



## Sixth Annual World Health Continuing Medical Education Conference

# Health Disparities Impacting Global and Local Caribbean Populations

**June 16–17, 2023**

Hyatt Centric Arlington

1325 Wilson Blvd.

Arlington, VA

Provided by Healthfirst, Howard University College of Medicine, and MediNova





# A CALL TO DO BETTER: ADDRESSING DIVERSITY WITHIN THE DENTAL PROFESSION

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General Practice Residency  
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Long Island Jewish Medical Center

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Donald and Barbara Zucker School of Medicine at  
Hofstra/Northwell  
Department of Dental Medicine

June 16<sup>th</sup>, 2023



## CREDENTIALS

B.S.	St. John's University
D.D.S.	NYU College of Dentistry
G.P.R.	Metropolitan Hospital Center
Dental Oncology Fellowship	Memorial-Sloan Kettering Cancer Center
M.P.H.	NYU College of Global Public Health
Associate GPR Director	Long Island Jewish Medical Center
Private practice	Fabiola Milord, DDS, MPH, PLLC



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## NORTHWELL HEALTH: GENERAL PRACTICE RESIDENCY (GPR) PROGRAM



### Who we are

Located on Long Island in New Hyde Park, NY, the Residency in General Practice Dentistry at North Shore University Hospital and Long Island Jewish Medical Center (NS/LIJ) is a one-year program providing comprehensive post-dental training for more than 50 years. The program is designed to train dentists in the management of complex and special needs patients in both an outpatient and inpatient setting.

Our general practice residency provides a broad range of experience dealing with dental patients in both a clinical and didactic sense. The caseload includes the hospitalized dental patient, a hospitalized patient with dental needs or complications, and the ambulatory but handicapped or medically compromised patient. Additionally, a significant percentage of well patients are treated in the ambulatory setting. The experience will provide the graduate resident with the confidence and experience necessary to comprehensively treat a diverse patient population.

<https://professionals.northwell.edu/graduate-medical-education/residency-general-practice-dentistry-nsuh-lij>

## PURPOSE AND OBJECTIVES

### PURPOSE

*Provide insights regarding the topic of diversity amongst dental providers in order to facilitate and improve access to care particularly by Black patients*

### OBJECTIVES

- Objective 1: Describe how lack of diversity amongst minority dental providers affects access to care
- Objective 2: Discuss the importance of mentorship
- Objective 3: Discuss issues surrounding educational affordability
- Objective 4: Compare a top/down vs. an individualized approach for attracting minority talent into the profession

### FINANCIAL DISCLOSURE

*Do you have a financial disclosure? No*



## BACKGROUND STATEMENT

Current systems have not been successful in addressing the existing racial inequities between black dental professionals and other racial groups. These dentists in particular seem to have less visibility and representation in organized dentistry. At no time has this been more obvious than during the COVID-19 pandemic, when African-American professionals were not as prominently featured among those offering their viewpoint and expertise. The following provides insights regarding the topic of diversity in order to gain perspective relative to the relationship between representation and access to care within the dental profession.



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## BLACK DENTISTS IN THE U.S.

- Percentage of dental school enrollees who were Black/African-American
  - 2000 = 4.7%
  - 2019 = 5.78%
- Total number of dentists in the U.S. = 202,536
  - 2020 = 3.8 % or 5,039 dentists (general dentists and specialists) were Black
- Black population, however, comprise 12.4% of the US population
- They are more likely to have graduated from the only Black dental HBCUs in the country – Howard University College of Dentistry or Meharry School of Dentistry



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## AN INVERSE RELATIONSHIP

- These 5,039 dentists are more likely to treat patients with Medicaid dental benefits, ...and more likely to be the ones providing care to Black patients.
- A 2017 study by Mertz et al concluded that the vast oral health disparities experienced by the Black population in the U.S. may be inversely related to the low numbers of Black dentists.
- A 2022 Pew Research report found that Black women 18-49 would prefer a Black healthcare provider for routine care as they feel “heard and listened to”.



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## EFFORTS TO ADDRESS DENTAL EDUCATION INEQUITIES – A TOP DOWN APPROACH

- The American Dental Association
  - Institute for Diversity in Leadership
  - Diversity Summits convened in 2010, 2015, and 2021
- The New York State Dental Association 2021
  - Diversity and Inclusion Task Force
  - Formally decided to recognize Black History Month



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## THE LEGACY OF STRUCTURAL AND INSTITUTIONAL RACISM IN DENTISTRY

- As late as 1961 Black dentists were excluded from membership in the state dental societies in Georgia, Texas, Louisiana, and Florida
- A series of lawsuits filed by the NAACP Legal Defense fund resulted in the inclusion of Black dentists by the end of 1963
- Despite the legal mandate, anecdotally Black dentists were not widely accepted into ADA membership until the 1970s
- For this reason, the ADA issued an organizational apology to the NDA admitting: “based on institutionalized racism that resulted in the systematic exclusion of Black dentists from participation in the ADA from 1856-1963...this contributed to irreparable harm and adverse health conditions for generations of African Americans, that adversely affected the health care of millions of Americans.”



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## CHRIS ROCK'S MOTHER AND DENTAL CARE IN 1950'S SOUTH CAROLINA

- In his 2023 Netflix Special, Chris Rock reveals the indignity of his mother having to be seen by a veterinarian in order to have her teeth pulled due to lack of access to dentists.
- In another interview, he also states she had to use the back door of the vet's office because of the fear of White people finding out that the same instruments used to treat their animals were being used to treat “N###s”.



