

Covid and Diabetes: What We Know Now



Susan Elizabeth Spratt, MD

June 5, 2020





Clinical Characteristics & Risk Factors for Mortality of COVID-19 Patients with Diabetes in Wuhan, China

- 1561 Covid-19 positive patients: 153 (9.8%) had diabetes
- Retrospective study of Covid 19 + patients with diabetes compared to age and sex matched control



Characteristics of Matched Cohort

	Patients without diabetes (<i>n</i> = 153)	Patients with diabetes (<i>n</i> = 153)	<i>P</i> value
Age, years	65.0 (56.0–72.0)	64.0 (56.0–72.0)	0.872
Sex			1.000
Female	78 (51.0)	78 (51.0)	–
Male	75 (49.0)	75 (49.0)	–
Exposure history	31 (20.3)	18 (11.8)	0.043
Smoking	9 (5.9)	7 (4.6)	0.608
Drinking	7 (4.6)	6 (3.9)	0.777
Comorbidities			
* Hypertension	44 (28.8)	87 (56.9)	<0.001
* Cardiovascular disease	17 (11.1)	32 (20.9)	0.019
* Cerebrovascular disease	2 (1.3)	12 (7.8)	0.006
Chronic pulmonary disease	13 (8.5)	8 (5.2)	0.258
Chronic kidney disease	6 (3.9)	6 (3.9)	1.000
Chronic liver disease	4 (2.6)	5 (3.3)	1.000
Malignancy	6 (3.9)	8 (5.2)	0.584



Signs and Symptoms

	Patients without diabetes (<i>n</i> = 153)	Patients with diabetes (<i>n</i> = 153)	<i>P</i> value
Signs and symptoms			
Fever	118 (77.1)	120 (78.4)	0.783
Cough	78 (51.0)	95 (62.1)	0.050
Dyspnea	60 (39.2)	52 (34.0)	0.342
Myalgia	16 (10.5)	22 (14.4)	0.298
Headache	6 (3.9)	3 (2.0)	0.501
Diarrhea	23 (15.0)	18 (11.8)	0.401
Nausea or vomiting	5 (3.3)	8 (5.2)	0.395
Anorexia	82 (53.6)	81 (52.9)	0.909
Fatigue	79 (51.6)	95 (62.1)	0.065



Timing of Symptoms/Signs and CT Findings

	Patients without diabetes (<i>n</i> = 153)	Patients with diabetes (<i>n</i> = 153)	<i>P</i> value
From onset symptom to, days			
Hospital admission	10.0 (7.0–15.0)	11.0 (7.0–18.0)	0.693
Confirmation of SARS-CoV-2	8.0 (5.0–12.0)	8.0 (4.0–14.0)	0.963
Hospital length of stay, days	15.0 (9.0–22.0)	15.0 (8.0–22.0)	0.507
ICU admission	12 (7.8)	27 (17.6)	0.010
Respiratory rate, rpm	20.0 (18.0–21.0)	20.0 (18.0–21.0)	0.719
Heart rate, bpm	84.0 (76.0–92.0)	83.0 (78.0–92.0)	0.665
Mean arterial pressure, mmHg	95.0 (87.0–103.0)	94.0 (87.0–102.0)	0.445
CT manifestations			
Area of lung injury			
<25%	81/118 (68.6)	74/121 (61.2)	0.225
25–50%	19/118 (16.1)	21/121 (17.4)	0.795
50–75%	10/118 (8.5)	19/121 (15.7)	0.087
>75%	6/118 (5.1)	8/121 (6.6)	0.615



Complications and Mortality

	Patients without diabetes (<i>n</i> = 153)	Patients with diabetes (<i>n</i> = 153)	<i>P</i> value
Complications			
ARDS	17 (11.1)	38 (24.8)	0.002
AKI	5 (3.3)	19 (12.4)	0.003
Acute cardiac injury	26 (17.0)	47 (30.7)	0.005
Shock	16 (10.5)	32 (20.9)	0.012
Shock	17 (11.1)	37 (24.2)	0.003
Prognosis			0.017
Death	16 (10.5)	31 (20.3)	—
Survival	137 (89.5)	122 (79.7)	—



