MASTER DATA MANAGEMENT

Master data management is a method used to define and manage the critical data of an organization to provide, with data integration, a single point of reference. The data that is mastered may include reference data- the SET of permissible values, and the analytical data that supports decision making.

Master data is being staged in MDM database on a non-production server nhazvbsqlt01 and being replicated on production server called dw_write under MDM schema of SANDBOX database.

Data is maintained primarily on non-production server as per requirement and UPDATEs are replicated across production server using Talend/SSIS jobs.

DATA OBJECTS

Master data comprises of following objects as of now:

1. Novant Providers
    1.1. Novant Physicians (Active)
    1.2. Novant Physicians (Termed 2016-2019)
    1.3. Novant Clinics/Doctor's Offices (Active)
    1.4. Novant Clinics/Doctor's Offices (Termed)
    1.5. Novant Acute Care Facilities (Hospitals)
    1.6. Novant Post-Acute Care – Home Health
    1.7. Novant Post-Acute Care – Skilled Nursing Facility (SNF)
2. NPPES Provider Registry
3. Contracted Providers
    3.1. ACO
    3.2. AXIA
    3.3. CIN
    3.4. Choice Health
    3.5. Laboratory Corporation
4. Novant Market Zipcode Data
5. Codes
    5.1. DRG Codes
    5.2. ICD 9 Diagnosis and Procedure Codes
    5.3. ICD 10 Diagnosis and Procedure Codes
    5.4. HCPCS & CPT Codes
    5.5. CMS Provider Specialty Codes
    5.6. NUCC Specialty Codes
    5.7. BETOS HCPCS Codes for Medicare financial evaluation
    5.8. FDA NDC (National Drug Codes) – For Products & Packages
6. Code Mappings
    6.1. DRG to Diagnosis Codes
    6.2. ICD 9 to ICD 10 Diagnosis Codes

6.3. ICD 9 to ICD 10 Procedure Codes

6.4. NUCC Codes to Milliman Provider Specialty

6.5. ICD to CCS (Clinical Classification Software) mappings for Diagnosis

6.6. ICD to CCS (Clinical Classification Software) mappings for Procedures

6.7. Geo Mappings : Location Information on Pharmacies, Food Pantries, Home Shelters, Groceries, NH Clinics, Atrium Clinics

7. Data from Prometheus XML file

SOURCES OF DATA

Sources for different data objects with their UPDATE cycles are as listed below:

Data Object	Data Owner/Author	UPDATE Cycle
ACO Providers	Annette Fulcher	Monthly
SNF Providers, Home Health Providers	Judy Moore	Monthly
Choice Health Providers	Joanna, Hardy	On demand
Hospital Based Providers	Jean Wester	On demand
Axia Providers	Brian Pearce	On demand
CIN Providers	Coretta Grant	On demand
Novant Facility Provider	Jacqueline Griffin	Monthly
Novant Physicians, Novant Clinics	Wanda Lawrence	Monthly
Termed Providers	Wanda Lawrence	Monthly
Novant Market Zipcodes	Cameron Cremeens/ Andrea Gymer	On demand
ICD Codes	CMS Website	Yearly
DRG Codes	CMS Website	Yearly
CCS Mappings	HCUP Website	On demand
CMS Specialty Codes	CMS Website	On demand
NUCC Specialty Codes	NUCC Website	On demand
Milliman Mapping	Matthew Hallgren	On demand
FDA NDC	FDA Website	On demand

For more information on data, refer to Source to Target mapping

MDM_S2T.xlsx

UPDATE AND MAINTENANCE PROCESS

As aforementioned, data is primarily experimented with and maintained on non-production SQL Server nhazvbsqlt01 and is replicated across MDM schema under SANDBOX database.