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## LEVELING THE PLAYING FIELD

### A fighting chance against structural racism by:

- Expanding cultural competence and awareness via education for faculty and students
- Visualizing Black dentists as important role models for students and residents by having an established presence
- Advancing inclusive scholarship and health equity
- Training and awareness in unconscious bias in dental school's admissions processes
- GRADES (!)
- Developing friendships and collegial relationships with different groups
  - Research has shown that cross-class relationships between the rich and poor opens up opportunities for the underprivileged closing the economic wealth divide

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## THE IMPORTANCE OF MENTORSHIP AND EARLY AWARENESS

- Research has shown that family members are the strongest influencers in choosing a dental career among students successfully matriculating into dental school, however, Black/African-Americans are much less likely to have a family member as a dentist.
- Awareness should begin at the junior high school and high school levels
- Pipeline Programs introduce underrepresented high school students to the dental profession
  - New York University's College of Dentistry Saturday Academy Program
  - SUNY-Buffalo School of Dental Medicine



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## ACCESS AND AFFORDABILITY



1. Average cost of dental school ranges from \$200,000 (public) - \$500,000 (private) over four years (excluding fees, cost of living expenses, and debt incurred from undergraduate education)
2. Given the well documented wealth gap between blacks and whites, financing dental education is an even greater challenge for black students
3. A broader range of public/private partnerships involving grants (both merit and needs-based) are necessary to become a larger part of the conversation
4. Military



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## U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES HEALTH RESOURCES & SERVICES ADMINISTRATION (HRSA)

### National Health Service Corps | NHSC

Must be a U.S. citizen

In an eligible discipline

- Physician
- Dentist
- Nurse Practitioner
- Nurse Midwife
- Physician Assistant

Commit to a minimum of two years of full-time service. You must serve at an NHSC-approved site in a HPSA. The total number of years you serve will depend on the number of school years of NHSC SP support you received. (This cannot exceed four school years.)

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### Faculty Loan Repayment Program

Must be a U.S. citizen

In an eligible discipline

- Allied health profession
- Dentistry
- Dental hygiene
- Medicine
- Behavioral and Mental Health (graduate level only)
- Nursing

Come from a disadvantaged background and have to be a faculty member at an approved health professions school. You must have a contract for at least two years with an option to renew.



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## A BOTTOM UP APPROACH


- One-on-one mentorship




- Exposure to more racially diverse industry leaders

Presented by the NYU Dentistry Alumni Diversity and Inclusion Committee

Dr. Raymond Gist, DDS



Interviewed by  
Dr. Fabiola Milord,  
DDS '94, MPH '13



**EARNING YOUR SEAT AT THE TABLE  
OF ORGANIZED DENTISTRY**

with Dr. Raymond Gist, the First Black ADA President

August 5, 2020  
6PM - 7PM

NYU DENTISTRY  
Development and Alumni Relations

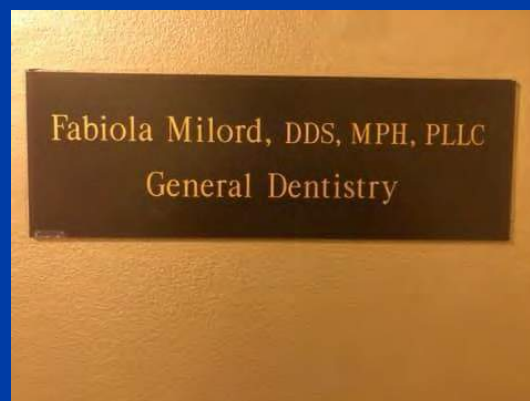
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## A BOTTOM UP APPROACH

Something to aspire to – ENTREPRENEURSHIP

In 2021 73% of dentists are practice owners



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## Membership in organized dentistry and advocacy matters!!!!

- National Dental Association
- Hispanic Dental Association
- American Dental Association
- State and local dental societies
- Political Action Committees (PACs)
- Collective Voices



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## CONCLUSION

- The underrepresentation for Black dentists is extraordinary, and the Black dentists that are in practice are shouldering a disproportionate share of dental care for minority and underserved communities
- Several studies have demonstrated improved health access and outcomes for patients receiving health care from racially concordant providers
- Increasing minority pipeline programs as a pathway to the dental profession would serve as a mechanism for increasing representation
- Applicants and students need to be made aware of all financial assistance (public, private, government, grants, etc.)
- Mentorship and exposure to leaders in the profession make a difference in recruitment efforts

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## CONTACT INFORMATION

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# THANK YOU





# Birth Equity Among Black and Latino Populations in NYC

Jocelyn Valdez, MPH

Program and Planning Coordinator

NYC Department of Health and Mental Hygiene

June 16, 2023



## Purpose

To highlight the inequities in maternal health and birth equity outcomes within Caribbean communities that have experienced disinvestment due to racism and systems of oppression

Describe the history of maternal health and birth equity work with the NYC Health Department

## Objectives

1. Increase awareness of NYC solutions to address inequities related to birth
2. Improve understanding of the intersecting needs of Black and Latino people
3. Elevate the importance of including community experiences and perspectives in solutions
4. Improve understanding of how collective impact approaches can bridge public health and healthcare

**Financial Disclosure** None



## Positionality: How We Show Up



Jocelyn  
Valdez, MPH

Program and Planning  
Coordinator

- I am a Mexican-American woman with an upbringing in a military family.
- California is my home and my peace.
- I am grateful for the opportunities and experiences that others like me haven't had, such as members of my own family.
- I am always learning and growing.
- I am a public health professional.