	Patients with diabetes	
	Survivors (<i>n</i> = 122)	Nonsurvivors (<i>n</i> = 31)
Age, years	63.0 (56.0–69.0)	76.0 (65.0–82.0)†
Sex		
Female	69 (56.6)	9 (29.0)†
Male	53 (43.4)	22 (71.0)†
Exposure history	14 (11.5)	4 (12.9)
Smoking	4 (3.3)	3 (9.7)
Drinking	5 (4.1)	1 (3.2)
Comorbidities		
Hypertension	61 (50.0)	26 (83.9)†
Cardiovascular disease	18 (14.8)	14 (45.2)†
Cerebrovascular disease	7 (5.7)	5 (16.1)
Chronic pulmonary disease	4 (3.3)	4 (12.9)
Chronic kidney disease	4 (3.3)	2 (6.5)
Chronic liver disease	5 (4.1)	0
Malignancy	6 (4.9)	2 (6.5)
HbA _{1c} , %	7.9 (6.6–9.1)	9.9 (8.4–11.4)



Summary of Findings

- Patients with diabetes had 2x mortality of those without diabetes
- Survivors with diabetes were more likely to have controlled diabetes as evidenced by lower HbA1c.
- Survivors were younger.
- Cardiovascular disease, COPD, and HTN were independent risk factors for death with or without diabetes



Diabetes and Use of DM Meds and Risk of Covid Mortality

Risk Factors for Higher Mortality

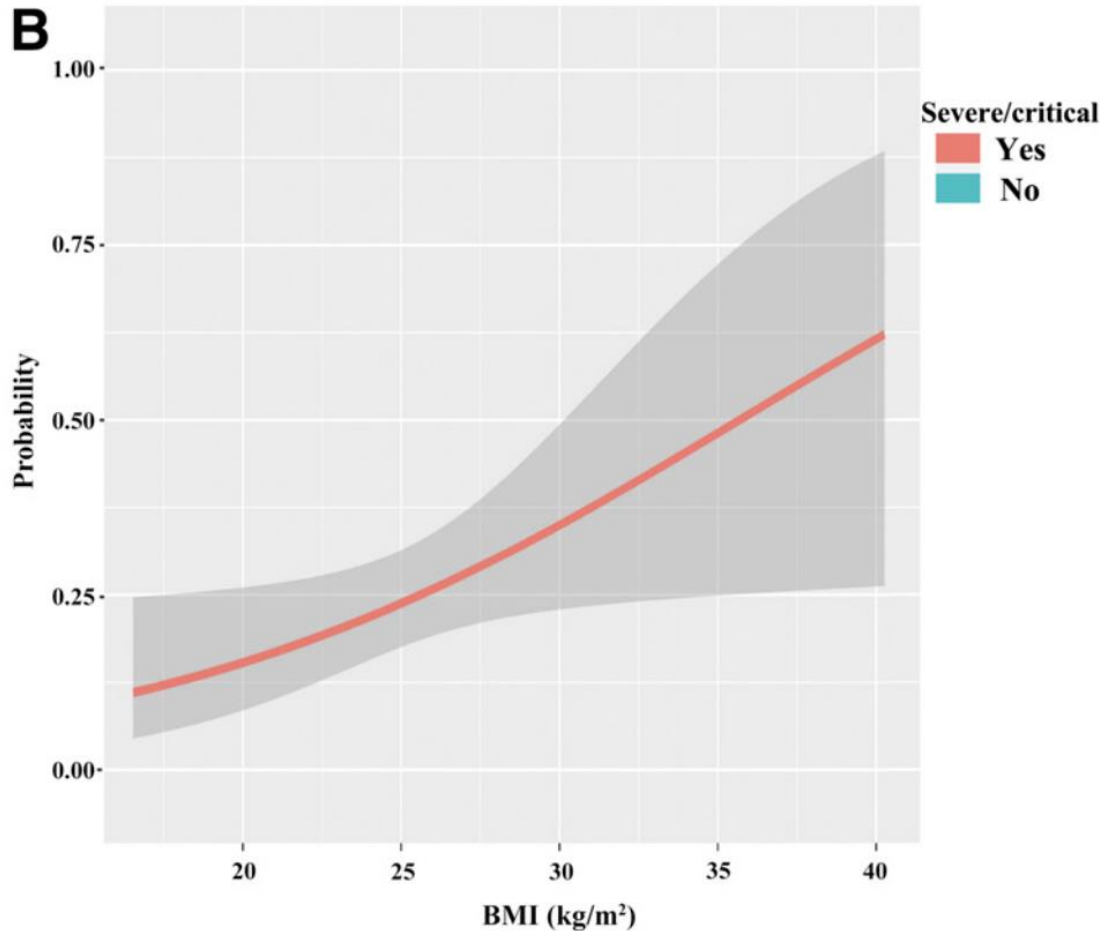
- Age
- Elevated C-Reactive Protein
- Use of insulin (worse prognosis)
- Male gender
- Diabetes (2.5x)

