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## Using SAS® to Identify and Stratify Members of Disease Management Programs at Community Care Behavioral Health Organization

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### ABSTRACT

Community Care Behavioral Health Organization (Community Care) created a Disease Management program in July of 2009 to support their members in their behavioral health recovery efforts. Community Care chose to have their Disease Management program accredited by the National Committee for Quality Assurance (NCQA). The guidelines for this accreditation are very detailed and require that specific data types be used to identify and stratify program members. In order to meet NCQA requirements, Community Care had to write several programs that would pull data from disparate data sources located on different technical platforms and merge that data for further processing and reporting. This type of data gathering and analysis would typically require manual transformation of data. However, the power of SAS® enabled Community Care to automate this process. Data from two different platforms were linked using the local machine as an intermediary. SAS data sets created from disparate sources can be stored on the local drive and then accessed by other sources with no manual intervention. The SAS solutions used are described in this paper.

### INTRODUCTION

Community Care Behavioral Health Organization (Community Care) is a member of the Insurance Services Division of the University of Pittsburgh Medical Center (UPMC). Community Care is the only Pennsylvania-based, not-for-profit, licensed behavioral health managed care organization (BH-MCO). Community Care was created to serve HealthChoices programs throughout Pennsylvania. Community Care holds both risk-bearing and Administrative Services Only (ASO) contracts. The organization has seven offices across the Commonwealth of Pennsylvania and currently has contractual arrangements with 35 of the 67 Pennsylvania counties. With nearly 500 employees and by utilizing a network of approximately 2,000 behavioral health providers, Community Care manages behavioral healthcare for nearly 600,000 Medicaid managed care enrollees. Community Care was designed primarily to serve the needs of public sector consumers, their families, and their communities. The mission of Community Care is to improve the health and well-being of the community through the delivery of clinically effective, cost-efficient, and accessible behavioral health services. In July of 2009, Community Care embarked upon the creation of a Disease Management program to support members in their behavioral health recovery efforts. In order to manage the complex data and technological tasks of this program, Community Care chose SAS as its programming tool. The SAS solutions used are described in this paper.

### THE DISEASE MANAGEMENT (DM) PROGRAM AT COMMUNITY CARE

Community Care developed the Steps of Hope (SOH) Program to enhance member self-management. The goal of the program is to help improve the lives of members by providing guidance, assistance and support in the member's management of their condition(s) and their efforts to recover from them. Currently, there are four targeted diagnostic groups in the Steps of Hope Program: 1.) Members with a diagnosis of Depression; 2.) Members with a diagnosis of Schizophrenia; 3.) Members with serious mental illness who wish to enter into a tobacco cessation program; and 4.) Members with a serious mental illness who wish to enter into a weight management program. Community Care chose to submit their programs for accreditation by National Committee for Quality Assurance (NCQA) and was fully accredited with a score of 100 percent.

### DATA SOURCES

NCQA guidelines necessitate that certain rules are followed when identifying and stratifying members for Disease Management Programs<sup>1</sup>. The guidelines are quoted below:

The organization has a documented process to identify patients who qualify for DM programs or to determine patient needs using the following data types.

1. Claims or encounter data or eligible patient list from client organizations
2. Pharmacy data, if applicable

3. Health appraisal results
4. Laboratory results, if applicable
5. Data collected through the utilization management, case management or care management process.
6. Referrals from health management, wellness or health coaching programs
7. Information from electronic health records, if applicable
8. Information collected from patients, practitioners and client organizations

The challenge these guidelines pose is that data have to be pulled from disparate data sources located on different technical platforms. Authorization data, member clinical documents, and member Medicaid eligibility data are stored as Microsoft SQL Server 2005 tables which are accessed using either SQL or SAS, on local servers. Behavioral health service claims tables are comprised of Medicaid claims that have been transformed to obtain detailed service information not directly included on submitted claims. These transformed service claims and the pharmacy claims are stored as Microsoft Access tables or SAS Datasets for use by analysts, on a vendor hosted web server.

