Estimated Error Margins for the American Human Development Index[1]

Standard Error and Margin of Error Basics for the American Human Development Index

Most of the data used in the the American Human Development Index are drawn from surveys taken among a small sample of the overall U.S. population. Some amount of sampling error is inherent in any data drawn from a sample and this error has an impact on the kinds of conclusions that we can draw from analyzing the data. With the exception of life expectancy at birth, data for the indicators that go into the Human Development Index come from the American Community Survey (ACS). Pretabulated estimates from the ACS are supplied with margins of error calculated using a 90% confidence level. This means that if the statistic in question were to be estimated from 10 different randomly drawn samples of the same population, we could expect the point estimate to fall within the confidence interval (the estimate +/- the margin of error) 9 out of those 10 times. Life expectancy estimates, though derived from a different source, have a small amount of error associated with them as well. Since these sources of error are all known, we can aggregate them to construct an estimated standard error, margin of error, and confidence interval for each score on the American HD Index. This document describes the methodology used to do this. This document does not however elaborate on the methods used to calculate the American HD Index itself and interested readers are encouraged to view this alongside the Methodological Notes from ***The Measure of America 2010-2011: Mapping Risks and Resilience***, either from the print edition or available on-line at: http://www.measureofamerica.org/the-measure-of-america-2010-2011-book/extracts/. Tables containing estimates standard errors and error margins for American HD Index values by state, congressional district, and metropolitan areas follow the text, starting on page 5.

Basic methods for aggregating standard errors were taken from the recommendations of the U.S. Census Bureau, presented in its *Accuracy of the Data 2008* document, which are based on Taylor series expansions. The two most common operations performed were those for estimating the standard error of the sum of two estimates and the standard error of a proportion. Standard errors of each estimate were calculated from the error margins supplied by the ACS simply by dividing the given error margin by 1.645. The standard error of a sum could then be estimated using the following formula in which X and Y are the estimates being summed and SE(X) and SE(Y) are their standard errors:

$$SE(X+Y) = \sqrt{\left[SE(X)^2 + SE(Y)^2\right]}$$

The standard error of a proportion was estimated using the following formula in which $P = X / Y$ and SE(X) and SE(Y) are the standard errors of X and Y:

$$SE(P) = \left(\frac{1}{Y}\right)\sqrt{\left[SE(X)\right]^2 - \frac{X^2}{Y^2}\left[SE(Y)\right]^2}$$

[1] Special thanks to our Senior Statistical Advisor Neil Bennett and to David Low for their assistance in developing and applying the methodology for estimating standard errors for the American HD Index.

Estimating Standard Errors for the American Human Development Index

Health Index

Standard errors could then be estimated for the Health, Education, and Income Indices and for the overall American HD Index. The standard error for the Health Index was calculated using the following formula, in which *Max* and *Min* are the goalposts for the Health Index and *LIEX* is life expectancy at birth:

$$SE(Health) = 10\left(\left(\frac{1}{(Max - Min)}\right)SE(LIEX)\right)$$

Education Index

The Education Index is the weighted average of the Attainment and Enrollment indices. The standard error of the Attainment Index was calculated as follows, in which *Max* and *Min* are the goalposts for the Attainment Index and *AttainmentSum* is the sum of the proportion of the adult population that has attained educational degrees of different levels:

$$SE(Attainment) = 10\left(\left(\frac{1}{(Max - Min)}\right)SE(AttainmentSum)^2\right)$$

The standard error of the Enrollment Index is calculated as below, in which *Max* and *Min* are the goalposts of the Enrollment Index and *EnrollmentRatio* is the gross enrollment ratio:

$$SE(Enrollment) = 10\left(\left(\frac{1}{(Max - Min)}\right)SE(EnrollmentRatio)^2\right)$$

Then, the standard error for the weighted Education Index was calculated as follows, in which *SE(Attainment)* and *SE(Enrollment)* are the standard errors of the Attainment and Enrollment indices:

$$SE(Education) = \sqrt{\left(\left(\frac{4}{9}\right)\left(SE(Atainment)^2\right)\right) + \left(\left(\frac{1}{9}\right)\left(SE(Enrollment)^2\right)\right)}$$

Income Index

The standard error of the Income Index was estimated using the following formula in which *Max* and *Min* are the inflation-adjusted goalposts of the Income Index and y_1 are the median personal earnings for any population:

$$SE(Income) = 10\left(\left(\frac{1}{(Log(Max) - Log(Min))}\right)\left(\frac{1}{y_1}\right)SE(y_1)\right)$$

Overall American HD Index

Finally, the standard errors for the Health, Education, and Income indices were aggregated to give an estimated standard error for the HD Index as a whole:

$$SE(HDIndex) = \frac{1}{3}\left(\sqrt{SE(Health)^2 + SE(Education)^2 + SE(Income)^2}\right)$$

The estimated margin of error for the American HD Index, at 90% confidence, can then be calculated by multiplying this final standard error for the overall Index by 1.645.