Maintenance processes for different data elements is as listed below:

1. Novant Physician (Individual) NPIs
    1.1. Data for Physicians termed in 2016-2018 is loaded once
    1.2. Data for Q1 of 2019 (both active & termed) and onwards is Updated in accordance with the raw excel files received every month (See the table for source) using an ETL job.
    1.3. Active and Termed NPIs are differentiated by 'Termination_Date' field
        - Termination_Date = NULL for Active NPIs
    1.4. Specialty information (missing in raw files) is added to the table structure using a stored procedure written in nhazvbsqlt01 which is as follows:

```sql
CREATE PROCEDURE [dbo].[SP_Load_Spec_Individual_NPI]
AS

BEGIN

UPDATE [MDM].[dbo].NH_INDIVIDUAL_NPI
SET [MDM].[dbo].NH_INDIVIDUAL_NPI.Taxonomy_Code = x.Taxonomy_Code,
    [MDM].[dbo].NH_INDIVIDUAL_NPI.Taxonomy_Name = x.Taxonomy_Name,
    [MDM].[dbo].NH_INDIVIDUAL_NPI.Taxonomy_Classification =
x.Taxonomy_Classfication,
    [MDM].[dbo].NH_INDIVIDUAL_NPI.Specialty_Name = x.Specialty_Name,
    [MDM].[dbo].NH_INDIVIDUAL_NPI.Modified_Specialty = x.Modified_Specialty

From
(
SELECT a.[NPI]
       ,a.[Healthcare_Provider_Taxonomy_Code_1] as Taxonomy_Code
       ,b.TAXONOMY_NAME as Taxonomy_Name
       ,b.TAXONOMY_CLASSIFICATION as Taxonomy_Classfication
       ,b.SPECIALTY_NAME as Specialty_Name
       ,b.MODIFIED_SPECIALTY as Modified_Specialty
FROM [MDM].[dbo].[NPPES PROVIDER] a
LEFT JOIN [dbo].[NUCC_TAXONOMY_CODES] b on
(a.Healthcare_Provider_Taxonomy_Code_1 = b.TAXONOMY_CODE)
LEFT JOIN [dbo].NH INDIVIDUAL NPI c on (a.NPI = c.Provider_NPI)
WHERE a.[NPI] = c.Provider_NPI
) x

WHERE [MDM].[dbo].NH_INDIVIDUAL_NPI.Provider_NPI = x.NPI
```

```
END;
```

