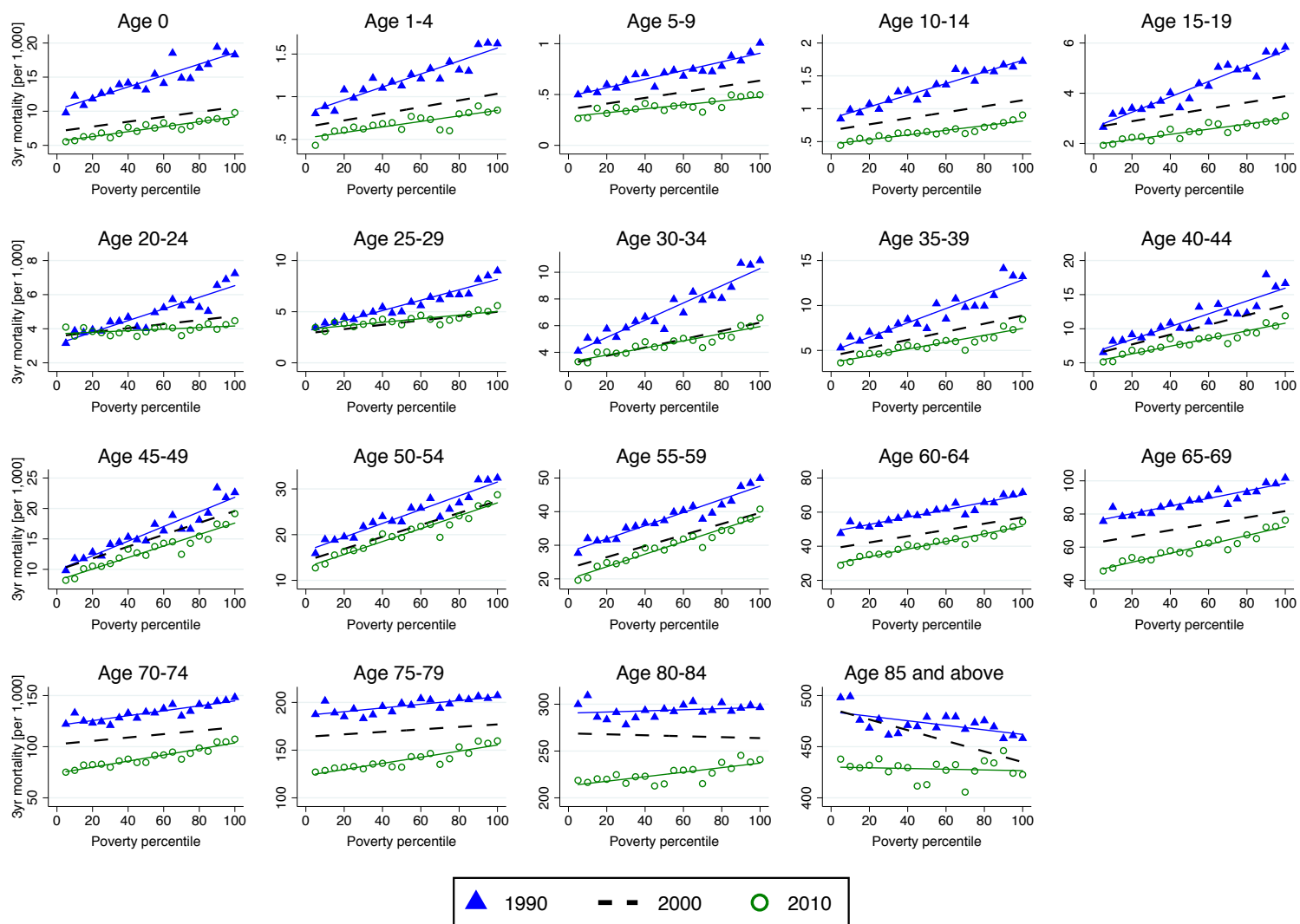


Figure 2: Male 3-year mortality rates by poverty percentile across age groups, based on NCHS bridged population estimates

