

# **EPIDEMIOLOGY OF CHRONIC KIDNEY DISEASE (CKD) PATIENTS FROM EASTERN NORTH CAROLINA (ENC) HOSPITALIZED WITH COVID-19**

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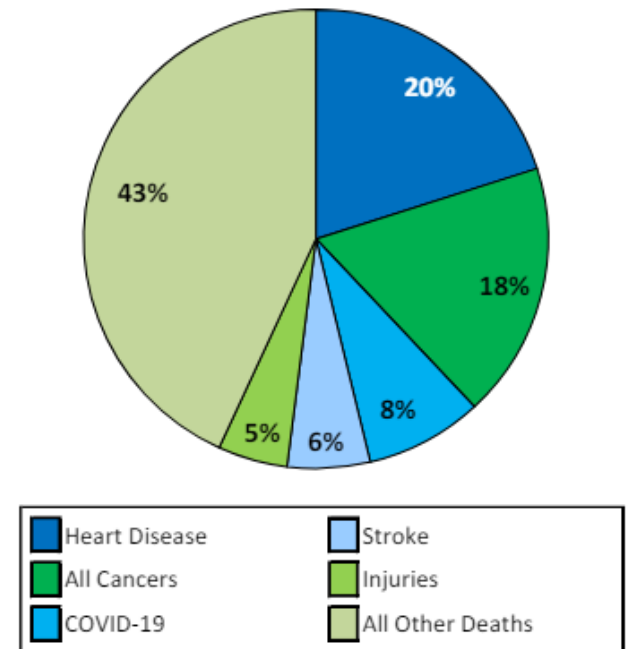


# Disclosures

- None

# Background

- North Carolina's first COVID-19 case was identified on March 2<sup>nd</sup>, 2020 and the first confirmed death occurred on March 12, 2020.
- By the end of 2020, 7,909 COVID-19 deaths had been reported in the state and the virus had become the third leading cause of death for the entire year.



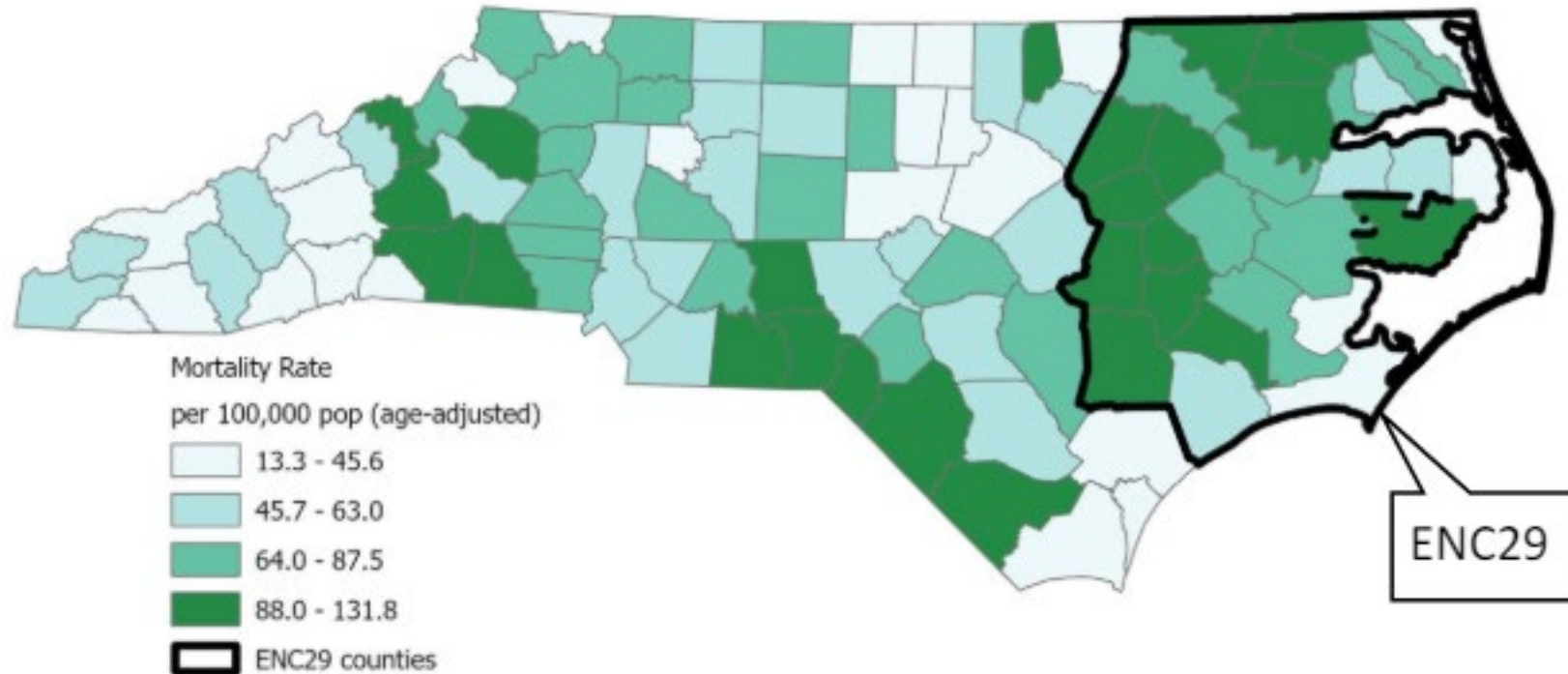
**Figure 1. Distribution of Causes of Death in North Carolina in 2020**

