



Dr. Chris Pernell, MD, MPH

**Strategic Integration and Health
Equity Officer**

University Hospital, Newark, New Jersey



The Pulse of a Pandemic: A Year in Review, Where We Are Now and the Inception of the COVID-19 Vaccine

December 29, 2020

Chris T. Pernell, MD, MPH, FACPM

Chief Strategic Integration and Health Equity Officer

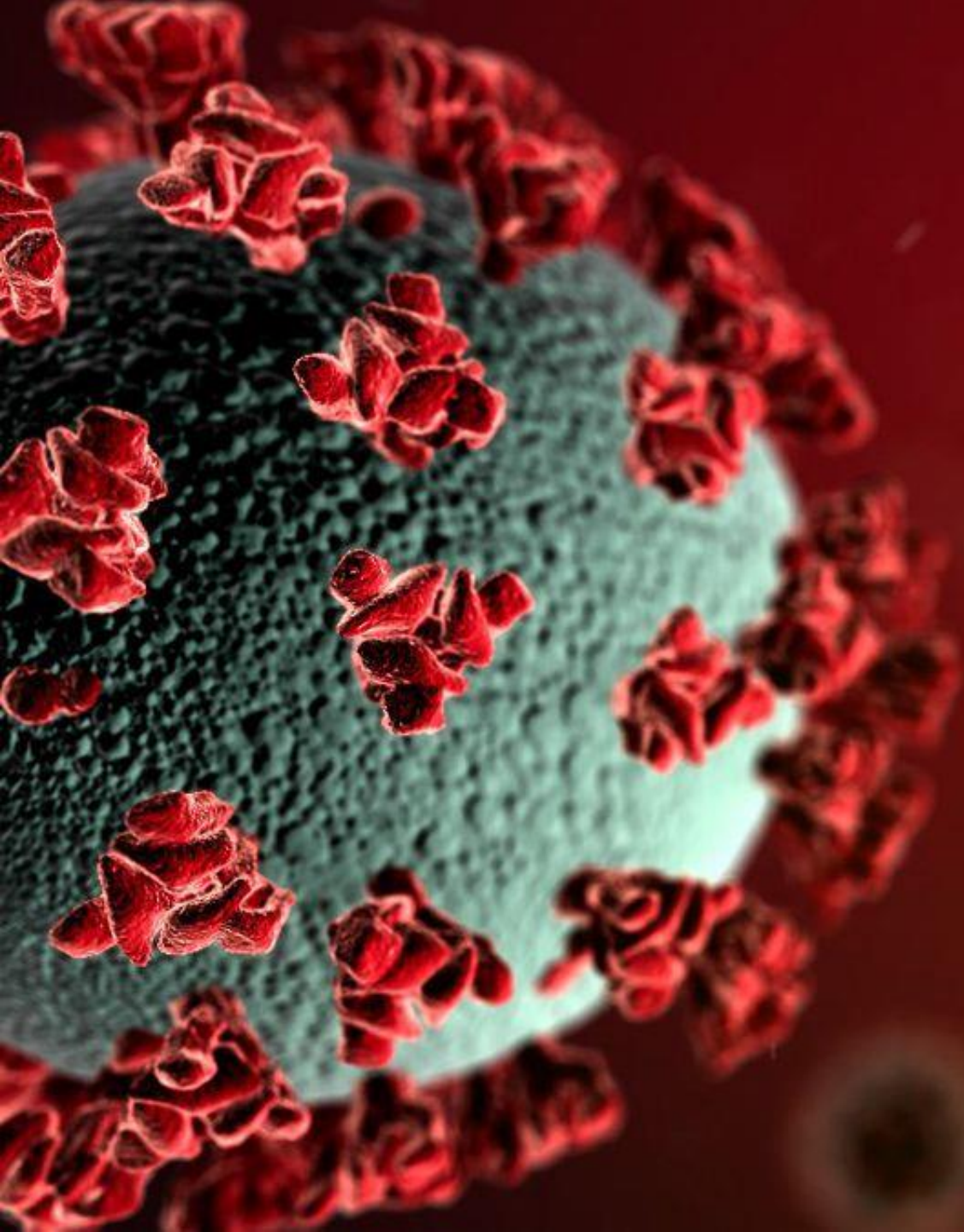
Objectives

- ❖ To provide a broad overview of the events and outcomes related to the coronavirus pandemic in the US over the last year.
- ❖ To use a health equity lens to understand how the pandemic has disproportionately impacted communities of color.
- ❖ To share key information and milestones about the COVID-19 vaccine development and approval process and likely next steps including vaccine allocation and distribution among priority populations.









