THE MASSACHUSETTS HEALTH REFORM SURVEY: METHODOLOGY REPORT

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OVERVIEW OF THE MASSACHUSETTS HEALTH REFORM SURVEY

In April 2006, Massachusetts passed a comprehensive health care reform bill entitled An Act Providing Access To Affordable, Quality, Accountable Health Care (Chapter 58 of the Acts of 2006), which sought to move the state to near universal coverage. In order to track the impacts of Chapter 58, the Blue Cross Blue Shield of Massachusetts Foundation began funding an annual telephone survey of nonelderly adults in the Commonwealth in fall 2006, just prior to the implementation of key elements of the law. That survey, called the Massachusetts Health Reform Survey (MHRS), has been fielded in the fall of 2006–2010, 2012, and 2013. The survey is funded by the Blue Cross Blue Shield of Massachusetts Foundation, with support for selected years from the Commonwealth Fund (2006–2008) and the Robert Wood Johnson Foundation (2006–2008, 2012–2013). The MHRS is fielded by Social Science Research Solutions (SSRS, formerly International Communications Research) in conjunction with the Urban Institute.

Public use files for the 2013 MHRS will be available through the Inter-university Consortium for Political and Social Research (http://www.icpsr.umich.edu/icpsrweb/landing.jsp) later in 2014.

Sample design. The MHRS sample was designed by Marketing Systems Group (MSG), using the GENESYS IDplus and CSS procedures to eliminate non-working and business landline numbers from the sample.

Survey samples. The MHRS is conducted with a random sample of working-age adults in Massachusetts in each year. In the initial years of the survey (2006–2009), "working-age" was defined as ages 18 to 64; in 2010 the definition was changed to ages 19 to 64 to establish consistency with the definition used by the Massachusetts Division of Health Care Finance and Policy, now the Center for Health Information and Analysis (CHIA).

The 2006 MHRS was based on a stratified random sample of households with a landline telephone. The survey oversampled low- and moderate-income populations targeted by many of the elements of Massachusetts' health reform initiative. The oversamples included uninsured adults, low-income adults with family income below 300 percent of the federal poverty level (FPL), and moderate-income adults with family income between 300 and 500 percent of the FPL. The same basic design was used in the 2006–2009 rounds of the MHRS. In the 2008 MHRS, additional oversamples were added based on geographic areas and selected minority populations (African American and Hispanic adults). In the 2010 MHRS, a random sample of cell phones was added to the survey to supplement the landline telephone sample to reduce the coverage issues associated with a landline-only survey. Finally, in the 2012 and 2013 MHRS, the oversample of uninsured adults was dropped from the survey to reduce survey fielding costs.

The decision to change the survey design in 2010 to include both landline telephones and cell phones reflects the rapid increase in the share of cell phone–only households in Massachusetts and the nation over the last few years. Estimates based on the National Health Interview Survey (NHIS) showed a nationwide increase in the percentage of adults in cell phone–only households

from 9.6 percent in January–June 2006 to 27.8 percent in July–December 2010.[1,2] Estimates for Massachusetts also showed a large gain in the percentage of adults in cell phone–only households, increasing from 7.9 percent in January–December 2007 to 16.8 percent in July 2009–June 2010 and to 24.1 percent in January-December 2012.[3]

As shown in Table 1, the sample size for each round of the MHRS has been roughly 3,000 non-elderly adults. The larger sample size in 2008 reflects the additional oversamples by geographic region and for African American and Hispanic adults in the 2008 MHRS.

TABLE 1: MHRS SAMPLE SIZES, 2006–2013

YEAR	LANDLINE SAMPLE	CELL PHONE SAMPLE	TOTAL	MARGIN OF ERROR*
2006	3,010	-	3,010	+/- 2.4%
2007	2,938	-	2,938	+/-2.6%
2008	4,046	-	4,046	+/-2.8%
2009	3,165	-	3,165	+/-2.6%
2010	2,418	622	3,040	+/-2.5%
2012	2,411	749	3,160	+/-2.5%
2013	2,151	873	3,024	+/-2.5%

*Weighted margin of error at the 95 percent confidence level.

Oversamples in the landline sample. As noted above, the landline sample in the MHRS has included oversamples of uninsured adults (2006–2010), low- and moderate-income adults (all years), and, in 2008, adults in specific geographic areas and in specific minority population groups.