# Demographic Discrepancies

- Nationwide, covid-19 death rates were higher for non-Whites and individuals with chronic health conditions such as diabetes, obesity, and chronic kidney disease
- Age was also a risk factor for severe Covid-19 and death; 83 % of the COVID-19 deaths in NC were in individuals aged 65 and older.

# Eastern North Carolina

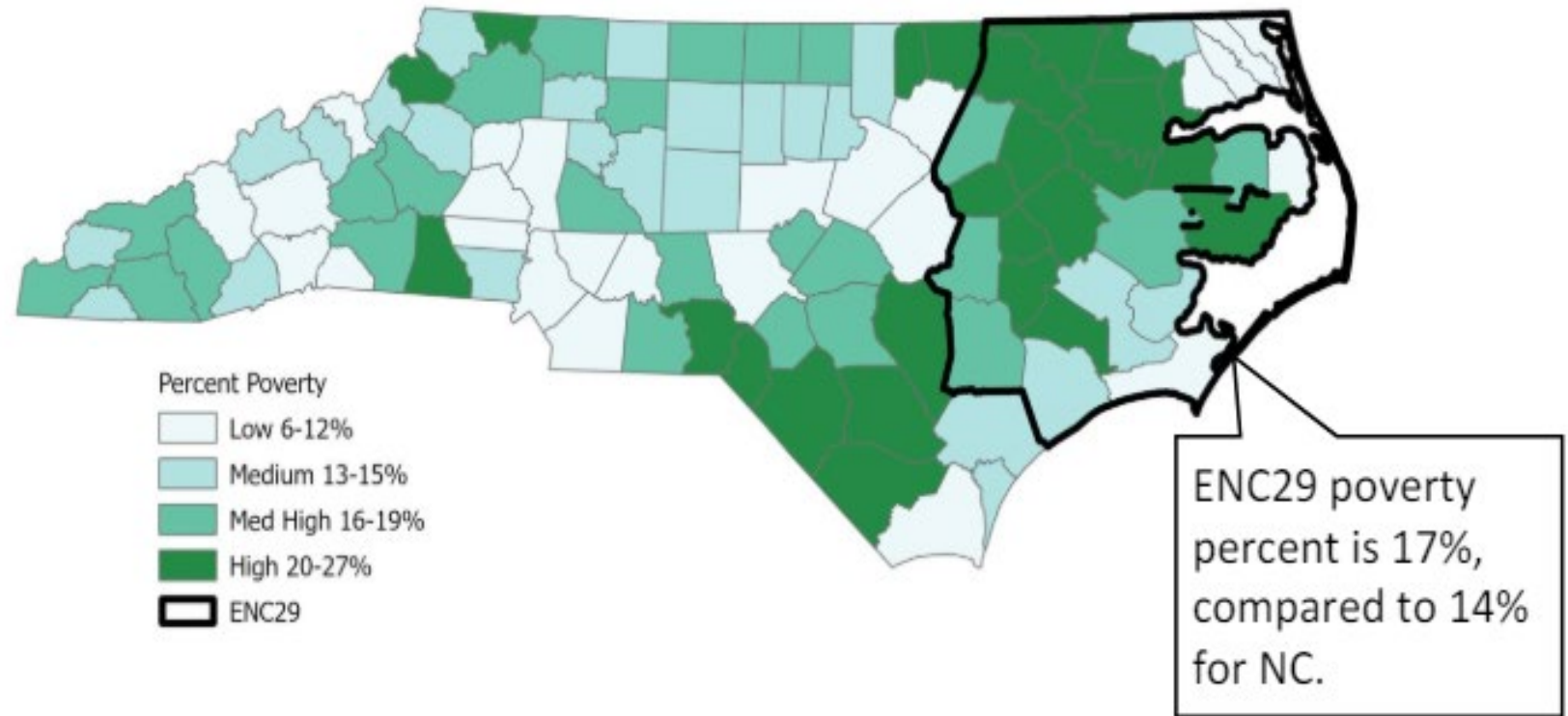
- The region had higher COVID-19 mortality compared to the rest of NC



