**Queries for Analysis**

-- 1.- ***Which diagnoses have seen more than one patient come back?***

*(we consider diagnoses in which at least two patients have come back)*

*select a1.DIAGNOSIS, count(distinct(a1.SUBJECT\_ID)) as UNIQ\_SUBJ\_COUNT, count(a1.HADM\_ID) as UNIQ\_VISIT\_COUNT*

*from ADMISSIONS a1*

*where SUBJECT\_ID = (*

*select a2.SUBJECT\_ID*

*from ADMISSIONS a2*

*where a1.DIAGNOSIS = a2.DIAGNOSIS*

*and a1.SUBJECT\_ID = a2.SUBJECT\_ID*

*group by a2.DIAGNOSIS, a2.SUBJECT\_ID*

*having count(HADM\_ID) >= 2*

*)*

*and a1.DIAGNOSIS <> 'NEWBORN'*

*group by a1.DIAGNOSIS*

*having UNIQ\_SUBJ\_COUNT >= 2*

*order by count(distinct(a1.SUBJECT\_ID)) desc;*

-- 2. **The Number of patients by gender with Heart Failure Conditions?**

*SELECT gender,DIAGNOSIS, COUNT(\*) AS 'Count of Patients'*

*FROM patients JOIN admissions USING(SUBJECT\_ID)*

*WHERE DIAGNOSIS like '%Heart Failure%'*

*GROUP BY gender;*

-- 3. **Retrieves count of Heart Failure Cases in order by month and year**

*SELECT*

*YEAR(adm.ADMITTIME) AS ADMIT\_YEAR,*

*MONTH(adm.ADMITTIME) AS ADMIT\_MONTH,*

*CONCAT(MONTH(adm.ADMITTIME),'-',YEAR(adm.ADMITTIME)) AS DT,*

*COUNT(\*) AS ADMIT\_COUNT*

*FROM*

*ADMISSIONS adm, ICUSTAYS icu*

*WHERE*

*adm.SUBJECT\_ID = icu.SUBJECT\_ID*

*AND adm.HADM\_ID = icu.HADM\_ID*

*AND adm.DIAGNOSIS LIKE ‘%HEART%FAILURE%’’*

*GROUP BY ADMIT\_YEAR ASC, ADMIT\_MONTH ASC, DT ASC;*

**-- 4. -*The highest no.of subjects identified for diagnosis for each ethnicity***

*Select S2.ETHNICITY,S2.DIAGNOSIS,S2.S\_COUNT from*

*(Select ETHNICITY,MAX(S\_COUNT) as MAXCOUNT from*

*(Select ETHNICITY,DIAGNOSIS,COUNT(\*) as S\_COUNT*

*From ADMISSIONS*

*Group by ETHNICITY,DIAGNOSIS*

*Having DIAGNOSIS<>'NEWBORN')S1*

*Group by ETHNICITY*

*)M*

*join*

*(Select ETHNICITY,DIAGNOSIS,COUNT(\*) as S\_COUNT*

*From ADMISSIONS*

*Group by ETHNICITY,DIAGNOSIS*

*Having DIAGNOSIS<>'NEWBORN')S2*

*On (S2.ETHNICITY=M.ETHNICITY AND S2.S\_COUNT=M.MAXCOUNT)*

*Order by 1,2;*

***--5* A. #Retrieves all observations made on patient who all diagnosed with heart failure**

*select I.SUBJECT\_ID as 'SUBJECT ID', I.HADM\_ID as 'H.ADM ID', I.ICUSTAY\_ID as*

*'ICUSTAY ID',DI.ICD9\_CODE as 'ICD9 CODE',DI.SEQ\_NUM as 'ORDER OF*

*OBS',DID.LONG\_TITLE as 'OBSERVATION',GENDER as 'GENDER',*

*AGE\_GROUP*

*from ICUSTAYS I join PATIENTS P on I.SUBJECT\_ID=P.SUBJECT\_ID*

*join AAA\_AGE AG on I.SUBJECT\_ID=AG.SUBJECT\_ID*

*join DIAGNOSES\_ICD DI on*

*DI.SUBJECT\_ID=I.SUBJECT\_ID and DI.HADM\_ID=I.HADM\_ID*

*join D\_ICD\_DIAGNOSES DID on DID.ICD9\_CODE=DI.ICD9\_CODE*

*join ADMISSIONS A on DI.SUBJECT\_ID=A.SUBJECT\_ID and*

*DI.HADM\_ID=A.HADM\_ID and A.DIAGNOSIS LIKE '%HEART%FAILURE%';*

***--5*  B. #Top 15 frequent observations for heart failure patients in ICU with %male and %female**

*(select ICD9\_CODE as 'INTL.DISEASE CODE',LONG\_TITLE as 'NAME OF THE OBSERVATION',CNT as 'NO.OF SUBJECTS OBSERVED',MALECNT,FEMALECNT,ROUND((MALECNT/CNT\*100),2) as '%MALE',ROUND((FEMALECNT/CNT\*100),2) as '%FEMALE'*