- *Oversample of uninsured adults.* In order to identify uninsured adults for the uninsured oversamples in 2006–2010, the survey included a set of screening questions that asked whether any household members in the appropriate age range (18 to 64 in the pre-2010 years of the survey and 19 to 64 in the 2010 MHRS) were currently covered by any type of health insurance. Based on the responses to those questions, one working-age adult was selected at random from each eligible household to complete the full survey, with an oversample of the adults who were reported to be uninsured. The full survey included more detailed insurance questions to identify specific types of coverage. In the 2012 and 2013 MHRS, the oversample

1 Blumberg, S.J. and Luke, J.V. Wireless Substitution: Early Release of Estimates Based on Data from the National Health Interview Survey, July–December 2006. Hyattsville, MD: National Center for Health Statistics, 2007. Available at www.cdc.gov/nchs/nhis.htm.

2 Blumberg, S.J. and Luke, J.V. Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July–December 2010. Hyattsville, MD: National Center for Health Statistics, 2011. Available at www.cdc.gov/nchs/nhis.htm.

3 The estimates for Massachusetts (and the remaining states) are based on small-area statistical modeling techniques. For a discussion of the methods and the estimates, see Blumberg, S.J., Luke, J.V., Ganesh, N., et al. Wireless Substitution: State-level Estimates from the National Health Interview Survey, 2012. National Health Statistics Reports, no 70. Hyattsville, MD: National Center for Health Statistics, 2013. Available at www.cdc.gov/nchs/data/nhsr/nhsr070.pdf.

of uninsured adults was eliminated to reduce the cost of fielding the survey. At that time, the screening questions on insurance status were dropped from the survey instrument. The sample sizes of uninsured adults in the MHRS are summarized in Table 2.

TABLE 2: MHRS SAMPLE SIZES FOR UNINSURED NONELDERLY ADULTS, 2006–2013

YEAR	UNINSURED ADULTS	MARGIN OF ERROR*
2006	703	+/-5.6%
2007	402	+/-6.7%
2008	448	+/-8.3%
2009	382	+/-8.2%
2010	304	+/-9.3%
2012	130	+/-10.8%
2013	100	+/-13.9%

*Weighted margin of error at the 95 percent confidence level.

- *Oversamples of low- and moderate-income adults*. The oversamples of low- and moderate-income adults are based on a geographic sampling strategy whereby local telephone exchanges are divided into three groups to reflect areas with high, moderate, and low concentrations of low- and moderate-income households. Disproportionate shares of the sample were drawn from exchanges in the state with high concentrations of low- and moderate-income households. Table 3 summarizes the sample sizes for low- and moderate-income adults, with low-income defined as those with family income below 300 percent of the FPL and moderate income defined as family income between 300 and 500 percent of the FPL.

TABLE 3: MHRS SAMPLE SIZES FOR LOW-INCOME NONELDERLY ADULTS, 2006–2013

YEAR	LOW-INCOME ADULTS	MARGIN OF ERROR*	MODERATE-INCOME ADULTS	MARGIN OF ERROR*
2006	1,381	+/- 3.6%	702	+/-5.0%
2007	1,234	+/-4.6%	607	+/-5.1%
2008	2,055	+/- 4.4%	854	+/-5.1%
2009	1,424	+/-4.4%	672	+/-5.3%
2010	1,640	+/-3.5%	641	+/-5.2%
2012	1,320	+/-3.7%	626	+/-5.8%
2013	1,340	+/-3.8%	630	+/-5.6%

*Weighted margin of error at the 95 percent confidence level.

- *Oversamples by geographic area and for racial/ethnic minorities in the 2008 MHRS*. As noted above, the 2008 MHRS included two additional oversamples. The geographic oversample was

obtained by selecting additional survey samples from telephone exchanges that were specific to each of the areas. The African American and Hispanic oversamples were obtained by selecting additional samples in areas with high concentrations of African American and Hispanic households. The sample sizes by region and racial/ethnic groups in 2008 are summarized in Table 4.