Source: NC Vital Statistics—Deaths 2020

# More Specifics

- ENC29 is poorer, more rural and less educated than the rest of the state



# Comorbidities & COVID-19

The CDC identified these chronic conditions as risk factors for serious COVID-19:

- 1) Diabetes
- 2) **Kidney Disease**
- 3) Cardiovascular Disease
- 4) Obesity
- 5) COPD

# Comorbidities in ENC29

Figure 7. Prevalence (%) of Chronic Conditions for ENC29 and Rest of NC (2019)

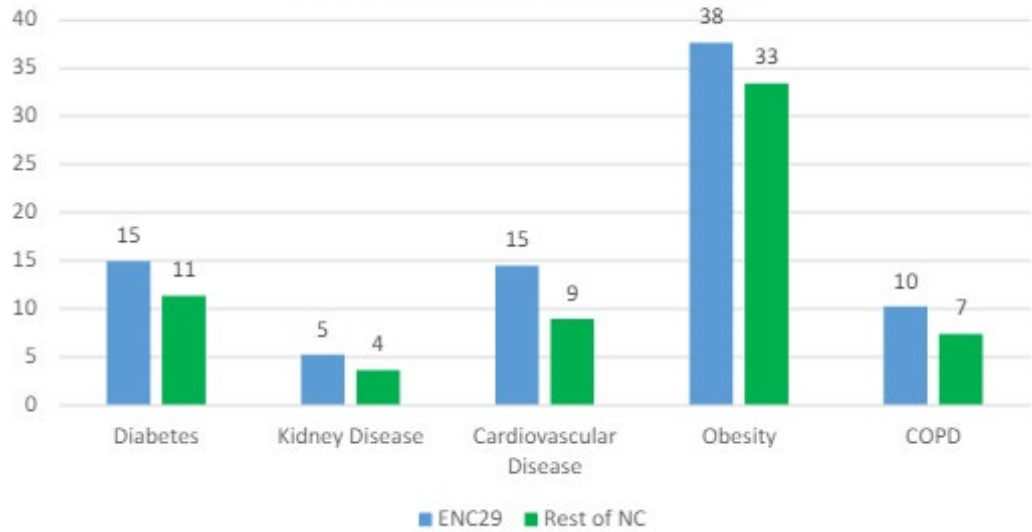
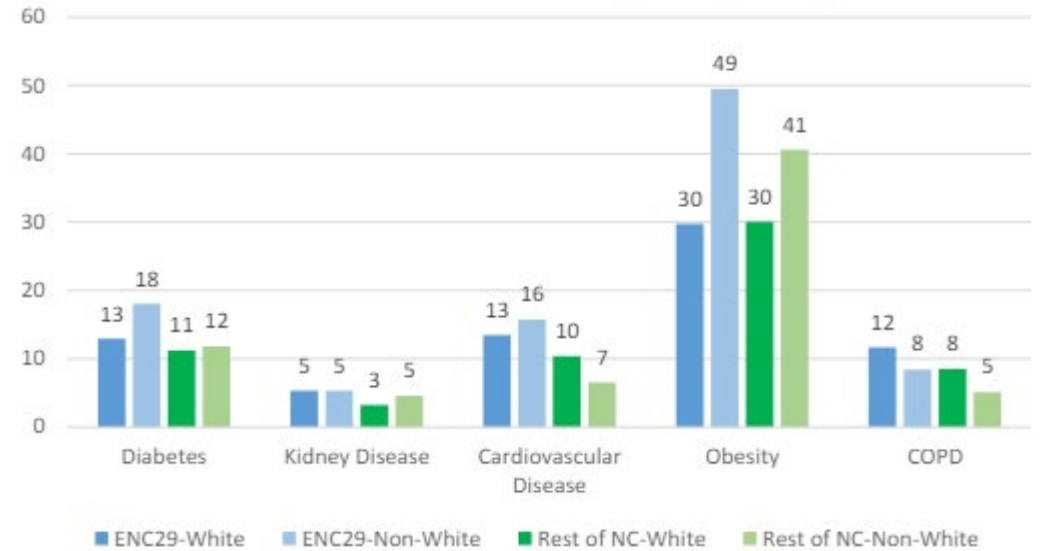