- **First confirmed case in the US reported on January 20, 2020¹**
- **Record number of cases confirmed in one day: 247K+ on December 17, 2020² and over 19M+ cases to date³**
- **~120,000 current hospitalizations in the US⁴**
- **330K+ deaths in the US and rising²; tracking to be the 3rd leading cause of death in the US in 2020⁵**
- **CDC estimates there have been ~322K cases among healthcare workers and ~1,121 deaths⁶**

THE COLOR OF CORONAVIRUS: COVID-19 DEATHS BY RACE AND ETHNICITY IN THE U.S.



RELATED CONTENT:

RESPONSE PANEL: [10 thought leaders respond to the Color of Coronavirus data](#)

BLOG: [Once slowing in pace, COVID deaths now rebounding for all groups](#)

VOTER PROFILE TOOLS: [Demographic and economic data for states and districts](#)

Fast and Slow Pandemics: COVID-19 and Earthquakes of Devastation in Black and Brown Communities

According to the most recent data compiled by the Color of Coronavirus project:

- ❖ 1 in 750 Indigenous Americans has died
- ❖ 1 in 800 Black Americans has died
- ❖ 1 in 1,100 Pacific Islander Americans has died
- ❖ 1 in 1,150 Latino Americans has died
- ❖ 1 in 1,325 White Americans has died
- ❖ 1 in 1,925 Asian Americans has died



COVID-19 Hospitalization and Death by Race/Ethnicity: Racism as a Pre-existing Condition

“Race and ethnicity are risk markers for other underlying conditions that impact health including socioeconomic status, access to health care, and exposure to the virus related to occupation, e.g., frontline, essential, and critical infrastructure workers.” (CDC, November 30, 2020)

Rate ratios compared to White, Non-Hispanic persons	American Indian or Alaska Native, Non-Hispanic persons	Asian, Non-Hispanic persons	Black or African American, Non-Hispanic persons	Hispanic or Latino persons
Cases ¹	1.8x	0.6x	1.4x	1.7x
Hospitalization ²	4.0x	1.2x	3.7x	4.1x
Death ³	2.6x	1.1x	2.8x	2.8x

Changing Course: Tools to Beat Back the Pandemic

THINK
Opinion, Analysis, Essays

I'm in a Covid-19 vaccine clinical trial to honor my father, fight racism and exercise my power

SHARE THIS — [f](#) [Twitter](#) [Email](#) [More](#)

SELF EXPLANATORY

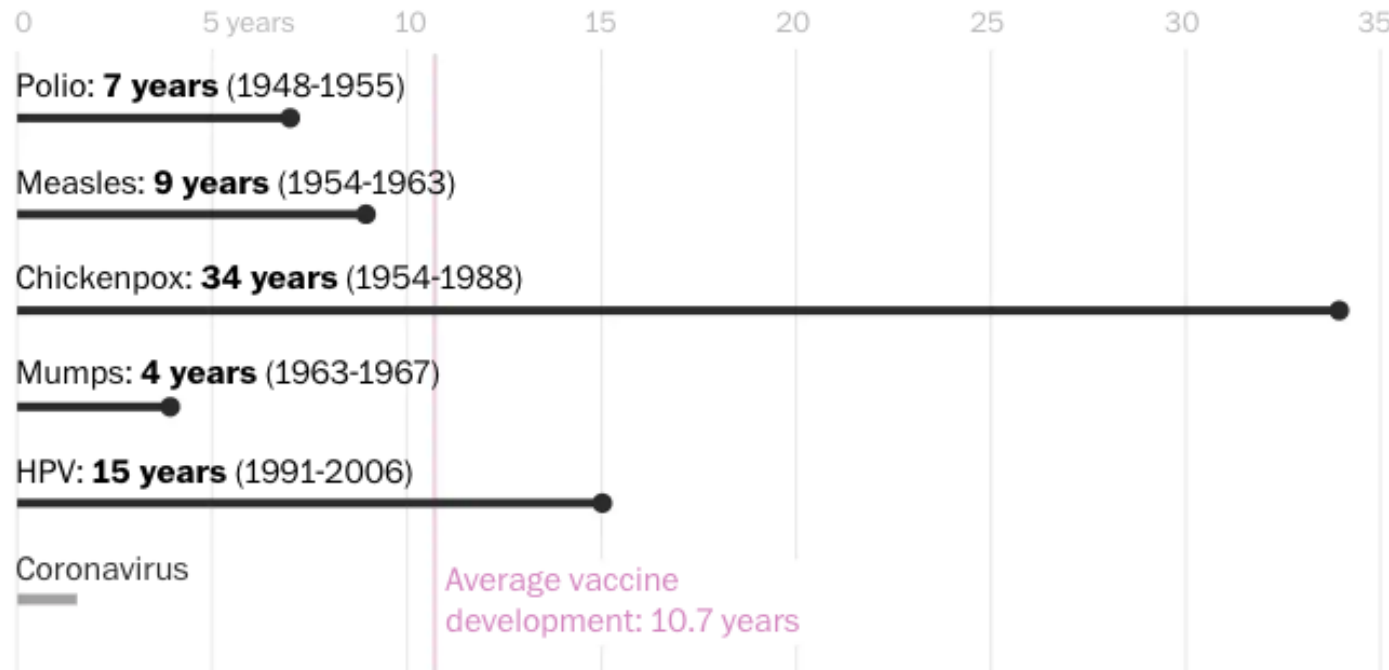
I'm in a Covid-19 vaccine clinical trial to honor my father, fight racism and exercise my power