1.5. Epic Provider ID is also added to this data from CLARITY_SER_2 with help of another stored procedure in MDM schema under SANDBOX Database as follows:

```
CREATE PROCEDURE [MDM].[SP_Load_EpicProvID_Individual_NPI]
AS

BEGIN
UPDATE SANDBOX.MDM.NH_INDIVIDUAL_NPI

SET SANDBOX.MDM.NH_INDIVIDUAL_NPI.EPIC_Prov_ID = x.PROV_ID

FROM
(
SELECT a.Provider_NPI
       ,b.PROV_ID
FROM SANDBOX.MDM.NH_INDIVIDUAL_NPI a
LEFT JOIN CLARITY.dbo.CLARITY_SER_2 b on (a.Provider_NPI = b.NPI)
WHERE a.Provider_NPI = b.NPI
) x

WHERE SANDBOX.MDM.NH_INDIVIDUAL_NPI.Provider_NPI = x.Provider_NPI

END
```
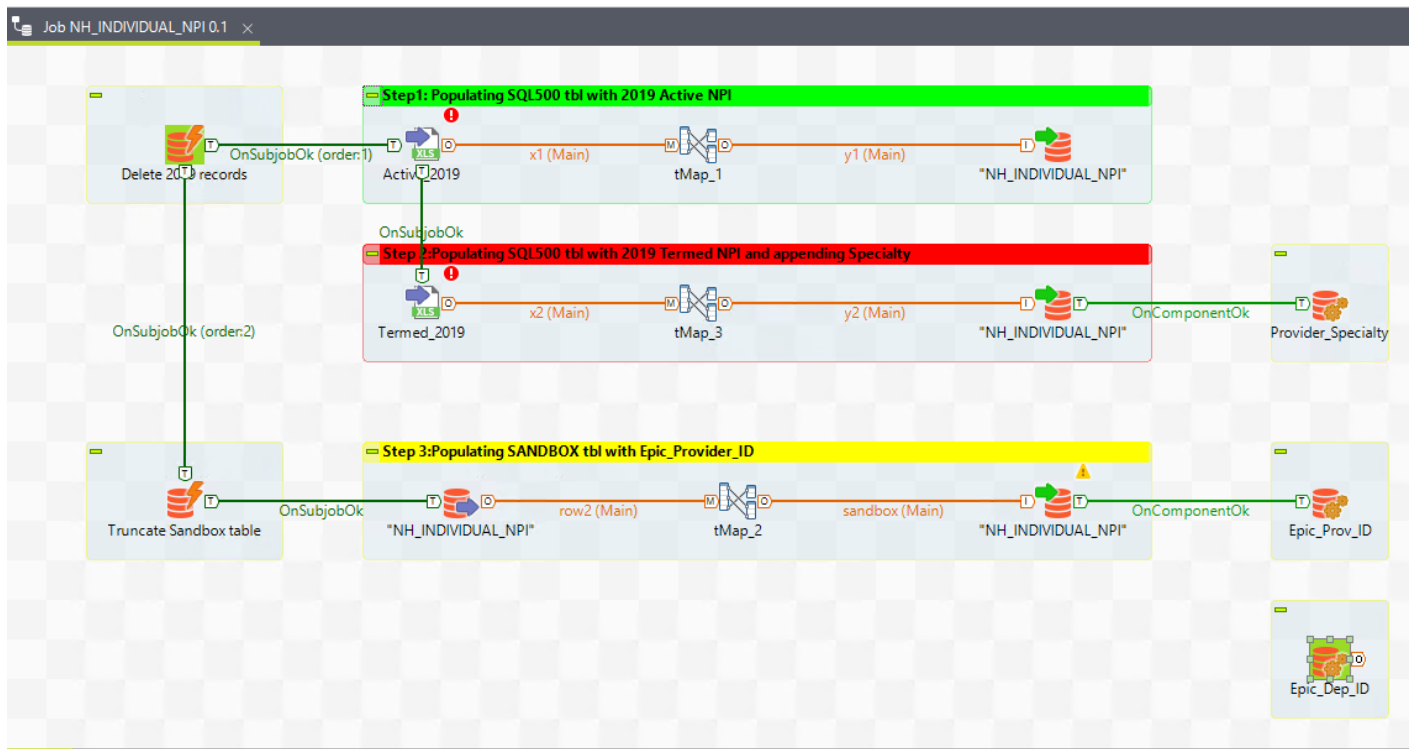
1.6. The raw spreadsheet for Physicians does not include Department ID mapped to a Physicians NPI. We have Group NPI and their respective Department IDs in Groups Spreadsheet which are then mapped to Physicians NPIs using following Stored Procedure in SANDBOX:

```
CREATE PROCEDURE MDM.SP_Load_EpicDepartmentID_Individual_NPI
AS

BEGIN
UPDATE MDM.NH_INDIVIDUAL_NPI
SET Epic_Department_ID = x.Epic_Department_ID
FROM
(
SELECT Group_NPI, EPIC_Department_ID, Group_Name from MDM.NH_GROUP_NPI
) x
WHERE (MDM.NH_INDIVIDUAL_NPI.Group_Name = x.Group_Name) and
(MDM.NH_INDIVIDUAL_NPI.Group_NPI = x.Group_NPI)
END
```

Step 1.6 should be perfomed only after successful update of Group_NPI table

Talend Job:

2. Novant Clinic (Group) NPIs
   2.1. Data for Medical Groups termed in 2016-2018 is loaded once
   2.2. Data for Q1 of 2019 (both Active & Termed) and onwards is Updated in accordance with the raw excel files received every month (See the table for source) using an ETL job
   2.3. Active and Termed NPIs are differentiated by 'Termination_Date' field
      - Termination_Date = NULL for Active NPIs
   2.4. Specialty information (missing in raw files) is added to the table structure using a stored procedure written in nhazvbsqlt01 which is as follows:

```
CREATE  PROCEDURE [dbo].[SP_Load_Spec_Group_NPI]
AS

BEGIN

UPDATE [MDM].[dbo].NH GROUP NPI
SET [MDM].[dbo].NH_GROUP_NPI.Taxonomy_Code = x.Taxonomy_Code,
    [MDM].[dbo].NH GROUP NPI.Taxonomy Name = x.Taxonomy_Name,
    [MDM].[dbo].NH_GROUP_NPI.Taxonomy_Classification =
x.Taxonomy_Classfication,
    [MDM].[dbo].NH GROUP NPI.Specialty Name = x.Specialty Name,
    [MDM].[dbo].NH_GROUP_NPI.Modified_Specialty = x.Modified_Specialty

From
(
```

```sql
SELECT a.[NPI]
      ,a.[Healthcare_Provider_Taxonomy_Code_1] as Taxonomy_Code
      ,b.TAXONOMY_NAME as Taxonomy_Name
      ,b.TAXONOMY_CLASSIFICATION as Taxonomy_Classfication
      ,b.SPECIALTY_NAME as Specialty_Name
      ,b.MODIFIED_SPECIALTY as Modified_Specialty
FROM [MDM].[dbo].[NPPES_PROVIDER] a
LEFT JOIN [dbo].[NUCC_TAXONOMY_CODES] b on
(a.Healthcare_Provider_Taxonomy_Code_1 = b.TAXONOMY_CODE)
LEFT JOIN [dbo].NH_GROUP_NPI c on (a.NPI = c.Group_NPI)
WHERE a.[NPI] = c.Group_NPI
) x

WHERE [MDM].[dbo].NH_GROUP_NPI.Group_NPI = x.NPI
END
```

