

EXCLUSION CRITERIA

```
WITH Total_ICU_Patients AS (  
    SELECT DISTINCT subject_id  
    FROM `physionet-data.mimiciv_icu.icustays`  
)  
  
ranked_icustays AS (  
    SELECT  
        subject_id,  
        los,  
        ROW_NUMBER() OVER (PARTITION BY subject_id ORDER BY intime) AS row_num  
    FROM physionet-data.mimiciv_icu.icustays  
)  
  
First_ICU_Stay AS (  
    SELECT  
        subject_id,  
        COUNT(*) AS num_admissions,  
        AVG(los) AS avg_los  
    FROM ranked_icustays  
    WHERE row_num = 1  
    GROUP BY subject_id  
)  
  
-- Patients with avg ICU stay > 2 days  
Filtered_ICU_Stay_Greater_Los AS (  
    SELECT  
        s.subject_id  
    FROM First_ICU_Stay AS s  
    WHERE s.avg_los > 2  
)  
  
-- Patients aged 18 or older  
Filtered_ICU_Stay_Aged_18 AS (  
    SELECT
```

```

        s.subject_id
    FROM Filtered_ICU_Stay_Greater_Los AS s
    INNER JOIN `physionet-data.mimiciv_hosp.patients` AS p ON s.subject_id =
p.subject_id
    WHERE p.anchor_age >= 18
),

-- Patients aged 18 or older with creatinine labels
Patients_Aged_18_With_Creatinine AS (
    SELECT DISTINCT
        f.subject_id
    FROM Filtered_ICU_Stay_Aged_18 AS f
    INNER JOIN `physionet-data.mimiciv_hosp.labevents` AS le ON f.subject_id =
le.subject_id
    WHERE le.itemid = 50912
    AND le.valuenum IS NOT NULL
),

MortalityDataPostICU AS (
    SELECT
        icu.subject_id,
        CASE
            WHEN pt.dod IS NOT NULL AND DATE(pt.dod) > DATE(icu.outtime) THEN 1
            ELSE 0
        END AS mortality_post_icu
    FROM `physionet-data.mimiciv_icu.icustays` AS icu
    INNER JOIN `physionet-data.mimiciv_hosp.patients` AS pt ON icu.subject_id =
pt.subject_id
    WHERE icu.subject_id IN (SELECT subject_id FROM Patients_Aged_18_With_Creatinine)
    GROUP BY icu.subject_id, pt.dod, icu.outtime
)
SELECT
    (SELECT COUNT(*) FROM Total_ICU_Patients) AS total_icu_patients,
    (SELECT COUNT(*) FROM First_ICU_Stay) AS patients_single_stay,
    (SELECT COUNT(*) FROM Filtered_ICU_Stay_Greater_Los) AS
patients_greater_than_1_day,

```

```
(SELECT COUNT(*) FROM Filtered_ICU_Stay_Aged_18) AS patients_aged_18_or_older,  
(SELECT COUNT(*) FROM Patients_Aged_18_With_Creatinine) AS  
patients_aged_18_with_creatinine,  
SUM(mortality_post_icu) AS patients_aged_18_with_creatinine_posticudeath  
FROM MortalityDataPostICU  
;
```

