DEPARTMENT OF HEALTH

Treated Chronic Disease Prevalence and Spending in Minnesota

ESTIMATED SPENDING FOR 2009 AND 2016

PROJECTED SPENDING FOR 2016 THROUGH 2027

SUPPLEMENTAL APPENDICES

Appendix 1: Certification to the Commissioner of Minnesota Management and Budget and Letter to Legislative Committees

m DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

December 8, 2021

Mr. Jim Schowalter
Commissioner
Minnesota Management and Budget
400 Centennial Building
658 Cedar Street
St. Paul, MN 55155

Dear Commissioner Schowalter,

The Minnesota Legislature has directed the Minnesota Department of Health (MDH) to report annually on health care spending attributable to select chronic conditions and smoking exposure, including by producing estimates of actual health care spending, ten-year projections, and a comparison of estimated spending against projections. In cases where actual spending falls short of projections, MDH is directed to estimate the portion of this difference attributable to state-administered health care programs (Minnesota Statutes, Chapter 62U.10, subd. 5-8). If this portion in one year or cumulatively over two or more years is greater than or equal to $50 million, a transfer of funds of $50 million from the General Fund to the Health Care Access Fund is triggered.

Although in aggregate statewide health care spending attributable to chronic conditions and smoking exposure fell below projected levels in the 2016 data year by roughly $456 million, we estimate that spending attributable to state-administered programs, including Medicaid and the State Employee Group Insurance Program, exceeds projections. As a result, our analysis of data from 2016 does <u>not</u> trigger a transfer as described in statute for the coming fiscal year.

The accompanying report to the Legislature includes a summary of the main findings from the analysis, a description of the methodology and additional data tables, and a statement about actuarial certification. Briefly, our budget did not permit actuarial certification for the 2016 report. The methodological approach for this report is very similar to the 2015 report, which did include certification, and the forthcoming reports for 2017 and 2018, which will also be actuarially certified. The same material will be accessible online at the MDH Health Economics Program Webpage (www.health.state.mn.us/healtheconomics).

If you or your staff have any questions regarding this report, please direct them to Stefan Gildemeister, Director of the Health Economics Program, at stefan.gildemeister@state.mn.us or 651-201-3554.

Sincerely,

Jan K. Malcolm
Commissioner

cc: Angela Vogt, Executive Budget Coordinator, MMB
      Joshua Riesen, Executive Budget Officer, MMB

Protecting, Maintaining and Improving the Health of All Minnesotans

December 8, 2021

Senator Michelle Benson
Chair, Health and Human Services Finance
and Policy Committee
Minnesota Senate
3109 Minnesota Senate Building
Saint Paul, MN 55155

Representative Tina Liebling
Chair, Health and Human Services Finance
Committee
Minnesota House of Representatives
477 State Office Building
Saint Paul, MN 55155

To the Honorable Chairs:

As required by Minnesota Statutes, Section 62U.10, this report describes the results of the Minnesota Department of Health's (MDH) work in developing estimates of the health care costs directly associated with selected chronic conditions and smoking. Key findings from the analysis of 2016 data include:

- Treated prevalence of diabetes, hypertension, dementia, and all chronic conditions for Minnesotans ages 60 and older increased between 2009 and 2016.
- Per-person *total health care spending* in 2016 for Minnesotans with diabetes, hypertension, or dementia was higher than that of the population as a whole in 2016, and increased between 2009 and 2016 for each chronic condition category.
- With the exception of dementia, average per-person health care spending in 2016 that is *attributable to a given condition* decreased from 2009 to 2016.
- Total health care spending in Minnesota attributable to selected chronic conditions is projected to grow between 21 percent (obesity) and 58 percent (dementia) between 2016 and 2027.
- Overall actual disease attributable spending in 2016 was substantially below baseline projections. However, for state-administered programs, actual spending was estimated to be greater than projections.

In requiring MDH to conduct this work, the Legislature recognizes the toll that chronic disease continues to take on individuals, communities, and the state. The dramatic projected growth in treatment costs and treated prevalence illustrated by this analysis reinforce the fact that Minnesota will not be able to treat its way out of this crisis. Without a strong and continuing focus on evidence-based strategies for preventing and managing chronic disease, the impact on costs and quality of life for individuals and communities will increase.

As required by statute, MDH also calculated the difference between actual and projected health care spending for 2016 for these conditions and estimated the percentage of this difference that accrued to state-administrated health care programs. Results from this analysis indicate that the portion of the difference accruing to state-administered health care programs, as defined in section 62U.10, subdivision 8, does not exceed $50 million. As a result, the condition that would trigger the requirement in statute for a transfer of resources between the General Fund and the Health Care Access Fund is not

met. I have certified this finding in correspondence with Minnesota Management and Budget (MMB) Commissioner Jim Showalter.

The enclosed report includes a summary of the main findings from the analysis, a description of the methodology and additional data tables, and a statement about actuarial certification. Briefly, our budget did not permit actuarial certification for the 2016 report. The methodological approach for this report is very similar to the 2015 report, which did include certification, and the forthcoming reports for 2017 and 2018, which will also be actuarially certified.

If you have any questions regarding this report, please direct them to Stefan Gildemeister at stefan.gildemeister@state.mn.us or 651-201-3554.

Sincerely,

Jan K. Malcolm
Commissioner
P.O. Box 64975
St. Paul, MN 55164-0975

Appendix 2: Actuarial Certification

In the statute governing the construction of this report, the Minnesota Legislature requested that the "assumptions and research methods used to calculate actual spending must be determined to be appropriate by an independent actuarial consultant."[1] In previous iterations of this report, the underlying assumptions and methods received this actuarial certification, documented within each report or methods document.

The resources allocated for production of the current 2016 iteration of the report did not permit MDH to attain actuarial certification, although the assumptions and methods remain nearly identical to those used in 2014 and 2015. The forthcoming reports for 2017 and 2018 employ similar methods and will include actuarial certification.

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[1] Minnesota Statutes, Chapter 62U.10, subd. 7.

Appendix 3: Data and Limitations

The analysis MDH was directed to perform is unique in the context of research conducted by other states, expansive in that it required developing estimates and projections across a range of conditions and risk factors, and technically demanding. To help readers weigh the evidence for policy-making purposes or for use in public health planning, this section provides context about the data that were used, information about high-level assumptions that were made along the way, and detail about potential limitations that are associated with this study. Because relevant technical information is provided throughout the report and the methodology is provided separately in Appendix 6, this section is intended to provide high-level, summary information.

This section does not focus on alternative ways of measuring the impact of chronic disease in Minnesota or on identifying strategies to affect the prevalence or the treatment cost of specific conditions. Rather, it is intended to provide detail on the study at hand for the specific measurement focus MDH was directed to pursue.

Generally speaking, developing an estimate of the costs of medical services and prescription drugs associated with specific chronic conditions or risk factors requires answering three questions:

1. How many people in Minnesota have a particular condition?
2. How much health care spending is accounted for by patients with that condition?
3. What portion of spending devoted to a patient's care is unrelated to the condition in question?[2]

In order to estimate future health care spending, analysts also have to determine what is known about expected demographic changes (chronic disease prevalence increases with age) and changes in health care prices, or medical inflation. Lastly, to assess the role of state public payers of health care, researchers need to have information on the prevalence of disease among beneficiaries of those programs or the age distribution in those programs relative to others with the disease.

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[2] The last question is about making sure estimates attributable to specific chronic conditions control for, or exclude, health care spending that is unrelated to the treatment of a specific condition. The aim here was to identify all costs for the treatment of a specific condition and all comorbidities that developed as a direct result of the condition, e.g., hypoglycemia for persons with diabetes.

Data Sources

Because there is no single data source to address these questions for the four chronic conditions that are the focus of this study and smoking exposure, the research team had to rely on multiple data systems. The following data resources were used for specific aspects of the modeling and estimation tasks:

- The **Minnesota All Payer Claims Database (MN APCD)**, which aggregates health care transaction data across public and private payers in Minnesota, was used to identify persons with each chronic condition (diabetes, hypertension, dementia, and all chronic conditions for persons 60 year or older), calculate person-level medical and prescription drug costs for these conditions, and control for unrelated costs.[3]

- The **Household Component of the Medical Expenditure Panel Survey (MEPS-HC)** was used to analyze conditions that are not directly observable in the MN APCD (obesity, smoking exposure) and, where applicable, to develop estimates for populations for all conditions of interest that are not part of the MN APCD (the uninsured, Tricare enrollees, and spending for people whose care is covered by Veterans Affairs benefits and the Indian Health Services).[4] Depending on the condition, data from the national, the Midwest, or Minnesota samples were used, adjusted to reflect Minnesota's distribution of health insurance coverage. Data are also benchmarked to the MN APCD.

- Minnesota's **Behavioral Risk Factor Surveillance System (BRFSS)**, the Minnesota Population sample of the **Tobacco Use Supplement to the Current Population Survey**, and a pooled sub-sample of the national MEPS linked to the **Adult Sample** of the **National Health Interview Survey (NHIS)** were used to obtain information on smoking exposure status (current smoker, past smoker, live with smoker), particularly the time since members in the sample have quit smoking.[5]

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[3] The Minnesota All Payer Claims Database (MN APCD) is the most comprehensive data system for health care delivery in Minnesota. It collects information from all major public and private payers of health care services delivered to Minnesota residents, covering the spectrum of the health care delivery system and tracking de-identified information over time and across the state's geography. The MN APCD includes claims data beginning in calendar year 2009. Use of the data is limited by the legislature in MN Statutes 62U.04, subd. 11 to specific activities conducted by MDH. Minnesota is one of many states with an active APCD, according to the APCD Council (https://www.apcdcouncil.org/state/map). Additional information on the Minnesota All Payer Claims Database, a project of the Minnesota Department of Health (MDH), is available online at the Minnesota All Payer Claims Database webpage (https://www.health.state.mn.us/data/apcd/index.html).

[4] Additional information on the Household Component of the Medical Expenditure Panel Survey (MEPS), a project of the Agency for Healthcare Research and Quality (AHRQ), is available online on the MEPS webpage (https://meps.ahrq.gov/survey_comp/household.jsp).

[5] Additional information on the National Health Interview Survey (NHIS), a project of the Centers for Disease Control and Prevention (CDC), is available online at the NHIS webpage (https://www.cdc.gov/nchs/nhis/index.htm).

- Minnesota's **BRFSS,** the **National Health and Nutrition Examination Survey (NHANES)**, and the **National Survey of Children's Health** were used to develop prevalence estimates of obesity in Minnesota.[6]
- Demographic information from the **American Community Survey (ACS)** and the **Minnesota State Demographic Center** and insurance coverage information from the **Minnesota Health Access Survey (MHAS)** were used to weight estimates to Minnesota population statistics and health insurance coverage distribution, and as benchmarks for age/sex cohorts. The ACS was also used to capture household income effects on service use by mapping MN APCD zip codes to U.S. Census-defined Zip Code Tabulation Areas (ZCTA).[7]
- Expected price trends were computed using data from the **Consumer Price Index for Urban Consumers (CPI-U)** and the **National Health Expenditure Accounts (NHEA)**.[8]

Challenges and Limitations

Although an interdisciplinary team of MDH researchers, analysts at Mathematica Policy Research and external content experts contributed for more than a year to the development of a robust methodology for estimating condition-attributable spending, the resulting estimates, as is true for all empirical investigations, remain associated with a number of methodological challenges and potential limitations. They derive from data available for the study and assumptions that were made in the process of developing estimates. Many of the key challenges and limitations presented below are discussed in greater detail in Appendix 6, where we present a detailed methodology for the estimation effort, including considerations for choosing among alternative methodological options.

Controlling for unrelated health care spending: Key for the analysis was the ability to identify which health conditions are related to or the direct outcome of one of the four chronic condition and smoking exposure. Much of the existing related literature, as noted in Appendix 5, either does not control for comorbidities or uses somewhat crude approaches to do so. For

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[6] Additional information on the Behavioral Risk Factor Surveillance System (BRFSS) and the National Health and Nutrition Examination Survey (NHANES), both projects of the CDC, is available online at the BRFSS webpage (https://www.cdc.gov/brfss/index.html) and NHANES webpage (https://www.cdc.gov/nchs/nhanes/index.htm).

[7] Additional information on the American Community Survey (ACS), a project of the U.S. Census Bureau, is available online on the ACS webpage (https://www.census.gov/programs-surveys/acs/). Additional information on data is available online from the Minnesota Demographic Center (https://mn.gov/admin/demography/).

[8] Additional information on the Consumer Price Index (CPI-U), a project of the U.S. Bureau of Labor Statistics (BLS) and the National Health Expenditure Accounts (NHEA), a project of the U.S. Centers for Medicare & Medicaid Services, is available online from the CPI webpage (https://www.bls.gov/cpi/) and the NHEA webpage (https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata).

this study, Mathematica Policy Research, MDH's analytics vendor, considered evidence from some of the most robust empirical studies and sought additional clinical expertise to identify unrelated comorbidities. Nevertheless, there is currently no consensus among researchers and clinicians we are aware of about how to identify health care services for the treatment of specific conditions and related diseases.

Use of administrative claims data to identify health care spending: The availability of health care claims data from transactions between health insurers and providers for Minnesota residents, collected in the MN APCD, made this study possible in the first place. Nevertheless, the data are associated with a number of potential limitations:

- Though our analysis captures, where possible, spending for individuals who are not routinely found in the MN APCD (e.g., Tricare enrollees, the uninsured, and people whose care is covered primarily through Veterans Affairs benefits or the Indian Health Service), health care claims data typically only include costs for health care services that represent covered insurance benefits. Costs for denied claims, services received outside of insurer provider networks (like, for example, assisted living costs for people with dementia), and contractual withholds are not captured in the data. Also not included are expenditures for over-the-counter medication, complementary or alternative therapies, spiritual healing or traditional (cultural) medicine. As such, estimates could reflect an over- or undercount of actual spending.
- By definition, health care claims only capture spending for patients who receive health care services.[9]
- Estimates of prevalence for specific conditions are, again by definition, limited to patients who present for health care and whose condition was diagnosed and recorded in claims data. Where there are barriers to making a diagnosis – conducting expensive tests, for example – or where the diagnosis will not affect the course of treatment, the number of patients identified as having a certain condition will be undercounted.
- Due to changes in coding practices over time, health care costs for a given set of conditions or services can appear to have changed solely as a result of the extent and scope of provider data submission to payers. This could be a result of attempts over time to optimize payments, the learning curve associated with coding practices, or changes in guidelines issued by payers to reduce unintended consequences associated with certain billing practices.
- Effective October 1, 2015, a new version of the *International Classification of Diseases* (10th revision or ICD-10) replaced the existing version (9th revision or ICD-9). This

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[9] Cost estimates for diabetes include only persons with a medical claim and at least one primary or secondary diagnosis of diabetes. However, many people with diabetes might be undiagnosed, and many more might have prediabetes, which does not correspond to a diagnostic code in medical claims data.

transition from ICD-9 to ICD-10 creates the potential for apparent changes in disease prevalence related only to differences in coding. The transition to ICD-10 has been shown to affect estimates of treated prevalence and spending for a range of diseases (See Appendix 6 for additional details). Thus, caution is warranted when comparing prevalence estimates for 2016 and later (coded under ICD-10) to estimates for 2015 and earlier (coded under ICD-9). This applies to any health care data and not just the MN APCD. Further, it should be noted that the projections are based on data from 2009 (coded under ICD-9), and are compared to actual spending for 2016 and later years (coded under 1CD-10).

- Beginning in 2016, there were reductions in the volume of available data for Minnesotans covered by certain commercial plans governed by the Employee Retirement Income Security Act (ERISA), which pose additional challenges for this and future iterations of this report. This was due to a 2016 U.S. Supreme Court decision in *Gobeille v. Liberty Mutual*, which holds that states do not have the authority to mandate reporting by ERISA-covered plans to state all payer claims databases. The decision does not prohibit the voluntary submission of ERISA-governed self-insured plan data to the MN APCD. The methods section in Appendix 6 includes a description of the approach used to address this challenge. Even with adjustments to the estimates, intended to represent the broader population, this change likely impacts prevalence and spending estimates in unknown ways.

Use of MEPS data as a proxy for Minnesota health care spending: Key methodological challenges associated with the MEPS relate to the fact that it does not capture health care spending for individuals who are institutionalized (either in long-term care facilities or by the justice system). Although approaches exist to adjust estimates for this gap, they have not been developed for state samples and no related adjustments were made for this study, likely resulting in underestimates of the spending attributable to obesity and smoking. In addition, the MEPS records diagnosis information only to the three-digit level, thereby foregoing precision associated with the more detailed coding available through the International Classification of Diseases (ICD-9 and ICD-10). Further, unlike the MN APCD, the MEPS is a sample with limited number of observations in certain age/sex and disease categories, particularly at the regional and state level (see additional detail in the discussion of smoking exposure and obesity estimates).

Bias in the Behavioral Risk Factor Surveillance System: Like all surveys, the BRFSS is subject to a range of biases, including selection bias, which might affect the survey's generalizability to the total Minnesota population, and response and recall bias, which might affect the accuracy of obesity and smoking prevalence estimates.

Use of the Johns Hopkins Adjusted Clinical Group (ACG) and Expanded Diagnosis Cluster System for chronic disease estimation: Identifying the presence of disease on the basis of diagnosis codes and prescription drugs in claims data involves making a host of decisions concerning how to interpret the presence and combination of codes. For the identification of chronic disease among persons aged 60 or older, our analytics vendor used ACG-flagged EDCs augmented with additional conditions outside of the ACG system that are generally viewed as chronic. To the extent that this approach misclassifies individuals with respect to their chronic disease status, estimates could be subject to bias in either direction.

Estimates of smoking exposure and obesity: Unlike the other conditions that were the focus of this study, smoking exposure and obesity are not directly observable in the MN APCD. That is, claims data do not consistently record diagnostic information permitting clear identification of either obesity or smoking exposure. Because of this, spending attributed to obesity and smoking exposure was estimated using relative cost factors derived from the MEPS public use data adjusted to the Midwest population sample. This approach assumes that the relative probability of service use and the relative cost of acute care services in Minnesota for smoking exposure and obesity is equal to the average (by age and sex) among all Midwestern states, and that long-term care costs in the MN APCD because of obesity or smoking exposure are higher in the same proportion as acute care costs.[10] Should this alignment not exist, resulting estimates could have an upward or downward bias.

Both estimates are further characterized by likely high statistical error that derives from the small number of observations available to the estimation process. While all estimates in this report are associated with estimation error, it is higher for estimates that rely on fewer observations, like smoking exposure and obesity.

Finally, cost estimates of smoking exposure are further limited by the following factors:

- Like elsewhere, this research was not able to account for the impact of health care spending from forms of smoking or tobacco exposure other than tobacco smoking, likely yielding artificially high numbers of "non-smokers."
- The data used to estimate current smoking, former smoking, and secondhand smoke exposure did not assess actual exposure to secondhand smoke exposure. Instead, "living with a smoker" was used as a proxy. While this helps to account for some individuals exposed to secondhand smoke, there are others who do not live with a smoker but are

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[10] As noted above, because estimating smoking exposure was limited to a single survey question in MEPS about the (adult) respondent's current smoking status, the analysis also used linked MEPS and NHIS data to improve precision of estimates.

regularly exposed to secondhand smoke. This results in an underestimate of the impact of smoking exposure.

- Modeling revealed substantial challenges with predicting low-cost cases or outliers at the low end of the cost distribution. As a result, in those cases cost estimates were not stable enough to be reported for this study. The smoking-attributable estimates exclude respective health care spending for children (younger than 18 years) and adults older than 65 years, creating a downward bias of total smoking exposure attributable estimates.[11]

Unobserved factors that affect projected health care spending: The estimates in this study control for a large number of diagnoses, as well as age and gender. However, various characteristics that might affect expenditures—such as race and ethnicity—are not observed. As in any analysis of this type, failure to control for an unobserved characteristic that is systematically related the outcome variable can result in projections that are too high or too low, if that characteristic changes over time. The projections also do not account for other changes that could occur over the course of a decade—including changes in disease prevalence (other than associated with changes in the age and sex distribution of the population); health insurance coverage (other than aging into Medicare); changes in medical technology that affect cost; the introduction of new drugs that can affect cost; price increases for existing drugs, generic or otherwise, that are outside of ordinary patterns of price inflation; and current high-cost drugs going off-patent. Although such "steady state" assumptions are usual when making projections, they can lead to significant error especially in later years of the projection period.

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[11] This is also true for obesity-related spending estimates for children under age 10 and adults 65 years of age or older.

Appendix 4.1: Detailed Data Table – Diabetes (All Ages)

Prevalence of diabetes among all Minnesotans: 2009 and 2016

	2009		2016		Percent change in the number of persons with diabetes (2009-2016)
	Number of persons with diabetes (000s)	Percent of persons with diabetes within age group	Number of persons with diabetes (000s)	Percent of persons with diabetes within age group	
All Minnesotans (all ages)	292.19	5.67%	366.75	6.70%	25.52%
Children (0-17)	3.56	0.30%	5.29	0.43%	48.79%
Adults (18-64)	167.28	5.01%	193.01	5.67%	15.38%
Adults Age 18-44	41.93	2.18%	51.01	2.64%	21.65%
Adults Age 45-64	125.36	8.83%	142.00	9.68%	13.28%
Seniors (65+)	121.35	18.74%	168.45	20.23%	38.82%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD) and the Medical Expenditure Panel Survey (MEPS). Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the MN APCD and 2016 results from Extract 22 of the MN APCD.

Note: Percent change estimates may reflect rounding error.

Estimated cost of health care among Minnesotans with diabetes: 2009 and 2016

	Total spending			Spending attributed to diabetes		
	Total spending, all persons ($ billions)	Per person total spending, all persons	Per person total spending among persons with diabetes	Total spending attributable to diabetes ($ billions)	Per person per year spending associated with diabetes, persons with diabetes	Percent of total spending attributed to diabetes among persons with diabetes
2009						
Total	$26.068	$5,057	$17,615	$1.111	$3,803	21.46%
Medical	$22.008	$4,269	$14,525	$0.892	$3,054	20.86%
Pharmacy	$4.060	$788	$3,090	$0.219	$749	24.28%
2016						
Total	$34.85	$6,366	$20,370	$1.293	$3,526	17.29%
Medical	$28.93	$5,285	$15,583	$0.883	$2,408	15.43%
Pharmacy	$5.92	$1,082	$4,787	$0.410	$1,119	23.31%
Percent change (2009 -2016)						
Total	33.71%	25.89%	15.64%	16.39%	-7.27%	-4.17%
Medical	31.46%	23.78%	7.28%	-1.04%	-21.16%	-5.43%
Pharmacy	45.87%	37.35%	54.91%	87.48%	49.36%	-0.97%

Source: Mathematica Policy Research analysis of the Minnesota All Payer Claims Database (MN APCD), the Minnesota population sample of the American Community Survey, and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the MN APCD and 2016 results from Extract 22 of the MN APCD.

Note: Percent change estimates may reflect rounding error. Highlighted (shaded) cells are calculated as a percentage point change.

Estimated per person per year spending attributable to diabetes in Minnesota by age group, persons with diabetes: 2009 and 2016

	All persons	Children (0-17)	Adults (18-64)	Seniors (65 plus)
2009				
Total	$3,803	$3,504	$3,644	$4,031
Medical	$3,054	$2,147	$2,744	$3,508
Pharmacy	$749	$1,357	$900	$523
2016				
Total	$3,526	a	$3,967	$3,142
Medical	$2,408	$3,372	$2,498	$2,347
Pharmacy	$1,119	a	$1,469	$795
Percent change (2009-2016)				
Total	-7.27%	a	8.86%	-22.04%
Medical	-21.16%	57.03%	-8.96%	-33.10%
Pharmacy	49.36%	a	63.18%	52.18%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD) and the Medical Expenditure Panel Survey. Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the MN APCD and 2016 results from Extract 22 of the MN APCD.

Note: Percent change estimates may reflect rounding error.

a: Pharmacy cost per person attributed to diabetes was indiscernible among children ages 0-17.

Appendix 4.2: Detailed Data Table – Hypertension (All Ages)

Prevalence of hypertension among all Minnesotans: 2009 and 2016

	2009		2016		Percent change in the number of persons with hypertension (2009-2016)
	Number of persons with hypertension (000s)	Percent of persons with hypertension within age group	Number of persons with hypertension (000s)	Percent of persons with hypertension within age group	
All Minnesotans (all ages)	915.03	17.75%	1,133.94	20.71%	23.92%
Children (0-17)	10.44	0.89%	22.17	1.79%	112.40%
Adults (18-64)	521.66	15.62%	578.50	17.01%	10.89%
Adults Age 18-44	111.06	5.78%	134.77	6.97%	21.35%
Adults Age 45-64	410.60	28.91%	443.73	30.24%	8.07%
Seniors (65+)	382.92	59.15%	533.27	64.05%	39.26%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD) and the Medical Expenditure Panel Survey (MEPS). Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error.

Estimated cost of health care among Minnesotans with hypertension: 2009 and 2016

	Total spending			Spending attributed to hypertension		
	Total spending, all persons ($ billions)	Per person total spending, all persons	Per person total spending among persons with hypertension	Total spending attributable to hypertension ($ billions)	Per person per year spending associated with hypertension, persons with hypertension	Percent of total spending attributed to hypertension among persons with hypertension
2009						
Total	$26.068	$5,057	$13,555	$4.072	$4,450	32.60%
Medical	$22.008	$4,269	$11,450	$3.450	$3,771	32.67%
Pharmacy	$4.060	$788	$2,105	$0.622	$680	32.18%
2016						
Total	$34.855	$6,366	$16,278	$4.599	$4,056	24.89%
Medical	$28.932	$5,285	$13,390	$3.561	$3,141	23.42%
Pharmacy	$5.922	$1,082	$2,888	$1.038	$915	31.71%
Percent change (2009-2016)						
Total	33.71%	25.89%	20.09%	12.94%	-8.86%	-7.71%
Medical	31.46%	23.78%	16.94%	3.23%	-16.70%	-9.26%
Pharmacy	45.87%	37.35%	37.20%	66.82%	34.62%	-0.47%

Source: Mathematica Policy Research analysis of the Minnesota All Payer Claims Database (MN APCD), the Minnesota population sample of the American Community Survey, and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error. Highlighted (shaded) cells are calculated as a percentage point change.

Estimated per person per year spending attributable to hypertension in Minnesota by age group, persons with hypertension: 2009 and 2016

	All persons	Children (0-17)	Adults (18-64)	Seniors (65+)
2009				
Total	$4,450	$3,916	$3,547	$5,417
Medical	$3,771	$3,355	$2,808	$4,843
Pharmacy	$680	$560	$739	$574
2016				
Total	$4,056	$4,805	$3,785	$4,359
Medical	$3,141	$4,090	$2,766	$3,540
Pharmacy	$915	$714	$1,019	$819
Percent change (2009-2016)				
Total	-8.86%	22.71%	6.71%	-19.53%
Medical	-16.70%	21.90%	-1.51%	-26.91%
Pharmacy	34.62%	27.53%	37.93%	42.73%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD) and the Medical Expenditure Panel Survey. Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error.

Appendix 4.3: Detailed Data Table – Dementia (Ages 18 and Older)

Prevalence of dementia among Minnesotans ages 18 and older: 2009 and 2016

	2009		2016		Percent change in the number of persons with dementia, 2009-2016
	Number of persons with dementia (000s)	Percent of persons with dementia within age group	Number of persons with dementia (000s)	Percent of persons with dementia within age group	
All Minnesotans (ages 18 and older)	45.81	1.30%	73.53	1.84%	60.51%
Adults (18-64)	5.76	0.20%	9.26	0.29%	60.80%
Adults Age 18-44	1.14	0.07%	2.44	0.14%	114.51%
Adults Age 45-64	4.62	0.36%	6.82	0.49%	47.57%
Seniors (65+)	40.05	6.19%	64.27	7.72%	60.47%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD) and the Medical Expenditure Panel Survey. Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error.

Estimated cost of health care among Minnesotans ages 18 and older with dementia: 2009 and 2016

	Total spending			Spending attributed to dementia		
	Total spending, all persons ($ billions)	Per person total spending, all persons	Per person total spending among persons with dementia	Total spending attributed to dementia ($ billions)	Per person per year spending attributed to dementia, persons with dementia	Percent of total spending attributed to dementia among persons with dementia
2009						
Total	$22.680	$6,416	$29,775	$0.190	$4,158	14.23%
Medical	$19.023	$5,381	$26,614	$0.174	$3,797	14.55%
Pharmacy	$3.658	$1,035	$3,161	$0.017	$361	11.52%
2016						
Total	$29.010	$7,255	$34,971	$0.312	$4,247	12.18%
Medical	$23.613	$5,905	$31,315	$0.297	$4,039	12.93%
Pharmacy	$5.396	$1,349	$3,656	$0.015	$208	5.69%
Percent change (2009-2016)						
Total	27.91%	13.08%	17.45%	63.94%	2.14%	-2.05%
Medical	24.13%	9.74%	17.66%	70.74%	6.37%	-1.62%
Pharmacy	47.52%	30.42%	15.67%	-7.60%	-42.44%	-5.83%

Source: Mathematica Policy Research analysis of the Minnesota All Payer Claims Database (MN APCD), the Minnesota population sample of the American Community Survey, and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error. Highlighted (shaded) cells are calculated as a percentage point change.

Estimated per person per year spending attributed to dementia among Minnesotans ages 18 and older with dementia, by age group: 2009 and 2016

	All persons	Adults ages 18-64	Seniors ages 65 and older
2009			
Total	$4,158	$9,793	$3,348
Medical	$3,797	$9,095	$3,036
Pharmacy	$361	$698	$312
2016			
Total	$4,247	$11,820	$3,240
Medical	$4,039	$11,089	$3,107
Pharmacy	$208	$731	$132
Percent change (2009 - 2016)			
Total	2.14%	20.69%	-3.24%
Medical	6.37%	21.92%	2.37%
Pharmacy	-42.44%	4.75%	-57.65%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD) and the Medical Expenditure Panel Survey. Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error.

Appendix 4.4: Detailed Data Table – Chronic Disease for Persons Ages 60 and older

Prevalence of chronic conditions among all Minnesotans ages 60 and older: 2009 and 2016

	2009		2016		Percent change in the number of persons with chronic conditions (2009-2016)
	Number of persons with chronic conditions (000s)	Percent of persons with chronic conditions within age group	Number of persons with chronic conditions (000s)	Percent of persons with chronic conditions within age group	
All Minnesotans (ages 60 and older)	695.13	77.83%	928.34	80.22%	33.55%
Age 60-64	181.21	74.65%	229.04	70.54%	26.39%
Age 65 - 74	244.46	73.97%	372.45	78.60%	52.35%
Age 75+	269.45	84.23%	326.86	91.12%	21.31%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD). Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error.

Estimated cost of health care among Minnesotans age 60 or older with a chronic condition: 2009 and 2016

	Total spending			Spending attributed to chronic conditions		
	Total spending, all persons ($ billions)	Per person total spending, all persons	Per person total spending among persons with chronic condition	Total spending attributable to chronic conditions ($ billions)	Per person per year spending associated with chronic conditions, persons with chronic conditions	Percent of total spending attributed to chronic conditions among persons with chronic conditions
2009						
Total	$9.099	$10,187	$12,488	$7.212	$10,376	83.01%
Medical	$7.687	$8,607	$10,712	$6.643	$9,556	89.12%
Pharmacy	$1.411	$1,580	$1,775	$0.570	$820	46.12%
2016						
Total	$12.88	$11,129	$13,983	$9.150	$9,857	70.46%
Medical	$10.73	$9,275	$11,435	$8.168	$8,798	76.87%
Pharmacy	$2.15	$1,854	$2,548	$0.983	$1,059	41.60%
Percent change (2009 -2016)						
Total	41.55%	9.25%	11.98%	26.87%	-5.00%	-12.55%
Medical	39.62%	7.76%	6.75%	22.96%	-7.93%	-12.25%
Pharmacy	52.05%	17.35%	43.52%	72.49%	29.15%	-4.52%

Source: Mathematica Policy Research analysis of the Minnesota All Payer Claims Database (MN APCD), the Minnesota population sample of the American Community Survey, and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error. Highlighted (shaded) cells are calculated as a percentage point change.

Estimated per person per year spending attributable to chronic conditions in Minnesota for age 60 or older, persons with chronic conditions: 2009 and 2016

	All persons	Age 60-64	Age 65 - 74	Age 75+
2009				
Total	$10,376	$9,867	$8,992	$11,973
Medical	$9,556	$8,655	$8,188	$11,403
Pharmacy	$820	$1,212	$805	$569
2016				
Total	$9,857	$10,235	$8,441	$11,205
Medical	$8,798	$8,912	$7,351	$10,368
Pharmacy	$1,059	$1,323	$1,090	$837
Percent change (2009-2016)				
Total	-5.00%	3.73%	-6.13%	-6.41%
Medical	-7.93%	2.96%	-10.22%	-9.08%
Pharmacy	29.15%	9.21%	35.42%	47.06%

Source: Mathematica Policy Research analysis of claims and encounter data from the Minnesota All Payer Claims Database (MN APCD). Estimates are weighted to population and coverage estimates reported in the Minnesota sample of the American Community Survey and the Minnesota Health Access Survey.

Note: 2009 results from Extract 19 of the Minnesota APCD and 2016 results from Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error.

Appendix 4.5: Detailed Data Table – Obesity (Ages 10 to 64)

Prevalence of obesity among all Minnesotans ages 10-64: 2009 and 2016

	2009		2016		Percent change in the number of persons that are obese, 2009-2016
	Number of persons that are obese (000s)	Percent of persons that are obese within age group	Number of persons that are obese (000s)	Percent of persons that are obese within age group	
All Minnesotans (ages 10-64)	919.2	23.6%	913.7	23.0%	-0.6%
Children (10-17)	61.3	11.0%	53.9	9.5%	-12.0%
Adults (18-64)	857.9	25.7%	859.8	25.3%	0.2%
Adults Age 18-44	451.9	23.5%	416.4	21.5%	-7.9%
Adults Age 45-64	406.0	28.6%	443.4	30.2%	9.2%

Source: Mathematica Policy Research estimates from the Minnesota Behavioral Risk Factor Surveillance System (Adults) and National Survey of Children's Health (Children). Estimates are weighted to population and coverage estimates reported in the Minnesota population sample of the American Community Survey and the Minnesota Health Access Survey.

Estimated cost of health care among Minnesotans ages 10-64 with obesity: 2009 and 2016

	Total spending		Spending attributed to obesity		
	Total spending, all persons ($ billions)	Per person total spending, all persons	Total spending attributed to obesity ($ billions)	Per person per year spending attributed to obesity, persons that are obese	Percent of total spending attributed to obesity
2009					
Total	$18.026	$4,625	$0.345	$376	1.92%
Medical	$15.132	$3,882	$0.226	$246	1.50%
Pharmacy	$2.894	$743	$0.119	$129	4.10%
2016					
Total	$23.652	$5,959	$0.315	$344	1.33%
Medical	$19.102	$4,812	$0.104	$113	0.54%
Pharmacy	$4.550	$1,146	$0.211	$231	4.64%
Percent change (2009-2016)					
Total	31.2%	28.8%	-8.8%	-8.3%	-0.6%
Medical	26.2%	24.0%	-54.2%	-54.0%	-1.0%
Pharmacy	57.2%	54.4%	77.7%	78.8%	0.5%

Source: Mathematica Policy Research analysis of the 2009-2016 Medical Expenditure Panel Survey. Estimates are weighted to population and coverage estimates reported in the Minnesota population sample of the American Community Survey and the Minnesota Health Access Survey, and benchmarked to the Minnesota All Payer Claims Database (MN APCD).

Note: 2009 results are benchmarked to Extract 19 of the Minnesota APCD and 2016 results are benchmarked to Extract 22 of the Minnesota APCD.

Note: Percent change estimates may reflect rounding error. Highlighted (shaded) cells are calculated as a percentage point change.

Estimated per person per year spending attributed to obesity in Minnesota among obese persons ages 10-64, by age group: 2009 and 2016

	All persons	Children age 10-17	Adults (18-64)
2009			
Total	$376	$493	$367
Medical	$246	$183	$251
Pharmacy	$129	$309	$116
2016			
Total	$344	$313	$346
Medical	$113	$21	$119
Pharmacy	$231	$292	$227
Percent change (2009-2016)			
Total	-8.30%	-36.56%	-5.67%
Medical	-53.97%	-88.50%	-52.49%
Pharmacy	78.77%	-5.80%	95.30%

Source: Mathematica Policy Research analysis of the 2009-2015 Medical Expenditure Panel Survey. Estimates are weighted to population and coverage estimates reported in the Minnesota population sample of the American Community Survey and the Minnesota Health Access Survey, and benchmarked to the Minnesota APCD v.20.

Note: Percent change estimates may reflect rounding error.

Appendix 4.6: Detailed Data Table – Smoking Exposure (Ages 18 to 64)

As described in the report, per-person health care spending estimates for 2009 and 2016 have been intentionally omitted from this report. The high-level interpretation of the 2016 estimates calculated for this report remains consistent with our findings from earlier years. Considering not only the cost of health care, but also the propensity to use health care, smoking attributable per-person health care spending for Minnesotans ages 18-64 is relatively low in any one year and subject to considerable uncertainty.

Appendix 4.7: Detailed Data Table – Projected Medical Service and Pharmacy Spending, 2009 and 2016-2027 (millions)

Total Spending

	2009	2016p	2017p	2018p	2019p	2020p	2021p	2022p	2023p	2024p	2025p	2026p	2027p
Total attributed spending (millions)													
Total	$8,752.2	$11,692.2	$11,809.0	$12,125.5	$12,639.0	$13,223.6	$13,821.7	$14,436.7	$15,068.1	$15,698.3	$16,327.9	$16,941.9	$17,539.2
Selected chronic conditions under age 60[a]	$1,539.9	$1,727.5	$1,678.8	$1,692.1	$1,684.1	$1,703.2	$1,724.0	$1,749.6	$1,779.9	$1,817.1	$1,864.3	$1,919.7	$1,978.7
All chronic conditions age 60 or older	$7,212.4	$9,964.7	$10,130.2	$10,433.4	$10,954.9	$11,520.5	$12,097.6	$12,687.1	$13,288.2	$13,881.2	$14,463.7	$15,022.2	$15,560.5
Selected chronic conditions:													
Diabetes (all ages)	$1,111.2	$1,385.0	$1,412.4	$1,448.3	$1,495.2	$1,553.5	$1,614.1	$1,675.5	$1,741.0	$1,809.3	$1,881.8	$1,955.7	$2,027.8
Hypertension (all ages)	$4,072.3	$5,143.0	$5,271.4	$5,413.0	$5,604.7	$5,840.3	$6,085.1	$6,333.4	$6,598.4	$6,873.1	$7,164.4	$7,460.6	$7,747.2
Dementia (age 18 or older)	$190.5	$249.1	$255.3	$263.2	$274.2	$287.3	$301.0	$314.9	$329.7	$345.0	$361.1	$377.4	$393.0
Obesity (age 10 to 64)	$345.2	$414.2	$411.6	$417.5	$421.8	$430.5	$439.5	$448.2	$457.6	$467.9	$478.6	$490.1	$502.4
Smoking exp. (age 18-64)	$109.4	$182.0	$178.0	$181.6	$185.5	$190.7	$196.1	$201.7	$207.8	$214.4	$221.4	$228.6	$236.2

Source: Mathematica Policy Research.

Note: "p" indicates a projected year. Attributed costs for 2009 are estimated from historical data. Estimates and projections are expressed in current (versus real) dollars.

[a] Summary estimates include attributed costs for obesity but are unadjusted for smoking exposure.

Medical Spending

	2009	2016p	2017p	2018p	2019p	2020p	2021p	2022p	2023p	2024p	2025p	2026p	2027p
Attributed medical spending (millions)													
Total	$7,843.1	$10,354.9	$10,452.2	$10,690.2	$11,119.7	$11,628.6	$12,146.9	$12,683.0	$13,231.9	$13,776.4	$14,319.5	$14,848.2	$15,359.5
Selected chronic conditions (under age 60)[a]	$1,200.5	$1,297.9	$1,258.4	$1,255.0	$1,239.7	$1,250.1	$1,261.4	$1,275.1	$1,292.3	$1,313.9	$1,342.3	$1,376.3	$1,412.1
All chronic conditions (ages 60 and older)	$6,642.6	$9,057.0	$9,193.8	$9,435.2	$9,880.0	$10,378.5	$10,885.5	$11,407.9	$11,939.6	$12,462.5	$12,977.2	$13,471.9	$13,947.4
Selected chronic conditions:													
Diabetes (all ages)	$892.4	$1,086.1	$1,106.4	$1,126.0	$1,157.9	$1,202.3	$1,248.0	$1,293.5	$1,342.0	$1,392.1	$1,445.0	$1,498.6	$1,549.8
Hypertension (all ages)	$3,450.1	$4,287.4	$4,389.7	$4,482.0	$4,626.4	$4,818.6	$5,017.3	$5,216.0	$5,428.3	$5,646.2	$5,876.5	$6,109.1	$6,330.7
Dementia (ages 18 and older)	$174.0	$224.6	$229.7	$235.6	$244.7	$256.1	$267.8	$279.7	$292.4	$305.3	$318.9	$332.7	$345.7
Obesity (ages 10-64)	$226.4	$257.3	$253.2	$252.2	$252.0	$255.9	$259.8	$263.1	$266.9	$271.0	$275.4	$279.9	$284.8
Smoking exp. (ages 18-64)	$60.4	$104.3	$99.8	$99.4	$100.0	$101.9	$103.9	$105.7	$107.9	$110.2	$112.8	$115.3	$118.1

Source: Mathematica Policy Research.

Note: "p" indicates a projected year. Attributed costs for 2009 are estimated from historical data. Estimates and projections are expressed in current (versus real) dollars.

[a]Summary estimates include attributed costs for obesity but are unadjusted for smoking exposure.

Pharmacy Spending

	2009	2016p	2017p	2018p	2019p	2020p	2021p	2022p	2023p	2024p	2025p	2026p	2027p
Attributed pharmacy spending (millions)													
Total	$909.1	$1,337.3	$1,356.9	$1,435.2	$1,519.3	$1,595.0	$1,674.7	$1,753.7	$1,836.2	$1,921.9	$2,008.4	$2,093.8	$2,179.7
Selected chronic conditions (under age 60)[a]	$339.4	$429.6	$420.5	$437.0	$444.3	$453.1	$462.6	$474.5	$487.6	$503.2	$521.9	$543.4	$566.6
All chronic conditions (ages 60 and older)	$569.8	$907.7	$936.4	$998.2	$1,074.9	$1,141.9	$1,212.1	$1,279.2	$1,348.7	$1,418.7	$1,486.5	$1,550.4	$1,613.1
Selected chronic conditions:													
Diabetes (all ages)	$218.8	$298.9	$306.0	$322.3	$337.3	$351.3	$366.1	$382.1	$399.0	$417.2	$436.7	$457.1	$478.0
Hypertension (all ages)	$622.2	$855.6	$881.7	$931.1	$978.4	$1,021.8	$1,067.9	$1,117.4	$1,170.1	$1,226.8	$1,287.8	$1,351.5	$1,416.5
Dementia (ages 18 and older)	$16.5	$24.5	$25.7	$27.5	$29.5	$31.3	$33.1	$35.2	$37.4	$39.7	$42.2	$44.7	$47.3
Obesity (age 10-64)	$118.8	$157.0	$158.4	$165.3	$169.8	$174.6	$179.8	$185.1	$190.7	$196.9	$203.3	$210.1	$217.5
Smoking exp. (age 18-64)	$49.1	$77.7	$78.2	$82.1	$85.5	$88.8	$92.3	$96.0	$99.9	$104.2	$108.6	$113.3	$118.1

Source: Mathematica Policy Research.

Note: "p" indicates a projected year. Attributed costs for 2009 are estimated from historical data. Estimates and projections are expressed in current (versus real) dollars.

[a]Summary estimates include attributed costs for obesity but are unadjusted for smoking exposure.

Appendix 4.8: Detailed Data Table – Actual Spending Compared to Baseline Projections, 2016

	2016 spending projected from 2009			Estimated actual 2016 spending			Difference (actual minus projected)	Actual as a percentage of projected
	Medical services	Prescription drugs	Total	Medical services	Prescription drugs	Total		
Total	$10,354.9	$1,337.3	$11,692.2	$9,644.1	$1,591.9	$11,236.1	($456.2)	96.1%
Selected chronic conditions (under age 60)[a]	$1,297.9	$429.6	$1,727.5	$1,476.5	$609.2	$2,085.7	$358.2	120.7%
All chronic conditions, ages 60 and older	$9,057.0	$907.7	$9,964.7	$8,167.7	$982.7	$9,150.4	($814.3)	91.8%
Selected chronic conditions:								
Diabetes	$1,086.1	$298.9	$1,385.0	$883.1	$410.2	$1,293.3	($91.7)	93.4%
Hypertension	$4,287.4	$855.6	$5,143.0	$3,561.4	$1,038.0	$4,599.4	($543.7)	89.4%
Dementia	$224.6	$24.5	$249.1	$297.0	$15.3	$312.3	$63.2	125.4%
Obesity	$257.3	$157.0	$414.2	$103.6	$211.0	$314.7	($99.6)	76.0%
Smoking exposure	$104.3	$77.7	$182.0	($120.3)	$128.0	$7.6	($174.3)	4.2%

Source: Mathematica Policy Research.

Note: Attributed costs for 2009 are estimated from historical data. Estimates and projections are expressed in current (versus real) dollars.

[a]Summary estimates include attributed costs for obesity but are unadjusted for smoking exposure.

Appendix 4.9: Detailed Data Table – Calculation of State-Administered Program Share of Difference between Actual and Projected Spending

	Percent	Under 60 years	Ages 60 and older	All Ages
			(in mill $)	
CONDITION-SPECIFIC DIFFERENCE (actual less projected)				
Hypertension				($543.67)
Diabetes				($91.65)
Obesity (ages 10 to 64)				$63.18
Dementia (ages 18 and older)				($99.56)
Smoking exposure (ages 18 to 64)				($174.31)
All chronic conditions (ages 60 and older)			($814.34)	($814.34)
NET DIFFERENCE (without impact of smoking exposure)		**$358.17**		**($456.18)**
PORTION STATE-ADMINISTERED PROGRAMS (SAP)				
Upper Bound				
Pct of net difference	26.2%	$93.68		
Pct of net difference	13.7%		($111.82)	**($18.14)**
Lower Bound				
Pct of net difference	31.3%	$89.31		
Pct of net difference	11.7%		($59.99)	**$29.32**
TOTAL NET DIFF with Smoking Exposure ESTIMATE				
Lower Bound				**($18.14)**
Higher Bound				**$29.32**

Source: Minnesota Department of Health. Relies upon data from Mathematica Policy Research.

Appendix 5: Review of the Literature

Mathematica Policy Research, the analytic vendor MDH retained to support this work, conducted a review of the published literature since 2005, as well as several seminal studies published since 2000, to identify estimates of the cost of the selected conditions for the 2014 report. The analysis identified approximately 35 studies summarized in a full literature review. Twenty-eight of these studies (summarized in the 2014 report, Appendix A) offered per-person cost estimates, presented either as the average total cost for all health care among people with the condition or as the average cost of health care attributable to having the condition.

Not all of the studies reviewed produced estimates that are directly comparable to this work. Of those that estimated the average health care costs specifically due to having a specific condition, relatively few took into account the presence of other chronic conditions that may have contributed to overall costs; even those that did often failed to use precise methods. In addition, most focused on specific subpopulations or excluded institutionalized persons, making it difficult to generalize their results to the broader population as the current work requires.

Two observations about these studies are of particular relevance. First, studies that statistically adjusted cost estimates to remove the effect of concurrent but unrelated chronic conditions produced much lower estimates of cost than studies that did not.[12] However, too few studies controlled for specific chronic conditions to help us understand how appropriate statistical controls would change estimates produced without such controls.

Second, when reported by age and age-by-gender population subgroups, the cost estimates varied widely across the subgroups. For example, estimates of costs associated with obesity (all uncontrolled for comorbidities) varied by orders of magnitude by age (Moriarty et al. 2012). Among workers age 60 or older, cost estimates for women were approximately twice those for men (Finkelstein et al. 2010). In addition, cost estimates for diabetes differed substantially for diagnoses of Type I diabetes versus Type II (e.g., Tunceli et al. 2010), although challenges concerning the availability of data that reliably permit identifying type 1 and type 2 diabetes are partly responsible for this variation.

Taken together this means the work pursued by Minnesota is methodologically complex and substantially innovative. However, there are also limited opportunities for benchmarking this work to existing estimates, either locally or nationally.

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[12] For example, in a given year, hypertensive patients might receive care for hypertension and care for a trauma injury. While the care might occur concurrently, the treatment of the injury is unrelated to the hypertension diagnoses, and cost estimates for hypertension would be inaccurate if the cost for injury care were not removed.

Appendix 6: Study Methodology, Mathematica Policy Research

Introduction

The methods used to produce initial estimates of health care spending for four chronic diseases (diabetes, hypertension, obesity and obesity-related conditions, and dementia) and one risk behavior (smoking exposure) are documented below. In this section, we describe our general approach and provide key definitions. In additional sections, we describe the development of adjustment factors to account for non-reporting of some commercial members and months to the Minnesota All Payer Claims Database (MN APCD) and document the data and methods used to develop estimates for each chronic condition, smoking exposure, all chronic conditions among Minnesotans age 60 or older, and total estimates for the selected chronic conditions among Minnesotans under age 60. Finally, we describe the methods used to project the spending estimates to 2027 and outline several important methodological challenges and limitations.

General approach

This report focuses on the methods used to generate cost estimates for 2016, and to project the estimates to 2027. Compared with the estimates produced for 2015, the 2016 estimates differ principally in the conversion of ICD-9 diagnosis coding to ICD-10 in the last quarter of 2015. Otherwise, the methods described in this report are essentially identical to those underlying the 2015 estimates.

To estimate spending related to diabetes, hypertension, and dementia for medical services and pharmacy in 2016 we identify persons with each condition, estimate their probability of service use, and estimate medical and pharmacy spending per member per month among service users. All analyses are conducted at the unique person level. The per-person-per-month cost estimates control for unrelated conditions that contribute to spending. All person-level observations are weighted by the number of months the person is observed in the source data.

In general, the estimating equations are specified as:

(1) $P(U_i) = f(X_i, C_{ik})$

(2) $S_j = f(X_j, C_{jk}, C_{jm})$

where $P(U_i)$ is the probability (equal to zero or one) that person *i* uses any services that generate spending of at least \$1 per month, S_j is average spending per member per month among the subset *j* of persons with spending of at least \$1 per month, and X_i and X_j are vectors of personal characteristics describing persons *i* and the subset of persons *j*, respectively. C_{ik} and

C_{jk} are indicator variables for the condition of interest k, and C_{jm} is a vector of indicator variables for conditions that are unrelated to C_{jk}.