2.5. Epic Provider ID is also added to this data from CLARITY_SER_2 with help of another stored procedure in MDM schema under SANDBOX Database as follows:

```sql
CREATE PROCEDURE [MDM].[SP_Load_EpicProvID_Group_NPI]
AS

BEGIN
UPDATE SANDBOX.MDM.NH_GROUP_NPI

SET SANDBOX.MDM.NH_GROUP_NPI.Epic_Prov_ID = x.PROV_ID

FROM
(
SELECT a.Group_NPI
      ,b.PROV_ID
FROM SANDBOX.MDM.NH_GROUP_NPI a
LEFT JOIN CLARITY.dbo.CLARITY_SER_2 b on (a.Group_NPI = b.NPI)
WHERE a.Group_NPI = b.NPI
) x

WHERE SANDBOX.MDM.NH_GROUP_NPI.Group_NPI = x.Group_NPI

END
```
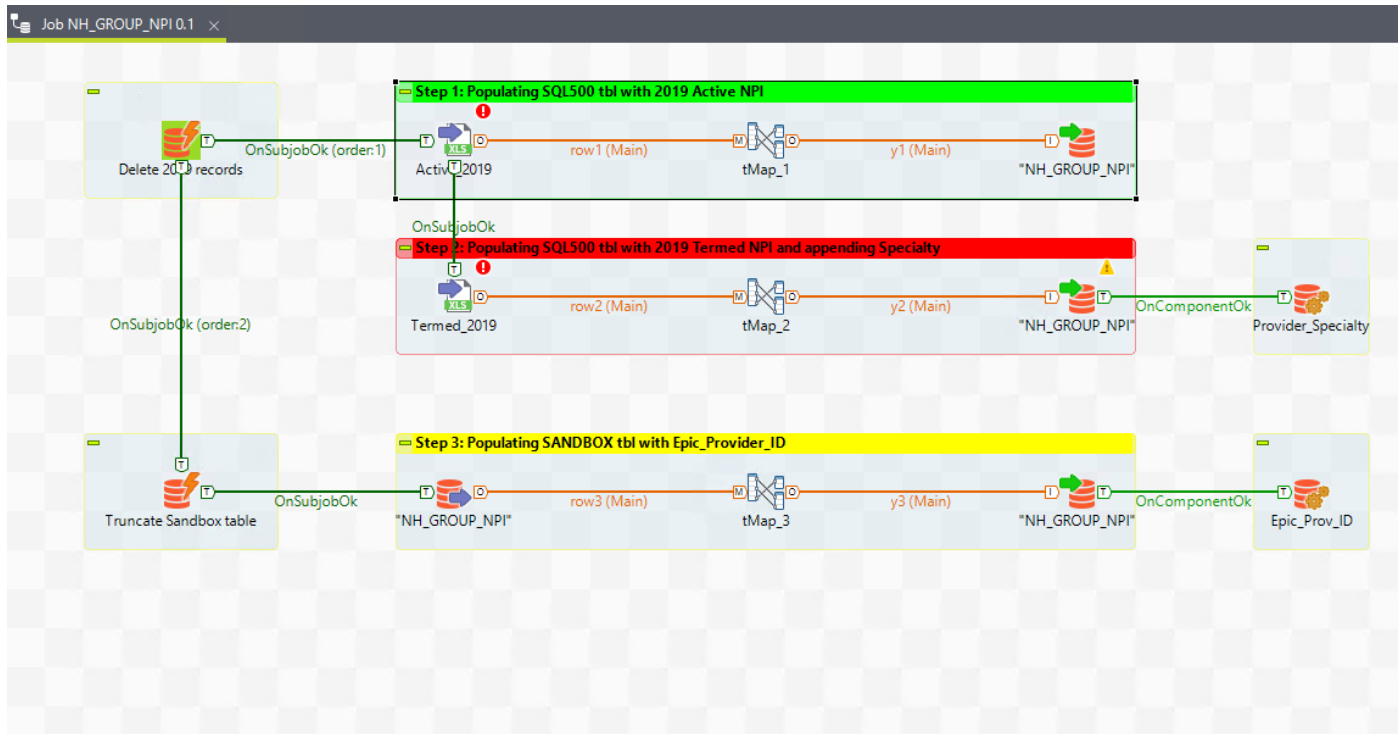
Talend Job:

3. Consolidated Active NPI List
   1. This table reflects whether an Active Novant NPI is also part of a contracted provider group (For e.g. Axia, CIN, Choice Health etc)
   2. It needs to be UPDATEd whenever there is an UPDATE propagated in any of the Provider tables
   3. A Stored Procedure to UPDATE this table is created in SANDBOX as follows:

```
CREATE PROCEDURE [MDM].[SP_Load_Consolidated_NPI_List]
AS
--Truncating table for an UPDATE--

TRUNCATE TABLE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]

-- INSERTing DISTINCT NPI from all the provider tables--

INSERT INTO [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST] (NPI)
SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
WHERE Termination_Date is null
UNION
SELECT DISTINCT npi from MDM.NH_FACILITY_PROVIDER
UNION
SELECT DISTINCT Group NPI from MDM.NH_GROUP_NPI
WHERE Termination_Date is null
UNION
SELECT DISTINCT npi from MDM.AXIA_PROVIDER
UNION
SELECT DISTINCT npi from MDM.CIN_PROVIDER
UNION
SELECT DISTINCT npi from MDM.CHOICEHEALTH_PROVIDER
```

```sql
UNION
SELECT DISTINCT npi from MDM.ACO_PROVIDER
WHERE ACOID = 'A3504'
UNION
SELECT DISTINCT npi from MDM.ACO_PROVIDER
WHERE ACOID = 'A3507'
UNION
SELECT DISTINCT npi from MDM.NH_HOME_HEALTH_PROVIDER
UNION
SELECT DISTINCT npi from MDM.LABCORP_PROVIDER
UNION
SELECT DISTINCT npi from MDM.HOSP_BASED_PROVIDER
UNION
SELECT DISTINCT npi from MDM.NH_SNF_PROVIDER;

--Flag valid Active NPIs as 1--

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET ACO_NC = '1'
WHERE npi in
(
    SELECT DISTINCT NPI from MDM.ACO_PROVIDER
    WHERE ACOID = 'A3504'
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET ACO_VA = '1'
WHERE npi in
(
    SELECT DISTINCT NPI from MDM.ACO_PROVIDER
    WHERE ACOID = 'A3507'
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Home_Health = '1'
WHERE npi in
(
    SELECT DISTINCT NPI from MDM.NH_HOME_HEALTH_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET SNF = '1'
WHERE npi in
(
    SELECT DISTINCT NPI from MDM.NH_SNF_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Axia = '1'
WHERE npi in
(
    SELECT DISTINCT NPI from MDM.AXIA_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET ChoiceHealth = '1'
WHERE npi in
(
    SELECT DISTINCT NPI from MDM.CHOICEHEALTH_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET CIN = '1'
```

```sql
WHERE npi in
(
  SELECT DISTINCT NPI from MDM.CIN_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Novant_Facility_Provider = '1'
WHERE npi in
(
  SELECT DISTINCT NPI from MDM.NH_FACILITY_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Novant Individual_Provider = '1'
WHERE npi in
(
  SELECT DISTINCT Provider NPI from MDM.NH_INDIVIDUAL_NPI
  WHERE Termination_Date is null
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Novant Medical_Group_Provider = '1'
WHERE npi in
(
  SELECT DISTINCT Group NPI from MDM.NH_GROUP_NPI
  WHERE Termination_Date is null
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Hospital_Based = '1'
WHERE npi in
(
  SELECT DISTINCT NPI from MDM.HOSP_BASED_PROVIDER
);

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET LabCorp = '1'
WHERE npi in
(
  SELECT DISTINCT NPI from MDM.LABCORP_PROVIDER
);

--Flag nulls as 0--

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Novant_Individual_Provider = '0'
WHERE Novant_Individual_Provider is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Novant_Facility_Provider = '0'
WHERE Novant_Facility_Provider is null;

UPDATE [MDM].[CONSOLIDATED ACTIVE NPI LIST]
SET Novant_Medical_Group_Provider = '0'
WHERE Novant_Medical_Group_Provider is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Axia = '0'
WHERE Axia is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET CIN = '0'
WHERE CIN is null;
```

```sql
UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET ChoiceHealth = '0'
WHERE ChoiceHealth is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET ACO_NC = '0'
WHERE ACO_NC is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET ACO_VA = '0'
WHERE ACO_VA is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Home_Health = '0'
WHERE Home_Health is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET LabCorp = '0'
WHERE LabCorp is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET Hospital_Based = '0'
WHERE Hospital_Based is null;

UPDATE [MDM].[CONSOLIDATED_ACTIVE_NPI_LIST]
SET SNF = '0'
WHERE SNF is null;
```

