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Title: Using PROC MEANS to summarize months of eligibility for Medicaid beneficiaries

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Background

The Division of Analytics and Policy Research (DAPR) within the District of Columbia Department of Health Care Finance (DHCF) produces the annual CMS-416 report to document the performance of the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit for the District's children under 21 who are enrolled in Medicaid. The report requires the calculation of the total months of eligibility for all beneficiaries included in the report, as beneficiaries can have multiple enrollment spans in a given year. Previously, duration of eligibility was calculated in multiple steps using Microsoft Excel, including IF functions and pivot tables. DAPR sought to streamline the calculation of eligibility duration using SAS®.

Methods

In SAS, binary variables were created for each month in the period of interest as indicators for eligibility, based on monthly enrollment dates. The values for each of these binary variables were then vertically summed by beneficiary Medicaid number using PROC MEANS. This step created a new data set with a de-duplicated list of Medicaid beneficiaries, and included a new variable representing the count of the months of eligibility for each beneficiary. A new variable measuring the total months of eligibility was then created, which captured the sum of the variables created in the previous step.

Results

The use of PROC MEANS allowed DAPR to account for multiple enrollment spans for Medicaid beneficiaries in the reporting year. DAPR was also able to use the summary variables to determine 90-day continuous eligibility, which is a requirement for inclusion in the denominator for several key measures of the CMS-416 report.

Conclusion

The PROC MEANS procedure allowed for more accurate and efficient calculation of beneficiary eligibility data, resulting in streamlined reporting capacities. DAPR has continued to use the PROC MEANS procedure in several other reports where calculation of beneficiary eligibility is required.

Introduction

The District of Columbia Department of Health Care Finance is the District's state Medicaid agency, and is responsible for administering the Medicaid benefits to approximately 260,000 low-income and disabled District residents¹. One of the District's Medicaid programs is the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit for children under 21 years of age. EPSDT services are comprehensive, including medical, dental, vision and behavioral health services, and also include development, behavioral, and lead screening according to recognized periodicity schedules.

The Centers for Medicare and Medicaid Services (CMS) requires states to submit an annual CMS-416 form to report basic information on state Medicaid and Children's Health Insurance Program (CHIP) programs to assess the effectiveness of EPSDT. The 416 report includes data on children's enrollment and eligibility; receipt of health screening services; referral for corrective treatment; receipt of dental services; and receipt of a lead screening test.

The report is submitted in April of each year and includes data from the previous federal fiscal year (October 1st through September 30th). For example, the fiscal year 2014 report was submitted in April 2015.

As part of the required enrollment data, states must calculate how many eligible children under 21 were enrolled continuously for 90 days in the reporting year; this figure accounts for “churn” in and out of the Medicaid program and is intended to accurately reflect the number of children who were consistently enrolled in Medicaid and had continuous access to health services. Further, this value serves as the denominator for all subsequent screening and participant rates in the report. In addition to the 90-day eligibility calculation, states must also calculate the total number of months in the reporting period in which each child was eligible; because children had to be eligible for at least 90 days, this number ranged from three to twelve months.

The Division of Analytics and Policy Research (DAPR) within the Health Care Policy and Research Administration (HCPRA) at DHCF works closely with the Division of Children’s Health Services (CHS) to compile the 416 report. In previous years, DAPR extracted the claims and enrollment data from the District’s Medicaid Management Information System (MMIS) via a portal called Cognos, and performed all analytic procedures in Microsoft Excel. The process was time-consuming and required multiple data pulls. Once the data was extracted and saved in Excel spreadsheets, the determination of 90-day eligibility and summation of months of eligibility required data analysts to take into account multiple enrollment spans for each Medicaid child. In Excel, this was calculated using IF functions for each month of the reporting year, and then summing the months of eligibility in a pivot table. Data analysts sought to streamline this process using SAS® Enterprise Guide.

Children often move into and out of the Medicaid program based on changes in family income or family size. In addition, all beneficiaries are first enrolled in fee-for-service benefit delivery system. Most beneficiaries, specifically those who are not blind, aged or disabled, are transitioned into a managed care delivery system, at which point they have a new enrollment span and a new eligibility program code. Again, data analysts need to account for all enrollment spans when considering each beneficiary’s eligibility.

In the summer of 2014, DHCF implemented a SAS-based data warehouse that served the same functionality as the Cognos portal. However, data analysts were now able to pull data directly from MMIS in SAS, and then perform data analytics in the same SAS program. This allowed for an exponential increase in the speed of data extraction, and streamlined reporting and analytical capabilities. When CMS issued instructions for the FY14 416 report in late calendar year 2014, the assigned data analyst in DAPR sought to mimic the eligibility calculation steps previously done in Excel, this time using SAS.