*from*

*(select DID.ICD9\_CODE,DID.LONG\_TITLE,COUNT(\*) as CNT,*

*sum(case*

*When GENDER='M'*

*THEN 1 ELSE 0*

*end) as MALECNT,*

*sum(case*

*When GENDER='F'*

*THEN 1 ELSE 0*

*end) as FEMALECNT*

*from ICUSTAYS I*

*join DIAGNOSES\_ICD DI on DI.SUBJECT\_ID=I.SUBJECT\_ID and*

*DI.HADM\_ID=I.HADM\_ID*

*join PATIENTS P on DI.SUBJECT\_ID=P.SUBJECT\_ID*

*join D\_ICD\_DIAGNOSES DID on DID.ICD9\_CODE=DI.ICD9\_CODE*

*join ADMISSIONS A on DI.SUBJECT\_ID=A.SUBJECT\_ID and*

*DI.HADM\_ID=A.HADM\_ID*

*and A.DIAGNOSIS LIKE '%HEART%FAILURE%'*

*group by DID.LONG\_TITLE)ICUOBS*

*order by CNT DESC*

*limit 15);*

***--6.* -*A*#Retrieves all procedures made on patient who all diagnosed with heart failure**

*select I.SUBJECT\_ID as 'SUBJECT ID', I.HADM\_ID as 'H.ADM ID', I.ICUSTAY\_ID as*

*'ICUSTAY ID',PI.ICD9\_CODE as 'ICD9 CODE',PI.SEQ\_NUM as 'ORDER OF*

*PROCEDURE',DIP.LONG\_TITLE as 'PROCEDURE TITLE',GENDER AS 'GENDER',*

*AGE\_GROUP*

*from ICUSTAYS I*

*join PATIENTS P on I.SUBJECT\_ID=P.SUBJECT\_ID*

*join AAA\_AGE AG on I.SUBJECT\_ID=AG.SUBJECT\_ID*

*join PROCEDURES\_ICD PI on PI.SUBJECT\_ID=I.SUBJECT\_ID and*

*PI.HADM\_ID=I.HADM\_ID*

*join D\_ICD\_PROCEDURES DIP on DIP.ICD9\_CODE=PI.ICD9\_CODE*

*join ADMISSIONS A on PI.SUBJECT\_ID=A.SUBJECT\_ID and PI.HADM\_ID=A.HADM\_ID*

*and A.DIAGNOSIS LIKE '%HEART%FAILURE%';*

***--6 B*#Top 15 frequent procedures for heart failure patients in ICU with %male and %female**

*(select ICD9\_CODE as 'INTL.PROCEDURE CODE',LONG\_TITLE as 'NAME OF THE*

*PROCEDURE,CNT as 'NO.OF SUBJECTS,*

*MALECNT,FEMALECNT,ROUND((MALECNT/CNT\*100),2) as '%MALE',*

*ROUND((FEMALECNT/CNT\*100),2) as '%FEMALE'*

*from*

*(select DIP.ICD9\_CODE,DID.LONG\_TITLE,COUNT(\*) as CNT,*

*sum(case*

*When GENDER='M'*

*THEN 1 ELSE 0*

*end) as MALECNT,*

*sum(case*

*When GENDER='F'*

*THEN 1 ELSE 0*

*end) as FEMALECNT*

*from ICUSTAYS I*

*join PROCEDURES\_ICD PI on PI.SUBJECT\_ID=I.SUBJECT\_ID and*

*PI.HADM\_ID=I.HADM\_ID*

*join PATIENTS P on PI.SUBJECT\_ID=P.SUBJECT\_ID*

*join D\_ICD\_PROCEDURES DIP on DIP.ICD9\_CODE=PI.ICD9\_CODE*

*join ADMISSIONS A on PI.SUBJECT\_ID=A.SUBJECT\_ID and*

*PI.HADM\_ID=A.HADM\_ID*

*and A.DIAGNOSIS LIKE '%HEART%FAILURE%'*

*group by DID.LONG\_TITLE)ICUPROC*

*order by CNT DESC*

*limit 15);*

**--7.A#No.of Heart failure Patients who died in ICU in each year**

*select DATE\_FORMAT*(DOD, *'%Y’*) *as* 'YEAR',CNT *as* 'NO.OF DEATHS'