This method of estimation is analogous the methods underlying the Centers for Disease Control and Prevention(CDC)/RTI cost estimation model with three key distinctions:[13, 14]

- As in past years' estimates, we use the most recent version of the MN APCD to identify Minnesotans with each condition (defined by diagnosis codes on one or more medical claims). The 2016 estimates and projections are based on the MN APCD version 22, which varies from version 20 (used in the 2015 estimates) in the process used to de-duplicate Medicare enrollment. In addition, because some insurers did not necessarily report self-insured commercial lives or claims in 2016 (and some may also not have reported fully insured commercial lives or claims), the 2016 spending estimates are adjusted upwards to make the estimates more comparable to spending estimates in earlier years. Claims records are used both to identify service users and to calculate medical and pharmacy spending controlling for unrelated conditions. Models estimated using the MN APCD omit the first estimating equation; the probability of service use among persons with the condition of interest (C_{ik}) is set to one.

- We use the Medical Expenditure Panel Survey (MEPS) to analyze obesity and smoking exposure, which are not fully observable in the MN APCD, and to analyze all conditions for populations with health care spending that is not reported to the MN APCD. Spending not reported to the MN APCD includes that for Tricare enrollees and the uninsured, and those who whose care is covered through Veterans Affairs benefits or the Indian Health Service.[15]

- We estimate spending per member per month separately for different age groups and levels of spending in order to improve the accuracy of the estimates in the "tails" of the spending distribution. This method serves to minimize overestimation of spending among very low spenders and underestimation of spending among very high spenders.

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[13] The Chronic Disease Calculator measures the medical cost (and, separately, the cost of absenteeism) associated with arthritis, asthma, cancer, cardiovascular diseases (specifically, congestive heart failure, coronary heart disease, hypertension, stroke, and other cerebrovascular disease), depression, and diabetes. See the technical documentation available at the Chronic Disease Calculator webpage (http://www.cdc.gov/chronicdisease/calculator/resources.html), accessed November 30, 2015.

[14] See Mathematica Policy Research. "CDC/RTI Chronic Disease Cost Calculator and Comparison with Proposed Mathematica Methods." Memorandum submitted to the Health Economics Division, Minnesota Department of Health (December 3, 2015).

[15] In contrast, the CDC/RTI estimates of service use and expenditures rely on the relatively small non-public sample of the Minnesota population in the MEPS.

Because the MN APCD captures payments for formal long-term care, we do not estimate those costs separately. The estimates for smoking exposure and obesity (which rely on the MEPS, so do not include spending for institutional long term care) are benchmarked to the MN APCD—in effect, assuming that institutional long-term care costs are proportional to acute care costs associated with those conditions.

For Minnesotans who are privately insured or enrolled in Medicare or one of the Minnesota Health Care Programs,[16] we estimate per-person cost among service users associated with (1) diabetes, (2) hypertension, (3) dementia, and (4) all chronic conditions among persons aged 60 or older from the MN APCD. Estimates for Minnesotans covered by small private insurers or self-insured employer groups (and not reported to the MN APCD) are benchmarked to privately insured spending in the MN APCD as described in Section II. Because our prevalence estimates for these conditions are based directly on diagnostic coding, in effect we assume that all persons with these conditions in the MN APCD have at least $1 of medical spending.

Estimates for Minnesotans enrolled in Tricare or who are uninsured (so not represented in the MN APCD), and all estimates for obesity and smoking exposure, are derived from MEPS and benchmarked directly to the MN APCD. For smoking and smoking exposure (which are not diagnosis based), we include all persons with the condition, regardless of their level of spending.

Outliers are defined among persons with medical or pharmacy spending greater than $1 per person month and removed from both datasets. In the MN APCD, outliers are defined as persons with medical or pharmacy spending per month that is more than twice the 99.99th percentile among all spenders, calculated separately for children, adults, and seniors. To develop MEPS-based estimates for smoking and obesity, outliers in MEPS are defined as persons with medical or pharmacy spending per month above the 99.90th percentile among all spenders, calculated separately for children, adults, and seniors. We selected the lower threshold to define outliers in MEPS because persons with spending above the 99.90th percentile included too few persons with the condition of interest to yield stable estimates.

Definitions

The following sections describe the definition of conditions, assignment of coverage categories (which enables benchmarking to account for persons not represented in the MN APCD), and how household income is estimated for modeling the probability and use of services underlying each set of cost estimates.

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[16] Minnesota Health Care Programs include Medical Assistance (the state's Medicaid program and MinnesotaCare (the state's Basic Health Plan).

Disease Coding

To identify the key diagnoses/risk factors and other diagnoses, we use (as available in each data source):

- Screening variables (in MEPS and the National Health Interview Survey [NHIS]), which include estimated Body Mass Index (used to identify obesity) and current or past smoking status

- *International Classification of Diseases, 9th Revision* (ICD-9) diagnosis codes (in MEPS and the MN APCD)

- *International Classification of Diseases, 10th Revision* (ICD-10) diagnosis codes (in MEPS and the MN APCD)

- Adjusted Clinical Group (ACG)/Expanded Diagnosis Clusters (EDCs) codes appended to the MN APCD.

MEPS reports three-digit ICD-9 diagnosis codes for services used in calendar 2015, and three-digit ICD-10 diagnosis codes for services used in 2016. In contrast, the MN APCD reports full ICD-9 diagnosis codes for most of 2015 (for dates of service in January through September 2015) and full ICD-10 diagnosis codes for the balance of 2015 (in general, for dates of service in October through December 2015) and all of 2016. The more detailed coding available in the MN APCD likely produces more accurate estimates of spending attributed to these conditions for populations represented in the APCD than for those whose cost estimates rely on MEPS. However, the transition from ICD-9 to ICD-10 coding during 2015 and throughout 2016 creates the potential for apparent changes in disease prevalence related only to differences in coding.

Diagnoses are defined based on medical claims exclusive of lab claims, which might code for conditions being tested. However, very few or none of the persons identified with any of the conditions defined in Appendix Table A.1 had lab claims coded with the condition, but no medical service claim coded with that condition.

Coverage

Common definitions of coverage are used for both the MEPS and MN APCD analyses. Persons in MEPS are assigned to unique coverage categories by arraying their sources of coverage by month and selecting the coverage status that corresponds to the greatest number of months during the year (that is, their modal coverage status). For persons with equal months of coverage from two or more sources, coverage is assigned hierarchically, giving precedence to Medicare, then commercial insurance or Tricare, then Medicaid or other public coverage, and then uninsured.

For persons in the MN APCD, sources of coverage by month are similarly arrayed. When two or more sources account for an equal number of months during the year, the same hierarchy is used to assign coverage: first Medicare, then commercial insurance, then Medicaid or other

public coverage. This process results in the assignment of each person to a unique, primary coverage status, although the person might have claims paid from multiple sources of coverage during the year.

The final estimates reflect the distribution of 2015 and 2017 health insurance coverage (by age and sex) reported in the Minnesota Health Access Survey (MHAS).[17] The MHAS is collected every other year, so 2016 estimates were interpolated from the 2015 and 2017 MHAS. The total number of persons across MHAS coverage categories is adjusted to Minnesota's total population estimates by age and sex to produce final coverage estimates.

Household Income

To capture the effects of household income on service use in the analyses that rely on the MN APCD, we assign each person in the MN APCD to a community. This assignment is done by mapping each person's zip code to their U.S. Census-defined Zip Code Tabulation Area (ZCTA). Household income by ZCTA is obtained from a published table of the 2016 American Community Survey population-weighted mean household estimates. We rounded household income to the nearest $100 and scaled by $10,000. For models using MEPS data, we use actual reported household income.

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[17] The Minnesota Health Access Survey (MHAS) is a biennial dual-frame, random-digit-dial household survey that collects information on health insurance and health care access among Minnesotans. See the MHAS webpage (https://www.health.state.mn.us/data/economics/hasurvey/index.html), accessed May 24, 2018.

Adjusting Estimates from the Minnesota APCD (Extract 22) for Unreported Commercial Members and Costs

After the *Gobeille v. Liberty Mutual* decision (2016)[18] some commercial submitters to the Minnesota All Payer Claims Database (MN APCD) stopped reporting self-insured claims.[19] In addition, after subtracting self-insured claims, some national carriers may have considered their fully insured business to be sufficiently small to exempt them from reporting fully insured claims as well.

This section describes Mathematica's investigation into the magnitude of unreported claims in the 2016 MN APCD, and our rationale for using the Health Plan Financial and Statistical Report (HPFSR) to account for them. We develop adjustment factors for 2016 medical and prescription drug costs per member per month, as reported to the MN APCD. In future years, it will be necessary to re-estimate these factors to ensure that the analysis of the cost of chronic conditions among commercially insured Minnesotans reflects total cost among both fully insured and self-insured lives.

Because diagnoses can be identified only on medical (not pharmacy) claims, and not all Minnesotans with pharmacy claims reported in the MN APCD are also enrolled in a medical plan, our methods focus first on medical claims and enrollment reported for commercial medical plans. We then consider pharmacy records, in total (as reported in the HPFSR) and for enrollees also in medical plans (as used to estimate pharmacy costs in the attributed cost analysis).

Assessment of commercial enrollment and medical claims
Number of reported medical months

We assessed patterns of MN APCD reporting in 2016. Of the 47 companies that submitted both enrollment and medical claims data in 2016 for any months, 27 reported for 12 months.[20] The 27 companies that reported for 12 months accounted for 96.8% of all member months reported to the MN APCD among companies that submitted enrollment and spending data for 2016, and 98.9% of total medical spending among these companies (Table 1). Among companies that reported all 12 months, medical spending per member per month was 2.2% higher than among all 47 reporting companies, although their medical cost per member per month increased much less from 2015-2016.

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[18] See the *Gobeille vs. Liberty Mutual* decision (https://www.supremecourt.gov/opinions/15pdf/14-181_5426.pdf).

[19] It is unknown which submitters are no longer reporting self-insured and/or stop-loss members and claims.

[20] Among the companies that reported 12 months of data in 2016, the number of member months reported dropped 40.9% from 2015 to 2016, while reported medical spending dropped 35.8%. We interpret these changes as a rough (and probably conservative) estimate of the magnitude of commercial insurance claims data that were not reported to the MN APCD in 2016.

Table 1. Analysis of commercial medical members and medical spending: MN APCD v.22, service year 2016

	Number of reporting companies	Total reported commercial member months	Total reported commercial medical spending	Commercial medical spending per member per month, weighted by member months	2015 -2016 change in commercial member months among 2016 submitters	2015-2016 change in commercial medical spending per member per month among 2016 submitters
Companies that reported members and spending for:						
Any months	47	19,022,303	$6,866,091,361	$361	-39.0%	8.2%
12 months	27	18,411,026	$6,789,084,531	$369	-33.8%	7.5%
As a percentage of companies that reported any months	57.4%	96.8%	98.9%	102.2%	--	--

Medical-plan months among companies that reported 12 months

Higher costs per member per month among insurers that reported 12 months of both medical enrollment and medical claims data could reflect selection bias between fully insured and self-insured lives. Alternatively, or in addition, it could reflect incomplete reporting—in particular, reporting of enrollment to the MN APCD but not all medical claims associated with reported enrollment.

While most companies that reported any data for 2016 reported for 11-12 months, the remaining companies that reported enrollment and medical spending to the MN APCD reported not more than 7 months, with very low average medical spending per member per month ($124 v. $369 among companies that reported 11-12 months) (Table 2). This wide discrepancy suggests that at least some companies that reported 1-7 months enrollment did not report all medical claims.

Table 2. Commercial medical member months and medical spending by number of calendar months reported: MN APCD v.22, service year 2016

Number of enrollment months reported	Commercial medical member months	Percentage of commercial medical member months	Commercial medical spending	Percentage of commercial medical spending	Commercial medical spending per member per month
Total, any months	18,981,821	100.0%	$6,862,302,522	100.0%	$362
11-12 months	18,425,639	97.1%	$6,793,177,285	99.0%	$369
1-7 months	556,182	2.8%	$69,125,237	1.0%	$124

Note: Table includes all companies that submitted data on both members and medical spending in any month. No companies reported only 8-10 months.

In addition, a significant number of companies that reported medical members in 11-12 months reported a dwindling number of member months over the course of 2016 (such that member months reported in Quarter 4 (Q4) were about 50% of member months reported in Q1). Among these companies, medical spending per member per month was substantially lower in Q4 than in Q1. Companies with questionable patterns of reporting accounted for 14% of commercial member months among companies that reported 11-12 months. Removing companies that reported less than 11 months as well as companies that reported much lower enrollment and spending in Q4 than in Q1 would leave a database for analysis that includes only about 80% of total reported member months, and it would exclude one of the largest commercial carriers in Minnesota.

Given these findings, we concluded that an external benchmark is needed to calibrate the commercial data reported to the MN APCD to spending per member per month among all fully insured and self-insured Minnesotans. We turned to the HPFSR, which the Minnesota Department of Health (MDH) collects annually to support estimation of total state expenditures, for two reasons: (1) benchmarking to the HPFSR avoids subjective rejection of MN APCD data, which appear to include some fully insured and self-insured lives and/or their claims in 2016; and (2) we expect that the HPFSR will support consistent benchmarking of members and spending reported to the MN APCD in future years.

Benchmarking to the HPFSR

Alignment of medical and pharmacy data reported in the MN APCD and HPFSR

To account for self-insured enrollment and medical spending that were not reported to the 2016 MN APCD (or reported in some months but not in others), we calculated benchmark amounts for medical and pharmacy spending (separately) per member per month from the HPFSR. However, to align the two data systems, it was necessary first to compare their reporting conventions and definitions.

There are at least two material differences between reporting to the HPFSR and the MN APCD:

- When reporting to the HPFSR, companies need not report actual cost sharing, but instead can report an actuarial estimate of cost sharing. The MN APCD reports actual cost sharing. Consequently, we compare only insurer-paid amounts reported to either system.

- Companies report to HPFSR total spending on prescription drugs after subtracting any manufacturer rebates. Reporting to the MN APCD includes any amounts that manufacturers may ultimately have rebated (that is, any rebates are made outside of the claims that comprise the MN APCD). We are unaware of an external benchmark to gauge the amount of manufacturer rebates received by MN insurers.

We compared data reported to HPFSR in 2014 and 2015, as well as in 2016, and because there is no way to match companies by a common numeric ID, we attempted to match them on the company name. We categorized companies that reported to the HPFSR or to the MN APCD in 3 categories: (1) companies that reported to both (called "matched"); (2) companies that reported only to the HPFSR; and (3) companies that reported only to the MN APCD. At the advice of MDH staff, we then moved some small companies that apparently reported only to the MN APCD into the matched category based on their affiliation with a company that reported to the HPFSR.

We found that the information reported to the HPFSR in 2014 and 2015 (in the aggregate, across all reporting companies) aligned well with the information reported to the MN APCD, considering both fully insured and self-insured member months. In 2016, medical members in matched companies accounted for 96.4% of all medical members reported to the MN APCD, and 98.6% of all members reported on the HPFSR (Table 3). Insurer-paid medical spending also aligned: in 2016, insurer-paid medical spending reported by matched companies accounted for 97.8% of all insurer-paid medical spending reported to the MN APCD and 99.9% of all insurer-paid spending reported on the HPFSR.

In addition, the relationship of member months and spending reported on the HPFSR changed from 2014 to 2016 in a way that is consistent with expected changes in reporting to the MN APCD. In 2014 and 2015, the ratio of covered lives and medical spending reported on the HPFSR to that reported to the MN APCD was very close to 1.000 among matched companies. However, in 2016, matched companies reported 71.9% more covered lives to HPFSR than to the MN APCD, and 69.4% more medical spending. The alignment of pharmacy spending, comparing 2014-2015 with 2016, also changed as expected. Taken together, these results present a strong case for benchmarking MN APCD-calculated per-member-per-month amounts to the HPFSR data for matched companies. Matched companies represented nearly all 2016 member months and spending among Minnesotans with health coverage in either reporting system.

In summary, using the HPFSR to benchmark the MN APCD to account for unreported spending in the MN APCD offers several advantages:

- Benchmarking to the HPFSR maximizes use of the MN APCD for the purpose of estimating the cost of the selected chronic conditions. Losing any observations of Minnesotans with these conditions weakens the cost estimates for those conditions.
- Matched companies account for nearly all of the information reported to either the MN APCD or on the HPFSR. As a result, omitting information for unmatched companies is unlikely to produce material bias in the estimates of spending per member per month.

- The information reported to the MN APCD and on the HPFSR aligns remarkably well across reporting companies in the aggregate, especially in 2015 and for matched companies.

Table 3. Comparison of reporting for commercial members: MN APCD v.22 and HPFSR, 2014-2016

	MN APCD medical members		MN APCD pharmacy members with medical coverage		HPFSR fully insured+ self-insured			Ratio: (HPFSR fully insured + self-insured) / MN APCD		
	Medical member months	Insurer paid medical spending	Pharmacy member months	Insurer paid pharmacy spending	Member months	Insurer paid medical spending	Insurer paid pharmacy spending	Member months	Insurer paid medical spending	Insurer paid pharmacy spending (MN APCD members with medical coverage)
2016										
All submitters	19,532,753	$5,853,817,127	19,559,176	$1,209,382,106	32,821,251	$9,709,990,155	$1,681,512,885	1.6800	1.6590	1.3900
Matched submitters	17,293,012	$5,082,432,442	16,234,838	$ 985,449,979	32,359,594	$9,701,276,096	$1,681,373,624	1.7190	1.6940	1.4970
Matched as a percentage of all submitters	88.53%	86.82%	83.00%	81.48%	98.60%	99.90%	100.00%	--	--	--
Matched submitters per member per month	--	$294	--	$61	--	$300	$52	--	1.0201	0.8560
2015										
All submitters	34,063,973	$9,346,463,809	34,799,258	$2,008,419,278	31,540,640	$9,153,107,406	$1,564,851,655	0.9260	0.9790	0.7790
Matched submitters	31,718,783	$8,600,746,843	29,550,363	$1,692,409,587	31,107,800	$9,145,703,304	$1,564,817,493	0.9900	1.0480	0.8840
Matched as a percentage of all submitters	93.1%	92.0%	84.9%	84.3%	98.6%	99.9%	100.0%	--	--	--
Matched submitters per member per month	--	$271	--	$57	--	$294	$50	--	1.0842	0.8783
2014										
All submitters	34,374,270	$9,344,869,515	35,745,773	$1,648,809,162	33,242,369	$9,740,088,392	$1,455,356,248	0.9670	1.0420	0.8830
Matched submitters	32,120,635	$8,643,107,616	29,847,635	$1,369,621,628	32,731,899	$9,729,072,849	$1,455,056,693	1.0240	1.1090	1.0230
Matched as a percentage of all submitters	93.00%	93.9%	83.0%	86.3%	98.5%	99.9%	100.0%	--	--	--
Matched submitters per member per month	--	$269	--	$46	--	$297	$44	--	1.1046	0.9688

Calculation of benchmarks

The process of benchmarking spending per member per month reported in the MN APCD to the HPFSR proceeded as follows:

- *Medical spending*. We adjusted insurer-paid medical spending per member per month in the MN APCD in 2016 by the 2016 ratio of insurer-paid spending per member per month for fully insured and self-insured lives in the HPFSR to insurer-paid spending per member per month in the MN APCD. Benchmarking spending per member per month to the HPFSR increased insurer-paid spending per member per month in the MN APCD by 2.01% (that is, by a factor of 1.0201, as shown in Table 3). To estimate total adjusted medical spending per member per month (including insurer- and consumer-paid amounts), we divided adjusted insurer-paid medical spending per member per month by total insurer-paid spending as a percentage of total medical spending reported in the MN APCD. The result is algebraically equivalent to increasing total commercial medical spending (including insurer-paid and consumer-paid amounts) by the 2.01% adjustment factor.

- *Pharmacy spending*. Because we lack an external benchmark for the amount of manufacturer rebates excluded from pharmacy spending reported in the HPFSR but reported in the MN APCD, we investigated the reasonableness of assuming that the entire difference between insurer-paid spending reported in each system might be attributed to manufacture rebates. We observed that the difference in reported pharmacy spending among matched companies in 2015 (12.2%, calculated as 1-0.8783, shown in Table 3) was similar to the difference in 2016 (14.4%, calculated as 1-0.8560, shown in Table 3). In both years, it was substantially more than in 2014, which perhaps coincidentally was the first implementation year of the Affordable Care Act. It is feasible that these differences each year—and in 2016, specifically—can be attributed to the value of manufacturer rebates in each year. Following that logic, we made no adjustment to the 2016 spending per member per month reported in the MN APCD. By inference, we assume that the value of manufacturer rebates in 2016 was approximately 17.3% of total reported pharmacy spending (calculated from Table 3 as $61/$52-1). In future years, finding an external benchmark may become more important if the difference between the MN APCD and HPFSR loses face validity as an estimate of the size of manufacture rebates.

Diabetes

Medical and pharmacy spending associated with diabetes is estimated from the MN APCD and from the MEPS:

- Spending among persons with Medicare, private (commercial) insurance, or Medicaid or other public coverage is estimated using the MN APCD.

- Spending among uninsured persons and persons in Tricare (neither represented in the MN APCD) is estimated using MEPS.

Estimating per-member-per-month spending for persons in Medicare, private insurance, or Medicaid or other public coverage

In the MN APCD, a person is defined as having diabetes if (1) he or she had a diagnosis of diabetes or (2) application of The Johns Hopkins ACG system indicated diabetes (lenient criteria), excluding gestational diabetes. We analyzed the difference between diabetes identified by the diagnosis coded in at least one medical claim unrelated to a lab test in 2014 in the APCD and the lenient ACG criteria (which require at least one medical diagnosis but consider pharmacy information as well). We found that 99.2 percent of persons identified as having or not having diabetes by inspection of medical claims were also flagged by the ACG system. We did not explore this relationship for analysis of the 2016 APCD. However, using the same criteria (the individual either had a claim coded with a diagnosis diabetes or was flagged by the ACG system), we produced diabetes prevalence estimates that were very similar to the 2014 estimates.

The probability of pharmacy spending among diabetics and the probabilities of medical and pharmacy spending among non-diabetics are set equal to the actual probabilities in the MN APCD by age, gender, and coverage category. The level of medical or pharmacy spending among those with monthly spending above $1 is estimated from a series of medical cost and pharmacy cost models.

We estimate average medical and pharmacy spending (separately) per month for each of 12 population groups (in total, 24 models). The 12 population groups are defined by age (children age 0-17, young adults age 18-44, older adults age 45-64, and seniors age 65 or older) and spending category (the latter to minimize error in predicting spending in the tails of each distribution). The spending categories are defined as:

- Low cost, defined as persons with per-member-per-month spending below the 80th percentile within their age category

- High cost, defined as persons with per-member-per-month spending at or above the 80th percentile but below the 98th percentile within their age category

- Extra high cost, defined as persons with per-member-per-month spending at or above the 98th percentile within their age category

Estimates of per-member-per-month spending among persons with total spending above $1 are based on generalized least-squares (log-linked, gamma distribution) unique-person-level regression models controlling for diagnoses independent of diabetes. The spending models, estimated by coverage category among medical service and pharmacy users are specified as follows:

- Medical spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, TBCO, DIAB, OBES, HPER, DEMT, ARTH, ASTH, OTH_CANC_D, INJR_DIAB, SURW, HIVA, PNEU, COPD, MHSA, BACK, PREG, PRNT, RHEU, VALV, PULM, PERI, OTHC_DIAB, AGE*SEX, DIAB*AGE, DIAB*SEX, HPER*DIAB, DEMT*DIAB, TBCO*DIAB, ARTH*DIAB, SURW*DIAB, HIVA*DIAB, PNEU*DIAB, COPD*DIAB, MHSA*DIAB, PREG*DIAB, VALV*DIAB, PULM*DIAB, PERI*DIAB)

- Pharmacy spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, TBCO, DIAB, OBES, HPER, DEMT, ARTH, ASTH, OTH_CANC_D, INJR_DIAB, SURW, HIVA, PNEU, COPD, MHSA, BACK, PREG, PRNT, RHEU, VALV, PULM, PERI, OTHC_DIAB, AGE*SEX, DIAB*AGE, DIAB*SEX, HPER*DIAB, DEMT*DIAB, TBCO*DIAB, ARTH*DIAB, SURW*DIAB, HIVA*DIAB, PNEU*DIAB, COPD*DIAB, MHSA*DIAB, PREG*DIAB, VALV*DIAB, PULM*DIAB, PERI*DIAB)

In the specifications above, AGE, INCOME, AND INCOME_SQ are continuous variables equal to the person's age, average family income (by ZCTA), and average family income (by ZCTA) squared (to capture potential non-linear effects of income on spending). MCR and MCD are categorical variables equal to 1 if the person is enrolled, respectively, in Medicare or Medicaid (or other public coverage) in most months of the year.

All other control variables are categorical variables indicating medical conditions that are clinically unrelated to diabetes (DIAB)—that is, a reduction in diabetes would not be expected to affect the incidence of these conditions. The clinically unrelated conditions are: smoking exposure (TBCO), obesity (OBES), hypertension (HPER), dementia (DEMT), arthritis (ARTH), asthma (ASTH), cancers unrelated to diabetes (OTH_CANC_D), injuries unrelated to diabetes (INJR_DIAB), surgical wounds (SURW), HIV-AIDS (HIVA), pneumonia (PNEU), chronic obstructive pulmonary disease (COPD), mental health and substance abuse (MHSA), back problems (BACK), pregnancy (PREG), perinatal conditions and fetal conditions (PRNT), rheumatic heart disease (RHEU), diseases of mitral and aortic valves and other endocardial structures (VALV), pulmonary disease (PULM), acute and other pericardial and endocardial disease (PERI), and some additional rare conditions (OTHC_DIAB). The ICD-9 and ICD-10 diagnosis codes that define each condition are listed in Table A.1.

Because the models do not control for diagnoses clinically linked to diabetes, the coefficient estimated for diabetes (DIAB) captures spending associated with clinically related conditions. Some condition variables (hypertension, dementia, smoking exposure, arthritis, surgical wounds, HIV, pneumonia, chronic obstructive pulmonary disease, mental health and substance abuse, pregnancy, diseases of mitral and aortic valves and other endocardial structures, pneumonia, pulmonary disease, acute and other pericardial and endocardial disease, and some additional rare conditions) are interacted with diabetes, as diabetes does not affect the occurrence of these conditions but can affect the health outcomes and cost of treating these conditions.

The models are edited (via stepwise regression) to remove variables with statistically insignificant associations with per-member-per-month spending ($p \geq 0.15$). Only variables with statistically significant associations ($p < 0.15$) with per-member-per-month spending remain in the final specification and contribute to the final spending estimates.

Using the estimated parameters, we calculate (separately) per-person-per-month medical and pharmacy spending for diabetes by age and gender as the difference between the sum of expected spending per member per month and the per-member-per-month spending that would occur in each coverage category if no person were diagnosed with diabetes (estimated with DIAB = 0):

(1) Medical cost of diabetes = Medical spending (DIAB = actual) -
Medical spending (DIAB = 0)

(2) Pharmacy cost of diabetes = Pharmacy spending (DIAB = actual)
- Pharmacy spending (DIAB = 0)

Estimating per-person-per-month spending for persons who are uninsured or in Tricare

Because the MN APCD does not include information for persons who are uninsured or on Tricare, we use MEPS data to estimate their spending. For these persons, we estimate logit models to predict the probability of medical and pharmacy spending among persons who are diabetic versus not diabetic. These models are estimated over a subset of the MEPS national population sample, including the persons with commercial insurance (baseline), persons who are uninsured (UNIS), and persons in Tricare (TRI). The models are specified as:

- P (Medical service use) = f (AGE, SEX, INCOME, MIDWEST, DIAB, UNIS)

- P (Pharmacy use) = f (AGE, SEX, INCOME, MIDWEST, DIAB, UNIS)

- P (Medical service use) = f (AGE, SEX, INCOME, MIDWEST, DIAB, TRI)

- P (Pharmacy use) = f (AGE, SEX, INCOME, MIDWEST, DIAB, TRI)

Because of the relatively small MEPS sample of persons with diabetes, we estimate medical and pharmacy cost models only for adults and in two population groups (in total, four models):

- Low-cost adults, defined as adults with per-person-per-month spending below the 80th percentile among adults

- High-cost adults, defined as adults with per-person-per-month spending at or above the 80th percentile among adults

Other than adding a MIDWEST region indicator, the medical and pharmacy cost models are specified identically to the MN APCD-based models, with two exceptions: (1) in the MEPS models, SURW are included in INJR_DIAB (consistent with ICD-10 coding); and (2) TBCO is entered as the MEPS screening variable indicating current smoking status. We estimate each model for persons in the MEPS sample who are (1) commercially insured versus uninsured and (2) commercially insured versus enrolled in Tricare. Statistically insignificant variables ($p > 0.15$) are removed via step-wise regression, and only statistically significant variables remain in the final specifications.

We then calculate the same equations (1) and (2) above as for the MN APCD population, but using estimates derived from MEPS. These results are benchmarked to spending among the privately insured population in the MN APCD (Equations 3 to 6 below) to arrive at the per-person-per-month medical and pharmacy cost of diabetes for Minnesotans who are uninsured or in Tricare:

(3) Medical cost of diabetes (uninsured) =

$$\frac{\text{Medical cost of DIAB (unin\_MEPS)}}{\text{Medical cost of DIAB (comm\_MEPS)}} * \text{Medical cost of DIAB (comm\_APCD)}$$

(4) Pharmacy cost of diabetes (uninsured) =

$$\frac{\text{Pharmacy cost of DIAB (unin\_MEPS)}}{\text{Pharmacy cost of DIAB (comm\_MEPS)}} * \text{Pharmacy cost of DIAB (comm\_APCD)}$$

(5) Medical cost of diabetes (Tricare) =

$$\frac{\text{Medical cost of DIAB (Tricare\_MEPS)}}{\text{Medical cost of DIAB (comm\_MEPS)}} * \text{Medical cost of DIAB (comm\_APCD)}$$

(6) Pharmacy cost of diabetes (Tricare) =

$$\frac{\text{Pharmacy cost of DIAB (Tricare\_MEPS)}}{\text{Pharmacy cost of DIAB (comm\_MEPS)}} * \text{Pharmacy cost of DIAB (comm\_APCD)}$$

Estimating total cost

Total medical and pharmacy spending associated with diabetes is calculated as per-person-per-month spending associated with diabetes among Minnesotans with diabetes in each coverage category (by age and sex) annualized over 12 months and multiplied by the estimated number of persons with diabetes. These calculations are done somewhat differently for persons observed in the MN APCD (in Medicare, Medicaid or other public coverage, or commercial insurance), versus those not observed in the MN APCD (in Tricare or uninsured):

- For persons with Medicare, Medicaid or other public coverage, or commercial insurance, the percentage of Minnesotans with diabetes (by age, sex, and source of coverage) is derived from the MN APCD. In effect, we assume that Minnesotans in fully insured or self-insured private plans that do not report to the MN APCD have the same rate of diabetes as the average among those in private insurance plans that do report.

- For persons in Tricare or who are uninsured, the number of Minnesotans with diabetes is estimated (by age, sex, and coverage) as the percentage of persons in 2016 Minnesota Behavioral Risk Factor Surveillance System (MN BRFSS) who report having ever been told they have diabetes, multiplied by the national MEPS percentage of all diabetics who are in Tricare or are uninsured (respectively).

Estimated costs per person are multiplied by the number of persons in each coverage status reported in the MHAS, benchmarked to the total Minnesota population reported in the ACS.

Hypertension

Medical and pharmacy spending associated with hypertension is estimated from the MN APCD and the MEPS – Household Component:

- Spending among persons with Medicare, private (commercial) insurance, or Medicaid or other public coverage is estimated using the MN APCD.

- Spending among uninsured persons and persons in Tricare (neither represented in the MN APCD) is estimated using MEPS.

Estimating per-member-per month medical and pharmacy cost among service users: persons in Medicare, commercial insurance, or Medicaid or other public coverage

We identified persons represented in the MN APCD are identified as having hypertension if (1) application of The Johns Hopkins Adjusted Clinical Groups® (ACG®) system (lenient criteria) indicated hypertension; or (2) they have a diagnosis of hypertension on at least two claims unrelated to a lab test.

Because our prevalence estimates are based directly on diagnostic coding, we assume that all persons with hypertension in the MN APCD have medical spending. The probability of pharmacy spending among persons with hypertension, and the probabilities of medical and pharmacy spending among persons without hypertension, are set equal to the actual probabilities in the MN APCD by age, gender, and coverage category.

We estimate average medical and pharmacy spending (separately) per month for each of 12 population groups (in total, 24 models). The 12 population groups are defined by age (children age 0-17, young adults age 18-44, older adults age 45-64, and seniors age 65 or older) and spending category (the latter to minimize error in predicting spending in the tails of each distribution). The spending categories are defined as:

- Low cost, defined as persons with per-member-per-month spending below the 80th percentile within their age category

- High cost, defined as persons with per-member-per-month spending at or above the 80th percentile but below the 98th percentile within their age category

- Extra high cost, defined as persons with per-member-per-month spending at or above the 98th percentile within their age category

Estimates of per-member-per-month spending among persons with total spending above $1 are based on generalized least-squares (log-linked, gamma distribution) unique-person-level regression models controlling for diagnoses that are independent of hypertension.

Estimated by coverage category among, respectively, medical service and pharmacy users, the spending models are specified as follows:

- Medical spending per month = f (AGE, SEX, INCOME, INCOME_SQ,[21] MCR, MCD, HPER, OBES, DEMT, TBCO, ARTH, ASTH, CANC, INJR, DYSL, HIVA, PNEU, COPD, MHSA, BACK, SKIN, PREG, PRNT, RHEU, VALV_HPER, PULM, PERI, OTHH, OTHC_HPER, AGE*SEX, HPER *AGE, HPER *SEX, HPER*OBES, DEMT* HPER, ARTH* HPER, ASTH* HPER, CANC* HPER, DYSL* HPER, COPD* HPER, MHSA* HPER, PREG* HPER, PULM* HPER)

- Pharmacy spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, HPER, OBES, DEMT, TBCO, ARTH, ASTH, CANC, INJR, DYSL, HIVA, PNEU, COPD, MHSA, BACK, SKIN, PREG, PRNT, RHEU, VALV_HPER, PULM, PERI, OTHH, OTHC_HPER, AGE*SEX, HPER *AGE, HPER *SEX, HPER*OBES, DEMT* HPER, ARTH* HPER, ASTH* HPER, CANC* HPER, DYSL* HPER, COPD* HPER, MHSA* HPER, PREG* HPER, PULM* HPER)

In these specifications, AGE, INCOME, INCOME_SQ are continuous variables; INCOME and INCOME_SQ are measured as average family income by ZCTA. MCR and MCD are indicator variables for coverage status (private insurance is the omitted category).

All other variables are indicator variables for diagnosed conditions: hypertension (HPER), obesity (OBES), dementia (DEMT), smoking exposure (TBCO), arthritis (ARTH), asthma (ASTH), cancer (CANC), injuries (INJ), dyslipidemia (DYSL), HIV-AIDS (HIVA), pneumonia (PNEU), chronic obstructive pulmonary disease (COPD), mental health and substance abuse (MHSA), back conditions (BACK), conditions of the skin (SKIN), pregnancy (PREG), perinatal conditions (PRNT) rheumatic heart disease (RHEU), diseases of mitral and aortic valves & other endocardial structures unrelated to hypertension (VALV_HPER), pulmonary disease (PULM), acute and other pericardial and endocardial disease (PERI), other or ill-defined heart disease(OTHH), and other conditions unrelated to hypertension (OTHC_HPER). The ICD-9 and ICD-10 diagnoses codes that compose these conditions are listed in Table A.1.

Because the models do not control for diagnoses clinically linked to hypertension, the coefficient estimated for hypertension (HPER) captures the impact on spending of clinically related conditions. Some condition variables (obesity, dementia, asthma, arthritis, cancer, dyslipidemia, chronic obstructive pulmonary disease, mental health and substance abuse, pregnancy, diseases of mitral and aortic valves and other endocardial structures, pneumonia, and pulmonary disease) are interacted with hypertension, because hypertension does not affect the occurrence of these conditions but can affect the health outcomes and cost of treating them.

The models are edited (via stepwise regression) to remove variables with statistically insignificant associations with per-member-per-month spending ($p \geq 0.15$). Only variables with

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[21] We included income and the square of income to capture the non-linear effect of income on spending.

statistically significant associations with per-member-per-month spending remain in the final specification and contribute to the final spending estimates.

Using the estimated parameters, we calculate (separately) medical and pharmacy spending for hypertension by age and gender as the difference between the sum of expected spending per member per month and the per-member-per-month spending that would occur if no person were diagnosed with hypertension (estimated with HPER = 0):

(1) Medical cost of hypertension = Medical spending (HPER = actual) -
Medical spending (HPER = 0)

(2) Pharmacy cost of hypertension = Pharmacy spending (HPER = actual) -
Pharmacy spending (HPER = 0)

Estimating the probability of medical service and pharmacy use and per-person-per-month spending among service users: persons who are uninsured or in Tricare

Because the MN APCD does not include information for persons who are uninsured or in Tricare, we use MEPS data to estimate their spending. For these persons, we estimate logit models to predict the probability of medical and pharmacy spending among persons who are hypertensive versus those who are not. These models are estimated over a subset of the MEPS national population sample, including the persons with commercial insurance (baseline), persons who are uninsured (UNIS, and persons in Tricare (TRI). The models are specified as:

- P (Medical service use) = f (AGE, SEX, INCOME, MIDWEST, HPER, UNIS)

- P (Pharmacy use) = f (AGE, SEX, INCOME, MIDWEST, HPER, UNIS)

- P (Medical service use) = f (AGE, SEX, INCOME, MIDWEST, HPER, TRI)

- P (Pharmacy use) = f (AGE, SEX, INCOME, MIDWEST, HPER, TRI)

Because of the relatively small MEPS sample of persons with hypertension, we estimate medical and pharmacy cost models only for adults and seniors combined, in two population groups (in total, four models):

- Low-cost adults and seniors, defined as adults with per-person-per-month spending below the 80th percentile among adults and seniors

- High-cost adults and seniors, defined as adults with per-person-per-month spending at or above the 80th percentile among adults and seniors

The medical and pharmacy cost model specifications are based on those used above for APCD, adding an indicator variable (MIDWEST) to designate the MEPS Midwest population sample, and omitting VALV_HPER (due to multiple mappings of this condition in 3-digit ICD-10 coding). We estimate each model twice, respectively for persons who are (1) commercially insured or uninsured and (2) commercially insured or in Tricare. Statistically insignificant variables (p $\geq$

0.15) are removed via step-wise regression, and only statistically significant variables remain in the final specification.

We then calculate the same equations (1) and (2) above as for the MN APCD population, but using estimates derived from MEPS. These results are benchmarked to spending among the privately insured population in the MN APCD (Equations 3 to 6 below) to arrive at the per-person-per-month medical and pharmacy cost of hypertension for Minnesotans who are uninsured or in Tricare:

(3) Medical cost of HPER (uninsured) =

$$\frac{\text{Medical cost of HPER (unin\_MEPS)}}{\text{Medical cost of HPER (comm\_MEPS)}} * \text{Medical cost of HPER (comm\_APCD)}$$

(4) Pharmacy cost of HPER (uninsured) =

$$\frac{\text{Pharmacy cost of HPER (unin\_MEPS)}}{\text{Pharmacy cost of HPER (comm\_MEPS)}} * \text{Pharmacy cost of HPER (comm\_APCD)}$$

(5) Medical cost of HPER (Tricare) =

$$\frac{\text{Medical cost of HPER (Tricare\_MEPS)}}{\text{Medical cost of HPER (comm\_MEPS)}} * \text{Medical cost of HPER (comm\_APCD)}$$

(6) Pharmacy cost of HPER (Tricare) =

$$\frac{\text{Pharmacy cost of HPER (Tricare\_MEPS)}}{\text{Pharmacy cost of HPER (comm\_MEPS)}} * \text{Pharmacy cost of HPER (comm\_APCD)}$$

Estimating total cost

Total medical and pharmacy spending associated with hypertension is calculated as per-person-per-month spending associated with hypertension among Minnesotans with hypertension in each coverage category (by age and sex) annualized over 12 months and multiplied by the number of persons with hypertension. These calculations are done somewhat differently for persons observed in the MN APCD (in Medicare, Medicaid or other public coverage, or commercial insurance), versus those not observed in the MN APCD (in Tricare or uninsured):

- For persons with Medicare, Medicaid or other public coverage, or commercial insurance, the percentage of Minnesotans with hypertension (by age, sex, and source of coverage) is derived from the MN APCD. We assume that Minnesotans in fully insured or self-insured private insurance plans that do not report to the MN APCD have the same rate of hypertension as the average among those in private insurance plans that do report.

- For persons in Tricare or who are uninsured, the number of Minnesotans with hypertension is estimated (by age, sex, and coverage) as the percentage of persons in the MN BRFSS who report having ever been told they have high blood pressure, multiplied by the national 2015 MEPS percentage of all hypertensive persons in Tricare or who are uninsured (respectively).

Estimated costs per person are multiplied by the number of persons in each coverage status reported in the MHAS, benchmarked to the total Minnesota population reported in the ACS.

Dementia

Medical and pharmacy spending associated with dementia among persons with Medicare, private (commercial) insurance, or Medicaid or other public coverage is estimated using the MN APCD. We found no diagnoses of dementia among uninsured persons and persons on Tricare in the MEPS population (presumably because of small sample size), so we do not estimate spending attributed to dementia among those population groups.

Persons with at least one diagnosis of dementia unrelated to a lab test in the MN APCD are defined as having dementia. Following our methods developed for the 2014 and 2015 estimates, we chose not to use Johns Hopkins EDC indicator for dementia (NUR24). For the 2014 and 2015 estimates, we investigated sources of differences between dementia identified by the diagnosis coded in at least one medical claim versus the ACG system and found that most persons with dementia identified from medical claims but not identified by the ACG system had dementia that derived from other diagnosed conditions.[22] Because we expect that legislative interest is focused largely on senile dementias, we use only medical claims diagnoses to identify dementia. In addition, because instances of dementia among children under age 18 are very rare[23] and highly clustered among infants, we omit children ages 0-17 from the analysis.

Estimating per-member-per-month medical and pharmacy cost among service users

We estimate average medical and pharmacy spending (separately) per month for each of 9 population groups (in total, 18 models). The 9 population groups are defined by age (young adults age 18-44, older adults age 45-64, and seniors age 65 or older) and spending category (the latter to minimize error in predicting spending in the tails of each distribution). The spending categories are defined as:

- Low cost, defined as persons with per-member-per-month spending below the 80th percentile within their age category

- High cost, defined as persons with per-member-per-month spending at or above the 80th percentile but below the 98th percentile within their age category

- Extra high cost, defined as persons with per-member-per-month spending at or above the 98th percentile within their age category

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[22] Most persons with dementia identified by the ACG system but not by examination of medical claims in 2014 had the following diagnoses: other persistent mental disorders due to conditions not classified elsewhere (ICD-9 294.8), dementia in conditions classified elsewhere without behavioral disturbance (ICD-9 294.10), dementia in conditions classified elsewhere with behavioral disturbance (ICD-9 294.11), or alcohol-induced persisting dementia (ICD-9 291.2).

[23] In 2014, such conditions included Reye's syndrome (ICD-9 331.81) and communicating hydrocephalus (ICD-9 331.3).

Estimates of per-member-per-month spending among persons with total spending above $1 are based on generalized least-squares (log-linked, gamma distribution) unique-person-level regression models controlling for diagnoses independent of dementia. Estimated by coverage category among, respectively, medical service and pharmacy users, the spending models are specified as follows:

- Medical spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, DEMT, DIAB, OBES, HPER, TBCO, ARTH, ASTH, CANC, CHF, CAD, STRO, OCVD, DYSL, HIVA, PNEU, COPD, MHSA, BACK, SKIN_DEMT, RENL, PREG, PRNT, RHEU, VALV, PULM, PERI, CARM, COND, CDYS, OTHH, OTHC_DEMT, AGE*SEX, DEMT*AGE, DEMT*SEX, HPER*DEMT, DIAB*DEMT, TBCO*DEMT, ARTH*DEMT, ASTH*DEMT, CANC*DEMT, CHF*DEMT, CAD*DEMT, STRO*DEMT, OCVD*DEMT, DYSL*DEMT, HIVA*DEMT, PNEU*DEMT, COPD*DEMT, MHSA*DEMT, SKIN_DEMT*DEMT, RENL*DEMT, RHEU*DEMT, VALV*DEMT, PULM*DEMT, PERI*DEMT, CARM*DEMT, COND*DEMT, CDYS*DEMT, OTHH*DEMT)

- Pharmacy spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, DEMT, DIAB, OBES, HPER, TBCO, ARTH, ASTH, CANC, CHF, CAD, STRO, OCVD, DYSL, HIVA, PNEU, COPD, MHSA, BACK, SKIN_DEMT, RENL, PREG, PRNT, RHEU, VALV, PULM, PERI, CARM, COND, CDYS, OTHH, OTHC_DEMT, AGE*SEX, DEMT*AGE, DEMT*SEX, HPER*DEMT, DIAB*DEMT, TBCO*DEMT, ARTH*DEMT, ASTH*DEMT, CANC*DEMT, CHF*DEMT, CAD*DEMT, STRO*DEMT, OCVD*DEMT, DYSL*DEMT, HIVA*DEMT, PNEU*DEMT, COPD*DEMT, MHSA*DEMT, SKIN_DEMT*DEMT, RENL*DEMT, RHEU*DEMT, VALV*DEMT, PULM*DEMT, PERI*DEMT, CARM*DEMT, COND*DEMT, CDYS*DEMT, OTHH*DEMT)

In these specifications, AGE, INCOME, INCOME_SQ are continuous variables; INCOME and INCOME_SQ are measured as average family income by ZCTA. MCR and MCD are indicator variables for coverage status (private insurance is the omitted category). All other variables are indicator variables for diagnosed conditions: diabetes (DIAB), obesity (OBES), hypertension (HPER), smoking exposure (TBCO), arthritis (ARTH), asthma (ASTH), cancer (CANC), congestive heart failure (CHF), coronary artery disease (CAD), stroke (STRO), other cerebrovascular disease (OCVD), dyslipidemia (DYSL), HIV-AIDS (HIVA), pneumonia (PNEU), chronic obstructive pulmonary disease (COPD), mental health and substance abuse (MHSA), back conditions (BACK), skin conditions unrelated to dementia behaviors (SKIN_DEMT),[24] renal failure and chronic kidney disease (RENL), pregnancy (PREG), perinatal and fetal conditions (PRNT), rheumatic heart disease (RHEU), diseases of mitral and aortic valves & other endocardial structures (VALV), pulmonary disease (PULM), acute and other pericardial and endocardial

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[24] Skin conditions related to dementia include corns and callosities (ICD-9 700), chronic ulcer of skin (ICD-9 707), and other local infections of skin and subcutaneous tissue (ICD-9 686).

disease (PERI), cardiomyopathy (CARM), conduction disorders (COND), cardiac dysrhythmias CDYS, other or ill-defined heart disease (OTHH), and other rare conditions unrelated to dementia (OTHC_DEMT). The ICD-9 and ICD-10 diagnoses codes that compose these conditions are listed in Table A.1.

Because the models do not control for diagnoses clinically linked to dementia (DEMT), the coefficient estimated for dementia captures the impact on spending of clinically related conditions. The model interacts with dementia many control conditions for which dementia can affect the cost of treatment, although it does not affect their occurrence.

The models are edited (via stepwise regression) to remove variables with statistically insignificant associations with per-member-per-month spending ($p \geq 0.15$). Only variables with statistically significant associations with per-member-per-month spending remain in the final specification and contribute to the final spending estimates.

Using the estimated parameters, we calculate (separately) medical and Rx spending for dementia by age and gender as the difference between the sum of expected spending per member per month and per-member-per-month spending that would occur if no person were diagnosed with dementia (estimated with DEMT = 0):

(1) Medical cost of dementia = Medical spending (DEMT = actual) - Medical spending (DEMT = 0)

(2) Pharmacy cost of dementia = Pharmacy spending (DEMT = actual) - Pharmacy spending (DEMT = 0)

Estimating total cost

Total medical and pharmacy spending associated with dementia is calculated as per-member-per-month spending associated with dementia among Minnesotans with dementia in each coverage category (by age and sex) annualized over 12 months. These calculations assume, in effect, that Minnesotans in fully insured or self-insured private insurance plans that do not report to the MN APCD have the same rate of dementia as the average among those in private insurance plans that do report. Estimated costs per person are multiplied by the number of persons in each coverage status reported in the MHAS, benchmarked to the total Minnesota population reported in the ACS.

Persons Age 60 or Older

We estimate spending attributed to one or more chronic conditions among residents age 60 or older only among Minnesotans who use services reported in the MN APCD. These persons have private insurance, Medicare, or Medicaid or other public coverage. Persons age 60 or older who are uninsured or have Tricare are omitted from the estimates only because they are too few in the MEPS population sample (the great majority are enrolled in commercial insurance or Medicare) to support stable cost estimates benchmarked to the APCD.

To develop estimates of total spending for chronic conditions, we select all persons age 60 or older in their first enrollment month in 2016—thus, we consider spending only in months when they were at least age 60. A person is identified as having one or more chronic conditions if he or she has at least one EDC flagged by the ACG Chronic Condition Count Marker[25] as "an alteration in the structures or functions of the body that is likely to last longer than 12 months and is likely to have a negative impact on health or functional status." We conducted a further clinical expert review of all EDCs and identified several additional EDCs that are generally viewed as chronic.[26] The analysis proceeded using the ACG-flagged EDC augmented with these additional conditions.[27] Outliers (identified as persons with per-member-per-month medical or pharmacy spending that is more than twice the level of per-member-per-month spending at the 99.99 percentile) are removed from the data.

Because the analysis relies only on observation of service users in the MN APCD, we calculate the probability of spending among persons with one or more chronic conditions directly from the data. All persons flagged with a chronic condition have either medical or Rx spending, but might not have both. As a result, although the probabilities of medical and pharmacy spending, respectively, among persons with a chronic condition are high, each is less than 1. Conversely, the probability of medical and pharmacy spending, respectively, for persons without a chronic condition (all other persons in the APCD) include persons with no medical or Rx spending.