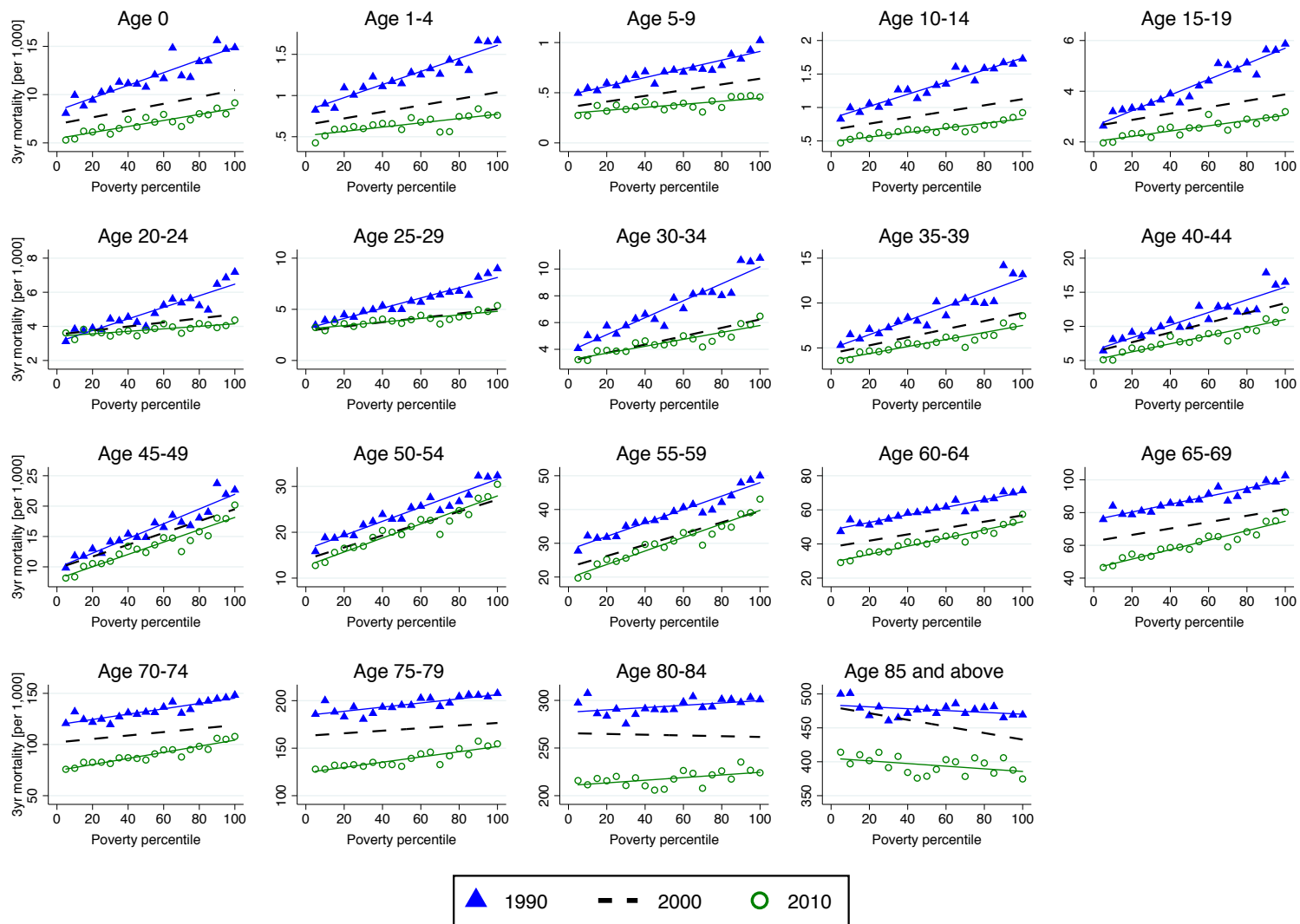


Figure 3: Female 3-year mortality rates by poverty percentile across age groups, based on Census population counts