Mortality and AKI Criteria Table

Digital Phenotype AKI

```
WITH ranked_icustays AS (  
    SELECT  
        subject_id,  
        los,  
        ROW_NUMBER() OVER (PARTITION BY subject_id ORDER BY intime) AS row_num  
    FROM physionet-data.mimiciv_icu.icustays  
)  
  
First_ICU_Stay AS (  
    SELECT  
        subject_id,  
        COUNT(*) AS num_admissions,  
        AVG(los) AS avg_los  
    FROM ranked_icustays  
    WHERE row_num = 1  
    GROUP BY subject_id  
)  
  
Filtered_ICU_Stay AS (  
    SELECT  
        subject_id  
    FROM First_ICU_Stay  
    WHERE avg_los > 2  
)  
  
Creatinine_Values AS (  
    SELECT  
        le.subject_id,  
        le.charttime,  
        le.valuenum AS creatinine_value,  
        LAG(le.valuenum) OVER (PARTITION BY le.subject_id ORDER BY le.charttime) AS  
        previous_creatinine_value,
```

```

        LAG(le.charttime) OVER (PARTITION BY le.subject_id ORDER BY le.charttime) AS
previous_charttime
    FROM `physionet-data.mimiciv_hosp.labevents` AS le
    WHERE le.itemid = 50912
    AND le.valuenum IS NOT NULL
)

SELECT
    cv.subject_id,
    COUNT(DISTINCT CASE WHEN cv.creatinine_value - cv.previous_creatinine_value >= 0.3
        AND TIMESTAMP_DIFF(cv.charttime, cv.previous_charttime,
HOUR) <= 48
            THEN cv.subject_id END) AS AKI_criterion1_patients,
    COUNT(DISTINCT CASE WHEN cv.creatinine_value >= 1.5 * cv.previous_creatinine_value
        AND TIMESTAMP_DIFF(cv.charttime, cv.previous_charttime,
HOUR) <= 168 -- 7 DAYS
            THEN cv.subject_id END) AS AKI_criterion2_patients,
    COUNT(DISTINCT CASE WHEN pt.dod IS NOT NULL AND DATE(pt.dod) <= DATE(icu.outtime)
THEN cv.subject_id END) AS deceased_patients

FROM Creatinine_Values AS cv
INNER JOIN `physionet-data.mimiciv_hosp.patients` as pt ON cv.subject_id =
pt.subject_id
INNER JOIN Filtered_ICU_Stay AS fis ON cv.subject_id = fis.subject_id
INNER JOIN `physionet-data.mimiciv_icu.icustays` AS icu ON cv.subject_id =
icu.subject_id -- Added this line to join with icustays
GROUP BY cv.subject_id, pt.dod, icu.outtime
HAVING AKI_criterion1_patients = 1
OR AKI_criterion2_patients = 1;

```

FINAL

```
WITH ranked_icustays AS (  
    SELECT  
        subject_id,  
        los,  
        ROW_NUMBER() OVER (PARTITION BY subject_id ORDER BY intime) AS row_num  
    FROM physionet-data.mimiciv-icu.icustays  
)
```

```
First_ICU_Stay AS (  
    SELECT  
        subject_id,  
        COUNT(*) AS num_admissions,  
        AVG(los) AS avg_los  
    FROM ranked_icustays  
    WHERE row_num = 1  
    GROUP BY subject_id  
)
```

```
Filtered_ICU_Stay AS (  
    SELECT  
        subject_id  
    FROM First_ICU_Stay  
    WHERE avg_los > 2  
)
```

```
Creatinine_Values AS (  
    SELECT  
        le.subject_id,  
        le.charttime,  
        le.valuenum AS creatinine_value,
```

```

        LAG(le.valuenum) OVER (PARTITION BY le.subject_id ORDER BY le.charttime) AS
previous_creatinine_value,
        LAG(le.charttime) OVER (PARTITION BY le.subject_id ORDER BY le.charttime) AS
previous_charttime
    FROM `physionet-data.mimiciv_hosp.labevents` AS le
    WHERE le.itemid = 50912
    AND le.valuenum IS NOT NULL
),

```

```

AKI_Criteria AS (
SELECT
    cv.subject_id,
    COUNT(DISTINCT CASE WHEN cv.creatinine_value - cv.previous_creatinine_value >= 0.3
        AND TIMESTAMP_DIFF(cv.charttime, cv.previous_charttime,
HOUR) <= 48
        THEN cv.subject_id END) AS AKI_criterion1_patients,
    COUNT(DISTINCT CASE WHEN cv.creatinine_value >= 1.5 * cv.previous_creatinine_value
        AND TIMESTAMP_DIFF(cv.charttime, cv.previous_charttime,
HOUR) <= 168 -- 7 DAYS
        THEN cv.subject_id END) AS AKI_criterion2_patients,
    COUNT(DISTINCT CASE WHEN pt.dod IS NOT NULL AND DATE(pt.dod) <= DATE(icu.outtime)
THEN cv.subject_id END) AS deceased_patients