Not associated with Higher Mortality

- Ace or ARB
- Metformin
- DPP-IV
- SU
- Alpha glucosidase i



Obesity and Covid Severity



The presence of obesity was associated with:

- 3x increased risk of having severe COVID-19 Controlled for presence of diabetes ([OR] 2.91, 95% CI 1.31– 6.47).
- Each 1-unit increase in BMI was associated w/ a 12% increase in the risk of severe COVID-19 (OR 1.12, 95% CI 1.01–1.23)

Feng Gao et al.
Diabetes Care May 2020



Diabetes and Covid in United Kingdom

- Of the 61,414,470 people registered at a doctor's office in the U.K., 263,830 (0.43%) individuals had a type 1 diabetes diagnosis, and 2,864,670 (4.6%) had a type 2 diabetes diagnosis.
- 23,804 COVID-19 related deaths
 - One-third occurred in people with diabetes
 - 7,466 (31.4%) with type 2
 - 365 (1.5%) with type 1 diabetes
- Older Age
- Lower SES



Coronado Study (France)

- 1317 patients with diabetes hospitalised for COVID-19 at 53 sites in France in the period from Mar 10 to Mar 31, 2020
- Primary outcome: mechanical ventilation and/or death within 7 days of admission
- Characteristics:
 - mean age of **69.8 years**
 - **64.9%** were men.
 - Median BMI was **28.4 kg/m²**
 - Mean HbA_{1c} = **8.1%**
 - Hypertension: **77.2%**
 - Dyslipidemia: **51%**
 - Microvascular complications: **46.8%**
 - Microvascular complications: **40.8%**



Coronado Study (France)

- **Diabetes Types:**
 - Type 2: 88.5%
 - Type 1: 3%
 - Other etiologies: 5.4%
 - Newly diagnosed: 3.1%
- **DM Medications:**
 - Insulin: 38.3%,
 - Metformin: 56.6%
 - DPP-IV: 21.6%
- **BP Medications**
 - ACE inhibitors/ ARBs: 57%
 - Statins: 47.6%
- **Hyperglycemia:**
 - Ketosis
 - Severe Hypoglycemia
 - Severe Hyperglycemia



Coronado Study (France)

- Primary Outcome of death or mechanical ventilation by day 7:
 - **29%**
- Death:
 - **10.6%**
- Other
- Risk Factors:
 - **Older Age**
 - **Male gender**
 - **BMI on overweight or obese range (but paradoxical)**



Care of Hospitalized Patients with COVID & DM

UNC

- Reduce PPE use and reduce patient and provider exposure
- Transition to a virtual care system
- Provide effective diabetes care through virtual means
- Kept TIR