These two systems are disparate and do not speak to each other directly. They can however be linked using the local computer as an intermediary. This is where BASE SAS®<sup>2</sup> has proven to be most useful because SAS datasets created from either source can be stored on the hard drive of the computer and then accessed by the other source with no other manual manipulation. Using Access or SQL in these cases requires manual transformation of data using notepad or excel which can be completely avoided, thus improving the efficiency of the process and allowing the process to be automated.

The current SAS paper focuses on one of the aforementioned DM programs – the DM program for Tobacco Cessation. The member identification for this program has proven to be the most challenging to automate because a number of different sources are needed to be used to identify potential participants from Community Care's membership.

## **DM PROGRAM FOR TOBACCO CESSATION**

The DM Program for Tobacco Cessation began in August 2010. It was designed to help members reduce/eliminate their dependence on nicotine. While such a program is common among Physical Health MCOs, it is rare for a Behavioral Health MCO to initiate and manage such a program. Nicotine dependence, though prevalent among members with behavioral health problems, is not a condition that is of priority when treating members with more serious psychiatric diagnoses. However, it has always been a goal of Community Care to treat the member rather than just the condition and the addition of this program with all its complexities, is another step toward achieving this objective.

Only Medicaid enrolled members between the ages of 18 and 64, who reside in Allegheny County and currently have an open authorization for treatment are considered for this program. After these initial conditions are met, members are identified from multiple sources, as shown in Figure 1, and grouped into two final categories:

1. Members who exhibit target behavior from clinical and claims data (smoking diagnoses attached to service claims and authorizations, pharmacy claims for smoking cessation products, and/or positive answers to smoking questions in clinical documents). This group is referred to as the Target Population in the paper.
2. Members who do not exhibit target behavior but are considered Seriously Mentally Ill (SMI) by the State of Pennsylvania (based on certain specific diagnoses). These members are the "at risk" group since there is no explicit data indicating that these members suffer from nicotine dependence. This group is referred to as the SMI Population in the paper.