TABLE 4: MHRS SAMPLE SIZES BY REGION AND RACIAL/ETHNIC GROUP, 2008

OVERSAMPLE	SAMPLE FROM CORE SURVEY	MARGIN OF ERROR: CORE SURVEY*	SAMPLE FROM TARGETED OVERSAMPLES	TOTAL SAMPLE	MARGIN OF ERROR: TOTAL*
Southeast region	763	+/-7.4%	--	850	+/-7.2%
Central region	475	+/-6.3%	128	643	+/-5.7%
Northeast region	492	+/-6.5%	109	667	+/-6.1%
MetroWest region	298	+/-7.8%	125	499	+/-6.1%
Western region	672	+/-6.4%	--	745	+/-6.1%
Boston region	380	+/-8.5%	44	642	+/-6.6%
African American	253	+/-10.1%	305	581	+/-7.1%
Hispanic	304	+/-11.9%	255	581	+/-7.3%

*Weighted margin of error at the 95 percent confidence level.

Survey fielding. The field period for the MHRS is generally October to January. All interviews were conducted using the Computer Assisted Telephone Interviewing (CATI) system. The CATI system ensured that questions followed logical skip patterns and that the listed attributes automatically rotated, eliminating "question position" bias. Extensive checking of the program was conducted to assure that skip patterns and sample splits followed the design of the questionnaire.

The survey was translated into Spanish and Portuguese to increase the survey's coverage by including non-English-speaking respondents in the survey. Of the 3,024 interviews in the 2013 MHRS, 72 were completed in Spanish.

CATI interviewers received written survey materials and formal training on administering the survey instrument. The written materials were provided prior to the beginning of the field period and included an annotated questionnaire that contained information about the goals of the study as well as detailed explanations of why questions were being asked, the meaning and pronunciation of key terms, potential obstacles to be overcome in getting good answers to questions, and anticipated respondent problems, along with strategies for addressing them.

Prior to the beginning of the field period, pre-test interviews were conducted to ensure that the questionnaire and CATI program were working properly. The 2012 MHRS pre-test demonstrated that the instrument was running long given the addition of new questions (discussed below). On the basis of this finding, several modifications were made to the questionnaire to shorten the length of the interview. Additional pre-test interviews were conducted to check the modifications to the questionnaire.

Interviewer training was conducted immediately before the survey was officially launched. Call center supervisors and interviewers were walked through each question in the questionnaire. Interviewers were given instructions to help them maximize response rates and ensure accurate data collection.

During the field period, SSRS placed initial refusers into a separate file for survey processing and withheld any attempt to convert them until a refusal letter was sent (to directory-listed households). Letters were sent to refusers each Monday, with refusal conversion attempts commencing the subsequent Friday. The letter detailed the nature of the study and noted that a $10 incentive would be offered. In all, 701 interviews were completed with respondents who had initially refused to be interviewed in 2013.

Survey content. In addition to questions on insurance status, the survey includes questions that focus on the individual's access to and use of health care, out-of-pocket health care costs and medical debt, insurance premiums and covered services (for those with insurance), and health and disability status. With few exceptions, the MHRS relies on questions drawn from established, well-validated surveys.[4] While we sought to maintain consistency with those prior surveys, some questions were modified to ensure that they address the issues of particular concern in Massachusetts. In addition, we developed new questions for some issues specific to the context of Massachusetts' reform initiative. The survey questionnaires for each year of the MHRS are included as an appendix to this report.

Over time, there have been changes to the content of the survey to add questions on emerging issues and, in order to keep the survey at a reasonable length, to eliminate questions that are deemed to be less useful. Table 5 indicates the questions that have changed (based on question numbers in the questionnaires in the appendix). Key additions in the fall 2012 survey included questions on (1) emergency room use, (2) access to specialist care, (3) factors considered by the individual in choosing health care providers and hospitals, (4) the impact of health care spending on the individual's personal finances, (5) the availability of a choice of health plans, including plans with tiered and limited networks, and (6) experiences with tiered networks.

Like all survey-based research, the MHRS relies on self-reported information. The quality of the data depends on the survey respondents' ability to understand the questions and the response categories, to remember the relevant information, and to report the information accurately. We would expect the quality of the information reported by respondents to be better for more recent circumstances and events and for events with greater saliency (e.g., current insurance status). Problems with recall are more likely for events that are more distant in time (e.g., number of doctor visits over the past year), while problems with misreporting are more likely for sensitive or embarrassing questions (e.g., problems paying medical bills) or questions that are more difficult to answer (e.g., the amount of out-of-pocket health care spending over the past year).