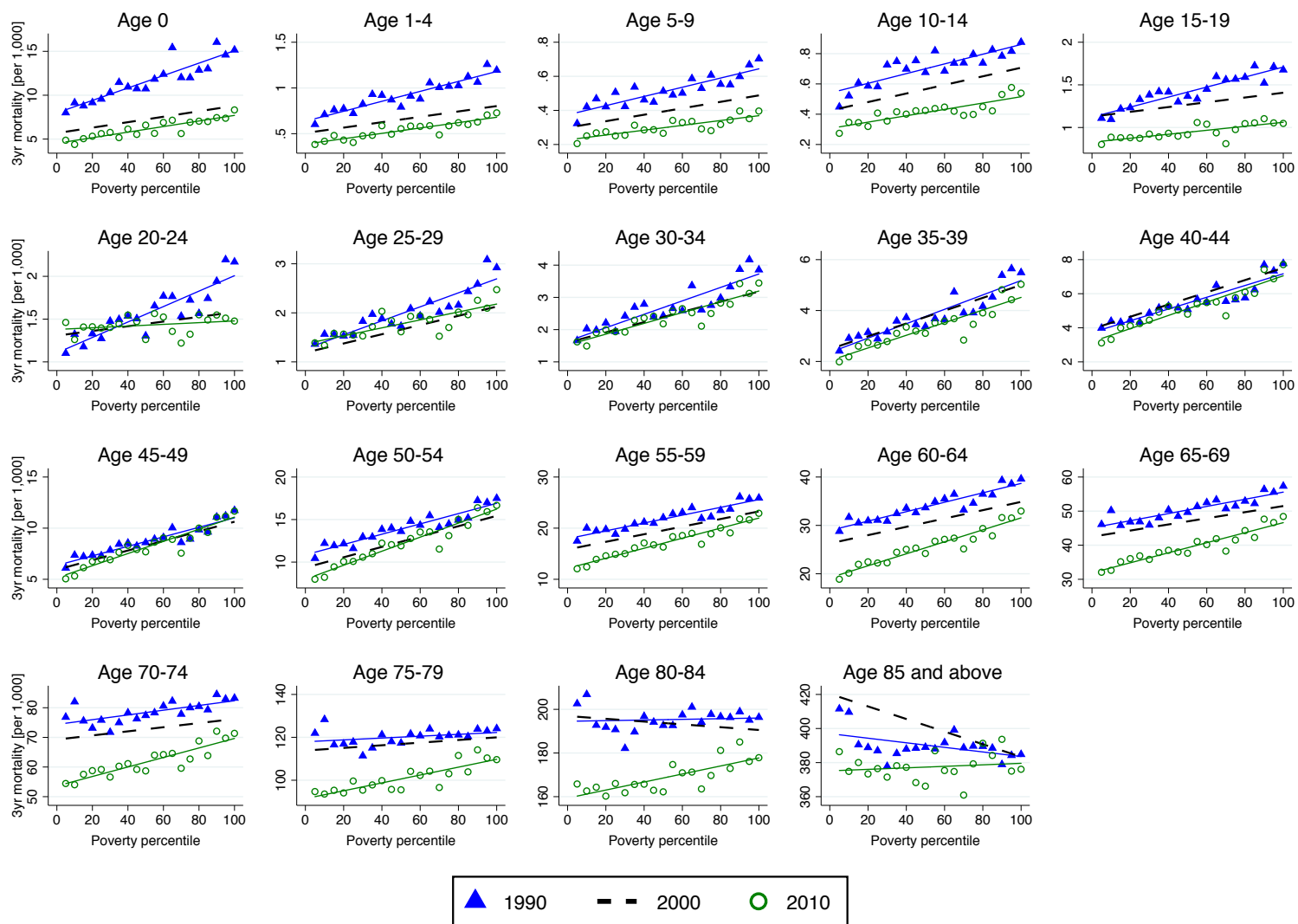


Figure 4: Female 3-year mortality rates by poverty percentile across age groups, based on NCHS bridged population estimates