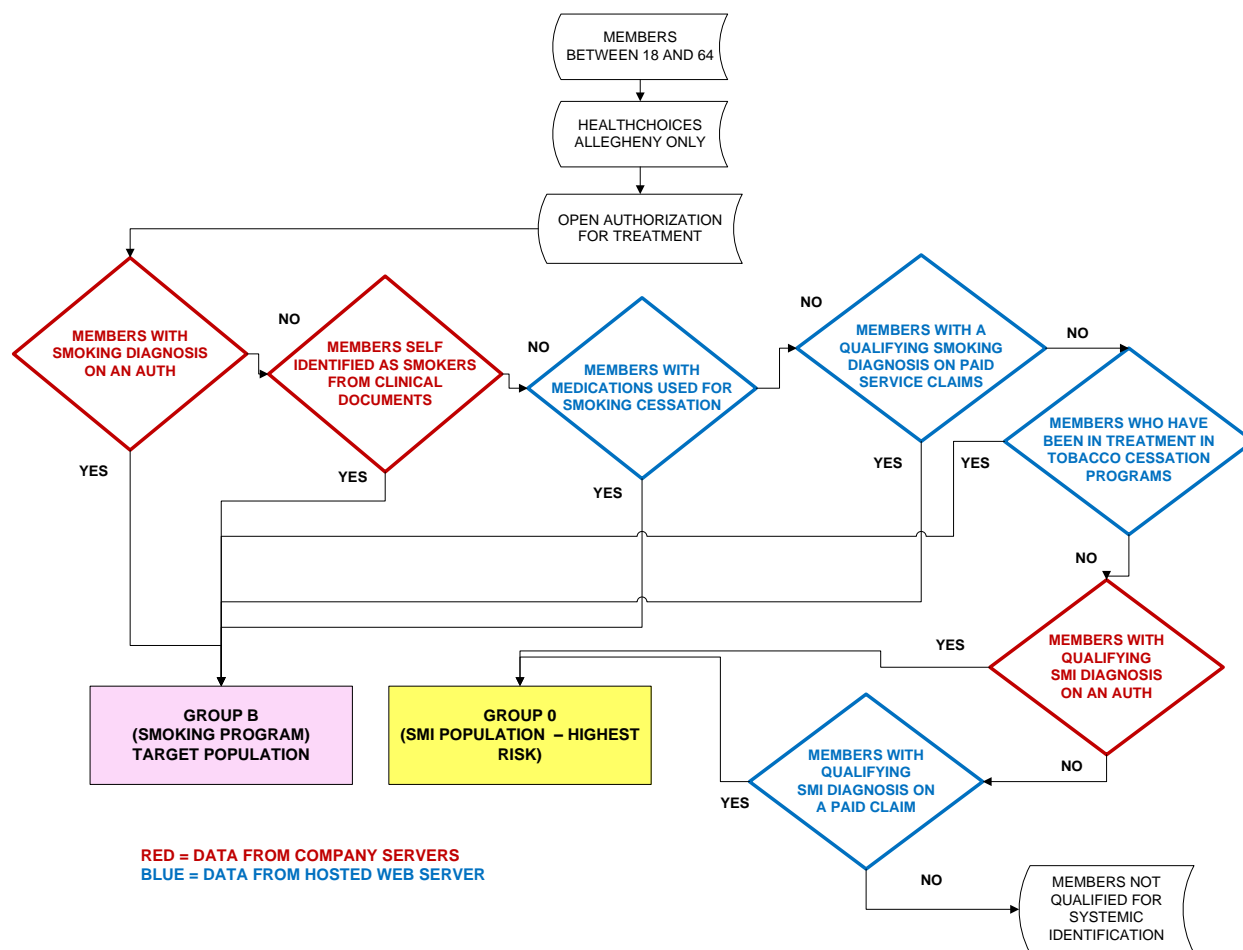


Figure 1: Smoking Cessation Target Population and SMI Population Identification

Members in the Target Population are sent mailings that describe the program, and inform them of their automatic enrollment. They are required to call and opt out if they do not wish to participate. Members in the SMI population are sent an invitational letter informing them of the availability of the tobacco cessation program. They must call to enroll in the program. The following section details the SAS procedures used to gather and merge all the data to produce the member mailing lists.

## THE SAS SOLUTION

All the different streams of data listed in Figure 1 reside in two distinct sources, Microsoft SQL server tables on Community Care servers and SAS datasets on the hosted web server. The data are run on a specified timeline and the look back period is defined based on the data source. Data from the company servers have a 30 day look back period to ensure that only members recently identified with targeted behavior (smoking) are considered for the program. Information gathered from processed data such as service claims data and pharmacy data have a longer look back period to allow for sufficient claims lag. Claims lag is the period of time it takes from when the provider submits a claim for payment until the claim is process, paid to the provider, and then added to our database. This lag can range from 60 – 120 days depending on the type of claim and amount of time the provider is allowed to submit the claim.

The LIBNAME statements shown in Figure 2 create datasets on the local computer. Figure 3, Figure 4 and Figure 5 show actual program code used to extract data from company servers along with a brief business explanation of the code.

```
LIBNAME MP4 odbc noprompt="DRIVER=SQL Server; SERVER=Server-Name;
UID=XXXX; PWD=XXXX;DATABASE=AuthTables" schema=dbo;

LIBNAME DAT 'Z:\parthasarathym\DM_Wellness\Data' ;

LIBNAME LOCAL "V:\Documents and Settings\parthasarathym\My Documents\DM Temp\DM_Wellness" ;
```

MP4 is the server that stores the authorizations.

The last LIBNAME statement links the server location to the local computer.

Figure 2: Assigning the LIBNAME to computer's C Drive

```
*****
2. SMOKING DX ON ANY AUTH IN THE PAST 30 DAYS
*****
PROC SQL;
CREATE TABLE SMOKE_DX_I AS
SELECT DISTINCT A.MEMBER_ID,
A.SESSION_NO,
A.SOURCE_NAME,
A.EPISODE_ID,
A.LEVEL_OF_CARE_CODE,
A.AUTHORIZATION_NO,
A.SESSION_DATE,
B.ENTRY_CHRON,
B.DIAGNOSIS_CODE,
B.DIAGNOSIS_VERSION
FROM MP3.DIAGNOSIS_SESSION A, MP3.DIAGNOSIS_SESSION_I B
WHERE A.SESSION_NO = B.SESSION_NO
AND B.DIAGNOSIS_CODE IN ("305.1") |
ORDER BY A.SESSION_DATE;
QUIT;

DATA DAT.SMOKE_DX_AUTH; SET SMOKE_DX2; RUN;

DATA LOCAL.SMOKE_DX_AUTH; SET DAT.SMOKE_DX_AUTH; RUN;
```

Members who have an authorization in the past 30 days with an Axis 1 diagnosis of Smoking are identified. The ICD9 diagnosis Code for Smoking is 305.1.