Estimating per-member-per-month medical and pharmacy cost

We estimate average medical and pharmacy spending (separately) per month for each of 6 population groups (in total, 12 models). The 6 population groups are defined by age (60-64, 65-74, and 75 and older) in two spending categories (the latter to minimize error in predicting spending in the tails of each distribution). The spending categories are defined as:

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[25]See page 50 of The Johns Hopkins ACG® System, Excerpt from Version 11.0 Technical Reference Guide (November 2014).

[26] These additional EDC codes are: MUS13 (Cervical pain syndromes); NUR04 (Vertiginous syndromes); NUR07 (Seizure disorder); PSY20 (Major depression); SKN02 (Dermatitis and eczema); and SKN12 (Psoriasis).

[27] Note that obesity is not included in the ACG definition of chronic conditions. We separately estimated cost of obesity among those who do not have any chronic conditions.

- Per-member-per-month spending below the 80th percentile within the person's age category

- Per-member-per-month spending at or above the 80th percentile within the person's age category

The models control for diagnoses clinically unrelated to chronic conditions ($X_{\sim CC}$). Some control conditions (X_{int}) are interacted with chronic conditions that can affect the cost treating the control condition but are not known to affect its occurrence.[28] The estimated coefficient on chronic conditions captures the impact of EDCs linked to one or more chronic conditions and, therefore, are omitted from the model.[29]

Estimates of per-member-per-month medical and pharmacy spending among persons with average spending above \$1 are based on generalized least-squares (log-linked, gamma distribution) regression. The regression models are specified as follows:

- Medical spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, CC, $X_{\sim CC}$, X_{int}, X_{int}*CC)

- Pharmacy spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MCR, MCD, CC, $X_{\sim CC}$, X_{int}, X_{int}*CC)

In these models, AGE, INCOME, and INCOME_SQ are continuous variables; INCOME and INCOME_SQ are measured as average family income by ZCTA. SEX is an indicator variable, as are MCR (Medicare) and MCD (Medicaid or other public coverage). CC is a binary indicator for one or more chronic conditions; $X_{\sim CC}$ and X_{int} are vectors of unrelated conditions and interacted conditions defined as above.

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[28] Interacted EDCs are: FRE04, GAS06, GSU02, GSU04, GSU05, NUR15, and REC04.

[29] The following EDCs are omitted from the models: ADM02, CAR13, DEN01-04, EAR01, EAR06, EAR09, EYE07, EYE09, FRE02, FRE05, FRE06, FRE08-09, FRE13, GAS08, GAS11, GS106-108, GSU08, GSU10, GSU13-14, GUR06, GUR08, GUR11, HEM02, INF01-02, INF05-06, INF08-09, MUS01, MUS10, MUS12, MUS15-16, NEW03-04, NUR02, NUR10, NUT02, NUT04, PSY06, PSY10, RES01, RES05, RES07, RES14, RHU04, SKN07-09, SKN11, SKN13, SKN16, SKN20, and TOX02.

The models are edited (via stepwise regression) to remove variables with statistically insignificant associations with per-member-per-month spending (p ≥ 0. 15). Only variables with statistically significant associations with per-member-per-month spending remain in the final specification and contribute to the final spending estimates.

Using the estimated parameters, we calculate per-member-per-month medical and pharmacy spending for one or more chronic conditions (CC) by age group and gender as the difference between the sum of total expected spending (with CC = actual) and the spending that would occur if no person had chronic conditions (setting CC = 0 for all persons):

(1) Medical cost of chronic conditions = Medical spending (CC = actual) - Medical spending (CC = 0)

(2) Pharmacy cost of chronic conditions = Pharmacy spending (CC = actual) - Pharmacy spending (CC = 0)

These calculations (at the person level) are summed to produce estimates of total cost among persons age 60 or older in the APCD. The estimates are then weighted to the population benchmarks by source of coverage (derived from the MHAS) to calculate the total cost of chronic conditions among persons age 60 or older in Minnesota.

Estimating total cost

Total medical and pharmacy spending associated with chronic conditions among persons age 60 or older is calculated as per-member-per-month spending associated with chronic conditions among those with chronic conditions in each coverage category (by age and sex) annualized over 12 months. These calculations assume, in effect, that Minnesotans age 60 or older in fully insured or self-insured private insurance plans that do not report to the MN APCD have the same rate of chronic conditions as the average among those in private insurance plans that do report. Estimated costs per person are multiplied by the number of persons in each coverage status reported in the MHAS, benchmarked to the total Minnesota population reported in the ACS.

Smoking Exposure

Because smoking status is not identified in the MN APCD, we used the MEPS national population sample (to obtain information on current smoking status) linked to the Sample Person NHIS, Adult Sample NHIS (to obtain additional information on past smoking status—specifically, time since having quit smoking). To estimate the probability of service and per-person-per-month cost among persons with smoking exposure, we used three years of MEPS data (2014–2016) for the 2016 estimates. Specifically, we matched the 2016 MEPS population sample to their 2015 MEPS, and 2015 or 2016 NHIS. We adjusted the MEPS person weight for individuals observed in more than one year of the two-year panel.

The MEPS sample was drawn from the prior-year NHIS. Because the MEPS sample includes each sample household for two years, each person has one or two annual responses to the MEPS question about current smoking. Among those that can be matched to NHIS, NHIS asks about current smoking and, if they do not currently smoke, whether they ever smoked and how long since they stopped smoking. MEPS and NHIS question only adults (age 18 to 64) and seniors (age 65 or older) about current or past smoking status.

For each calendar year, the information on smoking obtained by combining MEPS and NHIS for each estimation year is described in Table 4, showing the information used to produce the 2016 estimates.

Table 4. Merged information from the MEPS with NHIS

2016 MEPS panel year	2016 estimates
First year	• Current smoking status from the 2016 MEPS • Current smoking status from the 2015 NHIS; if not a smoker at time of 2015 NHIS question, whether the person ever smoked and how long ago the person quit
Second year	• Current smoking status from the 2016 MEPS • Current smoking status from the 2015 MEPS • Current smoking status from 2014 NHIS; if not a smoker at time of 2014 NHIS question, whether the person ever smoked and how long ago the person quit

The analyses of the probability of medical service and pharmacy use—and per-person-per-month medical and pharmacy costs among service users—relied on these matched data. For adults and seniors, we defined six categorical variables for direct smoking (current or past) and second-hand smoking:

- Current smokers (SMOKE_CURRENT) are persons who identified themselves as current smokers in MEPS.

- Nonsmokers (SMOKE_NEVER) are persons who identified themselves as NOT a current smoker in MEPS and never smoker in NHIS.

- Past smokers who quit within the past year (SMOKE_QUIT_PASTYEAR) are persons who identified themselves as NOT a current smoker in MEPS and either a current smoker in the prior year in NHIS or a current smoker in prior year MEPS.

- Past smokers who quit between one and five years ago (SMOKE_QUIT_PAST1_4) are persons who identified themselves as NOT a current smoker in MEPS and quit between one and four years in NHIS.

- Past smokers who quit more than five years ago (SMOKE_QUIT_PAST5) are persons who identified themselves as NOT a current smoker in MEPS and quit more than five years ago in NHIS.

- Persons exposed to secondhand smoking (SMOKE_SH), defined by living in the same dwelling as other family members that currently smoke

The first five categorical variables are mutually exclusive (never smoked is the omitted variable); SMOKE_SH can be 0 or 1 for any person.

We modeled the probability of use and per-person-per-month spending among service users. Medical service and pharmacy users were defined as persons with average medical and pharmacy spending, respectively, equal to at least $1 per month.

Estimating the probability of medical service and pharmacy use

The medical service and pharmacy use probability models for 2009 and 2014 were estimated using logistic regression. These models were specified as follows:

- P (Medical service use) = f (AGE, SEX, INCOME, MIDWEST, MCR, MCD, UINS, TRI, TBCO, YEAR)

- P (Pharmacy use) = f (AGE, SEX, INCOME, MIDWEST, MCD, MCR, UINS, TRI, TBCO, YEAR)

In these models, AGE and INCOME are continuous variables; SEX indicates gender; MIDWEST indicates the MEPS Midwest population sample; and MCR, MCD, UINS, and TRI indicate insurance status during most months of the year (respectively Medicare, Medicaid or other public programs, uninsured, or Tricare). TBCO is a vector of the smoking variables defined above. YEAR is a vector of indicator variables (2015 and 2016) that capture secular change in each time period relative to the baseline year (2014).

We calculated relativity factors from the probability models to benchmark the estimates to the probability of service use in Minnesota. The relativity factors are defined as the ratio of (1) the probability of medical or pharmacy spending for a person who *is exposed* to smoking (ever smoked, currently exposed to SHS) to (2) the probability of medical or pharmacy spending for a person who *is not* exposed in those ways:

- $R_{PMED\_TBCO} = \dfrac{P(\text{Medical service use} \mid TBCO=1)}{P(\text{Medical service use} \mid TBCO=0)}$

- $R_{PRX\_TBCO} = \dfrac{P(\text{Pharmacy use} \mid TBCO=1)}{P(\text{Pharmacy use} \mid TBCO=0)}$

The probability of medical service among Minnesotans not exposed to smoking was calculated by solving the following equation for the probability of any service use among persons not exposed to smoking in the APCD:

(1) P_MED$_{APCD}$ = P_TBCO * R$_{PMED\_TBCO}$ * P(Medical service use | TBCO=0) + (1 − P_TBCO) * P(Medical service use | TBCO=0)

⇨ P(Medical service use | TBCO=0) = P_MED$_{APCD}$ / (P_TBCO * R$_{PMED\_TBCO}$ + 1 − P_TBCO)

In these equations, P_MED$_{APCD}$ is the probability of any service use (regardless of smoking exposure status) in the APCD. P_TBCO is the probability of smoking exposure among persons in the MN BRFSS. R$_{PMED\_TBCO}$ is the relativity factor defined above, estimated from MEPS.

A probability-of use estimate for pharmacy adjusted to the APCD and MN BRFSS rates of smoking is calculated analogously, to produce (2):

⇨ P(Pharmacy use | TBCO=0) = P_RX$_{APCD}$ / (P_TBCO * R$_{PRX\_TBCO}$ + 1 − P_TBCO)

Medical and pharmacy spending associated with smoking exposure among medical service and pharmacy users were estimated relative to non-exposed adults. The spending estimates were based on generalized least-squares (log-linked, gamma distribution) unique-person-level regression models adults (age 18 to 64). We estimated a medical cost model and a pharmacy cost model for each of 4 population groups (in total, 4 models):

- Low-cost adults, defined as adults with per-person-per-month spending below the 80th percentile among adults

- High-cost adults, defined as adults with per-person-per-month spending at or above the 80th percentile among adults

Estimating per-person-per-month medical and pharmacy cost among service users

Estimates of per-person-per-month spending were based on generalized least-squares (log-linked, gamma distribution) unique-person-level regression models controlling for diagnoses independent of smoking exposure. Because the models did not control for diagnoses clinically linked to smoking exposure, the estimated coefficients on smoking exposure captured their impact on the dependent variable. The models interacted many control conditions with current or past smoking, as smoking can affect the cost treating these conditions, but it is not known to affect their occurrence. A number of rare conditions unrelated to current or past smoking were clustered in a single indicator variable (OTHC_TBCO) to simplify the models. Outliers were defined as persons with medical or pharmacy average spending per month at or above the 99th

percentile of all spenders, calculated separately for adults and seniors, and omitted from the modeling.

The spending models for adults/seniors were specified as follows (using the same specifications for medical and pharmacy spending):

- Spending per month = f (AGE, SEX, INCOME, MIDWEST, YEAR, TRI, MCD, MCR, UINS, SMOKE_CURRENT, SMOKE_QUIT_PASTYEAR, SMOKE_QUIT_PAST1_4, SMOKE_QUIT_PAST5, SMOKE_SH, DIAB, OBES, ARTH, OTH_CANC_T, DEPR, INJR, DYSL, HIVA, MHSA, BACK, SKIN, PREG, OHD, OTHC_TBCO, OTHC_TBCO_INTR, AGE * SMOKE_CURRENT, AGE * SMOKE_QUIT_PASTYEAR, AGE * SMOKE_QUIT_PAST1_4, AGE * SMOKE_QUIT_PAST5, SEX * SMOKE_CURRENT, SEX * SMOKE_QUIT_PASTYEAR, SEX * SMOKE_QUIT_PAST1_4, SEX * SMOKE_QUIT_PAST5, DIAB * SMOKE_CURRENT, DIAB * SMOKE_QUIT_PASTYEAR, OBES * SMOKE_QUIT_PASTYEAR, OBES * SMOKE_QUIT_PAST1_4, OBES * SMOKE_QUIT_PAST5, DYSL * SMOKE_CURRENT, DYSL * SMOKE_QUIT_PASTYEAR, HIVA * SMOKE_CURRENT, HIVA * SMOKE_QUIT_PASTYEAR, PREG * SMOKE_CURRENT, PREG * SMOKE_QUIT_PASTYEAR, OHD * SMOKE_CURRENT , OHD * SMOKE_QUIT_PASTYEAR , OHD * SMOKE_QUIT_PAST1_4, OHD * SMOKE_QUIT_PAST5, OTHC_TBCO_INTR * SMOKE_CURRENT , OTHC_TBCO_INTR * SMOKE_QUIT_PASTYEAR, OTHC_TBCO_INTR * SMOKE_QUIT_PAST1_4, OTHC_TBCO_INTR * SMOKE_QUIT_PAST5, INJR * SMOKE_CURRENT, AGE * SMOKE_SH, SEX * SMOKE_SH, DIAB * SMOKE_SH, PERS_OBES * SMOKE_SH, INJR * SMOKE_SH, DYSL * SMOKE_SH, HIVA * SMOKE_SH, PREG * SMOKE_SH, OHD * SMOKE_SH, OTHC_TBCO_INTR * SMOKE_SH)

In these specifications, AGE, INCOME, INCOME_SQ, MIDWEST, YEAR, and UNDERWGT are defined as in the probability models. MCR, MCD, TRI, and UINS indicate the person's primary source of coverage (Medicare, Medicaid or other public coverage, Tricare, or uninsured); private (commercial) insurance is the omitted coverage category.

All other variables are indicator variables for diagnosed conditions: diabetes (DIAB), obesity (OBES), dementia (DEMT), arthritis (ARTH), asthma (ASTH), cancer (CANC), depression (DEPR), injuries (INJ), dyslipidemia (DYSL), HIV-AIDS (HIVA), mental health and substance abuse (MHSA), back conditions (BACK), conditions of the skin (SKIN), pregnancy (PREG), other heard conditions (OHD), and other conditions unrelated to smoking exposure (OTHC_TBCO). The ICD-9 and ICD-10 diagnoses codes that compose these conditions are listed in Appendix Table A.1.

We employed stepwise regression, which successively adds or removes variables based statistical significance (p $\geq$ .15). All variables—including the smoking exposure variables—were allowed to drop from the model if they and none of their interactions terms are statistical significant. Only statistically significant variables remained in the final specification and contribute to the spending estimates.

Medical and pharmacy spending relativity factors were calculated from the final equations (in categories defined by coverage, age, and sex). The spending relativity factors are the ratio of expected medical or pharmacy spending per person per month if all Minnesotans were exposed to smoking and the medical or pharmacy spending per person per month that would occur if none were ever exposed in the same ways. The former scenario was estimated by imputing nonsmokers to current or past smokers according their age and sex distribution, while current and past smokers remain unchanged (TBCO =1). All persons were simulated to be exposed to SHS. The latter scenario was estimated with assigning zero to all current, past, and secondhand smoking categories (TBCO = 0).

- $R_{MED\_TBCO} = \dfrac{\text{(Predicted medical spending per person per month} \mid \text{TBCO=1)}}{\text{(Predicted medical spending per person per month} \mid \text{TBCO=0)}}$

- $R_{RX\_TBCO} = \dfrac{\text{(Predicted pharmacy spending per person per month} \mid \text{TBCO=1)}}{\text{(Predicted pharmacy spending per person per month} \mid \text{TBCO=0)}}$

We used these relativity factors to estimate medical and pharmacy spending of never-smokers by solving the following equations for $MED_{TBCO=0}$ and $Rx_{TBCO=0}$, which measure the spending that would occur if no Minnesota resident had ever smoked:

(1) MED_{APCD} = (P_TBCO * R_{MED_TBCO} * (Predicted medical spending per person per month| TBCO =0)) + (1- P_ TBCO) * $MED_{TBCO=0}$

⇨ $MED_{TBCO=0}$ = MED_{APCD} / (P_ TBCO * R_{MED_TBCO} + 1- P_ TBCO)

(2) Rx_{APCD} = (P_ TBCO * R_{RX_TBCO} * (Predicted pharmacy spending per person per month| TBCO =0)) + (1- P_ TBCO) * $Rx_{TBCO=0}$

⇨ $Rx_{TBCO=0}$ = Rx_{APCD} / (P_ TBCO * R_{RX_TBCO} + 1- P_ TBCO)

In the equations above, MED_{APCD} and Rx_{APCD} are actual medical and pharmacy spending per person per month among service users in the APCD, aggregated across all persons; P_ TBCO is the probability that an individual is exposed to smoking, estimated from the MN BRFSS; and R_{MED_TBCO} and R_{RX_TBCO} are the estimated spending relativity factors, as defined above.

Medical and pharmacy spending (respectively) per person per month attributed to smoking was calculated as the difference between estimated spending if no Minnesotan was exposed to smoking and actual spending in 2016:

(3) (P_MED_{APCD}* MED_{APCD}) - (P(Medical service use | TBCO=0) * $MED_{TBCO=0}$)

(4) (P_Rx_{APCD}* Rx_{APCD}) - (P(Pharmacy use | TBCO=0) * $MED_{TBCO=0}$)

Estimating total cost

Total cost is calculated as spending per person per month attributed to smoking (by coverage, age, and sex) annualized over 12 months. The number of smoking Minnesotans (by age and sex) in each coverage category is estimated as the total percentage of Minnesotans reported as exposed to smoking in the Current Population Survey, Tobacco Use Module multiplied by (1)

the MEPS percentage of all smoking persons in that coverage category in 2016 and (2) the number of persons reported in the MHAS in that coverage category, benchmarked to Minnesota population reported in the ACS.

Obesity

To estimate the probability of service and per-person-per-month cost among persons with obesity, we use three years of MEPS data (2014–2016 for the 2016 estimates) to achieve better precision in estimating cost associated with obesity, and adjust the MEPS person weight for individuals observed in more than one year of a two-year panel. Outliers are defined separately for children and adults, as persons with medical or pharmacy average spending per month at or above the 99.90th percentile among all persons with spending greater than $1, and removed from the data. We were unable to discern any reasonable cost per person attributed to obesity among seniors, so ultimately dropped them from the analysis.

Obesity is a dichotomized indicator, defined differently for adults and children.[30] Adults age 18 to 64 with reported body mass index (BMI) of 30.0 or more are defined as obese.[31] Children age 10 to 18 with BMI greater than the 95th percentile in the United States by age-gender category are defined as obese.[32]

Estimating the probability of medical service and pharmacy use

The probabilities of medical service and pharmacy use, respectively, are estimated using logistic regression models, specified as:

- P (Medical service use) = f (AGE, SEX, INCOME, MIDWEST, calendar year indicators, MCR, MCD, UINS, TRI, OBES, UNDERWGT, YEAR)

- P (Pharmacy use) = f (AGE, SEX, INCOME, MIDWEST, calendar year indicators, MCR, MCD, UINS, TRI, OBES, UNDERWGT, YEAR)

In these models, AGE and INCOME are continuous variables; SEX indicates gender; MIDWEST indicates the MEPS Midwest population sample; and MCR, MCD, UINS, and TRI indicate insurance status during most months of the year (respectively Medicare, Medicaid or other public programs, uninsured, or Tricare). OBES is an indicator variable defined as above. UNDERWGT is defined among adults as BMI less than 18.5; among children it is defined as below the 5th percentile in the United States for the child's age-gender category. YEAR is a

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[30] In developing past estimates, we tested BMI as a continuous variable but found that a dichotomous variable predicted with slightly better precision as well as performance on common model selection criteria including the Akaike information criterion and Bayesian information criterion. In addition, a continuous BMI would require assignment of every obese or non-obese person, respectively, a specific alternative weight to estimate the cost of obesity, an approach that likely would introduce false precision.

[31] See the CDC guidelines for adult obesity (https://www.cdc.gov/obesity/adult/defining.html).

[32] See the CDC guidelines for childhood obesity (https://www.cdc.gov/obesity/childhood/defining.html). We omit children under age 9 in order to use the Minnesota rate of obesity estimated from National Survey of Children's Health for children age 10 to 17 to benchmark the estimates.

vector of indicator variables (2015 and 2016) that capture secular change in each time period relative to the baseline year (2014).

We estimate the change in the probability of service use that would occur if no Minnesotan were obese by calculating relativity factors (in categories defined by coverage, age, and sex) from the logistic regression models above. The relativity factors are defined as the ratio of (1) the probability of medical or pharmacy use among obese persons to (2) the probability of medical or pharmacy spending among non-obese persons:

- $R_{PMED\_OBES} = \dfrac{P(\text{Medical service use} \mid \text{OBES}=1)}{P(\text{Medical service use} \mid \text{OBES}=0)}$

- $R_{PRX\_OBES} = \dfrac{P(\text{Pharmacy use} \mid \text{OBES}=1)}{P(\text{Pharmacy use} \mid \text{OBES}=0)}$

The probability of medical service use among Minnesotans who are non-obese is calculated by solving the following equation for the probability of any service use among non-obese persons in the MN APCD (v19):

(1) P_MED_{APCD} = P_OBES * $R_{PMED\sim OBES}$ * P(Medical service use | OBES = 0)+ (1 – P_OBES) * P(Medical service use | OBES = 0)

⇨ P(Medical service use | OBES = 0) = P_MED_{APCD} / (P_OBES * R_{PMED_OBES} + 1 – P_OBES)

In the equations above, P_MED_{APCD} is the probability of any service use in the APCD among all persons (whether obese or not); P_OBES is the probability of obesity estimated from the MN BRFSS for adults age 18 or older and from CDC's National Health and Nutrition Examination Survey (NHANES)[33] for children; and R_{PMED_OBES} is the probability of medical service relativity factor estimated from MEPS.

A probability-of-use estimate for pharmacy adjusted to the APCD and MN BRFSS rates of obesity in Minnesota is calculated analogously, to produce:

(2) P(Pharmacy use | OBES=0) = P_RX_{APCD} / (P_OBES * RPRX_OBES + 1 – P_OBES)

Estimating per-person-per-month medical and pharmacy cost among service users

We use the same MEPS data to estimate medical and pharmacy spending associated with obesity among medical service and pharmacy users respectively, defining medical service and pharmacy users as persons with per-person-per-month spending equal to at least $1. The spending estimates are based on generalized least-squares (log-linked, gamma distribution) unique-person-level regression models.

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[33] See Childhood Overweight and Obesity Trends at the National Conference of State Legislatures webpage (http://www.ncsl.org/research/health/childhood-obesity-trends-state-rates.aspx#2007).

For each year of interest, we model 5 medical and pharmacy cost models (in total, 10 models). For children (age 10 to 17), we model medical and pharmacy costs in two spending categories:

- Low cost, defined as persons with per-person-per-month medical and pharmacy spending below the 80th percentile within their age category

- High cost, defined as persons with per-person-per-month medical and pharmacy spending at or above the 80th percentile within their age category

Exploiting their larger sample size, we model adults (ages 18 to 64) in three spending categories:

- Low cost, defined as persons with per-person-per-month medical and pharmacy spending below the 80th percentile within their age category

- High cost, defined as persons with per-person-per-month medical and pharmacy spending at or above the 80th percentile but below the 98th percentile within their age category

- Very high cost, defined as persons with per-person-per-month medical and pharmacy spending at or above the 98th percentile in their age category

In each model, the dependent variable is spending per person per month. The control variables include conditions that are independent of obesity (that is, a change in the rate of obesity would not be expected to change the rate of occurrence of the condition) and exclude diagnoses clinically linked to obesity.[34]

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[34] The diagnoses linked to obesity (and therefore omitted from the specifications) are:
- diabetes (DIAB)
- arthritis (ARTH)
- Asthma (ASTH)
- cancers associated with obesity (CANC_OBES)
- congestive heart failure (CHF)
- coronary heart disease (CHD)
- Hypertension (HPER)
- stroke (STRO)
- other cardiovascular disease (OCVD)
- depression (DEPR)
- dyslipidemia (DYSL)
- back problems (BACK)
- decubitus ulcers (removed from SKIN)
- other or ill-defined heart disease (OTHH)

Controlling for demographic factors, family income, Midwest region, and coverage category, the medical and pharmacy spending models are specified as follows for adults (age 18-64):[35]

- Medical spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MIDWEST, YEAR, MCR, MCD, TRI, UINS, UNDERWGT, OBES, DEMT, TBCO, OTH_CANC_O, INJR, HIVA, PNEU, MHSA, SKIN_OBES, PREG, PRNT, PULM_OBES, PERI, RARE, OTHC_OBES, AGE*OBES, AGE*FEMALE, FEMALE*OBES, INJR*OBES, PNEU*OBES, PREG*OBES, PULM_OBES*OBES, PERI*OBES, RARE*OBES)

- Pharmacy spending per month = f (AGE, SEX, INCOME, INCOME_SQ, MIDWEST, YEAR, MCR, MCD, TRI, UINS, UNDERWGT, OBES, DEMT, TBCO, OTH_CANC_O, INJR, HIVA, PNEU, MHSA, SKIN_OBES, PREG, PULM_OBES, PERI, RARE, OTHC_OBES , AGE*OBES, AGE*FEMALE, FEMALE*OBES, INJR*OBES, PNEU*OBES, PREG*OBES, PULM_OBES*OBES, PERI*OBES, RARE*OBES)

In these specifications, AGE, INCOME, INCOME_SQ, MIDWEST, YEAR, and UNDERWGT are defined as in the probability models. MCR, MCD, TRI, and UINS indicate the person's primary source of coverage (Medicare, Medicaid or other public coverage, Tricare, or uninsured); private (commercial) insurance is the omitted coverage category.

Several conditions unrelated to obesity and that occur rarely—rheumatic heart disease (RHEU), cardiomyopathy (CARM), and conduction disorders (COND)—are grouped into a single variable (RARE) to maximize degrees of freedom. Some condition variables—pregnancy (PREG), injury (INJR), pneumonia (PNEU), pulmonary disease not related to obesity (PULM_OBES), acute and other pericardial and endocardial disease (PERI), and rare conditions (RARE)—are interacted with obesity; obesity does not affect the occurrence of these conditions but can affect the health outcomes and cost of treating them.

Similar spending models are used for children. Because HIV-AIDS (HIVA), dementia (DEMT), and acute and other pericardial and endocardial disease (PERI) are rare among children, these conditions are combined with other rare conditions (RARE) and included from the spending models.

The models are edited (via stepwise regression) to remove variables with statistically insignificant associations with per-person-per-month spending (p $\geq$ 0. 15). Only variables with statistically significant associations with per-person-per-month spending remain in the final specification and contribute to the final spending estimates.

Among persons who use medical services and pharmacy, respectively, we estimate the change in the per-person-per-month cost of medical services and pharmacy that would occur if no

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[35] 2013–2014 MEPS edits out ICD-9 diagnosis codes that appear in the data fewer than 20 times. For this reason, we are able to control for two conditions (HIVA and PERI) only with respect to the 2012 data used in the 2012–2014 spending models.

Minnesotan were obese by calculating relativity factors, analogous to the relativity factors estimated for the probability of service use. The medical service use and pharmacy use relativity factors (in categories defined by coverage, age, and sex) are calculated from the final regression models described above in each reference year.

The spending relativity factors are defined as the ratio of expected medical service or pharmacy spending per person per month if all Minnesotans were obese (estimated with OBES = 1) and per-person-per-month medical or pharmacy spending that would occur if none were obese (estimated with OBES = 0):

- $R_{MED\_OBES} = \dfrac{(\text{Predicted medical spending per person per month} \mid OBES=1)}{(\text{Predicted medical spending per person per month} \mid OBES=0)}$

- $R_{RX\_OBES} = \dfrac{(\text{Predicted pharmacy spending per person per month} \mid OBES=1)}{(\text{Predicted pharmacy spending per person per month} \mid OBES=0)}$

In all calculations, the weight of persons who are underweight or pregnant is assumed not to change.[36]

We use these relativity factors to estimate per-person-per-month medical and pharmacy spending among non-obese persons by solving the following equations for $MED_{NON\text{-}OBES}$ (predicted medical services spending per person per month if OBES = 0) and $Rx_{NON\text{-}OBES}$ (predicted pharmacy spending per person per month if OBES = 0):

(1) $MED_{APCD} = (P\_OBES * R_{MED\_OBES} * MED_{NON\text{-}OBES} + (1- P\_OBES) * MED_{NON\text{-}OBES}$

⇨ $MED_{NON\text{-}OBES} = MED_{APCD} / (P\_OBES * R_{MED\_OBES} + 1- P\_OBES)$

(2) $Rx_{APCD} = (P\_OBES * R_{RX\_OBES} * Rx_{NON\text{-}OBES} + (1- P\_OBES) * Rx_{NON\text{-}OBES}$

⇨ $Rx_{NON\text{-}OBES} = Rx_{APCD} / (P\_OBES * R_{RX\_OBES} + 1- P\_OBES)$

In the equations above, MED_{APCD} and Rx_{APCD} are actual medical and pharmacy spending per person per month among service users in the APCD (whether or not obese), thus benchmarking the estimates to spending levels in the APCD. P_OBES is the probability of an individual being obese, estimated from the MN BRFSS or NHANES; and R_{MED_OBES} and R_{RX_OBES} are the estimated spending relativity factors.

Per-person-per-month medical and pharmacy spending associated with obesity are separately calculated as the difference between predicted spending per person per month if no Minnesotan were obese and actual spending per person per month in each year:

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[36] Because MEPS does not adjust BMI for stages of pregnancy or otherwise identify obesity during pregnancy, we do not attempt to estimate the potential cost associated with obesity among pregnant women.

(3) $(\text{P\_MED}_{APCD} * \text{MED}_{APCD}) - (\text{P\_MED}_{NON\text{-}OBES} * \text{MED}_{NON\text{-}OBES})$

(4) $(\text{P\_Rx}_{APCD} * \text{Rx}_{APCD}) - (\text{P\_Rx}_{NON\text{-}OBES} * \text{Rx}_{NON\text{-}OBES})$

Estimating total cost

Total medical and pharmacy spending associated with obesity in each coverage category is calculated as estimated spending per person per month associated with obesity among obese persons (by age and sex), annualized over 12 months and multiplied by the estimated number of obese persons in each coverage category. The number of obese Minnesotans (by age and sex) in each coverage category is estimated as the percentage of all Minnesotans reported as obese in MN BRFSS (adults) or National Survey of Children's Health (children) multiplied by the MEPS percentage of all obese persons in that coverage category and multiplied by the number of persons reported in MHAS in that coverage category. Estimated costs per person are multiplied by the number of persons in each coverage status reported in the MHAS, benchmarked to the total Minnesota population reported in the ACS.

Aggregate spending for selected chronic conditions under age 60

To compare actual and projected spending attributed to selected chronic conditions without double-counting, we developed a separate aggregate estimate of spending attributed to the selected chronic conditions among the population under age 60. This method avoids double-counting spending among persons age 60-64 (attributed spending for these conditions is already incorporated in the estimates developed for the population age 60 or older), and it avoids double counting across conditions among Minnesotans with more than one of the chronic conditions.

We estimate total spending attributed to any (or any combination of) the selected chronic conditions (hypertension, diabetes, dementia, or obesity) by summing across the following estimates:

- For persons with Medicare, private insurance, or Medicaid or other public coverage, we estimate probability-of-use and per-month spending models using the MN APCD and MEPS, as follows:

  o Using the MN APCD, we estimate a probability model that controls jointly for any or any combination of three selected conditions: hypertension or diabetes or dementia. We estimate spending-per-month models (for adults and children by spending level) controlling jointly for any of the conditions, and also for comorbidities unrelated to any of the conditions. Because the model does not control for obesity (which rarely occurs in diagnosis coding), the coefficient estimated for the joint condition indicator picks up spending related to obesity to the extent that it correlates with the joint condition indicator.

  o From MEPS, we model per-month spending attributed to obesity among persons who do not have hypertension, diabetes, or dementia. Obesity is defined as having a diagnosis of obesity or by reference to BMI. The probability and spending models estimated for this population are identical to the models described in Section V.

- For persons enrolled in Tricare or who are uninsured, we estimate probability-of-use and per-month spending models using MEPS. These models control jointly for any of the three selected conditions plus obesity defined by diagnosis or BMI. The spending model further controls for comorbidities unrelated to any of these conditions.

The total cost estimates are calculated by a simulation exercise analogous to that described for the population age 60 or older.

Spending Projections

We project the 2009 estimates for each condition/behavior to 2016, and the 2016 estimates to 2027. Both projection series use the distribution of coverage in Minnesota reported in MHAS (interpolating 2016 from the 2015 and 2017 MHAS). The distribution of coverage in each age/sex group is assumed to remain at 2017 levels through 2027. The projections for each condition assume that the prevalence rate within each age/sex group remains at the base-year levels (in 2009 and 2016, respectively) through 2027.

To project the estimates to 2027, we benchmark to Minnesota population projections by age and sex developed by the Minnesota State Demographic Center. Any further changes in the mix of coverage from 2017 forward or the prevalence of conditions (observed in 2009 and 2016, respectively) are driven only by changes in the size and age/sex distribution of the projected population.

Costs in each year are inflated by a price index derived from (1) the medical component of the Bureau of Labor Statistics' Consumer Price Index – Urban Consumers (CPI-U), nationally and for Minneapolis-St. Paul (MSP); and (2) the Centers for Medicare & Medicaid Services (CMS) National Health Expenditure Accounts (NHEA) estimates and price index, and the CMS State Health Expenditure Accounts (SHEA) estimates for Minnesota. The MSP CPI-U reflects medical-component price increases that are steeper than the national CPI-U medical component, consistent with other analyses conducted for and by MDH. Therefore, it is important that projected spending in Minnesota reflect this faster price growth relative to the national average, when comparing with actual spending in 2016 (at actual 2016 prices).

To develop a Minnesota-specific price index for medical services, we assume that pharmacy prices in Minnesota rise at the national average, and remove pharmacy spending in each year from the NHEA price index, the national CPI-U, and the MSP CPI-U.[37] We remove pharmacy spending from the MSP CPI-U using historic pharmacy spending as a percentage of total personal health care spending in the Minnesota SHEA, updated to each projection year by the 3-year moving average. We take the ratio of NHEA medical services index to the national CPI-U to develop an adjustment factor reflecting differences between the two indices in the weighting of all components of spending, and multiply this factor by the MSP net CPI-U. This adjustment yields a price index for medical services in Minnesota that rises faster than the national NHEA price index, resulting in medical services price growth that is about two percentage points higher in Minnesota than national price growth from 2009 to 2014. Because the price index

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[37] The NHEA price index reflects all services purchased during the year; the CPI-U indices reflect only consumer direct spending for medical services. In the NHEA index, pharmacy spending represents 11 percent of total spending; in the CPI-U, pharmacy spending represents 18 percent of total spending. BLS does not publish a consumer price index for pharmacy spending that is separate from the medical component of the CPI-U.

series produced by this method shows unexplained negative price growth in 2015-2017, we estimated those years by linear interpolation between 2014 to 2018.

Methodological Challenges and Limitations

The methods used to produce cost estimates reflect a number of issues related to the reporting of diagnoses in claims and encounter data—including low rates of (or no) diagnostic coding for some conditions, estimates for payers that do not report to the MN APCD, and the inability to observe some factors that affect health care spending; as well as the need to benchmark all of the estimates for fully insured and self-insured commercial enrollment and claims no longer reported to the MN APCD, as described in Section II. The limitations described below are similar or identical to those described in our 2017 report (which documented methods for the 2015 estimates),[38] with the notable exception of transitioning from ICD-9 to ICD-10 diagnostic coding in the MN APCD and MEPS as described below.

Diagnostic coding

The estimates of spending associated with the selected conditions and risk behaviors reflect the strengths and limitations of analyses based on claims data. Although paid claims enable identification of detailed diagnoses likely to be more accurate and specific than self-reported information, some prevalent conditions—including obesity, smoking status, and prediabetes—are poorly captured in claims data.

In this study, spending attributed to obesity is estimated using relative cost factors derived from the 2016 MEPS public use data adjusted to the Midwest population sample. The MEPS data do not represent Minnesota independent of other Midwestern states, nor do they include spending for long-term care for persons who reside in nursing homes or other institutions. As a result, the obesity cost estimates reflect two major assumptions:

- The relative probability of service use and the relative cost of acute care services in Minnesota due to obesity is equal to the average (by age and sex) among all Midwestern states.

- Long-term care costs in the MN APCD due to obesity differ in the same proportion as acute care costs differ.

Our estimates of the medical cost of smoking exposure also rely on the MN BRFSS and MEPS, and are affected by the same data issues as limit the estimates of obesity. However, in addition, the estimates of smoking exposure are limited by these surveys' questioning—and the questioning in MEPS, in particular. MEPS asks a single question about the respondent's current smoking status and asks this question of only respondents age 18 or older. Consequently, we use linked MEPS and NHIS data for the smoking exposure estimates.

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[38] Methods used to estimate 2014 attributed cost are documented in Chollet, D., J. Li, T. Bell, and Q. Shang, "The Cost of Selected Chronic Diseases and Smoking Exposure." Report submitted to the Minnesota Department of Health (revised November 30, 2017).

Cost estimates for diabetes include only persons with a medical claim and at least one primary or secondary diagnosis of diabetes. However, many people with diabetes might be undiagnosed, and many more might have prediabetes, which, prior to ICD 10 coding, did not correspond to a diagnostic code in medical claims data. Although prediabetes is largely addressed by changes in diet and exercise, in some cases a drug to help control glucose might be prescribed. In the 2009 MN APCD, just 0.3 percent of persons with no diabetes diagnosis and 1.0 percent of those with no medical claims in the APCD had any claim for a glucose control drug such as metformin or glipizide. To maintain comparability with the 2009 estimates, the costs of persons with prediabetes (identifiable since the introduction of ICD 10 coding) are not included in the diabetes estimates.

Lastly, since 2014, MEPS removes ICD diagnosis codes that appear in the data fewer than 20 times. For this reason, we are unable to control for some rare conditions such as HIV-AIDS (HIVA) or acute and other pericardial and endocardial disease (PERI) in the 2016 MEPS spending models.

In future analyses, other factors might complicate comparison of prevalence and therefore spending for chronic conditions over time. Such factors will include the introduction of more explicit/refined diagnosis coding (including but not limited to use of ICD10 coding) and changes in clinical thresholds (such as the 2017 American College of Cardiology/American Heart Association Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure) that trigger diagnosis and treatment.

ICD-9 to ICD-10 code conversion

Since October 1, 2015, health care providers, health plans, and health care clearinghouses have used the International Classification of Diseases, Tenth Revision (ICD-10) system to classify and code diagnoses, symptoms, and procedures codes.[39] Since the change in ICD systems occurred during the calendar year, the 2015 MN APCD includes both sets of codes.

The change from ICD-9 (which had been in use since 1979) to ICD-10 was driven by the need for more clinically accurate data about patients' medical conditions and hospital inpatient procedures. Compared with ICD-9, ICD-10 includes nearly five times as many diagnosis codes (nearly 70,000 codes).

Using the list of ICD-9 diagnosis codes that we used to define chronic conditions in earlier work (for service year 2014), we mapped each condition to one or more ICD-10 classifications using a proprietary tool to search ICD-9 to ICD-10 diagnosis and procedure code general equivalence

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[39] Centers for Disease Control and Prevention (Oct 1, 2015). International Classification of Diseases, (ICD-10-CM/PCS) transition – background. Retrieved on April 10, 2018 from the CDC ICD-10 Transition webpage (https://www.cdc.gov/nchs/icd/icd10cm_pcs_background.htm).

mappings (GEMS). The updated chronic conditions definitions using the list of ICD-10 codes are reported in Table A.1.

An ICD-9 diagnosis code can map to more than one ICD-10 code and conversely, an ICD-10 code can map to more than one ICD9-defined condition. Alternative mappings and our resolution for each are described below:

- If an ICD9 code that helped define a condition mapped to more than one ICD10 code, then all of the ICD10 codes were assigned to that condition. This is common due to the much greater specificity of the ICD10 codes.

- If two ICD9 codes (each contributing to a different condition) map to the same ICD10 code, the ICD10 code is included in both conditions. As a result, some individuals that had been coded as having a single condition became coded as having multiple conditions.

Payers that do not report to the MN APCD

In addition to some commercial insurers, several public payers do not report enrollment and claims data to the APCD—including Tricare, Veterans Affairs benefits, and the Indian Health Service. Moreover, the MN APCD does not account for medical expenditures that do not result in claims—including expenditures by uninsured residents and expenditures for care that is not covered.

The estimates are adjusted to account for payers that do not report. The adjustment for non-reporting commercial payers that report to the HPFSR, but not to the MN APCD is described in Section II. With respect to payers that report to HPFSR but not the MN APCD, or might report to neither system, we assume that their payments per member per month equal the average among those that do report. The adjustments for Tricare members and uninsured residents, which are based on analysis of medical expenditures among Tricare enrollees and the uninsured represented in the public use MEPS data, assume that the incidence and cost of each chronic condition or risk behavior among Tricare enrollees and the uninsured in Minnesota, relative to the privately insured population, are the same as the average in all Midwest states.

Finally, spending for services and medical equipment not covered by health insurance plans is not reported. Currently, long-term care costs among persons not enrolled in Medicaid might account for the largest segment of unreported costs among Medicare and privately insured Minnesotans. However, comparison estimates for 2009 (before implementation of the Affordable Care Act in 2014) may omit significant costs such as prescription drug and mental health and substance abuse services among persons enrolled in private health insurance plans, and all costs that exceeded the annual and lifetime limits that prevailed before 2014.

Unobserved factors that affect projected health care spending

The estimates control for a large number of diagnoses, as well as a resident's age and gender. However, various characteristics that might affect expenditures—such as race and ethnicity—are not observed. As in any analysis of this type, failure to control for an unobserved characteristic that is systematically related the outcome variable can result in projections that are too high or too low, if that characteristic changes over time.

The projections also do not account for other changes that could occur over the course of a decade—including changes in disease prevalence (other than associated with changes in the age and sex distribution of the population) health insurance coverage (other than aging into Medicare), changes in medical technology that affect cost, the introduction of new drugs that can affect cost, or current high-cost drugs going off-patent. Although such "steady state" assumptions are usual when making projections, they can lead to significant error especially in later years of the projection period.

Appendix 7: ICD-9, ICD-10, and ACG Codes Used to Define Conditions in MEPS and the MN APCD

Table A.1. ICD-9, ICD-10, and ACG[40] codes used to define conditions in MEPS and the MN APCD

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
1. Diabetes (DIAB)	250	E08-E13	E08311-E0836, E0840, E0842, E09311-E0936, E0940, E0942, E1010-E139
2. Obesity (OBES)	Reported BMI	Reported BMI	E65-E68, Z6830- Z6845
3. Hypertension (HPER)	401-405 twice or more	I10-I13, I15-I16, N26	I10, I169, N262
4. Dementia (DEMT)	290, 331	F01, F03, G30-G31, G91, G94	F0150-F0151, F0390, F05, G132-G138, G300-G312, G3183-G319, G910, G912, G914, G937, G94
5. Smoking (TBCO)	Reported current smoker (age 18+)	Reported current smoker (age 18+)	Z720
6. Arthritis (ARTH)	714-716	M05-M08, M11-M12, M14-M18, M25	E08618, E09618, E11618, E08618, E09618, E10618, E11618, E13618, M0500-M0809, M0820-M0899, M1200- M1219, M1250-M1389, M150-M1993
7. Asthma (ASTH)	493	J44-J45	J440-J45998
8. Any cancer (CANC)	140-209, 230-239	C00-C96, D00-D49	C000-C866, C882-C964, C969-D099, D3701-D471, D473, D479-D499, Q8500-Q8509
9. Cancers associated with obesity (CANC_OBES)[41]	150, 153, 156, 157, 174 (if AGE>50), 182, 189, 193, 209, 230	C15,C18-C25, C49-C50,C54-C56,C64-C66,C73,C78, C79,C90,D00-D01, D05,D39	Models do not require coding of the condition from this data source.
10. Cancers not associated with obesity (OTH_CANC_O)	140-209 230-239 and CANC_OBES = 0	C00-C14,C16-C17,C26-C48,C51-C53,C57-C63,C67,C69-C72,C74-C77,C80-C88,C91-C96,D02-D04,D06-D09,D3A-D38,D40-D49 and CANC_OBES = 0	Models do not require coding of the condition from this data source.
11. Cancer associated with diabetes (CANC_DIAB)	153,155,157,174,175,179,182,188	C18-C25, C49-C50, C54-C56, C67, C78-C79, C90, D05, D39	C180-C189, C220-C229, C250-C259, C50011-C50929, C540-C55, C670-C679
12. Cancer not associated with diabetes (OTH_CANC_D)	140-209, 230-239 and CANC_DIAB = 0	C00-C17, C23, C26, C30-C34, C37-C48, C51-C53, C57-C77, C80-C88, C91-C96, D00-D04, D09, D3A, D37-D38, D40-D49	C000-C179, C19-C218, C23-C249, C260-C4A9, C510-C539, C561-C669, C680-C866, C882-C964, C969-D099, D3701-D471, D473, D479-D499, Q8500-Q8509

[40] ACGs are assigned using the Johns Hopkins Adjusted Clinical Groups® system

[41] Obesity-related cancers are those reported on the National Cancer Institute's Obesity and Cancer webpage http://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet#q3.

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
13. Cancers associated with smoking (CANC_TBCO)[42]	140-149, 150, 151, 157, 160 – 162, 180, 183, 188, 189, 205, 230, 231, 235	C00-C16,C25,C30-C34,C53,C56-C57,C64-C68,C92,C93,D01,D02,D37,D38,D47	Models do not require coding of the condition from this data source.
14. Cancers not associated with smoking (OTH_CANC_T)	140-209, 230-239 and CANC_TBCO = 0	C17-C24,C26,C37-C52,C54-C55,C58-C63,C69-C91,C94-C96,D03-D09,D3A,D39-D46,D48-D49 and CANC_TBCO = 0	Models do not require coding of the condition from this data source.
15. Congestive heart failure (CHF)	428	I50	I501-I509
16. Coronary artery disease (CAD)	414	I23,I25	I2510, I25119, I253, I259
17. Stroke (STRO)	433-435	G45-G46, I63-I66	G450-G452, G458-G462, I6300-I669, I67841-I67848
18. Other cerebrovascular disease (OCVD)	402; 415-417; 420-423; 429; 436-438	I30, I33, I39, I67-I69	A1884, G454, G463-G468, I110-I119, I230-I238, I2510, I2601-I2782, I2789-I339, I39-I41, I510-I52, I671-I672, I674-I6782, I6789-I69998, I970-I97191, M3212, T800XXA, T81718A, T8172XA, T82817A, T82818A
19. Depression (DEPR)	300, 311	F32, F34, F40-F41, F99,	ACG definition of DEPR
20. Injuries (INJR)	800-846,848-998	A40, A42, D87, E36, G97, J95,K68, L76, M19, M48,M96-M97, R65, S00-S32, S35-S99, T07, T14-T79, T81-T88	A021, A227, A267, A327, A400-A419, A427, A5486, B377, D7801-D7889, E3601-E368, E89810-E8989, G038, G970, G972-G9732, G9748-G9782, H59011-H59369, H59811-H5989, H9521-H9589, I97110-I97191, I973-I9789, J954-J9572, J95830-J95831, J95851-J9589, K6811, K913-K9132, K9161-K91841, K9186-K9189, L0889, L599, L7601-L7682, M1A10X0-M1A19X1, M4840XS, M4841XS, M4842XS, M4843XS, M4844XS, M4845XS, M4846XS, M4847XS, M4848XS, M4850XS, M4851XS, M4852XS, M4853XS, M4854XS, M4855XS, M4856XS, M4857XS, M4858XS, M6790, M8000XS, M80011S, M80012S, M80019S, M80021S, M80022S, M80029S, M80031S, M80032S, M80039S, M80041S, M80042S, M80049S, M80051S, M80052S, M80059S, M80061S, M80062S, M80069S, M80071S, M80072S, M80079S, M8008XS, M8080XS, M80811S, M80812S, M80819S, M80821S, M80822S, M80829S, M80831S, M80832S, M80839S, M80841S, M80842S, M80849S, M80851S, M80852S, M80859S, M80861S, M80862S, M80869S, M80871S, M80872S, M80879S, M8088XS, M8430XS, M84311S,

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[42] Tobacco-related cancers are those reported by the CDC, augmented to also include uterine cancer, nasal and paranasal sinus cancers, and cerebrovascular disease (stroke). See the November 14, 2008 CDC MMWR weekly (http://www.cdc.gov/mmwr/preview/mmwrhtml/ mm5745a3.htm) .

