Understanding and Analyzing MEPS Household Component Medical Condition Data

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Introduction

MEPS Household Component (MEPS-HC) respondents are asked open-ended questions about their own medical conditions as well as those of other family members' in various sections of the computer assisted personal interview (CAPI) questionnaire. A particular condition for an individual may be reported in all, some, or none of these sections. This document describes the reporting of medical conditions in MEPS and uses 2008 data to quantify the extent to which sample persons' conditions are reported in different sections of the survey. A particular focus is on the extent to which the series of questions related to medical events account for condition reporting in the MEPS-HC.

Condition Data Collection

Household respondents are asked open-ended questions about MEPS sample persons' medical conditions in the following sections of the questionnaire: 1) Condition Enumeration (CE), 2) Medical Events (ME) and 3) Disability Days (DD). The CE section is the first among these sections and asks respondents to identify any specific physical or mental health problems for the person during the interview reference period (regardless of whether there was associated medical care or disability days). In most ME sections (medical provider office visits (MV), emergency rooms (ER), outpatient departments (OP), hospital inpatient stays (HS), prescribed medicine purchases (PM) and home health providers (HH)), household respondents are asked to identify the conditions that are associated with care/events they reported (conditions are not asked in the dental (DN) or other medical (OM) event sections)). Finally, conditions that caused sample persons to miss school or work, or spend more than half a day in bed, are ascertained in the DD section.

A particular condition for a sample person may be reported in all, some, or none of the sections described above. Interview responses that identify conditions are recorded as verbatim text by interviewers and then professionally coded for MEPS analytic files to fully-specified ICD-9-CM codes. Specific questions for each section with condition probes are provided in the Appendix.

In addition to open-ended reporting of conditions in the CE, ME, and DD sections, the priority condition enumeration section (PE) contains a series of "yes/no" questions on whether the person has ever been diagnosed as having each of several specific conditions that are generally chronic in nature. These conditions, which include high blood pressure, heart disease, stroke, emphysema, chronic bronchitis, high cholesterol, cancer, diabetes, joint pain, arthritis, asthma, and attention deficit disorder/attention deficit hyperactivity disorder, were deemed by the Agency for Healthcare Research and Quality (AHRQ) as "priority" for the survey due to their relatively high prevalence and generally accepted criteria for assessing appropriate clinical care. While variables based on responses to the PE questions are included in the MEPS Full Year Consolidated files, this report focuses only on the reporting of conditions in the CE, ME, and DD

sections (i.e., not PE) because these sections have the potential to capture any condition and comprise the data in the MEPS Medical Conditions public use files. However, because the PE questions are asked prior to the CE, ME, and DD sections, reporting of the specific PE conditions may be greater in these subsequent sections than would have occurred in the absence of a PE section.

MEPS Medical Conditions Files

Each record in a MEPS annual medical condition file represents a "current" condition reported as existing for a MEPS sample person at any time during the specific data year (i.e., those identified in the CE, ME, or DD sections of the questionnaire). To preserve confidentiality, diagnosis condition codes provided on the Medical Conditions file are collapsed from fully-specified 5-digit ICD-9-CM codes to 3-digit ICD-9-CM code categories.

The following table provides SAS code that can be used to identify conditions in a Medical Condition file according to which section of the questionnaire they were reported. This code reflects the methodology used to develop table 1 for this report (see "Methods" section below).

CAPI section	SAS code
Medical Events (ME)	If HHNUM>0 or IPNUM>0 or OPNUM>0 or OBNUM>0 or ERNUM>0 or RXNUM>0 then Section=ME;
Disability Days (DD) but not ME	Else if MISSWORK=1 or MISSSCHL=1 or INBEDFLG=1 then Section=DD;
Condition Enumeration (CE) only	Else Section=CE_only;

While it is reasonable to presume that many conditions reported in the ME and/or DD sections were also reported in the CE section, only those conditions reported exclusively in the CE can be identified based on information provided in the Medical Conditions file (see SAS code in table above).