Figure 8. Prevalence (%) of Chronic Conditions for ENC29 and Rest of NC by Race (2019)





# EPIDEMIOLOGY OF CHRONIC KIDNEY DISEASE (CKD) PATIENTS FROM EASTERN NORTH CAROLINA (ENC) HOSPITALIZED WITH COVID-19

## METHODS & COHORT



Retrospective, observational study



9 ECU Health Hospitals



SARS-CoV-2 Positive



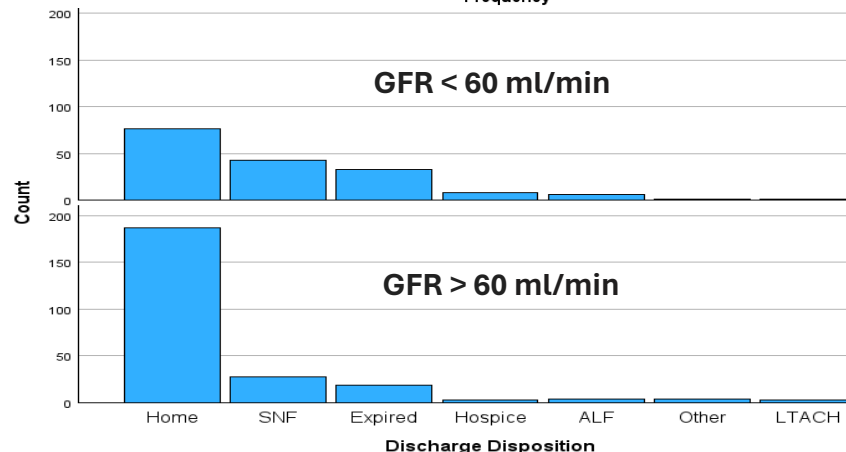
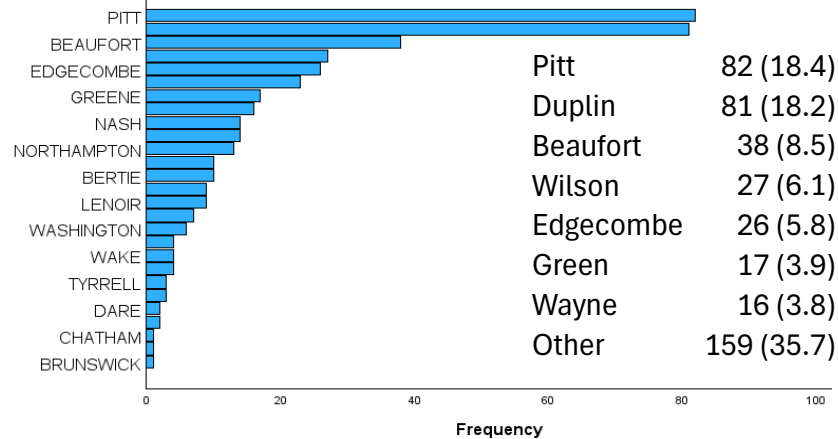
N=446  
Age= 64.5