## Outline

- 1 Birth equity in NYC
- 2 NYC Health Department programs
- 3 Public health approaches
- 4 Reflections
- 5 Key takeaways



# Birth Equity in NYC

Citywide and Community Level Data

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## Maternal Mortality & Morbidity in NYC<sup>1,2</sup>

74% of all pregnancy-related deaths were preventable

Black women were 9.4X more likely to die of a pregnancy-related death

60% of all pregnancy-associated deaths were preventable

75% of P.A. deaths were preventable for Black women and 65% for Latina women (vs 43%)

96% diseases of despair, 55% embolism, 52% by ~~BY~~ conditions

Black women had 2.6X the SMM rate of white women, Latina women had 1.9X the SMM rate

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## Over Half Of All Deaths Occur Between 43 days - 1 Year Of The End Of Pregnancy <sup>1</sup>

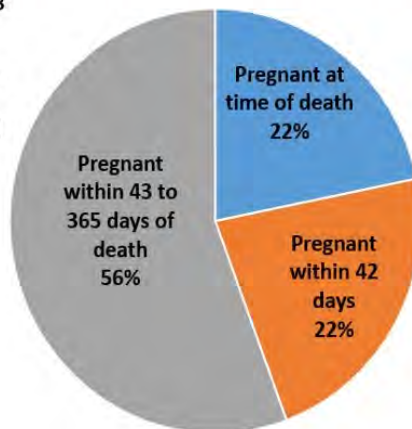
**Pregnancy-Associated Deaths, n=133**

**Top Causes of Death Within 43 to 365 Days of Pregnancy**

- Mental Health Conditions (19)
- Cancer (16)
- Cardiovascular Conditions (13)

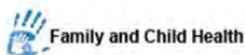
**Top Causes of Death During Pregnancy/Childbirth**

- Hemorrhage (7)
- Cardiovascular conditions (5)
- Embolism (3)
- Mental Health (3)



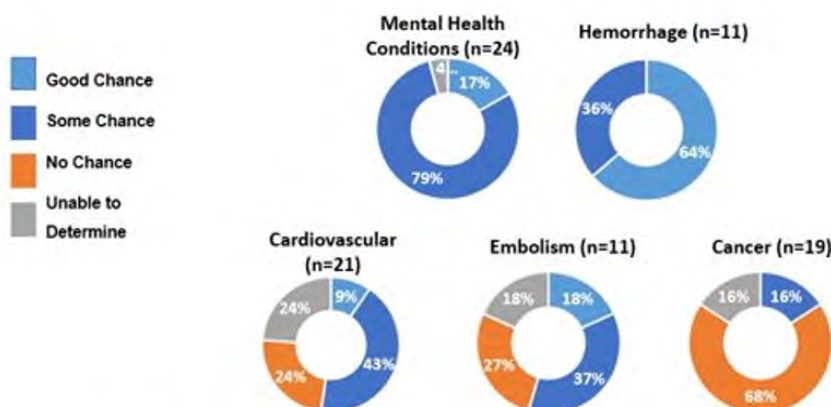
**Top Causes of Death Within 42 Days of Pregnancy**

- Embolism (5)
- Infection (4)
- Cardiovascular conditions (3)
- Hemorrhage (3)
- Cancer (3)



## Almost All Deaths Related to Mental Health Conditions and Hemorrhage Were Preventable <sup>1</sup>

**Preventability of Pregnancy-Associated Deaths by Select Cause of Death, 2016-2018**

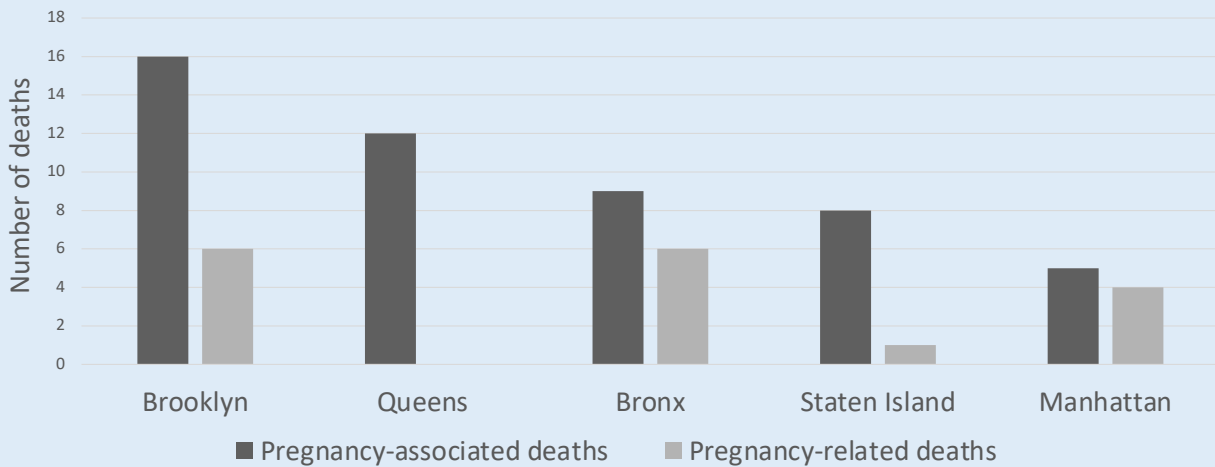


A death is preventable if there is at least some chance of the death being averted by one or more reasonable changes to factors at any level (patient/family, community, provider, facility and/or systems)





## Mortality by Borough, 2017



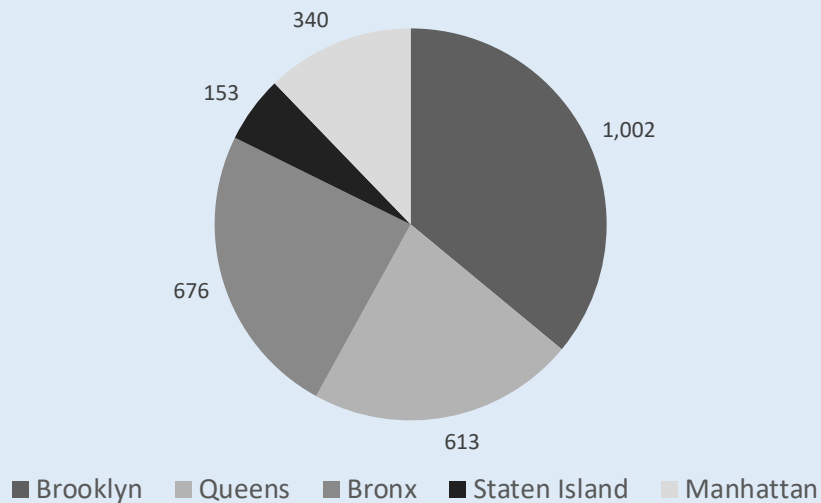
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## Severe Maternal Morbidity by Borough, 2017

