Does Moving the Condition Questions to the Beginning of Round 1 in the Medical Expenditure Panel Survey Produce Different Condition Estimates?

Frances M. Chevarley[1]
[1]Agency for Healthcare Research and Quality, Department of Health and Human Services, 540 Gaither Road, Rockville, MD 20850

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Abstract
This paper analyzes condition estimates from the Medical Expenditure Panel Survey, a nationally representative survey studying health care use, access, expenditures, source of payment, insurance coverage, and quality of care. Each year a new panel begins and each panel has 5 rounds of data collection over 2½ years that covers a two-year period. Alternative condition estimates based on MEPS data exist including responses to a set of priority condition-specific questions in the household CAPI instrument; and conditions associated with health events such as doctor visits (treated prevalence). This paper focuses on whether changes to the placement and streamlining the priority condition-specific questions of the MEPS CAPI instrument produce different condition estimates. Starting with Panel 12 (2007 Panel) in an attempt to improve the reporting of conditions associated with events, the priority condition-specific questions were moved to the first round of data collection and earlier in the CAPI instrument. In an attempt to reduce respondent burden these questions are streamlined in rounds 3 and 5: only asked of those who have not reported the condition previously.

Key Words: MEPS, CAPI, sample design, conditions, treated prevalence

1. Introduction

The prevalence of and expenditures for medical conditions are important to public health. Studies using the Medical Expenditure Panel Survey (MEPS) have demonstrated high health care utilization and expenses for certain conditions and for persons with multiple chronic conditions.[1,2,3] Because of the importance of condition data in determining health care access, utilization, costs, and condition prevalence there have been a number of studies evaluating the quality of condition data reported on health surveys such as MEPS and the National Health Interview Survey (NHIS); a few references are provided.[4,5,6,7,8] In MEPS conditions can be determined in several ways: Responses to condition-specific questions in the household CAPI instrument; conditions associated with medical events such as doctor visits (e.g. treated prevalence, costs of medical conditions); conditions reported as bothering the person during the MEPS reference period; and conditions associated with disability work loss days.

This paper focuses on the conditions associated with medical events. Starting with MEPS panel 12 (the MEPS panel that began in calendar year 2007), changes were made to when and how often the priority condition-specific questions are asked. These changes were made in order to: enhance the analytic utility of the survey; improve reporting of conditions associated with events; make the interview process smoother; and, improve the reporting of conditions using the condition-specific questions. The objective of this paper is to evaluate whether the changes made with Panel 12 affected the reporting of conditions associated with medical events.

1.1 Background/Data

The Medical Expenditure Panel Survey (MEPS) is a nationally representative longitudinal survey that collects detailed information on health care utilization and expenditures, health insurance, and health status, as well as on a wide variety of social, demographic, and economic characteristics for the U.S. civilian noninstitutionalized population. MEPS's main sponsor is the Agency for Healthcare Research and Quality. The MEPS has three components—Household, Medical Provider, and Insurance. The MEPS Household component (MEPS-HC) uses the National Health Interview Survey as it's sampling frame; has an overlapping panel design—5 interviews over 2 ½ years covering a 2-year reference period. Data for a full year file is based on data for rounds 1-3 of the panel that began that year and data for rounds 3-5 of the panel that began the year before.

1.2 Condition Questions in MEPS

Specific high prevalent "ever" condition questions have been asked in MEPS since 2000. The questions begin with "Has (PERSON) ever been told by a doctor or other health professional that (PERSON) had..." The conditions asked about include: diabetes (ages 18+), asthma (all ages), hypertension/high blood pressure (ages 18+); high cholesterol (ages 18+) (since 2005), coronary heart disease (ages 18+), angina (ages 18+), heart attack/myocardial infarction (MI) (ages 18+), any other kind of heart condition (ages 18+), stroke or transient ischemic attack (TIA) (ages 18+), emphysema (ages 18+) and arthritis (ages 18+). These qustions are often referred to as the priority conditions. For this paper analysis is restricted to individuals ages 18 and over for all the conditions even though asthma was collected for all ages.