Using Standard Errors to Test the Statistical Significance of a Difference

To test the statistical significance of the difference between any two estimates, the following formula is used to estimate the z-score of that difference. If Z >1.645 or Z < - 1.645 then we consider the difference between the two estimates to be significant at a 90% confidence level.

$$Z = \frac{Est_1 - Est_2}{\sqrt{(SE_1)^2 - (SE_2)^2}}$$

Limitations of The Data

It should be noted that these standard errors are only rough estimates for a variety of reasons. Data from the ACS come with an estimated margin of error at a 90% confidence level which we divide by 1.645 to obtain the standard error. ACS error margins are rounded to only one significant digit in most cases, meaning that the standard errors that we have to work with for these estimates have somewhat limited precision to begin with. Second, many of the methods employed to estimate standard errors for the HD Index assume that variables in the Index do not co-vary and that population estimates are normally distributed and indeed these assumptions may not always be fully met. As a result, standard error and error margin estimates for the American HD Index calculated for states,

congressional districts, and metropolitan areas should be considered rough approximations of the sampling error inherent in each value on the index. At 90% confidence, the average margin of error for American HD Index scores across all states for the entire population was +/- 0.09 and the average across all congressional districts was +/- 0.3. Interested readers are encouraged to make use of these standard errors and error margins for making comparisons between HD Index scores.

Sources:

U.S. Census Bureau. *2008 ACS Accuracy of the Data.* Available at: http://www.census.gov/acs/www/Downloads/data_documentation/Accuracy/accuracy2008.pdf

Standard Errors and Error Margins for the American HD Index

HD Index By State, 2010-2011: Standard Errors and Error Margins

State	HD Index Value	Standard Error	Error Margin* (+/-)
United States	**5.17**	**0.009**	**0.014**
Alabama	4.09	0.039	0.064
Alaska	5.27	0.089	0.147
Arizona	5.11	0.057	0.093
Arkansas	3.87	0.073	0.120
California	5.56	0.014	0.022
Colorado	5.65	0.035	0.057
Connecticut	6.30	0.041	0.068
Delaware	5.33	0.081	0.133
District of Columbia	6.21	0.108	0.178
Florida	5.07	0.027	0.044
Georgia	4.86	0.042	0.068
Hawaii	5.73	0.067	0.111
Idaho	4.65	0.070	0.115
Illinois	5.39	0.021	0.034
Indiana	4.74	0.045	0.073
Iowa	5.06	0.041	0.067
Kansas	5.06	0.064	0.105
Kentucky	4.23	0.041	0.068
Louisiana	4.07	0.046	0.075
Maine	4.89	0.059	0.096
Maryland	5.96	0.042	0.069
Massachusetts	6.24	0.032	0.052
Michigan	4.99	0.029	0.047
Minnesota	5.74	0.028	0.045
Mississippi	3.93	0.066	0.109
Missouri	4.68	0.032	0.053
Montana	4.49	0.095	0.156
Nebraska	5.05	0.052	0.086
Nevada	4.78	0.045	0.075
New Hampshire	5.73	0.062	0.102
New Jersey	6.16	0.048	0.079
New Mexico	4.56	0.083	0.137
New York	5.77	0.018	0.029
North Carolina	4.64	0.031	0.050
North Dakota	4.92	0.096	0.158
Ohio	4.87	0.032	0.052

Oklahoma	4.15	0.044	0.072
Oregon	5.03	0.052	0.086
Pennsylvania	5.12	0.020	0.033
Rhode Island	5.56	0.070	0.116
South Carolina	4.36	0.041	0.068
South Dakota	4.82	0.086	0.142
Tennessee	4.33	0.035	0.058
Texas	4.67	0.018	0.030
Utah	5.08	0.059	0.097
Vermont	5.27	0.086	0.141
Virginia	5.53	0.039	0.065
Washington	5.53	0.031	0.050
West Virginia	3.85	0.086	0.142
Wisconsin	5.23	0.040	0.066
Wyoming	4.80	0.156	0.256