3



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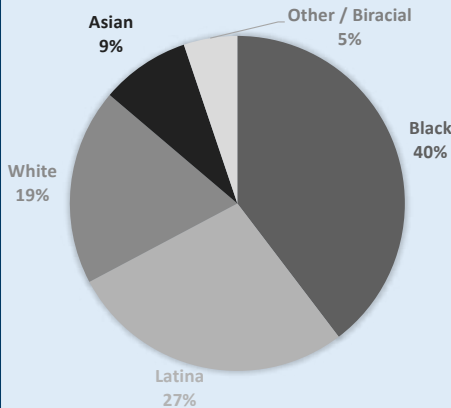
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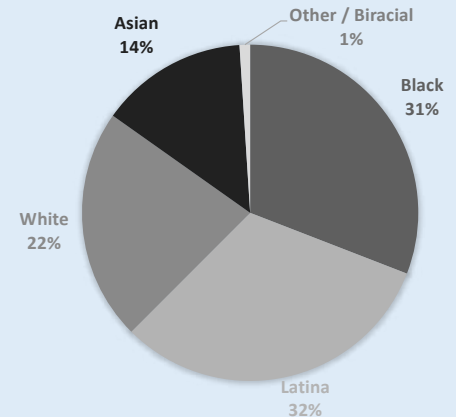


## Inequities by Race, 2017

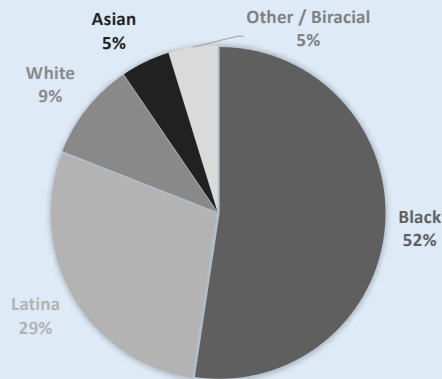
PREGNANCY-ASSOCIATED DEATHS



SEVERE MATERNAL MORBIDITY



PREGNANCY-RELATED DEATHS



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What surprises you about these specific data from NYC?

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# NYC Health Department Programs

Agencywide and Brooklyn focus

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## NYC Department of Health & Mental Hygiene

- DOHMH is one of the nation's oldest public health agencies, > 200 yrs. of work
- With ~6,000 employees, the Agency is one of the largest in the world
- Every day, DOHMH protects and promotes the health of 8.5 million New Yorkers
- Health equity and racial justice are becoming central to the Department's work

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## NYC Health Department Birth Equity Leaders



Michelle  
Morse, MD  
Chief Medical  
Officer, Deputy  
Commissioner



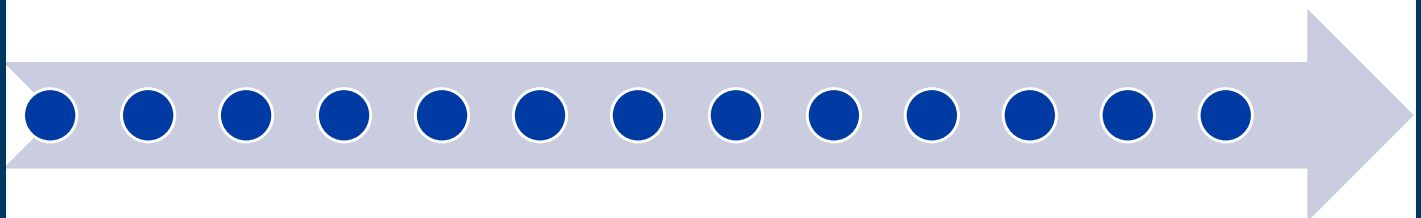
Leslie  
Hayes, MD  
Deputy  
Commissioner