Before MEPS panel 12, the "ever" questions were asked in the priority conditions quality supplement section (PC) towards the end of the interview in rounds 3 and 5. The Diabetes Care Supplement was given out right after a person was reported as ever having diabetes. Follow-up asthma questions were asked right after a person was identified as ever having had asthma, and either still has asthma or had an episode of asthma or an asthma attack in the past 12 months.

Starting with MEPS panel 12 (the panel starting in calendar year 2007) the high prevalent "ever" condition questions were moved from the priority conditions quality supplement section (PC) that was asked towards the end of the interview in rounds 3 and 5 to the priority conditions enumeration section (PE) at the beginning of the interview in round 1 and subsequent rounds in certain situations. Starting with panel 12 the "ever" questions are asked: in round 1 of everyone; in round 2 of new people to the survey; in round 3 of persons whose response up to this point is not "yes" for the condition; in round 4 of new people to the survey; and, in round 5 of persons whose responses up to this point were not "yes" for the condition. Starting with Panel 12, follow-up asthma questions are attempted

later in the priority conditions quality supplement section (PC) asked toward the end of the round 3 and 5 interviews of those who were reported to have ever had asthma in that or a previous round. Also an attempt is made in the PC toward the end of the round 3 and 5 interviews to distribute the diabetes care supplement, a paper-and-pencil self-administered questionnaire (SAQ), to those reported as ever having diabetes in that or a previous round.

The Panel 12 change also involved moving the priority condition questions to the beginning of the round 1 interview, before the collection of medical events. For persons identified by the questions to have a specified condition, the identified condition is added to the condition roster for that person. If a condition on the condition roster is identified as the reason for a medical event, then the interviewer can select that condition from the condition roster instead of having to type it.

1.3 Data

Condition data associated with medical events are analyzed before (2005, 2006) and after this change (2008, 2009). The analyses are restricted to adults, persons ages 18 and over. The data used are from the 2005, 2006, 2008, 2009 MEPS-HC files, MEPS Condition files, and MEPS Event files. Z-tests comparing 2006 and 2008 estimates are provided.

2. Analysis

2.1 Are people reporting a larger number of conditions associated with events after the change than before?

Starting with Panel 12 (the panel that began in calendar year 2007), the condition questions in the priority conditions enumeration section (PE) are asked before the collection of medical events and conditions identified by the questions are added to the person's condition roster. Now that the interviewer can select conditions identified from the questions from a pick list, would the interviewer have more time to type in other conditions for medical events?

In MEPS there are six types of medical events that collect condition data: visits to providers seen in office-based settings or clinics; visits to both physicians and other medical providers seen in hospital outpatient departments; emergency department visits; hospital in-patient discharges, prescriptions medicines; and home health visits. For these analyses, visits seen in office-based settings or clinics were combined with visits in hospital outpatient departments to form the category ambulatory visits.

Table 1
For adults ages 18 and over, percent of events with a condition associated and for those events with conditions, the average number of conditions per event: United States, 2005, 2006, 2008, 2009

	2005	2006	2008	2009	2006-2008 z-test	2006-2008 percent change[1]
All medical events						
% with cond	86.1	86.1	84.1	85.4	-5.03	-2.4
Avg # of conds per event	1.2	1.2	1.2	1.2	0.17	0.2
Ambulatory visits						
% with cond	81.2	81.1	77.8	79.4	-4.87	-4.1
Avg # of conds per event	1.3	1.3	1.3	1.4	0.37	0.6
Emergency department visits						
% with cond	95.1	94.7	93.9	92.6	-1.13	-0.9
Avg # of conds per event	1.1	1.1	1.2	1.2	0.70	1.2
Hospital inpatient discharges						
% with cond	91.9	91.6	91.0	91.0	-0.54	-0.6
Avg # of conds per event	1.2	1.2	1.3	1.3	0.42	1.2
Prescription medicines						
% with cond	92.6	92.6	91.4	92.3	-2.93	-1.3
Avg # of conds per event	1.1	1.1	1.1	1.1	1.08	0.4
Home health visits						
% with cond	71.2	68.2	71.6	73.9	1.01	5.0
Avg # of conds per event	2.1	2.2	2.3	2.0	0.35	3.0

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.