My dad told me: 'Follow the data. It will lead you to the answers.' Daddy, not only am I following the data, I've become the data.



Steckelberg, A., Johnson, C.Y., Florit, G., Alcantara, C. (2020, November 23). These are the top coronavirus vaccines to watch. *Washington Post*. <https://www.washingtonpost.com>

How long it took to develop other notable vaccines



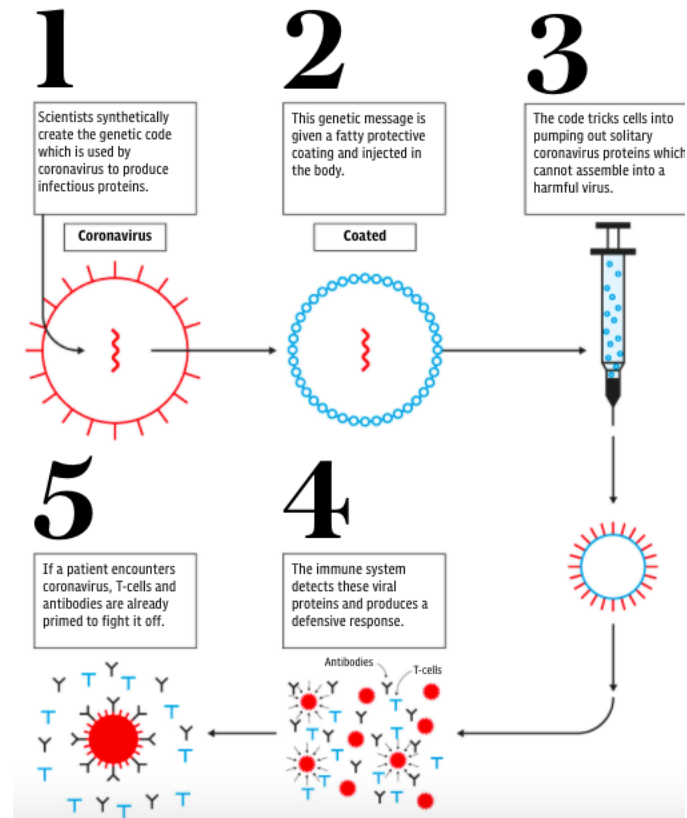
How Is the Coronavirus Vaccine Development Different?