HD Index By Congressional District, 2010-2011: Standard Errors and Error Margins

State	Congressional District Number	HD Index Value	Standard Error	Error Margin* (+/-)
United States		**5.17**	**0.009**	**0.014**
Alabama	1	4.07	0.122	0.201
Alabama	2	3.95	0.146	0.241
Alabama	3	3.61	0.157	0.258
Alabama	4	3.37	0.126	0.208
Alabama	5	4.56	0.131	0.215
Alabama	6	5.30	0.168	0.276
Alabama	7	3.46	0.164	0.270
Alaska		5.27	0.089	0.147
Arizona	1	4.26	0.167	0.275
Arizona	2	5.07	0.183	0.302
Arizona	3	5.66	0.242	0.398
Arizona	4	3.70	0.212	0.349
Arizona	5	6.31	0.325	0.534
Arizona	6	5.56	0.214	0.352
Arizona	7	4.38	0.179	0.294
Arizona	8	5.57	0.191	0.315
Arkansas	1	3.39	0.110	0.180
Arkansas	2	4.39	0.128	0.211
Arkansas	3	4.06	0.134	0.220
Arkansas	4	3.50	0.101	0.166

California	1	4.93	0.154	0.253
California	2	4.11	0.163	0.268
California	3	5.96	0.197	0.324
California	4	5.76	0.195	0.321
California	5	5.14	0.243	0.400
California	6	6.54	0.126	0.208
California	7	5.69	0.257	0.423
California	8	7.47	0.282	0.465
California	9	6.59	0.271	0.447
California	10	6.71	0.236	0.388
California	11	5.97	0.213	0.351
California	12	7.44	0.209	0.343
California	13	6.43	0.227	0.373
California	14	8.11	0.339	0.557
California	15	7.60	0.295	0.486
California	16	6.27	0.252	0.414
California	17	5.09	0.172	0.283
California	18	3.73	0.201	0.331
California	19	4.79	0.219	0.361
California	20	2.60	0.234	0.385
California	21	4.13	0.189	0.311
California	22	4.80	0.204	0.335
California	23	4.90	0.225	0.371
California	24	6.56	0.208	0.343
California	25	5.37	0.229	0.376
California	26	6.42	0.310	0.509
California	27	5.56	0.287	0.473
California	28	4.80	0.269	0.442
California	29	6.36	0.416	0.684
California	30	7.71	0.383	0.630
California	31	3.78	0.296	0.488
California	32	4.55	0.313	0.515
California	33	5.23	0.328	0.540
California	34	3.69	0.249	0.410
California	35	4.45	0.265	0.435
California	36	6.72	0.354	0.582
California	37	4.64	0.280	0.460
California	38	4.59	0.244	0.401
California	39	4.82	0.288	0.474
California	40	5.99	0.252	0.414
California	41	4.84	0.230	0.378

California	42	6.87	0.289	0.475
California	43	3.80	0.224	0.369
California	44	5.31	0.208	0.342
California	45	4.67	0.204	0.335
California	46	7.17	0.371	0.610
California	47	4.11	0.247	0.407
California	48	7.66	0.310	0.510
California	49	4.78	0.282	0.463
California	50	6.79	0.295	0.485
California	51	4.90	0.241	0.397
California	52	6.12	0.270	0.443
California	53	6.11	0.273	0.449
Colorado	1	5.41	0.124	0.205
Colorado	2	6.09	0.174	0.286
Colorado	3	4.73	0.114	0.188
Colorado	4	5.45	0.152	0.250
Colorado	5	5.51	0.158	0.260
Colorado	6	7.11	0.135	0.222
Colorado	7	4.98	0.215	0.354
Connecticut	1	6.18	0.177	0.291
Connecticut	2	6.18	0.128	0.211
Connecticut	3	6.15	0.178	0.293
Connecticut	4	7.06	0.164	0.270
Connecticut	5	6.09	0.219	0.360
Delaware		5.33	0.081	0.133
District of Columbia		6.21	0.108	0.178
Florida	1	4.27	0.134	0.221
Florida	2	4.66	0.125	0.206
Florida	3	3.86	0.310	0.510
Florida	4	4.77	0.177	0.291
Florida	5	4.46	0.190	0.313
Florida	6	4.99	0.186	0.306
Florida	7	5.38	0.226	0.371
Florida	8	5.33	0.220	0.361
Florida	9	5.37	0.212	0.349
Florida	10	5.29	0.235	0.387
Florida	11	4.68	0.232	0.382
Florida	12	4.56	0.195	0.320
Florida	13	5.30	0.186	0.306
Florida	14	5.52	0.177	0.292