Methods

Among persons with one or more records in the 2008 Medical Conditions file, table 1 shows the distributions by MEPS questionnaire section that the condition was reported for the 50 most common condition categories while table 2 provides two different types of population prevalence estimates for the 50 conditions. Persons are classified in table 1 into 3 mutually exclusive categories: 1) those with one or more medical events reported as associated with the condition, 2) those with the condition reported in DD section but no associated medical events reported, or 3) those with the condition reported in the CE section only. Table 2 shows "total" population prevalence estimates based on all persons and "treated" population estimates based on only persons with associated medical event(s) reported. The condition categories were defined using the Clinical Classification Software (CCS) which is a tool developed by AHRQ for clustering diagnoses into a manageable number of clinically meaningful policy-relevant categories (see http://meps.ahrq.gov/mepsweb/data_stats/download_data/pufs/h120/h120doc.pdf for crosswalk between CCS condition categories and component ICD-9-CM codes). The number of sample persons range across the 50 condition categories from 177 to 6,469. All estimates were weighted

by the MEPS person-level weight (PERWT08F) to produce national estimates and standard errors shown in table 2 were computed using a Taylor Series estimation approach.

Results

Table 1 shows that, in general, a high proportion of persons with a condition reported in any section had the condition identified in the medical events sections. For 32 of the 50 conditions shown, 80 percent or more of persons had medical events associated with the condition. Moreover, 95 percent or more of persons with thyroid disease (CCS=48), diabetes (CCS=49–50), epilepsy/convulsions (CCS=83) or male genital disorders (CCS=164–166) in the Medical Conditions file had medical events associated with the condition. In contrast, only 30 percent of persons with influenza (CCS=123) and 23 percent of those with an intestinal infection (CCS=135) reported in any section had a medical event reported for those conditions. These two conditions were more likely to be reported in the DD section (55 percent of those with influenza and 69 percent of those with intestinal infections reported). Other conditions with a notable proportion of persons identified in the DD section (but not ME) include acute bronchitis/upper respiratory infection (URI) (36 percent, CCS=125–126), and headache (33 percent, CCS=84). Most conditions (42 of the 50) had less than 10 percent reported in DD with no medical events reported for the same condition. Finally, for all but three of the conditions, less than 20 percent of persons were identified as having the condition in the CE section only. The three conditions with more than 20 percent identified in the CE section only were trauma-related disorders (21 percent, CCS=225–236 etc.), disorders of teeth or jaws (25 percent, CCS=136), and osteoarthritis (33 percent, CCS=201–204).

Table 1. Percentage Distribution by Section in which Condition was Reported for Selected Condition Categories, 2008

			Percentage distribution of condition report by section		
CCS code(s)	Condition category	Number of persons (unweighted)	ME[1]	DD but not ME[2]	CE only
1–9	**Infectious diseases**	1,993	75.2	12.5	12.4
10, 254–258	**Other care and screening**	1,866	84.6	2.7	12.7
11–45	**Cancer**	1,321	89	1.2	9.9
46, 47	**Non-malignant neoplasm**	381	83.6	1.7	14.7
48	**Thyroid disease**	1,285	97.3	0.3	2.4
49, 50	**Diabetes mellitus**	2,263	95.4	0.8	3.8
51, 52, 54–58	**Other endocrine, nutritional, & immune disorder**	1,180	87.8	2.6	9.6
53	**Hyperlipidemia**	4,488	87.2	0.1	12.6
59	**Anemia and other deficiencies**	401	84.8	1.1	14.1