Diagnosis Session is a SQL Server table with authorization information. Diagnosis Session I is a SQL Server table with the Axis I diagnosis information and the two tables are linked by Session No.

This step allows a copy of the same dataset to be stored on the C Drive of the local machine. This dataset can then be accessed by a hosted web server via the local machine which will allow for seamless processing when data sources change.

This step allows the creation of a permanent dataset on the company server's user profile.

Figure 3: Authorizations with a Diagnosis of Smoking

```

3.SHOKING = YES ON ANY INPATIENT MENTAL HEALTH
DISCHARGE FORM OR DA DISCHARGE FORM
*****
PROC SQL;
CREATE TABLE MH_DC_MBR5 AS
SELECT DISTINCT A.*,
                B.COUNTY,
                DATEPART(B.DATE_REVIEW) FORMAT MMDDYY10. AS DATE_REVIEW,
                DATEPART(B.DATE_DISCHARGE) FORMAT MMDDYY10. AS DATE_DISCHARGE
FROM MP3.DOC_ENTITY A, MP3.DOC_DW_MH_DC B
WHERE A.DOC_SESSION_NO = B.DOC_SESSION_NO
AND A.CURRENT_VERSION_NO = B.VERSION_NO
AND A.STATUS = "SA" AND B.COUNTY = "HCAL"
AND DATEPART(B.DATE_REVIEW) >= TODAY()-30
AND DATEPART(B.DATE_REVIEW) <= TODAY();
QUIT;

PROC SQL;
CREATE TABLE MH_DC_MBR52 AS
SELECT DISTINCT A.DOC_SESSION_NO, A.DOC_CODE, A.STATUS,
                A.EFFECTIVE_DATE, A.ENTITY_ROOT_ID,
                B.SMOKER,
                C.COUNTY,
                C.DATE_REVIEW,
                C.DATE_DISCHARGE
FROM MP3.DOC_ENTITY A, MP3.DOC_DW_SHOKING_CESSATION B, MH_DC_MBR5 C
WHERE A.DOC_SESSION_NO = B.DOC_SESSION_NO
AND A.CURRENT_VERSION_NO = B.VERSION_NO
AND A.ENTITY_ROOT_ID = C.ENTITY_ROOT_ID
AND A.DOC_CODE = "MH_DC"
AND B.SMOKER = "Y"
AND A.STATUS = "SA" ;
QUIT;

```

Self identification by members as Smokers forms a significant part of this identification process. There are discharge forms that are filled out by Care Managers when a member is discharged from an Inpatient Mental Health or Drug & Alcohol facility. This form has a flag to indicate if a member is a smoker.

Figure 4: Clinical Documents where members self identify as "Smokers"

```

1. LOOK FOR MEMBERS WITH SMI ON ANY AUTH IN THE PAST 30 DAYS
*****
PROC SQL;
CREATE TABLE SMI_AUTH AS
SELECT
    C.member_id,
    B.benefit_plan_id,
    A.authorization_no,
    A.billing_code,
    datepart(A.from_date) format mmddyy10. as from_date,
    datepart(A.to_date) format mmddyy10. as to_date,
    E.diagnosis_code
FROM
    MP4.Provider_Proc_Auth_Detail A
INNER JOIN
    MP4.Provider_Auth_Eligibility B
ON
    A.authorization_no = B.authorization_no
INNER JOIN
    MP4.Member C
ON
    B.member_id = C.member_id
INNER JOIN
    MP4.Diagnosis_Session D
ON
    A.authorization_no = D.authorization_no
INNER JOIN
    MP4.Diagnosis_Session_I E
ON
    D.session_no = E.session_no
WHERE
    DATEPART(A.FROM_DATE) >= TODAY() - 30
AND
    DATEPART(A.FROM_DATE) <= TODAY()
AND
    (B.benefit_plan_id in ('HCAL')) ;
QUIT;

DATA SMI_AUTH2;
SET SMI_AUTH;
DIAGNOSIS_CODE = STRIP(DIAGNOSIS_CODE);
IF SUBSTR(DIAGNOSIS_CODE,1,4) IN ('295.', '296.') THEN OUTPUT;
IF SUBSTR(DIAGNOSIS_CODE,1,5) IN ('301.83') THEN OUTPUT ;
RUN;