4 These include government-sponsored surveys, such as the National Health Interview Survey (NHIS), the Medical Expenditure Panel Survey (MEPS), and Consumer Assessment of Healthcare Providers and Systems (CAHPS), and special surveys such as the Massachusetts Division of Health Care Finance and Policy's Survey of Health Insurance Status, the Commonwealth Fund's Biennial Health Insurance Survey and Consumerism in Health Care Survey, the Kaiser Family Foundation's Low-income Survey, the Urban Institute's National Survey of America's Families, and the RAND Corporation's Survey of Individual Market Candidates in California, among others.

TABLE 5: SUMMARY OF MHRS QUESTIONNAIRE CHANGES OVER TIME

QUESTION NUMBER	CHANGE
CELL1	2010: Question added
CELL2	2010: Question added
CELL3	2010: Question added
HHx1	2007: Question deleted
HHx2	2012: Question deleted
HH6	2012: Question deleted
HH3a	2007: Question added
HH6a	2012: Question deleted
HH7	2012: Question deleted
HH7a	2012: Question deleted
HH8	2012: Question deleted
HH8a	2012: Question deleted
HH8b	2012: Question deleted
HH9	2012: Question deleted
HH9a	2007: Question added; 2012: Question modified
HH9b	2007: Question added; 2012: Question deleted
HH12	2012: Question deleted
HH13	2012: Question deleted
C2	2010: Question modified
C2a	2007: Question added: 2012: Question modified
C2a1	2010: Question added; 2012: Question deleted
C2b	2009: Question added; 2010: Question deleted
C2c	2009: Question added; 2010: Question deleted
C3a2	2008: Question added; 2010: Question modified
C3a3	2012: Question added
C3b1	2009: Question added; 2010: Question deleted; 2012: Question replaced with new question
C3b2	2009: Question added; 2010: Question deleted
C3c2	2010: Question deleted
C3c2a	2007: Question added; 2009: Question modified; 2010: Question deleted
C3d	2010: Questions modified
C3d1	2010: Question added
C3d2	2010: Question added
C3f1	2009: Question added; 2010: Question deleted
C3f2	2009: Question added; 2010: Question deleted
C3h	2008: Question added
C3hc	2012: Question deleted
C3i	2008: Question added; 2010: Question modified
C3j	2010: Question added; 2012: Question deleted
C3k	2010: Question added; 2012: Question deleted

continued

TABLE 5: SUMMARY OF MHRS QUESTIONNAIRE CHANGES OVER TIME *(continued)*

QUESTION NUMBER	CHANGE
C3k2	2012: Question added
C4	2012: Questions modified
C4a2	2010: Question added; 2012: Question deleted
C5	2010: Question added; 2012: Question modified
C5e	2010: Question added; 2012: Question deleted
C5e1	2010: Question added
C5e2	2010: Question added
C7	2012: Question added
C8	2012: Question added
C9	2012: Question deleted
C10	2012: Question added
C11	2012: Question added
D1a	2010: Question modified
E1	2010: Question modified
E1a	2010: Questions modified
E1ad	2010: Question added; 2012: Question deleted
E1ae	2010: Question added
E1af	2010: Question added; 2012: Question modified
E2a	2009: Question added; 2012: Question deleted
E2b	2010: Question added; 2012: Question modified
E3b	2010: Question added
E3c	2012: Question added
E4a	2010: Question added; 2012: Question replaced with new question
F4	2007: Question added
F4a	2007: Question added
F4b	2007: Question added
F5a1	2007: Question added
F9a	2010: Question added
F9b	2010: Question added
F10b	2008: Question added; 2010: Question replaced with new question
F11d	2010: Question added
F11c	2010: Question replaced with new question
F12	2010: Question added
F10c	2008: Question added; 2010: Question deleted
F11a	2007: Question added
F11b	2007: Question added
F11c	2009: Question added
G3a	2012: Question added
G3b	2012: Question added
G3c	2012: Question added