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M84312S, M84319S, M84321S, M84322S, M84329S, M84331S, M84332S, M84333S, M84334S, M84339S, M84341S, M84342S, M84343S, M84344S, M84345S, M84346S, M84350S, M84351S, M84352S, M84353S, M84359S, M84361S, M84362S, M84363S, M84364S, M84369S, M84371S, M84372S, M84373S, M84374S, M84375S, M84376S, M84377S, M84378S, M84379S, M8438XS, M8440XS, M84411S, M84412S, M84419S, M84421S, M84422S, M84429S, M84431S, M84432S, M84433S, M84434S, M84439S, M84441S, M84442S, M84443S, M84444S, M84445S, M84446S, M84451S, M84452S, M84453S, M84454S, M84459S, M84461S, M84462S, M84463S, M84464S, M84469S, M84471S, M84472S, M84473S, M84474S, M84475S, M84476S, M84477S, M84478S, M84479S, M8448XS, M8450XS, M84511S, M84512S, M84519S, M84521S, M84522S, M84529S, M84531S, M84532S, M84533S, M84534S, M84539S, M84541S, M84542S, M84549S, M84550S, M84551S, M84552S, M84553S, M84559S, M84561S, M84562S, M84563S, M84564S, M84569S, M84571S, M84572S, M84573S, M84574S, M84575S, M84576S, M8458XS, M8460XS, M84611S, M84612S, M84619S, M84621S, M84622S, M84629S, M84631S, M84632S, M84633S, M84634S, M84639S, M84641S, M84642S, M84649S, M84650S, M84651S, M84652S, M84653S, M84659S, M84661S, M84662S, M84663S, M84664S, M84669S, M84671S, M84672S, M84673S, M84674S, M84675S, M84676S, M8468XS, M84750S, M84751S, M84752S, M84753S, M84754S, M84755S, M84756S, M84757S, M84758S, M84759S, M960, M96621-M979XXS, M9910-M9919, N981-N990, N99520-N99821, N99840-NODX, R6510-R6521, S0000XA-S020XXB, S020XXS-S02101B, S02101S-S02102B, S02102S-S02109B, S02109S-S0210XB, S0210XS-S02110B, S02110S-S02111B, S02111S-S02112B, S02112S-S02113B, S02113S-S02118B, S02118S-S02119B, S02119S-S0211AB, S0211AS-S0211BB, S0211BS-S0211CB, S0211CS-S0211DB, S0211DS-S0211EB, S0211ES-S0211FB, S0211FS-S0211GB, S0211GS-S0211HB, S0211HS-S0219XB, S0219XS-S022XXB, S022XXS-S0230XB, S0230XS-S0231XB, S0231XS-S0232XB, S0232XS-S023XXB, S023XXS-S02400B, S02400S-S02401B, S02401S-S02402B, S02402S-S0240AB, S0240AS-S0240BB, S0240BS-S0240CB, S0240CS-S0240DB, S0240DS-S0240EB, S0240ES-S0240FB, S0240FS-S02411B, S02411S-S02412B, S02412S-S02413B, S02413S-S0242XB, S0242XS-S025XXB, S025XXS-S02600B, S02600S-S02601B, S02601S-S02602B, S02602S-S02609B, S02609S-S02610B, S02610S-S02611B, S02611S-S02612B, S02612S-S0261XB, S0261XS-S02620B, S02620S-S02621B, S02621S-S02622B, S02622S-S0262XB, S0262XS-S02630B, S02630S-S02631B, S02631S-S02632B, S02632S-S0263XB,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S0263XS-S02640B, S02640S-S02641B, S02641S-S02642B, S02642S-S0264XB, S0264XS-S02650B, S02650S-S02651B, S02651S-S02652B, S02652S-S0265XB, S0265XS-S0266XB, S0266XS-S02670B, S02670S-S02671B, S02671S-S02672B, S02672S-S0267XB, S0267XS-S0269XB, S0269XS-S0280XB, S0280XS-S0281XB, S0281XS-S0282XB, S0282XS-S028XXB, S028XXS-S0291XB, S0291XS-S0292XB, S0292XS-S12000B, S12000S-S12001B, S12001S-S1201XB, S1201XS-S1202XB, S1202XS-S12030B, S12030S-S12031B, S12031S-S12040B, S12040S-S12041B, S12041S-S12090B, S12090S-S12091B, S12091S-S12100B, S12100S-S12101B, S12101S-S12110B, S12110S-S12111B, S12111S-S12112B, S12112S-S12120B, S12120S-S12121B, S12121S-S12130B, S12130S-S12131B, S12131S-S1214XB, S1214XS-S12150B, S12150S-S12151B, S12151S-S12190B, S12190S-S12191B, S12191S-S12200B, S12200S-S12201B, S12201S-S12230B, S12230S-S12231B, S12231S-S1224XB, S1224XS-S12250B, S12250S-S12251B, S12251S-S12290B, S12290S-S12291B, S12291S-S12300B, S12300S-S12301B, S12301S-S12330B, S12330S-S12331B, S12331S-S1234XB, S1234XS-S12350B, S12350S-S12351B, S12351S-S12390B, S12390S-S12391B, S12391S-S12400B, S12400S-S12401B, S12401S-S12430B, S12430S-S12431B, S12431S-S1244XB, S1244XS-S12450B, S12450S-S12451B, S12451S-S12490B, S12490S-S12491B, S12491S-S12500B, S12500S-S12501B, S12501S-S12530B, S12530S-S12531B, S12531S-S1254XB, S1254XS-S12550B, S12550S-S12551B, S12551S-S12590B, S12590S-S12591B, S12591S-S12600B, S12600S-S12601B, S12601S-S12630B, S12630S-S12631B, S12631S-S1264XB, S1264XS-S12650B, S12650S-S12651B, S12651S-S12690B, S12690S-S12691B, S12691S-S1329XS, S134XXS-S135XXS, S138XXS-S159XXS, S161XXS-S22000B, S22000S-S22001B, S22001S-S22002B, S22002S-S22008B, S22008S-S22009B, S22009S-S22010B, S22010S-S22011B, S22011S-S22012B, S22012S-S22018B, S22018S-S22019B, S22019S-S22020B, S22020S-S22021B, S22021S-S22022B, S22022S-S22028B, S22028S-S22029B, S22029S-S22030B, S22030S-S22031B, S22031S-S22032B, S22032S-S22038B, S22038S-S22039B, S22039S-S22040B, S22040S-S22041B, S22041S-S22042B, S22042S-S22048B, S22048S-S22049B, S22049S-S22050B, S22050S-S22051B, S22051S-S22052B, S22052S-S22058B, S22058S-S22059B, S22059S-S22060B, S22060S-S22061B, S22061S-S22062B, S22062S-S22068B, S22068S-S22069B, S22069S-S22070B, S22070S-S22071B, S22071S-S22072B, S22072S-S22078B, S22078S-S22079B, S22079S-S22080B, S22080S-S22081B, S22081S-S22082B, S22082S-S22088B, S22088S-S22089B, S22089S-S2220XB, S2220XS-S2221XB, S2221XS-S2222XB, S2222XS-S2223XB, S2223XS-S2224XB, S2224XS-S2231XB, S2231XS-S2232XB, S2232XS-S2239XB, S2239XS-S2241XB, S2241XS-S2242XB, S2242XS-S2243XB, S2243XS-S2249XB, S2249XS-S225XXB, S225XXS-S229XXB, S229XXS-S2329XS, S233XXS-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S23429S, S238XXS, S239XXS-S32000B, S32000S-S32001B, S32001S-S32002B, S32002S-S32008B, S32008S-S32009B, S32009S-S32010B, S32010S-S32011B, S32011S-S32012B, S32012S-S32018B, S32018S-S32019B, S32019S-S32020B, S32020S-S32021B, S32021S-S32022B, S32022S-S32028B, S32028S-S32029B, S32029S-S32030B, S32030S-S32031B, S32031S-S32032B, S32032S-S32038B, S32038S-S32039B, S32039S-S32040B, S32040S-S32041B, S32041S-S32042B, S32042S-S32048B, S32048S-S32049B, S32049S-S32050B, S32050S-S32051B, S32051S-S32052B, S32052S-S32058B, S32058S-S32059B, S32059S-S3210XB, S3210XS-S32110B, S32110S-S32111B, S32111S-S32112B, S32112S-S32119B, S32119S-S32120B, S32120S-S32121B, S32121S-S32122B, S32122S-S32129B, S32129S-S32130B, S32130S-S32131B, S32131S-S32132B, S32132S-S32139B, S32139S-S3214XB, S3214XS-S3215XB, S3215XS-S3216XB, S3216XS-S3217XB, S3217XS-S3219XB, S3219XS-S322XXB, S322XXS-S32301B, S32301S-S32302B, S32302S-S32309B, S32309S-S32311B, S32311S-S32312B, S32312S-S32313B, S32313S-S32314B, S32314S-S32315B, S32315S-S32316B, S32316S-S32391B, S32391S-S32392B, S32392S-S32399B, S32399S-S32401B, S32401S-S32402B, S32402S-S32409B, S32409S-S32411B, S32411S-S32412B, S32412S-S32413B, S32413S-S32414B, S32414S-S32415B, S32415S-S32416B, S32416S-S32421B, S32421S-S32422B, S32422S-S32423B, S32423S-S32424B, S32424S-S32425B, S32425S-S32426B, S32426S-S32431B, S32431S-S32432B, S32432S-S32433B, S32433S-S32434B, S32434S-S32435B, S32435S-S32436B, S32436S-S32441B, S32441S-S32442B, S32442S-S32443B, S32443S-S32444B, S32444S-S32445B, S32445S-S32446B, S32446S-S32451B, S32451S-S32452B, S32452S-S32453B, S32453S-S32454B, S32454S-S32455B, S32455S-S32456B, S32456S-S32461B, S32461S-S32462B, S32462S-S32463B, S32463S-S32464B, S32464S-S32465B, S32465S-S32466B, S32466S-S32471B, S32471S-S32472B, S32472S-S32473B, S32473S-S32474B, S32474S-S32475B, S32475S-S32476B, S32476S-S32481B, S32481S-S32482B, S32482S-S32483B, S32483S-S32484B, S32484S-S32485B, S32485S-S32486B, S32486S-S32491B, S32491S-S32492B, S32492S-S32499B, S32499S-S32501B, S32501S-S32502B, S32502S-S32509B, S32509S-S32511B, S32511S-S32512B, S32512S-S32519B, S32519S-S32591B, S32591S-S32592B, S32592S-S32599B, S32599S-S32601B, S32601S-S32602B, S32602S-S32609B, S32609S-S32611B, S32611S-S32612B, S32612S-S32613B, S32613S-S32614B, S32614S-S32615B, S32615S-S32616B, S32616S-S32691B, S32691S-S32692B, S32692S-S32699B, S32699S-S32810B, S32810S-S32811B, S32811S-S3282XB, S3282XS-S3289XB, S3289XS-S329XXB, S329XXS-S334XXS, S335XXS-S42001B, S42001S-S42002B, S42002S-S42009B, S42009S-S42011B, S42011S-S42012B, S42012S-S42013B, S42013S-S42014B, S42014S-S42015B, S42015S-S42016B, S42016S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42017B, S42017S-S42018B, S42018S-S42019B, S42019S-S42021B, S42021S-S42022B, S42022S-S42023B, S42023S-S42024B, S42024S-S42025B, S42025S-S42026B, S42026S-S42031B, S42031S-S42032B, S42032S-S42033B, S42033S-S42034B, S42034S-S42035B, S42035S-S42036B, S42036S-S42101B, S42101S-S42102B, S42102S-S42109B, S42109S-S42111B, S42111S-S42112B, S42112S-S42113B, S42113S-S42114B, S42114S-S42115B, S42115S-S42116B, S42116S-S42121B, S42121S-S42122B, S42122S-S42123B, S42123S-S42124B, S42124S-S42125B, S42125S-S42126B, S42126S-S42131B, S42131S-S42132B, S42132S-S42133B, S42133S-S42134B, S42134S-S42135B, S42135S-S42136B, S42136S-S42141B, S42141S-S42142B, S42142S-S42143B, S42143S-S42144B, S42144S-S42145B, S42145S-S42146B, S42146S-S42151B, S42151S-S42152B, S42152S-S42153B, S42153S-S42154B, S42154S-S42155B, S42155S-S42156B, S42156S-S42191B, S42191S-S42192B, S42192S-S42199B, S42199S-S42201B, S42201S-S42202B, S42202S-S42209B, S42209S-S42211B, S42211S-S42212B, S42212S-S42213B, S42213S-S42214B, S42214S-S42215B, S42215S-S42216B, S42216S-S42221B, S42221S-S42222B, S42222S-S42223B, S42223S-S42224B, S42224S-S42225B, S42225S-S42226B, S42226S-S42231B, S42231S-S42232B, S42232S-S42239B, S42239S-S42241B, S42241S-S42242B, S42242S-S42249B, S42249S-S42251B, S42251S-S42252B, S42252S-S42253B, S42253S-S42254B, S42254S-S42255B, S42255S-S42256B, S42256S-S42261B, S42261S-S42262B, S42262S-S42263B, S42263S-S42264B, S42264S-S42265B, S42265S-S42266B, S42266S-S42271A, S42271S-S42272A, S42272S-S42279A, S42279S-S42291B, S42291S-S42292B, S42292S-S42293B, S42293S-S42294B, S42294S-S42295B, S42295S-S42296B, S42296S-S42301B, S42301S-S42302B, S42302S-S42309B, S42309S-S42311A, S42311S-S42312A, S42312S-S42319A, S42319S-S42321B, S42321S-S42322B, S42322S-S42323B, S42323S-S42324B, S42324S-S42325B, S42325S-S42326B, S42326S-S42331B, S42331S-S42332B, S42332S-S42333B, S42333S-S42334B, S42334S-S42335B, S42335S-S42336B, S42336S-S42341B, S42341S-S42342B, S42342S-S42343B, S42343S-S42344B, S42344S-S42345B, S42345S-S42346B, S42346S-S42351B, S42351S-S42352B, S42352S-S42353B, S42353S-S42354B, S42354S-S42355B, S42355S-S42356B, S42356S-S42361B, S42361S-S42362B, S42362S-S42363B, S42363S-S42364B, S42364S-S42365B, S42365S-S42366B, S42366S-S42391B, S42391S-S42392B, S42392S-S42399B, S42399S-S42401B, S42401S-S42402B, S42402S-S42409B, S42409S-S42411B, S42411S-S42412B, S42412S-S42413B, S42413S-S42414B, S42414S-S42415B, S42415S-S42416B, S42416S-S42421B, S42421S-S42422B, S42422S-S42423B, S42423S-S42424B, S42424S-S42425B, S42425S-S42426B, S42426S-S42431B, S42431S-S42432B, S42432S-S42433B, S42433S-S42434B, S42434S-S42435B, S42435S-S42436B,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42436S-S42441B, S42441S-S42442B, S42442S-S42443B, S42443S-S42444B, S42444S-S42445B, S42445S-S42446B, S42446S-S42447B, S42447S-S42448B, S42448S-S42449B, S42449S-S42451B, S42451S-S42452B, S42452S-S42453B, S42453S-S42454B, S42454S-S42455B, S42455S-S42456B, S42456S-S42461B, S42461S-S42462B, S42462S-S42463B, S42463S-S42464B, S42464S-S42465B, S42465S-S42466B, S42466S-S42471B, S42471S-S42472B, S42472S-S42473B, S42473S-S42474B, S42474S-S42475B, S42475S-S42476B, S42476S-S42481A, S42481S-S42482A, S42482S-S42489A, S42489S-S42491B, S42491S-S42492B, S42492S-S42493B, S42493S-S42494B, S42494S-S42495B, S42495S-S42496B, S42496S-S4290XB, S4290XS-S4291XB, S4291XS-S4292XB, S4292XS-S49001A, S49001S-S49002A, S49002S-S49009A, S49009S-S49011A, S49011S-S49012A, S49012S-S49019A, S49019S-S49021A, S49021S-S49022A, S49022S-S49029A, S49029S-S49031A, S49031S-S49032A, S49032S-S49039A, S49039S-S49041A, S49041S-S49042A, S49042S-S49049A, S49049S-S49091A, S49091S-S49092A, S49092S-S49099A, S49099S-S49101A, S49101S-S49102A, S49102S-S49109A, S49109S-S49111A, S49111S-S49112A, S49112S-S49119A, S49119S-S49121A, S49121S-S49122A, S49122S-S49129A, S49129S-S49131A, S49131S-S49132A, S49132S-S49139A, S49139S-S49141A, S49141S-S49142A, S49142S-S49149A, S49149S-S49191A, S49191S-S49192A, S49192S-S49199A, S49199S-S52001C, S52001S-S52002C, S52002S-S52009C, S52009S-S52011A, S52011S-S52012A, S52012S-S52019A, S52019S-S52021C, S52021S-S52022C, S52022S-S52023C, S52023S-S52024C, S52024S-S52025C, S52025S-S52026C, S52026S-S52031C, S52031S-S52032C, S52032S-S52033C, S52033S-S52034C, S52034S-S52035C, S52035S-S52036C, S52036S-S52041C, S52041S-S52042C, S52042S-S52043C, S52043S-S52044C, S52044S-S52045C, S52045S-S52046C, S52046S-S52091C, S52091S-S52092C, S52092S-S52099C, S52099S-S52101C, S52101S-S52102C, S52102S-S52109C, S52109S-S52111A, S52111S-S52112A, S52112S-S52119A, S52119S-S52121C, S52121S-S52122C, S52122S-S52123C, S52123S-S52124C, S52124S-S52125C, S52125S-S52126C, S52126S-S52131C, S52131S-S52132C, S52132S-S52133C, S52133S-S52134C, S52134S-S52135C, S52135S-S52136C, S52136S-S52181C, S52181S-S52182C, S52182S-S52189C, S52189S-S52201C, S52201S-S52202C, S52202S-S52209C, S52209S-S52211A, S52211S-S52212A, S52212S-S52219A, S52219S-S52221C, S52221S-S52222C, S52222S-S52223C, S52223S-S52224C, S52224S-S52225C, S52225S-S52226C, S52226S-S52231C, S52231S-S52232C, S52232S-S52233C, S52233S-S52234C, S52234S-S52235C, S52235S-S52236C, S52236S-S52241C, S52241S-S52242C, S52242S-S52243C, S52243S-S52244C, S52244S-S52245C, S52245S-S52246C, S52246S-S52251C, S52251S-S52252C, S52252S-S52253C, S52253S-S52254C, S52254S-S52255C, S52255S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S52256C, S52256S-S52261C, S52261S-S52262C, S52262S-S52263C, S52263S-S52264C, S52264S-S52265C, S52265S-S52266C, S52266S-S52271C, S52271S-S52272C, S52272S-S52279C, S52279S-S52281C, S52281S-S52282C, S52282S-S52283C, S52283S-S52291C, S52291S-S52292C, S52292S-S52299C, S52299S-S52301C, S52301S-S52302C, S52302S-S52309C, S52309S-S52311A, S52311S-S52312A, S52312S-S52319A, S52319S-S52321C, S52321S-S52322C, S52322S-S52323C, S52323S-S52324C, S52324S-S52325C, S52325S-S52326C, S52326S-S52331C, S52331S-S52332C, S52332S-S52333C, S52333S-S52334C, S52334S-S52335C, S52335S-S52336C, S52336S-S52341C, S52341S-S52342C, S52342S-S52343C, S52343S-S52344C, S52344S-S52345C, S52345S-S52346C, S52346S-S52351C, S52351S-S52352C, S52352S-S52353C, S52353S-S52354C, S52354S-S52355C, S52355S-S52356C, S52356S-S52361C, S52361S-S52362C, S52362S-S52363C, S52363S-S52364C, S52364S-S52365C, S52365S-S52366C, S52366S-S52371C, S52371S-S52372C, S52372S-S52379C, S52379S-S52381C, S52381S-S52382C, S52382S-S52389C, S52389S-S52391C, S52391S-S52392C, S52392S-S52399C, S52399S-S52501C, S52501S-S52502C, S52502S-S52509C, S52509S-S52511C, S52511S-S52512C, S52512S-S52513C, S52513S-S52514C, S52514S-S52515C, S52515S-S52516C, S52516S-S52521A, S52521S-S52522A, S52522S-S52529A, S52529S-S52531C, S52531S-S52532C, S52532S-S52539C, S52539S-S52541C, S52541S-S52542C, S52542S-S52549C, S52549S-S52551C, S52551S-S52552C, S52552S-S52559C, S52559S-S52561C, S52561S-S52562C, S52562S-S52569C, S52569S-S52571C, S52571S-S52572C, S52572S-S52579C, S52579S-S52591C, S52591S-S52592C, S52592S-S52599C, S52599S-S52601C, S52601S-S52602C, S52602S-S52609C, S52609S-S52611C, S52611S-S52612C, S52612S-S52613C, S52613S-S52614C, S52614S-S52615C, S52615S-S52616C, S52616S-S52621A, S52621S-S52622A, S52622S-S52629A, S52629S-S52691C, S52691S-S52692C, S52692S-S52699C, S52699S-S5290XC, S5290XS-S5291XC, S5291XS-S5292XC, S5292XS-S59001A, S59001S-S59002A, S59002S-S59009A, S59009S-S59011A, S59011S-S59012A, S59012S-S59019A, S59019S-S59021A, S59021S-S59022A, S59022S-S59029A, S59029S-S59031A, S59031S-S59032A, S59032S-S59039A, S59039S-S59041A, S59041S-S59042A, S59042S-S59049A, S59049S-S59091A, S59091S-S59092A, S59092S-S59099A, S59099S-S59101A, S59101S-S59102A, S59102S-S59109A, S59109S-S59111A, S59111S-S59112A, S59112S-S59119A, S59119S-S59121A, S59121S-S59122A, S59122S-S59129A, S59129S-S59131A, S59131S-S59132A, S59132S-S59139A, S59139S-S59141A, S59141S-S59142A, S59142S-S59149A, S59149S-S59191A, S59191S-S59192A, S59192S-S59199A, S59199S-S59201A, S59201S-S59202A, S59202S-S59209A, S59209S-S59211A, S59211S-S59212A, S59212S-S59219A, S59219S-S59221A, S59221S-S59222A,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S59222S-S59229A, S59229S-S59231A, S59231S-S59232A, S59232S-S59239A, S59239S-S59241A, S59241S-S59242A, S59242S-S59249A, S59249S-S59291A, S59291S-S59292A, S59292S-S59299A, S59299S-S62001B, S62001S-S62002B, S62002S-S62009B, S62009S-S62011B, S62011S-S62012B, S62012S-S62013B, S62013S-S62014B, S62014S-S62015B, S62015S-S62016B, S62016S-S62021B, S62021S-S62022B, S62022S-S62023B, S62023S-S62024B, S62024S-S62025B, S62025S-S62026B, S62026S-S62031B, S62031S-S62032B, S62032S-S62033B, S62033S-S62034B, S62034S-S62035B, S62035S-S62036B, S62036S-S62101B, S62101S-S62102B, S62102S-S62109B, S62109S-S62111B, S62111S-S62112B, S62112S-S62113B, S62113S-S62114B, S62114S-S62115B, S62115S-S62116B, S62116S-S62121B, S62121S-S62122B, S62122S-S62123B, S62123S-S62124B, S62124S-S62125B, S62125S-S62126B, S62126S-S62131B, S62131S-S62132B, S62132S-S62133B, S62133S-S62134B, S62134S-S62135B, S62135S-S62136B, S62136S-S62141B, S62141S-S62142B, S62142S-S62143B, S62143S-S62144B, S62144S-S62145B, S62145S-S62146B, S62146S-S62151B, S62151S-S62152B, S62152S-S62153B, S62153S-S62154B, S62154S-S62155B, S62155S-S62156B, S62156S-S62161B, S62161S-S62162B, S62162S-S62163B, S62163S-S62164B, S62164S-S62165B, S62165S-S62166B, S62166S-S62171B, S62171S-S62172B, S62172S-S62173B, S62173S-S62174B, S62174S-S62175B, S62175S-S62176B, S62176S-S62181B, S62181S-S62182B, S62182S-S62183B, S62183S-S62184B, S62184S-S62185B, S62185S-S62186B, S62186S-S62201B, S62201S-S62202B, S62202S-S62209B, S62209S-S62211B, S62211S-S62212B, S62212S-S62213B, S62213S-S62221B, S62221S-S62222B, S62222S-S62223B, S62223S-S62224B, S62224S-S62225B, S62225S-S62226B, S62226S-S62231B, S62231S-S62232B, S62232S-S62233B, S62233S-S62234B, S62234S-S62235B, S62235S-S62236B, S62236S-S62241B, S62241S-S62242B, S62242S-S62243B, S62243S-S62244B, S62244S-S62245B, S62245S-S62246B, S62246S-S62251B, S62251S-S62252B, S62252S-S62253B, S62253S-S62254B, S62254S-S62255B, S62255S-S62256B, S62256S-S62291B, S62291S-S62292B, S62292S-S62299B, S62299S-S62300B, S62300S-S62301B, S62301S-S62302B, S62302S-S62303B, S62303S-S62304B, S62304S-S62305B, S62305S-S62306B, S62306S-S62307B, S62307S-S62308B, S62308S-S62309B, S62309S-S62310B, S62310S-S62311B, S62311S-S62312B, S62312S-S62313B, S62313S-S62314B, S62314S-S62315B, S62315S-S62316B, S62316S-S62317B, S62317S-S62318B, S62318S-S62319B, S62319S-S62320B, S62320S-S62321B, S62321S-S62322B, S62322S-S62323B, S62323S-S62324B, S62324S-S62325B, S62325S-S62326B, S62326S-S62327B, S62327S-S62328B, S62328S-S62329B, S62329S-S62330B, S62330S-S62331B, S62331S-S62332B, S62332S-S62333B, S62333S-S62334B, S62334S-S62335B, S62335S-S62336B, S62336S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62337B, S62337S-S62338B, S62338S-S62339B, S62339S-S62340B, S62340S-S62341B, S62341S-S62342B, S62342S-S62343B, S62343S-S62344B, S62344S-S62345B, S62345S-S62346B, S62346S-S62347B, S62347S-S62348B, S62348S-S62349B, S62349S-S62350B, S62350S-S62351B, S62351S-S62352B, S62352S-S62353B, S62353S-S62354B, S62354S-S62355B, S62355S-S62356B, S62356S-S62357B, S62357S-S62358B, S62358S-S62359B, S62359S-S62360B, S62360S-S62361B, S62361S-S62362B, S62362S-S62363B, S62363S-S62364B, S62364S-S62365B, S62365S-S62366B, S62366S-S62367B, S62367S-S62368B, S62368S-S62369B, S62369S-S62390B, S62390S-S62391B, S62391S-S62392B, S62392S-S62393B, S62393S-S62394B, S62394S-S62395B, S62395S-S62396B, S62396S-S62397B, S62397S-S62398B, S62398S-S62399B, S62399S-S62501B, S62501S-S62502B, S62502S-S62509B, S62509S-S62511B, S62511S-S62512B, S62512S-S62513B, S62513S-S62514B, S62514S-S62515B, S62515S-S62516B, S62516S-S62521B, S62521S-S62522B, S62522S-S62523B, S62523S-S62524B, S62524S-S62525B, S62525S-S62526B, S62526S-S62600B, S62600S-S62601B, S62601S-S62602B, S62602S-S62603B, S62603S-S62604B, S62604S-S62605B, S62605S-S62606B, S62606S-S62607B, S62607S-S62608B, S62608S-S62609B, S62609S-S62610B, S62610S-S62611B, S62611S-S62612B, S62612S-S62613B, S62613S-S62614B, S62614S-S62615B, S62615S-S62616B, S62616S-S62617B, S62617S-S62618B, S62618S-S62619B, S62619S-S62620B, S62620S-S62621B, S62621S-S62622B, S62622S-S62623B, S62623S-S62624B, S62624S-S62625B, S62625S-S62626B, S62626S-S62627B, S62627S-S62628B, S62628S-S62629B, S62629S-S62630B, S62630S-S62631B, S62631S-S62632B, S62632S-S62633B, S62633S-S62634B, S62634S-S62635B, S62635S-S62636B, S62636S-S62637B, S62637S-S62638B, S62638S-S62639B, S62639S-S62640B, S62640S-S62641B, S62641S-S62642B, S62642S-S62643B, S62643S-S62644B, S62644S-S62645B, S62645S-S62646B, S62646S-S62647B, S62647S-S62648B, S62648S-S62649B, S62649S-S62650B, S62650S-S62651B, S62651S-S62652B, S62652S-S62653B, S62653S-S62654B, S62654S-S62655B, S62655S-S62656B, S62656S-S62657B, S62657S-S62658B, S62658S-S62659B, S62659S-S62660B, S62660S-S62661B, S62661S-S62662B, S62662S-S62663B, S62663S-S62664B, S62664S-S62665B, S62665S-S62666B, S62666S-S62667B, S62667S-S62668B, S62668S-S62669B, S62669S-S6290XB, S6290XS-S6291XB, S6291XS-S6292XB, S6292XS-S72001C, S72001S-S72002C, S72002S-S72009C, S72009S-S72011C, S72011S-S72012C, S72012S-S72019C, S72019S-S72021C, S72021S-S72022C, S72022S-S72023C, S72023S-S72024C, S72024S-S72025C, S72025S-S72026C, S72026S-S72031C, S72031S-S72032C, S72032S-S72033C, S72033S-S72034C, S72034S-S72035C, S72035S-S72036C, S72036S-S72041C, S72041S-S72042C, S72042S-S72043C, S72043S-S72044C,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S72044S-S72045C, S72045S-S72046C, S72046S-S72051C, S72051S-S72052C, S72052S-S72059C, S72059S-S72061C, S72061S-S72062C, S72062S-S72063C, S72063S-S72064C, S72064S-S72065C, S72065S-S72066C, S72066S-S72091C, S72091S-S72092C, S72092S-S72099C, S72099S-S72101C, S72101S-S72102C, S72102S-S72109C, S72109S-S72111C, S72111S-S72112C, S72112S-S72113C, S72113S-S72114C, S72114S-S72115C, S72115S-S72116C, S72116S-S72121C, S72121S-S72122C, S72122S-S72123C, S72123S-S72124C, S72124S-S72125C, S72125S-S72126C, S72126S-S72131C, S72131S-S72132C, S72132S-S72133C, S72133S-S72134C, S72134S-S72135C, S72135S-S72136C, S72136S-S72141C, S72141S-S72142C, S72142S-S72143C, S72143S-S72144C, S72144S-S72145C, S72145S-S72146C, S72146S-S7221XC, S7221XS-S7222XC, S7222XS-S7223XC, S7223XS-S7224XC, S7224XS-S7225XC, S7225XS-S7226XC, S7226XS-S72301C, S72301S-S72302C, S72302S-S72309C, S72309S-S72321C, S72321S-S72322C, S72322S-S72323C, S72323S-S72324C, S72324S-S72325C, S72325S-S72326C, S72326S-S72331C, S72331S-S72332C, S72332S-S72333C, S72333S-S72334C, S72334S-S72335C, S72335S-S72336C, S72336S-S72341C, S72341S-S72342C, S72342S-S72343C, S72343S-S72344C, S72344S-S72345C, S72345S-S72346C, S72346S-S72351C, S72351S-S72352C, S72352S-S72353C, S72353S-S72354C, S72354S-S72355C, S72355S-S72356C, S72356S-S72361C, S72361S-S72362C, S72362S-S72363C, S72363S-S72364C, S72364S-S72365C, S72365S-S72366C, S72366S-S72391C, S72391S-S72392C, S72392S-S72399C, S72399S-S72401C, S72401S-S72402C, S72402S-S72409C, S72409S-S72411C, S72411S-S72412C, S72412S-S72413C, S72413S-S72414C, S72414S-S72415C, S72415S-S72416C, S72416S-S72421C, S72421S-S72422C, S72422S-S72423C, S72423S-S72424C, S72424S-S72425C, S72425S-S72426C, S72426S-S72431C, S72431S-S72432C, S72432S-S72433C, S72433S-S72434C, S72434S-S72435C, S72435S-S72436C, S72436S-S72441C, S72441S-S72442C, S72442S-S72443C, S72443S-S72444C, S72444S-S72445C, S72445S-S72446C, S72446S-S72451C, S72451S-S72452C, S72452S-S72453C, S72453S-S72454C, S72454S-S72455C, S72455S-S72456C, S72456S-S72461C, S72461S-S72462C, S72462S-S72463C, S72463S-S72464C, S72464S-S72465C, S72465S-S72466C, S72466S-S72471A, S72471S-S72472A, S72472S-S72479A, S72479S-S72491C, S72491S-S72492C, S72492S-S72499C, S72499S-S728X1C, S728X1S-S728X2C, S728X2S-S728X9C, S728X9S-S7290XE, S7290XS-S7291XE, S7291XS-S7292XE, S7292XS-S79001A, S79001S-S79002A, S79002S-S79009A, S79009S-S79011A, S79011S-S79012A, S79012S-S79019A, S79019S-S79091A, S79091S-S79092A, S79092S-S79099A, S79099S-S79101A, S79101S-S79102A, S79102S-S79109A, S79109S-S79111A, S79111S-S79112A, S79112S-S79119A, S79119S-S79121A, S79121S-S79122A, S79122S-S79129A, S79129S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S79131A, S79131S-S79132A, S79132S-S79139A, S79139S-S79141A, S79141S-S79142A, S79142S-S79149A, S79149S-S79191A, S79191S-S79192A, S79192S-S79199A, S79199S-S82001C, S82001S-S82002C, S82002S-S82009C, S82009S-S82011C, S82011S-S82012C, S82012S-S82013C, S82013S-S82014C, S82014S-S82015C, S82015S-S82016C, S82016S-S82021C, S82021S-S82022C, S82022S-S82023C, S82023S-S82024C, S82024S-S82025C, S82025S-S82026C, S82026S-S82031C, S82031S-S82032C, S82032S-S82033C, S82033S-S82034C, S82034S-S82035C, S82035S-S82036C, S82036S-S82041C, S82041S-S82042C, S82042S-S82043C, S82043S-S82044C, S82044S-S82045C, S82045S-S82046C, S82046S-S82091C, S82091S-S82092C, S82092S-S82099C, S82099S-S82101C, S82101S-S82102C, S82102S-S82109C, S82109S-S82111C, S82111S-S82112C, S82112S-S82113C, S82113S-S82114C, S82114S-S82115C, S82115S-S82116C, S82116S-S82121C, S82121S-S82122C, S82122S-S82123C, S82123S-S82124C, S82124S-S82125C, S82125S-S82126C, S82126S-S82131C, S82131S-S82132C, S82132S-S82133C, S82133S-S82134C, S82134S-S82135C, S82135S-S82136C, S82136S-S82141C, S82141S-S82142C, S82142S-S82143C, S82143S-S82144C, S82144S-S82145C, S82145S-S82146C, S82146S-S82151C, S82151S-S82152C, S82152S-S82153C, S82153S-S82154C, S82154S-S82155C, S82155S-S82156C, S82156S-S82161A, S82161S-S82162A, S82162S-S82169A, S82169S-S82191C, S82191S-S82192C, S82192S-S82199C, S82199S-S82201C, S82201S-S82202C, S82202S-S82209C, S82209S-S82221C, S82221S-S82222C, S82222S-S82223C, S82223S-S82224C, S82224S-S82225C, S82225S-S82226C, S82226S-S82231C, S82231S-S82232C, S82232S-S82233C, S82233S-S82234C, S82234S-S82235C, S82235S-S82236C, S82236S-S82241C, S82241S-S82242C, S82242S-S82243C, S82243S-S82244C, S82244S-S82245C, S82245S-S82246C, S82246S-S82251C, S82251S-S82252C, S82252S-S82253C, S82253S-S82254C, S82254S-S82255C, S82255S-S82256C, S82256S-S82261C, S82261S-S82262C, S82262S-S82263C, S82263S-S82264C, S82264S-S82265C, S82265S-S82266C, S82266S-S82291C, S82291S-S82292C, S82292S-S82299C, S82299S-S82301C, S82301S-S82302C, S82302S-S82309C, S82309S-S82311A, S82311S-S82312A, S82312S-S82319A, S82319S-S82391C, S82391S-S82392C, S82392S-S82399C, S82399S-S82401C, S82401S-S82402C, S82402S-S82409C, S82409S-S82421C, S82421S-S82422C, S82422S-S82423C, S82423S-S82424C, S82424S-S82425C, S82425S-S82426C, S82426S-S82431C, S82431S-S82432C, S82432S-S82433C, S82433S-S82434C, S82434S-S82435C, S82435S-S82436C, S82436S-S82441C, S82441S-S82442C, S82442S-S82443C, S82443S-S82444C, S82444S-S82445C, S82445S-S82446C, S82446S-S82451C, S82451S-S82452C, S82452S-S82453C, S82453S-S82454C, S82454S-S82455C, S82455S-S82456C, S82456S-S82461C, S82461S-S82462C, S82462S-S82463C,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82463S-S82464C, S82464S-S82465C, S82465S-S82466C, S82466S-S82491C, S82491S-S82492C, S82492S-S82499C, S82499S-S8251XC, S8251XS-S8252XC, S8252XS-S8253XC, S8253XS-S8254XC, S8254XS-S8255XC, S8255XS-S8256XC, S8256XS-S8261XC, S8261XS-S8262XC, S8262XS-S8263XC, S8263XS-S8264XC, S8264XS-S8265XC, S8265XS-S8266XC, S8266XS-S82811A, S82811S-S82812A, S82812S-S82819A, S82819S-S82821A, S82821S-S82822A, S82822S-S82829A, S82829S-S82831C, S82831S-S82832C, S82832S-S82839C, S82839S-S82841C, S82841S-S82842C, S82842S-S82843C, S82843S-S82844C, S82844S-S82845C, S82845S-S82846C, S82846S-S82851C, S82851S-S82852C, S82852S-S82853C, S82853S-S82854C, S82854S-S82855C, S82855S-S82856C, S82856S-S82861C, S82861S-S82862C, S82862S-S82863C, S82863S-S82864C, S82864S-S82865C, S82865S-S82866C, S82866S-S82871C, S82871S-S82872C, S82872S-S82873C, S82873S-S82874C, S82874S-S82875C, S82875S-S82876C, S82876S-S82891C, S82891S-S82892C, S82892S-S82899C, S82899S-S8290XC, S8290XS-S8291XC, S8291XS-S8292XC, S8292XS-S89001A, S89001S-S89002A, S89002S-S89009A, S89009S-S89011A, S89011S-S89012A, S89012S-S89019A, S89019S-S89021A, S89021S-S89022A, S89022S-S89029A, S89029S-S89031A, S89031S-S89032A, S89032S-S89039A, S89039S-S89041A, S89041S-S89042A, S89042S-S89049A, S89049S-S89091A, S89091S-S89092A, S89092S-S89099A, S89099S-S89101A, S89101S-S89102A, S89102S-S89109A, S89109S-S89111A, S89111S-S89112A, S89112S-S89119A, S89119S-S89121A, S89121S-S89122A, S89122S-S89129A, S89129S-S89131A, S89131S-S89132A, S89132S-S89139A, S89139S-S89141A, S89141S-S89142A, S89142S-S89149A, S89149S-S89191A, S89191S-S89192A, S89192S-S89199A, S89199S-S89201A, S89201S-S89202A, S89202S-S89209A, S89209S-S89211A, S89211S-S89212A, S89212S-S89219A, S89219S-S89221A, S89221S-S89222A, S89222S-S89229A, S89229S-S89291A, S89291S-S89292A, S89292S-S89299A, S89299S-S89301A, S89301S-S89302A, S89302S-S89309A, S89309S-S89311A, S89311S-S89312A, S89312S-S89319A, S89319S-S89321A, S89321S-S89322A, S89322S-S89329A, S89329S-S89391A, S89391S-S89392A, S89392S-S89399A, S89399S-S92001B, S92001S-S92002B, S92002S-S92009B, S92009S-S92011B, S92011S-S92012B, S92012S-S92013B, S92013S-S92014B, S92014S-S92015B, S92015S-S92016B, S92016S-S92021B, S92021S-S92022B, S92022S-S92023B, S92023S-S92024B, S92024S-S92025B, S92025S-S92026B, S92026S-S92031B, S92031S-S92032B, S92032S-S92033B, S92033S-S92034B, S92034S-S92035B, S92035S-S92036B, S92036S-S92041B, S92041S-S92042B, S92042S-S92043B, S92043S-S92044B, S92044S-S92045B, S92045S-S92046B, S92046S-S92051B, S92051S-S92052B, S92052S-S92053B, S92053S-S92054B, S92054S-S92055B, S92055S-S92056B, S92056S-S92061B, S92061S-S92062B, S92062S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92063B, S92063S-S92064B, S92064S-S92065B, S92065S-S92066B, S92066S-S92101B, S92101S-S92102B, S92102S-S92109B, S92109S-S92111B, S92111S-S92112B, S92112S-S92113B, S92113S-S92114B, S92114S-S92115B, S92115S-S92116B, S92116S-S92121B, S92121S-S92122B, S92122S-S92123B, S92123S-S92124B, S92124S-S92125B, S92125S-S92126B, S92126S-S92131B, S92131S-S92132B, S92132S-S92133B, S92133S-S92134B, S92134S-S92135B, S92135S-S92136B, S92136S-S92141B, S92141S-S92142B, S92142S-S92143B, S92143S-S92144B, S92144S-S92145B, S92145S-S92146B, S92146S-S92151B, S92151S-S92152B, S92152S-S92153B, S92153S-S92154B, S92154S-S92155B, S92155S-S92156B, S92156S-S92191B, S92191S-S92192B, S92192S-S92199B, S92199S-S92201B, S92201S-S92202B, S92202S-S92209B, S92209S-S92211B, S92211S-S92212B, S92212S-S92213B, S92213S-S92214B, S92214S-S92215B, S92215S-S92216B, S92216S-S92221B, S92221S-S92222B, S92222S-S92223B, S92223S-S92224B, S92224S-S92225B, S92225S-S92226B, S92226S-S92231B, S92231S-S92232B, S92232S-S92233B, S92233S-S92234B, S92234S-S92235B, S92235S-S92236B, S92236S-S92241B, S92241S-S92242B, S92242S-S92243B, S92243S-S92244B, S92244S-S92245B, S92245S-S92246B, S92246S-S92251B, S92251S-S92252B, S92252S-S92253B, S92253S-S92254B, S92254S-S92255B, S92255S-S92256B, S92256S-S92301B, S92301S-S92302B, S92302S-S92309B, S92309S-S92311B, S92311S-S92312B, S92312S-S92313B, S92313S-S92314B, S92314S-S92315B, S92315S-S92316B, S92316S-S92321B, S92321S-S92322B, S92322S-S92323B, S92323S-S92324B, S92324S-S92325B, S92325S-S92326B, S92326S-S92331B, S92331S-S92332B, S92332S-S92333B, S92333S-S92334B, S92334S-S92335B, S92335S-S92336B, S92336S-S92341B, S92341S-S92342B, S92342S-S92343B, S92343S-S92344B, S92344S-S92345B, S92345S-S92346B, S92346S-S92351B, S92351S-S92352B, S92352S-S92353B, S92353S-S92354B, S92354S-S92355B, S92355S-S92356B, S92356S-S92401B, S92401S-S92402B, S92402S-S92403B, S92403S-S92404B, S92404S-S92405B, S92405S-S92406B, S92406S-S92411B, S92411S-S92412B, S92412S-S92413B, S92413S-S92414B, S92414S-S92415B, S92415S-S92416B, S92416S-S92421B, S92421S-S92422B, S92422S-S92423B, S92423S-S92424B, S92424S-S92425B, S92425S-S92426B, S92426S-S92491B, S92491S-S92492B, S92492S-S92499B, S92499S-S92501B, S92501S-S92502B, S92502S-S92503B, S92503S-S92504B, S92504S-S92505B, S92505S-S92506B, S92506S-S92511B, S92511S-S92512B, S92512S-S92513B, S92513S-S92514B, S92514S-S92515B, S92515S-S92516B, S92516S-S92521B, S92521S-S92522B, S92522S-S92523B, S92523S-S92524B, S92524S-S92525B, S92525S-S92526B, S92526S-S92531B, S92531S-S92532B, S92532S-S92533B, S92533S-S92534B, S92534S-S92535B, S92535S-S92536B, S92536S-S92591B, S92591S-S92592B,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92592S-S92599B, S92599S-S92811B, S92811S-S92812B, S92812S-S92819B, S92819S-S92901B, S92901S-S92902B, S92902S-S92909B, S92909S-S92911B, S92911S-S92912B, S92912S-S92919B, S92919S-S99001B, S99001S-S99002B, S99002S-S99009B, S99009S-S99011B, S99011S-S99012B, S99012S-S99019B, S99019S-S99021B, S99021S-S99022B, S99022S-S99029B, S99029S-S99031B, S99031S-S99032B, S99032S-S99039B, S99039S-S99041B, S99041S-S99042B, S99042S-S99049B, S99049S-S99091B, S99091S-S99092B, S99092S-S99099B, S99099S-S99101B, S99101S-S99102B, S99102S-S99109B, S99109S-S99111B, S99111S-S99112B, S99112S-S99119B, S99119S-S99121B, S99121S-S99122B, S99122S-S99129B, S99129S-S99131B, S99131S-S99132B, S99132S-S99139B, S99139S-S99141B, S99141S-S99142B, S99142S-S99149B, S99149S-S99191B, S99191S-S99192B, S99192S-S99199B, S99199S-S99201B, S99201S-S99202B, S99202S-S99209B, S99209S-S99211B, S99211S-S99212B, S99212S-S99219B, S99219S-S99221B, S99221S-S99222B, S99222S-S99229B, S99229S-S99231B, S99231S-S99232B, S99232S-S99239B, S99239S-S99241B, S99241S-S99242B, S99242S-S99249B, S99249S-S99291B, S99291S-S99292B, S99292S-S99299B, S99299S-T79A9XS, T800XXS, T801XXS, T80211S, T80212S, T80218S, T80219S, T8022XS, T8029XS, T8030XS, T80310S, T80311S, T80319S, T8039XS, T8040XS, T80410S, T80411S, T80419S, T8049XS, T8051XS, T8052XS, T8059XS, T8061XS, T8062XS, T8069XS, T80810S, T80818S, T8089XS, T8090XS, T80910S, T80911S, T80919S, T8092XS, T80A0XS, T80A10S, T80A11S, T80A19S, T80A9XS-T8172XS, T8181XS-T836XXS, T83711S-T83719S, T83721S-T879, T880XXS, T881XXS-T883XXS, T884XXS-T886XXS, T887XXS-T888XXS, T889XXS
21. Injuries not related to diabetes (INJR_DIAB)	800-846,848-997	N/A	A021, A227, A267, A327, A400-A419, A427, A5486, B377, D7801-D7889, E3601-E368, E89810-E8989, G038, G970, G972-G9732, G9748-G9782, H59011-H59369, H59811-H5989, H9521-H9589, I97110-I97191, I973-I9789, J954-J9572, J95830-J95831, J95851-J9589, K6811, K913-K9132, K9161-K91841, K9186-K9189, L0889, L599, L7601-L7682, M1A10X0-M1A19X1, M4840XS, M4841XS, M4842XS, M4843XS, M4844XS, M4845XS, M4846XS, M4847XS, M4848XS, M4850XS, M4851XS, M4852XS, M4853XS, M4854XS, M4855XS, M4856XS, M4857XS, M4858XS, M6790, M8000XS, M80011S, M80012S, M80019S, M80021S, M80022S, M80029S, M80031S, M80032S, M80039S, M80041S, M80042S, M80049S, M80051S, M80052S, M80059S, M80061S, M80062S, M80069S, M80071S, M80072S, M80079S, M8008XS, M8080XS, M80811S, M80812S, M80819S, M80821S, M80822S, M80829S, M80831S, M80832S, M80839S, M80841S, M80842S, M80849S, M80851S, M80852S, M80859S, M80861S, M80862S,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M80869S, M80871S, M80872S, M80879S, M8088XS, M8430XS, M84311S, M84312S, M84319S, M84321S, M84322S, M84329S, M84331S, M84332S, M84333S, M84334S, M84339S, M84341S, M84342S, M84343S, M84344S, M84345S, M84346S, M84350S, M84351S, M84352S, M84353S, M84359S, M84361S, M84362S, M84363S, M84364S, M84369S, M84371S, M84372S, M84373S, M84374S, M84375S, M84376S, M84377S, M84378S, M84379S, M8438XS, M8440XS, M84411S, M84412S, M84419S, M84421S, M84422S, M84429S, M84431S, M84432S, M84433S, M84434S, M84439S, M84441S, M84442S, M84443S, M84444S, M84445S, M84446S, M84451S, M84452S, M84453S, M84454S, M84459S, M84461S, M84462S, M84463S, M84464S, M84469S, M84471S, M84472S, M84473S, M84474S, M84475S, M84476S, M84477S, M84478S, M84479S, M8448XS, M8450XS, M84511S, M84512S, M84519S, M84521S, M84522S, M84529S, M84531S, M84532S, M84533S, M84534S, M84539S, M84541S, M84542S, M84549S, M84550S, M84551S, M84552S, M84553S, M84559S, M84561S, M84562S, M84563S, M84564S, M84569S, M84571S, M84572S, M84573S, M84574S, M84575S, M84576S, M8458XS, M8460XS, M84611S, M84612S, M84619S, M84621S, M84622S, M84629S, M84631S, M84632S, M84633S, M84634S, M84639S, M84641S, M84642S, M84649S, M84650S, M84651S, M84652S, M84653S, M84659S, M84661S, M84662S, M84663S, M84664S, M84669S, M84671S, M84672S, M84673S, M84674S, M84675S, M84676S, M8468XS, M84750S, M84751S, M84752S, M84753S, M84754S, M84755S, M84756S, M84757S, M84758S, M84759S, M960, M96621-M979XXS, M9910-M9919, N981-N990, N99520-N99821, N99840-NODX, R6510-R6521, S0000XA-S020XXB, S020XXS-S02101B, S02101S-S02102B, S02102S-S02109B, S02109S-S0210XB, S0210XS-S02110B, S02110S-S02111B, S02111S-S02112B, S02112S-S02113B, S02113S-S02118B, S02118S-S02119B, S02119S-S0211AB, S0211AS-S0211BB, S0211BS-S0211CB, S0211CS-S0211DB, S0211DS-S0211EB, S0211ES-S0211FB, S0211FS-S0211GB, S0211GS-S0211HB, S0211HS-S0219XB, S0219XS-S022XXB, S022XXS-S0230XB, S0230XS-S0231XB, S0231XS-S0232XB, S0232XS-S023XXB, S023XXS-S02400B, S02400S-S02401B, S02401S-S02402B, S02402S-S0240AB, S0240AS-S0240BB, S0240BS-S0240CB, S0240CS-S0240DB, S0240DS-S0240EB, S0240ES-S0240FB, S0240FS-S02411B, S02411S-S02412B, S02412S-S02413B, S02413S-S0242XB, S0242XS-S025XXB, S025XXS-S02600B, S02600S-S02601B, S02601S-S02602B, S02602S-S02609B, S02609S-S02610B, S02610S-S02611B, S02611S-S02612B, S02612S-S0261XB, S0261XS-S02620B, S02620S-S02621B, S02621S-S02622B, S02622S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S0262XB, S0262XS-S02630B, S02630S-S02631B, S02631S-S02632B, S02632S-S0263XB, S0263XS-S02640B, S02640S-S02641B, S02641S-S02642B, S02642S-S0264XB, S0264XS-S02650B, S02650S-S02651B, S02651S-S02652B, S02652S-S0265XB, S0265XS-S0266XB, S0266XS-S02670B, S02670S-S02671B, S02671S-S02672B, S02672S-S0267XB, S0267XS-S0269XB, S0269XS-S0280XB, S0280XS-S0281XB, S0281XS-S0282XB, S0282XS-S028XXB, S028XXS-S0291XB, S0291XS-S0292XB, S0292XS-S12000B, S12000S-S12001B, S12001S-S1201XB, S1201XS-S1202XB, S1202XS-S12030B, S12030S-S12031B, S12031S-S12040B, S12040S-S12041B, S12041S-S12090B, S12090S-S12091B, S12091S-S12100B, S12100S-S12101B, S12101S-S12110B, S12110S-S12111B, S12111S-S12112B, S12112S-S12120B, S12120S-S12121B, S12121S-S12130B, S12130S-S12131B, S12131S-S1214XB, S1214XS-S12150B, S12150S-S12151B, S12151S-S12190B, S12190S-S12191B, S12191S-S12200B, S12200S-S12201B, S12201S-S12230B, S12230S-S12231B, S12231S-S1224XB, S1224XS-S12250B, S12250S-S12251B, S12251S-S12290B, S12290S-S12291B, S12291S-S12300B, S12300S-S12301B, S12301S-S12330B, S12330S-S12331B, S12331S-S1234XB, S1234XS-S12350B, S12350S-S12351B, S12351S-S12390B, S12390S-S12391B, S12391S-S12400B, S12400S-S12401B, S12401S-S12430B, S12430S-S12431B, S12431S-S1244XB, S1244XS-S12450B, S12450S-S12451B, S12451S-S12490B, S12490S-S12491B, S12491S-S12500B, S12500S-S12501B, S12501S-S12530B, S12530S-S12531B, S12531S-S1254XB, S1254XS-S12550B, S12550S-S12551B, S12551S-S12590B, S12590S-S12591B, S12591S-S12600B, S12600S-S12601B, S12601S-S12630B, S12630S-S12631B, S12631S-S1264XB, S1264XS-S12650B, S12650S-S12651B, S12651S-S12690B, S12690S-S12691B, S12691S-S1329XS, S134XXS-S135XXS, S138XXS-S159XXS, S161XXS-S22000B, S22000S-S22001B, S22001S-S22002B, S22002S-S22008B, S22008S-S22009B, S22009S-S22010B, S22010S-S22011B, S22011S-S22012B, S22012S-S22018B, S22018S-S22019B, S22019S-S22020B, S22020S-S22021B, S22021S-S22022B, S22022S-S22028B, S22028S-S22029B, S22029S-S22030B, S22030S-S22031B, S22031S-S22032B, S22032S-S22038B, S22038S-S22039B, S22039S-S22040B, S22040S-S22041B, S22041S-S22042B, S22042S-S22048B, S22048S-S22049B, S22049S-S22050B, S22050S-S22051B, S22051S-S22052B, S22052S-S22058B, S22058S-S22059B, S22059S-S22060B, S22060S-S22061B, S22061S-S22062B, S22062S-S22068B, S22068S-S22069B, S22069S-S22070B, S22070S-S22071B, S22071S-S22072B, S22072S-S22078B, S22078S-S22079B, S22079S-S22080B, S22080S-S22081B, S22081S-S22082B, S22082S-S22088B, S22088S-S22089B, S22089S-S2220XB, S2220XS-S2221XB, S2221XS-S2222XB, S2222XS-S2223XB, S2223XS-S2224XB, S2224XS-S2231XB, S2231XS-S2232XB, S2232XS-S2239XB, S2239XS-S2241XB, S2241XS-S2242XB, S2242XS-S2243XB,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S2243XS-S2249XB, S2249XS-S225XXB, S225XXS-S229XXB, S229XXS-S2329XS, S233XXS-S23429S, S238XXS, S239XXS-S32000B, S32000S-S32001B, S32001S-S32002B, S32002S-S32008B, S32008S-S32009B, S32009S-S32010B, S32010S-S32011B, S32011S-S32012B, S32012S-S32018B, S32018S-S32019B, S32019S-S32020B, S32020S-S32021B, S32021S-S32022B, S32022S-S32028B, S32028S-S32029B, S32029S-S32030B, S32030S-S32031B, S32031S-S32032B, S32032S-S32038B, S32038S-S32039B, S32039S-S32040B, S32040S-S32041B, S32041S-S32042B, S32042S-S32048B, S32048S-S32049B, S32049S-S32050B, S32050S-S32051B, S32051S-S32052B, S32052S-S32058B, S32058S-S32059B, S32059S-S3210XB, S3210XS-S32110B, S32110S-S32111B, S32111S-S32112B, S32112S-S32119B, S32119S-S32120B, S32120S-S32121B, S32121S-S32122B, S32122S-S32129B, S32129S-S32130B, S32130S-S32131B, S32131S-S32132B, S32132S-S32139B, S32139S-S3214XB, S3214XS-S3215XB, S3215XS-S3216XB, S3216XS-S3217XB, S3217XS-S3219XB, S3219XS-S322XXB, S322XXS-S32301B, S32301S-S32302B, S32302S-S32309B, S32309S-S32311B, S32311S-S32312B, S32312S-S32313B, S32313S-S32314B, S32314S-S32315B, S32315S-S32316B, S32316S-S32391B, S32391S-S32392B, S32392S-S32399B, S32399S-S32401B, S32401S-S32402B, S32402S-S32409B, S32409S-S32411B, S32411S-S32412B, S32412S-S32413B, S32413S-S32414B, S32414S-S32415B, S32415S-S32416B, S32416S-S32421B, S32421S-S32422B, S32422S-S32423B, S32423S-S32424B, S32424S-S32425B, S32425S-S32426B, S32426S-S32431B, S32431S-S32432B, S32432S-S32433B, S32433S-S32434B, S32434S-S32435B, S32435S-S32436B, S32436S-S32441B, S32441S-S32442B, S32442S-S32443B, S32443S-S32444B, S32444S-S32445B, S32445S-S32446B, S32446S-S32451B, S32451S-S32452B, S32452S-S32453B, S32453S-S32454B, S32454S-S32455B, S32455S-S32456B, S32456S-S32461B, S32461S-S32462B, S32462S-S32463B, S32463S-S32464B, S32464S-S32465B, S32465S-S32466B, S32466S-S32471B, S32471S-S32472B, S32472S-S32473B, S32473S-S32474B, S32474S-S32475B, S32475S-S32476B, S32476S-S32481B, S32481S-S32482B, S32482S-S32483B, S32483S-S32484B, S32484S-S32485B, S32485S-S32486B, S32486S-S32491B, S32491S-S32492B, S32492S-S32499B, S32499S-S32501B, S32501S-S32502B, S32502S-S32509B, S32509S-S32511B, S32511S-S32512B, S32512S-S32519B, S32519S-S32591B, S32591S-S32592B, S32592S-S32599B, S32599S-S32601B, S32601S-S32602B, S32602S-S32609B, S32609S-S32611B, S32611S-S32612B, S32612S-S32613B, S32613S-S32614B, S32614S-S32615B, S32615S-S32616B, S32616S-S32691B, S32691S-S32692B, S32692S-S32699B, S32699S-S32810B, S32810S-S32811B, S32811S-S3282XB, S3282XS-S3289XB, S3289XS-S329XXB, S329XXS-S334XXS, S335XXS-S42001B, S42001S-S42002B, S42002S-S42009B, S42009S-S42011B, S42011S-S42012B,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42012S-S42013B, S42013S-S42014B, S42014S-S42015B, S42015S-S42016B, S42016S-S42017B, S42017S-S42018B, S42018S-S42019B, S42019S-S42021B, S42021S-S42022B, S42022S-S42023B, S42023S-S42024B, S42024S-S42025B, S42025S-S42026B, S42026S-S42031B, S42031S-S42032B, S42032S-S42033B, S42033S-S42034B, S42034S-S42035B, S42035S-S42036B, S42036S-S42101B, S42101S-S42102B, S42102S-S42109B, S42109S-S42111B, S42111S-S42112B, S42112S-S42113B, S42113S-S42114B, S42114S-S42115B, S42115S-S42116B, S42116S-S42121B, S42121S-S42122B, S42122S-S42123B, S42123S-S42124B, S42124S-S42125B, S42125S-S42126B, S42126S-S42131B, S42131S-S42132B, S42132S-S42133B, S42133S-S42134B, S42134S-S42135B, S42135S-S42136B, S42136S-S42141B, S42141S-S42142B, S42142S-S42143B, S42143S-S42144B, S42144S-S42145B, S42145S-S42146B, S42146S-S42151B, S42151S-S42152B, S42152S-S42153B, S42153S-S42154B, S42154S-S42155B, S42155S-S42156B, S42156S-S42191B, S42191S-S42192B, S42192S-S42199B, S42199S-S42201B, S42201S-S42202B, S42202S-S42209B, S42209S-S42211B, S42211S-S42212B, S42212S-S42213B, S42213S-S42214B, S42214S-S42215B, S42215S-S42216B, S42216S-S42221B, S42221S-S42222B, S42222S-S42223B, S42223S-S42224B, S42224S-S42225B, S42225S-S42226B, S42226S-S42231B, S42231S-S42232B, S42232S-S42239B, S42239S-S42241B, S42241S-S42242B, S42242S-S42249B, S42249S-S42251B, S42251S-S42252B, S42252S-S42253B, S42253S-S42254B, S42254S-S42255B, S42255S-S42256B, S42256S-S42261B, S42261S-S42262B, S42262S-S42263B, S42263S-S42264B, S42264S-S42265B, S42265S-S42266B, S42266S-S42271A, S42271S-S42272A, S42272S-S42279A, S42279S-S42291B, S42291S-S42292B, S42292S-S42293B, S42293S-S42294B, S42294S-S42295B, S42295S-S42296B, S42296S-S42301B, S42301S-S42302B, S42302S-S42309B, S42309S-S42311A, S42311S-S42312A, S42312S-S42319A, S42319S-S42321B, S42321S-S42322B, S42322S-S42323B, S42323S-S42324B, S42324S-S42325B, S42325S-S42326B, S42326S-S42331B, S42331S-S42332B, S42332S-S42333B, S42333S-S42334B, S42334S-S42335B, S42335S-S42336B, S42336S-S42341B, S42341S-S42342B, S42342S-S42343B, S42343S-S42344B, S42344S-S42345B, S42345S-S42346B, S42346S-S42351B, S42351S-S42352B, S42352S-S42353B, S42353S-S42354B, S42354S-S42355B, S42355S-S42356B, S42356S-S42361B, S42361S-S42362B, S42362S-S42363B, S42363S-S42364B, S42364S-S42365B, S42365S-S42366B, S42366S-S42391B, S42391S-S42392B, S42392S-S42399B, S42399S-S42401B, S42401S-S42402B, S42402S-S42409B, S42409S-S42411B, S42411S-S42412B, S42412S-S42413B, S42413S-S42414B, S42414S-S42415B, S42415S-S42416B, S42416S-S42421B, S42421S-S42422B, S42422S-S42423B, S42423S-S42424B, S42424S-S42425B, S42425S-S42426B, S42426S-S42431B, S42431S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42432B, S42432S-S42433B, S42433S-S42434B, S42434S-S42435B, S42435S-S42436B, S42436S-S42441B, S42441S-S42442B, S42442S-S42443B, S42443S-S42444B, S42444S-S42445B, S42445S-S42446B, S42446S-S42447B, S42447S-S42448B, S42448S-S42449B, S42449S-S42451B, S42451S-S42452B, S42452S-S42453B, S42453S-S42454B, S42454S-S42455B, S42455S-S42456B, S42456S-S42461B, S42461S-S42462B, S42462S-S42463B, S42463S-S42464B, S42464S-S42465B, S42465S-S42466B, S42466S-S42471B, S42471S-S42472B, S42472S-S42473B, S42473S-S42474B, S42474S-S42475B, S42475S-S42476B, S42476S-S42481A, S42481S-S42482A, S42482S-S42489A, S42489S-S42491B, S42491S-S42492B, S42492S-S42493B, S42493S-S42494B, S42494S-S42495B, S42495S-S42496B, S42496S-S4290XB, S4290XS-S4291XB, S4291XS-S4292XB, S4292XS-S49001A, S49001S-S49002A, S49002S-S49009A, S49009S-S49011A, S49011S-S49012A, S49012S-S49019A, S49019S-S49021A, S49021S-S49022A, S49022S-S49029A, S49029S-S49031A, S49031S-S49032A, S49032S-S49039A, S49039S-S49041A, S49041S-S49042A, S49042S-S49049A, S49049S-S49091A, S49091S-S49092A, S49092S-S49099A, S49099S-S49101A, S49101S-S49102A, S49102S-S49109A, S49109S-S49111A, S49111S-S49112A, S49112S-S49119A, S49119S-S49121A, S49121S-S49122A, S49122S-S49129A, S49129S-S49131A, S49131S-S49132A, S49132S-S49139A, S49139S-S49141A, S49141S-S49142A, S49142S-S49149A, S49149S-S49191A, S49191S-S49192A, S49192S-S49199A, S49199S-S52001C, S52001S-S52002C, S52002S-S52009C, S52009S-S52011A, S52011S-S52012A, S52012S-S52019A, S52019S-S52021C, S52021S-S52022C, S52022S-S52023C, S52023S-S52024C, S52024S-S52025C, S52025S-S52026C, S52026S-S52031C, S52031S-S52032C, S52032S-S52033C, S52033S-S52034C, S52034S-S52035C, S52035S-S52036C, S52036S-S52041C, S52041S-S52042C, S52042S-S52043C, S52043S-S52044C, S52044S-S52045C, S52045S-S52046C, S52046S-S52091C, S52091S-S52092C, S52092S-S52099C, S52099S-S52101C, S52101S-S52102C, S52102S-S52109C, S52109S-S52111A, S52111S-S52112A, S52112S-S52119A, S52119S-S52121C, S52121S-S52122C, S52122S-S52123C, S52123S-S52124C, S52124S-S52125C, S52125S-S52126C, S52126S-S52131C, S52131S-S52132C, S52132S-S52133C, S52133S-S52134C, S52134S-S52135C, S52135S-S52136C, S52136S-S52181C, S52181S-S52182C, S52182S-S52189C, S52189S-S52201C, S52201S-S52202C, S52202S-S52209C, S52209S-S52211A, S52211S-S52212A, S52212S-S52219A, S52219S-S52221C, S52221S-S52222C, S52222S-S52223C, S52223S-S52224C, S52224S-S52225C, S52225S-S52226C, S52226S-S52231C, S52231S-S52232C, S52232S-S52233C, S52233S-S52234C, S52234S-S52235C, S52235S-S52236C, S52236S-S52241C, S52241S-S52242C, S52242S-S52243C, S52243S-S52244C, S52244S-S52245C, S52245S-S52246C, S52246S-S52251C,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S52251S-S52252C, S52252S-S52253C, S52253S-S52254C, S52254S-S52255C, S52255S-S52256C, S52256S-S52261C, S52261S-S52262C, S52262S-S52263C, S52263S-S52264C, S52264S-S52265C, S52265S-S52266C, S52266S-S52271C, S52271S-S52272C, S52272S-S52279C, S52279S-S52281C, S52281S-S52282C, S52282S-S52283C, S52283S-S52291C, S52291S-S52292C, S52292S-S52299C, S52299S-S52301C, S52301S-S52302C, S52302S-S52309C, S52309S-S52311A, S52311S-S52312A, S52312S-S52319A, S52319S-S52321C, S52321S-S52322C, S52322S-S52323C, S52323S-S52324C, S52324S-S52325C, S52325S-S52326C, S52326S-S52331C, S52331S-S52332C, S52332S-S52333C, S52333S-S52334C, S52334S-S52335C, S52335S-S52336C, S52336S-S52341C, S52341S-S52342C, S52342S-S52343C, S52343S-S52344C, S52344S-S52345C, S52345S-S52346C, S52346S-S52351C, S52351S-S52352C, S52352S-S52353C, S52353S-S52354C, S52354S-S52355C, S52355S-S52356C, S52356S-S52361C, S52361S-S52362C, S52362S-S52363C, S52363S-S52364C, S52364S-S52365C, S52365S-S52366C, S52366S-S52371C, S52371S-S52372C, S52372S-S52379C, S52379S-S52381C, S52381S-S52382C, S52382S-S52389C, S52389S-S52391C, S52391S-S52392C, S52392S-S52399C, S52399S-S52501C, S52501S-S52502C, S52502S-S52509C, S52509S-S52511C, S52511S-S52512C, S52512S-S52513C, S52513S-S52514C, S52514S-S52515C, S52515S-S52516C, S52516S-S52521A, S52521S-S52522A, S52522S-S52529A, S52529S-S52531C, S52531S-S52532C, S52532S-S52539C, S52539S-S52541C, S52541S-S52542C, S52542S-S52549C, S52549S-S52551C, S52551S-S52552C, S52552S-S52559C, S52559S-S52561C, S52561S-S52562C, S52562S-S52569C, S52569S-S52571C, S52571S-S52572C, S52572S-S52579C, S52579S-S52591C, S52591S-S52592C, S52592S-S52599C, S52599S-S52601C, S52601S-S52602C, S52602S-S52609C, S52609S-S52611C, S52611S-S52612C, S52612S-S52613C, S52613S-S52614C, S52614S-S52615C, S52615S-S52616C, S52616S-S52621A, S52621S-S52622A, S52622S-S52629A, S52629S-S52691C, S52691S-S52692C, S52692S-S52699C, S52699S-S5290XC, S5290XS-S5291XC, S5291XS-S5292XC, S5292XS-S59001A, S59001S-S59002A, S59002S-S59009A, S59009S-S59011A, S59011S-S59012A, S59012S-S59019A, S59019S-S59021A, S59021S-S59022A, S59022S-S59029A, S59029S-S59031A, S59031S-S59032A, S59032S-S59039A, S59039S-S59041A, S59041S-S59042A, S59042S-S59049A, S59049S-S59091A, S59091S-S59092A, S59092S-S59099A, S59099S-S59101A, S59101S-S59102A, S59102S-S59109A, S59109S-S59111A, S59111S-S59112A, S59112S-S59119A, S59119S-S59121A, S59121S-S59122A, S59122S-S59129A, S59129S-S59131A, S59131S-S59132A, S59132S-S59139A, S59139S-S59141A, S59141S-S59142A, S59142S-S59149A, S59149S-S59191A, S59191S-S59192A, S59192S-S59199A, S59199S-S59201A, S59201S-S59202A, S59202S-S59209A, S59209S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S59211A, S59211S-S59212A, S59212S-S59219A, S59219S-S59221A, S59221S-S59222A, S59222S-S59229A, S59229S-S59231A, S59231S-S59232A, S59232S-S59239A, S59239S-S59241A, S59241S-S59242A, S59242S-S59249A, S59249S-S59291A, S59291S-S59292A, S59292S-S59299A, S59299S-S62001B, S62001S-S62002B, S62002S-S62009B, S62009S-S62011B, S62011S-S62012B, S62012S-S62013B, S62013S-S62014B, S62014S-S62015B, S62015S-S62016B, S62016S-S62021B, S62021S-S62022B, S62022S-S62023B, S62023S-S62024B, S62024S-S62025B, S62025S-S62026B, S62026S-S62031B, S62031S-S62032B, S62032S-S62033B, S62033S-S62034B, S62034S-S62035B, S62035S-S62036B, S62036S-S62101B, S62101S-S62102B, S62102S-S62109B, S62109S-S62111B, S62111S-S62112B, S62112S-S62113B, S62113S-S62114B, S62114S-S62115B, S62115S-S62116B, S62116S-S62121B, S62121S-S62122B, S62122S-S62123B, S62123S-S62124B, S62124S-S62125B, S62125S-S62126B, S62126S-S62131B, S62131S-S62132B, S62132S-S62133B, S62133S-S62134B, S62134S-S62135B, S62135S-S62136B, S62136S-S62141B, S62141S-S62142B, S62142S-S62143B, S62143S-S62144B, S62144S-S62145B, S62145S-S62146B, S62146S-S62151B, S62151S-S62152B, S62152S-S62153B, S62153S-S62154B, S62154S-S62155B, S62155S-S62156B, S62156S-S62161B, S62161S-S62162B, S62162S-S62163B, S62163S-S62164B, S62164S-S62165B, S62165S-S62166B, S62166S-S62171B, S62171S-S62172B, S62172S-S62173B, S62173S-S62174B, S62174S-S62175B, S62175S-S62176B, S62176S-S62181B, S62181S-S62182B, S62182S-S62183B, S62183S-S62184B, S62184S-S62185B, S62185S-S62186B, S62186S-S62201B, S62201S-S62202B, S62202S-S62209B, S62209S-S62211B, S62211S-S62212B, S62212S-S62213B, S62213S-S62221B, S62221S-S62222B, S62222S-S62223B, S62223S-S62224B, S62224S-S62225B, S62225S-S62226B, S62226S-S62231B, S62231S-S62232B, S62232S-S62233B, S62233S-S62234B, S62234S-S62235B, S62235S-S62236B, S62236S-S62241B, S62241S-S62242B, S62242S-S62243B, S62243S-S62244B, S62244S-S62245B, S62245S-S62246B, S62246S-S62251B, S62251S-S62252B, S62252S-S62253B, S62253S-S62254B, S62254S-S62255B, S62255S-S62256B, S62256S-S62291B, S62291S-S62292B, S62292S-S62299B, S62299S-S62300B, S62300S-S62301B, S62301S-S62302B, S62302S-S62303B, S62303S-S62304B, S62304S-S62305B, S62305S-S62306B, S62306S-S62307B, S62307S-S62308B, S62308S-S62309B, S62309S-S62310B, S62310S-S62311B, S62311S-S62312B, S62312S-S62313B, S62313S-S62314B, S62314S-S62315B, S62315S-S62316B, S62316S-S62317B, S62317S-S62318B, S62318S-S62319B, S62319S-S62320B, S62320S-S62321B, S62321S-S62322B, S62322S-S62323B, S62323S-S62324B, S62324S-S62325B, S62325S-S62326B, S62326S-S62327B, S62327S-S62328B, S62328S-S62329B, S62329S-S62330B, S62330S-S62331B, S62331S-S62332B,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62332S-S62333B, S62333S-S62334B, S62334S-S62335B, S62335S-S62336B, S62336S-S62337B, S62337S-S62338B, S62338S-S62339B, S62339S-S62340B, S62340S-S62341B, S62341S-S62342B, S62342S-S62343B, S62343S-S62344B, S62344S-S62345B, S62345S-S62346B, S62346S-S62347B, S62347S-S62348B, S62348S-S62349B, S62349S-S62350B, S62350S-S62351B, S62351S-S62352B, S62352S-S62353B, S62353S-S62354B, S62354S-S62355B, S62355S-S62356B, S62356S-S62357B, S62357S-S62358B, S62358S-S62359B, S62359S-S62360B, S62360S-S62361B, S62361S-S62362B, S62362S-S62363B, S62363S-S62364B, S62364S-S62365B, S62365S-S62366B, S62366S-S62367B, S62367S-S62368B, S62368S-S62369B, S62369S-S62390B, S62390S-S62391B, S62391S-S62392B, S62392S-S62393B, S62393S-S62394B, S62394S-S62395B, S62395S-S62396B, S62396S-S62397B, S62397S-S62398B, S62398S-S62399B, S62399S-S62501B, S62501S-S62502B, S62502S-S62509B, S62509S-S62511B, S62511S-S62512B, S62512S-S62513B, S62513S-S62514B, S62514S-S62515B, S62515S-S62516B, S62516S-S62521B, S62521S-S62522B, S62522S-S62523B, S62523S-S62524B, S62524S-S62525B, S62525S-S62526B, S62526S-S62600B, S62600S-S62601B, S62601S-S62602B, S62602S-S62603B, S62603S-S62604B, S62604S-S62605B, S62605S-S62606B, S62606S-S62607B, S62607S-S62608B, S62608S-S62609B, S62609S-S62610B, S62610S-S62611B, S62611S-S62612B, S62612S-S62613B, S62613S-S62614B, S62614S-S62615B, S62615S-S62616B, S62616S-S62617B, S62617S-S62618B, S62618S-S62619B, S62619S-S62620B, S62620S-S62621B, S62621S-S62622B, S62622S-S62623B, S62623S-S62624B, S62624S-S62625B, S62625S-S62626B, S62626S-S62627B, S62627S-S62628B, S62628S-S62629B, S62629S-S62630B, S62630S-S62631B, S62631S-S62632B, S62632S-S62633B, S62633S-S62634B, S62634S-S62635B, S62635S-S62636B, S62636S-S62637B, S62637S-S62638B, S62638S-S62639B, S62639S-S62640B, S62640S-S62641B, S62641S-S62642B, S62642S-S62643B, S62643S-S62644B, S62644S-S62645B, S62645S-S62646B, S62646S-S62647B, S62647S-S62648B, S62648S-S62649B, S62649S-S62650B, S62650S-S62651B, S62651S-S62652B, S62652S-S62653B, S62653S-S62654B, S62654S-S62655B, S62655S-S62656B, S62656S-S62657B, S62657S-S62658B, S62658S-S62659B, S62659S-S62660B, S62660S-S62661B, S62661S-S62662B, S62662S-S62663B, S62663S-S62664B, S62664S-S62665B, S62665S-S62666B, S62666S-S62667B, S62667S-S62668B, S62668S-S62669B, S62669S-S6290XB, S6290XS-S6291XB, S6291XS-S6292XB, S6292XS-S72001C, S72001S-S72002C, S72002S-S72009C, S72009S-S72011C, S72011S-S72012C, S72012S-S72019C, S72019S-S72021C, S72021S-S72022C, S72022S-S72023C, S72023S-S72024C, S72024S-S72025C, S72025S-S72026C, S72026S-S72031C, S72031S-S72032C, S72032S-S72033C, S72033S-S72034C, S72034S-S72035C, S72035S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S72036C, S72036S-S72041C, S72041S-S72042C, S72042S-S72043C, S72043S-S72044C, S72044S-S72045C, S72045S-S72046C, S72046S-S72051C, S72051S-S72052C, S72052S-S72059C, S72059S-S72061C, S72061S-S72062C, S72062S-S72063C, S72063S-S72064C, S72064S-S72065C, S72065S-S72066C, S72066S-S72091C, S72091S-S72092C, S72092S-S72099C, S72099S-S72101C, S72101S-S72102C, S72102S-S72109C, S72109S-S72111C, S72111S-S72112C, S72112S-S72113C, S72113S-S72114C, S72114S-S72115C, S72115S-S72116C, S72116S-S72121C, S72121S-S72122C, S72122S-S72123C, S72123S-S72124C, S72124S-S72125C, S72125S-S72126C, S72126S-S72131C, S72131S-S72132C, S72132S-S72133C, S72133S-S72134C, S72134S-S72135C, S72135S-S72136C, S72136S-S72141C, S72141S-S72142C, S72142S-S72143C, S72143S-S72144C, S72144S-S72145C, S72145S-S72146C, S72146S-S7221XC, S7221XS-S7222XC, S7222XS-S7223XC, S7223XS-S7224XC, S7224XS-S7225XC, S7225XS-S7226XC, S7226XS-S72301C, S72301S-S72302C, S72302S-S72309C, S72309S-S72321C, S72321S-S72322C, S72322S-S72323C, S72323S-S72324C, S72324S-S72325C, S72325S-S72326C, S72326S-S72331C, S72331S-S72332C, S72332S-S72333C, S72333S-S72334C, S72334S-S72335C, S72335S-S72336C, S72336S-S72341C, S72341S-S72342C, S72342S-S72343C, S72343S-S72344C, S72344S-S72345C, S72345S-S72346C, S72346S-S72351C, S72351S-S72352C, S72352S-S72353C, S72353S-S72354C, S72354S-S72355C, S72355S-S72356C, S72356S-S72361C, S72361S-S72362C, S72362S-S72363C, S72363S-S72364C, S72364S-S72365C, S72365S-S72366C, S72366S-S72391C, S72391S-S72392C, S72392S-S72399C, S72399S-S72401C, S72401S-S72402C, S72402S-S72409C, S72409S-S72411C, S72411S-S72412C, S72412S-S72413C, S72413S-S72414C, S72414S-S72415C, S72415S-S72416C, S72416S-S72421C, S72421S-S72422C, S72422S-S72423C, S72423S-S72424C, S72424S-S72425C, S72425S-S72426C, S72426S-S72431C, S72431S-S72432C, S72432S-S72433C, S72433S-S72434C, S72434S-S72435C, S72435S-S72436C, S72436S-S72441C, S72441S-S72442C, S72442S-S72443C, S72443S-S72444C, S72444S-S72445C, S72445S-S72446C, S72446S-S72451C, S72451S-S72452C, S72452S-S72453C, S72453S-S72454C, S72454S-S72455C, S72455S-S72456C, S72456S-S72461C, S72461S-S72462C, S72462S-S72463C, S72463S-S72464C, S72464S-S72465C, S72465S-S72466C, S72466S-S72471A, S72471S-S72472A, S72472S-S72479A, S72479S-S72491C, S72491S-S72492C, S72492S-S72499C, S72499S-S728X1C, S728X1S-S728X2C, S728X2S-S728X9C, S728X9S-S7290XE, S7290XS-S7291XE, S7291XS-S7292XE, S7292XS-S79001A, S79001S-S79002A, S79002S-S79009A, S79009S-S79011A, S79011S-S79012A, S79012S-S79019A, S79019S-S79091A, S79091S-S79092A, S79092S-S79099A, S79099S-S79101A, S79101S-S79102A, S79102S-S79109A, S79109S-S79111A, S79111S-S79112A,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S79112S-S79119A, S79119S-S79121A, S79121S-S79122A, S79122S-S79129A, S79129S-S79131A, S79131S-S79132A, S79132S-S79139A, S79139S-S79141A, S79141S-S79142A, S79142S-S79149A, S79149S-S79191A, S79191S-S79192A, S79192S-S79199A, S79199S-S82001C, S82001S-S82002C, S82002S-S82009C, S82009S-S82011C, S82011S-S82012C, S82012S-S82013C, S82013S-S82014C, S82014S-S82015C, S82015S-S82016C, S82016S-S82021C, S82021S-S82022C, S82022S-S82023C, S82023S-S82024C, S82024S-S82025C, S82025S-S82026C, S82026S-S82031C, S82031S-S82032C, S82032S-S82033C, S82033S-S82034C, S82034S-S82035C, S82035S-S82036C, S82036S-S82041C, S82041S-S82042C, S82042S-S82043C, S82043S-S82044C, S82044S-S82045C, S82045S-S82046C, S82046S-S82091C, S82091S-S82092C, S82092S-S82099C, S82099S-S82101C, S82101S-S82102C, S82102S-S82109C, S82109S-S82111C, S82111S-S82112C, S82112S-S82113C, S82113S-S82114C, S82114S-S82115C, S82115S-S82116C, S82116S-S82121C, S82121S-S82122C, S82122S-S82123C, S82123S-S82124C, S82124S-S82125C, S82125S-S82126C, S82126S-S82131C, S82131S-S82132C, S82132S-S82133C, S82133S-S82134C, S82134S-S82135C, S82135S-S82136C, S82136S-S82141C, S82141S-S82142C, S82142S-S82143C, S82143S-S82144C, S82144S-S82145C, S82145S-S82146C, S82146S-S82151C, S82151S-S82152C, S82152S-S82153C, S82153S-S82154C, S82154S-S82155C, S82155S-S82156C, S82156S-S82161A, S82161S-S82162A, S82162S-S82169A, S82169S-S82191C, S82191S-S82192C, S82192S-S82199C, S82199S-S82201C, S82201S-S82202C, S82202S-S82209C, S82209S-S82221C, S82221S-S82222C, S82222S-S82223C, S82223S-S82224C, S82224S-S82225C, S82225S-S82226C, S82226S-S82231C, S82231S-S82232C, S82232S-S82233C, S82233S-S82234C, S82234S-S82235C, S82235S-S82236C, S82236S-S82241C, S82241S-S82242C, S82242S-S82243C, S82243S-S82244C, S82244S-S82245C, S82245S-S82246C, S82246S-S82251C, S82251S-S82252C, S82252S-S82253C, S82253S-S82254C, S82254S-S82255C, S82255S-S82256C, S82256S-S82261C, S82261S-S82262C, S82262S-S82263C, S82263S-S82264C, S82264S-S82265C, S82265S-S82266C, S82266S-S82291C, S82291S-S82292C, S82292S-S82299C, S82299S-S82301C, S82301S-S82302C, S82302S-S82309C, S82309S-S82311A, S82311S-S82312A, S82312S-S82319A, S82319S-S82391C, S82391S-S82392C, S82392S-S82399C, S82399S-S82401C, S82401S-S82402C, S82402S-S82409C, S82409S-S82421C, S82421S-S82422C, S82422S-S82423C, S82423S-S82424C, S82424S-S82425C, S82425S-S82426C, S82426S-S82431C, S82431S-S82432C, S82432S-S82433C, S82433S-S82434C, S82434S-S82435C, S82435S-S82436C, S82436S-S82441C, S82441S-S82442C, S82442S-S82443C, S82443S-S82444C, S82444S-S82445C, S82445S-S82446C, S82446S-S82451C, S82451S-S82452C, S82452S-S82453C, S82453S-S82454C, S82454S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82455C, S82455S-S82456C, S82456S-S82461C, S82461S-S82462C, S82462S-S82463C, S82463S-S82464C, S82464S-S82465C, S82465S-S82466C, S82466S-S82491C, S82491S-S82492C, S82492S-S82499C, S82499S-S8251XC, S8251XS-S8252XC, S8252XS-S8253XS, S8253XS-S8254XC, S8254XS-S8255XC, S8255XS-S8256XC, S8256XS-S8261XC, S8261XS-S8262XC, S8262XS-S8263XC, S8263XS-S8264XC, S8264XS-S8265XC, S8265XS-S8266XC, S8266XS-S82811A, S82811S-S82812A, S82812S-S82819A, S82819S-S82821A, S82821S-S82822A, S82822S-S82829A, S82829S-S82831C, S82831S-S82832C, S82832S-S82839C, S82839S-S82841C, S82841S-S82842C, S82842S-S82843C, S82843S-S82844C, S82844S-S82845C, S82845S-S82846C, S82846S-S82851C, S82851S-S82852C, S82852S-S82853C, S82853S-S82854C, S82854S-S82855C, S82855S-S82856C, S82856S-S82861C, S82861S-S82862C, S82862S-S82863C, S82863S-S82864C, S82864S-S82865C, S82865S-S82866C, S82866S-S82871C, S82871S-S82872C, S82872S-S82873C, S82873S-S82874C, S82874S-S82875C, S82875S-S82876C, S82876S-S82891C, S82891S-S82892C, S82892S-S82899C, S82899S-S8290XC, S8290XS-S8291XC, S8291XS-S8292XC, S8292XS-S89001A, S89001S-S89002A, S89002S-S89009A, S89009S-S89011A, S89011S-S89012A, S89012S-S89019A, S89019S-S89021A, S89021S-S89022A, S89022S-S89029A, S89029S-S89031A, S89031S-S89032A, S89032S-S89039A, S89039S-S89041A, S89041S-S89042A, S89042S-S89049A, S89049S-S89091A, S89091S-S89092A, S89092S-S89099A, S89099S-S89101A, S89101S-S89102A, S89102S-S89109A, S89109S-S89111A, S89111S-S89112A, S89112S-S89119A, S89119S-S89121A, S89121S-S89122A, S89122S-S89129A, S89129S-S89131A, S89131S-S89132A, S89132S-S89139A, S89139S-S89141A, S89141S-S89142A, S89142S-S89149A, S89149S-S89191A, S89191S-S89192A, S89192S-S89199A, S89199S-S89201A, S89201S-S89202A, S89202S-S89209A, S89209S-S89211A, S89211S-S89212A, S89212S-S89219A, S89219S-S89221A, S89221S-S89222A, S89222S-S89229A, S89229S-S89291A, S89291S-S89292A, S89292S-S89299A, S89299S-S89301A, S89301S-S89302A, S89302S-S89309A, S89309S-S89311A, S89311S-S89312A, S89312S-S89319A, S89319S-S89321A, S89321S-S89322A, S89322S-S89329A, S89329S-S89391A, S89391S-S89392A, S89392S-S89399A, S89399S-S92001B, S92001S-S92002B, S92002S-S92009B, S92009S-S92011B, S92011S-S92012B, S92012S-S92013B, S92013S-S92014B, S92014S-S92015B, S92015S-S92016B, S92016S-S92021B, S92021S-S92022B, S92022S-S92023B, S92023S-S92024B, S92024S-S92025B, S92025S-S92026B, S92026S-S92031B, S92031S-S92032B, S92032S-S92033B, S92033S-S92034B, S92034S-S92035B, S92035S-S92036B, S92036S-S92041B, S92041S-S92042B, S92042S-S92043B, S92043S-S92044B, S92044S-S92045B, S92045S-S92046B, S92046S-S92051B, S92051S-S92052B, S92052S-S92053B, S92053S-S92054B,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92054S-S92055B, S92055S-S92056B, S92056S-S92061B, S92061S-S92062B, S92062S-S92063B, S92063S-S92064B, S92064S-S92065B, S92065S-S92066B, S92066S-S92101B, S92101S-S92102B, S92102S-S92109B, S92109S-S92111B, S92111S-S92112B, S92112S-S92113B, S92113S-S92114B, S92114S-S92115B, S92115S-S92116B, S92116S-S92121B, S92121S-S92122B, S92122S-S92123B, S92123S-S92124B, S92124S-S92125B, S92125S-S92126B, S92126S-S92131B, S92131S-S92132B, S92132S-S92133B, S92133S-S92134B, S92134S-S92135B, S92135S-S92136B, S92136S-S92141B, S92141S-S92142B, S92142S-S92143B, S92143S-S92144B, S92144S-S92145B, S92145S-S92146B, S92146S-S92151B, S92151S-S92152B, S92152S-S92153B, S92153S-S92154B, S92154S-S92155B, S92155S-S92156B, S92156S-S92191B, S92191S-S92192B, S92192S-S92199B, S92199S-S92201B, S92201S-S92202B, S92202S-S92209B, S92209S-S92211B, S92211S-S92212B, S92212S-S92213B, S92213S-S92214B, S92214S-S92215B, S92215S-S92216B, S92216S-S92221B, S92221S-S92222B, S92222S-S92223B, S92223S-S92224B, S92224S-S92225B, S92225S-S92226B, S92226S-S92231B, S92231S-S92232B, S92232S-S92233B, S92233S-S92234B, S92234S-S92235B, S92235S-S92236B, S92236S-S92241B, S92241S-S92242B, S92242S-S92243B, S92243S-S92244B, S92244S-S92245B, S92245S-S92246B, S92246S-S92251B, S92251S-S92252B, S92252S-S92253B, S92253S-S92254B, S92254S-S92255B, S92255S-S92256B, S92256S-S92301B, S92301S-S92302B, S92302S-S92309B, S92309S-S92311B, S92311S-S92312B, S92312S-S92313B, S92313S-S92314B, S92314S-S92315B, S92315S-S92316B, S92316S-S92321B, S92321S-S92322B, S92322S-S92323B, S92323S-S92324B, S92324S-S92325B, S92325S-S92326B, S92326S-S92331B, S92331S-S92332B, S92332S-S92333B, S92333S-S92334B, S92334S-S92335B, S92335S-S92336B, S92336S-S92341B, S92341S-S92342B, S92342S-S92343B, S92343S-S92344B, S92344S-S92345B, S92345S-S92346B, S92346S-S92351B, S92351S-S92352B, S92352S-S92353B, S92353S-S92354B, S92354S-S92355B, S92355S-S92356B, S92356S-S92401B, S92401S-S92402B, S92402S-S92403B, S92403S-S92404B, S92404S-S92405B, S92405S-S92406B, S92406S-S92411B, S92411S-S92412B, S92412S-S92413B, S92413S-S92414B, S92414S-S92415B, S92415S-S92416B, S92416S-S92421B, S92421S-S92422B, S92422S-S92423B, S92423S-S92424B, S92424S-S92425B, S92425S-S92426B, S92426S-S92491B, S92491S-S92492B, S92492S-S92499B, S92499S-S92501B, S92501S-S92502B, S92502S-S92503B, S92503S-S92504B, S92504S-S92505B, S92505S-S92506B, S92506S-S92511B, S92511S-S92512B, S92512S-S92513B, S92513S-S92514B, S92514S-S92515B, S92515S-S92516B, S92516S-S92521B, S92521S-S92522B, S92522S-S92523B, S92523S-S92524B, S92524S-S92525B, S92525S-S92526B, S92526S-S92531B, S92531S-S92532B, S92532S-S92533B, S92533S-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92534B, S92534S-S92535B, S92535S-S92536B, S92536S-S92591B, S92591S-S92592B, S92592S-S92599B, S92599S-S92811B, S92811S-S92812B, S92812S-S92819B, S92819S-S92901B, S92901S-S92902B, S92902S-S92909B, S92909S-S92911B, S92911S-S92912B, S92912S-S92919B, S92919S-S99001B, S99001S-S99002B, S99002S-S99009B, S99009S-S99011B, S99011S-S99012B, S99012S-S99019B, S99019S-S99021B, S99021S-S99022B, S99022S-S99029B, S99029S-S99031B, S99031S-S99032B, S99032S-S99039B, S99039S-S99041B, S99041S-S99042B, S99042S-S99049B, S99049S-S99091B, S99091S-S99092B, S99092S-S99099B, S99099S-S99101B, S99101S-S99102B, S99102S-S99109B, S99109S-S99111B, S99111S-S99112B, S99112S-S99119B, S99119S-S99121B, S99121S-S99122B, S99122S-S99129B, S99129S-S99131B, S99131S-S99132B, S99132S-S99139B, S99139S-S99141B, S99141S-S99142B, S99142S-S99149B, S99149S-S99191B, S99191S-S99192B, S99192S-S99199B, S99199S-S99201B, S99201S-S99202B, S99202S-S99209B, S99209S-S99211B, S99211S-S99212B, S99212S-S99219B, S99219S-S99221B, S99221S-S99222B, S99222S-S99229B, S99229S-S99231B, S99231S-S99232B, S99232S-S99239B, S99239S-S99241B, S99241S-S99242B, S99242S-S99249B, S99249S-S99291B, S99291S-S99292B, S99292S-S99299B, S99299S-T79A9XS, T800XXS, T801XXS, T80211S, T80212S, T80218S, T80219S, T8022XS, T8029XS, T8030XS, T80310S, T80311S, T80319S, T8039XS, T8040XS, T80410S, T80411S, T80419S, T8049XS, T8051XS, T8052XS, T8059XS, T8061XS, T8062XS, T8069XS, T80810S, T80818S, T8089XS, T8090XS, T80910S, T80911S, T80919S, T8092XS, T80A0XS, T80A10S, T80A11S, T80A19S, T80A9XS-T8172XS, T8181XS-T836XXS, T83711S-T83719S, T83721S-T879, T880XXS, T881XXS-T883XXS, T884XXS-T886XXS, T887XXS-T888XXS, T889XXS
22. Surgical Wounds (SURW)	998	N/A	T8189XA
23. Dyslipidemia (DYSL)	272	E78	E7130, E7521-E7522, E75240-E75249, E753, E755-E756, E770-E7870, E7879-E789, E881-E882, E8889
24. HIV/AIDS and varicose veins of other sites (HIVA)	042, V08, 456	B20, I85-I86, Z21	B20, I8500 – I868, and Z21
25. Pneumonia (PNEU)	480-486	J12-J18	A221, A3701, A3711, A3781, A3791, A481, B250, B440, B7781, J120-J181, J188-J189
26. Chronic obstructive pulmonary disease (COPD)	491-492, 494-496	J42-J43	ACG definition of COPD
27. Other mental health/substance abuse (MHSA)	291-299, 301-308, 310, 312-314, V40	F02, F04-F31, F33, F39, F42-F53, F55-F69, F81-F88, F90-F91, F95-F98, R37, R45-R46, Z87, Z91	F0280-F1699, F17203-F17209, F17213-F17219, F17223-F17229, F17293-F328, F3289-F5103, F5109-F5112, F5119-F53, F550-F69, F819, F840, F843-F849, F900-F989, G44209, R37, R451, R457-R4582, R4681-R4689, Z8659-Z87890, Z9183
28. Back problems (BACK)	720-724,847	M43-M54, M99, S33-S34	A1801, M081, M2578, M4320-M4328, M436, M438X9, M450-M461, M4640-M4838, M488X1-M531, M532X7-M532X8, M533-M5409, M5411-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M5417, M542-M549, M62830, M6788, M961, M9901-M9903, M9920-M9979, S134XXA, S138XXA, S161XXA, S233XXA, S238XXA, S239XXA, S335XXA, S338XXA
29. Skin disorders (SKIN)	216, 680-686, 690-698, 700-702, 705-709, 782	I70, L08, L88-L89, L97	B781, D220-D239, E08628, E09628, E832, I70231-I7025, I70331-I7035, I70431-I7045, I70531-I7055, I70631-I7065, I70731-I7075, K122, L00-L080, L0881-L443, L448-L599, L661, L664, L700-L720, L722-L730, L732, L739-L759, L80-L945, L948-L99, NODX, R17, R200-R239, R600-R609
30. Skin disorders not related to obesity (SKIN_OBES)	216, 680-685, 690-698, 700-702, 705-706, 708-709, 782	D22-D23, L00-L05, L10-L71, L75, L80-L99, R17, R20-R21, R23, R60	Models do not require coding of the condition from this data source.
31. Skin disorders not related to dementia (SKIN_DEMT)	N/A	N/A	D220-D239, E08628, E09628, K122, L00-L0592, L100-L443, L448-L599, L661, L664-L700-L720, L722-L730, L732, L739-L759, L80-L83, L850-L879, L900-L923, L929-L945, L948-L959, L981-L983, L985-L99, R17, R200-R239, R600-R609,
32. Renal failure and chronic kidney disease (RENL)	584-588	N18-N19, N23	N170-N19, N250-N261, N269
33. Pregnancy (PREG) [43]	630-677,679, V22-24,V27, V28 (restriction: female, age 15-55)	A34, O00-O99, O9A, Z33-Z36, Z3A, Z38 (restriction: female, age 15-55)	A34, O000-O2693, O29011-O30019, O30031-O368199, O368310-O9A53, P0701-P0718, Z00110-Z003, Z331-Z392, Z87898
34. Perinatal and fetal conditions (PRNT)	678, V21, V29, 760-779	A33, P00-P96, Q86, Z00, Z05	A33, NODX, O30021-O30029, O358XX0-O358XX9, O368210-O368299, P000-P0822, P100-P292, P294-P969, Q860-Q868, R0603, R7881, Z002-Z059, Z87898
35. Rheumatic heart disease (RHEU)	390-393, 395, 398	I00-I02, I06, I09	I00-I029, I060-I069, U090, I092-I099
36. Underweight (UNDERWGT)	Reported BMI	Reported BMI	Models do not require coding of the condition from this data source.
37. Diseases of mitral and aortic valves & other endocardial structures (VALV)	093, 394, 396, 424, 725, 745, 746	I34, I35	A1884, A5200-A5209, I050-I059, I080, I088-I089, I2783, I340-I39, M3211, M353, Q200-Q249
38. Diseases of mitral and aortic valves & other endocardial structures not related to hypertension (VALV_HPER)	093, 394, 396, 725, 745, 746	N/A	A5200-A5209, I050-I059, I080, I088-I089, I2783, M353
39. Acute and chronic pulmonary heart disease (PULM)	415-416	I26-I28	I2601-I2782, I2789-I279, T800XXA, T81718A, T8172XA, T82817A, T82818A,
40. Acute and chronic pulmonary heart disease	415	I26-I28	Models do not require coding of the condition from this data source.