March-  
October 2020

Subcategorized patients into two cohorts:

- GFR > 60 ml/min/1.73 m<sup>2</sup>
- GFR < 60 ml/min/1.73 m<sup>2</sup>



## RESULTS

GFR < 60 ml/min

- >70 years old
- African-American
- More comorbidities (DM, HTN, CAD)

GFR < 60 ml/min



LOS days  
6 (IQR 3, 9)

D/C home  
89 (48.6%)

Died  
32 (17.5%)

## CONCLUSION

Patients who had a GFR < 60 ml/min/1.73 m<sup>2</sup> had a higher risk of in-hospital death compared to those with GFR > 60 ml/min/1.73 m<sup>2</sup> (p-value <0.001).

**Table 1: Baseline Characteristics of Patients Hospitalized with COVID-19 and the Initial Glomerular Filtration Rate (GFR)**

<b>Demographic Informaton</b>	<b>Overall</b>	<b>GFR &gt; 60 ml/min</b>	<b>GFR &lt; 60 ml/min</b>	<b>p</b>
<b>Total No.</b>	<b>446</b>	<b>263</b>	<b>183</b>	
Age, median (IQR)	65 (48.5, 76)	58 (44, 71)	71 (61, 80)	<0.001
Sex				0.076
Female	197 (44.7)	107 (40.7)	90 (49.2)	
Male	249 (55.8)	156 (59.3)	93 (50.8)	
Race				<0.001
African American	219 (49.1)	108 (41.1)	111 (60.7)	
White	134 (30.0)	76 (28.9)	58 (31.7)	
Hispanic	84 (18.8)	71 (27.0)	13 (7.1)	
Other	9 (2.0)	8 (3.0)	1 (0.5)	
Insurance				<0.001
Medicare	229 (51.9)	99 (37.6)	133 (72.7)	
Special programs	66 (15.0)	60 (22.8)	9 (4.9)	
Blue Shield	55 (12.5)	41 (15.6)	14 (7.7)	
Medicaid	32 (7.3)	19 (7.2)	14 (7.7)	
Self-pay	27 (6.1)	20 (7.6)	7 (3.8)	
Other	32 (7.2)	24 (9.1)	6 (3.2)	