- ❖ Government has taken on the financial risk of COVID vaccine development
 - ✓ The US gov't invested \$9.5B to speed up development and jumpstart manufacturing before testing is finished
 - ✓ Removed the financial disincentives to manufacture vaccines before a drugmaker knows they will work
 - ✓ NIH entered into public-private-partnership with drug companies where hundreds of millions of dollars in funding have allowed specific companies to expedite the process and raise large-scale nationwide trials (e.g., Moderna, J&J, AstraZeneca)

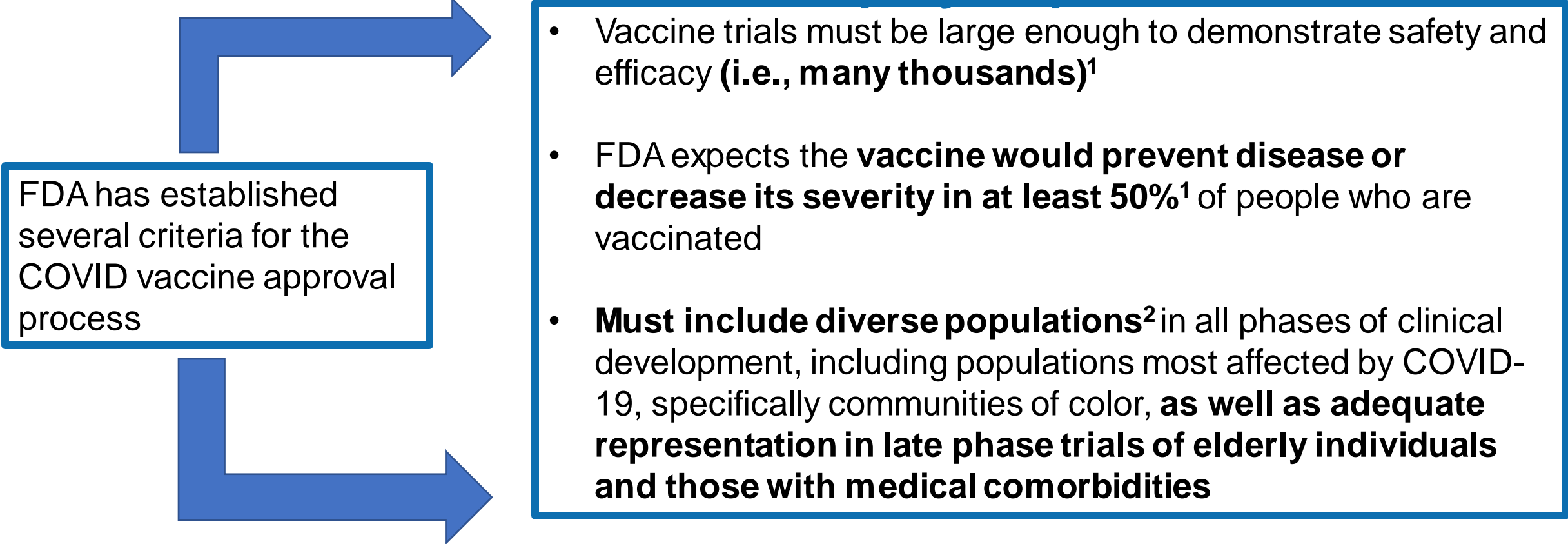
How Is the Coronavirus Vaccine Development Different?

- ❖ New technologies have given researchers new tools
 - ✓ Synthetic genetic material can be delivered into the body's cells, making them into **factories to produce specific proteins**, which then trigger a robust immune response
 - ✓ Skipping otherwise time-consuming steps such as manufacturing viral proteins or growing the whole virus in chicken eggs
- ❖ **Pfizer and Moderna are the only two vaccine candidates that specifically use mRNA technologies**
 - ✓ Have the advantage of speed – can be designed and manufactured quickly
 - ✓ mRNA science has been used in medical research for the past four decades; if proven successful as a vaccine, it has the potential to be a game changer
 - ✓ Requires two doses

How the mRNA Vaccine Candidates Work



Key Steps Along the Pathway to Vaccine EUA and Phased Distribution: Health Equity Implications



FDA has established several criteria for the COVID vaccine approval process

- Vaccine trials must be large enough to demonstrate safety and efficacy (**i.e., many thousands**)¹
- FDA expects the **vaccine would prevent disease or decrease its severity in at least 50%**¹ of people who are vaccinated
- **Must include diverse populations**² in all phases of clinical development, including populations most affected by COVID-19, specifically communities of color, **as well as adequate representation in late phase trials of elderly individuals and those with medical comorbidities**