*from*

(*select*  I.SUBJECT\_ID,I.HADM\_ID,I.ICUSTAY\_ID,GENDER,FIRST\_CAREUNIT,INTIME,OUTTIME,DOD,COUNT(\*) *as* CNT

*from* ICUSTAYS I JOIN PATIENTS P *on* I.SUBJECT\_ID=P.SUBJECT\_ID

*join* ADMISSIONS A *on* I.SUBJECT\_ID=A.SUBJECT\_ID *and* I.HADM\_ID=A.HADM\_ID

*and A.DIAGNOSIS LIKE '%HEART%FAILURE%'*

*where DATE\_FORMAT(OUTTIME, '%Y-%m-%d') = DATE\_FORMAT(DOD, '%Y-%m-%d')*

*group by DATE\_FORMAT*(DOD,  *'%Y*'))*ICUDEATH*

*order by* YEAR;

**--7B#Mortality rate for patients in ICU, male or female**

*select CNT as 'NO. OF HEART FAILURE PATIENTS DIED WHILE IN ICU',MALECNT as*

*'MALE',FEMALECNT as 'FEMALE',ROUND((MALECNT/CNT\*100),2) as*

*'%MALE',ROUND((FEMALECNT/CNT\*100),2) as '%FEMALE'*

*from*

*(select COUNT(\*) as CNT,*

*sum(case*

*When GENDER='M'*

*THEN 1 ELSE 0*

*end) as MALECNT,*

*sum(case*

*When GENDER='F'*

*THEN 1 ELSE 0*

*end) as FEMALECNT*

*from ICUSTAYS I*

*join PATIENTS P on I.SUBJECT\_ID=P.SUBJECT\_ID*

*join ADMISSIONS A on I.SUBJECT\_ID=A.SUBJECT\_ID and*

*I.HADM\_ID=A.HADM\_ID*

*and A.DIAGNOSIS LIKE '%HEART%FAILURE%'*

*where DATE\_FORMAT(OUTTIME, '%Y-%m-%d') = DATE\_FORMAT(DOD,*

*'%Y-%m-%d')*

*)ICUDEATH;*

**--8. -- To check if there are any neonates(<1 year old) with heart failure in ICU**

*select I.SUBJECT\_ID as 'SUBJECT ID', I.HADM\_ID as 'H.ADM ID', I.ICUSTAY\_ID as*

*'ICUSTAY ID',P.GENDER as 'GENDER',AGE\_GROUP*

*from ICUSTAYS I join PATIENTS P on I.SUBJECT\_ID=P.SUBJECT\_ID*

*join AAA\_AGE AG on I.SUBJECT\_ID=AG.SUBJECT\_ID*

*join ADMISSIONS A on I.SUBJECT\_ID=A.SUBJECT\_ID and*

*I.HADM\_ID=A.HADM\_ID*

*and A.DIAGNOSIS LIKE '%HEART%FAILURE%'*

*and AGE\_GROUP='NEONATE';*

-- **9. - retrieves count and description of caregivers for Congestive Heart Failure ICU patients**

*SELECT DISTINCT*

*DESCRIPTION, COUNT(\*) AS COUNT\_CG*

*FROM*

*ADMISSIONS adm, ICUSTAYS icu, CHARTEVENTS chtev, CAREGIVERS care*

*WHERE*

*adm.SUBJECT\_ID = icu.SUBJECT\_ID*

*AND adm.HADM\_ID = icu.HADM\_ID*

*AND icu.ICUSTAY\_ID = chtev.ICUSTAY\_ID*

*AND chtev.CGID = care.CGID*

*AND adm.DIAGNOSIS LIKE ‘%HEART%FAILURE%’*

*AND DESCRIPTION IS NOT NULL*

*GROUP BY DESCRIPTION*

*ORDER BY COUNT\_CG DESC;*

*-- 10 JOSE - Pulling all HADM\_ID that were not present in the ICUSTAY table*

*SELECT \**

*FROM*

*ADMISSIONS adm*

*LEFT OUTER JOIN*

*ICUSTAYS icu*

*ON (adm.HADM\_ID = icu.HADM\_ID AND adm.SUBJECT\_ID = icu.SUBJECT\_ID)*

*WHERE*

*icu.ICUSTAY\_ID IS NULL*

*AND adm.DIAGNOSIS LIKE ‘%HEART%FAILURE%’;*

***-- 11.* - What were the number of returning ICU patients with Heart Failure?**

*-- query gives a high level of how many unique patients returned at least once and the total number of visits*