As indicated in Table 1, in 2006 86.1 percent of all medical events had a condition associated with it. This decreased by 2.4 percent from 86.1 percent in 2006 to 84.1 percent in 2008. This decrease for all medical events reflects the 4.1 percent decrease in the percent of ambulatory visits associated with a condition from 81.1 percent in 2006 to 77.8 percent in 2008. It's hard to speculate about these decreases since there is variability in the data which suggests a longer time period is needed to analyze the trend.

Also as indicated in Table 2, the average number of conditions reported for events with conditions reported did not change significantly from 2006 to 2008 for all medical events or for any of the medical event types. Therefore, identifying conditions early and putting them on a pick list did not increase the reporting of more conditions associated with medical events in MEPS.

2.2 Is the treated prevalence (using all medical events) for the conditions with questions larger after the change than before the change?

Treated prevalence is defined by MEPS as the percent of persons with a medical event associated with a particular condition during the year. Treated prevalence is shown in Table 2 for 2005, 2006, 2008, and 2009 for the conditions that have questions both before and after this change. Appendix A provides specific ICD-9-CM codes associated with the

conditions. Does asking people about ever having conditions before asking about medical events increase the liklihood that they will report these conditions associated with medical events?

Table 2
Treated prevalence in MEPS for adults ages 18 and over: United States, 2005, 2006, 2008, 2009

	2005	2006	2008	2009	2006-2008 z-test	2006-2008 percent change[1]
Diabetes	7.3	7.8	8.9	8.5	3.39	14.5
High Cholesterol	12.5	13.1	19.2	19.3	11.03	46.8
Heart disease	6.5	6.7	8.4	8.3	4.52	25.4
Hypertension	20.2	20.3	23.9	24.4	5.78	18.0
Coronary heart disease	1.5	1.5	5.8	5.6	16.91	272.0
Heart attack	0.8	0.8	2.2	2.2	8.91	169.6
Stroke	1.0	0.9	1.6	1.6	4.75	73.8
Emphysema	0.5	0.6	1.2	1.1	5.18	107.2
Asthma	3.5	3.7	4.4	4.5	3.14	19.2
Arthritis	9.7	9.5	15.2	15.1	13.01	60.1

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.

As shown Table 2, 7.8 percent of all persons ages 18 and over reported an event associated with Diabetes (treated prevalence) in 2006. This increased to 8.9 percent in 2008, a 14.5 percent increase. Treated prevalence increased from 2006 to 2008 for all of the conditions in which questions were asked before and after 2007. The 2008 treated prevalence estimate for coronary heart disease was 272 percent higher or four times the 2006 estimate; the 2008 treated prevalence estimate for stroke was 169.6 percent higher than the 2006 estimate; and the treated prevalence for emphysema doubled (an 107.2 percent increase) from 0.6 percent in 2006 to 1.2 percent in 2008.

2.3 Are conditions with questions more likely to be associated with events after 2007 than before?

Starting with Panel 12 (the panel that began in calendar year 2007), conditions identified for a person from condition questions are added to a condition pick list from which the interviewer can select the condition as being associated with medical events and/or prescriptions asked about later in the interview. Now that the interviewer can select conditions identified from the questions from a pick list, would the interviewer be more likely to associate these condtions with medical events? Will the percent of all events in which these conditions are associated increase from 2006 to 2008? The percentage of all events in which these conditions are associated are shown in Table 3A for 2005, 2006, 2008, 2009.

Table 3A
For adults ages 18 and over, percentage of all events in which specified conditions were associated: United States, 2005, 2006, 2008, 2009

All events	2005	2006	2008	2009	2006-2008 z-test	2006-2008 percent change[1]
Diabetes	5.3	5.9	5.7	5.4	-0.67	-3.5
High cholesterol	3.9	4.2	5.6	5.7	7.24	33.7
Heart disease	3.8	4.1	4.4	4.7	1.30	8.8
Hypertension	8.8	9.1	9.7	9.8	1.82	6.4
Coronary heart disease	0.8	0.9	3.0	3.1	11.03	233.5
Heart attack	0.4	0.5	0.8	0.9	2.74	56.1
Stroke	0.6	0.6	0.7	0.8	0.73	14.7
Emphysema	0.3	0.5	0.5	0.5	0.76	17.9
Asthma	1.5	1.6	1.7	1.7	0.65	5.2
Arthritis	4.5	4.6	6.4	6.4	6.03	38.1

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.

