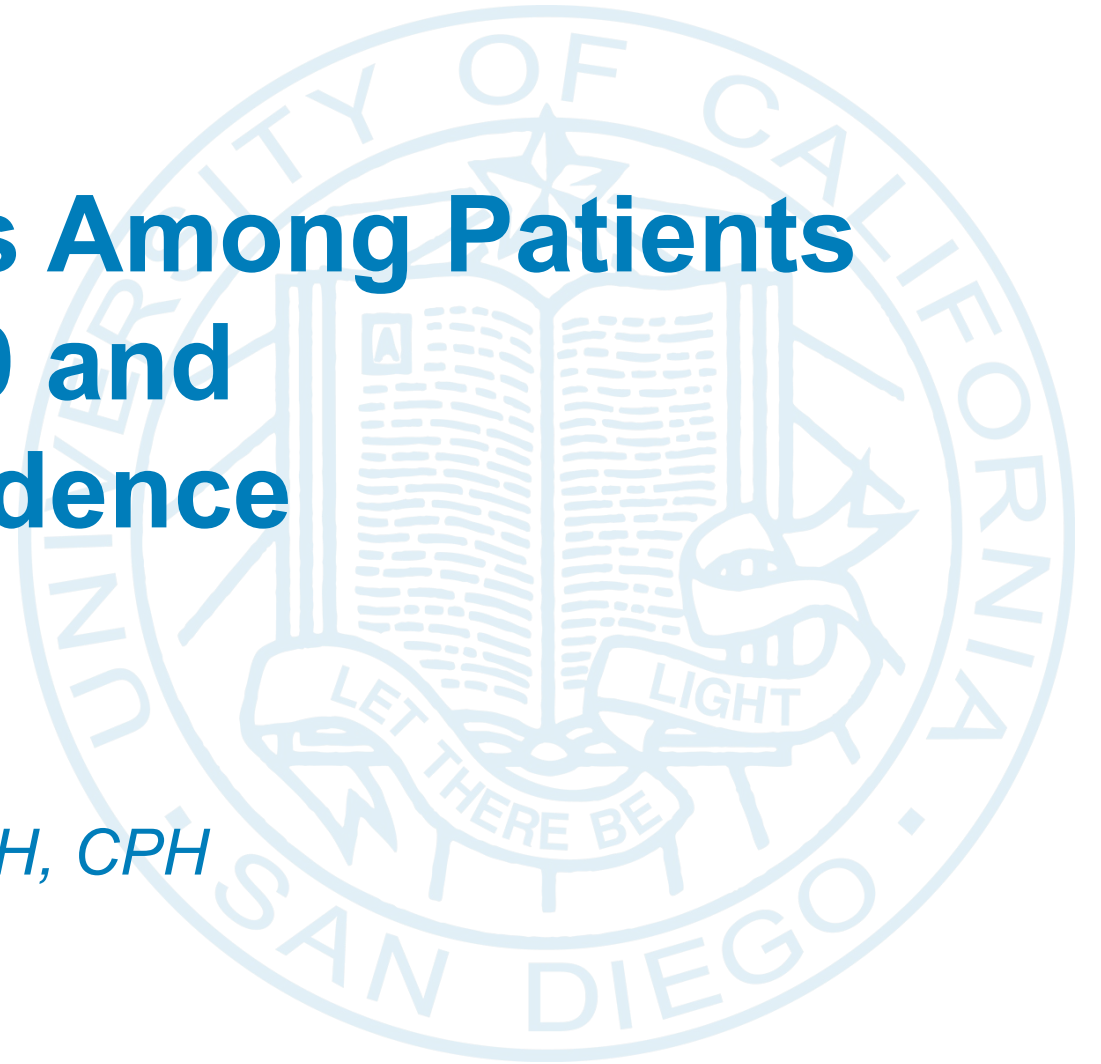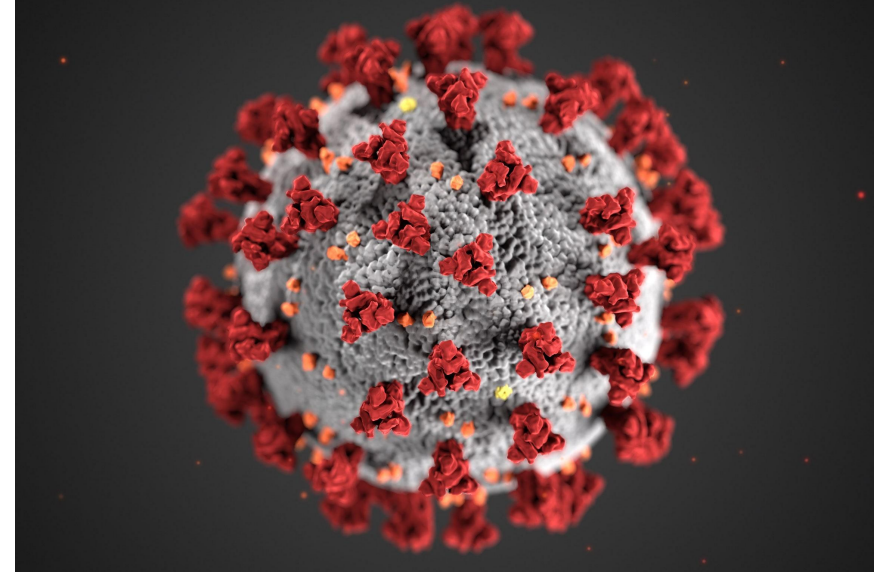# Co-Occurring Conditions Among Patients with Comorbid