Florida	15	5.03	0.175	0.287
Florida	16	4.79	0.235	0.386
Florida	17	4.43	0.274	0.451
Florida	18	5.13	0.334	0.550
Florida	19	5.91	0.320	0.527
Florida	20	6.25	0.309	0.508
Florida	21	5.20	0.320	0.527
Florida	22	6.31	0.379	0.624
Florida	23	4.32	0.298	0.491
Florida	24	5.55	0.248	0.408
Florida	25	5.34	0.298	0.490
Georgia	1	3.93	0.161	0.265
Georgia	2	3.55	0.155	0.254
Georgia	3	4.90	0.127	0.209
Georgia	4	5.10	0.241	0.397
Georgia	5	5.82	0.312	0.513
Georgia	6	6.79	0.198	0.326
Georgia	7	5.76	0.163	0.267
Georgia	8	4.06	0.163	0.268
Georgia	9	4.32	0.126	0.208
Georgia	10	4.48	0.150	0.247
Georgia	11	4.81	0.135	0.222
Georgia	12	3.66	0.168	0.277
Georgia	13	5.18	0.203	0.333
Hawaii	1	6.07	0.190	0.313
Hawaii	2	5.41	0.165	0.271
Idaho	1	4.75	0.118	0.195
Idaho	2	4.53	0.138	0.227
Illinois	1	4.81	0.290	0.477
Illinois	2	5.27	0.252	0.414
Illinois	3	5.18	0.232	0.381
Illinois	4	3.80	0.238	0.391
Illinois	5	5.89	0.304	0.501
Illinois	6	6.29	0.226	0.372
Illinois	7	5.76	0.295	0.485
Illinois	8	6.08	0.203	0.333
Illinois	9	6.32	0.338	0.556
Illinois	10	6.56	0.266	0.438
Illinois	11	4.97	0.180	0.295
Illinois	12	4.64	0.131	0.216
Illinois	13	6.84	0.200	0.329

Illinois	14	5.56	0.106	0.174
Illinois	15	5.04	0.135	0.222
Illinois	16	5.22	0.117	0.193
Illinois	17	4.32	0.154	0.253
Illinois	18	4.98	0.235	0.387
Illinois	19	4.76	0.168	0.276
Indiana	1	4.82	0.095	0.157
Indiana	2	4.49	0.126	0.207
Indiana	3	4.79	0.125	0.206
Indiana	4	5.18	0.162	0.266
Indiana	5	5.75	0.155	0.255
Indiana	6	4.42	0.130	0.213
Indiana	7	4.22	0.153	0.251
Indiana	8	4.30	0.115	0.189
Indiana	9	4.65	0.113	0.186
Iowa	1	5.03	0.099	0.163
Iowa	2	5.35	0.097	0.160
Iowa	3	5.47	0.089	0.147
Iowa	4	4.85	0.107	0.176
Iowa	5	4.62	0.090	0.148
Kansas	1	4.39	0.099	0.163
Kansas	2	4.79	0.118	0.194
Kansas	3	6.22	0.143	0.235
Kansas	4	4.91	0.134	0.220
Kentucky	1	3.50	0.139	0.229
Kentucky	2	4.27	0.128	0.211
Kentucky	3	5.10	0.112	0.184
Kentucky	4	4.67	0.128	0.210
Kentucky	5	2.82	0.127	0.210
Kentucky	6	4.84	0.132	0.217
Louisiana	1	4.79	0.149	0.246
Louisiana	2	3.68	0.221	0.364
Louisiana	3	3.94	0.168	0.277
Louisiana	4	3.99	0.109	0.179
Louisiana	5	3.52	0.173	0.284
Louisiana	6	4.54	0.186	0.307
Louisiana	7	3.87	0.135	0.222
Maine	1	5.37	0.156	0.256
Maine	2	4.40	0.115	0.190
Maryland	1	5.57	0.156	0.257
Maryland	2	5.24	0.193	0.318