			Percentage distribution of condition report by section		
CCS code(s)	Condition category	Number of persons (unweighted)	ME[1]	DD but not ME[2]	CE only
79–81	**Hereditary, degenerative, and other nervous system disorders**	248	90.5	0.5	9
83	**Epilepsy and convulsions**	242	95.2	0.8	4.1
84	**Headache**	1,394	51.6	33.2	15.2
86	**Cataract**	423	86	0.1	13.9
87, 89–91	**Other eye disorders**	1,823	78.7	2.9	18.4
88	**Glaucoma**	352	92.1	0	7.9
92	**Otitis media**	1,164	81.6	6.8	11.6
93–95	**Other central nervous system (CNS) disorders**	1,727	76.8	4.6	18.7
96, 97, 100–108	**Heart conditions**	2,343	86.7	2.1	11.2
98, 99	**Hypertension**	5,607	93	0.6	6.4
109–113	**Cerebrovascular disease**	402	79.9	6.1	14
114–121	**Other circulatory conditions arteries, veins, and lymphatics**	578	81.5	3.6	14.9
122	**Pneumonia**	432	78.9	12.7	8.5
123	**Influenza**	1,097	30	55.4	14.6
125, 126	**Acute bronchitis and URI**	6,469	44.7	36	19.3
127–134	**COPD, asthma**	6,105	74.2	8.6	17.3
135	**Intestinal infection**	3,957	23.3	68.8	7.9
136	**Disorders of teeth and jaws**	1,132	63.9	11	25.1
138–141	**Disorders of the upper gastrointestinal (GI)**	2,602	81	12	6.9
143	**Hernias**	240	80.7	5.7	13.6
144–148	**Other stomach and intestinal disorders**	194	86.8	4.8	8.5
149–152	**Gallbladder, pancreatic, and liver disease**	339	81.3	5.6	13.1
153–155	**Other GI**	1,041	77.3	8.8	13.9
156–158, 160, 161	**Kidney disease**	431	89.9	3.7	6.4
159	**Urinary tract infections**	849	83.2	3.7	13.1

			Percentage distribution of condition report by section		
CCS code(s)	Condition category	Number of persons (unweighted)	ME[1]	DD but not ME[2]	CE only
162, 163	**Other urinary**	495	89.2	1.6	9.2
164–166	**Male genital disorders**	410	95	0.5	4.6
167	**Non-malignant breast disease**	195	84.4	0.7	14.9
168–176	**Female genital disorders, and contraception**	1,398	86.3	6.7	7
177–195	**Complications of pregnancy and birth**	192	78.1	9.3	12.6
196, 218	**Normal birth/live born**	865	80	6.2	13.8
197–200	**Skin disorders**	2,310	85.2	1.7	13.1
201–204	**Osteoarthritis and other non-traumatic joint disorders**	5,014	62.7	4.6	32.8
205	**Back problems**	2,076	75.8	7.2	17
206–209, 212	**Other bone and musculoskeletal disease**	789	89.3	1.4	9.4
210–211	**Systemic lupus and connective tissues disorders**	1,657	77.5	4.1	18.4
213–217	**Congenital anomalies**	177	82.1	0.9	17
225–236, 239, 240, 244	**Trauma-related disorders**	4,058	72.7	6.7	20.5
241–243	**Poisoning by medical and non-medical substances**	242	74.7	9.4	15.9
253	**Allergic reactions**	785	80.5	3.2	16.3
650–670	**Mental disorders**	4,289	79	6.1	15

[1]Condition may also have been reported in DD or CE sections.

[2]Condition may also have been reported in CE section.

Table 2 compares "total population prevalence" estimates for the 50 condition categories based on the entire Medical Conditions file to "treated population prevalence" estimates based only on condition records associated with medical events. It is apparent from the table that the rank orders of the two sets of population estimates are highly correlated (r=.98). However, acute bronchitis/URI (CCS=125–126), intestinal infections (CCS=135), and influenza (CCS=123) rank notably higher in terms of total reported conditions than in terms of treated prevalence. The ratio of "treated prevalence" to "total reported"

population estimates[1] ranges from 23 percent for intestinal infections (9,725,098/41,676,660) to 97 percent for thyroid disease (CCS=48) (15,434,555/15,869,425). In other words, the 2008 MEPS treated prevalence population estimate for intestinal infections is substantially lower than the total estimate (9.7 versus 41.7 million) while treated prevalence and total prevalence estimates are similar for thyroid disease (15.4 versus 15.9 million).