## Table 2: Comorbidities of Patients Hospitalized with COVID-19 and the Initial GFR

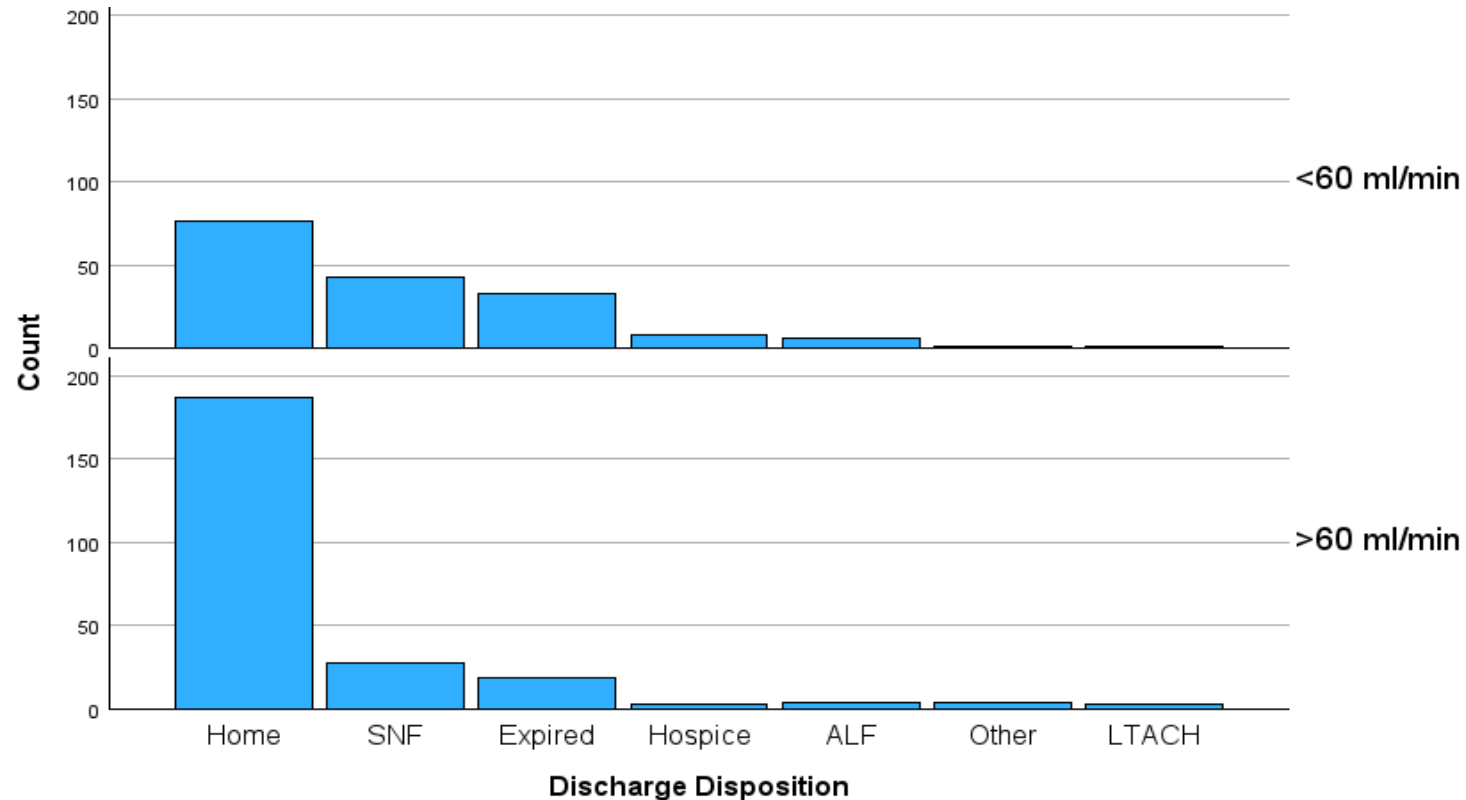
Comorbidities	GFR > 60 ml/min	GFR < 60 ml/min	p
<b>Total No.</b>	<b>263</b>	<b>183</b>	
Cancer (Breast > colon > prostate)	17 (7.2)	10 (5.5)	0.62
Cardiovascular disease			<0.001
Hypertension	148 (56.7)	154 (84.2)	
Coronary artery disease	21 (8.0)	41 (22.4)	
Peripheral vascular disease	9 (3.4)	18 (9.8)	0.005
Chronic respiratory disease	39 (14.8)	27 (14.8)	0.98
Liver disease	3 (1.1)	4 (2.2)	0.39
Metabolic disease			
BMI, median (IQR)	30.4 (24.9, 37.7)	28.8 (24.2, 34.6)	0.042
DM	85 (32.3)	107 (58.5)	<0.001
Smoking Status			<0.001
Current	26 (9.9)	25 (13.7)	
Former	59 (22.4)	69 (37.7)	
Never	127 (48.3)	79 (43.2)	
Chronic Kidney Disease			<0.001
Stage III	0	63 (34.5)	
Stage IV	0	14 (7.7)	
ESRD	0	14 (7.6)	

**Table 3. Presentation Vitals and Laboratory Results of Patients Hospitalized With COVID-19**

<b>Clinical presentation</b>	<b>GFR &gt; 60 ml/min</b>	<b>GFR &lt; 60 ml/min</b>	<b><i>p</i></b>
<b>Total No.</b>	263	183	
<b>Vital signs</b>			0.72
Systolic BP, median (IQR)	133.0 (120.0, 150.0)	126.0 (111.0, 149.0)	
Heart rate, median (IQR)	96.0 (85.0, 109.0)	90.0 (78.0, 104.0)	
Respiratory rate, median (IQR)	20.0 (18.0, 25.0)	20.0 (18.0, 24.0)	
<b>Blood work</b>			0.28
D-dimer, median (IQR)	1000.5 (606.0, 1269.0)	1000.5 (902.0, 1905.0)	
Ferritin, median (IQR)	478.5 (285.0, 636.0)	470.0 (370.0, 1037.0)	
Albumin, median (IQR)	3.6 (3.3, 3.9)	3.5 (3.2, 3.8)	