Maryland	3	6.14	0.210	0.345
Maryland	4	6.28	0.219	0.360
Maryland	5	6.14	0.156	0.257
Maryland	6	5.66	0.142	0.234
Maryland	7	5.22	0.205	0.337
Maryland	8	7.57	0.193	0.317
Massachusetts	1	5.52	0.177	0.291
Massachusetts	2	5.53	0.212	0.349
Massachusetts	3	6.14	0.217	0.357
Massachusetts	4	6.29	0.237	0.389
Massachusetts	5	6.45	0.251	0.413
Massachusetts	6	6.52	0.219	0.360
Massachusetts	7	6.81	0.270	0.444
Massachusetts	8	6.22	0.212	0.349
Massachusetts	9	6.56	0.292	0.480
Massachusetts	10	6.40	0.185	0.304
Michigan	1	4.15	0.100	0.164
Michigan	2	4.63	0.136	0.224
Michigan	3	5.15	0.127	0.209
Michigan	4	4.36	0.127	0.209
Michigan	5	4.47	0.134	0.221
Michigan	6	4.72	0.126	0.207
Michigan	7	4.93	0.132	0.217
Michigan	8	5.62	0.164	0.270
Michigan	9	6.75	0.206	0.339
Michigan	10	5.31	0.132	0.217
Michigan	11	5.73	0.236	0.388
Michigan	12	5.40	0.236	0.388
Michigan	13	3.95	0.313	0.514
Michigan	14	4.13	0.289	0.476
Michigan	15	5.36	0.207	0.340
Minnesota	1	5.34	0.103	0.169
Minnesota	2	6.25	0.100	0.164
Minnesota	3	6.69	0.173	0.284
Minnesota	4	6.06	0.116	0.190
Minnesota	5	6.09	0.198	0.326
Minnesota	6	5.99	0.124	0.204
Minnesota	7	4.65	0.092	0.151
Minnesota	8	4.73	0.103	0.169
Mississippi	1	3.99	0.101	0.166
Mississippi	2	3.34	0.147	0.242

Mississippi	3	4.23	0.147	0.242
Mississippi	4	4.04	0.135	0.222
Missouri	1	4.87	0.198	0.326
Missouri	2	6.24	0.147	0.242
Missouri	3	5.19	0.185	0.304
Missouri	4	4.09	0.167	0.274
Missouri	5	4.87	0.121	0.200
Missouri	6	5.12	0.098	0.162
Missouri	7	4.22	0.108	0.178
Missouri	8	3.24	0.119	0.196
Missouri	9	4.51	0.146	0.240
Montana		4.49	0.095	0.156
Nebraska	1	5.13	0.102	0.168
Nebraska	2	5.56	0.101	0.166
Nebraska	3	4.44	0.113	0.186
Nevada	1	4.26	0.185	0.304
Nevada	2	4.76	0.117	0.193
Nevada	3	5.28	0.202	0.333
New Hampshire	1	5.74	0.154	0.253
New Hampshire	2	5.74	0.140	0.230
New Jersey	1	5.34	0.168	0.276
New Jersey	2	5.14	0.122	0.200
New Jersey	3	6.16	0.199	0.328
New Jersey	4	5.95	0.188	0.309
New Jersey	5	7.11	0.198	0.326
New Jersey	6	6.10	0.198	0.326
New Jersey	7	7.31	0.205	0.338
New Jersey	8	5.76	0.179	0.295
New Jersey	9	6.47	0.231	0.380
New Jersey	10	5.13	0.186	0.306
New Jersey	11	7.33	0.144	0.237
New Jersey	12	7.28	0.218	0.359
New Jersey	13	5.15	0.237	0.389
New Mexico	1	5.18	0.144	0.237
New Mexico	2	3.95	0.138	0.228
New Mexico	3	4.50	0.163	0.269
New York	1	6.41	0.249	0.410
New York	2	6.33	0.236	0.388
New York	3	6.79	0.255	0.420
New York	4	6.57	0.241	0.397
New York	5	6.30	0.345	0.568