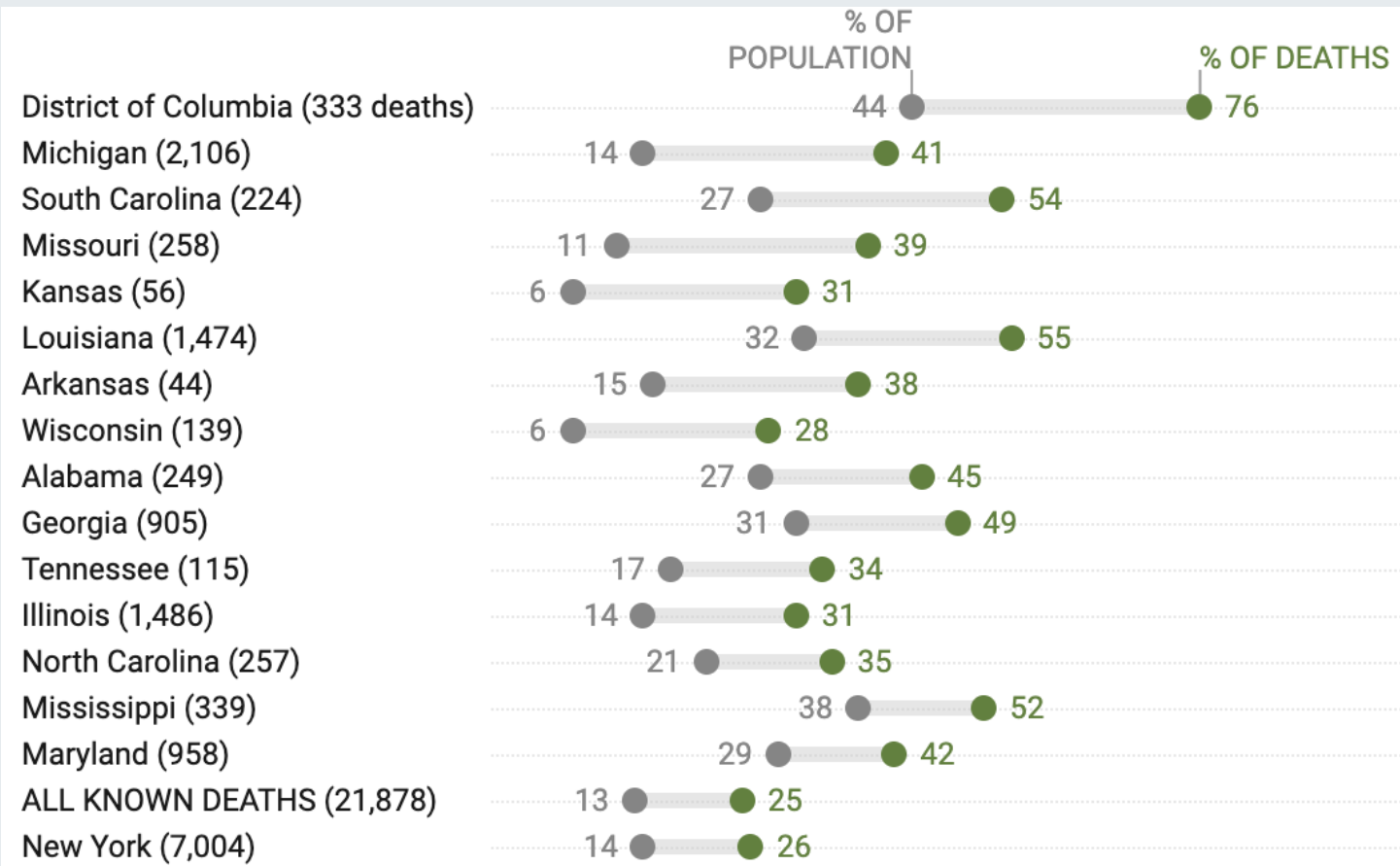
Covid and Disparities

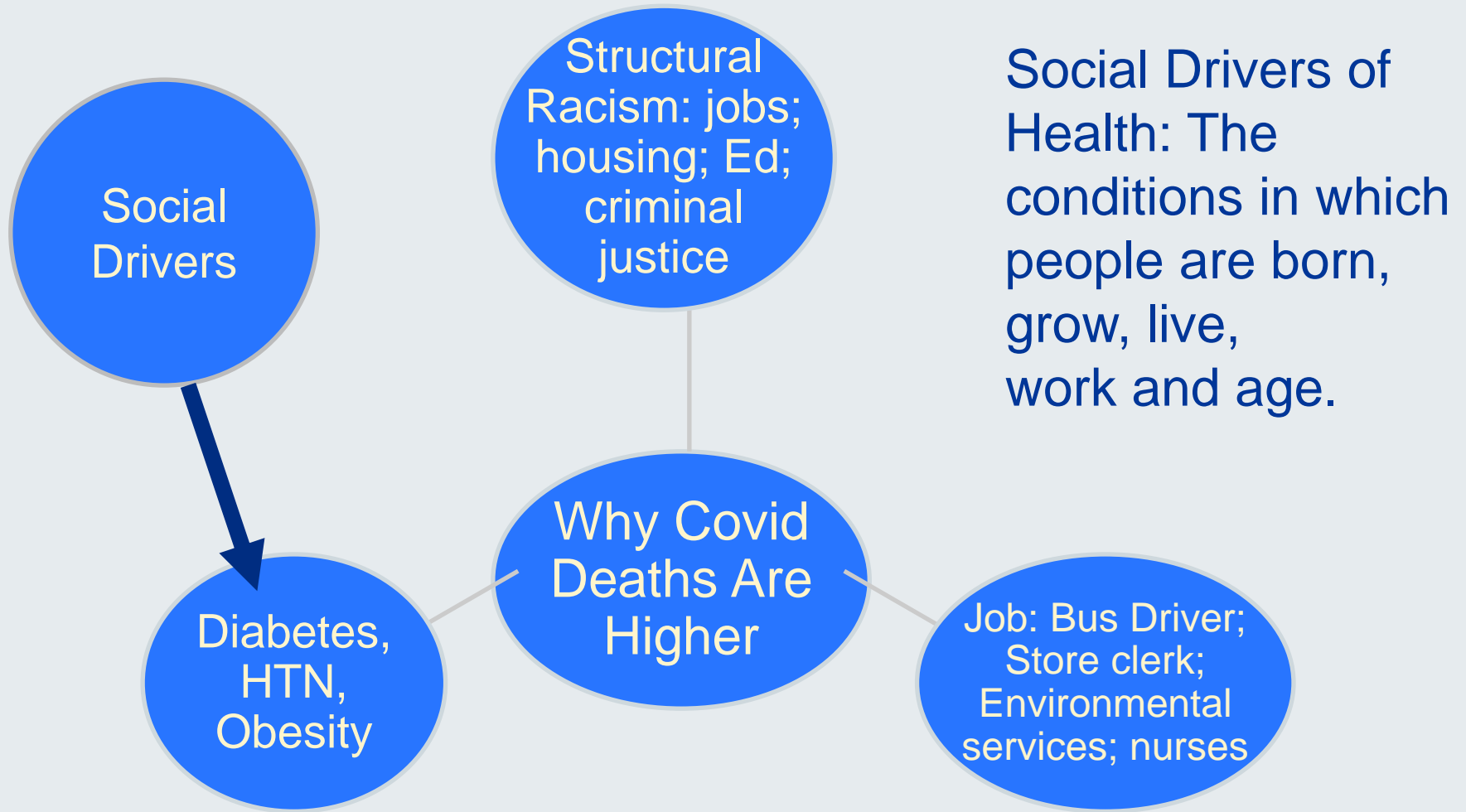
- **The latest overall COVID-19 mortality rate for Black Americans is 2.4 times as high as the rate for Whites and 2.2 times as high as the rate for Asians and Latinos.**
- **1 in 1,850 Black Americans has died (or 54.6 deaths per 100,000)**
 - **1 in 4,000 Latino Americans has died (or 24.9 deaths per 100,000)**
 - **1 in 4,200 Asian Americans has died (or 24.3 deaths per 100,000)**
 - **1 in 4,400 White Americans has died (or 22.7 deaths per 100,000)**

<https://www.apmresearchlab.org/covid/deaths-by-race>



Covid and disparities





Thank you!



Susan Elizabeth Spratt, MD