*select a1.DIAGNOSIS, count(distinct(a1.SUBJECT\_ID)) as UNIQ\_SUBJ\_COUNT, count(a1.HADM\_ID) as UNIQ\_VISIT\_COUNT*

*from ADMISSIONS a1*

*join (*

*select SUBJECT\_ID, DIAGNOSIS*

*from ADMISSIONS*

*group by DIAGNOSIS, SUBJECT\_ID*

*having count(HADM\_ID) >= 2*

*) as a2*

*where a1.SUBJECT\_ID = a2.SUBJECT\_ID*

*and a1.DIAGNOSIS = a2.DIAGNOSIS*

*and a1.DIAGNOSIS LIKE ‘%HEART%FAILURE%’*

*group by a1.DIAGNOSIS*

*having UNIQ\_SUBJ\_COUNT >= 2*

*order by count(distinct(a1.SUBJECT\_ID)) desc;*

*-- shows how many subjects for each number of times someone came back (distribution)*

*SELECT SUBJECT\_ID, COUNT(HADM\_ID) AS UNIQ\_VISIT\_COUNT*

*FROM ADMISSIONS*

*WHERE DIAGNOSIS LIKE '%HEART%FAILURE%’*

*GROUP BY SUBJECT\_ID*

*HAVING UNIQ\_VISIT\_COUNT >= 2;*

***-- 12. - returns the age groups that the subjects are in***

*CREATE TABLE AAA\_FIRST\_ADMISSION\_TIME AS*

*SELECT*

*p.subject\_id, p.dob, p.gender, MIN(a.admittime) AS first\_admittime,MIN( ROUND( (cast(admittime as date) - cast(dob as date)) / 365.242,2) ) AS first\_admit\_age*

*FROM patients p*

*INNER JOIN admissions a*

*ON p.subject\_id = a.subject\_id*

*GROUP BY p.subject\_id, p.dob, p.gender*

*ORDER BY p.subject\_id;*

*CREATE TABLE AAA\_AGE AS*

*SELECT*

*subject\_id, dob, gender, first\_admittime, first\_admit\_age*

*CASE*

*-- all ages > 89 in the database were replaced with 300*

*-- we check using > 100 as a conservative threshold to ensure we capture all these patients*

*WHEN first\_admit\_age > 100 THEN '>89'*

*WHEN first\_admit\_age >= 14 THEN 'adult'*

*WHEN first\_admit\_age <= 1 THEN 'neonate'*

*ELSE 'middle'*

*END AS age\_group*

*FROM AAA\_FIRST\_ADMISSION\_TIME;*

*-- selecting*

*select age\_group, gender, count(subject\_id) as NumberOfPatients*

*from AAA\_AGE*

*group by age\_group, gender;*

*--****13.* - returns the top drugs prescribed for heart failure patients in ICU**

-- A. to find all drugs given to each subject

*SELECT I.SUBJECT\_ID AS 'SUBJECT ID', I.HADM\_ID AS 'H.ADM ID', I.ICUSTAY\_ID AS 'ICUSTAY ID',P.GENDER AS 'GENDER',AGE\_GROUP,DRUG,STARTDATE,ENDDATE*

*FROM ICUSTAYS I JOIN PATIENTS P ON I.SUBJECT\_ID=P.SUBJECT\_ID*

*JOIN AAA\_AGE AG ON I.SUBJECT\_ID=AG.SUBJECT\_ID*

*JOIN PRESCRIPTIONS PR ON PR.SUBJECT\_ID=I.SUBJECT\_ID AND*

*PR.HADM\_ID=I.HADM\_ID*

*JOIN ADMISSIONS A ON PR.SUBJECT\_ID=A.SUBJECT\_ID AND*

*PR.HADM\_ID=A.HADM\_ID*

*AND A.DIAGNOSIS LIKE '%HEART%FAILURE%';*

-- B. Top 15 drugs given to heart failure patients in ICU

*(SELECT DRUG AS 'DRUG NAME',CNT AS 'NO.OF SUBJECTS PRESCRIBED'*

*FROM*

*(SELECT DRUG,COUNT(\*) AS CNT*

*FROM ICUSTAYS I*

*JOIN PATIENTS P ON I.SUBJECT\_ID=P.SUBJECT\_ID*

*JOIN PRESCRIPTIONS PR ON PR.SUBJECT\_ID=I.SUBJECT\_ID AND*

*PR.HADM\_ID=I.HADM\_ID*

*JOIN ADMISSIONS A ON I.SUBJECT\_ID=A.SUBJECT\_ID AND*

*I.HADM\_ID=A.HADM\_ID*

*AND A.DIAGNOSIS* ***LIKE '%HEART%FAILURE%'***

*GROUP BY DRUG)ICUDRUG*

*ORDER BY CNT DESC*

*LIMIT 15);*

--14.1 **What is the gender distribution for patients with Heart Failure?**

SELECT DISTINCT(DIAGNOSIS),gender, COUNT(\*) AS 'Count of Patients'