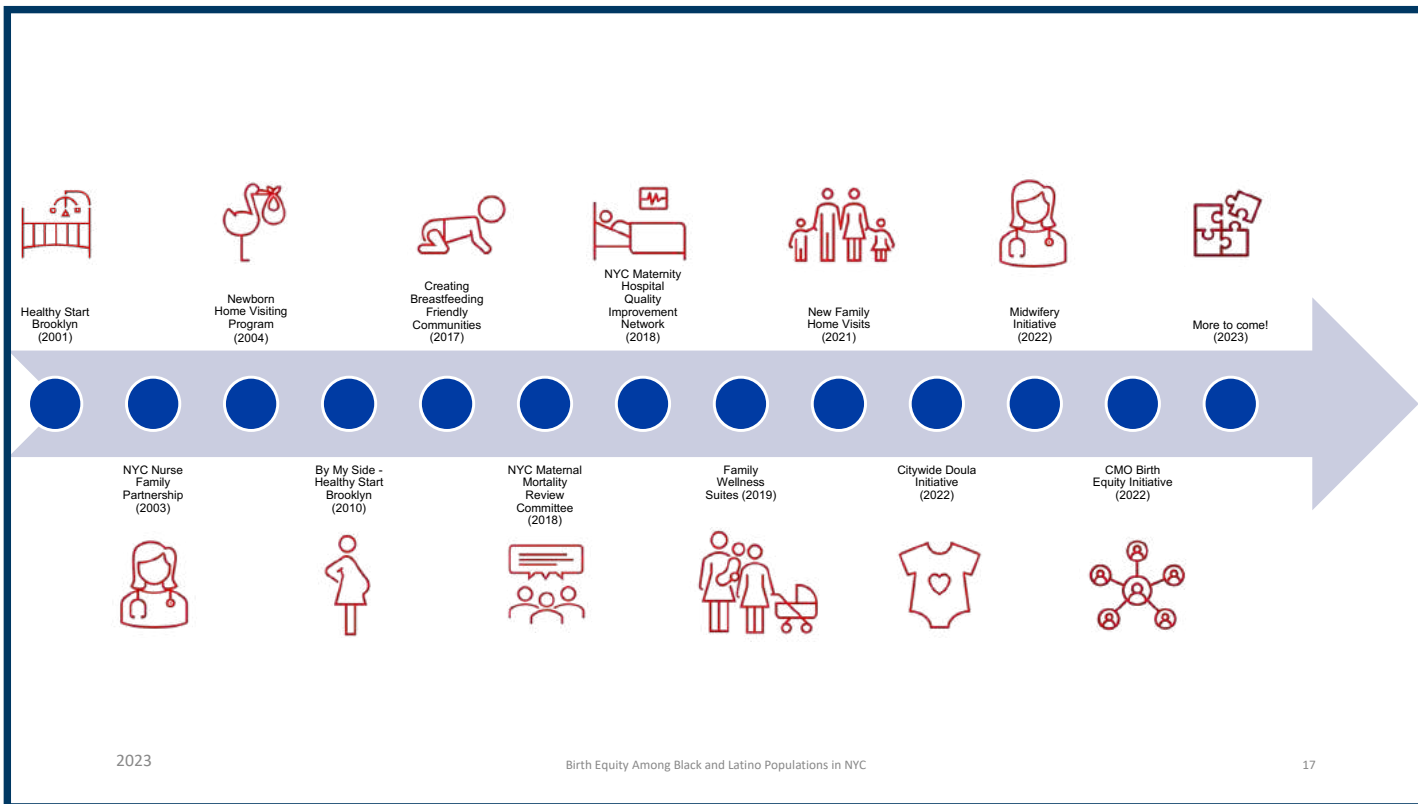


Zahirah  
McNatt,  
DrPH, MHSA  
Assistant  
Commissioner



Laura  
Louison,  
MSW, MSPH  
Assistant  
Commissioner

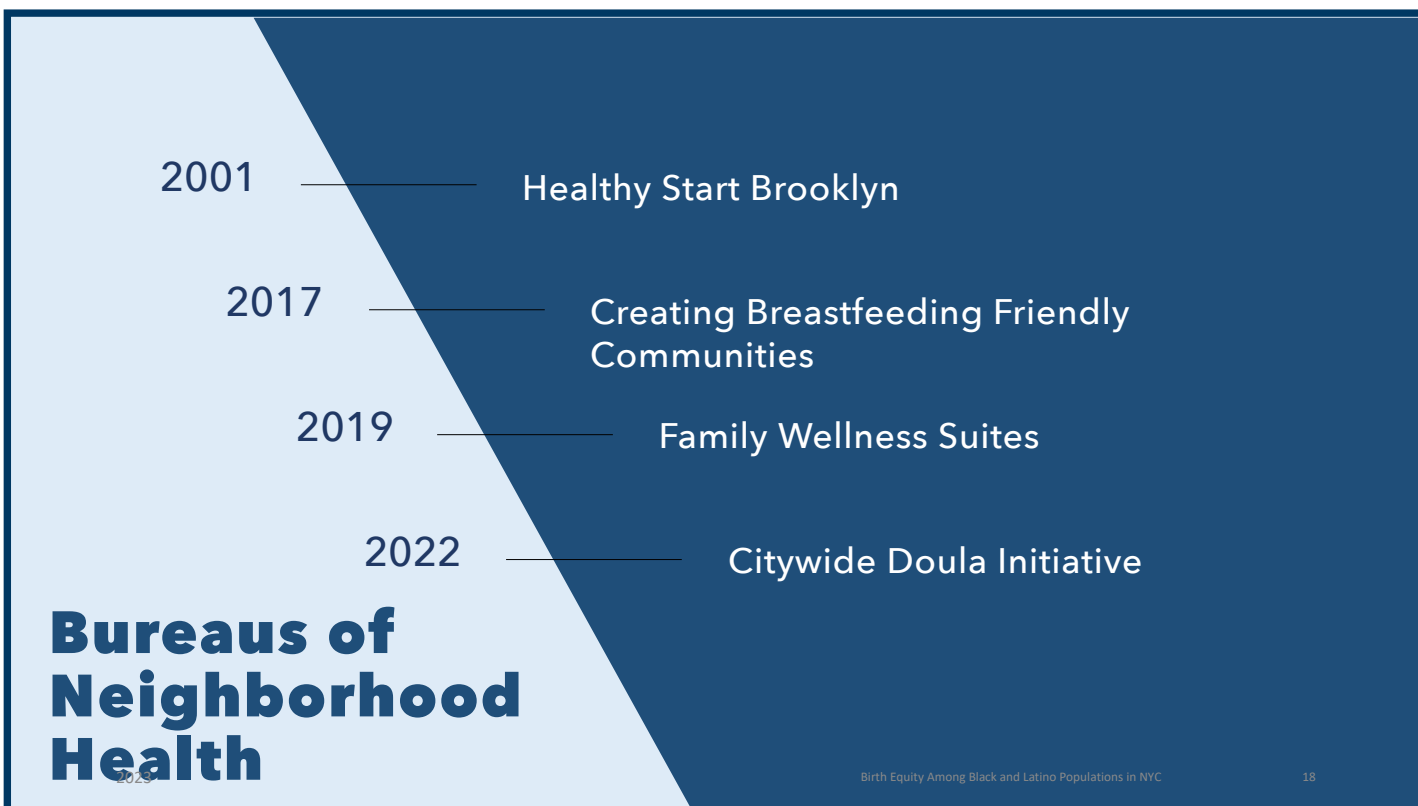




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# Healthy Start Brooklyn

**1 Health Education**  
Including childbirth education, newborn care, infant safety/CPR, ROSE (to prevent postpartum depression)