Table 2. Population Prevalence Estimates Based on Full Condition File Data versus only Persons w/ Medical Events, Selected Condition Categories, 2008

CCS code(s)	Condition category	Total (full conditions file)			Associated w/ medical event(s)		
		Population	SE	Rank	Population	SE	Rank
1–9	**Infectious diseases**	21,989,219	788,465	14	16,526,955	625,421	14
10, 254–258	**Other care and screening**	20,347,107	931,518	16	17,219,615	808,617	13
11–45	**Cancer**	17,400,124	736,081	19	15,479,928	709,324	17
46, 47	**Non-malignant neoplasm**	4,708,789	327,107	37	3,936,964	304,736	36
48	**Thyroid disease**	15,869,425	705,056	20	15,434,555	687,100	18
49, 50	**Diabetes mellitus**	22,170,464	723,833	13	21,157,779	717,549	11
51, 52, 54–58	**Other endocrine, nutritional, and immune disorder**	13,226,874	531,229	23	11,608,845	512,025	21
53	**Hyperlipidemia**	50,898,959	1,459,715	5	44,401,137	1,365,597	3
59	**Anemia and other deficiencies**	3,619,403	234,119	41	3,069,478	219,283	41
79–81	**Hereditary, degenerative and other nervous system disorders**	3,072,974	220,610	43	2,780,439	212,717	43
83	**Epilepsy and convulsions**	2,603,482	212,087	46	2,477,566	207,632	44
84	**Headache**	14,129,062	568,284	22	7,297,193	367,256	28
86	**Cataract**	5,247,714	362,558	34	4,514,756	328,839	34
87, 89–91	**Other eye disorders**	20,479,939	827,815	15	16,115,728	675,354	15
88	**Glaucoma**	3,970,976	302,947	40	3,656,679	293,172	38
92	**Otitis media**	11,783,337	520,238	24	9,619,883	449,185	23
93–95	**Other CNS disorders**	20,196,297	707,327	17	15,503,906	634,403	16
96, 97, 100–108	**Heart conditions**	26,788,637	936,846	10	23,234,187	879,698	8
98, 99	**Hypertension**	59,334,619	1,556,908	3	55,197,052	1,490,396	1
109–113	**Cerebrovascular disease**	4,610,873	320,606	38	3,684,310	290,958	37
114–121	**Other circulatory conditions arteries, veins, and lymphatics**	6,768,348	338,658	32	5,517,244	289,264	31
122	**Pneumonia**	4,527,763	305,919	39	3,571,130	285,979	39
123	**Influenza**	10,657,800	683,241	27	3,201,693	262,339	40
125, 126	**Acute bronchitis and URI**	68,738,432	1,895,626	1	30,735,580	928,828	7
127–134	**COPD, asthma**	62,697,942	1,856,151	2	46,492,922	1,469,667	2
135	**Intestinal infection**	41,676,660	1,423,233	8	9,725,098	514,380	22
136	**Disorders of teeth and jaws**	11,477,850	540,660	25	7,331,240	383,290	27

[1] This ratio is equivalent to the percent of persons with the condition identified in the events section shown in table 1.

CCS code(s)	Condition category	Total (full conditions file)			Associated w/ medical event(s)		
		Population	SE	Rank	Population	SE	Rank
138–141	**Disorders of the upper GI**	27,790,982	857,891	9	22,521,248	714,505	9
143	**Hernias**	2,787,080	211,583	45	2,248,293	186,716	46
144–148	**Other stomach and intestinal disorders**	2,597,150	252,798	47	2,253,680	231,991	45
149–152	**Gallbladder, pancreatic, and liver disease**	3,571,157	243,743	42	2,904,198	207,600	42
153–155	**Other GI**	11,147,354	535,300	26	8,612,365	468,067	25
156–158, 160, 161	**Kidney disease**	4,719,110	321,565	36	4,242,635	318,244	35
159	**Urinary tract infections**	9,454,716	435,691	29	7,869,037	386,379	26
162, 163	**Other urinary**	5,473,173	327,429	33	4,883,913	317,867	32
164–166	**Male genital disorders**	5,097,348	338,889	35	4,840,044	325,804	33
167	**Non-malignant breast disease**	2,164,857	197,391	48	1,827,690	174,594	48
168–176	**Female genital disorders, and contraception**	15,812,862	637,006	21	13,644,918	617,463	20
177–195	**Complications of pregnancy and birth**	1,751,045	186,002	50	1,367,201	152,547	50
196, 218	**Normal birth/live born**	7,557,688	439,270	31	6,045,920	356,662	30
197-200	**Skin disorders**	25,801,812	825,649	11	21,976,284	773,751	10
201–204	**Osteoarthritis and other non-traumatic joint disorders**	55,944,585	1,719,769	4	35,053,634	1,133,487	5
205	**Back problems**	23,606,471	802,807	12	17,895,697	671,758	12
206–209, 212	**Other bone and musculoskeletal disease**	9,667,717	438,216	28	8,630,869	432,237	24
210–211	**Systemic lupus and connective tissues disorders**	18,869,533	695,706	18	14,625,583	592,138	19
213–217	**Congenital anomalies**	2,017,420	174,932	49	1,656,071	155,477	49
225–236, 239, 240, 244	**Trauma-related disorders**	45,575,137	1,297,478	7	33,140,004	1,075,738	6
241–243	**Poisoning by medical and non-medical substances**	2,914,645	222,170	44	2,177,129	186,994	47
253	**Allergic reactions**	8,230,755	427,283	30	6,624,015	365,856	29
650–670	**Mental disorders**	47,879,960	1,426,609	6	37,799,317	1,225,226	4