FROM patients JOIN admissions USING(SUBJECT\_ID)

WHERE diagnosis like '%Heart Failure%'

GROUP BY gender;

**-- 14.2 Total count of patients with Congestive Heart Failure by gender?**

SELECT gender, DIAGNOSIS, COUNT(\*) AS 'Count of Patients'

FROM patients JOIN admissions USING(SUBJECT\_ID)

WHERE DIAGNOSIS = 'Congestive Heart Failure'

GROUP BY gender;

**---14. 3 Obtain the number of number of days spent at the hospital (Admissions and ICU) and sort it out by age group?**

On average, males were more likely to be admitted to the hospital for longer periods than females.

SELECT SUBJECT\_ID, diagnosis, age\_group, gender, datediff( DISCHTIME,ADMITTIME) AS 'Duration\_of\_Stay', datediff(OUTTIME,INTIME) as Duration\_in\_ICU

FROM aaa\_age

JOIN admissions USING(SUBJECT\_ID)

JOIN icustays USING(SUBJECT\_ID)

WHERE diagnosis = 'Congestive Heart Failure'

ORDER BY Duration\_in\_ICU DESC;

**-- Ref 14.4 What is the ethnicity distribution for ICU patients with Heart Failure?**

SELECT COUNT(ETHNICITY),Ethnicity, Diagnosis, Description, datediff(DISCHTIME,ADMITTIME) AS Duration\_of\_Stay, datediff(OUTTIME,INTIME) as Duration\_in\_ICU

FROM admissions

JOIN icustays USING(Subject\_id)

JOIN drgcodes USING(Subject\_id)

WHERE diagnosis = 'Congestive Heart Failure'

GROUP BY ethnicity

ORDER BY ethnicity;

**#-14.5 General overview of ICD Diagnosis, ICD\_Procedures and description of illness of patients admitted into ICU.**

SELECT DC.SUBJECT\_ID,A.HADM\_ID, D.ICD9\_CODE, D.short\_title as ICD\_Diagnosis, P.short\_title as ICD\_Procedure, Diagnosis, Description,Insurance,

datediff( DISCHTIME,ADMITTIME) AS Duration\_of\_Admission, datediff(OUTTIME,INTIME) as Duration\_in\_ICU, COUNT(INSURANCE)

FROM d\_icd\_diagnoses D JOIN d\_icd\_procedures P ON D.ICD9\_CODE = P.ICD9\_CODE

JOIN drgcodes DC ON P.ICD9\_CODE = DC.DRG\_CODE

JOIN admissions A ON DC.HADM\_ID = A.HADM\_ID

JOIN icustays IC ON A.HADM\_ID = IC.HADM\_ID

WHERE DIAGNOSIS = 'Congestive Heart Failure' AND datediff(OUTTIME,INTIME) <> 0

GROUP BY DESCRIPTION

ORDER BY datediff( DISCHTIME,ADMITTIME) DESC;

**#-14.6 Description of ICD Diagnosis, ICD\_Procedures, drugs prescription for diagnoses of patients admitted into ICU.**

SELECT DC.SUBJECT\_ID,A.HADM\_ID, D.ICD9\_CODE, D.short\_title as ICD\_Diagnosis, P.short\_title as ICD\_Procedure, Diagnosis, Description,Insurance,

datediff(OUTTIME,INTIME) as Duration\_in\_ICU, COUNT(INSURANCE)

FROM d\_icd\_diagnoses D JOIN d\_icd\_procedures P ON D.ICD9\_CODE = P.ICD9\_CODE

JOIN drgcodes DC ON P.ICD9\_CODE = DC.DRG\_CODE

JOIN admissions A ON DC.HADM\_ID = A.HADM\_ID

JOIN icustays IC ON A.HADM\_ID = IC.HADM\_ID

WHERE DIAGNOSIS = 'Congestive Heart Failure' AND datediff(OUTTIME,INTIME) >= 1

GROUP BY DESCRIPTION

ORDER BY Duration\_in\_ICU DESC;