In the preliminary data extraction stage, data was extracted from the enrollment package for all children under age 21 who had an enrollment span within the period of interest – in this case, fiscal year 2014. Twelve binary variables measuring eligibility in each month of the fiscal year were then created in a data step:

```
data cms.eligibility_5;
set cms.eligibility_4;
if B_COE_SPN_BEG_DT<='31OCT2014'd and B_COE_SPN_END_DT>='01OCT2014'd then eligible_1=1
; else eligible_1=0;
if B_COE_SPN_BEG_DT<='30NOV2014'd and B_COE_SPN_END_DT>='01NOV2014'd then eligible_2=1
; else eligible_2=0;
if B_COE_SPN_BEG_DT<='31DEC2014'd and B_COE_SPN_END_DT>='01DEC2014'd then eligible_3=1
; else eligible_3=0;
if B_COE_SPN_BEG_DT<='31JAN2015'd and B_COE_SPN_END_DT>='01JAN2015'd then eligible_4=1
; else eligible_4=0;
if B_COE_SPN_BEG_DT<='28FEB2015'd and B_COE_SPN_END_DT>='01FEB2015'd then eligible_5=1
; else eligible_5=0;
if B_COE_SPN_BEG_DT<='31MAR2015'd and B_COE_SPN_END_DT>='01MAR2015'd then eligible_6=1
; else eligible_6=0;
if B_COE_SPN_BEG_DT<='30APR2015'd and B_COE_SPN_END_DT>='01APR2015'd then eligible_7=1
; else eligible_7=0;
if B_COE_SPN_BEG_DT<='31MAY2015'd and B_COE_SPN_END_DT>='01MAY2015'd then eligible_8=1
; else eligible_8=0;
if B_COE_SPN_BEG_DT<='30JUN2015'd and B_COE_SPN_END_DT>='01JUN2015'd then eligible_9=1
; else eligible_9=0;
if B_COE_SPN_BEG_DT<='31JUL2015'd and B_COE_SPN_END_DT>='01JUL2015'd then eligible_10=
1; else eligible_10=0;
if B_COE_SPN_BEG_DT<='31AUG2015'd and B_COE_SPN_END_DT>='01AUG2015'd then eligible_11=
1; else eligible_11=0;
if B_COE_SPN_BEG_DT<='30SEP2015'd and B_COE_SPN_END_DT>='01SEP2015'd then eligible_12=
1; else eligible_12=0;
```

run;

In the following step, the values for each of these binary variables were then vertically summed by beneficiary Medicaid number using PROC MEANS. This step created a new data set with a de-duplicated list of Medicaid beneficiaries, and included a new variable representing the count of the months of eligibility for each beneficiary.

```
proc sort data=cms.eligibility_5;
by MBR_ORIG_ID;
run;
```

```
proc means data=cms.eligibility_5 noprint;
var eligible_1 eligible_2 eligible_3 eligible_4 eligible_5 eligible_6 eligible_7
eligible_8 eligible_9 eligible_10 eligible_11 eligible_12;
output out=cms.eligibility_6
sum(eligible_1-eligible_12)=sum_eligible_1-sum_eligible_12;
by mbr_orig_id;
run;
```

A new variable measuring the total months of eligibility was then created, which captured the sum of the variables created in the previous step.

```
data cms.eligibility_7;
set cms.eligibility_6;
total_months_eligible=sum(sum_eligible_1, sum_eligible_2, sum_eligible_3,
sum_eligible_4, sum_eligible_5, sum_eligible_6, sum_eligible_7, sum_eligible_8,
sum_eligible_9, sum_eligible_10, sum_eligible_11, sum_eligible_12);
run;
```

Results

An excerpt of the results for the summation of months of eligibility for children in the CMS-416 report are included below. This table was accessed from a zip file including FY14 data from all states, which is located on the CMS webpage on EPSDT². The results indicate an approximately 2% increase in the number of children eligible for EPSDT compared to FY13.

Annual EPSDT Participation Report									
Form CMS-416									
Fiscal Year: 2014									
State: District of Columbia									
Description	Cat	Total	< 1	1-2	3-5	6-9	10-14	15-18	19-20
1a. Total individuals eligible for EPSDT	CN	98,347	5,446	11,470	16,789	19,843	19,776	15,811	9,212
	MN	3	0	1	0	0	0	1	1
	Total	98,350	5,446	11,471	16,789	19,843	19,776	15,812	9,213
1b. Total Individuals eligible for EPSDT for 90 Continuous Days	CN	94,806	4,483	11,078	16,319	19,360	19,274	15,377	8,915
	MN	3	0	1	0	0	0	1	1
	Total	94,806	4,483	11,078	16,319	19,360	19,274	15,377	8,915
1c. Total Individuals Eligible under a CHIP Medicaid Expansion	CN	8,060	83	329	748	1,940	2,454	2,228	278
	MN	3	0	1	0	0	0	1	1
	Total	8,063	83	330	748	1,940	2,454	2,229	279
2a. State Periodicity Schedule			7	4	3	4	5	4	2
2b. Number of Years in Age Group			1	2	3	4	5	4	2
2c. Annualized State Periodicity Schedule			7.00	2.00	1.00	1.00	1.00	1.00	1.00
3a. Total Months of Eligibility	CN	1,070,092	32,661	126,537	187,668	223,290	222,669	176,576	100,691
	MN	29	0	5	0	0	0	12	12
	Total	1,070,121	32,661	126,542	187,668	223,290	222,669	176,588	100,703

Table 1: Results from District of Columbia Form CMS-416 report, eligibility data

Conclusion

As stated above, the use of PROC MEANS allowed DAPR to account for multiple enrollment spans for Medicaid beneficiaries in the reporting year. DAPR was also able to use the summary variables to determine 90-day continuous eligibility, which is a requirement for inclusion in the denominator for several key measures of the CMS-416 report. While the initial coding for this function required considerable time to test and correct, the code has been used several times for subsequent reports and has streamlined reporting processes for multiple projects.

References

1. DC Medical Care Advisory Committee May 2015 enrollment report (available at: <http://dhcf.dc.gov/sites/default/files/dc/sites/dhcf/publication/attachments/MCAC%20May%202015%20Report.pdf>).
2. Centers for Medicare and Medicaid Services, Early and Periodic Screening, Diagnostic, and Treatment webpage, FY14 data (available at: <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-and-Periodic-Screening-Diagnostic-and-Treatment.html>).

Your comments and questions are valued and encouraged. Contact the author at:

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