Analytic Considerations

Quality of household reported information

MEPS condition information is reported by a household respondent and consequently subject to limitations in detail and accuracy. In general, conditions that are salient, painful, require hospitalization, require ongoing treatment, have specific recognizable treatment, alter lifestyle and/or affect daily life tend to be more accurately reported by household respondents (Machlin et. al, 2009). Moreover, research has suggested that the agreement between conditions reported by household respondents and medical providers is weak for very specific conditions, but improves as condition categories are expanded to include broader ranges of conditions (Cox and Cohen, 1985). Consequently, the Clinical Classification Codes (varname=CCCODEX) generated

by CCS, which aggregate somewhat similar ICD-9-CM conditions into broad but clinically meaningful categories, are provided for analysts on the Conditions file.

Prevalence estimation limitations
As described earlier, medical conditions for MEPS sample persons are identified if reported as a general problem, associated with medical care events, or as the reason for missing school or work, or for spending days in bed during the year. When analyzing MEPS condition data, it is important to consider that persons may have conditions that are not captured in any of these sections so MEPS condition data cannot be regarded as completely exhaustive. Moreover, the household respondent reporting for other household members may not be fully aware of problematic conditions for those persons (particularly those not associated with medical events) and also may not be aware of some of their own conditions. Consequently, estimates of condition prevalence in the population during the year based on MEPS should be undertaken with caution and the quality of such estimates likely varies substantially by type of condition.

To avoid some of the problems associated with estimating condition prevalence, an option for MEPS analysts is to focus on "treated prevalence" in which conditions are ascribed to persons only if they are reported as associated with medical events in the survey. This approach has the advantages of tying the analysis directly to MEPS utilization and expenditure data, which are key components of the survey, and reducing the risk that the estimates or analysis will be misconstrued as reflecting "true" prevalence. Nonetheless, "treated prevalence" estimates are also subject to underestimation to the extent that medical events and associated conditions are underreported by respondents. It should also be considered that treated prevalence estimates from MEPS are likely to better reflect true prevalence for conditions that are salient and require ongoing treatment. For example, MEPS is commonly used to produce estimates of treated prevalence and expenditures for chronic conditions. The AHRQ Healthcare Utilization Project Chronic Condition Indicator (CCI) (http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp) tool provides a method for identifying chronic conditions in MEPS.

Summary

This document uses 2008 MEPS data to describe the types, sources, and limitations of condition information available from the survey. MEPS condition information is household reported and consequently subject to limitations in detail and accuracy. Household respondents are asked open-ended questions about MEPS sample persons' medical conditions in the following sections of the questionnaire: 1) Condition Enumeration (CE), 2) Medical Events (MV, ER, OP, HS, PM, and HH) and 3) Disability Days (DD) sections. A particular condition for an individual may be reported in all, some, or none of these sections.

Estimates of condition prevalence in the population based on MEPS should be undertaken with caution and the quality of such estimates likely varies substantially by type of condition. Most conditions are identified in MEPS as a result of their association with medical events reported by the household respondent. To avoid some of the problems in estimating total population condition prevalence, MEPS analysts may choose to focus on "treated prevalence" by ascribing conditions to persons only when reported as associated with medical events in the survey. This approach ties the analysis directly to MEPS utilization and expenditure data which are key components of the survey.