```

Members with SMI diagnoses on Authorizations in the 30 days prior to program run date are identified.

The ICD9 diagnoses for SMI are 295.XX (Schizophrenic Disorders), 296.XX (Depression Disorders) and 301.83 (Borderline Personality Disorder).

These diagnostic groups are designated SMI by PA Department of Public Welfare (DPW).

Figure 5: Authorizations with an SMI Diagnosis

Once members have been identified from the authorizations and the clinical documents, the next steps are to identify members based on service claims and pharmacy claims information. These claims are stored as SAS datasets on the hosted web server. As stated before this web server cannot access data on the local server except via the local machine. The LIBNAME statements shown in Figure 6 in the SAS program on the web server make this data accessible to the next part of the identification process.

```

OPTIONS MLOGIC MPRINT NOOVP SPOOL SYMBOLGEN;

LIBNAME DAT 'R:\Work_CCBH\Meghna_Parthasarathy\Disease_Mgt\DM_Wellness\Membership\Data';

LIBNAME LOCAL 'V:\Documents and Settings\parthasarathym\My Documents\DM Temp\DM_Wellness';

```

Figure 6: LIBNAME statement for datasets stored on the computer

Figure 7, Figure 8, Figure 9 and Figure 10 show code used to gather data from service claims and pharmacy claims from the hosted web server.

```

1.members who satisfy SMI conditions as established by DFW -
  Schizophrenic Disorders = 295.XX
  Episodic Mood Disorders = 296.XX
  Borderline Personality Disorder = 301.83 in the past 60 days
***** ;

proc sql;
create table all_claims as
select distinct a.*, b.svc_dat, b.cos, b.comb_key_raw, b.diagn1, b.diagn2, b.diagn3,
b.alv_amt
from dat.wellness_starting_pop a, hcal.paid_Detail b
where a.member_id = b.member_id
and b.svc_dat >= today() - 60
and b.svc_dat <= today() ;
quit;

*****
4.members have 305.1 regardless of SMI in the past 60 days
***** ;

data smoking_dx_claims;
set all_claims2;
if diagn1 in ('305.1')
or diagn2 in ('305.1')
or diagn3 in ('305.1') ;
run;

data dat.smoke_dx_claims; set smoking_dx_claims; run;

```

This section identifies all service claims for Community Care members in the 60 days prior to the program run date and then subsets claims with an ICD9 Smoking Diagnosis assigned as a primary, secondary or a tertiary diagnosis.

Figure 7: Claims with a diagnosis of Smoking

```

6.members who have a service for a smoking cessation service code in the past 60 days
***** ;

data smoking_svc_claims;
set all_claims2;
if comb_key_raw in ("11S9075HQ", "11S907599");
run;

data dat.smoking_svc_claims; set smoking_svc_claims; run;

```

Paid claims for Tobacco Cessation treatment services are subset using specific billing codes.