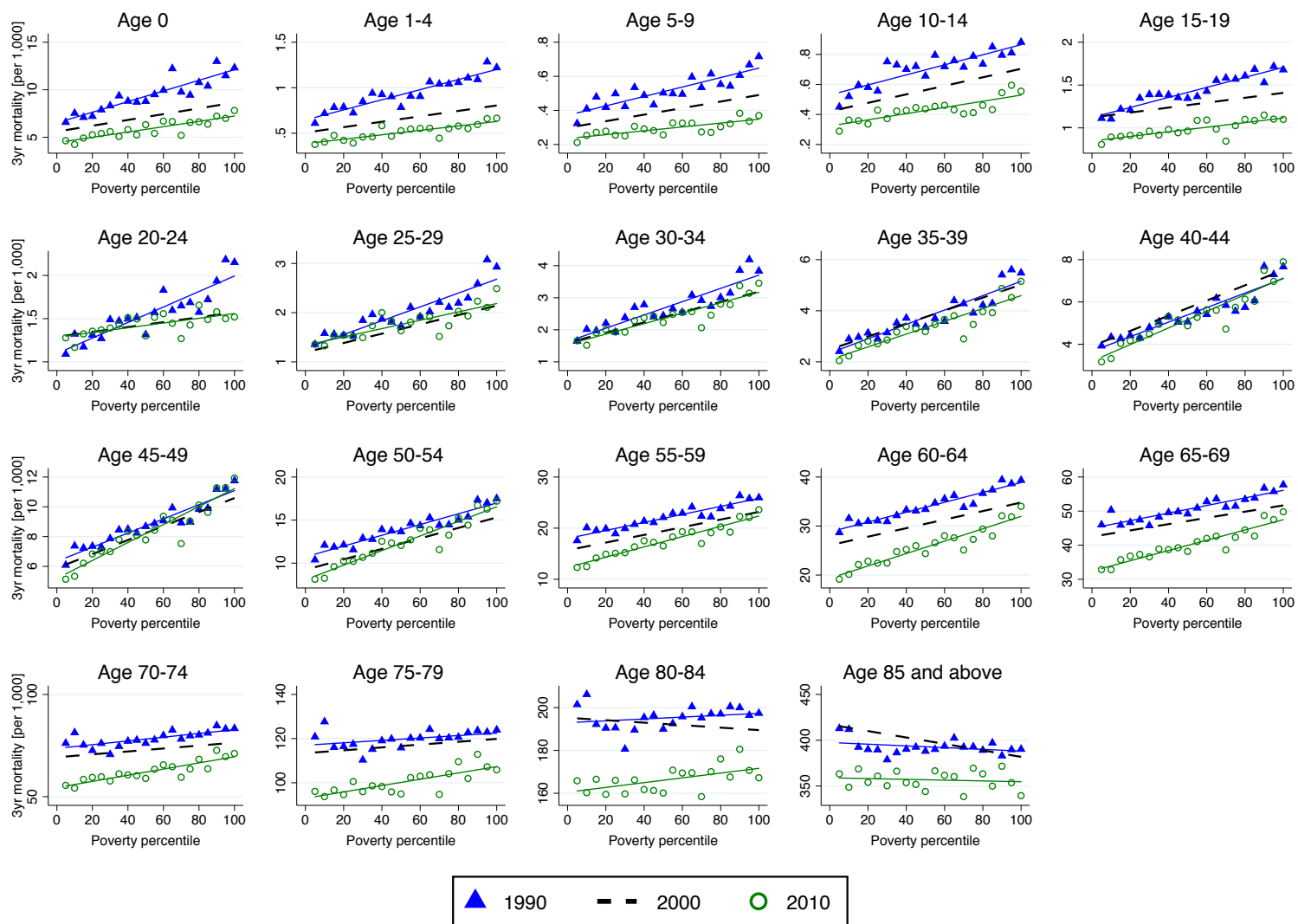


Table 1: Male 3-year mortality (based on NCHS bridged population estimates) of bottom and top poverty county group and slope of fitted regression line, 1990 vs. 2010