**Table 4. Discharge Disposition by GFR of Patients Hospitalized With COVID-19**

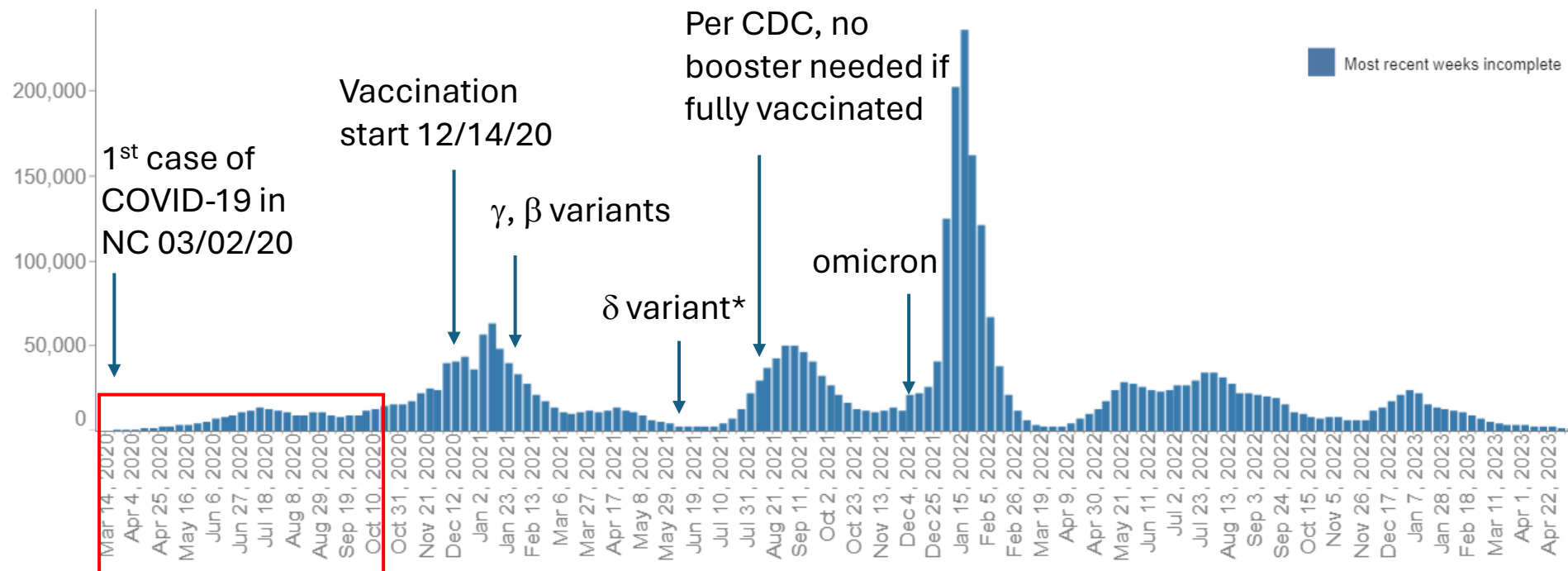
<b>Outcomes</b>	<b>GFR &gt; 60 ml/min</b>	<b>GFR &lt; 60 ml/min</b>	<b><i>p</i></b>
<b>Total No.</b>	263	183	
Admission GFR, median (IQR)	87.5 (74.0, 101.0)	35.0 (22.0, 47.0)	<0.001
Discharge GFR, median (IQR)	99.0 (84.0, 110.0)	53.0 (31.0, 72.0)	<0.001
Length of Stay, median (IQR)	5.0 (3.0, 9.0)	6.0 (3.0, 10.0)	0.39
Deceased	22 (8.4)	32 (17.5)	0.004



# Future Analysis

- Need to determine if a  $GFR < 60 \text{ ml/min/1.73 m}^2$  conveys an additional mortality risk outside the lower socioeconomic status.
- How did vaccination rates affect this data/outcomes?
- Does this data remain true given that most NC cases weren't until 1/2022?

3,501,404 Total Cases in North Carolina



# References

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