Reported Side Effects of the Pfizer/BioNTech Vaccine

1st Dose

	Any reaction	Mild	Moderate	Severe
Pain*	83.1%	51.1%	31.1%	1%
Redness*	4.5%	3.1%	1.2%	0.3%
Swelling*	5.7%	3.8%	1.7%	0.2%
Fatigue	47.4%	26.1%	19.9%	1.4%
Fever	3.7%	2.8%	0.7%	0.3%
Headache	41.9%	27.4%	13.4%	1%
Chills	14%	10%	3.6%	0.4%
Vomiting	1.2%	1%	0.2%	0%
Diarrhea	11.1%	9%	2%	0.1%
Muscle pain	21.3%	11.2%	9.5%	0.6%
Joint pain	11%	6.4%	4.3%	0.2%

2nd Dose

	Any reaction	Mild	Moderate	Severe
Pain*	66.1%	47.7%	18%	0.5%
Redness*	7.2%	3.6%	3.2%	0.5%
Swelling*	7.5%	4.1%	3.2%	0.2%
Fatigue	59.4%	21.1%	33.7%	4.6%
Fever	15.8%	9.2%	5.2%	1.2%
Headache	51.7%	25.6%	22.9%	3.2%
Chills	35.1%	17.1%	15.9%	2.1%
Vomiting	1.9%	1.3%	0.4%	0.2%
Diarrhea	10.4%	8.5%	1.7%	0.2%
Muscle pain	37.3%	15.5%	19.5%	2.2%
Joint pain	21.9%	9.8%	11.2%	1%

Reported Side Effects of the Moderna Vaccine

1st Dose

	Any reaction	Severe	ER visit or Hospitalization
Pain*	74%	1.3%	
Redness*	2.3%	0.2%	
Swelling*	4.4%	0.5%	
Swollen lymph nodes	6.1%		
Fever	0.9%	0.3%	
Fatigue	38.5%	0.1%	0.1%
Headache	35.4%	1.1%	0.1%
Muscle pain	23.7%	1.9%	
Joint pain	16.6%	0.6%	0.1%
Chills	9.2%	0.4%	
Nausea/vomiting	9.4%	0.1%	

2nd Dose

	Any reaction	Severe	ER visit or Hospitalization
Pain*	90.1%	4.6%	
Redness*	9%	2%	
Swelling*	12.6%	1.7%	
Swollen lymph nodes	16%	0.4%	
Fever	17.4%	1.6%	
Fatigue	67.6%	10.6%	0.1%
Headache	62.8%	5%	
Muscle pain	6.1%	0.1%	
Joint pain	45.2%	5.8%	
Chills	48.3%	1.5%	
Nausea/vomiting	21.3%	0.1%	

Demonstrating Trustworthiness and Building Trust

The NEW ENGLAND JOURNAL of MEDICINE

SUBSCRIBE OR RENEW

PERSPECTIVE
New Order, New Hope

AHA Scientific Sessions 2020

ORIGINAL ARTICLE
Oral Azacitidine Maintenance Therapy for Acute Myeloid Leukemia in First Remissi...

IMAGES IN CLINICAL MEDICINE
Acquired Hypertrichosis Lanuginosa

IMAGES IN CLINICAL MEDICINE
Hearing Music while Checking a Pulse

Editor's Note: This article was published on October 16, 2020, at NEJM.org.

Perspective

Trustworthiness before Trust — Covid-19 Vaccine Trials and the Black Community

Rueben C. Warren, D.D.S., Dr.P.H., M.Div., Lachlan Forrow, M.D., David Augustin Hodge, Sr., D.Min., Ph.D., and Robert D. Truog, M.D.

Article Metrics

November 26, 2020
N Engl J Med 2020; 383:e121
DOI: 10.1056/NEJMp2030033

5 References 2 Citing Articles

The only way out of today's misery is for people to become worthy of each other's trust.
— Albert Schweitzer

AS THE RACE TO DEVELOP A VACCINE FOR COVID-19 HAS REACHED PHASE 3 CLINICAL trials, concerns are increasing about the low rates of trial participation in important subgroups, including Black communities. Recent data show that although Black people make up 13% of the U.S. population, they account for 21% of deaths from Covid-19 but only 3% of enrollees in

ADVERTISEMENT
CALL FOR LATE-BREAKING CLINICAL TRIALS
Submit by Jan. 26 at 1 P.M ET!
Select LBCTs will ACCO21



University
HOSPITAL

Newark, NJ