New York	6	5.90	0.208	0.341
New York	7	5.40	0.258	0.424
New York	8	7.48	0.428	0.704
New York	9	6.57	0.295	0.485
New York	10	5.72	0.265	0.436
New York	11	5.98	0.262	0.432
New York	12	5.08	0.273	0.448
New York	13	6.09	0.230	0.379
New York	14	8.79	0.449	0.738
New York	15	5.87	0.257	0.423
New York	16	3.20	0.198	0.326
New York	17	6.00	0.289	0.476
New York	18	7.12	0.213	0.350
New York	19	6.58	0.193	0.317
New York	20	5.28	0.147	0.242
New York	21	5.57	0.118	0.194
New York	22	5.09	0.192	0.316
New York	23	4.29	0.138	0.227
New York	24	4.56	0.133	0.219
New York	25	5.64	0.123	0.203
New York	26	5.30	0.204	0.336
New York	27	4.89	0.195	0.320
New York	28	4.83	0.217	0.358
New York	29	5.05	0.159	0.261
North Carolina	1	3.53	0.203	0.334
North Carolina	2	4.14	0.170	0.280
North Carolina	3	4.20	0.156	0.257
North Carolina	4	6.68	0.159	0.262
North Carolina	5	4.54	0.164	0.269
North Carolina	6	4.74	0.193	0.317
North Carolina	7	4.09	0.198	0.326
North Carolina	8	4.34	0.173	0.285
North Carolina	9	5.82	0.161	0.264
North Carolina	10	4.13	0.144	0.237
North Carolina	11	4.34	0.143	0.235
North Carolina	12	4.47	0.231	0.380
North Carolina	13	4.96	0.201	0.330
North Dakota		4.92	0.096	0.158
Ohio	1	4.88	0.175	0.288
Ohio	2	5.40	0.168	0.276
Ohio	3	5.02	0.203	0.334

Ohio	4	4.40	0.115	0.190
Ohio	5	4.71	0.105	0.173
Ohio	6	4.04	0.190	0.312
Ohio	7	4.85	0.167	0.274
Ohio	8	4.74	0.131	0.216
Ohio	9	4.71	0.143	0.235
Ohio	10	4.99	0.190	0.312
Ohio	11	4.88	0.201	0.330
Ohio	12	5.77	0.202	0.332
Ohio	13	5.24	0.208	0.341
Ohio	14	5.54	0.145	0.239
Ohio	15	5.36	0.167	0.275
Ohio	16	4.75	0.112	0.184
Ohio	17	4.27	0.189	0.310
Ohio	18	3.98	0.149	0.245
Oklahoma	1	4.65	0.155	0.255
Oklahoma	2	3.33	0.131	0.215
Oklahoma	3	3.95	0.138	0.227
Oklahoma	4	4.28	0.121	0.199
Oklahoma	5	4.39	0.113	0.186
Oregon	1	5.89	0.110	0.180
Oregon	2	4.26	0.127	0.208
Oregon	3	5.30	0.147	0.242
Oregon	4	4.60	0.152	0.250
Oregon	5	5.07	0.157	0.259
Pennsylvania	1	3.86	0.219	0.361
Pennsylvania	2	4.81	0.288	0.474
Pennsylvania	3	4.40	0.125	0.206
Pennsylvania	4	5.30	0.203	0.333
Pennsylvania	5	...	...	...
Pennsylvania	6	6.23	0.200	0.329
Pennsylvania	7	6.58	0.153	0.252
Pennsylvania	8	6.23	0.170	0.280
Pennsylvania	9	4.29	0.129	0.212
Pennsylvania	10	4.53	0.129	0.212
Pennsylvania	11	4.55	0.119	0.197
Pennsylvania	12	4.22	0.189	0.311
Pennsylvania	13	5.77	0.253	0.416
Pennsylvania	14	4.91	0.209	0.344
Pennsylvania	15	5.47	0.099	0.163
Pennsylvania	16	5.13	0.119	0.196