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[43] Pregnancy diagnoses are restricted to women age 15 to 55. In the MN APCD, 58 percent of the 2014 pregnancy diagnosis codes for females age 10 to 15 derived from a diagnosis of alcohol affecting the fetus or newborn via placenta or breast milk (767.01).

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
not related to obesity (PULM_OBES)			
41. Acute and other pericardial & endocardial disease (PERI)	397	I07-I08, I31-I32	I070-I079, I081-I089, I091
42. Cardiomyopathy (CARM)	425	I42-I43	A1884, I420-I43
43. Conduction disorders (COND)	426	I44-I45	I1440-I1459, J410-J449, J470-J479, J670-J679
44. Cardiac dysrhythmias (CDYS)	427	I38, I47-I49	I462-I499, R001
45. Other or ill-defined heart disease (OTHH)	410-413, 429	I20-I22, I24, I40-I41, I50-I52	I200-I252, I25700-I25799, I510-I52, I970-I97191
46. Overall heart conditions (OHD)	RHEU, VALV, PULM, PERI, CARM, COND, CDYS, OTHH	RHEU, VALV, PULM, PERI, CARM, COND, CDYS, OTHH	RHEU, VALV, PULM, PERI, CARM, COND, CDYS, OTHH
47. Other conditions (OTHC)[44]	0-41,45-66,70-88,90-92, 94-133, 134-139, 211-215, 217-229, 240-246, 249, 251-259, 260-2710, 273-277, 279-289, 315, 316,317-319, 320-323, 324-326, 327, 330, 332, 333-337, 338-359, 360-379, 380-389, 417, 420-423, 430-432,440-442, 443, 444-449, 451-454, 455, 457, 458, 459, 460-466, 470-473, 474-478, 487,488, 490, 500-516, 517, 518-519, 520-579, 580- 583, 589-599, 600-608, 610-612, 614-616, 617-629, 703-704, 710-713, 717-719, 726-739, 740-744, 747-759, 780-781, 783-799, 999	A00-A99, B00-B19, B25-B99, D12-D36, D50-D89, E00-E07, E15-E35, E40-E77, E79-E89, F54, F70, F78-F80, F89, G00-G26, G32, G35-G40, G47, G50-G90, G92-G93, G95-G96, G98-G99, H00-H95, I60, I74-I78, I81-I82, I87-I95, I97-I99, J00-J40,J60-J66, J68-J70, J80-J99, K00-K14, K25-K67, K70-K94, L44-L50, L60-L68, L72-L74, L94, M00-M04, M10, M13, M20-M24, M26-M42, M60-M95, N00-N17, N20-N22, N27-N60, N65-N99, O28, P09, P29, Q00-Q99, R03, R06, R09-R11, R16, R18-R19, R25-R29, R31, R36, R39, R41, R43-R44, R52-R54, R58-R50, R62-R64, R68-R99	A001-A329, A35-A480, A482-A519, A5210-B199, B250-B780, B787-B999, C880, C965-C966, D100-D219, D241-D369, D472, D474, D481, D500-D77, D800-E099, E103521-E103549, E1041, E1043-E1052, E10610, E10630, E113521-E113549, E1141, E1143-E1152, E11610, E11630, E1300-E35, E40-E649, E700-E712, E71310-E7519, E7523, E7525-E7529, E754, E7601-E769, E771, E7871-E7872, E790-E8319, E8330-E8809, E883-E896, F3281, F5104-F5105, F5113, F518, F54, F70-F82, F842, F88-F89, G000-G131, G14-G26, G3181-G3182, G319-G4489, G453, G4700-G909, G911, G913, G918-G936, G9381-G939, G950-G969, G971, G9741, G9782-H579, H5940-H5943, H6000-H95199, I280-I339, I39-I41, I6000-I629, I670, I673, I6783, I700-I8393, I87001-I96, I972, I998-J1189, J129, J17, J181-J182, J200-J40, J60-J668, J680-J953, J95811-J95822, J9584, J9600-K67, K6812-K912, K915, K91850-K91858, K9189-K9589, L081, L444, L600-L660, L662-L663, L668-L689, L7211-L7212, L731, L738-L739, L946, M0000-M049, M0540-M0559, M0760-M0769, M1000-M119, M1220-M1249, M1280, M1460-M1489, M1A00X0-M1A09X1, M1A20X0-M25776, M2580-M352, M354-M4319, M433-M435X9, M438X1-M439, M4620-M4639, M4840XA, M4841XA, M4842XA, M4843XA, M4844XA, M4845XA, M4846XA, M4847XA, M4848XA, M4850XA, M4851XA, M4852XA, M4853XA, M4854XA, M4855XA, M4856XA, M4857XA, M4858XA, M532X1-M532X6, M532X9, M5410, M5418, M60000-M6282, M62831-M8000XP, M80011A-M80011P, M80012A-M80012P, M80019A-M80019P, M80021A-M80021P, M80022A-M80022P, M80029A-M80029P, M80031A-M80031P, M80032A-M80032P, M80039A-M80039P, M80041A-M80041P, M80042A-M80042P, M80049A-M80049P, M80051A-

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[44] Other conditions include all codes that are not categorized elsewhere.