As shown in Table 3A, 5.6 percent of all events for adults in 2008 had high cholesterol associated, a 33.7 percent increase from the 4.2 percent of all events in 2006. The percentage of all events associated with coronary heart disease increased 233.5 percent from 0.9 percent in 2006 to 3.0 percent in 2008. The percentage of all events associated with heart attack also increased from 2006 (0.5 percent) to 2008 (0.8 percent), as did the percentage of all events associated with arthritis (from 4.6 percent in 2006 to 6.4 percent in 2008.)

Table 3B presents the percentage of events by type of event associated with high cholesterol and coronary heart disease, two conditions which were more likely to be reported in 2008 than in 2006 for all events (Table 3A).

Table 3B
For adults ages 18 and over, percentage of events associated with high cholesterol and coronary heart disease by type of event: United States, 2005, 2006, 2008, 2009

	2005	2006	2008	2009	2006-2008 z-test	2006-2008 percent change[1]
High cholesterol						
All events	3.9	4.2	5.6	5.7	7.24	33.7
Ambulatory	2.9	3.0	3.9	4.0	3.72	30.1
EROM	0.1	0.2	0.3	0.2	0.93	101.2
Inpatient	0.1	0.3	0.7	0.3	1.04	103.5
PMED	5.4	6.0	8.0	8.2	8.91	33.7
Home health	1.5	2.0	2.2	2.3	0.32	13.8
Coronary heart disease						
All events	0.8	0.9	3.0	3.1	11.03	233.5
Ambulatory	0.6	0.8	2.3	2.7	8.00	197.9
EROM	2.1	1.6	2.7	3.3	2.05	68.4
Inpatient	4.1	3.7	6.3	7.0	2.51	72.4
PMED	0.9	0.9	3.4	3.2	11.25	281.1
Home health	2.7	2.3	11.9	7.7	5.25	425.6

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.

In 2008, high cholesterol was more likely to be associated with ambulatory events and also with prescription medicines than in 2006. Coronary heart disease was more likely to be associated with all 5 types of events in 2008 than in 2006. For example the percentage of all ambulatory events associated with coronary heart disease almost tripled from 0.8 percent in 2006 to 2.3 percent in 2008; the percentage of all prescriptions associated with coronary heart disease increased 281.1 percent and the percentage of all home health visits associated with coronary heart disease increased 425.6 percent.

Table 3C shows the statistically significant percentage changes (2008 vs. 2006) in percentage of event associated with specified conditions by type of event for each of the 10 conditions (not just High cholesterol and Coronary heart disease that are shown in Table 3B).

Table 3C
For adults ages 18 and over, statistically significant percentage changes[1] (2008 vs. 2006) in percentage of events associated with specified conditions by type of event: United States, 2005, 2006, 2008, 2009

Percentage change 2006-2008 (z-tests>=1.96)	All	Amb	ED	IP	RX	HH
Diabetes						
High cholesterol	33.7	30.1			33.7	
All heart disease						
Hypertension					7.7	
Coronary heart disease	233.5	197.9	68.4	72.4	281.1	425.6
Heart attack	56.1				67.6	314.8
Stroke						
Emphysema						
Asthma						
Arthritis	38.1	39.3			40.2	

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.

Three of the 10 conditions are more likely to be reported with ambulatory visits in 2008 than in 2006; the pecentage of ambulatory events associated with high cholesterol, coronary heart disease, and arthritis increased from 2006 to 2008. Five conditions are more likely to be reported with prescription medicines in 2008 than in 2006 -- high cholesterol, hypertension, coronary heart disease, heart attack, and arthritis. Coronary heart disease is the only one of the ten conditions that was statistically significantly more likely to be reported with emergency department visits and with hospital inpatient visits in 2008 than in 2006.

2.4 For people reported to ever have each condition based on the questions, are their events more likely to have the conditions associated after 2007 than before?