```

```

FROM Creatinine_Values AS cv
INNER JOIN `physionet-data.mimiciv_hosp.patients` as pt ON cv.subject_id =
pt.subject_id
INNER JOIN Filtered_ICU_Stay AS fis ON cv.subject_id = fis.subject_id
INNER JOIN `physionet-data.mimiciv_icu.icustays` AS icu ON cv.subject_id =
icu.subject_id -- Added this line to join with icustays
GROUP BY cv.subject_id, pt.dod, icu.outtime
HAVING AKI_criterion1_patients = 1
OR AKI_criterion2_patients = 1
),

```

```

Demographics AS (
SELECT

```

```

    p.subject_id,
    p.gender,
    p.anchor_age
FROM
    `physionet-data.mimiciv_hosp.patients` AS p
WHERE
    p.subject_id IN (select subject_id from AKI_Criteria)
),

```

```

Comorbidity AS (
SELECT
    p.subject_id,
    IFNULL(c.diabetes, 0) AS diabetes,
    IFNULL(c.hypertension, 0) AS hypertension,
    IFNULL(c.chronic_kidney_disease, 0) AS chronic_kidney_disease,
    IFNULL(c.sepsis, 0) AS sepsis,
    IFNULL(c.cardiovascular_disease, 0) AS cardiovascular_disease
FROM
    `physionet-data.mimiciv_hosp.patients` AS p
LEFT JOIN
    ((
SELECT subject_id,
    MAX(CASE WHEN icd_code LIKE '250%' OR icd_code LIKE 'E1[0-4]%' THEN 1 ELSE 0
END) AS diabetes,
    MAX(CASE WHEN icd_code LIKE '401%' OR icd_code LIKE 'I10%' THEN 1 ELSE 0 END)
AS hypertension,
    MAX(CASE WHEN icd_code LIKE '585%' OR icd_code LIKE 'N18%' THEN 1 ELSE 0 END)
AS chronic_kidney_disease,
    MAX(CASE WHEN icd_code LIKE 'A40%' OR icd_code LIKE 'A41%' THEN 1 ELSE 0 END)
AS sepsis,
    MAX(CASE WHEN icd_code IN('42731', '42732') OR icd_code LIKE '410%' OR icd_code LIKE
'428%' THEN 1 ELSE 0 END) AS cardiovascular_disease

FROM `physionet-data.mimiciv_hosp.diagnoses_icd`
WHERE subject_id IN (select subject_id from AKI_Criteria)
GROUP BY subject_id)) AS c
ON
    p.subject_id = c.subject_id

```


WHERE

p.subject_id IN (select subject_id from AKI_Criteria)),

RankedLabFeatures AS (

SELECT

le.subject_id AS subject_id,

p.gender AS gender,

p.anchor_age AS age,

p.dod AS dod,

l.itemid AS lab_itemid,

l.label AS lab_label,

le.valuenum AS lab_val,

le.valueuom AS lab_unit,

ROW_NUMBER() OVER(PARTITION BY le.subject_id, l.label ORDER BY le.itemid) AS

rn

FROM

`physionet-data.mimiciv_hosp.labevents` AS le

JOIN

`physionet-data.mimiciv_hosp.d_labitems` AS l

ON l.itemid = le.itemid

JOIN

`physionet-data.mimiciv_hosp.patients` AS p

ON le.subject_id = p.subject_id

WHERE le.itemid in (50811, 50833, 50862, 50912, 51237, 50983, 51006, 51070, 51274,
52407, 52022, 51006, 226566, 227519, 50902, 51275, 50868, 51300, 50885, 50884, 50971,
50821, 50803, 51265) AND

le.subject_id IN (select subject_id from AKI_Criteria)

),

LabFeatures AS (

SELECT

subject_id,

gender,

```

age,
lab_label AS label,
lab_val AS value,
dod
FROM
RankedLabFeatures
WHERE
rn = 1),