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M80051P, M80052A-M80052P, M80059A-M80059P, M80061A-M80061P, M80062A-M80062P, M80069A-M80069P, M80071A-M80071P, M80072A-M80072P, M80079A-M80079P, M8008XA-M8008XP, M8080XA-M8080XP, M80811A-M80811P, M80812A-M80812P, M80819A-M80819P, M80821A-M80821P, M80822A-M80822P, M80829A-M80829P, M80831A-M80831P, M80832A-M80832P, M80839A-M80839P, M80841A-M80841P, M80842A-M80842P, M80849A-M80849P, M80851A-M80851P, M80852A-M80852P, M80859A-M80859P, M80861A-M80861P, M80862A-M80862P, M80869A-M80869P, M80871A-M80871P, M80872A-M80872P, M80879A-M80879P, M8088XA-M8088XP, M810-M8430XP, M84311A-M84311P, M84312A-M84312P, M84319A-M84319P, M84321A-M84321P, M84322A-M84322P, M84329A-M84329P, M84331A-M84331P, M84332A-M84332P, M84333A-M84333P, M84334A-M84334P, M84339A-M84339P, M84341A-M84341P, M84342A-M84342P, M84343A-M84343P, M84344A-M84344P, M84345A-M84345P, M84346A-M84346P, M84350A-M84350P, M84351A-M84351P, M84352A-M84352P, M84353A-M84353P, M84359A-M84359P, M84361A-M84361P, M84362A-M84362P, M84363A-M84363P, M84364A-M84364P, M84369A-M84369P, M84371A-M84371P, M84372A-M84372P, M84373A-M84373P, M84374A-M84374P, M84375A-M84375P, M84376A-M84376P, M84377A-M84377P, M84378A-M84378P, M84379A-M84379P, M8438XA-M8438XP, M8440XA-M8440XP, M84411A-M84411P, M84412A-M84412P, M84419A-M84419P, M84421A-M84421P, M84422A-M84422P, M84429A-M84429P, M84431A-M84431P, M84432A-M84432P, M84433A-M84433P, M84434A-M84434P, M84439A-M84439P, M84441A-M84441P, M84442A-M84442P, M84443A-M84443P, M84444A-M84444P, M84445A-M84445P, M84446A-M84446P, M84451A-M84451P, M84452A-M84452P, M84453A-M84453P, M84454A-M84454P, M84459A-M84459P, M84461A-M84461P, M84462A-M84462P, M84463A-M84463P, M84464A-M84464P, M84469A-M84469P, M84471A-M84471P, M84472A-M84472P, M84473A-M84473P, M84474A-M84474P, M84475A-M84475P, M84476A-M84476P, M84477A-M84477P, M84478A-M84478P, M84479A-M84479P, M8448XA-M8448XP, M8450XA-M8450XP, M84511A-M84511P, M84512A-M84512P, M84519A-M84519P, M84521A-M84521P, M84522A-M84522P, M84529A-M84529P, M84531A-M84531P, M84532A-M84532P, M84533A-M84533P, M84534A-M84534P, M84539A-M84539P, M84541A-M84541P, M84542A-M84542P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M84549A-M84549P, M84550A-M84550P, M84551A-M84551P, M84552A-M84552P, M84553A-M84553P, M84559A-M84559P, M84561A-M84561P, M84562A-M84562P, M84563A-M84563P, M84564A-M84564P, M84569A-M84569P, M84571A-M84571P, M84572A-M84572P, M84573A-M84573P, M84574A-M84574P, M84575A-M84575P, M84576A-M84576P, M8458XA-M8458XP, M8460XA-M8460XP, M84611A-M84611P, M84612A-M84612P, M84619A-M84619P, M84621A-M84621P, M84622A-M84622P, M84629A-M84629P, M84631A-M84631P, M84632A-M84632P, M84633A-M84633P, M84634A-M84634P, M84639A-M84639P, M84641A-M84641P, M84642A-M84642P, M84649A-M84649P, M84650A-M84650P, M84651A-M84651P, M84652A-M84652P, M84653A-M84653P, M84659A-M84659P, M84661A-M84661P, M84662A-M84662P, M84663A-M84663P, M84664A-M84664P, M84669A-M84669P, M84671A-M84671P, M84672A-M84672P, M84673A-M84673P, M84674A-M84674P, M84675A-M84675P, M84676A-M84676P, M8468XA-M8468XP, M84750A-M84750P, M84751A-M84751P, M84752A-M84752P, M84753A-M84753P, M84754A-M84754P, M84755A-M84755P, M84756A-M84756P, M84757A-M84757P, M84758A-M84758P, M84759A-M84759P, M8480-M959, M962-M965, M9900-M9909, M9980-N16, N171-N172, N200-N23, N270-N981, N99110-N99518, N9983, NODX, O280-O289, P09, P293-P2938, Q000-Q189, Q250-Q849, Q851-Q859, Q870-R000, R002-R162, R180-R198, R220-R222, R250-R369, R390-R450, R453-R454, R4583-R599, R61-R64, R6521-R99, S020XXK, S02101K, S02102K, S02109K, S0210XK, S02110K, S02111K, S02112K, S02113K, S02118K, S02119K, S0211AK, S0211BK, S0211CK, S0211DK, S0211EK, S0211FK, S0211GK, S0211HK, S0219XK, S022XXK, S0230XK, S0231XK, S0232XK, S023XXK, S02400K, S02401K, S02402K, S0240AK, S0240BK, S0240CK, S0240DK, S0240EK, S0240FK, S02411K, S02412K, S02413K, S0242XK, S025XXK, S02600K, S02601K, S02602K, S02609K, S02610K, S02611K, S02612K, S0261XK, S02620K, S02621K, S02622K, S0262XK, S02630K, S02631K, S02632K, S0263XK, S02640K, S02641K, S02642K, S0264XK, S02650K, S02651K, S02652K, S0265XK, S0266XK, S02670K, S02671K, S02672K, S0267XK, S0269XK, S0280XK, S0281XK, S0282XK, S028XXK, S0291XK, S0292XK, S061X0A, S061X1A, S061X2A, S061X3A, S061X4A, S061X5A, S061X6A, S061X7A, S061X8A, S061X9A, S12000K, S12001K, S1201XK, S1202XK, S12030K, S12031K, S12040K, S12041K, S12090K, S12091K, S12100K, S12101K, S12110K, S12111K, S12112K, S12120K, S12121K, S12130K, S12131K, S1214XK, S12150K, S12151K, S12190K, S12191K, S12200K, S12201K, S12230K, S12231K, S1224XK, S12250K, S12251K, S12290K, S12291K, S12300K, S12301K, S12330K, S12331K,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S1234XK, S12350K, S12351K, S12390K, S12391K, S12400K, S12401K, S12430K, S12431K, S1244XK, S12450K, S12451K, S12490K, S12491K, S12500K, S12501K, S12530K, S12531K, S1254XK, S12550K, S12551K, S12590K, S12591K, S12600K, S12601K, S12630K, S12631K, S1264XK, S12650K, S12651K, S12690K, S12691K, S22000K, S22001K, S22002K, S22008K, S22009K, S22010K, S22011K, S22012K, S22018K, S22019K, S22020K, S22021K, S22022K, S22028K, S22029K, S22030K, S22031K, S22032K, S22038K, S22039K, S22040K, S22041K, S22042K, S22048K, S22049K, S22050K, S22051K, S22052K, S22058K, S22059K, S22060K, S22061K, S22062K, S22068K, S22069K, S22070K, S22071K, S22072K, S22078K, S22079K, S22080K, S22081K, S22082K, S22088K, S22089K, S2220XK, S2221XK, S2222XK, S2223XK, S2224XK, S2231XK, S2232XK, S2239XK, S2241XK, S2242XK, S2243XK, S2249XK, S225XXK, S229XXK, S32000K, S32001K, S32002K, S32008K, S32009K, S32010K, S32011K, S32012K, S32018K, S32019K, S32020K, S32021K, S32022K, S32028K, S32029K, S32030K, S32031K, S32032K, S32038K, S32039K, S32040K, S32041K, S32042K, S32048K, S32049K, S32050K, S32051K, S32052K, S32058K, S32059K, S3210XK, S32110K, S32111K, S32112K, S32119K, S32120K, S32121K, S32122K, S32129K, S32130K, S32131K, S32132K, S32139K, S3214XK, S3215XK, S3216XK, S3217XK, S3219XK, S322XXK, S32301K, S32302K, S32309K, S32311K, S32312K, S32313K, S32314K, S32315K, S32316K, S32391K, S32392K, S32399K, S32401K, S32402K, S32409K, S32411K, S32412K, S32413K, S32414K, S32415K, S32416K, S32421K, S32422K, S32423K, S32424K, S32425K, S32426K, S32431K, S32432K, S32433K, S32434K, S32435K, S32436K, S32441K, S32442K, S32443K, S32444K, S32445K, S32446K, S32451K, S32452K, S32453K, S32454K, S32455K, S32456K, S32461K, S32462K, S32463K, S32464K, S32465K, S32466K, S32471K, S32472K, S32473K, S32474K, S32475K, S32476K, S32481K, S32482K, S32483K, S32484K, S32485K, S32486K, S32491K, S32492K, S32499K, S32501K, S32502K, S32509K, S32511K, S32512K, S32519K, S32591K, S32592K, S32599K, S32601K, S32602K, S32609K, S32611K, S32612K, S32613K, S32614K, S32615K, S32616K, S32691K, S32692K, S32699K, S32810K, S32811K, S3282XK, S3289XK, S329XXK, S42001K-S42001P, S42002K-S42002P, S42009K-S42009P, S42011K-S42011P, S42012K-S42012P, S42013K-S42013P, S42014K-S42014P, S42015K-S42015P, S42016K-S42016P, S42017K-S42017P, S42018K-S42018P, S42019K-S42019P, S42021K-S42021P, S42022K-S42022P, S42023K-S42023P, S42024K-S42024P, S42025K-S42025P, S42026K-S42026P, S42031K-S42031P, S42032K-S42032P, S42033K-S42033P, S42034K-S42034P, S42035K-S42035P, S42036K-S42036P, S42101K-S42101P, S42102K-S42102P, S42109K-S42109P, S42111K-S42111P, S42112K-S42112P, S42113K-S42113P, S42114K-S42114P, S42115K-S42115P, S42116K-S42116P, S42121K-S42121P, S42122K-S42122P, S42123K-S42123P, S42124K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62364P, S62365K-S62365P, S62366K-S62366P, S62367K-S62367P, S62368K-S62368P, S62369K-S62369P, S62390K-S62390P, S62391K-S62391P, S62392K-S62392P, S62393K-S62393P, S62394K-S62394P, S62395K-S62395P, S62396K-S62396P, S62397K-S62397P, S62398K-S62398P, S62399K-S62399P, S62501K-S62501P, S62502K-S62502P, S62509K-S62509P, S62511K-S62511P, S62512K-S62512P, S62513K-S62513P, S62514K-S62514P, S62515K-S62515P, S62516K-S62516P, S62521K-S62521P, S62522K-S62522P, S62523K-S62523P, S62524K-S62524P, S62525K-S62525P, S62526K-S62526P, S62600K-S62600P, S62601K-S62601P, S62602K-S62602P, S62603K-S62603P, S62604K-S62604P, S62605K-S62605P, S62606K-S62606P, S62607K-S62607P, S62608K-S62608P, S62609K-S62609P, S62610K-S62610P, S62611K-S62611P, S62612K-S62612P, S62613K-S62613P, S62614K-S62614P, S62615K-S62615P, S62616K-S62616P, S62617K-S62617P, S62618K-S62618P, S62619K-S62619P, S62620K-S62620P, S62621K-S62621P, S62622K-S62622P, S62623K-S62623P, S62624K-S62624P, S62625K-S62625P, S62626K-S62626P, S62627K-S62627P, S62628K-S62628P, S62629K-S62629P, S62630K-S62630P, S62631K-S62631P, S62632K-S62632P, S62633K-S62633P, S62634K-S62634P, S62635K-S62635P, S62636K-S62636P, S62637K-S62637P, S62638K-S62638P, S62639K-S62639P, S62640K-S62640P, S62641K-S62641P, S62642K-S62642P, S62643K-S62643P, S62644K-S62644P, S62645K-S62645P, S62646K-S62646P, S62647K-S62647P, S62648K-S62648P, S62649K-S62649P, S62650K-S62650P, S62651K-S62651P, S62652K-S62652P, S62653K-S62653P, S62654K-S62654P, S62655K-S62655P, S62656K-S62656P, S62657K-S62657P, S62658K-S62658P, S62659K-S62659P, S62660K-S62660P, S62661K-S62661P, S62662K-S62662P, S62663K-S62663P, S62664K-S62664P, S62665K-S62665P, S62666K-S62666P, S62667K-S62667P, S62668K-S62668P, S62669K-S62669P, S6290XK-S6290XP, S6291XK-S6291XP, S6292XK-S6292XP, S72001K-S72001R, S72002K-S72002R, S72009K-S72009R, S72011K-S72011R, S72012K-S72012R, S72019K-S72019R, S72021K-S72021R, S72022K-S72022R, S72023K-S72023R, S72024K-S72024R, S72025K-S72025R, S72026K-S72026R, S72031K-S72031R, S72032K-S72032R, S72033K-S72033R, S72034K-S72034R, S72035K-S72035R, S72036K-S72036R, S72041K-S72041R, S72042K-S72042R, S72043K-S72043R, S72044K-S72044R, S72045K-S72045R, S72046K-S72046R, S72051K-S72051R, S72052K-S72052R, S72059K-S72059R, S72061K-S72061R, S72062K-S72062R, S72063K-S72063R, S72064K-S72064R, S72065K-S72065R, S72066K-S72066R, S72091K-S72091R, S72092K-S72092R, S72099K-S72099R, S72101K-S72101R, S72102K-S72102R, S72109K-S72109R, S72111K-S72111R, S72112K-S72112R, S72113K-S72113R, S72114K-S72114R, S72115K-S72115R, S72116K-S72116R, S72121K-S72121R, S72122K-S72122R, S72123K-S72123R, S72124K-S72124R,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82034R, S82035K-S82035R, S82036K-S82036R, S82041K-S82041R, S82042K-S82042R, S82043K-S82043R, S82044K-S82044R, S82045K-S82045R, S82046K-S82046R, S82091K-S82091R, S82092K-S82092R, S82099K-S82099R, S82101K-S82101R, S82102K-S82102R, S82109K-S82109R, S82111K-S82111R, S82112K-S82112R, S82113K-S82113R, S82114K-S82114R, S82115K-S82115R, S82116K-S82116R, S82121K-S82121R, S82122K-S82122R, S82123K-S82123R, S82124K-S82124R, S82125K-S82125R, S82126K-S82126R, S82131K-S82131R, S82132K-S82132R, S82133K-S82133R, S82134K-S82134R, S82135K-S82135R, S82136K-S82136R, S82141K-S82141R, S82142K-S82142R, S82143K-S82143R, S82144K-S82144R, S82145K-S82145R, S82146K-S82146R, S82151K-S82151R, S82152K-S82152R, S82153K-S82153R, S82154K-S82154R, S82155K-S82155R, S82156K-S82156R, S82161K-S82161P, S82162K-S82162P, S82169K-S82169P, S82191K-S82191R, S82192K-S82192R, S82199K-S82199R, S82201K-S82201R, S82202K-S82202R, S82209K-S82209R, S82221K-S82221R, S82222K-S82222R, S82223K-S82223R, S82224K-S82224R, S82225K-S82225R, S82226K-S82226R, S82231K-S82231R, S82232K-S82232R, S82233K-S82233R, S82234K-S82234R, S82235K-S82235R, S82236K-S82236R, S82241K-S82241R, S82242K-S82242R, S82243K-S82243R, S82244K-S82244R, S82245K-S82245R, S82246K-S82246R, S82251K-S82251R, S82252K-S82252R, S82253K-S82253R, S82254K-S82254R, S82255K-S82255R, S82256K-S82256R, S82261K-S82261R, S82262K-S82262R, S82263K-S82263R, S82264K-S82264R, S82265K-S82265R, S82266K-S82266R, S82291K-S82291R, S82292K-S82292R, S82299K-S82299R, S82301K-S82301R, S82302K-S82302R, S82309K-S82309R, S82311K-S82311P, S82312K-S82312P, S82319K-S82319P, S82391K-S82391R, S82392K-S82392R, S82399K-S82399R, S82401K-S82401R, S82402K-S82402R, S82409K-S82409R, S82421K-S82421R, S82422K-S82422R, S82423K-S82423R, S82424K-S82424R, S82425K-S82425R, S82426K-S82426R, S82431K-S82431R, S82432K-S82432R, S82433K-S82433R, S82434K-S82434R, S82435K-S82435R, S82436K-S82436R, S82441K-S82441R, S82442K-S82442R, S82443K-S82443R, S82444K-S82444R, S82445K-S82445R, S82446K-S82446R, S82451K-S82451R, S82452K-S82452R, S82453K-S82453R, S82454K-S82454R, S82455K-S82455R, S82456K-S82456R, S82461K-S82461R, S82462K-S82462R, S82463K-S82463R, S82464K-S82464R, S82465K-S82465R, S82466K-S82466R, S82491K-S82491R, S82492K-S82492R, S82499K-S82499R, S8251XK-S8251XR, S8252XK-S8252XR, S8253XK-S8253XR, S8254XK-S8254XR, S8255XK-S8255XR, S8256XK-S8256XR, S8261XK-S8261XR, S8262XK-S8262XR, S8263XK-S8263XR, S8264XK-S8264XR, S8265XK-S8265XR, S8266XK-S8266XR, S82811K-S82811P, S82812K-S82812P, S82819K-S82819P, S82821K-S82821P, S82822K-S82822P, S82829K-S82829P, S82831K-S82831R, S82832K-S82832R, S82839K-S82839R,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82841K-S82841R, S82842K-S82842R, S82843K-S82843R, S82844K-S82844R, S82845K-S82845R, S82846K-S82846R, S82851K-S82851R, S82852K-S82852R, S82853K-S82853R, S82854K-S82854R, S82855K-S82855R, S82856K-S82856R, S82861K-S82861R, S82862K-S82862R, S82863K-S82863R, S82864K-S82864R, S82865K-S82865R, S82866K-S82866R, S82871K-S82871R, S82872K-S82872R, S82873K-S82873R, S82874K-S82874R, S82875K-S82875R, S82876K-S82876R, S82891K-S82891R, S82892K-S82892R, S82899K-S82899R, S8290XK-S8290XR, S8291XK-S8291XR, S8292XK-S8292XR, S89001K-S89001P, S89002K-S89002P, S89009K-S89009P, S89011K-S89011P, S89012K-S89012P, S89019K-S89019P, S89021K-S89021P, S89022K-S89022P, S89029K-S89029P, S89031K-S89031P, S89032K-S89032P, S89039K-S89039P, S89041K-S89041P, S89042K-S89042P, S89049K-S89049P, S89091K-S89091P, S89092K-S89092P, S89099K-S89099P, S89101K-S89101P, S89102K-S89102P, S89109K-S89109P, S89111K-S89111P, S89112K-S89112P, S89119K-S89119P, S89121K-S89121P, S89122K-S89122P, S89129K-S89129P, S89131K-S89131P, S89132K-S89132P, S89139K-S89139P, S89141K-S89141P, S89142K-S89142P, S89149K-S89149P, S89191K-S89191P, S89192K-S89192P, S89199K-S89199P, S89201K-S89201P, S89202K-S89202P, S89209K-S89209P, S89211K-S89211P, S89212K-S89212P, S89219K-S89219P, S89221K-S89221P, S89222K-S89222P, S89229K-S89229P, S89291K-S89291P, S89292K-S89292P, S89299K-S89299P, S89301K-S89301P, S89302K-S89302P, S89309K-S89309P, S89311K-S89311P, S89312K-S89312P, S89319K-S89319P, S89321K-S89321P, S89322K-S89322P, S89329K-S89329P, S89391K-S89391P, S89392K-S89392P, S89399K-S89399P, S92001K-S92001P, S92002K-S92002P, S92009K-S92009P, S92011K-S92011P, S92012K-S92012P, S92013K-S92013P, S92014K-S92014P, S92015K-S92015P, S92016K-S92016P, S92021K-S92021P, S92022K-S92022P, S92023K-S92023P, S92024K-S92024P, S92025K-S92025P, S92026K-S92026P, S92031K-S92031P, S92032K-S92032P, S92033K-S92033P, S92034K-S92034P, S92035K-S92035P, S92036K-S92036P, S92041K-S92041P, S92042K-S92042P, S92043K-S92043P, S92044K-S92044P, S92045K-S92045P, S92046K-S92046P, S92051K-S92051P, S92052K-S92052P, S92053K-S92053P, S92054K-S92054P, S92055K-S92055P, S92056K-S92056P, S92061K-S92061P, S92062K-S92062P, S92063K-S92063P, S92064K-S92064P, S92065K-S92065P, S92066K-S92066P, S92101K-S92101P, S92102K-S92102P, S92109K-S92109P, S92111K-S92111P, S92112K-S92112P, S92113K-S92113P, S92114K-S92114P, S92115K-S92115P, S92116K-S92116P, S92121K-S92121P, S92122K-S92122P, S92123K-S92123P, S92124K-S92124P, S92125K-S92125P, S92126K-S92126P, S92131K-S92131P, S92132K-S92132P, S92133K-S92133P, S92134K-S92134P, S92135K-S92135P, S92136K-S92136P, S92141K-S92141P, S92142K-S92142P, S92143K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92143P, S92144K-S92144P, S92145K-S92145P, S92146K-S92146P, S92151K-S92151P, S92152K-S92152P, S92153K-S92153P, S92154K-S92154P, S92155K-S92155P, S92156K-S92156P, S92191K-S92191P, S92192K-S92192P, S92199K-S92199P, S92201K-S92201P, S92202K-S92202P, S92209K-S92209P, S92211K-S92211P, S92212K-S92212P, S92213K-S92213P, S92214K-S92214P, S92215K-S92215P, S92216K-S92216P, S92221K-S92221P, S92222K-S92222P, S92223K-S92223P, S92224K-S92224P, S92225K-S92225P, S92226K-S92226P, S92231K-S92231P, S92232K-S92232P, S92233K-S92233P, S92234K-S92234P, S92235K-S92235P, S92236K-S92236P, S92241K-S92241P, S92242K-S92242P, S92243K-S92243P, S92244K-S92244P, S92245K-S92245P, S92246K-S92246P, S92251K-S92251P, S92252K-S92252P, S92253K-S92253P, S92254K-S92254P, S92255K-S92255P, S92256K-S92256P, S92301K-S92301P, S92302K-S92302P, S92309K-S92309P, S92311K-S92311P, S92312K-S92312P, S92313K-S92313P, S92314K-S92314P, S92315K-S92315P, S92316K-S92316P, S92321K-S92321P, S92322K-S92322P, S92323K-S92323P, S92324K-S92324P, S92325K-S92325P, S92326K-S92326P, S92331K-S92331P, S92332K-S92332P, S92333K-S92333P, S92334K-S92334P, S92335K-S92335P, S92336K-S92336P, S92341K-S92341P, S92342K-S92342P, S92343K-S92343P, S92344K-S92344P, S92345K-S92345P, S92346K-S92346P, S92351K-S92351P, S92352K-S92352P, S92353K-S92353P, S92354K-S92354P, S92355K-S92355P, S92356K-S92356P, S92401K-S92401P, S92402K-S92402P, S92403K-S92403P, S92404K-S92404P, S92405K-S92405P, S92406K-S92406P, S92411K-S92411P, S92412K-S92412P, S92413K-S92413P, S92414K-S92414P, S92415K-S92415P, S92416K-S92416P, S92421K-S92421P, S92422K-S92422P, S92423K-S92423P, S92424K-S92424P, S92425K-S92425P, S92426K-S92426P, S92491K-S92491P, S92492K-S92492P, S92499K-S92499P, S92501K-S92501P, S92502K-S92502P, S92503K-S92503P, S92504K-S92504P, S92505K-S92505P, S92506K-S92506P, S92511K-S92511P, S92512K-S92512P, S92513K-S92513P, S92514K-S92514P, S92515K-S92515P, S92516K-S92516P, S92521K-S92521P, S92522K-S92522P, S92523K-S92523P, S92524K-S92524P, S92525K-S92525P, S92526K-S92526P, S92531K-S92531P, S92532K-S92532P, S92533K-S92533P, S92534K-S92534P, S92535K-S92535P, S92536K-S92536P, S92591K-S92591P, S92592K-S92592P, S92599K-S92599P, S92811K-S92811P, S92812K-S92812P, S92819K-S92819P, S92901K-S92901P, S92902K-S92902P, S92909K-S92909P, S92911K-S92911P, S92912K-S92912P, S92919K-S92919P, S99001K-S99001P, S99002K-S99002P, S99009K-S99009P, S99011K-S99011P, S99012K-S99012P, S99019K-S99019P, S99021K-S99021P, S99022K-S99022P, S99029K-S99029P, S99031K-S99031P, S99032K-S99032P, S99039K-S99039P, S99041K-S99041P, S99042K-S99042P, S99049K-S99049P, S99091K-S99091P, S99092K-S99092P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S99099K-S99099P, S99101K-S99101P, S99102K-S99102P, S99109K-S99109P, S99111K-S99111P, S99112K-S99112P, S99119K-S99119P, S99121K-S99121P, S99122K-S99122P, S99129K-S99129P, S99131K-S99131P, S99132K-S99132P, S99139K-S99139P, S99141K-S99141P, S99142K-S99142P, S99149K-S99149P, S99191K-S99191P, S99192K-S99192P, S99199K-S99199P, S99201K-S99201P, S99202K-S99202P, S99209K-S99209P, S99211K-S99211P, S99212K-S99212P, S99219K-S99219P, S99221K-S99221P, S99222K-S99222P, S99229K-S99229P, S99231K-S99231P, S99232K-S99232P, S99239K-S99239P, S99241K-S99241P, S99242K-S99242P, S99249K-S99249P, S99291K-S99291P, S99292K-S99292P, S99299K-S99299P, T800XXA, T801XXA, T80211A, T80212A, T80218A, T80219A, T8022XA, T8029XA, T8030XA, T80310A, T80311A, T80319A, T8039XA, T8040XA, T80410A, T80411A, T80419A, T8049XA, T8051XA, T8052XA, T8059XA, T8061XA, T8062XA, T8069XA, T80810A, T80818A, T8089XA, T8090XA, T80910A, T80911A, T80919A, T8092XA, T80A0XA, T80A10A, T80A11A, T80A19A, T80A9XA, T8181XA, T83711A, T83721A, T880XXA, T881XXA, T884XXA, T887XXA, T888XXA, T889XXA
48. Other conditions not related to smoking (OTHC_TBCO)	OTHC except 218, 256, 365, 366, 368, 370, 440-442, 443, 460-466, 473, 478, 521-523, 527, 529, 530-533, 627, 786,	OTHC, except D12-D17, E76-E 88, F70,F78-F89,R86-R99	Models do not require coding of the condition from this data source.
49. Other conditions made worse by smoking (OTHC_TBCO_INTR)	277, 487, 488, 517, 500-516,	B03,B08,D57,E76,E79 ,E80,J10,J11,J17,J60,J 68-J70, J84-J85,J90-J94,J99,M31-M32,M34-M35	Models do not require coding of the condition from this data source.
50. Other conditions not related to obesity (OTHC_OBES)	OTHC except 274, 327, 440-442, 451, 454, 530, 539, 574, 717, 780, 786-788	A01-A39, A41, A43-A99, B00-B19, B25-B99, D12-D21, D24-D36, D50-D89, E00-E89, F54, F70, F78-F80, F89, G00-G26, G32-G44, G47-G99, H00-H96, I60, I62,I73-I79, I81-I82,I87-I99, J01-J40, J61-J66, J68-J99, K00-K14,K25-K94, L44-L68, L72-L94, M00-M10, M13, M20-M42, M60-M95, N00-N17, N20-N60, N65-N99, O28, P09,P29, Q00-Q99, R00-R22, R25-R36, R41, R43-R44, R47-RR49, R51-R54, R57-R59, R62-R64, R68-R99, T80	Models do not require coding of the condition from this data source.