Table 4A shows for adults reported to ever have each condition by the questions, the precentage of all their events associated with that condition in 2005, 2006, 2008 and 2009. Appendix A provides the MEPS file variable names used for the conditions. Again we are interested in the conditions with questions before and after 2007: Diabetes, high cholesterol, heart disease, hypertension, coronary heart disease, heart attack, stroke, emphysema, asthma, and arthritis.

Table 4A
For adults ages 18 and over reported to ever have each condition by the questions, percentage of all their events associated with the condition: United States, 2005, 2006, 2008, 2009

All events	2005	2006	2008	2009	2006-2008 z-test	2006-2008 percent change[1]
Diabetes	26.7	28.1	25.2	25.6	-3.05	-10.4
High cholesterol	8.6	9.1	10.4	10.5	3.41	13.7
Heart disease[2]	13.4	14.6	13.7	14.2	-1.18	-6.4
Hypertension	17.5	17.8	17.4	17.4	-0.85	-2.4
Coronary heart disease[3]	5.3	5.7	14.8	15.6	10.88	162.1
Heart attack	4.5	5.7	8.0	8.4	2.08	41.3
Stroke	7.5	8.2	7.4	8.1	-0.57	-9.4
Emphysema	8.1	8.8	8.5	7.9	-0.24	-4.2
Asthma	9.4	9.6	10.9	10.7	1.85	14.4
Arthritis	8.7	9.0	10.3	10.1	2.23	13.5

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.
[2]Heart disease questions include questions on coronary heart disease, angina, myocardial infarction, or other heart disease.
[3]Coronary heart disease questions include questions on coronary heart disease, angina, or myocardial infarction.

As shown in Table 4A, for people reported to ever have Diabetes based on the questions, an estimated 25.2 percent of their events had diabetes associated in 2008, a 10.4 percent decrease from the 28.1 percent in 2006. There is some fluctuation in these percents from 2005 to 2009, which suggests a longer time period may be needed to analyze the trend.

The percent of all events associated with high cholesterol, coronary heart disease, heart attack and arthritis increased from 2006 to 2008 for persons with these conditions (based on the questions.) For example, for adults reported by the questions to ever have coronary heart disease (reported that they ever had coronary heart disease, angina, myocardial infarction, or other heart disease) the percentage of their events associated with coronary heart disease more than doubled from 5.7 percent of all their events in 2006 to 14.8 percent of all their events in 2008. For persons reported to ever have arthritis (based on the questions) the percent of all their events associated with arthritis increased 13.5 percent (9.0 percent in 2006 to 10.3 percent in 2008.)

Again taking high cholesterol and coronary heart disease as examples as we did in Table 3B, Table 4B shows for persons reported (by the questions) to ever have high cholesterol or coronary heart disease, the percentage of all their events by type of event associated with high cholesterol and coronary heart disease.

Table 4B
For adults ages 18 and over reported to ever have high cholesterol or coronary heart disase by the questions, percentage of their events that were associated with high cholesterol or coronary heart disease by type of event: United States, 2005, 2006, 2008, 2009

	2005	2006	2008	2009	2006-2008 z-test	2006-2008 percent change[1]
High cholesterol						
All events	8.6	9.1	10.4	10.5	3.41	13.7
Ambulatory	7.1	7.3	8.0	8.1	1.30	9.5
EROM	0.2	0.5	0.9	0.5	0.81	83.6
Inpatient	0.3	0.9	1.4	0.6	0.72	61.9
PMED	10.6	11.4	13.3	13.5	5.44	16.6
Home health	2.8	4.5	3.8	4.1	-0.46	-17.5
Coronary heart disease[2]						
All events	5.3	5.7	14.8	15.6	10.88	162.1
Ambulatory	4.8	6.3	14.3	16.7	6.58	128.0
EROM	13.5	9.8	13.9	17.1	1.37	42.3
Inpatient	16.9	14.8	20.9	24.5	1.68	41.0
PMED	4.8	4.6	14.2	14.2	11.05	208.0
Home health	10.4	8.1	30.9	22.4	5.60	281.6

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.
[2]Coronary heart disease questions include questions on coronary heart disease, angina, and myocardial infarction.