```

```

RankedClinicalFeatures AS (
SELECT
ce.subject_id AS subject_id,
p.gender AS gender,
p.anchor_age AS age,
p.dod AS dod,
c.itemid AS clinic_itemid,
c.label AS clinic_label,
ce.valuenum AS clinic_val,
ce.valueuom AS clinic_unit,
ROW_NUMBER() OVER(PARTITION BY ce.subject_id, c.label ORDER BY ce.itemid) AS
rn
FROM
`physionet-data.mimiciv_icu.chartevents` AS ce
JOIN
`physionet-data.mimiciv_icu.d_items` AS c
ON c.itemid = ce.itemid
JOIN
`physionet-data.mimiciv_hosp.patients` AS p
ON ce.subject_id = p.subject_id
WHERE ce.itemid IN (220045, 220050, 220051, 220210, 220046, 226763, 224718,
226253, 223762, 3580, 227457, 220052) AND
ce.subject_id IN (select subject_id from AKI_Criteria)
),

```

```

ClinicalFeatures AS (

```

```

SELECT
    subject_id,
    gender,
    age,
    clinic_label as label,
    clinic_val as value,
    dod
FROM
    RankedClinicalFeatures
WHERE
    rn = 1),

AllFeatures AS (
select * from LabFeatures
UNION ALL
select * from ClinicalFeatures)

```

```

SELECT c.subject_id,
a.gender, a.age, a.label, a.value,
c.diabetes, c.hypertension, c.chronic_kidney_disease, c.sepsis,
c.cardiovascular_disease,
a.dod
    from Comorbidity c
left join AllFeatures a
on c.subject_id = a.subject_id

```

NEW COLUMNS NEEDED TO CALCULATE SAPS II AND SOFA score

```

SELECT *
FROM labevents
WHERE itemid = 51300; -- Item ID for white blood cell count

```

```

SELECT *

```

```
FROM labevents
WHERE itemid IN (50885, 50884); -- Item IDs for total and direct bilirubin measurements
```

```
SELECT *
FROM labevents
WHERE itemid IN (50971); -- Item ID for serum potassium measurements
```

```
SELECT *
FROM labevents
WHERE itemid IN (50821); -- Item ID for PaO2 measurements
```

```
SELECT *
FROM labevents
WHERE itemid IN (50803); -- Item ID for serum bicarbonate measurements
```

```
SELECT *
FROM labevents
WHERE itemid IN (50983); -- Item ID for serum sodium measurements
```

```
SELECT *
FROM outpotevents
WHERE itemid IN (40055); -- Item ID for urinary output measurements
```

```
SELECT *
FROM chartevents
WHERE itemid IN (184, 223900, 223901)
```

```
SELECT *
FROM labevents
WHERE itemid IN (51265); -- Item ID for platelet count measurements
```

-- Diagnoses related to cardiovascular issues

```
SELECT *
FROM diagnoses_icd
WHERE icd_code LIKE 'I%'; -- This selects diagnoses with ICD-9 codes related to
cardiovascular issues
```

-- Procedures related to cardiovascular issues

```
SELECT *
FROM procedures_icd
WHERE icd_code LIKE '00%'; -- This selects procedures with ICD-9 procedure codes related to
cardiovascular issues
```

```

SELECT p.subject_id, p.hadm_id, p.icustay_id
FROM patients p
JOIN (
    -- Subquery to identify patients with cardiovascular procedures
    SELECT DISTINCT icustay_id
    FROM procedures_icd
    WHERE icd_code LIKE '00%' -- Filter for cardiovascular procedures using appropriate ICD-9
    procedure codes
) cardio_procedures
ON p.icustay_id = cardio_procedures.icustay_id
UNION
SELECT p.subject_id, p.hadm_id, p.icustay_id
FROM patients p
JOIN (
    -- Subquery to identify patients who received specific medications
    SELECT DISTINCT icustay_id
    FROM inputevents_cv
    WHERE itemid IN (
        -- Item IDs for Dopamine, Epinephrine, and Norepinephrine medications
        30050, -- Dopamine
        30119, -- Epinephrine
        30120 -- Norepinephrine
    )
) med_admin
ON p.icustay_id = med_admin.icustay_id;

```