continued

TABLE 5: SUMMARY OF MHRS QUESTIONNAIRE CHANGES OVER TIME *(continued)*

QUESTION NUMBER	CHANGE
G6	2007: Question deleted
G7a	2007: Question deleted
G7b	2007: Question deleted
G11a2	2007: Question added
G12	2009: Question deleted
G12a	2009: Question deleted
G14	2009: Question deleted
G14b1	2009: Question deleted
G16a	2010: Question added
G16b	2010: Question added
G16c	2010: Question added
G18	2010: Question deleted
G18a	2007: Question added; 2010: Question deleted
G18b	2007: Question added; 2010: Question deleted
G20	2012: Question added
G21a	2012: Question added
G21b	2012: Question added
H4	2010: Question deleted
I15	2007: Question modified
I15a	2010: Question deleted
I15b	2010: Question deleted
I16	2007: Question modified; 2010: Question deleted
I17	2010: Question modified
I18	2010: Question deleted
I18a	2010: Question deleted
I19	2010: Question deleted
I19a	2007: Question added; 2010: Question deleted
I19b	2007: Question added; 2008: Question deleted
I19b1	2008: Question added; 2012: Question deleted
I19b2	2008: Question added; 2012: Question deleted
I19b3	2008: Question added; 2012: Question deleted
I19c	2007: Question added; 2012: Question deleted
I19d	2007: Question added; 2012: Question deleted
I19e	2007: Question added; 2008: Question deleted
I20	2007: Question deleted
I20a	2007: Question deleted
I21	2007: Question deleted
I22	2007: Question deleted
I23	2007: Question deleted
I26b	2010: Question modified

continued

TABLE 5: SUMMARY OF MHRS QUESTIONNAIRE CHANGES OVER TIME *(continued)*

QUESTION NUMBER	CHANGE
I26c	2010: Question modified
I26d	2008: Question added
I27	2010: Question deleted
I28	2009: Question deleted
I29b	2008: Question added
I29c	2008: Question added
I30a	2007: Question added
J1a	2007: Question added
J1b	2007: Question added
J3	2007: Question added
J3a	2007: Question deleted
J3b	2007: Question added
J4a	2012: Question added
J6	2012: Question deleted
K1	2012: Question added
K2	2012: Question added

Survey response rate. The MHRS employs several strategies to increase the response rate to the survey. First, a $10 incentive is offered to all who complete the survey. Second, when addresses are available from reverse directory services, letters are sent to households that initially refused to complete the survey and to those households to which six call attempts are made without an answer. Third, a toll-free number is provided in the letters to allow sample households to call in to complete the survey if they are motivated to do so. Finally, telephone numbers with no answers or voice messages are called at least 12 times, with attempts made at different times and on different days of the week. The 12 call attempts also include a rest period of at least seven days between the sixth and seventh calls.

Table 6 reports on the final sample dispositions for the 2013 MHRS, with separate tabulations for the landline and cell phone samples.

TABLE 6: SAMPLE DISPOSITIONS FOR 2012 MHRS

	LANDLINE SAMPLE	CELL PHONE SAMPLE	TOTAL
ELIGIBLE, INTERVIEW (CATEGORY 1)			
Complete	2,153	871	3,024
ELIGIBLE, NON-INTERVIEW (CATEGORY 2)			
Refusal	2,595	1,661	4,256
Physically/mentally incompetent	203	61	264
Language problem	502	339	841
UNKNOWN ELIGIBILITY, NON-INTERVIEW (CATEGORY 3)			
Always busy	975	12	987
No answer	22,621	6,802	29,423
Answering machine—don't know if household	3,147	309	3,456
Call blocking	79	1	80
Technical phone problems	3,217	3	3,220
No screener completed	4,541	1,315	5,856
NOT ELIGIBLE (CATEGORY 4)			
Fax/data line	4,271	636	4,907
Non-working number	40,470	10,614	51,084
Business, government office, other organizations	4,943	564	5,507
No eligible respondent	1,114	1,538	2,652
TOTAL	**89,717**	**24,726**	**115,557**

The overall response rate for the survey in the 2013 MHRS was 30.4 percent, which combines the response rates for the landline telephone sample (36.6 percent) and the cell phone sample (23.9 percent). This calculation is based on the response rate calculation formula (RR3) recommended by the American Association for Public Opinion Research (AAPOR). This formula is set to determine the percent of completed interviews out of all eligible cases in the sample. While responses rates for cell phone samples are generally lower than those for landline samples, the cell phone sample captures a part of the population (adults in cell phone–only households) that is missed completely in surveys that focus only on the population with a landline telephone.