COVID-19 and Tobacco/Nicotine Dependence
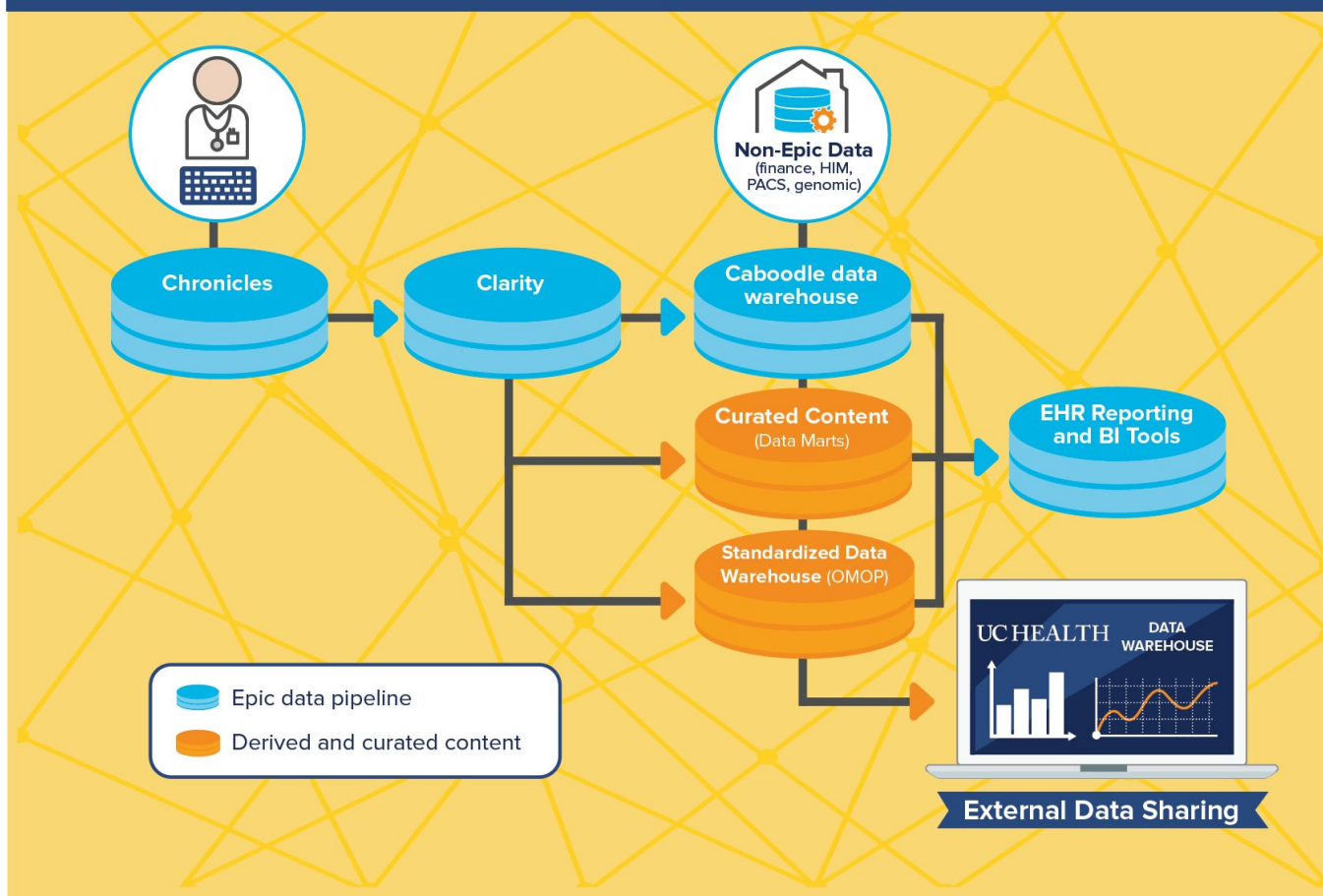
Presented by: Raphael E. Cuomo, PhD, MPH, CPH