Age group	Mortality rate (per 1,000) in 5% of the population living in				Slope of fitted regression line		
	counties with lowest poverty rate		counties with highest poverty rate		1990	2010	p-value of difference
	1990 rate (1)	2010 rate (2)	1990 rate (3)	2010 rate (4)	(5)	(6)	(7)
<1	8.07	5.29	14.87	9.14	0.066	0.031	<0.001
1-4	0.82	0.43	1.67	0.76	0.008	0.003	<0.001
5-9	0.49	0.27	1.02	0.46	0.004	0.002	<0.001
10-14	0.83	0.47	1.73	0.92	0.009	0.003	<0.001
15-19	2.63	1.96	5.87	3.19	0.031	0.010	<0.001
20-24	3.11	3.61	7.18	4.37	0.034	0.007	<0.001
25-29	3.44	3.22	8.98	5.36	0.050	0.017	<0.001
30-34	4.07	3.23	10.81	6.47	0.063	0.026	<0.001
35-39	5.28	3.60	13.17	8.58	0.078	0.039	<0.001
40-44	6.42	5.10	16.48	12.39	0.093	0.059	0.004
45-49	9.82	8.15	22.65	20.17	0.121	0.102	0.115
50-54	15.80	12.74	32.33	30.45	0.153	0.153	0.983
55-59	27.71	19.69	49.95	43.06	0.199	0.200	0.934
60-64	47.32	29.06	71.34	57.36	0.222	0.239	0.451
65-69	75.79	46.44	102	80.19	0.241	0.289	0.124
70-74	121	75.73	148	108	0.261	0.297	0.371
75-79	186	128	208	154	0.218	0.275	0.297
80-84	297	216	301	224	0.121	0.139	0.820
>84	500	414	469	375	-0.136	-0.194	0.630

Table 2: Male 3-year mortality (based on NCHS bridged population estimates) of bottom and top poverty county group and slope of fitted regression line, 1990 vs. 2010

Age group	Mortality rate (per 1,000) in 5% of the population living in				Slope of fitted regression line		
	counties with lowest poverty rate		counties with highest poverty rate		1990	2010	p-value of difference
	1990 rate (1)	2010 rate (3)	1990 rate (5)	2010 rate (7)	1990 (9)	2010 (10)	(11)
<1	6.58	4.64	12.31	7.82	0.056	0.028	<0.001
1-4	0.61	0.38	1.22	0.66	0.006	0.002	<0.001
5-9	0.32	0.21	0.72	0.37	0.003	0.001	<0.001
10-14	0.45	0.29	0.88	0.55	0.003	0.002	0.024
15-19	1.11	0.81	1.68	1.10	0.006	0.003	<0.001
20-24	1.09	1.28	2.15	1.52	0.009	0.003	<0.001
25-29	1.36	1.36	2.93	2.49	0.014	0.008	0.008
30-34	1.65	1.66	3.83	3.45	0.021	0.016	0.121
35-39	2.41	2.05	5.48	5.15	0.028	0.025	0.423
40-44	3.92	3.17	7.66	7.90	0.034	0.039	0.319
45-49	6.08	5.13	11.75	11.93	0.048	0.060	0.046
50-54	10.38	8.13	17.49	17.19	0.063	0.085	0.009
55-59	17.57	12.31	25.95	23.58	0.078	0.101	0.029
60-64	28.66	19.13	39.33	34.01	0.101	0.127	0.049
65-69	45.98	32.82	57.70	49.79	0.111	0.151	0.034
70-74	76.12	55.50	83.36	71.10	0.092	0.151	0.041
75-79	121	96.08	124	106	0.055	0.143	0.033
80-84	201	166	197	167	0.043	0.112	0.245
>84	413	363	390	339	-0.094	-0.043	0.610