As with other surveys, the response rates for the landline and cell phone components of the MHRS have dropped over time (Table 7). These response rates are comparable to those achieved in other recent social science and health surveys, as is the decline in the response rate to the survey over time.[5]

5 Davern, M., McAlpine, D., Beebe, T.J., Ziegenfuss, J., Rockwood, T., and Call, K.C. Are Lower Response Rates Hazardous to Your Health Survey? An Analysis of Three State Telephone Health Surveys. Health Services Research, 2010, 45(5, Part 1):1324–44.

TABLE 7: MHRS RESPONSE RATES, 2006-2013

YEAR	LANDLINE SAMPLE	CELL PHONE SAMPLE	TOTAL
2006	48.9%	-	48.9%
2007	45.2%	-	45.2%
2008	43.8%	-	43.8%
2009	45.5%	-	45.5%
2010	42.4%	30.6%	38.2%
2012	37.0%	25.7%	33.1%
2013	36.6%	23.9%	30.4%

Survey response rates have been declining for both government and non-government surveys for more than 20 years, as contacting sample members becomes more difficult and more of the sample members who are contacted refuse to complete surveys.[6,7] For example, the response rate for the Survey of Public Participation in the Arts, a supplement to the Current Population Survey, dropped by 15 percentage points between 2008 and 2012,[8] and the response rate for the Pew Research Center's People and the Press polls fell from 36 percent in 1997 to 25 percent in 2003 to 9 percent in 2012.[9] Because of concerns about the declining response rates across surveys, AAPOR has created a special task force to study the issue of survey refusals.

Sample weights. All tabulations based on the survey data were prepared using weights that adjust for the complex design of the survey, for undercoverage, and for survey nonresponse. Separate weights were constructed for the landline sample and for the combined landline and cell phone samples. The relative weights of the landline and cell phone samples for Massachusetts were determined using National Health Interview Survey estimates of the share of Massachusetts adults in households with landlines and cell phones.[10]

The final weights were constructed from a base weight for each adult that reflects his or her probability of selection for the survey and a post-stratification adjustment to ensure that the characteristics of the overall sample were consistent with the characteristics of the Massachusetts

6 Atrostic, B.K., Bates, N., Burt, G., and Silberstein, A. Nonresponse in U.S. Government Household Surveys: Consistent Measures, Recent Trends, and New Insights, Journal of Official Statistics, 2001, 17(2):209-26.

7 Curtin, R, Presser, S., and Singer, E. Changes in Telephone Survey Nonresponse Over the Past Quarter Century, Public Opinion Quarterly, 2005, 69(1 Spring):87-98.

8 Triplett, T., and Silber, B. 2012 Summary Report for the Survey of Public Participation in the Arts. Washington, D.C.: National Endowment for the Arts, forthcoming.

9 Kohut, A., Keeter, S., Dimrock, M., Doherty, C. and Christian, L.M. Assessing the Representativeness of Public Opinion Surveys, Pew Research Center. Pew Research Center, 2012.

10 Blumberg, S.J., Luke, J.V., Ganesh, N., et al. Wireless Substitution: State-level Estimates from the National Health Interview Survey, 2010–2011. National Health Statistics Reports, no 61. Hyattsville, MD: National Center for Health Statistics, 2012. Available at http://www.cdc.gov/nchs/data/nhsr/nhsr061.pdf.

population as projected by the U.S. Census Bureau.[11] Specifically, the final weights include an adjustment to ensure that the age, sex, race/ethnicity, education, number of adults 19 to 64, number of seniors 65 or older, and geographic distribution of the sample are consistent with the distribution of the population in Massachusetts. This adjustment is needed since some adults are less likely than others to be included in the survey, resulting in their characteristics being under-represented in the sample. The overall design effect for the final weights (after the post-stratification adjustments) was 2.03 in the 2013 MHRS. The MHRS design effect was higher in 2008, which reflects the African American and Hispanic oversampling that was done only in 2008.

TABLE 8: MHRS DESIGN EFFECTS, 2006-2012

YEAR	DESIGN EFFECT
2006	1.91
2007	1.97
2008	2.38
2009	2.02
2010	1.98
2012	2.04
2013	2.03

Variance estimation. Variance estimation procedures have been developed for most standard software packages to account for design effects due to complex survey designs. We provide a replicate stratum (strata) and primary sampling unit (psu) variable on the survey data files that can be used with the appropriate weight variable to obtain corrected standard errors using a Taylor series approximation (or other related linearization method). Users interested in applying a linearization method can choose to use SUDAAN, the "SVY" commands in Stata, the "PROC SURVEYMEANS" and "PROC SURVEYREG" commands in SAS, or the "CSELECT" complex samples procedures in the SPSS complex samples module.