Figure 8: Paid claims for Tobacco Cessation treatment services

```

5.members have an rx for a smoking deterrent in the past 90 days
***** ;

*** get smoking deterrent meds**
data dat.smoking_meds;
set local.fdb_12Aug10;
if hic3 in ('J3A', 'J3C', 'H7N');
keep ndc_drug_code label_name brand_name generic_name hic3 hic3_desc
generic_ther_class_code generic_ther_class_Desc bb_price ;
run;

proc sql;
create table smoking_rxl as
select distinct a.*, b.svc_dat as fill_date, b.ndc_drug_code, b.drug_name, b.billed_unit,
c.brand_name, c.generic_name, c.hic3, c.hic3_desc
from dat.wellness_starting_pop a, rx.rx_Detail b, dat.smoking_meds c
where a.member_id = b.member_id
and b.ndc_drug_code = c.ndc_drug_code
and b.svc_dat >= today() - 90
and b.svc_dat <= today() ;
quit;

```

Using Medicaid paid Pharmacy claims, members are identified based on smoking cessation prescription products that may have been prescribed to them up to 90 days prior to program run date.

Figure 9: Pharmacy claims for Smoking Cessations Products

```

1.members who satisfy SMI conditions as established by DPW -
  Schizophrenic Disorders = 295.XX
  Episodic Mood Disorders = 296.XX
  Borderline Personality Disorder = 301.83 in the past 60 days
*****
proc sql;
create table all_claims as
select distinct a.*, b.svc_dat, b.cos, b.comb_key_raw,
b.diagn1, b.diagn2, b.diagn3,
b.alw_amt
from dat.wellness_starting_pop a, hcal.paid_Detail b
where a.member_id = b.member_id
and b.svc_dat >= today() - 61
and b.svc_dat <= today() -1;
quit;

data SMI_claims;
set all_claims2;
if index(diagn1,'295.') > 0
or index(diagn1, "296.") > 0
or index(diagn1, "301.83") > 0
or index(diagn2,'295.') > 0
or index(diagn2, "296.") > 0
or index(diagn2, "301.83") > 0
or index(diagn3,'295.') > 0
or index(diagn3, "296.") > 0
or index(diagn3, "301.83") > 0 ;
run;

```

All paid service claims in the past 60 days are identified and from there a subset of claims which have any SMI diagnoses are extracted.

Figure 10: Service claims with an SMI Diagnosis

Once all the individual pieces of data are obtained from the different sources, the data is formatted to specification and only unique records are obtained and merged.

The target population and the SMI population are then sorted and merged to ensure that members in the target population are excluded from the SMI population since it is possible for members to be both SMI and have the target behavior that will include them in the target population. Mutually exclusive lists of members in the target population and the SMI population are then created using code shown in Figure 11.

```

data final_nontarget final_smoke_target ;

merge   smi_auth2(in=a )
        smi_claims2(in=b)
        smoke_discharge_auth2 (in=c)
        smoke_dx_auth2(in=d)
        smoke_dx_claims2(in=e)
        smoke_svc_claims2(in=k)
        smoke_Rx2(in=f) ;

by member_id DOB benefit_plan_id;
if (a or b)
and (not c and not d and not e and not f and not k)
then output final_nontarget;
else if (c or d or e or f or k) then output final_smoke_target;

run;

```

This final merge is what separates the target population from the SMI population since 2 unique member lists have to be created at the end of this program.

Figure 11: Final member Identification for the program

Once the unique member lists are created, they are date stamped, and matched to available addresses for educational mailings that are a part of the SOH program. These final lists are then stored for program tracking and NCQA chart reviews.

## CONCLUSION

Since its inception in August 2010, the DM program for Tobacco Cessation has enrolled 3,239 members. This program has been very well received by Community Care members as evidenced by the number of SMI members calling to enroll in the Tobacco cessation program. Currently this program is a pilot and enrollment is open only

members who belong to one specific Community Care contract. In March 2011, two targeted changes will be made to this process.

1. Community Care members with a Drug & Alcohol diagnosis will be added to the member pool.
2. Enrollment opportunity will be expanded to include one more HealthChoices contract in Pennsylvania.

Performance measures are being developed to study the impact of the program. One of the main measures is to study the uptake of smoking cessation products from the time a member enrolls in the program. Information collected from enrolled members on what they smoke how much and how often they smoke will also be used to track the effectiveness of the program.

## REFERENCES

<sup>1</sup>National Committee for Quality Assurance. 2010 Disease Management Standards and Guidelines. Washington, DC 20005.

<sup>2</sup> SAS Institute Inc. Copyright (c) 2002-2008, Cary, NC, USA.  
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