**2 Parental Support**  
Including parenting classes, Fatherhood Program, Family Foundations for couples, Excellence Baby Academy, and support through the Community Action Network (CAN)

**3 By My Side Birth Support Program**  
Doula support and apprentice program that was the base model for the Citywide Doula Initiative



# Citywide Doula Initiative

**1 Doula Care**  
Providing no-cost doula care in underserved (TRIE) neighborhoods citywide

**2 Workforce**  
Expanding and strengthening the doula workforce

**3 Hospitals**  
Supporting hospitals in becoming more doula-friendly





# Creating Breastfeeding Friendly Communities

**1** **Community Partnerships**  
Building and expanding relationships within community settings including businesses and worksites, childcare, and healthcare

**2** **Baby Café**  
Support groups for breastfeeding / chestfeeding people, mothers, partners and family with both peer and professional (IBCLC) support

## GOAL

Advance policy, system, and environmental changes for breastfeeding protection, promotion, and support



# Family Wellness Suites

**1** **Space**  
Providing a safe, welcoming, and supportive space for every family member

**2** **Education and Parental Support**  
Including Safe Sleep, car seat safety, newborn care, infant safety/CPR, childbirth education, lactation care, 4th trimester, NYPL read-along, and parenting classes

**3** **Distribution**  
Including needed resources such as pack n' play cribs, car seats, and emergency diapers





## Service Delivery Impact

Programs	Results
City Wide Doula Initiative (5 boroughs)	Served more than 1200 families since 4/2022; R&E in process YTD: <b>c-section rates (26.7% vs 32%), postpartum depression (1.4% vs 12.8%), preterm birth (5.7% vs 9.2%), low birthweight (6.7% vs 10.1%), analysis underway</b>
Healthy Start Brooklyn (Brooklyn)	Serves more than 200 families per year; compared to catchment area, BMS participants had <a href="#">significantly lower rates of preterm birth (6.3 vs. 12.4%)</a> and <b>low birthweight (6.5 vs. 11.1%)</b> from 2010-2015
Family Wellness Suites (Brooklyn, Bronx, Harlem)	More than 1,000 visits/year for <b>support groups, workshops</b> , 250 car seats/pack n plays, 1000s of diapers. Future measurement of <b>social connection as a promoter</b> of positive maternal health and mental health
Creating Breastfeeding Friendly Communities (Brooklyn, Bronx, Harlem)	All catchment areas saw increased rates of any breastfeeding at 8 weeks and exclusive breastfeeding at 8 weeks; Brownsville saw significant increase in exclusive breastfeeding from <b>9.6% in 2009-2012 to 29.9% in 2017-2020</b>

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What stands out to you from the NYC Health Department programming and services?

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# Public Health Approaches

Addressing root causes

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## Implemented approaches<sup>5</sup> in NYC

Place-based	Collective impact	Anti-Racist	Community health
Multidimensional Defined geographic areas Ecological perspective Based on community needs and priorities	Network committed to advancing equity Learning, aligning, and integrating actions Population and systems level change	People and institutions Center Black and Indigenous people and PoC Account for disparate harm Improve outcomes	Multi-sector Multi-disciplinary Public health science Evidence-based Defined community

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# CMO Birth Equity Initiative

**1 Working Group**  
Convene a group of diverse stakeholders bi-monthly for 2 years to work toward a collective impact goal, achievable in 4 years

**2 Medicaid Maternal Home**  
Advance a home payment bundle model and establish a payer and provider agnostic Brooklyn Maternal Home

**3 Primary Care Integration**  
Support integration with Birth Equity to identify a specific scope of primary care services and establish connections with other safety net programming





## The Vision

Paraphrased:

- Widespread community awareness of racial birth inequities
- Provider and health systems acknowledgement of harms
- Reduction in preventable mortality and morbidity suffered by Black women and birthing persons beginning in Brooklyn
- Requires a collective impact approach.

## Reflections

Successes, gaps, and future direction



## Successes

Implementing public health approaches

Including community

Improvement in many process and outcome metrics

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## Gaps

Comprehensively addressing all root causes

Duplication of efforts

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## Future Direction

More intentional and strategic cross-sector collaboration

Use previous programming and recommendations as guidance

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# Key Takeaways

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## Summary

- The data highlights the inequities in maternal morbidity and mortality
- Public health approaches can help target root causes for a greater segment of the population, especially by using collective impact
- The NYC Health Department has a long history of contributing to birth equity and our programs are having an impact
- A lot of great work has occurred in different spaces and organizations, but more work is needed to better coordinate, align, communicate, and package services as a unit

## Thank you!

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Program and Planning Coordinator  
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718-637-5243



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## Long COVID: Relationship to the Caribbean population

- Alem Mehari MD, MS, FCCP
- Associate Professor of Medicine
- Howard University College of Medicine

6<sup>th</sup> Annual World Health CME Conference  
Health Disparities Impacting Local and Global Caribbean Populations

Arlington, Virginia  
June 16, 2023



## Disclosures

- I have no disclosures



## OBJECTIVES

- What: What is long COVID?
- WHO: Who gets Long COVID?
- How: How do we treat Long COVID?
- Why: What are the Biological Mechanism?
- Implication: to the Caribbean population