References

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Appendix. MEPS CAPI Questions Ascertaining Medical Conditions

I. Condition Enumeration Section

CE04
====
Between (START DATE) and (END DATE), did (PERSON) have any physical or mental health problems, accidents, or injuries?}
[Please include all of (PERSON)'s conditions, accidents, or injuries regardless of whether (PERSON) saw a medical provider, received treatment, or took medications {since (START DATE)/between (START DATE) and (END DATE)}. {Also include health problems that may have been mentioned during a previous interview, but have also bothered (PERSON) {since (START DATE)/between (START DATE) and (END DATE)}.}]

CE05
====
What did (PERSON) have?
PROBE: Did (PERSON) have any **other** health problems, accidents, or injuries?

II. Medical Events Sections

Medical Provider Visits

MV08
=====
Was this visit related to any specific health condition or were any conditions discovered during this visit?

MV09
=====
What conditions were discovered or led (PERSON) to make this {visit/telephone call}?
PROBE: Any other condition?

Emergency Room

ER03
====
Was this visit related to any specific health condition or were any conditions discovered during this visit?

ER04
====
What conditions were discovered or led (PERSON) to make this visit?
PROBE: Any other condition?

Home Health

HH05
=====
What health condition led (PERSON) to receive home health care services from {someone from} (PROVIDER) during (VISIT MONTH)?
PROBE: Any **other** health condition?

Hospital Stay

HS03
====
Was this hospital stay related to any specific health condition or were any conditions discovered during this hospital stay?

HS04
====
What conditions were discovered or led (PERSON) to enter the hospital?
PROBE: Any other condition?

Outpatient Department

OP08
====
Was this {visit/telephone call} related to any specific health condition or were any conditions discovered during this {visit/
telephone call}?

OP09
====
What conditions were discovered or led (PERSON) to make this {visit/telephone call}?
PROBE: Any other condition?

Prescribed Medicines

PMO8
=====
Is (MEDICINE) used for a specific health problem?

PMO9
=====
What health problem is (MEDICINE) prescribed for?
PROBE: Any other health problems?

III. Disability Days Section

The next questions ask about time when (PERSON) may have missed a half day or more from work or school or spent a half day or more in bed {since (START DATE)/between (START DATE) and (END DATE)}. In answering these questions, please include any time when this occurred because of (PERSON)'s physical illness or injury, or a mental or emotional problem such as stress or depression.

DD02
=====
Let's start with work. {Including the time (PERSON) (were/was) in {the hospital} {and} {the long-term care facility}, how/How}
many days did (PERSON) miss a half day or more from work {since (START DATE)/between (START DATE) and (END DATE)}? Please do not include work around the house.
PROBE: Include any time when a half day or more was missed because of a physical illness or injury, or a mental or emotional problem.

DD03

=====

What are the health problems that caused (PERSON) to miss work on those days?
PROBE: Any other health problems?

DD04

=====

Of those days, how many did (PERSON) stay in bed for a half day or more?

DD05

=====

Let's talk about school (and day care). {Including the time (PERSON) (were/was) in {the hospital} {and} {the long-term care facility}, how/How} many days did (PERSON) miss a half day or more of school (or day care) {since (START DATE)/between (START DATE) and (END DATE)}?
PROBE: Include any time when a half day or more of school (or day care) was missed because of a physical illness or injury, or a mental or emotional problem.

DD06

=====

What are the health problems that caused (PERSON) to miss school on those days?
PROBE: Any other health problems?

DD07

=====

Of those days, how many did (PERSON) stay in bed a half day or more?

DD08

=====

{Besides the days in bed you just told me about, how/How} many {additional} days did (PERSON) spend a half day or more in bed {since (START DATE)/between (START DATE) and (END DATE)} because of a physical illness or injury, or mental or emotional problem?

DD09

=====

What are the health problems that caused (PERSON) to spend a half day or more in bed on those days?
PROBE: Any other health problems?