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
51. Other conditions not related to diabetes (OTHC_DIAB)	OTHC except 365, 369, 440-442	A00-A99, B00-B19, B25-B99, D12-D26, D50-D89, E00-E07, E15-E35, E40-E89, F54, F70, F78-F80, F89, G00-G44, G47-G99, H00-H95, I60, I62, I71-I99, J00-J99, K00-K67, K70-K95, L44-L50, L60-L68, L72-L94, M00-M13, M20-M42, M60-M95, N00-N99, O28, P09, P29, Q00-Q99, R00-R04, R06-E11, R16, R18-R19, R22, R25-R29, R31, R36, R39, R41, R43-R44, R47-R49, R51-R54, R57-R59, R62-R64, R68-R99, T80	A001-A329, A35-A480, A482-A519, A5210-B199, B250-B780, B787-B999, C880, C965-C966, D100-D219, D241-D369, D472, D474, D481, D500-D77, D800-E099, E103521-E103549, E1041, E1043-E1052, E10610, E10630, E113521-E113549, E1141, E1143-E1152, E11610, E11630, E1300-E35, E40-E649, E700-E712, E71310-E7519, E7523 E7525-E7529, E754, E7601-E769, E771, E7871-E7872, E790-E8319, E8330-E8809, E883-E896, F3281, F5104-F5105, F5113, F518, F54, F70-F82 F842, F88-F89, G000-G131, G14-G26, G3181-G3182, G319-G4489, G453, G4700-G909, G911, G913, G918-G936, G9381-G939, G950-G969, G971, G9741, G9782-H36 H4040X0, H4300-H539, H5500-H579, H5940-H5943, H6000-H95199, I280-I339, I39-I41, I6000-I629, I670, I673, I6783, I70361-I70369, I70461-I70469, I70561-I70569, I70661-I70669, I70761-I70769, I7300-I789, I791-I8393, I87001-I96, I972, I998-J1189, J129, J17, J181-J182, J200-J40, J60-J668, J680-J953, J95811-J95822, J9584 J9600-K67, K6812-K912, K915, K91850-K91858, K9189-K9589, L081, L444, L600-L660, L662-L663, L668-L689, L7211-L7212, L731, L738-L739, L946, M0000 M0540-M0559, M0760-M0769, M1000-M119, M1220-M1249, M1280, M1460-M1489, M1A00X0-M1A09X1, M1A20X0-M25776, M2580-M352, M354-M4319, M433-M435X9, M438X1-M439, M4620-M4639, M4840XA, M4841XA, M4842XA, M4843XA, M4844XA, M4845XA, M4846XA, M4847XA, M4848XA, M4850XA, M4851XA, M4852XA, M4853XA, M4854XA, M4855XA, M4856XA, M4857XA, M4858XA, M532X1-M532X6, M532X9, M5410, M5418, M60000-M6282, M62831-M8000XP, M80011A-M80011P, M80012A-M80012P, M80019A-M80019P, M80021A-M80021P, M80022A-M80022P, M80029A-M80029P, M80031A-M80031P, M80032A-M80032P, M80039A-M80039P, M80041A-M80041P, M80042A-M80042P, M80049A-M80049P, M80051A-M80051P, M80052A-M80052P, M80059A-M80059P, M80061A-M80061P, M80062A-M80062P, M80069A-M80069P, M80071A-M80071P, M80072A-M80072P, M80079A-M80079P, M8008XA-M8008XP, M8080XA-M8080XP, M80811A-M80811P, M80812A-M80812P, M80819A-M80819P, M80821A-M80821P, M80822A-M80822P, M80829A-M80829P, M80831A-M80831P, M80832A-M80832P, M80839A-M80839P, M80841A-M80841P, M80842A-M80842P, M80849A-M80849P, M80851A-M80851P, M80852A-M80852P, M80859A-M80859P, M80861A-M80861P, M80862A-M80862P, M80869A-M80869P, M80871A-M80871P, M80872A-M80872P, M80879A-M80879P, M8088XA-M8088XP, M810-M8430XP, M84311A-M84311P, M84312A-M84312P, M84319A-M84319P, M84321A-M84321P, M84322A-M84322P, M84329A-M84329P, M84331A-M84331P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M84332A-M84332P, M84333A-M84333P, M84334A-M84334P, M84339A-M84339P, M84341A-M84341P, M84342A-M84342P, M84343A-M84343P, M84344A-M84344P, M84345A-M84345P, M84346A-M84346P, M84350A-M84350P, M84351A-M84351P, M84352A-M84352P, M84353A-M84353P, M84359A-M84359P, M84361A-M84361P, M84362A-M84362P, M84363A-M84363P, M84364A-M84364P, M84369A-M84369P, M84371A-M84371P, M84372A-M84372P, M84373A-M84373P, M84374A-M84374P, M84375A-M84375P, M84376A-M84376P, M84377A-M84377P, M84378A-M84378P, M84379A-M84379P, M8438XA-M8438XP, M8440XA-M8440XP, M84411A-M84411P, M84412A-M84412P, M84419A-M84419P, M84421A-M84421P, M84422A-M84422P, M84429A-M84429P, M84431A-M84431P, M84432A-M84432P, M84433A-M84433P, M84434A-M84434P, M84439A-M84439P, M84441A-M84441P, M84442A-M84442P, M84443A-M84443P, M84444A-M84444P, M84445A-M84445P, M84446A-M84446P, M84451A-M84451P, M84452A-M84452P, M84453A-M84453P, M84454A-M84454P, M84459A-M84459P, M84461A-M84461P, M84462A-M84462P, M84463A-M84463P, M84464A-M84464P, M84469A-M84469P, M84471A-M84471P, M84472A-M84472P, M84473A-M84473P, M84474A-M84474P, M84475A-M84475P, M84476A-M84476P, M84477A-M84477P, M84478A-M84478P, M84479A-M84479P, M8448XA-M8448XP, M8450XA-M8450XP, M84511A-M84511P, M84512A-M84512P, M84519A-M84519P, M84521A-M84521P, M84522A-M84522P, M84529A-M84529P, M84531A-M84531P, M84532A-M84532P, M84533A-M84533P, M84534A-M84534P, M84539A-M84539P, M84541A-M84541P, M84542A-M84542P, M84549A-M84549P, M84550A-M84550P, M84551A-M84551P, M84552A-M84552P, M84553A-M84553P, M84559A-M84559P, M84561A-M84561P, M84562A-M84562P, M84563A-M84563P, M84564A-M84564P, M84569A-M84569P, M84571A-M84571P, M84572A-M84572P, M84573A-M84573P, M84574A-M84574P, M84575A-M84575P, M84576A-M84576P, M8458XA-M8458XP, M8460XA-M8460XP, M84611A-M84611P, M84612A-M84612P, M84619A-M84619P, M84621A-M84621P, M84622A-M84622P, M84629A-M84629P, M84631A-M84631P, M84632A-M84632P, M84633A-M84633P, M84634A-M84634P, M84639A-M84639P, M84641A-M84641P, M84642A-M84642P, M84649A-M84649P, M84650A-M84650P, M84651A-M84651P, M84652A-M84652P, M84653A-M84653P, M84659A-M84659P, M84661A-M84661P, M84662A-M84662P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M84663A-M84663P, M84664A-M84664P, M84669A-M84669P, M84671A-M84671P, M84672A-M84672P, M84673A-M84673P, M84674A-M84674P, M84675A-M84675P, M84676A-M84676P, M8468XA-M8468XP, M84750A-M84750P, M84751A-M84751P, M84752A-M84752P, M84753A-M84753P, M84754A-M84754P, M84755A-M84755P, M84756A-M84756P, M84757A-M84757P, M84758A-M84758P, M84759A-M84759P, M8480-M959, M962-M965, M9900-M9909, M9980-N16, N171-N172, N200-N23, N270-N981, N99110-N99518, N9983, O280 P09, P293-P2938, Q000-Q189, Q250-Q849, Q851-Q859, Q870-R000, R002-R162, R180-R198, R220-R222, R250-R369, R390-R450, R453-R454, R4583-R599, R61-R64, R6521-R99, S020XXK, S02101K, S02102K, S02109K, S0210XK, S02110K, S02111K, S02112K, S02113K, S02118K, S02119K, S0211AK, S0211BK, S0211CK, S0211DK, S0211EK, S0211FK, S0211GK, S0211HK, S0219XK, S022XXK, S0230XK, S0231XK, S0232XK, S023XXK, S02400K, S02401K, S02402K, S0240AK, S0240BK, S0240CK, S0240DK, S0240EK, S0240FK, S02411K, S02412K, S02413K, S0242XK, S025XXK, S02600K, S02601K, S02602K, S02609K, S02610K, S02611K, S02612K, S0261XK, S02620K, S02621K, S02622K, S0262XK, S02630K, S02631K, S02632K, S0263XK, S02640K, S02641K, S02642K, S0264XK, S02650K, S02651K, S02652K, S0265XK, S0266XK, S02670K, S02671K, S02672K, S0267XK, S0269XK, S0280XK, S0281XK, S0282XK, S028XXK, S0291XK, S0292XK, S061X0A, S061X1A, S061X2A, S061X3A, S061X4A, S061X5A, S061X6A, S061X7A, S061X8A, S061X9A, S12000K, S12001K, S1201XK, S1202XK, S12030K, S12031K, S12040K, S12041K, S12090K, S12091K, S12100K, S12101K, S12110K, S12111K, S12112K, S12120K, S12121K, S12130K, S12131K, S1214XK, S12150K, S12151K, S12190K, S12191K, S12200K, S12201K, S12230K, S12231K, S1224XK, S12250K, S12251K, S12290K, S12291K, S12300K, S12301K, S12330K, S12331K, S1234XK, S12350K, S12351K, S12390K, S12391K, S12400K, S12401K, S12430K, S12431K, S1244XK, S12450K, S12451K, S12490K, S12491K, S12500K, S12501K, S12530K, S12531K, S1254XK, S12550K, S12551K, S12590K, S12591K, S12600K, S12601K, S12630K, S12631K, S1264XK, S12650K, S12651K, S12690K, S12691K, S22000K, S22001K, S22002K, S22008K, S22009K, S22010K, S22011K, S22012K, S22018K, S22019K, S22020K, S22021K, S22022K, S22028K, S22029K, S22030K, S22031K, S22032K, S22038K, S22039K, S22040K, S22041K, S22042K, S22048K, S22049K, S22050K, S22051K, S22052K, S22058K, S22059K, S22060K, S22061K, S22062K, S22068K, S22069K, S22070K, S22071K, S22072K, S22078K, S22079K, S22080K, S22081K, S22082K, S22088K, S22089K, S2220XK, S2221XK, S2222XK, S2223XK, S2224XK, S2231XK, S2232XK, S2239XK, S2241XK, S2242XK, S2243XK, S2249XK, S225XXK, S229XXK, S32000K, S32001K, S32002K, S32008K, S32009K, S32010K, S32011K, S32012K, S32018K, S32019K, S32020K,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S32021K, S32022K, S32028K, S32029K, S32030K, S32031K, S32032K, S32038K, S32039K, S32040K, S32041K, S32042K, S32048K, S32049K, S32050K, S32051K, S32052K, S32058K, S32059K, S3210XK, S32110K, S32111K, S32112K, S32119K, S32120K, S32121K, S32122K, S32129K, S32130K, S32131K, S32132K, S32139K, S3214XK, S3215XK, S3216XK, S3217XK, S3219XK, S322XXK, S32301K, S32302K, S32309K, S32311K, S32312K, S32313K, S32314K, S32315K, S32316K, S32391K, S32392K, S32399K, S32401K, S32402K, S32409K, S32411K, S32412K, S32413K, S32414K, S32415K, S32416K, S32421K, S32422K, S32423K, S32424K, S32425K, S32426K, S32431K, S32432K, S32433K, S32434K, S32435K, S32436K, S32441K, S32442K, S32443K, S32444K, S32445K, S32446K, S32451K, S32452K, S32453K, S32454K, S32455K, S32456K, S32461K, S32462K, S32463K, S32464K, S32465K, S32466K, S32471K, S32472K, S32473K, S32474K, S32475K, S32476K, S32481K, S32482K, S32483K, S32484K, S32485K, S32486K, S32491K, S32492K, S32499K, S32501K, S32502K, S32509K, S32511K, S32512K, S32519K, S32591K, S32592K, S32599K, S32601K, S32602K, S32609K, S32611K, S32612K, S32613K, S32614K, S32615K, S32616K, S32691K, S32692K, S32699K, S32810K, S32811K, S3282XK, S3289XK, S329XXK, S42001K-S42001P, S42002K-S42002P, S42009K-S42009P, S42011K-S42011P, S42012K-S42012P, S42013K-S42013P, S42014K-S42014P, S42015K-S42015P, S42016K-S42016P, S42017K-S42017P, S42018K-S42018P, S42019K-S42019P, S42021K-S42021P, S42022K-S42022P, S42023K-S42023P, S42024K-S42024P, S42025K-S42025P, S42026K-S42026P, S42031K-S42031P, S42032K-S42032P, S42033K-S42033P, S42034K-S42034P, S42035K-S42035P, S42036K-S42036P, S42101K-S42101P, S42102K-S42102P, S42109K-S42109P, S42111K-S42111P, S42112K-S42112P, S42113K-S42113P, S42114K-S42114P, S42115K-S42115P, S42116K-S42116P, S42121K-S42121P, S42122K-S42122P, S42123K-S42123P, S42124K-S42124P, S42125K-S42125P, S42126K-S42126P, S42131K-S42131P, S42132K-S42132P, S42133K-S42133P, S42134K-S42134P, S42135K-S42135P, S42136K-S42136P, S42141K-S42141P, S42142K-S42142P, S42143K-S42143P, S42144K-S42144P, S42145K-S42145P, S42146K-S42146P, S42151K-S42151P, S42152K-S42152P, S42153K-S42153P, S42154K-S42154P, S42155K-S42155P, S42156K-S42156P, S42191K-S42191P, S42192K-S42192P, S42199K-S42199P, S42201K-S42201P, S42202K-S42202P, S42209K-S42209P, S42211K-S42211P, S42212K-S42212P, S42213K-S42213P, S42214K-S42214P, S42215K-S42215P, S42216K-S42216P, S42221K-S42221P, S42222K-S42222P, S42223K-S42223P, S42224K-S42224P, S42225K-S42225P, S42226K-S42226P, S42231K-S42231P, S42232K-S42232P, S42239K-S42239P, S42241K-S42241P, S42242K-S42242P, S42249K-S42249P, S42251K-S42251P, S42252K-S42252P, S42253K-S42253P, S42254K-S42254P, S42255K-S42255P, S42256K-S42256P, S42261K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42261P, S42262K-S42262P, S42263K-S42263P, S42264K-S42264P, S42265K-S42265P, S42266K-S42266P, S42271K-S42271P, S42272K-S42272P, S42279K-S42279P, S42291K-S42291P, S42292K-S42292P, S42293K-S42293P, S42294K-S42294P, S42295K-S42295P, S42296K-S42296P, S42301K-S42301P, S42302K-S42302P, S42309K-S42309P, S42311K-S42311P, S42312K-S42312P, S42319K-S42319P, S42321K-S42321P, S42322K-S42322P, S42323K-S42323P, S42324K-S42324P, S42325K-S42325P, S42326K-S42326P, S42331K-S42331P, S42332K-S42332P, S42333K-S42333P, S42334K-S42334P, S42335K-S42335P, S42336K-S42336P, S42341K-S42341P, S42342K-S42342P, S42343K-S42343P, S42344K-S42344P, S42345K-S42345P, S42346K-S42346P, S42351K-S42351P, S42352K-S42352P, S42353K-S42353P, S42354K-S42354P, S42355K-S42355P, S42356K-S42356P, S42361K-S42361P, S42362K-S42362P, S42363K-S42363P, S42364K-S42364P, S42365K-S42365P, S42366K-S42366P, S42391K-S42391P, S42392K-S42392P, S42399K-S42399P, S42401K-S42401P, S42402K-S42402P, S42409K-S42409P, S42411K-S42411P, S42412K-S42412P, S42413K-S42413P, S42414K-S42414P, S42415K-S42415P, S42416K-S42416P, S42421K-S42421P, S42422K-S42422P, S42423K-S42423P, S42424K-S42424P, S42425K-S42425P, S42426K-S42426P, S42431K-S42431P, S42432K-S42432P, S42433K-S42433P, S42434K-S42434P, S42435K-S42435P, S42436K-S42436P, S42441K-S42441P, S42442K-S42442P, S42443K-S42443P, S42444K-S42444P, S42445K-S42445P, S42446K-S42446P, S42447K-S42447P, S42448K-S42448P, S42449K-S42449P, S42451K-S42451P, S42452K-S42452P, S42453K-S42453P, S42454K-S42454P, S42455K-S42455P, S42456K-S42456P, S42461K-S42461P, S42462K-S42462P, S42463K-S42463P, S42464K-S42464P, S42465K-S42465P, S42466K-S42466P, S42471K-S42471P, S42472K-S42472P, S42473K-S42473P, S42474K-S42474P, S42475K-S42475P, S42476K-S42476P, S42481K-S42481P, S42482K-S42482P, S42489K-S42489P, S42491K-S42491P, S42492K-S42492P, S42493K-S42493P, S42494K-S42494P, S42495K-S42495P, S42496K-S42496P, S4290XK-S4290XP, S4291XK-S4291XP, S4292XK-S4292XP, S49001K-S49001P, S49002K-S49002P, S49009K-S49009P, S49011K-S49011P, S49012K-S49012P, S49019K-S49019P, S49021K-S49021P, S49022K-S49022P, S49029K-S49029P, S49031K-S49031P, S49032K-S49032P, S49039K-S49039P, S49041K-S49041P, S49042K-S49042P, S49049K-S49049P, S49091K-S49091P, S49092K-S49092P, S49099K-S49099P, S49101K-S49101P, S49102K-S49102P, S49109K-S49109P, S49111K-S49111P, S49112K-S49112P, S49119K-S49119P, S49121K-S49121P, S49122K-S49122P, S49129K-S49129P, S49131K-S49131P, S49132K-S49132P, S49139K-S49139P, S49141K-S49141P, S49142K-S49142P, S49149K-S49149P, S49191K-S49191P, S49192K-S49192P, S49199K-S49199P, S52001K-S52001R, S52002K-S52002R, S52009K-S52009R,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S52011K-S52011P, S52012K-S52012P, S52019K-S52019P, S52021K-S52021R, S52022K-S52022R, S52023K-S52023R, S52024K-S52024R, S52025K-S52025R, S52026K-S52026R, S52031K-S52031R, S52032K-S52032R, S52033K-S52033R, S52034K-S52034R, S52035K-S52035R, S52036K-S52036R, S52041K-S52041R, S52042K-S52042R, S52043K-S52043R, S52044K-S52044R, S52045K-S52045R, S52046K-S52046R, S52091K-S52091R, S52092K-S52092R, S52099K-S52099R, S52101K-S52101R, S52102K-S52102R, S52109K-S52109R, S52111K-S52111P, S52112K-S52112P, S52119K-S52119P, S52121K-S52121R, S52122K-S52122R, S52123K-S52123R, S52124K-S52124R, S52125K-S52125R, S52126K-S52126R, S52131K-S52131R, S52132K-S52132R, S52133K-S52133R, S52134K-S52134R, S52135K-S52135R, S52136K-S52136R, S52181K-S52181R, S52182K-S52182R, S52189K-S52189R, S52201K-S52201R, S52202K-S52202R, S52209K-S52209R, S52211K-S52211P, S52212K-S52212P, S52219K-S52219P, S52221K-S52221R, S52222K-S52222R, S52223K-S52223R, S52224K-S52224R, S52225K-S52225R, S52226K-S52226R, S52231K-S52231R, S52232K-S52232R, S52233K-S52233R, S52234K-S52234R, S52235K-S52235R, S52236K-S52236R, S52241K-S52241R, S52242K-S52242R, S52243K-S52243R, S52244K-S52244R, S52245K-S52245R, S52246K-S52246R, S52251K-S52251R, S52252K-S52252R, S52253K-S52253R, S52254K-S52254R, S52255K-S52255R, S52256K-S52256R, S52261K-S52261R, S52262K-S52262R, S52263K-S52263R, S52264K-S52264R, S52265K-S52265R, S52266K-S52266R, S52271K-S52271R, S52272K-S52272R, S52279K-S52279R, S52281K-S52281R, S52282K-S52282R, S52283K-S52283R, S52291K-S52291R, S52292K-S52292R, S52299K-S52299R, S52301K-S52301R, S52302K-S52302R, S52309K-S52309R, S52311K-S52311P, S52312K-S52312P, S52319K-S52319P, S52321K-S52321R, S52322K-S52322R, S52323K-S52323R, S52324K-S52324R, S52325K-S52325R, S52326K-S52326R, S52331K-S52331R, S52332K-S52332R, S52333K-S52333R, S52334K-S52334R, S52335K-S52335R, S52336K-S52336R, S52341K-S52341R, S52342K-S52342R, S52343K-S52343R, S52344K-S52344R, S52345K-S52345R, S52346K-S52346R, S52351K-S52351R, S52352K-S52352R, S52353K-S52353R, S52354K-S52354R, S52355K-S52355R, S52356K-S52356R, S52361K-S52361R, S52362K-S52362R, S52363K-S52363R, S52364K-S52364R, S52365K-S52365R, S52366K-S52366R, S52371K-S52371R, S52372K-S52372R, S52379K-S52379R, S52381K-S52381R, S52382K-S52382R, S52389K-S52389R, S52391K-S52391R, S52392K-S52392R, S52399K-S52399R, S52501K-S52501R, S52502K-S52502R, S52509K-S52509R, S52511K-S52511R, S52512K-S52512R, S52513K-S52513R, S52514K-S52514R, S52515K-S52515R, S52516K-S52516R, S52521K-S52521P, S52522K-S52522P, S52529K-S52529P, S52531K-S52531R, S52532K-S52532R, S52539K-S52539R, S52541K-S52541R, S52542K-S52542R, S52549K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62183K-S62183P, S62184K-S62184P, S62185K-S62185P, S62186K-S62186P, S62201K-S62201P, S62202K-S62202P, S62209K-S62209P, S62211K-S62211P, S62212K-S62212P, S62213K-S62213P, S62221K-S62221P, S62222K-S62222P, S62223K-S62223P, S62224K-S62224P, S62225K-S62225P, S62226K-S62226P, S62231K-S62231P, S62232K-S62232P, S62233K-S62233P, S62234K-S62234P, S62235K-S62235P, S62236K-S62236P, S62241K-S62241P, S62242K-S62242P, S62243K-S62243P, S62244K-S62244P, S62245K-S62245P, S62246K-S62246P, S62251K-S62251P, S62252K-S62252P, S62253K-S62253P, S62254K-S62254P, S62255K-S62255P, S62256K-S62256P, S62291K-S62291P, S62292K-S62292P, S62299K-S62299P, S62300K-S62300P, S62301K-S62301P, S62302K-S62302P, S62303K-S62303P, S62304K-S62304P, S62305K-S62305P, S62306K-S62306P, S62307K-S62307P, S62308K-S62308P, S62309K-S62309P, S62310K-S62310P, S62311K-S62311P, S62312K-S62312P, S62313K-S62313P, S62314K-S62314P, S62315K-S62315P, S62316K-S62316P, S62317K-S62317P, S62318K-S62318P, S62319K-S62319P, S62320K-S62320P, S62321K-S62321P, S62322K-S62322P, S62323K-S62323P, S62324K-S62324P, S62325K-S62325P, S62326K-S62326P, S62327K-S62327P, S62328K-S62328P, S62329K-S62329P, S62330K-S62330P, S62331K-S62331P, S62332K-S62332P, S62333K-S62333P, S62334K-S62334P, S62335K-S62335P, S62336K-S62336P, S62337K-S62337P, S62338K-S62338P, S62339K-S62339P, S62340K-S62340P, S62341K-S62341P, S62342K-S62342P, S62343K-S62343P, S62344K-S62344P, S62345K-S62345P, S62346K-S62346P, S62347K-S62347P, S62348K-S62348P, S62349K-S62349P, S62350K-S62350P, S62351K-S62351P, S62352K-S62352P, S62353K-S62353P, S62354K-S62354P, S62355K-S62355P, S62356K-S62356P, S62357K-S62357P, S62358K-S62358P, S62359K-S62359P, S62360K-S62360P, S62361K-S62361P, S62362K-S62362P, S62363K-S62363P, S62364K-S62364P, S62365K-S62365P, S62366K-S62366P, S62367K-S62367P, S62368K-S62368P, S62369K-S62369P, S62390K-S62390P, S62391K-S62391P, S62392K-S62392P, S62393K-S62393P, S62394K-S62394P, S62395K-S62395P, S62396K-S62396P, S62397K-S62397P, S62398K-S62398P, S62399K-S62399P, S62501K-S62501P, S62502K-S62502P, S62509K-S62509P, S62511K-S62511P, S62512K-S62512P, S62513K-S62513P, S62514K-S62514P, S62515K-S62515P, S62516K-S62516P, S62521K-S62521P, S62522K-S62522P, S62523K-S62523P, S62524K-S62524P, S62525K-S62525P, S62526K-S62526P, S62600K-S62600P, S62601K-S62601P, S62602K-S62602P, S62603K-S62603P, S62604K-S62604P, S62605K-S62605P, S62606K-S62606P, S62607K-S62607P, S62608K-S62608P, S62609K-S62609P, S62610K-S62610P, S62611K-S62611P, S62612K-S62612P, S62613K-S62613P, S62614K-S62614P, S62615K-S62615P, S62616K-S62616P, S62617K-S62617P, S62618K-S62618P, S62619K-S62619P, S62620K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62620P, S62621K-S62621P, S62622K-S62622P, S62623K-S62623P, S62624K-S62624P, S62625K-S62625P, S62626K-S62626P, S62627K-S62627P, S62628K-S62628P, S62629K-S62629P, S62630K-S62630P, S62631K-S62631P, S62632K-S62632P, S62633K-S62633P, S62634K-S62634P, S62635K-S62635P, S62636K-S62636P, S62637K-S62637P, S62638K-S62638P, S62639K-S62639P, S62640K-S62640P, S62641K-S62641P, S62642K-S62642P, S62643K-S62643P, S62644K-S62644P, S62645K-S62645P, S62646K-S62646P, S62647K-S62647P, S62648K-S62648P, S62649K-S62649P, S62650K-S62650P, S62651K-S62651P, S62652K-S62652P, S62653K-S62653P, S62654K-S62654P, S62655K-S62655P, S62656K-S62656P, S62657K-S62657P, S62658K-S62658P, S62659K-S62659P, S62660K-S62660P, S62661K-S62661P, S62662K-S62662P, S62663K-S62663P, S62664K-S62664P, S62665K-S62665P, S62666K-S62666P, S62667K-S62667P, S62668K-S62668P, S62669K-S62669P, S6290XK-S6290XP, S6291XK-S6291XP, S6292XK-S6292XP, S72001K-S72001R, S72002K-S72002R, S72009K-S72009R, S72011K-S72011R, S72012K-S72012R, S72019K-S72019R, S72021K-S72021R, S72022K-S72022R, S72023K-S72023R, S72024K-S72024R, S72025K-S72025R, S72026K-S72026R, S72031K-S72031R, S72032K-S72032R, S72033K-S72033R, S72034K-S72034R, S72035K-S72035R, S72036K-S72036R, S72041K-S72041R, S72042K-S72042R, S72043K-S72043R, S72044K-S72044R, S72045K-S72045R, S72046K-S72046R, S72051K-S72051R, S72052K-S72052R, S72059K-S72059R, S72061K-S72061R, S72062K-S72062R, S72063K-S72063R, S72064K-S72064R, S72065K-S72065R, S72066K-S72066R, S72091K-S72091R, S72092K-S72092R, S72099K-S72099R, S72101K-S72101R, S72102K-S72102R, S72109K-S72109R, S72111K-S72111R, S72112K-S72112R, S72113K-S72113R, S72114K-S72114R, S72115K-S72115R, S72116K-S72116R, S72121K-S72121R, S72122K-S72122R, S72123K-S72123R, S72124K-S72124R, S72125K-S72125R, S72126K-S72126R, S72131K-S72131R, S72132K-S72132R, S72133K-S72133R, S72134K-S72134R, S72135K-S72135R, S72136K-S72136R, S72141K-S72141R, S72142K-S72142R, S72143K-S72143R, S72144K-S72144R, S72145K-S72145R, S72146K-S72146R, S7221XK-S7221XR, S7222XK-S7222XR, S7223XK-S7223XR, S7224XK-S7224XR, S7225XK-S7225XR, S7226XK-S7226XR, S72301K-S72301R, S72302K-S72302R, S72309K-S72309R, S72321K-S72321R, S72322K-S72322R, S72323K-S72323R, S72324K-S72324R, S72325K-S72325R, S72326K-S72326R, S72331K-S72331R, S72332K-S72332R, S72333K-S72333R, S72334K-S72334R, S72335K-S72335R, S72336K-S72336R, S72341K-S72341R, S72342K-S72342R, S72343K-S72343R, S72344K-S72344R, S72345K-S72345R, S72346K-S72346R, S72351K-S72351R, S72352K-S72352R, S72353K-S72353R, S72354K-S72354R, S72355K-S72355R, S72356K-S72356R, S72361K-S72361R, S72362K-S72362R, S72363K-S72363R, S72364K-S72364R,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S72365K-S72365R, S72366K-S72366R, S72391K-S72391R, S72392K-S72392R, S72399K-S72399R, S72401K-S72401R, S72402K-S72402R, S72409K-S72409R, S72411K-S72411R, S72412K-S72412R, S72413K-S72413R, S72414K-S72414R, S72415K-S72415R, S72416K-S72416R, S72421K-S72421R, S72422K-S72422R, S72423K-S72423R, S72424K-S72424R, S72425K-S72425R, S72426K-S72426R, S72431K-S72431R, S72432K-S72432R, S72433K-S72433R, S72434K-S72434R, S72435K-S72435R, S72436K-S72436R, S72441K-S72441R, S72442K-S72442R, S72443K-S72443R, S72444K-S72444R, S72445K-S72445R, S72446K-S72446R, S72451K-S72451R, S72452K-S72452R, S72453K-S72453R, S72454K-S72454R, S72455K-S72455R, S72456K-S72456R, S72461K-S72461R, S72462K-S72462R, S72463K-S72463R, S72464K-S72464R, S72465K-S72465R, S72466K-S72466R, S72471K-S72471P, S72472K-S72472P, S72479K-S72479P, S72491K-S72491R, S72492K-S72492R, S72499K-S72499R, S728X1K-S728X1R, S728X2K-S728X2R, S728X9K-S728X9R, S7290XK-S7290XR, S7291XK-S7291XR, S7292XK-S7292XR, S79001K-S79001P, S79002K-S79002P, S79009K-S79009P, S79011K-S79011P, S79012K-S79012P, S79019K-S79019P, S79091K-S79091P, S79092K-S79092P, S79099K-S79099P, S79101K-S79101P, S79102K-S79102P, S79109K-S79109P, S79111K-S79111P, S79112K-S79112P, S79119K-S79119P, S79121K-S79121P, S79122K-S79122P, S79129K-S79129P, S79131K-S79131P, S79132K-S79132P, S79139K-S79139P, S79141K-S79141P, S79142K-S79142P, S79149K-S79149P, S79191K-S79191P, S79192K-S79192P, S79199K-S79199P, S82001K-S82001R, S82002K-S82002R, S82009K-S82009R, S82011K-S82011R, S82012K-S82012R, S82013K-S82013R, S82014K-S82014R, S82015K-S82015R, S82016K-S82016R, S82021K-S82021R, S82022K-S82022R, S82023K-S82023R, S82024K-S82024R, S82025K-S82025R, S82026K-S82026R, S82031K-S82031R, S82032K-S82032R, S82033K-S82033R, S82034K-S82034R, S82035K-S82035R, S82036K-S82036R, S82041K-S82041R, S82042K-S82042R, S82043K-S82043R, S82044K-S82044R, S82045K-S82045R, S82046K-S82046R, S82091K-S82091R, S82092K-S82092R, S82099K-S82099R, S82101K-S82101R, S82102K-S82102R, S82109K-S82109R, S82111K-S82111R, S82112K-S82112R, S82113K-S82113R, S82114K-S82114R, S82115K-S82115R, S82116K-S82116R, S82121K-S82121R, S82122K-S82122R, S82123K-S82123R, S82124K-S82124R, S82125K-S82125R, S82126K-S82126R, S82131K-S82131R, S82132K-S82132R, S82133K-S82133R, S82134K-S82134R, S82135K-S82135R, S82136K-S82136R, S82141K-S82141R, S82142K-S82142R, S82143K-S82143R, S82144K-S82144R, S82145K-S82145R, S82146K-S82146R, S82151K-S82151R, S82152K-S82152R, S82153K-S82153R, S82154K-S82154R, S82155K-S82155R, S82156K-S82156R, S82161K-S82161P, S82162K-S82162P, S82169K-S82169P, S82191K-S82191R, S82192K-S82192R, S82199K-S82199R, S82201K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82201R, S82202K-S82202R, S82209K-S82209R, S82221K-S82221R, S82222K-S82222R, S82223K-S82223R, S82224K-S82224R, S82225K-S82225R, S82226K-S82226R, S82231K-S82231R, S82232K-S82232R, S82233K-S82233R, S82234K-S82234R, S82235K-S82235R, S82236K-S82236R, S82241K-S82241R, S82242K-S82242R, S82243K-S82243R, S82244K-S82244R, S82245K-S82245R, S82246K-S82246R, S82251K-S82251R, S82252K-S82252R, S82253K-S82253R, S82254K-S82254R, S82255K-S82255R, S82256K-S82256R, S82261K-S82261R, S82262K-S82262R, S82263K-S82263R, S82264K-S82264R, S82265K-S82265R, S82266K-S82266R, S82291K-S82291R, S82292K-S82292R, S82299K-S82299R, S82301K-S82301R, S82302K-S82302R, S82309K-S82309R, S82311K-S82311P, S82312K-S82312P, S82319K-S82319P, S82391K-S82391R, S82392K-S82392R, S82399K-S82399R, S82401K-S82401R, S82402K-S82402R, S82409K-S82409R, S82421K-S82421R, S82422K-S82422R, S82423K-S82423R, S82424K-S82424R, S82425K-S82425R, S82426K-S82426R, S82431K-S82431R, S82432K-S82432R, S82433K-S82433R, S82434K-S82434R, S82435K-S82435R, S82436K-S82436R, S82441K-S82441R, S82442K-S82442R, S82443K-S82443R, S82444K-S82444R, S82445K-S82445R, S82446K-S82446R, S82451K-S82451R, S82452K-S82452R, S82453K-S82453R, S82454K-S82454R, S82455K-S82455R, S82456K-S82456R, S82461K-S82461R, S82462K-S82462R, S82463K-S82463R, S82464K-S82464R, S82465K-S82465R, S82466K-S82466R, S82491K-S82491R, S82492K-S82492R, S82499K-S82499R, S8251XK-S8251XR, S8252XK-S8252XR, S8253XK-S8253XR, S8254XK-S8254XR, S8255XK-S8255XR, S8256XK-S8256XR, S8261XK-S8261XR, S8262XK-S8262XR, S8263XK-S8263XR, S8264XK-S8264XR, S8265XK-S8265XR, S8266XK-S8266XR, S82811K-S82811P, S82812K-S82812P, S82819K-S82819P, S82821K-S82821P, S82822K-S82822P, S82829K-S82829P, S82831K-S82831R, S82832K-S82832R, S82839K-S82839R, S82841K-S82841R, S82842K-S82842R, S82843K-S82843R, S82844K-S82844R, S82845K-S82845R, S82846K-S82846R, S82851K-S82851R, S82852K-S82852R, S82853K-S82853R, S82854K-S82854R, S82855K-S82855R, S82856K-S82856R, S82861K-S82861R, S82862K-S82862R, S82863K-S82863R, S82864K-S82864R, S82865K-S82865R, S82866K-S82866R, S82871K-S82871R, S82872K-S82872R, S82873K-S82873R, S82874K-S82874R, S82875K-S82875R, S82876K-S82876R, S82891K-S82891R, S82892K-S82892R, S82899K-S82899R, S8290XK-S8290XR, S8291XK-S8291XR, S8292XK-S8292XR, S89001K-S89001P, S89002K-S89002P, S89009K-S89009P, S89011K-S89011P, S89012K-S89012P, S89019K-S89019P, S89021K-S89021P, S89022K-S89022P, S89029K-S89029P, S89031K-S89031P, S89032K-S89032P, S89039K-S89039P, S89041K-S89041P, S89042K-S89042P, S89049K-S89049P, S89091K-S89091P, S89092K-S89092P, S89099K-S89099P, S89101K-S89101P, S89102K-S89102P, S89109K-S89109P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S89111K-S89111P, S89112K-S89112P, S89119K-S89119P, S89121K-S89121P, S89122K-S89122P, S89129K-S89129P, S89131K-S89131P, S89132K-S89132P, S89139K-S89139P, S89141K-S89141P, S89142K-S89142P, S89149K-S89149P, S89191K-S89191P, S89192K-S89192P, S89199K-S89199P, S89201K-S89201P, S89202K-S89202P, S89209K-S89209P, S89211K-S89211P, S89212K-S89212P, S89219K-S89219P, S89221K-S89221P, S89222K-S89222P, S89229K-S89229P, S89291K-S89291P, S89292K-S89292P, S89299K-S89299P, S89301K-S89301P, S89302K-S89302P, S89309K-S89309P, S89311K-S89311P, S89312K-S89312P, S89319K-S89319P, S89321K-S89321P, S89322K-S89322P, S89329K-S89329P, S89391K-S89391P, S89392K-S89392P, S89399K-S89399P, S92001K-S92001P, S92002K-S92002P, S92009K-S92009P, S92011K-S92011P, S92012K-S92012P, S92013K-S92013P, S92014K-S92014P, S92015K-S92015P, S92016K-S92016P, S92021K-S92021P, S92022K-S92022P, S92023K-S92023P, S92024K-S92024P, S92025K-S92025P, S92026K-S92026P, S92031K-S92031P, S92032K-S92032P, S92033K-S92033P, S92034K-S92034P, S92035K-S92035P, S92036K-S92036P, S92041K-S92041P, S92042K-S92042P, S92043K-S92043P, S92044K-S92044P, S92045K-S92045P, S92046K-S92046P, S92051K-S92051P, S92052K-S92052P, S92053K-S92053P, S92054K-S92054P, S92055K-S92055P, S92056K-S92056P, S92061K-S92061P, S92062K-S92062P, S92063K-S92063P, S92064K-S92064P, S92065K-S92065P, S92066K-S92066P, S92101K-S92101P, S92102K-S92102P, S92109K-S92109P, S92111K-S92111P, S92112K-S92112P, S92113K-S92113P, S92114K-S92114P, S92115K-S92115P, S92116K-S92116P, S92121K-S92121P, S92122K-S92122P, S92123K-S92123P, S92124K-S92124P, S92125K-S92125P, S92126K-S92126P, S92131K-S92131P, S92132K-S92132P, S92133K-S92133P, S92134K-S92134P, S92135K-S92135P, S92136K-S92136P, S92141K-S92141P, S92142K-S92142P, S92143K-S92143P, S92144K-S92144P, S92145K-S92145P, S92146K-S92146P, S92151K-S92151P, S92152K-S92152P, S92153K-S92153P, S92154K-S92154P, S92155K-S92155P, S92156K-S92156P, S92191K-S92191P, S92192K-S92192P, S92199K-S92199P, S92201K-S92201P, S92202K-S92202P, S92209K-S92209P, S92211K-S92211P, S92212K-S92212P, S92213K-S92213P, S92214K-S92214P, S92215K-S92215P, S92216K-S92216P, S92221K-S92221P, S92222K-S92222P, S92223K-S92223P, S92224K-S92224P, S92225K-S92225P, S92226K-S92226P, S92231K-S92231P, S92232K-S92232P, S92233K-S92233P, S92234K-S92234P, S92235K-S92235P, S92236K-S92236P, S92241K-S92241P, S92242K-S92242P, S92243K-S92243P, S92244K-S92244P, S92245K-S92245P, S92246K-S92246P, S92251K-S92251P, S92252K-S92252P, S92253K-S92253P, S92254K-S92254P, S92255K-S92255P, S92256K-S92256P, S92301K-S92301P, S92302K-S92302P, S92309K-S92309P, S92311K-S92311P, S92312K-S92312P, S92313K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92313P, S92314K-S92314P, S92315K-S92315P, S92316K-S92316P, S92321K-S92321P, S92322K-S92322P, S92323K-S92323P, S92324K-S92324P, S92325K-S92325P, S92326K-S92326P, S92331K-S92331P, S92332K-S92332P, S92333K-S92333P, S92334K-S92334P, S92335K-S92335P, S92336K-S92336P, S92341K-S92341P, S92342K-S92342P, S92343K-S92343P, S92344K-S92344P, S92345K-S92345P, S92346K-S92346P, S92351K-S92351P, S92352K-S92352P, S92353K-S92353P, S92354K-S92354P, S92355K-S92355P, S92356K-S92356P, S92401K-S92401P, S92402K-S92402P, S92403K-S92403P, S92404K-S92404P, S92405K-S92405P, S92406K-S92406P, S92411K-S92411P, S92412K-S92412P, S92413K-S92413P, S92414K-S92414P, S92415K-S92415P, S92416K-S92416P, S92421K-S92421P, S92422K-S92422P, S92423K-S92423P, S92424K-S92424P, S92425K-S92425P, S92426K-S92426P, S92491K-S92491P, S92492K-S92492P, S92499K-S92499P, S92501K-S92501P, S92502K-S92502P, S92503K-S92503P, S92504K-S92504P, S92505K-S92505P, S92506K-S92506P, S92511K-S92511P, S92512K-S92512P, S92513K-S92513P, S92514K-S92514P, S92515K-S92515P, S92516K-S92516P, S92521K-S92521P, S92522K-S92522P, S92523K-S92523P, S92524K-S92524P, S92525K-S92525P, S92526K-S92526P, S92531K-S92531P, S92532K-S92532P, S92533K-S92533P, S92534K-S92534P, S92535K-S92535P, S92536K-S92536P, S92591K-S92591P, S92592K-S92592P, S92599K-S92599P, S92811K-S92811P, S92812K-S92812P, S92819K-S92819P, S92901K-S92901P, S92902K-S92902P, S92909K-S92909P, S92911K-S92911P, S92912K-S92912P, S92919K-S92919P, S99001K-S99001P, S99002K-S99002P, S99009K-S99009P, S99011K-S99011P, S99012K-S99012P, S99019K-S99019P, S99021K-S99021P, S99022K-S99022P, S99029K-S99029P, S99031K-S99031P, S99032K-S99032P, S99039K-S99039P, S99041K-S99041P, S99042K-S99042P, S99049K-S99049P, S99091K-S99091P, S99092K-S99092P, S99099K-S99099P, S99101K-S99101P, S99102K-S99102P, S99109K-S99109P, S99111K-S99111P, S99112K-S99112P, S99119K-S99119P, S99121K-S99121P, S99122K-S99122P, S99129K-S99129P, S99131K-S99131P, S99132K-S99132P, S99139K-S99139P, S99141K-S99141P, S99142K-S99142P, S99149K-S99149P, S99191K-S99191P, S99192K-S99192P, S99199K-S99199P, S99201K-S99201P, S99202K-S99202P, S99209K-S99209P, S99211K-S99211P, S99212K-S99212P, S99219K-S99219P, S99221K-S99221P, S99222K-S99222P, S99229K-S99229P, S99231K-S99231P, S99232K-S99232P, S99239K-S99239P, S99241K-S99241P, S99242K-S99242P, S99249K-S99249P, S99291K-S99291P, S99292K-S99292P, S99299K-S99299P, T800XXA, T801XXA, T80211A, T80212A, T80218A, T80219A, T8022XA, T8029XA, T8030XA, T80310A, T80311A, T80319A, T8039XA, T8040XA, T80410A, T80411A, T80419A, T8049XA, T8051XA, T8052XA, T8059XA, T8061XA, T8062XA, T8069XA, T80810A, T80818A, T8089XA, T8090XA,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			T80910A, T80911A, T80919A, T8092XA, T80A0XA, T80A10A, T80A11A, T80A19A, T80A9XA, T8181XA, T83711A, T83721A, T880XXA, T881XXA, T884XXA, T887XXA, T888XXA, T889XXA

52.	Other conditions not related to hypertension (OTHC_HPER)	OTHC except 274, 327, 346, 443, 440-442, 784-785	A00-A99, B00-B19, B25-B99, D12-D36, D50-D89, E00-E07, E15-E35, E40-E77, E79-E89, F54, F70, F78-F80, F89, G00-G26, G32, G35-G40, G47, G50-G90, G92-G93, G95-G96, G98-G99, H00-H95, I60, I74-I78, I81-I82, I87-I95, I97-I99, J00-J40,J60-J66, J68-J70, J80-J99, K00-K14, K25-K67, K70-K94, L44-L50, L60-L68, L72-L74, L94, M00-M04, M10, M13, M20-M24, M26-M42, M60-M95, N00-N17, N20-N22, N27-N60, N65-N99, O28, P09, P29, Q00-Q99, R03, R06, R09-R11, R16, R18-R19, R25-R29, R31, R36, R39, R41, R43-R44, R52-R54, R58-R50, R62-R64, R68-R99	A001-A329, A35-A480, A482-A519, A5210-B199, B250-B780, B787-B999, C880, C965-C966, D100-D219, D241-D369, D472, D474, D481, D500-D77, D800-E099, E103521-E103549, E1041, E1043-E1049, E10610, E10630, E113521-E113549, E1141, E1143-E1149, E11610, E11630, E1300-E35, E40-E649, E700-E712, E71310-E7519, E7523, E7525 E754, E7601-E769, E771, E7871-E7872, E790-E8319, E8330-E8809, E883-E896, F3281, F518, F54, F70-F82, F842, F88-F89, G000-G131, G14-G26, G3181-G3182, G319-G40B19, G44001-G44099, G44201-G4489, G453, G4700, G4710, G4720, G4730, G47411-G47429, G478-G909, G911, G913, G918-G936, G9381-G939, G950-G969, G971, G9741, G9782-H579, H5940-H5943, H6000-H95199, I280-I339, I39-I41, I6000-I629, I673, I6783, I7401-I776, I77810-I789, I8000-I8393, I87001-I959, I972, I998-J1189, J129, J17, J181-J182, J200-J40, J60-J668, J680-J953, J95811-J95822, J9584, J9600-K67, K6812-K912, K915, K91850-K91858, K9189-K9589, L081, L444, L600-L660, L662-L663, L668-L689, L7211-L7212, L731, L738-L739, L946, M0000-M049, M0540-M0559, M0760-M0769, M1100-M119, M1220-M1249, M1280, M1460-M1489, M20001-M25776, M2580-M352, M354-M4319, M433-M435X9, M438X1-M439, M4620-M4639, M4840XA, M4841XA, M4842XA, M4843XA, M4844XA, M4845XA, M4846XA, M4847XA, M4848XA, M4850XA, M4851XA, M4852XA, M4853XA, M4854XA, M4855XA, M4856XA, M4857XA, M4858XA, M532X1-M532X6 M532X9, M5410, M5418, M60000-M6282, M62831-M8000XP, M80011A-M80011P, M80012A-M80012P, M80019A-M80019P, M80021A-M80021P, M80022A-M80022P, M80029A-M80029P, M80031A-M80031P, M80032A-M80032P, M80039A-M80039P, M80041A-M80041P, M80042A-M80042P, M80049A-M80049P, M80051A-M80051P, M80052A-M80052P, M80059A-M80059P, M80061A-M80061P, M80062A-M80062P, M80069A-M80069P, M80071A-M80071P, M80072A-M80072P, M80079A-M80079P, M8008XA-M8008XP, M8080XA-M8080XP, M80811A-M80811P, M80812A-M80812P, M80819A-M80819P, M80821A-M80821P, M80822A-M80822P, M80829A-M80829P, M80831A-M80831P, M80832A-M80832P, M80839A-M80839P, M80841A-M80841P, M80842A-M80842P, M80849A-M80849P, M80851A-M80851P, M80852A-M80852P, M80859A-M80859P, M80861A-M80861P, M80862A-M80862P, M80869A-M80869P, M80871A-M80871P, M80872A-M80872P, M80879A-M80879P, M8088XA-M8088XP, M810-M8430XP, M84311A-M84311P, M84312A-M84312P, M84319A-M84319P, M84321A-M84321P, M84322A-M84322P, M84329A-M84329P, M84331A-M84331P, M84332A-M84332P, M84333A-M84333P, M84334A-M84334P, M84339A-M84339P, M84341A-M84341P, M84342A-M84342P, M84343A-M84343P, M84344A-M84344P, M84345A-M84345P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M84346A-M84346P, M84350A-M84350P, M84351A-M84351P, M84352A-M84352P, M84353A-M84353P, M84359A-M84359P, M84361A-M84361P, M84362A-M84362P, M84363A-M84363P, M84364A-M84364P, M84369A-M84369P, M84371A-M84371P, M84372A-M84372P, M84373A-M84373P, M84374A-M84374P, M84375A-M84375P, M84376A-M84376P, M84377A-M84377P, M84378A-M84378P, M84379A-M84379P, M8438XA-M8438XP, M8440XA-M8440XP, M84411A-M84411P, M84412A-M84412P, M84419A-M84419P, M84421A-M84421P, M84422A-M84422P, M84429A-M84429P, M84431A-M84431P, M84432A-M84432P, M84433A-M84433P, M84434A-M84434P, M84439A-M84439P, M84441A-M84441P, M84442A-M84442P, M84443A-M84443P, M84444A-M84444P, M84445A-M84445P, M84446A-M84446P, M84451A-M84451P, M84452A-M84452P, M84453A-M84453P, M84454A-M84454P, M84459A-M84459P, M84461A-M84461P, M84462A-M84462P, M84463A-M84463P, M84464A-M84464P, M84469A-M84469P, M84471A-M84471P, M84472A-M84472P, M84473A-M84473P, M84474A-M84474P, M84475A-M84475P, M84476A-M84476P, M84477A-M84477P, M84478A-M84478P, M84479A-M84479P, M8448XA-M8448XP, M8450XA-M8450XP, M84511A-M84511P, M84512A-M84512P, M84519A-M84519P, M84521A-M84521P, M84522A-M84522P, M84529A-M84529P, M84531A-M84531P, M84532A-M84532P, M84533A-M84533P, M84534A-M84534P, M84539A-M84539P, M84541A-M84541P, M84542A-M84542P, M84549A-M84549P, M84550A-M84550P, M84551A-M84551P, M84552A-M84552P, M84553A-M84553P, M84559A-M84559P, M84561A-M84561P, M84562A-M84562P, M84563A-M84563P, M84564A-M84564P, M84569A-M84569P, M84571A-M84571P, M84572A-M84572P, M84573A-M84573P, M84574A-M84574P, M84575A-M84575P, M84576A-M84576P, M8458XA-M8458XP, M8460XA-M8460XP, M84611A-M84611P, M84612A-M84612P, M84619A-M84619P, M84621A-M84621P, M84622A-M84622P, M84629A-M84629P, M84631A-M84631P, M84632A-M84632P, M84633A-M84633P, M84634A-M84634P, M84639A-M84639P, M84641A-M84641P, M84642A-M84642P, M84649A-M84649P, M84650A-M84650P, M84651A-M84651P, M84652A-M84652P, M84653A-M84653P, M84659A-M84659P, M84661A-M84661P, M84662A-M84662P, M84663A-M84663P, M84664A-M84664P, M84669A-M84669P, M84671A-M84671P, M84672A-M84672P, M84673A-M84673P, M84674A-M84674P, M84675A-M84675P, M84676A-M84676P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M8468XA-M8468XP, M84750A-M84750P, M84751A-M84751P, M84752A-M84752P, M84753A-M84753P, M84754A-M84754P, M84755A-M84755P, M84756A-M84756P, M84757A-M84757P, M84758A-M84758P, M84759A-M84759P, M8480-M959, M962-M965, M9900-M9909, M9980-N16, N171-N172, N200-N23, N270-N981, N99110-N99518, N9983, NODX, O280-O289, P09, P293-P2938, Q000-Q189, Q250-Q849, Q851-Q859, Q870-Q999, R030-R031, R042-R064, R066, R0681-R069, R071-R0981, R0989-R162, R180-R195, R197-R198, R222, R250-R369, R390-R450, R453-R454, R4583-R4689, R480, R483, R502-R509, R52-R569 R58, R61-R64, R680-R6883, R6889-R899, R9081-R99, S020XXK, S02101K, S02102K, S02109K, S0210XK, S02110K, S02111K, S02112K, S02113K, S02118K, S02119K, S0211AK, S0211BK, S0211CK, S0211DK, S0211EK, S0211FK, S0211GK, S0211HK, S0219XK, S022XXK, S0230XK, S0231XK, S0232XK, S023XXK, S02400K, S02401K, S02402K, S0240AK, S0240BK, S0240CK, S0240DK, S0240EK, S0240FK, S02411K, S02412K, S02413K, S0242XK, S025XXK, S02600K, S02601K, S02602K, S02609K, S02610K, S02611K, S02612K, S0261XK, S02620K, S02621K, S02622K, S0262XK, S02630K, S02631K, S02632K, S0263XK, S02640K, S02641K, S02642K, S0264XK, S02650K, S02651K, S02652K, S0265XK, S0266XK, S02670K, S02671K, S02672K, S0267XK, S0269XK, S0280XK, S0281XK, S0282XK, S028XXK, S0291XK, S0292XK, S061X0A, S061X1A, S061X2A, S061X3A, S061X4A, S061X5A, S061X6A, S061X7A, S061X8A, S061X9A, S12000K, S12001K, S1201XK, S1202XK, S12030K, S12031K, S12040K, S12041K, S12090K, S12091K, S12100K, S12101K, S12110K, S12111K, S12112K, S12120K, S12121K, S12130K, S12131K, S1214XK, S12150K, S12151K, S12190K, S12191K, S12200K, S12201K, S12230K, S12231K, S1224XK, S12250K, S12251K, S12290K, S12291K, S12300K, S12301K, S12330K, S12331K, S1234XK, S12350K, S12351K, S12390K, S12391K, S12400K, S12401K, S12430K, S12431K, S1244XK, S12450K, S12451K, S12490K, S12491K, S12500K, S12501K, S12530K, S12531K, S1254XK, S12550K, S12551K, S12590K, S12591K, S12600K, S12601K, S12630K, S12631K, S1264XK, S12650K, S12651K, S12690K, S12691K, S22000K, S22001K, S22002K, S22008K, S22009K, S22010K, S22011K, S22012K, S22018K, S22019K, S22020K, S22021K, S22022K, S22028K, S22029K, S22030K, S22031K, S22032K, S22038K, S22039K, S22040K, S22041K, S22042K, S22048K, S22049K, S22050K, S22051K, S22052K, S22058K, S22059K, S22060K, S22061K, S22062K, S22068K, S22069K, S22070K, S22071K, S22072K, S22078K, S22079K, S22080K, S22081K, S22082K, S22088K, S22089K, S2220XK, S2221XK, S2222XK, S2223XK, S2224XK, S2231XK, S2232XK, S2239XK, S2241XK, S2242XK, S2243XK, S2249XK, S225XXK, S229XXK, S32000K, S32001K, S32002K, S32008K, S32009K, S32010K, S32011K, S32012K, S32018K, S32019K, S32020K, S32021K, S32022K, S32028K, S32029K, S32030K, S32031K, S32032K,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S32038K, S32039K, S32040K, S32041K, S32042K, S32048K, S32049K, S32050K, S32051K, S32052K, S32058K, S32059K, S3210XK, S32110K, S32111K, S32112K, S32119K, S32120K, S32121K, S32122K, S32129K, S32130K, S32131K, S32132K, S32139K, S3214XK, S3215XK, S3216XK, S3217XK, S3219XK, S322XXK, S32301K, S32302K, S32309K, S32311K, S32312K, S32313K, S32314K, S32315K, S32316K, S32391K, S32392K, S32399K, S32401K, S32402K, S32409K, S32411K, S32412K, S32413K, S32414K, S32415K, S32416K, S32421K, S32422K, S32423K, S32424K, S32425K, S32426K, S32431K, S32432K, S32433K, S32434K, S32435K, S32436K, S32441K, S32442K, S32443K, S32444K, S32445K, S32446K, S32451K, S32452K, S32453K, S32454K, S32455K, S32456K, S32461K, S32462K, S32463K, S32464K, S32465K, S32466K, S32471K, S32472K, S32473K, S32474K, S32475K, S32476K, S32481K, S32482K, S32483K, S32484K, S32485K, S32486K, S32491K, S32492K, S32499K, S32501K, S32502K, S32509K, S32511K, S32512K, S32519K, S32591K, S32592K, S32599K, S32601K, S32602K, S32609K, S32611K, S32612K, S32613K, S32614K, S32615K, S32616K, S32691K, S32692K, S32699K, S32810K, S32811K, S3282XK, S3289XK, S329XXK, S42001K-S42001P, S42002K-S42002P, S42009K-S42009P, S42011K-S42011P, S42012K-S42012P, S42013K-S42013P, S42014K-S42014P, S42015K-S42015P, S42016K-S42016P, S42017K-S42017P, S42018K-S42018P, S42019K-S42019P, S42021K-S42021P, S42022K-S42022P, S42023K-S42023P, S42024K-S42024P, S42025K-S42025P, S42026K-S42026P, S42031K-S42031P, S42032K-S42032P, S42033K-S42033P, S42034K-S42034P, S42035K-S42035P, S42036K-S42036P, S42101K-S42101P, S42102K-S42102P, S42109K-S42109P, S42111K-S42111P, S42112K-S42112P, S42113K-S42113P, S42114K-S42114P, S42115K-S42115P, S42116K-S42116P, S42121K-S42121P, S42122K-S42122P, S42123K-S42123P, S42124K-S42124P, S42125K-S42125P, S42126K-S42126P, S42131K-S42131P, S42132K-S42132P, S42133K-S42133P, S42134K-S42134P, S42135K-S42135P, S42136K-S42136P, S42141K-S42141P, S42142K-S42142P, S42143K-S42143P, S42144K-S42144P, S42145K-S42145P, S42146K-S42146P, S42151K-S42151P, S42152K-S42152P, S42153K-S42153P, S42154K-S42154P, S42155K-S42155P, S42156K-S42156P, S42191K-S42191P, S42192K-S42192P, S42199K-S42199P, S42201K-S42201P, S42202K-S42202P, S42209K-S42209P, S42211K-S42211P, S42212K-S42212P, S42213K-S42213P, S42214K-S42214P, S42215K-S42215P, S42216K-S42216P, S42221K-S42221P, S42222K-S42222P, S42223K-S42223P, S42224K-S42224P, S42225K-S42225P, S42226K-S42226P, S42231K-S42231P, S42232K-S42232P, S42239K-S42239P, S42241K-S42241P, S42242K-S42242P, S42249K-S42249P, S42251K-S42251P, S42252K-S42252P, S42253K-S42253P, S42254K-S42254P, S42255K-S42255P, S42256K-S42256P, S42261K-S42261P, S42262K-S42262P, S42263K-S42263P, S42264K-S42264P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S52561K-S52561R, S52562K-S52562R, S52569K-S52569R, S52571K-S52571R, S52572K-S52572R, S52579K-S52579R, S52591K-S52591R, S52592K-S52592R, S52599K-S52599R, S52601K-S52601R, S52602K-S52602R, S52609K-S52609R, S52611K-S52611R, S52612K-S52612R, S52613K-S52613R, S52614K-S52614R, S52615K-S52615R, S52616K-S52616R, S52621K-S52621P, S52622K-S52622P, S52629K-S52629P, S52691K-S52691R, S52692K-S52692R, S52699K-S52699R, S5290XK-S5290XR, S5291XK-S5291XR, S5292XK-S5292XR, S59001K-S59001P, S59002K-S59002P, S59009K-S59009P, S59011K-S59011P, S59012K-S59012P, S59019K-S59019P, S59021K-S59021P, S59022K-S59022P, S59029K-S59029P, S59031K-S59031P, S59032K-S59032P, S59039K-S59039P, S59041K-S59041P, S59042K-S59042P, S59049K-S59049P, S59091K-S59091P, S59092K-S59092P, S59099K-S59099P, S59101K-S59101P, S59102K-S59102P, S59109K-S59109P, S59111K-S59111P, S59112K-S59112P, S59119K-S59119P, S59121K-S59121P, S59122K-S59122P, S59129K-S59129P, S59131K-S59131P, S59132K-S59132P, S59139K-S59139P, S59141K-S59141P, S59142K-S59142P, S59149K-S59149P, S59191K-S59191P, S59192K-S59192P, S59199K-S59199P, S59201K-S59201P, S59202K-S59202P, S59209K-S59209P, S59211K-S59211P, S59212K-S59212P, S59219K-S59219P, S59221K-S59221P, S59222K-S59222P, S59229K-S59229P, S59231K-S59231P, S59232K-S59232P, S59239K-S59239P, S59241K-S59241P, S59242K-S59242P, S59249K-S59249P, S59291K-S59291P, S59292K-S59292P, S59299K-S59299P, S62001K-S62001P, S62002K-S62002P, S62009K-S62009P, S62011K-S62011P, S62012K-S62012P, S62013K-S62013P, S62014K-S62014P, S62015K-S62015P, S62016K-S62016P, S62021K-S62021P, S62022K-S62022P, S62023K-S62023P, S62024K-S62024P, S62025K-S62025P, S62026K-S62026P, S62031K-S62031P, S62032K-S62032P, S62033K-S62033P, S62034K-S62034P, S62035K-S62035P, S62036K-S62036P, S62101K-S62101P, S62102K-S62102P, S62109K-S62109P, S62111K-S62111P, S62112K-S62112P, S62113K-S62113P, S62114K-S62114P, S62115K-S62115P, S62116K-S62116P, S62121K-S62121P, S62122K-S62122P, S62123K-S62123P, S62124K-S62124P, S62125K-S62125P, S62126K-S62126P, S62131K-S62131P, S62132K-S62132P, S62133K-S62133P, S62134K-S62134P, S62135K-S62135P, S62136K-S62136P, S62141K-S62141P, S62142K-S62142P, S62143K-S62143P, S62144K-S62144P, S62145K-S62145P, S62146K-S62146P, S62151K-S62151P, S62152K-S62152P, S62153K-S62153P, S62154K-S62154P, S62155K-S62155P, S62156K-S62156P, S62161K-S62161P, S62162K-S62162P, S62163K-S62163P, S62164K-S62164P, S62165K-S62165P, S62166K-S62166P, S62171K-S62171P, S62172K-S62172P, S62173K-S62173P, S62174K-S62174P, S62175K-S62175P, S62176K-S62176P, S62181K-S62181P, S62182K-S62182P, S62183K-S62183P, S62184K-S62184P, S62185K-S62185P, S62186K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S72392R, S72399K-S72399R, S72401K-S72401R, S72402K-S72402R, S72409K-S72409R, S72411K-S72411R, S72412K-S72412R, S72413K-S72413R, S72414K-S72414R, S72415K-S72415R, S72416K-S72416R, S72421K-S72421R, S72422K-S72422R, S72423K-S72423R, S72424K-S72424R, S72425K-S72425R, S72426K-S72426R, S72431K-S72431R, S72432K-S72432R, S72433K-S72433R, S72434K-S72434R, S72435K-S72435R, S72436K-S72436R, S72441K-S72441R, S72442K-S72442R, S72443K-S72443R, S72444K-S72444R, S72445K-S72445R, S72446K-S72446R, S72451K-S72451R, S72452K-S72452R, S72453K-S72453R, S72454K-S72454R, S72455K-S72455R, S72456K-S72456R, S72461K-S72461R, S72462K-S72462R, S72463K-S72463R, S72464K-S72464R, S72465K-S72465R, S72466K-S72466R, S72471K-S72471P, S72472K-S72472P, S72479K-S72479P, S72491K-S72491R, S72492K-S72492R, S72499K-S72499R, S728X1K-S728X1R, S728X2K-S728X2R, S728X9K-S728X9R, S7290XK-S7290XR, S7291XK-S7291XR, S7292XK-S7292XR, S79001K-S79001P, S79002K-S79002P, S79009K-S79009P, S79011K-S79011P, S79012K-S79012P, S79019K-S79019P, S79091K-S79091P, S79092K-S79092P, S79099K-S79099P, S79101K-S79101P, S79102K-S79102P, S79109K-S79109P, S79111K-S79111P, S79112K-S79112P, S79119K-S79119P, S79121K-S79121P, S79122K-S79122P, S79129K-S79129P, S79131K-S79131P, S79132K-S79132P, S79139K-S79139P, S79141K-S79141P, S79142K-S79142P, S79149K-S79149P, S79191K-S79191P, S79192K-S79192P, S79199K-S79199P, S82001K-S82001R, S82002K-S82002R, S82009K-S82009R, S82011K-S82011R, S82012K-S82012R, S82013K-S82013R, S82014K-S82014R, S82015K-S82015R, S82016K-S82016R, S82021K-S82021R, S82022K-S82022R, S82023K-S82023R, S82024K-S82024R, S82025K-S82025R, S82026K-S82026R, S82031K-S82031R, S82032K-S82032R, S82033K-S82033R, S82034K-S82034R, S82035K-S82035R, S82036K-S82036R, S82041K-S82041R, S82042K-S82042R, S82043K-S82043R, S82044K-S82044R, S82045K-S82045R, S82046K-S82046R, S82091K-S82091R, S82092K-S82092R, S82099K-S82099R, S82101K-S82101R, S82102K-S82102R, S82109K-S82109R, S82111K-S82111R, S82112K-S82112R, S82113K-S82113R, S82114K-S82114R, S82115K-S82115R, S82116K-S82116R, S82121K-S82121R, S82122K-S82122R, S82123K-S82123R, S82124K-S82124R, S82125K-S82125R, S82126K-S82126R, S82131K-S82131R, S82132K-S82132R, S82133K-S82133R, S82134K-S82134R, S82135K-S82135R, S82136K-S82136R, S82141K-S82141R, S82142K-S82142R, S82143K-S82143R, S82144K-S82144R, S82145K-S82145R, S82146K-S82146R, S82151K-S82151R, S82152K-S82152R, S82153K-S82153R, S82154K-S82154R, S82155K-S82155R, S82156K-S82156R, S82161K-S82161P, S82162K-S82162P, S82169K-S82169P, S82191K-S82191R, S82192K-S82192R, S82199K-S82199R, S82201K-S82201R, S82202K-S82202R, S82209K-S82209R, S82221K-S82221R,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82222K-S82222R, S82223K-S82223R, S82224K-S82224R, S82225K-S82225R, S82226K-S82226R, S82231K-S82231R, S82232K-S82232R, S82233K-S82233R, S82234K-S82234R, S82235K-S82235R, S82236K-S82236R, S82241K-S82241R, S82242K-S82242R, S82243K-S82243R, S82244K-S82244R, S82245K-S82245R, S82246K-S82246R, S82251K-S82251R, S82252K-S82252R, S82253K-S82253R, S82254K-S82254R, S82255K-S82255R, S82256K-S82256R, S82261K-S82261R, S82262K-S82262R, S82263K-S82263R, S82264K-S82264R, S82265K-S82265R, S82266K-S82266R, S82291K-S82291R, S82292K-S82292R, S82299K-S82299R, S82301K-S82301R, S82302K-S82302R, S82309K-S82309R, S82311K-S82311P, S82312K-S82312P, S82319K-S82319P, S82391K-S82391R, S82392K-S82392R, S82399K-S82399R, S82401K-S82401R, S82402K-S82402R, S82409K-S82409R, S82421K-S82421R, S82422K-S82422R, S82423K-S82423R, S82424K-S82424R, S82425K-S82425R, S82426K-S82426R, S82431K-S82431R, S82432K-S82432R, S82433K-S82433R, S82434K-S82434R, S82435K-S82435R, S82436K-S82436R, S82441K-S82441R, S82442K-S82442R, S82443K-S82443R, S82444K-S82444R, S82445K-S82445R, S82446K-S82446R, S82451K-S82451R, S82452K-S82452R, S82453K-S82453R, S82454K-S82454R, S82455K-S82455R, S82456K-S82456R, S82461K-S82461R, S82462K-S82462R, S82463K-S82463R, S82464K-S82464R, S82465K-S82465R, S82466K-S82466R, S82491K-S82491R, S82492K-S82492R, S82499K-S82499R, S8251XK-S8251XR, S8252XK-S8252XR, S8253XK-S8253XR, S8254XK-S8254XR, S8255XK-S8255XR, S8256XK-S8256XR, S8261XK-S8261XR, S8262XK-S8262XR, S8263XK-S8263XR, S8264XK-S8264XR, S8265XK-S8265XR, S8266XK-S8266XR, S82811K-S82811P, S82812K-S82812P, S82819K-S82819P, S82821K-S82821P, S82822K-S82822P, S82829K-S82829P, S82831K-S82831R, S82832K-S82832R, S82839K-S82839R, S82841K-S82841R, S82842K-S82842R, S82843K-S82843R, S82844K-S82844R, S82845K-S82845R, S82846K-S82846R, S82851K-S82851R, S82852K-S82852R, S82853K-S82853R, S82854K-S82854R, S82855K-S82855R, S82856K-S82856R, S82861K-S82861R, S82862K-S82862R, S82863K-S82863R, S82864K-S82864R, S82865K-S82865R, S82866K-S82866R, S82871K-S82871R, S82872K-S82872R, S82873K-S82873R, S82874K-S82874R, S82875K-S82875R, S82876K-S82876R, S82891K-S82891R, S82892K-S82892R, S82899K-S82899R, S8290XK-S8290XR, S8291XK-S8291XR, S8292XK-S8292XR, S89001K-S89001P, S89002K-S89002P, S89009K-S89009P, S89011K-S89011P, S89012K-S89012P, S89019K-S89019P, S89021K-S89021P, S89022K-S89022P, S89029K-S89029P, S89031K-S89031P, S89032K-S89032P, S89039K-S89039P, S89041K-S89041P, S89042K-S89042P, S89049K-S89049P, S89091K-S89091P, S89092K-S89092P, S89099K-S89099P, S89101K-S89101P, S89102K-S89102P, S89109K-S89109P, S89111K-S89111P, S89112K-S89112P, S89119K-S89119P, S89121K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S89121P, S89122K-S89122P, S89129K-S89129P, S89131K-S89131P, S89132K-S89132P, S89139K-S89139P, S89141K-S89141P, S89142K-S89142P, S89149K-S89149P, S89191K-S89191P, S89192K-S89192P, S89199K-S89199P, S89201K-S89201P, S89202K-S89202P, S89209K-S89209P, S89211K-S89211P, S89212K-S89212P, S89219K-S89219P, S89221K-S89221P, S89222K-S89222P, S89229K-S89229P, S89291K-S89291P, S89292K-S89292P, S89299K-S89299P, S89301K-S89301P, S89302K-S89302P, S89309K-S89309P, S89311K-S89311P, S89312K-S89312P, S89319K-S89319P, S89321K-S89321P, S89322K-S89322P, S89329K-S89329P, S89391K-S89391P, S89392K-S89392P, S89399K-S89399P, S92001K-S92001P, S92002K-S92002P, S92009K-S92009P, S92011K-S92011P, S92012K-S92012P, S92013K-S92013P, S92014K-S92014P, S92015K-S92015P, S92016K-S92016P, S92021K-S92021P, S92022K-S92022P, S92023K-S92023P, S92024K-S92024P, S92025K-S92025P, S92026K-S92026P, S92031K-S92031P, S92032K-S92032P, S92033K-S92033P, S92034K-S92034P, S92035K-S92035P, S92036K-S92036P, S92041K-S92041P, S92042K-S92042P, S92043K-S92043P, S92044K-S92044P, S92045K-S92045P, S92046K-S92046P, S92051K-S92051P, S92052K-S92052P, S92053K-S92053P, S92054K-S92054P, S92055K-S92055P, S92056K-S92056P, S92061K-S92061P, S92062K-S92062P, S92063K-S92063P, S92064K-S92064P, S92065K-S92065P, S92066K-S92066P, S92101K-S92101P, S92102K-S92102P, S92109K-S92109P, S92111K-S92111P, S92112K-S92112P, S92113K-S92113P, S92114K-S92114P, S92115K-S92115P, S92116K-S92116P, S92121K-S92121P, S92122K-S92122P, S92123K-S92123P, S92124K-S92124P, S92125K-S92125P, S92126K-S92126P, S92131K-S92131P, S92132K-S92132P, S92133K-S92133P, S92134K-S92134P, S92135K-S92135P, S92136K-S92136P, S92141K-S92141P, S92142K-S92142P, S92143K-S92143P, S92144K-S92144P, S92145K-S92145P, S92146K-S92146P, S92151K-S92151P, S92152K-S92152P, S92153K-S92153P, S92154K-S92154P, S92155K-S92155P, S92156K-S92156P, S92191K-S92191P, S92192K-S92192P, S92199K-S92199P, S92201K-S92201P, S92202K-S92202P, S92209K-S92209P, S92211K-S92211P, S92212K-S92212P, S92213K-S92213P, S92214K-S92214P, S92215K-S92215P, S92216K-S92216P, S92221K-S92221P, S92222K-S92222P, S92223K-S92223P, S92224K-S92224P, S92225K-S92225P, S92226K-S92226P, S92231K-S92231P, S92232K-S92232P, S92233K-S92233P, S92234K-S92234P, S92235K-S92235P, S92236K-S92236P, S92241K-S92241P, S92242K-S92242P, S92243K-S92243P, S92244K-S92244P, S92245K-S92245P, S92246K-S92246P, S92251K-S92251P, S92252K-S92252P, S92253K-S92253P, S92254K-S92254P, S92255K-S92255P, S92256K-S92256P, S92301K-S92301P, S92302K-S92302P, S92309K-S92309P, S92311K-S92311P, S92312K-S92312P, S92313K-S92313P, S92314K-S92314P, S92315K-S92315P, S92316K-S92316P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92321K-S92321P, S92322K-S92322P, S92323K-S92323P, S92324K-S92324P, S92325K-S92325P, S92326K-S92326P, S92331K-S92331P, S92332K-S92332P, S92333K-S92333P, S92334K-S92334P, S92335K-S92335P, S92336K-S92336P, S92341K-S92341P, S92342K-S92342P, S92343K-S92343P, S92344K-S92344P, S92345K-S92345P, S92346K-S92346P, S92351K-S92351P, S92352K-S92352P, S92353K-S92353P, S92354K-S92354P, S92355K-S92355P, S92356K-S92356P, S92401K-S92401P, S92402K-S92402P, S92403K-S92403P, S92404K-S92404P, S92405K-S92405P, S92406K-S92406P, S92411K-S92411P, S92412K-S92412P, S92413K-S92413P, S92414K-S92414P, S92415K-S92415P, S92416K-S92416P, S92421K-S92421P, S92422K-S92422P, S92423K-S92423P, S92424K-S92424P, S92425K-S92425P, S92426K-S92426P, S92491K-S92491P, S92492K-S92492P, S92499K-S92499P, S92501K-S92501P, S92502K-S92502P, S92503K-S92503P, S92504K-S92504P, S92505K-S92505P, S92506K-S92506P, S92511K-S92511P, S92512K-S92512P, S92513K-S92513P, S92514K-S92514P, S92515K-S92515P, S92516K-S92516P, S92521K-S92521P, S92522K-S92522P, S92523K-S92523P, S92524K-S92524P, S92525K-S92525P, S92526K-S92526P, S92531K-S92531P, S92532K-S92532P, S92533K-S92533P, S92534K-S92534P, S92535K-S92535P, S92536K-S92536P, S92591K-S92591P, S92592K-S92592P, S92599K-S92599P, S92811K-S92811P, S92812K-S92812P, S92819K-S92819P, S92901K-S92901P, S92902K-S92902P, S92909K-S92909P, S92911K-S92911P, S92912K-S92912P, S92919K-S92919P, S99001K-S99001P, S99002K-S99002P, S99009K-S99009P, S99011K-S99011P, S99012K-S99012P, S99019K-S99019P, S99021K-S99021P, S99022K-S99022P, S99029K-S99029P, S99031K-S99031P, S99032K-S99032P, S99039K-S99039P, S99041K-S99041P, S99042K-S99042P, S99049K-S99049P, S99091K-S99091P, S99092K-S99092P, S99099K-S99099P, S99101K-S99101P, S99102K-S99102P, S99109K-S99109P, S99111K-S99111P, S99112K-S99112P, S99119K-S99119P, S99121K-S99121P, S99122K-S99122P, S99129K-S99129P, S99131K-S99131P, S99132K-S99132P, S99139K-S99139P, S99141K-S99141P, S99142K-S99142P, S99149K-S99149P, S99191K-S99191P, S99192K-S99192P, S99199K-S99199P, S99201K-S99201P, S99202K-S99202P, S99209K-S99209P, S99211K-S99211P, S99212K-S99212P, S99219K-S99219P, S99221K-S99221P, S99222K-S99222P, S99229K-S99229P, S99231K-S99231P, S99232K-S99232P, S99239K-S99239P, S99241K-S99241P, S99242K-S99242P, S99249K-S99249P, S99291K-S99291P, S99292K-S99292P, S99299K-S99299P, T800XXA, T801XXA, T80211A, T80212A, T80218A, T80219A, T8022XA, T8029XA, T8030XA, T80310A, T80311A, T80319A, T8039XA, T8040XA, T80410A, T80411A, T80419A, T8049XA, T8051XA, T8052XA, T8059XA, T8061XA, T8062XA, T8069XA, T80810A, T80818A, T8089XA, T8090XA, T80910A, T80911A, T80919A, T8092XA, T80A0XA, T80A10A, T80A11A,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			T80A19A, T80A9XA, T8181XA, T83711A, T83721A, T880XXA, T881XXA, T884XXA, T887XXA, T888XXA, T889XXA
53. Other conditions not related to dementia (OTHC_DEMT)	N/A	N/A	A001-A039, A060-A079, A150-A159, A1783 A179-A329, A35-A399, A420-A422, A4281-A480, A482-A488, A5001-A519, A5215-A5216, A5271-A809, A820-B199, B250-B780, B787-B949, B970-B999, C880, C965-C966, D100-D219, D241-D369, D472, D474, D481, D500-D77, D800-D81810, D8189-E012, E030-E031, E034, E040-E049, E060-E099, E103521-E103549, E1041, E1043-E1052, E10610, E113521-E113549, E1141, E1143-E1152, E11610, E1300 E201, E220-E35, E40-E52, E54-E649, E700-E712, E71310-E7519, E7523, E7525-E7529, E754, E7601-E769, E771, E7871-E7872, E790-E8319, E8330-E859, E8801-E8809, E883-E889, E891, E893-E896, F3281, F54, F800-F82, F842, F88-F89, G000-G09, G110-G131, G14, G3181-G3182, G319-G4489, G453, G47411-G47429, G500-G802, G804-G902, G904-G909, G911, G913, G918-G932, G9340-G936, G9381-G939, G950-G969, G971, G9741, G9782-H579, H5940-H5943, H6000-H95199, I300-I339, I39-I41, I6000-I629, I670, I6783, I70361-I70369, I70461-I70469, I70561-I70569, I70661-I70669, I70761-I70769, I7100-I8393, I87001-I96, I972, I998-J069 J17, J181-J182, J200-J40, J60-J668, J680-J953, J95811-J95822, J9584, J9600-K011, K080-K67, K6812-K912, K915, K91850-K91858, K9189-K9589, L081, L444, L600-L660, L662-L663, L668-L689, L7211-L7212, L731, L738 L946, M0000-M049, M0540-M0559, M0760-M0769, M1000-M119, M1220-M1249, M1280, M1460 M1A00X0-M1A09X1, M1A20X0-M25776, M2580-M352, M354-M4319, M433-M435X9, M438X1-M439, M4620-M4639, M4840XA, M4841XA, M4842XA, M4843XA, M4844XA, M4845XA, M4846XA, M4847XA, M4848XA, M4850XA, M4851XA, M4852XA, M4853XA, M4854XA, M4855XA, M4856XA, M4857XA, M4858XA, M532X1, M532X9, M5410, M5418, M60000, M62831, M80011A, M80012A, M80019A, M80021A, M80022A, M80029A, M80031A, M80032A, M80039A, M80041A, M80042A, M80049A, M80051A, M80052A, M80059A, M80061A, M80062A, M80069A, M80071A, M80072A, M80079A, M8008XA, M8080XA, M80811A, M80812A, M80819A, M80821A, M80822A, M80829A, M80831A, M80832A, M80839A, M80841A, M80842A, M80849A, M80851A, M80852A, M80859A, M80861A, M80862A, M80869A, M80871A, M80872A, M80879A, M8088XA, M810, M84311A, M84312A, M84319A, M84321A, M84322A, M84329A, M84331A, M84332A, M84333A, M84334A, M84339A, M84341A, M84342A, M84343A, M84344A, M84345A, M84346A, M84350A, M84351A, M84352A, M84353A, M84359A, M84361A, M84362A, M84363A, M84364A, M84369A, M84371A, M84372A, M84373A, M84374A, M84375A, M84376A, M84377A, M84378A, M84379A,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			M8438XA, M8440XA, M84411A, M84412A, M84419A, M84421A, M84422A, M84429A, M84431A, M84432A, M84433A, M84434A, M84439A, M84441A, M84442A, M84443A, M84444A, M84445A, M84446A, M84451A, M84452A, M84453A, M84454A, M84459A, M84461A, M84462A, M84463A, M84464A, M84469A, M84471A, M84472A, M84473A, M84474A, M84475A, M84476A, M84477A, M84478A, M84479A, M8448XA, M8450XA, M84511A, M84512A, M84519A, M84521A, M84522A, M84529A, M84531A, M84532A, M84533A, M84534A, M84539A, M84541A, M84542A, M84549A, M84550A, M84551A, M84552A, M84553A, M84559A, M84561A, M84562A, M84563A, M84564A, M84569A, M84571A, M84572A, M84573A, M84574A, M84575A, M84576A, M8458XA, M8460XA, M84611A, M84612A, M84619A, M84621A, M84622A, M84629A, M84631A, M84632A, M84633A, M84634A, M84639A, M84641A, M84642A, M84649A, M84650A, M84651A, M84652A, M84653A, M84659A, M84661A, M84662A, M84663A, M84664A, M84669A, M84671A, M84672A, M84673A, M84674A, M84675A, M84676A, M8468XA, M84750A, M84751A, M84752A, M84753A, M84754A, M84755A, M84756A, M84757A, M84758A, M84759A, M8480, M962, M9900, M9980, N111, N130, N1370, N158, N171, N200, N270, N2889, N310, N981, N99110, N9983, NODX, O280, P09, P293, Q000, Q250, Q851, Q870, R002, R091, R093, R180, R220, R252, R262, R292, R294, R29898, R300, R390, R441, R4701, R51, R570, R620, R6521, R682, R6884, R700, S020XXK, S02101K, S02102K, S02109K, S0210XK, S02110K, S02111K, S02112K, S02113K, S02118K, S02119K, S0211AK, S0211BK, S0211CK, S0211DK, S0211EK, S0211FK, S0211GK, S0211HK, S0219XK, S022XXK, S0230XK, S0231XK, S0232XK, S023XXK, S02400K, S02401K, S02402K, S0240AK, S0240BK, S0240CK, S0240DK, S0240EK, S0240FK, S02411K, S02412K, S02413K, S0242XK, S025XXK, S02600K, S02601K, S02602K, S02609K, S02610K, S02611K, S02612K, S0261XK, S02620K, S02621K, S02622K, S0262XK, S02630K, S02631K, S02632K, S0263XK, S02640K, S02641K, S02642K, S0264XK, S02650K, S02651K, S02652K, S0265XK, S0266XK, S02670K, S02671K, S02672K, S0267XK, S0269XK, S0280XK, S0281XK, S0282XK, S028XXK, S0291XK, S0292XK, S061X0A, S061X1A, S061X2A, S061X3A, S061X4A, S061X5A, S061X6A, S061X7A, S061X8A, S061X9A, S12000K, S12001K, S1201XK, S1202XK, S12030K, S12031K, S12040K, S12041K, S12090K, S12091K, S12100K, S12101K, S12110K, S12111K, S12112K, S12120K, S12121K, S12130K, S12131K, S1214XK, S12150K, S12151K, S12190K, S12191K, S12200K, S12201K, S12230K, S12231K, S1224XK, S12250K, S12251K, S12290K, S12291K, S12300K, S12301K, S12330K, S12331K, S1234XK, S12350K, S12351K, S12390K, S12391K, S12400K, S12401K, S12430K, S12431K, S1244XK, S12450K,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S12451K, S12490K, S12491K, S12500K, S12501K, S12530K, S12531K, S1254XK, S12550K, S12551K, S12590K, S12591K, S12600K, S12601K, S12630K, S12631K, S1264XK, S12650K, S12651K, S12690K, S12691K, S22000K, S22001K, S22002K, S22008K, S22009K, S22010K, S22011K, S22012K, S22018K, S22019K, S22020K, S22021K, S22022K, S22028K, S22029K, S22030K, S22031K, S22032K, S22038K, S22039K, S22040K, S22041K, S22042K, S22048K, S22049K, S22050K, S22051K, S22052K, S22058K, S22059K, S22060K, S22061K, S22062K, S22068K, S22069K, S22070K, S22071K, S22072K, S22078K, S22079K, S22080K, S22081K, S22082K, S22088K, S22089K, S2220XK, S2221XK, S2222XK, S2223XK, S2224XK, S2231XK, S2232XK, S2239XK, S2241XK, S2242XK, S2243XK, S2249XK, S225XXK, S229XXK, S32000K, S32001K, S32002K, S32008K, S32009K, S32010K, S32011K, S32012K, S32018K, S32019K, S32020K, S32021K, S32022K, S32028K, S32029K, S32030K, S32031K, S32032K, S32038K, S32039K, S32040K, S32041K, S32042K, S32048K, S32049K, S32050K, S32051K, S32052K, S32058K, S32059K, S3210XK, S32110K, S32111K, S32112K, S32119K, S32120K, S32121K, S32122K, S32129K, S32130K, S32131K, S32132K, S32139K, S3214XK, S3215XK, S3216XK, S3217XK, S3219XK, S322XXK, S32301K, S32302K, S32309K, S32311K, S32312K, S32313K, S32314K, S32315K, S32316K, S32391K, S32392K, S32399K, S32401K, S32402K, S32409K, S32411K, S32412K, S32413K, S32414K, S32415K, S32416K, S32421K, S32422K, S32423K, S32424K, S32425K, S32426K, S32431K, S32432K, S32433K, S32434K, S32435K, S32436K, S32441K, S32442K, S32443K, S32444K, S32445K, S32446K, S32451K, S32452K, S32453K, S32454K, S32455K, S32456K, S32461K, S32462K, S32463K, S32464K, S32465K, S32466K, S32471K, S32472K, S32473K, S32474K, S32475K, S32476K, S32481K, S32482K, S32483K, S32484K, S32485K, S32486K, S32491K, S32492K, S32499K, S32501K, S32502K, S32509K, S32511K, S32512K, S32519K, S32591K, S32592K, S32599K, S32601K, S32602K, S32609K, S32611K, S32612K, S32613K, S32614K, S32615K, S32616K, S32691K, S32692K, S32699K, S32810K, S32811K, S3282XK, S3289XK, S329XXK, S42001K-S42001P, S42002K-S42002P, S42009K-S42009P, S42011K-S42011P, S42012K-S42012P, S42013K-S42013P, S42014K-S42014P, S42015K-S42015P, S42016K-S42016P, S42017K-S42017P, S42018K-S42018P, S42019K-S42019P, S42021K-S42021P, S42022K-S42022P, S42023K-S42023P, S42024K-S42024P, S42025K-S42025P, S42026K-S42026P, S42031K-S42031P, S42032K-S42032P, S42033K-S42033P, S42034K-S42034P, S42035K-S42035P, S42036K-S42036P, S42101K-S42101P, S42102K-S42102P, S42109K-S42109P, S42111K-S42111P, S42112K-S42112P, S42113K-S42113P, S42114K-S42114P, S42115K-S42115P, S42116K-S42116P, S42121K-S42121P, S42122K-S42122P, S42123K-S42123P, S42124K-S42124P, S42125K-S42125P, S42126K-S42126P, S42131K-S42131P, S42132K-S42132P, S42133K-S42133P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42134K-S42134P, S42135K-S42135P, S42136K-S42136P, S42141K-S42141P, S42142K-S42142P, S42143K-S42143P, S42144K-S42144P, S42145K-S42145P, S42146K-S42146P, S42151K-S42151P, S42152K-S42152P, S42153K-S42153P, S42154K-S42154P, S42155K-S42155P, S42156K-S42156P, S42191K-S42191P, S42192K-S42192P, S42199K-S42199P, S42201K-S42201P, S42202K-S42202P, S42209K-S42209P, S42211K-S42211P, S42212K-S42212P, S42213K-S42213P, S42214K-S42214P, S42215K-S42215P, S42216K-S42216P, S42221K-S42221P, S42222K-S42222P, S42223K-S42223P, S42224K-S42224P, S42225K-S42225P, S42226K-S42226P, S42231K-S42231P, S42232K-S42232P, S42239K-S42239P, S42241K-S42241P, S42242K-S42242P, S42249K-S42249P, S42251K-S42251P, S42252K-S42252P, S42253K-S42253P, S42254K-S42254P, S42255K-S42255P, S42256K-S42256P, S42261K-S42261P, S42262K-S42262P, S42263K-S42263P, S42264K-S42264P, S42265K-S42265P, S42266K-S42266P, S42271K-S42271P, S42272K-S42272P, S42279K-S42279P, S42291K-S42291P, S42292K-S42292P, S42293K-S42293P, S42294K-S42294P, S42295K-S42295P, S42296K-S42296P, S42301K-S42301P, S42302K-S42302P, S42309K-S42309P, S42311K-S42311P, S42312K-S42312P, S42319K-S42319P, S42321K-S42321P, S42322K-S42322P, S42323K-S42323P, S42324K-S42324P, S42325K-S42325P, S42326K-S42326P, S42331K-S42331P, S42332K-S42332P, S42333K-S42333P, S42334K-S42334P, S42335K-S42335P, S42336K-S42336P, S42341K-S42341P, S42342K-S42342P, S42343K-S42343P, S42344K-S42344P, S42345K-S42345P, S42346K-S42346P, S42351K-S42351P, S42352K-S42352P, S42353K-S42353P, S42354K-S42354P, S42355K-S42355P, S42356K-S42356P, S42361K-S42361P, S42362K-S42362P, S42363K-S42363P, S42364K-S42364P, S42365K-S42365P, S42366K-S42366P, S42391K-S42391P, S42392K-S42392P, S42399K-S42399P, S42401K-S42401P, S42402K-S42402P, S42409K-S42409P, S42411K-S42411P, S42412K-S42412P, S42413K-S42413P, S42414K-S42414P, S42415K-S42415P, S42416K-S42416P, S42421K-S42421P, S42422K-S42422P, S42423K-S42423P, S42424K-S42424P, S42425K-S42425P, S42426K-S42426P, S42431K-S42431P, S42432K-S42432P, S42433K-S42433P, S42434K-S42434P, S42435K-S42435P, S42436K-S42436P, S42441K-S42441P, S42442K-S42442P, S42443K-S42443P, S42444K-S42444P, S42445K-S42445P, S42446K-S42446P, S42447K-S42447P, S42448K-S42448P, S42449K-S42449P, S42451K-S42451P, S42452K-S42452P, S42453K-S42453P, S42454K-S42454P, S42455K-S42455P, S42456K-S42456P, S42461K-S42461P, S42462K-S42462P, S42463K-S42463P, S42464K-S42464P, S42465K-S42465P, S42466K-S42466P, S42471K-S42471P, S42472K-S42472P, S42473K-S42473P, S42474K-S42474P, S42475K-S42475P, S42476K-S42476P, S42481K-S42481P, S42482K-S42482P, S42489K-S42489P, S42491K-S42491P, S42492K-S42492P, S42493K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S42493P, S42494K-S42494P, S42495K-S42495P, S42496K-S42496P, S4290XK-S4290XP, S4291XK-S4291XP, S4292XK-S4292XP, S49001K-S49001P, S49002K-S49002P, S49009K-S49009P, S49011K-S49011P, S49012K-S49012P, S49019K-S49019P, S49021K-S49021P, S49022K-S49022P, S49029K-S49029P, S49031K-S49031P, S49032K-S49032P, S49039K-S49039P, S49041K-S49041P, S49042K-S49042P, S49049K-S49049P, S49091K-S49091P, S49092K-S49092P, S49099K-S49099P, S49101K-S49101P, S49102K-S49102P, S49109K-S49109P, S49111K-S49111P, S49112K-S49112P, S49119K-S49119P, S49121K-S49121P, S49122K-S49122P, S49129K-S49129P, S49131K-S49131P, S49132K-S49132P, S49139K-S49139P, S49141K-S49141P, S49142K-S49142P, S49149K-S49149P, S49191K-S49191P, S49192K-S49192P, S49199K-S49199P, S52001K-S52001R, S52002K-S52002R, S52009K-S52009R, S52011K-S52011P, S52012K-S52012P, S52019K-S52019P, S52021K-S52021R, S52022K-S52022R, S52023K-S52023R, S52024K-S52024R, S52025K-S52025R, S52026K-S52026R, S52031K-S52031R, S52032K-S52032R, S52033K-S52033R, S52034K-S52034R, S52035K-S52035R, S52036K-S52036R, S52041K-S52041R, S52042K-S52042R, S52043K-S52043R, S52044K-S52044R, S52045K-S52045R, S52046K-S52046R, S52091K-S52091R, S52092K-S52092R, S52099K-S52099R, S52101K-S52101R, S52102K-S52102R, S52109K-S52109R, S52111K-S52111P, S52112K-S52112P, S52119K-S52119P, S52121K-S52121R, S52122K-S52122R, S52123K-S52123R, S52124K-S52124R, S52125K-S52125R, S52126K-S52126R, S52131K-S52131R, S52132K-S52132R, S52133K-S52133R, S52134K-S52134R, S52135K-S52135R, S52136K-S52136R, S52181K-S52181R, S52182K-S52182R, S52189K-S52189R, S52201K-S52201R, S52202K-S52202R, S52209K-S52209R, S52211K-S52211P, S52212K-S52212P, S52219K-S52219P, S52221K-S52221R, S52222K-S52222R, S52223K-S52223R, S52224K-S52224R, S52225K-S52225R, S52226K-S52226R, S52231K-S52231R, S52232K-S52232R, S52233K-S52233R, S52234K-S52234R, S52235K-S52235R, S52236K-S52236R, S52241K-S52241R, S52242K-S52242R, S52243K-S52243R, S52244K-S52244R, S52245K-S52245R, S52246K-S52246R, S52251K-S52251R, S52252K-S52252R, S52253K-S52253R, S52254K-S52254R, S52255K-S52255R, S52256K-S52256R, S52261K-S52261R, S52262K-S52262R, S52263K-S52263R, S52264K-S52264R, S52265K-S52265R, S52266K-S52266R, S52271K-S52271R, S52272K-S52272R, S52279K-S52279R, S52281K-S52281R, S52282K-S52282R, S52283K-S52283R, S52291K-S52291R, S52292K-S52292R, S52299K-S52299R, S52301K-S52301R, S52302K-S52302R, S52309K-S52309R, S52311K-S52311P, S52312K-S52312P, S52319K-S52319P, S52321K-S52321R, S52322K-S52322R, S52323K-S52323R, S52324K-S52324R, S52325K-S52325R, S52326K-S52326R, S52331K-S52331R, S52332K-S52332R, S52333K-S52333R, S52334K-S52334R, S52335K-S52335R,