Background

- As of late October 2021, there have been approximately 45 million cases of COVID-19 in the United States

- During this same time, about 60 million adults used a tobacco or nicotine product

- **What clinically observable symptoms are more likely to be experienced by individuals with both COVID-19 and tobacco use compared to individuals with COVID-19 alone or tobacco use alone?**

Methods – Data Source

- The origin of data is from interactions between patients and clinicians

- Clinician observations are stored in a database which gets standaredized and de-anonymized in a queryable database

Methods – Data Collection
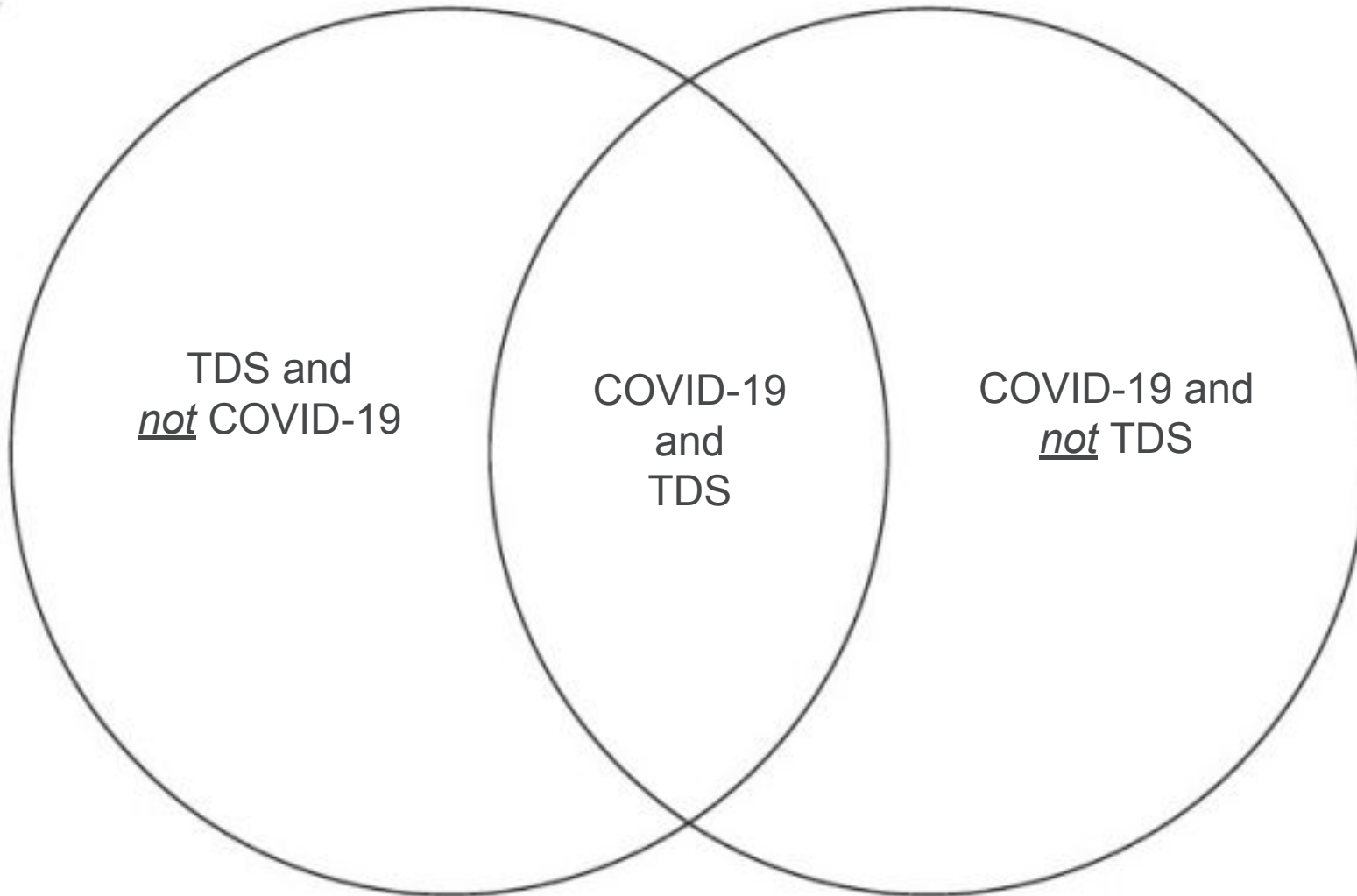
```
WITH table1 AS (
    SELECT    DISTINCT person_id
    FROM      UCCORDS.OMOP5.condition_occurrence
    WHERE     condition_concept_id = 437264 or
              condition_concept_id = 4209423)
SELECT    DISTINCT t1.person_id, condition_concept_id,
              gender_concept_id, race_concept_id,
              ethnicity_concept_id, location_id
FROM      UCCORDS.OMOP5.condition_occurrence t1
JOIN      UCCORDS.OMOP5.person t2 on t1.person_id=t2.person_id
WHERE     t1.person_id IN (SELECT person_id FROM table1)
```

- Data are stored in a database using an internationally standardized set of codes in health data sciences (OMOP CDM)

- Queries were run to count the amount of people with clinical conditions in the following three samples:

  - Patients with tobacco/nicotine dependence syndrome (TDS) and _not_ COVID-19

  - Patients with COVID-19 and _not_ TDS

  - Patients with both COVID-19 and TDS

ID ▼	CODE ▼	NAME ▼	CLASS ▼	CONCEPT ▼	VALIDITY ▼	DOMAIN ▼	VOCAB ▼
437264	89765005	Tobacco dependence syndrome	Clinical Finding	Standard	Valid	Condition	SNOMED

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Methods – Data Analysis

TDS and
not COVID-19

COVID-19
and
TDS

COVID-19 and
not TDS

- We selected the top ten symptoms experienced by individuals with TDS (by proportion)

- These data were joined with the proportion of patients having these symptoms with COVID-19 and with both COVID-19 and tobacco/nicotine dependence

- Proportions were then compared

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Results – Patient Demographics