For adults reported to have high cholesterol based on the questions, 13.3 percent of all their reported prescription medicines in 2008 were associated with high cholesterol which is an increase of 16.6 percent over the 11.4 percent of all their prescription medicines in 2006.

Adults reported to have coronary heart disease based on the questions increased the reporting of coronary heart disease associated with ambulatory events (from 6.3 percent in 2006 to 14.3 percent in 2008), associated with prescription medicines (from 4.6 percent in 2006 to 14.2 percent in 2008), and associated with home health events (from 8.1 percent in 2006 to 30.9 percent in 2008.)

Table 4C shows for persons reported by the questions to have the conditions, the statistically significant percentage changes (2008 vs. 2006) by type of event in percentage of events associated with the specified conditions.

Table 4C
For adults ages 18 and over, statistically significant percentage changes[1] (2008 vs. 2006) in percentage of events associated with specified conditions by type of event: United States, 2005, 2006, 2008, 2009 (EDIT)

Percentage change 2006-2008 (z-tests>=1.96)	All	Amb	ED	IP	RX	HH
Diabetes	-10.4	-11.7			-9.4	
High cholesterol	13.7				16.6	
Heart disease[2]						
Hypertension						
Coronary heart disease[3]	162.1	128.0			208.0	281.6
Heart attack	41.3				52.9	548.2
Stroke						
Emphysema						
Asthma						
Arthritis	13.5				15.3	

[1]Calculated from percents for 2006 and 2008 rounded to 6 decimal places.
[2]Heart disease questions include questions on coronary heart disease, angina, myocardial infarction. or other heart disease.
[3]Coronary heart disease questions include questions on coronary heart disease, angina, or myocardial infarction.

For people reported to ever have Diabetes based on the questions, the percentage of their ambulatory visits associated with Diabetes decreased 11.7 percent. On the other hand, coronary heart disease was more likely to be reported with ambulatory visits in 2008 than in 2006 for adults with coronary heart disease (a 128 percent increase.). Prescription medicines were less likely to be associated with Diabetes in 2008 than in 2006 (a 9.4 percent decrease) for persons with Diabetes, yet prescription medicines were more likely to be associated with high cholesterol, coronary heart disease, and arthritis for persons reported by the questions to have these conditions.

3. Summary

Starting with Panel 12 (the MEPS panel that began in calendar year 2007), high prevalent "ever" condition questions moved from the end of Rounds 3 and 5 to the beginning of Round 1 before the collection of medical events. For persons with conditions identified by the questions, the conditions were added to that person's condition roster. When asking respondents about conditions associated with their medical events the interviewer can select instead of typing those conditions already on the condition roster. We calculated several condition estimates for 2005, 2006, 2008 and 2009 and some changed and some did not.

We first explored whether people were reporting a larger number of conditions associated with events after the change than before since the interviewer would not have to type out

(they could select from a pick list) conditions identified by the questions. We found that the percent of all medical events and of all ambulatory events associated with a condition actually decreased from 2006 to 2008, though the percent changes are small and there is variability in the data. Also the average number of conditions reported for events with conditions reported did not change significantly from 2006 to 2008 for all medical events or for any of the medical event types.

Next we explored treated prevalence which is the percent of persons with a medical event associated with a particular condition during the year. Treated prevalence increased for each of the ten conditions with "ever" questions before and after 2007. Treated prevalence for coronary heart disease, heart attack, emphysema was more than doubled from 2006 to 2008.

We then learned that some of the conditions with "ever" questions were more likely to be reported with all events after the change and some were not. High cholesterol, coronary heart disease, heart attack, and arthritis were more likely to be reported with all events after the change than before. Being more likely to be reported with specific types of events depended on the condition and the type of event. For example: high cholesterol was more likely to be reported after the change for ambulatory events and for prescription medications; coronary heart disease was more likely to be reported after the change for all the different types of events: Ambulatory, emergency departement, hospital in-patient, prescription medications, or home health. When considering all of the 10 conditions (not just high cholesterol and coronary heart disease) we noted that after the change, 5 of the 10 conditions (high cholesterol, hypertension, coronary heart disease, heart attack, and arthritis) were more likely than before to be reported with prescription medications; 3 of the 10 conditions (high cholesterol, coronary heart disease, and arthritis) were more likely to be reported with ambulatory events; 2 of the 10 condtions (coronary heart disease, heart attack) were more likely to be reported with home health events; and only 1 of the 10 conditions (coronary heart disease) was more likely to be reported with emergency department events and inpatient events.