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Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S52336K-S52336R, S52341K-S52341R, S52342K-S52342R, S52343K-S52343R, S52344K-S52344R, S52345K-S52345R, S52346K-S52346R, S52351K-S52351R, S52352K-S52352R, S52353K-S52353R, S52354K-S52354R, S52355K-S52355R, S52356K-S52356R, S52361K-S52361R, S52362K-S52362R, S52363K-S52363R, S52364K-S52364R, S52365K-S52365R, S52366K-S52366R, S52371K-S52371R, S52372K-S52372R, S52379K-S52379R, S52381K-S52381R, S52382K-S52382R, S52389K-S52389R, S52391K-S52391R, S52392K-S52392R, S52399K-S52399R, S52501K-S52501R, S52502K-S52502R, S52509K-S52509R, S52511K-S52511R, S52512K-S52512R, S52513K-S52513R, S52514K-S52514R, S52515K-S52515R, S52516K-S52516R, S52521K-S52521P, S52522K-S52522P, S52529K-S52529P, S52531K-S52531R, S52532K-S52532R, S52539K-S52539R, S52541K-S52541R, S52542K-S52542R, S52549K-S52549R, S52551K-S52551R, S52552K-S52552R, S52559K-S52559R, S52561K-S52561R, S52562K-S52562R, S52569K-S52569R, S52571K-S52571R, S52572K-S52572R, S52579K-S52579R, S52591K-S52591R, S52592K-S52592R, S52599K-S52599R, S52601K-S52601R, S52602K-S52602R, S52609K-S52609R, S52611K-S52611R, S52612K-S52612R, S52613K-S52613R, S52614K-S52614R, S52615K-S52615R, S52616K-S52616R, S52621K-S52621P, S52622K-S52622P, S52629K-S52629P, S52691K-S52691R, S52692K-S52692R, S52699K-S52699R, S5290XK-S5290XR, S5291XK-S5291XR, S5292XK-S5292XR, S59001K-S59001P, S59002K-S59002P, S59009K-S59009P, S59011K-S59011P, S59012K-S59012P, S59019K-S59019P, S59021K-S59021P, S59022K-S59022P, S59029K-S59029P, S59031K-S59031P, S59032K-S59032P, S59039K-S59039P, S59041K-S59041P, S59042K-S59042P, S59049K-S59049P, S59091K-S59091P, S59092K-S59092P, S59099K-S59099P, S59101K-S59101P, S59102K-S59102P, S59109K-S59109P, S59111K-S59111P, S59112K-S59112P, S59119K-S59119P, S59121K-S59121P, S59122K-S59122P, S59129K-S59129P, S59131K-S59131P, S59132K-S59132P, S59139K-S59139P, S59141K-S59141P, S59142K-S59142P, S59149K-S59149P, S59191K-S59191P, S59192K-S59192P, S59199K-S59199P, S59201K-S59201P, S59202K-S59202P, S59209K-S59209P, S59211K-S59211P, S59212K-S59212P, S59219K-S59219P, S59221K-S59221P, S59222K-S59222P, S59229K-S59229P, S59231K-S59231P, S59232K-S59232P, S59239K-S59239P, S59241K-S59241P, S59242K-S59242P, S59249K-S59249P, S59291K-S59291P, S59292K-S59292P, S59299K-S59299P, S62001K-S62001P, S62002K-S62002P, S62009K-S62009P, S62011K-S62011P, S62012K-S62012P, S62013K-S62013P, S62014K-S62014P, S62015K-S62015P, S62016K-S62016P, S62021K-S62021P, S62022K-S62022P, S62023K-S62023P, S62024K-S62024P, S62025K-S62025P, S62026K-S62026P, S62031K-S62031P, S62032K-S62032P, S62033K-S62033P, S62034K-S62034P, S62035K-S62035P, S62036K-S62036P, S62101K-S62101P, S62102K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62102P, S62109K-S62109P, S62111K-S62111P, S62112K-S62112P, S62113K-S62113P, S62114K-S62114P, S62115K-S62115P, S62116K-S62116P, S62121K-S62121P, S62122K-S62122P, S62123K-S62123P, S62124K-S62124P, S62125K-S62125P, S62126K-S62126P, S62131K-S62131P, S62132K-S62132P, S62133K-S62133P, S62134K-S62134P, S62135K-S62135P, S62136K-S62136P, S62141K-S62141P, S62142K-S62142P, S62143K-S62143P, S62144K-S62144P, S62145K-S62145P, S62146K-S62146P, S62151K-S62151P, S62152K-S62152P, S62153K-S62153P, S62154K-S62154P, S62155K-S62155P, S62156K-S62156P, S62161K-S62161P, S62162K-S62162P, S62163K-S62163P, S62164K-S62164P, S62165K-S62165P, S62166K-S62166P, S62171K-S62171P, S62172K-S62172P, S62173K-S62173P, S62174K-S62174P, S62175K-S62175P, S62176K-S62176P, S62181K-S62181P, S62182K-S62182P, S62183K-S62183P, S62184K-S62184P, S62185K-S62185P, S62186K-S62186P, S62201K-S62201P, S62202K-S62202P, S62209K-S62209P, S62211K-S62211P, S62212K-S62212P, S62213K-S62213P, S62221K-S62221P, S62222K-S62222P, S62223K-S62223P, S62224K-S62224P, S62225K-S62225P, S62226K-S62226P, S62231K-S62231P, S62232K-S62232P, S62233K-S62233P, S62234K-S62234P, S62235K-S62235P, S62236K-S62236P, S62241K-S62241P, S62242K-S62242P, S62243K-S62243P, S62244K-S62244P, S62245K-S62245P, S62246K-S62246P, S62251K-S62251P, S62252K-S62252P, S62253K-S62253P, S62254K-S62254P, S62255K-S62255P, S62256K-S62256P, S62291K-S62291P, S62292K-S62292P, S62299K-S62299P, S62300K-S62300P, S62301K-S62301P, S62302K-S62302P, S62303K-S62303P, S62304K-S62304P, S62305K-S62305P, S62306K-S62306P, S62307K-S62307P, S62308K-S62308P, S62309K-S62309P, S62310K-S62310P, S62311K-S62311P, S62312K-S62312P, S62313K-S62313P, S62314K-S62314P, S62315K-S62315P, S62316K-S62316P, S62317K-S62317P, S62318K-S62318P, S62319K-S62319P, S62320K-S62320P, S62321K-S62321P, S62322K-S62322P, S62323K-S62323P, S62324K-S62324P, S62325K-S62325P, S62326K-S62326P, S62327K-S62327P, S62328K-S62328P, S62329K-S62329P, S62330K-S62330P, S62331K-S62331P, S62332K-S62332P, S62333K-S62333P, S62334K-S62334P, S62335K-S62335P, S62336K-S62336P, S62337K-S62337P, S62338K-S62338P, S62339K-S62339P, S62340K-S62340P, S62341K-S62341P, S62342K-S62342P, S62343K-S62343P, S62344K-S62344P, S62345K-S62345P, S62346K-S62346P, S62347K-S62347P, S62348K-S62348P, S62349K-S62349P, S62350K-S62350P, S62351K-S62351P, S62352K-S62352P, S62353K-S62353P, S62354K-S62354P, S62355K-S62355P, S62356K-S62356P, S62357K-S62357P, S62358K-S62358P, S62359K-S62359P, S62360K-S62360P, S62361K-S62361P, S62362K-S62362P, S62363K-S62363P, S62364K-S62364P, S62365K-S62365P, S62366K-S62366P, S62367K-S62367P, S62368K-S62368P, S62369K-S62369P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S62390K-S62390P, S62391K-S62391P, S62392K-S62392P, S62393K-S62393P, S62394K-S62394P, S62395K-S62395P, S62396K-S62396P, S62397K-S62397P, S62398K-S62398P, S62399K-S62399P, S62501K-S62501P, S62502K-S62502P, S62509K-S62509P, S62511K-S62511P, S62512K-S62512P, S62513K-S62513P, S62514K-S62514P, S62515K-S62515P, S62516K-S62516P, S62521K-S62521P, S62522K-S62522P, S62523K-S62523P, S62524K-S62524P, S62525K-S62525P, S62526K-S62526P, S62600K-S62600P, S62601K-S62601P, S62602K-S62602P, S62603K-S62603P, S62604K-S62604P, S62605K-S62605P, S62606K-S62606P, S62607K-S62607P, S62608K-S62608P, S62609K-S62609P, S62610K-S62610P, S62611K-S62611P, S62612K-S62612P, S62613K-S62613P, S62614K-S62614P, S62615K-S62615P, S62616K-S62616P, S62617K-S62617P, S62618K-S62618P, S62619K-S62619P, S62620K-S62620P, S62621K-S62621P, S62622K-S62622P, S62623K-S62623P, S62624K-S62624P, S62625K-S62625P, S62626K-S62626P, S62627K-S62627P, S62628K-S62628P, S62629K-S62629P, S62630K-S62630P, S62631K-S62631P, S62632K-S62632P, S62633K-S62633P, S62634K-S62634P, S62635K-S62635P, S62636K-S62636P, S62637K-S62637P, S62638K-S62638P, S62639K-S62639P, S62640K-S62640P, S62641K-S62641P, S62642K-S62642P, S62643K-S62643P, S62644K-S62644P, S62645K-S62645P, S62646K-S62646P, S62647K-S62647P, S62648K-S62648P, S62649K-S62649P, S62650K-S62650P, S62651K-S62651P, S62652K-S62652P, S62653K-S62653P, S62654K-S62654P, S62655K-S62655P, S62656K-S62656P, S62657K-S62657P, S62658K-S62658P, S62659K-S62659P, S62660K-S62660P, S62661K-S62661P, S62662K-S62662P, S62663K-S62663P, S62664K-S62664P, S62665K-S62665P, S62666K-S62666P, S62667K-S62667P, S62668K-S62668P, S62669K-S62669P, S6290XK-S6290XP, S6291XK-S6291XP, S6292XK-S6292XP, S72001K-S72001R, S72002K-S72002R, S72009K-S72009R, S72011K-S72011R, S72012K-S72012R, S72019K-S72019R, S72021K-S72021R, S72022K-S72022R, S72023K-S72023R, S72024K-S72024R, S72025K-S72025R, S72026K-S72026R, S72031K-S72031R, S72032K-S72032R, S72033K-S72033R, S72034K-S72034R, S72035K-S72035R, S72036K-S72036R, S72041K-S72041R, S72042K-S72042R, S72043K-S72043R, S72044K-S72044R, S72045K-S72045R, S72046K-S72046R, S72051K-S72051R, S72052K-S72052R, S72059K-S72059R, S72061K-S72061R, S72062K-S72062R, S72063K-S72063R, S72064K-S72064R, S72065K-S72065R, S72066K-S72066R, S72091K-S72091R, S72092K-S72092R, S72099K-S72099R, S72101K-S72101R, S72102K-S72102R, S72109K-S72109R, S72111K-S72111R, S72112K-S72112R, S72113K-S72113R, S72114K-S72114R, S72115K-S72115R, S72116K-S72116R, S72121K-S72121R, S72122K-S72122R, S72123K-S72123R, S72124K-S72124R, S72125K-S72125R, S72126K-S72126R, S72131K-S72131R, S72132K-S72132R, S72133K-S72133R, S72134K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S72134R, S72135K-S72135R, S72136K-S72136R, S72141K-S72141R, S72142K-S72142R, S72143K-S72143R, S72144K-S72144R, S72145K-S72145R, S72146K-S72146R, S7221XK-S7221XR, S7222XK-S7222XR, S7223XK-S7223XR, S7224XK-S7224XR, S7225XK-S7225XR, S7226XK-S7226XR, S72301K-S72301R, S72302K-S72302R, S72309K-S72309R, S72321K-S72321R, S72322K-S72322R, S72323K-S72323R, S72324K-S72324R, S72325K-S72325R, S72326K-S72326R, S72331K-S72331R, S72332K-S72332R, S72333K-S72333R, S72334K-S72334R, S72335K-S72335R, S72336K-S72336R, S72341K-S72341R, S72342K-S72342R, S72343K-S72343R, S72344K-S72344R, S72345K-S72345R, S72346K-S72346R, S72351K-S72351R, S72352K-S72352R, S72353K-S72353R, S72354K-S72354R, S72355K-S72355R, S72356K-S72356R, S72361K-S72361R, S72362K-S72362R, S72363K-S72363R, S72364K-S72364R, S72365K-S72365R, S72366K-S72366R, S72391K-S72391R, S72392K-S72392R, S72399K-S72399R, S72401K-S72401R, S72402K-S72402R, S72409K-S72409R, S72411K-S72411R, S72412K-S72412R, S72413K-S72413R, S72414K-S72414R, S72415K-S72415R, S72416K-S72416R, S72421K-S72421R, S72422K-S72422R, S72423K-S72423R, S72424K-S72424R, S72425K-S72425R, S72426K-S72426R, S72431K-S72431R, S72432K-S72432R, S72433K-S72433R, S72434K-S72434R, S72435K-S72435R, S72436K-S72436R, S72441K-S72441R, S72442K-S72442R, S72443K-S72443R, S72444K-S72444R, S72445K-S72445R, S72446K-S72446R, S72451K-S72451R, S72452K-S72452R, S72453K-S72453R, S72454K-S72454R, S72455K-S72455R, S72456K-S72456R, S72461K-S72461R, S72462K-S72462R, S72463K-S72463R, S72464K-S72464R, S72465K-S72465R, S72466K-S72466R, S72471K-S72471P, S72472K-S72472P, S72479K-S72479P, S72491K-S72491R, S72492K-S72492R, S72499K-S72499R, S728X1K-S728X1R, S728X2K-S728X2R, S728X9K-S728X9R, S7290XK-S7290XR, S7291XK-S7291XR, S7292XK-S7292XR, S79001K-S79001P, S79002K-S79002P, S79009K-S79009P, S79011K-S79011P, S79012K-S79012P, S79019K-S79019P, S79091K-S79091P, S79092K-S79092P, S79099K-S79099P, S79101K-S79101P, S79102K-S79102P, S79109K-S79109P, S79111K-S79111P, S79112K-S79112P, S79119K-S79119P, S79121K-S79121P, S79122K-S79122P, S79129K-S79129P, S79131K-S79131P, S79132K-S79132P, S79139K-S79139P, S79141K-S79141P, S79142K-S79142P, S79149K-S79149P, S79191K-S79191P, S79192K-S79192P, S79199K-S79199P, S82001K-S82001R, S82002K-S82002R, S82009K-S82009R, S82011K-S82011R, S82012K-S82012R, S82013K-S82013R, S82014K-S82014R, S82015K-S82015R, S82016K-S82016R, S82021K-S82021R, S82022K-S82022R, S82023K-S82023R, S82024K-S82024R, S82025K-S82025R, S82026K-S82026R, S82031K-S82031R, S82032K-S82032R, S82033K-S82033R, S82034K-S82034R, S82035K-S82035R, S82036K-S82036R, S82041K-S82041R, S82042K-S82042R, S82043K-S82043R,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82044K-S82044R, S82045K-S82045R, S82046K-S82046R, S82091K-S82091R, S82092K-S82092R, S82099K-S82099R, S82101K-S82101R, S82102K-S82102R, S82109K-S82109R, S82111K-S82111R, S82112K-S82112R, S82113K-S82113R, S82114K-S82114R, S82115K-S82115R, S82116K-S82116R, S82121K-S82121R, S82122K-S82122R, S82123K-S82123R, S82124K-S82124R, S82125K-S82125R, S82126K-S82126R, S82131K-S82131R, S82132K-S82132R, S82133K-S82133R, S82134K-S82134R, S82135K-S82135R, S82136K-S82136R, S82141K-S82141R, S82142K-S82142R, S82143K-S82143R, S82144K-S82144R, S82145K-S82145R, S82146K-S82146R, S82151K-S82151R, S82152K-S82152R, S82153K-S82153R, S82154K-S82154R, S82155K-S82155R, S82156K-S82156R, S82161K-S82161P, S82162K-S82162P, S82169K-S82169P, S82191K-S82191R, S82192K-S82192R, S82199K-S82199R, S82201K-S82201R, S82202K-S82202R, S82209K-S82209R, S82221K-S82221R, S82222K-S82222R, S82223K-S82223R, S82224K-S82224R, S82225K-S82225R, S82226K-S82226R, S82231K-S82231R, S82232K-S82232R, S82233K-S82233R, S82234K-S82234R, S82235K-S82235R, S82236K-S82236R, S82241K-S82241R, S82242K-S82242R, S82243K-S82243R, S82244K-S82244R, S82245K-S82245R, S82246K-S82246R, S82251K-S82251R, S82252K-S82252R, S82253K-S82253R, S82254K-S82254R, S82255K-S82255R, S82256K-S82256R, S82261K-S82261R, S82262K-S82262R, S82263K-S82263R, S82264K-S82264R, S82265K-S82265R, S82266K-S82266R, S82291K-S82291R, S82292K-S82292R, S82299K-S82299R, S82301K-S82301R, S82302K-S82302R, S82309K-S82309R, S82311K-S82311P, S82312K-S82312P, S82319K-S82319P, S82391K-S82391R, S82392K-S82392R, S82399K-S82399R, S82401K-S82401R, S82402K-S82402R, S82409K-S82409R, S82421K-S82421R, S82422K-S82422R, S82423K-S82423R, S82424K-S82424R, S82425K-S82425R, S82426K-S82426R, S82431K-S82431R, S82432K-S82432R, S82433K-S82433R, S82434K-S82434R, S82435K-S82435R, S82436K-S82436R, S82441K-S82441R, S82442K-S82442R, S82443K-S82443R, S82444K-S82444R, S82445K-S82445R, S82446K-S82446R, S82451K-S82451R, S82452K-S82452R, S82453K-S82453R, S82454K-S82454R, S82455K-S82455R, S82456K-S82456R, S82461K-S82461R, S82462K-S82462R, S82463K-S82463R, S82464K-S82464R, S82465K-S82465R, S82466K-S82466R, S82491K-S82491R, S82492K-S82492R, S82499K-S82499R, S8251XK-S8251XR, S8252XK-S8252XR, S8253XK-S8253XR, S8254XK-S8254XR, S8255XK-S8255XR, S8256XK-S8256XR, S8261XK-S8261XR, S8262XK-S8262XR, S8263XK-S8263XR, S8264XK-S8264XR, S8265XK-S8265XR, S8266XK-S8266XR, S82811K-S82811P, S82812K-S82812P, S82819K-S82819P, S82821K-S82821P, S82822K-S82822P, S82829K-S82829P, S82831K-S82831R, S82832K-S82832R, S82839K-S82839R, S82841K-S82841R, S82842K-S82842R, S82843K-S82843R, S82844K-S82844R, S82845K-S82845R, S82846K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S82846R, S82851K-S82851R, S82852K-S82852R, S82853K-S82853R, S82854K-S82854R, S82855K-S82855R, S82856K-S82856R, S82861K-S82861R, S82862K-S82862R, S82863K-S82863R, S82864K-S82864R, S82865K-S82865R, S82866K-S82866R, S82871K-S82871R, S82872K-S82872R, S82873K-S82873R, S82874K-S82874R, S82875K-S82875R, S82876K-S82876R, S82891K-S82891R, S82892K-S82892R, S82899K-S82899R, S8290XK-S8290XR, S8291XK-S8291XR, S8292XK-S8292XR, S89001K-S89001P, S89002K-S89002P, S89009K-S89009P, S89011K-S89011P, S89012K-S89012P, S89019K-S89019P, S89021K-S89021P, S89022K-S89022P, S89029K-S89029P, S89031K-S89031P, S89032K-S89032P, S89039K-S89039P, S89041K-S89041P, S89042K-S89042P, S89049K-S89049P, S89091K-S89091P, S89092K-S89092P, S89099K-S89099P, S89101K-S89101P, S89102K-S89102P, S89109K-S89109P, S89111K-S89111P, S89112K-S89112P, S89119K-S89119P, S89121K-S89121P, S89122K-S89122P, S89129K-S89129P, S89131K-S89131P, S89132K-S89132P, S89139K-S89139P, S89141K-S89141P, S89142K-S89142P, S89149K-S89149P, S89191K-S89191P, S89192K-S89192P, S89199K-S89199P, S89201K-S89201P, S89202K-S89202P, S89209K-S89209P, S89211K-S89211P, S89212K-S89212P, S89219K-S89219P, S89221K-S89221P, S89222K-S89222P, S89229K-S89229P, S89291K-S89291P, S89292K-S89292P, S89299K-S89299P, S89301K-S89301P, S89302K-S89302P, S89309K-S89309P, S89311K-S89311P, S89312K-S89312P, S89319K-S89319P, S89321K-S89321P, S89322K-S89322P, S89329K-S89329P, S89391K-S89391P, S89392K-S89392P, S89399K-S89399P, S92001K-S92001P, S92002K-S92002P, S92009K-S92009P, S92011K-S92011P, S92012K-S92012P, S92013K-S92013P, S92014K-S92014P, S92015K-S92015P, S92016K-S92016P, S92021K-S92021P, S92022K-S92022P, S92023K-S92023P, S92024K-S92024P, S92025K-S92025P, S92026K-S92026P, S92031K-S92031P, S92032K-S92032P, S92033K-S92033P, S92034K-S92034P, S92035K-S92035P, S92036K-S92036P, S92041K-S92041P, S92042K-S92042P, S92043K-S92043P, S92044K-S92044P, S92045K-S92045P, S92046K-S92046P, S92051K-S92051P, S92052K-S92052P, S92053K-S92053P, S92054K-S92054P, S92055K-S92055P, S92056K-S92056P, S92061K-S92061P, S92062K-S92062P, S92063K-S92063P, S92064K-S92064P, S92065K-S92065P, S92066K-S92066P, S92101K-S92101P, S92102K-S92102P, S92109K-S92109P, S92111K-S92111P, S92112K-S92112P, S92113K-S92113P, S92114K-S92114P, S92115K-S92115P, S92116K-S92116P, S92121K-S92121P, S92122K-S92122P, S92123K-S92123P, S92124K-S92124P, S92125K-S92125P, S92126K-S92126P, S92131K-S92131P, S92132K-S92132P, S92133K-S92133P, S92134K-S92134P, S92135K-S92135P, S92136K-S92136P, S92141K-S92141P, S92142K-S92142P, S92143K-S92143P, S92144K-S92144P, S92145K-S92145P, S92146K-S92146P, S92151K-S92151P, S92152K-S92152P,

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S92153K-S92153P, S92154K-S92154P, S92155K-S92155P, S92156K-S92156P, S92191K-S92191P, S92192K-S92192P, S92199K-S92199P, S92201K-S92201P, S92202K-S92202P, S92209K-S92209P, S92211K-S92211P, S92212K-S92212P, S92213K-S92213P, S92214K-S92214P, S92215K-S92215P, S92216K-S92216P, S92221K-S92221P, S92222K-S92222P, S92223K-S92223P, S92224K-S92224P, S92225K-S92225P, S92226K-S92226P, S92231K-S92231P, S92232K-S92232P, S92233K-S92233P, S92234K-S92234P, S92235K-S92235P, S92236K-S92236P, S92241K-S92241P, S92242K-S92242P, S92243K-S92243P, S92244K-S92244P, S92245K-S92245P, S92246K-S92246P, S92251K-S92251P, S92252K-S92252P, S92253K-S92253P, S92254K-S92254P, S92255K-S92255P, S92256K-S92256P, S92301K-S92301P, S92302K-S92302P, S92309K-S92309P, S92311K-S92311P, S92312K-S92312P, S92313K-S92313P, S92314K-S92314P, S92315K-S92315P, S92316K-S92316P, S92321K-S92321P, S92322K-S92322P, S92323K-S92323P, S92324K-S92324P, S92325K-S92325P, S92326K-S92326P, S92331K-S92331P, S92332K-S92332P, S92333K-S92333P, S92334K-S92334P, S92335K-S92335P, S92336K-S92336P, S92341K-S92341P, S92342K-S92342P, S92343K-S92343P, S92344K-S92344P, S92345K-S92345P, S92346K-S92346P, S92351K-S92351P, S92352K-S92352P, S92353K-S92353P, S92354K-S92354P, S92355K-S92355P, S92356K-S92356P, S92401K-S92401P, S92402K-S92402P, S92403K-S92403P, S92404K-S92404P, S92405K-S92405P, S92406K-S92406P, S92411K-S92411P, S92412K-S92412P, S92413K-S92413P, S92414K-S92414P, S92415K-S92415P, S92416K-S92416P, S92421K-S92421P, S92422K-S92422P, S92423K-S92423P, S92424K-S92424P, S92425K-S92425P, S92426K-S92426P, S92491K-S92491P, S92492K-S92492P, S92499K-S92499P, S92501K-S92501P, S92502K-S92502P, S92503K-S92503P, S92504K-S92504P, S92505K-S92505P, S92506K-S92506P, S92511K-S92511P, S92512K-S92512P, S92513K-S92513P, S92514K-S92514P, S92515K-S92515P, S92516K-S92516P, S92521K-S92521P, S92522K-S92522P, S92523K-S92523P, S92524K-S92524P, S92525K-S92525P, S92526K-S92526P, S92531K-S92531P, S92532K-S92532P, S92533K-S92533P, S92534K-S92534P, S92535K-S92535P, S92536K-S92536P, S92591K-S92591P, S92592K-S92592P, S92599K-S92599P, S92811K-S92811P, S92812K-S92812P, S92819K-S92819P, S92901K-S92901P, S92902K-S92902P, S92909K-S92909P, S92911K-S92911P, S92912K-S92912P, S92919K-S92919P, S99001K-S99001P, S99002K-S99002P, S99009K-S99009P, S99011K-S99011P, S99012K-S99012P, S99019K-S99019P, S99021K-S99021P, S99022K-S99022P, S99029K-S99029P, S99031K-S99031P, S99032K-S99032P, S99039K-S99039P, S99041K-S99041P, S99042K-S99042P, S99049K-S99049P, S99091K-S99091P, S99092K-S99092P, S99099K-S99099P, S99101K-S99101P, S99102K-S99102P, S99109K-S99109P, S99111K-S99111P, S99112K-

Condition	2015 MEPS (ICD-9)	2016 MEPS (ICD-10)	MN APCD (ICD-10)
			S99112P, S99119K-S99119P, S99121K-S99121P, S99122K-S99122P, S99129K-S99129P, S99131K-S99131P, S99132K-S99132P, S99139K-S99139P, S99141K-S99141P, S99142K-S99142P, S99149K-S99149P, S99191K-S99191P, S99192K-S99192P, S99199K-S99199P, S99201K-S99201P, S99202K-S99202P, S99209K-S99209P, S99211K-S99211P, S99212K-S99212P, S99219K-S99219P, S99221K-S99221P, S99222K-S99222P, S99229K-S99229P, S99231K-S99231P, S99232K-S99232P, S99239K-S99239P, S99241K-S99241P, S99242K-S99242P, S99249K