Covariate	TND & COVID (n=2,193)	TND not COVID (n=25,419)	COVID not TND (n=25,194)
Female	39.06%	40.98%	57.49%
White	72.39%	75.15%	76.13%
Native American	0.61%	0.76%	0.54%
Asian	6.40%	6.30%	11.56%
Black	19.32%	17.06%	10.53%
Native Hawaiian/Pacific Islander	1.29%	0.73%	1.24%
Hispanic	27.63%	15.96%	39.37%

Results – Main Findings

Covariate	TND & COVID (n=2,193)	TND not COVID (n=25,419)	COVID not TND (n=25,194)
Essential hypertension	53.40%	44.43%	34.61%
Abnormal findings on diagnostic imaging of lung	55.72%	30.04%	32.41%
Hyperlipidemia	40.54%	29.21%	28.35%
Chest pain	52.58%	27.68%	28.35%
Chronic pain	39.67%	28.44%	21.27%
Dyspnea	54.26%	27.06%	33.23%
Anxiety disorder	36.48%	27.57%	20.05%
Major depression, single episode	32.79%	24.56%	14.07%
Electrocardiogram abnormal	35.89%	23.82%	17.32%
Cough	50.62%	21.97%	36.72%

Results – Increased Risk for Tobacco/Nicotine Users

Covariate	TND & COVID	TND not COVID	Increased Risk for TND Patients
Cough	50.62%	21.97%	28.64%
Dyspnea	54.26%	27.06%	27.21%
Abnormal findings on diagnostic imaging of lung	55.72%	30.04%	25.69%
Chest pain	52.58%	27.68%	24.90%
Electrocardiogram abnormal	35.89%	23.82%	12.06%
Hyperlipidemia	40.54%	29.21%	11.33%
Chronic pain	39.67%	28.44%	11.23%
Essential hypertension	53.40%	44.43%	8.97%
Anxiety disorder	36.48%	27.57%	8.91%
Major depression, single episode	32.79%	24.56%	8.23%

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Results – Increased Risk for COVID-19 Patients

Covariate	TND & COVID	COVID not TND	Increased Risk for COVID Patients
Chest pain	52.58%	28.35%	24.22%
Abnormal findings on diagnostic imaging of lung	55.72%	32.41%	23.31%
Dyspnea	54.26%	33.23%	21.03%
Essential hypertension	53.40%	34.61%	18.79%
Major depression, single episode	32.79%	14.07%	18.71%
Electrocardiogram abnormal	35.89%	17.32%	18.57%
Chronic pain	39.67%	21.27%	18.40%
Anxiety disorder	36.48%	20.05%	16.43%
Cough	50.62%	36.72%	13.90%
Hyperlipidemia	40.54%	28.35%	12.19%

Discussion

- Patients with both COVID-19 and TDS had higher rates of all comorbidities compared to patients with COVID-19 alone or TDS alone

- In particular, the following three symtoms are much more likely in patients with both COVID-19 and TDS together:

  - Chest pain

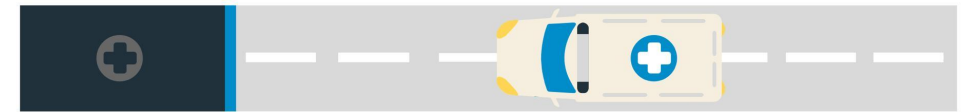 - Dyspnea

  - Abnormal findings on diagnostic imaging of lung

Multiple pure ground-glass opacity (GGO) mainly in right lower lobe of a lung CT scane for a 35-year-old woman with COVID-19*

*Wang et al. (2020). Temporal Changes of CT Findings in 90 Patients with COVID-19 Pneumonia: A Longitudinal Study. *Radiology*.

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Conclusions

- These preliminary findings are consistent with findings showing increased risk for adverse outcomes for smokers who contract COVID-19

- However, results from this study further suggest that patients with both COVID-19 and TDS appear to have unique disease etiologies

- Further studies should examine sub-populations among patients with dual TDS and COVID-19, including mediating/moderating covariates and health disparity factors

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Conflict of Interest
The author declares no conflicts of interest.