4. Provider Historical Lookup
    1. This table can be used to do a quick check whether a Novant NPI is Active or Termed between years (2016-2019)
    2. Given a situation where an NPI could be active in 2016 and then in 2019, it will be reflected as termed in 2017 and 2018
    3. A Stored Procedure to populate this table in SANDBOX is written as follows:

```sql
CREATE PROCEDURE [MDM].[SP_Load_NH_Provider_Historical_Lookup]
AS
---Truncating table to take in new NPIs (UPDATEd every month)
Truncate table MDM.NH_Provider_historical_Lookup;

---Inserting unique NPIs
INSERT INTO MDM.NH_Provider_Historical_Lookup (NPI)
SELECT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
UNION
SELECT Group_NPI from MDM.NH_GROUP_NPI
UNION
SELECT NPI from MDM.NH_FACILITY_PROVIDER;

---Flagging NH Physicians NPIs
UPDATE MDM.NH_Provider_Historical_Lookup
SET Individual = '1'
WHERE NPI in
(
  SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
);

---Flagging NH Medical Group NPIs
```

```sql
UPDATE MDM.NH_Provider_Historical_Lookup
SET Clinic = '1'
WHERE NPI in
(
  SELECT DISTINCT Group_NPI from MDM.NH_GROUP_NPI
);

---Flagging NH Facility NPIs
UPDATE MDM.NH_Provider_Historical_Lookup
SET Facility = '1'
WHERE NPI in
(
  SELECT DISTINCT NPI from MDM.NH_FACILITY_PROVIDER
);

---Flagging Active Physician/Clinic/Facility NPIs
UPDATE MDM.NH_Provider_Historical_Lookup
SET Active = '1'
WHERE NPI in
(
  SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
  WHERE Termination_Date is null
);
UPDATE MDM.NH_Provider_Historical_Lookup
SET Active = '1'
WHERE NPI in
(
  SELECT DISTINCT Group_NPI from MDM.NH_GROUP_NPI
  WHERE Termination_Date is null
);
UPDATE MDM.NH_Provider_Historical_Lookup
SET Active = '1'
WHERE NPI in
(
  SELECT DISTINCT NPI from MDM.NH_FACILITY_PROVIDER
);

---Flagging Physician NPIs termed in between 2016-2019
UPDATE MDM.NH_Provider_Historical_Lookup
SET Termed_2016 = '1'
WHERE NPI in
(
  SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2016'
);
UPDATE MDM.NH_Provider_Historical_Lookup
SET Termed_2017 = '1'
WHERE NPI in
(
  SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2017'
);
UPDATE MDM.NH_Provider_Historical_Lookup
SET Termed_2018 = '1'
WHERE NPI in
(
  SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2018'
);
UPDATE MDM.NH_Provider_Historical_Lookup
SET Termed_2019 = '1'
WHERE NPI in
(
```

```sql
  SELECT DISTINCT Provider_NPI from MDM.NH_INDIVIDUAL_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2019'
);

------Flagging Clinic NPIs termed in between 2016-2019
UPDATE MDM.NH_Provider_Historical_Lookup
SET Termed_2016 = '1'
WHERE NPI in
(
  SELECT DISTINCT Group_NPI from MDM.NH_GROUP_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2016'
);
UPDATE MDM.NH_Provider_Historical_Lookup
SET Termed 2017 = '1'
WHERE NPI in
(
  SELECT DISTINCT Group NPI from MDM.NH GROUP NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2017'
);
UPDATE MDM.NH Provider_Historical_Lookup
SET Termed_2018 = '1'
WHERE NPI in
(
  SELECT DISTINCT Group_NPI from MDM.NH_GROUP_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2018'
);
UPDATE MDM.NH Provider_Historical_Lookup
SET Termed_2019 = '1'
WHERE NPI in
(
  SELECT DISTINCT Group_NPI from MDM.NH_GROUP_NPI
  WHERE DATEPART(YEAR, Termination_Date) = '2019'
);

---Flagging every nulls AS 0
UPDATE NH_Provider_Historical_Lookup
SET Active = '0'
WHERE Active is null;

UPDATE NH_Provider_Historical_Lookup
SET Individual = '0'
WHERE Individual is null;

UPDATE NH_Provider_Historical_Lookup
SET Clinic = '0'
WHERE Clinic is null;

UPDATE NH_Provider_Historical_Lookup
SET Facility = '0'
WHERE Facility is null;

UPDATE NH_Provider_Historical_Lookup
SET Termed 2016 = '0'
WHERE Termed_2016 is null;

UPDATE NH Provider Historical_Lookup
SET Termed_2017 = '0'
WHERE Termed_2017 is null;

UPDATE NH_Provider_Historical_Lookup
SET Termed 2018 = '0'
WHERE Termed_2018 is null;
```

```sql
UPDATE NH_Provider_Historical_Lookup
SET Termed_2019 = '0'
WHERE Termed_2019 is null;
```