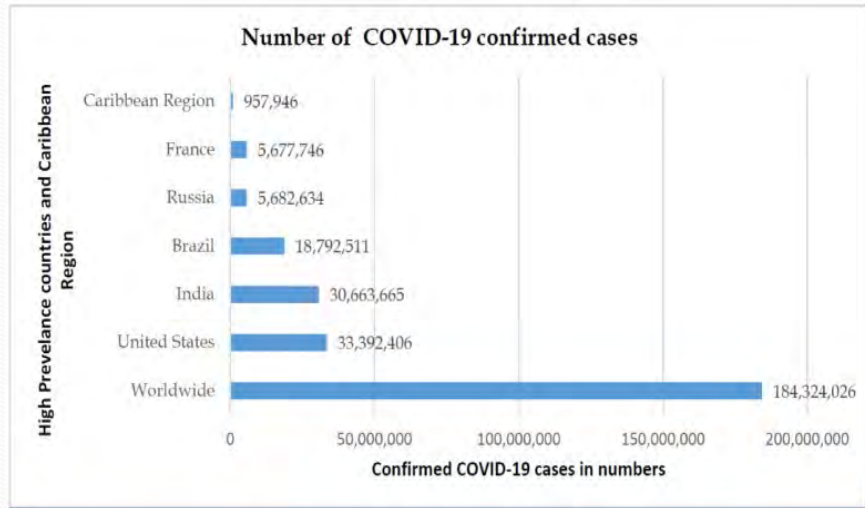
## Burden of COVID-19

- **Globally, as of May 10, 2023 (WHO)**
  - Cases=765,903,278 ,
  - Deaths=6,927,378
- **Caribbean Nations :**
  - First case was reported on March 10, 2020, in Jamaica
  - As of March 9, 2023 (Virus trucker)
    - Cases=4,468,561
    - Deaths=37,053

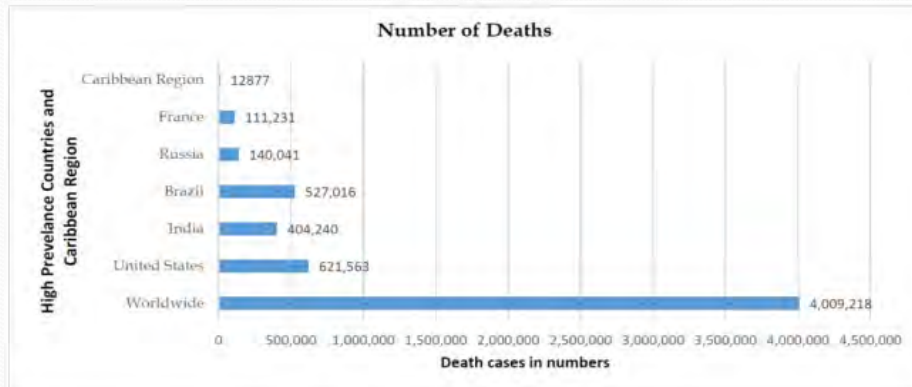




## Caribbean Region Vs. High Prevalence countries



## Caribbean Region Vs. High Prevalence countries





## The Long Shadow of COVID

- The toll of hospitalization and death from acute COVID is only the iceberg
- Long Covid
- Disease and disability
- Development and educational attainment
- Life expectancy
- Economic implications
- Social implications



## Many terms are used to refer to the Long-term sequelae of COVID-19

- Long COVID
  - A patient Community Generated Term
- Post-COVID Condition(s)
  - CDC and WHO
- Post-Acute Sequelae of SARS-CoV-2 (PASC)
  - NIH

**\*\*Long COVID is an emerging phenomenon that is not yet fully understood**



## Long COVID- an Umbrella term

- Overlap with
  - -post hospitalization
  - -post ICU syndrome (PICS)
- Similarities and differences with:
  - Other post viral illnesses
  - Post flu (encephalitis lethargica or sleepy sickness, post encephalitic parkinsonism)
  - Measles ( subacute sclerosing pan encephalitis)
  - EBV (multiple sclerosis)
  - Post-polio syndrome
  - Chronic fatigue syndrome(ME/CFS)

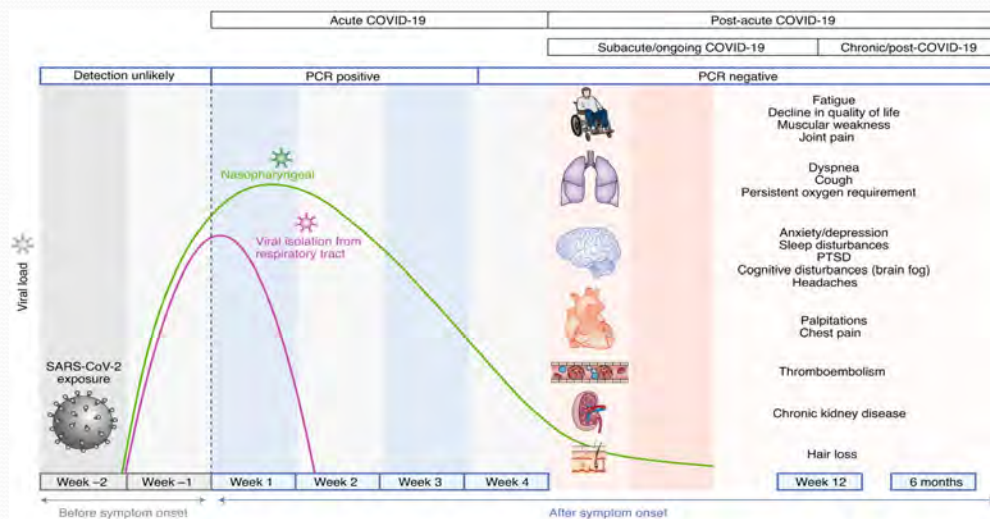
## Dr. ANTHONY FAUCI

- “Even after you clear the virus, there are post viral symptoms. I know, because I follow on the phone a lot of people who call me up and talk about their course. And it’ s extraordinary how many people have a post viral syndrome that’s very strikingly similar to myalgic encephalomyelitis/chronic fatigue syndrome” .