Pennsylvania	17	4.94	0.107	0.176
Pennsylvania	18	5.64	0.230	0.378
Pennsylvania	19	5.38	0.088	0.145
Rhode Island	1	5.49	0.199	0.328
Rhode Island	2	5.62	0.180	0.295
South Carolina	1	4.76	0.128	0.211
South Carolina	2	5.05	0.158	0.261
South Carolina	3	4.19	0.141	0.231
South Carolina	4	4.46	0.102	0.168
South Carolina	5	4.07	0.120	0.198
South Carolina	6	3.52	0.165	0.272
South Dakota		4.82	0.086	0.142
Tennessee	1	3.81	0.127	0.209
Tennessee	2	4.66	0.112	0.184
Tennessee	3	4.13	0.156	0.257
Tennessee	4	3.50	0.169	0.278
Tennessee	5	5.12	0.115	0.190
Tennessee	6	4.30	0.096	0.158
Tennessee	7	5.40	0.183	0.301
Tennessee	8	3.69	0.198	0.326
Tennessee	9	4.08	0.192	0.315
Texas	1	3.89	0.182	0.299
Texas	2	5.00	0.253	0.417
Texas	3	6.19	0.192	0.317
Texas	4	4.52	0.150	0.246
Texas	5	4.20	0.235	0.386
Texas	6	4.89	0.212	0.349
Texas	7	6.69	0.276	0.453
Texas	8	4.51	0.142	0.233
Texas	9	3.99	0.245	0.402
Texas	10	5.56	0.231	0.381
Texas	11	4.10	0.122	0.200
Texas	12	4.55	0.199	0.327
Texas	13	3.92	0.134	0.220
Texas	14	4.79	0.141	0.232
Texas	15	3.74	0.203	0.333
Texas	16	4.32	0.110	0.181
Texas	17	4.17	0.162	0.266
Texas	18	4.10	0.215	0.354
Texas	19	4.01	0.140	0.231
Texas	20	3.92	0.199	0.327

Texas	21	5.72	0.209	0.344
Texas	22	5.96	0.230	0.378
Texas	23	4.48	0.198	0.325
Texas	24	5.73	0.246	0.405
Texas	25	4.93	0.186	0.306
Texas	26	5.43	0.189	0.311
Texas	27	3.88	0.138	0.228
Texas	28	3.78	0.173	0.284
Texas	29	3.23	0.218	0.359
Texas	30	3.90	0.216	0.356
Texas	31	5.11	0.089	0.146
Texas	32	4.93	0.286	0.470
Utah	1	4.95	0.120	0.197
Utah	2	5.53	0.181	0.297
Utah	3	4.81	0.127	0.209
Vermont		5.27	0.086	0.141
Virginia	1	5.65	0.169	0.278
Virginia	2	5.27	0.147	0.242
Virginia	3	4.24	0.172	0.283
Virginia	4	4.69	0.136	0.223
Virginia	5	4.27	0.158	0.260
Virginia	6	4.72	0.130	0.214
Virginia	7	5.79	0.150	0.247
Virginia	8	8.30	0.196	0.323
Virginia	9	3.50	0.129	0.211
Virginia	10	7.12	0.176	0.290
Virginia	11	7.51	0.201	0.331
Washington	1	6.50	0.189	0.310
Washington	2	5.25	0.151	0.249
Washington	3	5.27	0.112	0.184
Washington	4	4.24	0.134	0.221
Washington	5	4.80	0.108	0.178
Washington	6	4.80	0.210	0.346
Washington	7	6.89	0.250	0.410
Washington	8	6.72	0.206	0.338
Washington	9	5.25	0.200	0.330
West Virginia	1	4.15	0.149	0.244
West Virginia	2	4.16	0.125	0.205
West Virginia	3	3.16	0.136	0.223
Wisconsin	1	5.41	0.145	0.239
Wisconsin	2	5.90	0.111	0.182

Wisconsin	3	4.86	0.082	0.135
Wisconsin	4	4.35	0.156	0.256
Wisconsin	5	6.27	0.131	0.216
Wisconsin	6	4.97	0.127	0.208
Wisconsin	7	4.76	0.087	0.143
Wisconsin	8	5.06	0.109	0.179
Wyoming		4.80	0.156	0.256

HD Index By Metropolitan Area, 2010-2011: Standard Errors and Error Margins

Metropolitan Statistical Area	HD Index Value	Standard Error	Error Margin* (+/-)
United States	**5.17**	**0.009**	**0.014**
Atlanta	5.53	0.038	0.062
Boston	6.55	0.043	0.071
Chicago	5.61	0.044	0.072
Dallas	5.11	0.030	0.049
Houston	5.02	0.036	0.059
Los Angeles	5.60	0.021	0.035
Miami	5.46	0.064	0.106
New York	6.26	0.022	0.036
Philadelphia	5.70	0.030	0.049
Washington DC	6.94	0.059	0.096

* Calculated at a 90% confidence level