Item nonresponse. For the most part, survey respondents answered all the questions in the survey. As a result, there was very little missing data or item nonresponse. An exception to this was the family income measure: between four and six percent of the sample either did not know or would not provide any information on family income, and another three to five percent would only provide information on whether their family income was above or below 300 percent of the FPL. We used hot deck procedures to assign values for the missing income data based on the individual's age, sex, marital status, family type (parent or childless adult), educational attainment, and, where available, income category (above or below 300 percent of the FPL). Because of an

11 For a discussion of the derivation of the population control totals generated by the U.S. Census Bureau for the Current Population Survey, see Appendix D (Derivation of Independent Population Controls) of the Current Population Survey Technical Paper 63RV: Design and Methodology [Internet]. Washington, DC: U.S. Census Bureau, 2002. Available at www.census.gov/prod/2002pubs/tp63rv.pdf.

error in the question on family income in 2010, there was a more elaborate adjustment to the income measure in that survey year.[12]

Defining health insurance coverage. Survey respondents were asked a series of "yes/no" questions about whether they had each of the different types of insurance coverage available in the state, including Medicare, employer-sponsored insurance (ESI), and non-group coverage, as well as the range of publicly funded programs.[13] Respondents were told to exclude health care plans that covered a single type of care (e.g., dental care, prescription drugs). Individuals who received care under the state's uncompensated care program were counted as uninsured.

The primary insurance coverage questions in the MHRS focus on insurance coverage at the time of the survey (i.e., current insurance coverage); however, the survey also asks those who are currently insured whether they were uninsured at any time in the prior year and asks those who are currently uninsured whether they were insured at any time in the prior year. Thus, there are three measures of insurance coverage available from the survey: the individuals' current insurance coverage, whether the individual was ever uninsured over the past year, and whether the individual was ever insured over the past year. Unless otherwise noted, we use "uninsured" in the text to refer to individuals who were uninsured at the time of the survey.

While most people are believed to report accurately whether they have insurance coverage in surveys, there is evidence of some misreporting of coverage type.[14,15] In Massachusetts, where several coverage options have similar names, respondents in the survey often reported being enrolled in multiple programs (e.g., Commonwealth Care and Commonwealth Choice) or having both direct purchase and public coverage. As this raises concerns about the accuracy of the reporting of coverage type for the various public programs and direct purchase, the analysis of source of coverage is limited to ESI coverage and all other types of insurance. An individual reporting both public coverage and ESI coverage (perhaps because they have coverage through the Insurance Partnership program under MassHealth or wraparound services under MassHealth) would be assigned to ESI coverage. Among lower-income adults, the "public and other coverage" category is generally reported to be public coverage, while for higher-income adults, this category is more likely to represent direct purchase or Commonwealth Choice.

12 The data error and the adjustment for the data error are described in Long, S.K., Stockley, K., and Dahlen, H. Health Reform in Massachusetts as of Fall 2010: Getting Ready for the Affordable Care Act & Addressing Affordability. Boston, MA: Blue Cross Blue Shield of Massachusetts Foundation, 2012.
Available at http://bluecrossmafoundation.org/sites/default/files/MHRS%20Report%20Jan2012.pdf.

13 One advantage of the MHRS relative to national surveys is the ability to ask detailed questions about the range of insurance options available in Massachusetts. In addition, the survey also asks about other sources of care that are available in the state, such as the Indian Health Service and the Health Safety Net/Uncompensated Care/Free Care program. Those types of care are excluded from the MHRS measures of insurance coverage.

14 Call, K.T., Davidson, G., Sommers, A.S., Feldman, R., Farseth, P., and Rockwood, T. Uncovering the Missing Medicaid Cases and Assessing Their Bias for Estimates of the Uninsured. Inquiry, 2001–2002, 38(4):396-408.

15 Cantor, J.C., Monheit, A.C., Brownlee, S., and Schneider, C. The Adequacy of Household Survey Data for Evaluating the Nongroup Health Insurance Market. Health Services Research, 2007, 42(4):1739-57.