For people reported to ever have the conditions based on the questions, four of the 10 conditions (high cholesterol, coronary heart disease, heart attack, and arthritis) were more likely to be reported with all events after the change than before. For people with Diabetes based on the questions, Diabetes was less likely to be reported with all events after the change than before, though there is variability in the data and a longer trend analysis would be useful. After the change for people with the specified condition based on the questions: 4 of the 10 conditions (high cholesterol, coronary heart disease, heart attack, and arthritis) were more likely in 2008 than in 2006 to be reported with prescription medications; 1 of the 10 conditions (coronary heart disease) was more likely to be reported with ambulatory events; 2 of the 10 conditions (coronary heart disease, heart attack) were more likely to be reported with home health events; and none of the 10 conditions was more likely to be reported with emergency department events and inpatient events. In contrast for adults with Diabetes based on the questions, Diabetes was less likely to be reported with ambulatory events and with prescription medicines after the change than before.

3.1 Future work

The effect of on the data of asking the condition questions and seeding the condition roster before asking about conditions associated with medical events is complicated and more work is needed. It appears that some MEPS condition estimates associated with

reported medical events have changed starting with Panel 12. It is hard to tell if the changes in estimates are due to condition question changes and placements since other changes were made at the same time. In addition to the condition question changes, MEPS converted from a DOS to a window's based CAPI instrument in 2007 and the sample changed in 2007.

This is just a microcosm of what we are going to study. Data were compared from before (2005, 2006) and after the change (2008, 2009). Fluctuation in the data suggests a longer time period is needed to analyze the trend. Because respondents are asked about the conditions before being asked about conditions associated with events, there may be a tendency for the respondent to use the condition wording used in the condition questions rather than terminology they may have used had they not been asked the condition question. Or perhaps the interviewer will lead the respondent to use the terminology used in the questions since that condition is already on the pick list and the interviewer would not have to type and add another condition to the condition roster. As a result the distribution of ICD codes for the conditions associated with events may be less diverse than before. Also the distribution of ICD codes for conditions associated with events may be more diverse if terminology prompting has changed respondents to pick more specific conditions (based on the questions)--e.g. coronary heart disease when previously they might have just reported heart problems. Additional analyses of changes to the reporting of condtions bothering the person could be done to see if the number of conditions or distribution of conditions differs starting with Panel 12 data. Previous work has explored changes to the reporting of conditions based on the questions.[8] In any case, analysts should use caution in examining trends for priority conditions associated with medical events, based on the condition questions, and reported as bothering the person during this time period (2006-2008).

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Appendix A

ICD-9-CM codes for Conditions associated with MEPS medical events

Condition	ICD-9-CM codes
Diabetes	250
High cholesterol	272
Heart disease	390-398,402,404-429
Hypertension	401-405
Coronary heart disease	410-414
Heart attack	410,412
Stroke	430-438
Emphysema	492
Asthma	493
Arthritis	710-719

Priority condition variables used

Condition	Variables for 2005, 2006	Variables for 2008, 2009
Diabetes	DIABDX53	DIABDX
High cholesterol	CHOLDX53	CHOLDX
Heart disease	CHDDX53, ANGIDX53, MIDX53, OHRTDX53	CHDDX, ANGIDX, MIDX, OHRTDX
Hypertension	HIBPDX53	HIBPDX
Coronary heart disease	CHDDX53, ANGIDX53 MIDX53	CHDDX, ANGIDX, MIDX
Heart attack	MIDX53	MIDX
Stroke	STRKDX53	STRKDX
Emphysema	EMPHDX53	EMPHDX
Asthma	ASTJDX53	ASTJDX
Arthritis	ARTHDX53	ARTHDX