- Fauci to Medscape: 'We're All In It Together and We're Gonna Get Through It'  
Eric J. Topol, MD; Abraham Verghese, MD; Anthony S. Fauci, MD  
July 17, 2020



## Defining post-acute COVID-19/ Long COVID: Symptom Post 12 weeks



Nalbandian A et al. Nat Med 2021; 27:601–15.

## WHO case definition of post COVID-19: October 2021-WHO

- **Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis.**
- **Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time**



## Prevalence of post-COVID conditions among adults

- Self-report of symptoms on surveys range from **13.3%** at 1 month to **2.5%** at 3 months
- Based on electronic health record data.
  - Of non-hospitalized adults with COVID-19, **7.7%** experienced one or more of 10 identified late-onset conditions 1 to 4 months post infection <sup>2</sup>
  - Burden of at least one symptom at 6 months differs by **severity** of acute COVID <sup>3</sup>
  - Overall: 73.4/1,000 patients
    - Non-hospitalized: 44.5/1,000 patients
    - Hospitalized: 217.1/1,000 patients
    - ICU 360.5/1,000 patients

1.Sudre CH et al Nature Medicine 27, 626-631 (2021)  
2.Chevinsky JR et al. Clinical Infectious Diseases 73 (S1) 2021  
3.Xie Y et al. Nature Communications 12, 6571 (2021)

## Wide range in prevalence of post-COVID conditions among children

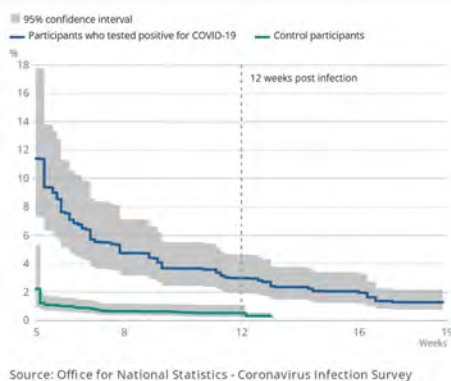
- Symptoms lasting 4 weeks or longer following SARS-CoV-2 infection are common among children and adolescents.
- The most common symptoms include:
  - Headache or respiratory symptoms (~7%)
  - Sleep disorders (~8%)
  - Fatigue (9%)
  - Mood disorders (~16%)

The Pediatric Infectious Disease Journal 41(5):424-426, May 2022.



## Duration and burden of Long COVID can vary among adults

### Report of symptoms lasting 4 or more weeks-April 2020 –August 2021



- The proportion reporting on-going symptoms decreases 4-12 weeks
- Improvement slows around 12 weeks after infection
- symptom prevalence was highest among
  - women
  - adults aged 50 to 69 years,
  - people with a pre-existing health condition, and
  - those with signs of high viral load at the time of infection.

Technical article: Updated estimates of the prevalence of post-acute symptoms among people with coronavirus (COVID-19) in the UK

## Long COVID-Racial and ethnic considerations

- Acute COVID-19 has been recognized to disproportionately affect communities of color.
  - A total of 51.6% of survivors in the post-acute COVID-19 **US** study were Black
  - Black, Asian and minority ethnic (BAME) group comprised 19–20.9% in the **UK** studies
- BAME group were more likely to experience dyspnea than White individuals (42.1 versus 25%, respectively) at 4–8 weeks in only 1 study<sup>2</sup>
- MIS-C is also known to disproportionately affect children and adolescents of African, Afro-Caribbean or Hispanic ethnicity<sup>3</sup>
- Larger studies are required to ascertain the association between sequelae of post-acute COVID-19 and race and ethnicity.

1.Chopra V. Et al..Ann. Intern. Med 10.7326/M20-5661 (2020)  
2.Arnold DT et al Thorax 10.1136/thoraxjnl-2020-216086 (2020)  
3.Henderson LA et al Arthritis Rheumatol. 72, 1791–1805 (2020)



**Annals of Internal Medicine**

**OBSERVATIONS: BRIEF RESEARCH REPORTS**

**Sixty-Day Outcomes Among Patients Hospitalized With COVID-19**

**Background:** Although characteristics and in-hospital outcomes for persons with coronavirus disease 2019 (COVID-19) have been well described, less is known about the longer-term outcomes of hospitalized patients.  
**Objective:** To describe 60-day postdischarge clinical, financial, and mental health outcomes of patients with COVID-19.  
**Approach:** This observational cohort study looked at patients hospitalized with COVID-19 (discharged between 16 March and 1 July 2020) at 38 hospitals participating in the MI COVID-19 initiative. The aim of MI-COVID-19, a Michigan state-wide collaboration sponsored by Blue Cross Blue Shield of Michigan (BCBSM) and Blue Care Network, is to improve care for patients hospitalized with COVID-19. Trained quality abstractors (often registered nurses) collect data from patient

**LETTERS**

medical records using structured templates. For hospitals unable to abstract all COVID-19 hospitalizations, a sample is selected for inclusion by using a pseudo-randomization procedure (minute of hospital discharge).  
 At 60 days after discharge, abstractors review the medical record to collect data on clinical events, including readmission (to the index hospital or any hospital viewable in the medical record) and postdischarge death. In addition, for all patients alive and not residing in a health care or correctional facility, abstractors contact patients by telephone to complete a survey about primary care follow-up, ongoing cardiopulmonary symptoms, return to normal activity, financial impact, and emotional and mental health outcomes. At least 3 attempts are made to contact patients. The study was deemed "not regulated" by the University of Michigan institutional review board (HUM 001796.11).  
**Findings:** Of 1648 patients with COVID-19 admitted to 38 hospitals, 308 (24.2%) died during hospitalization and 1250 (75.8%) survived. Of 1250 patients discharged alive, 975 (78.0%) went home whereas 155 (12.6%) were discharged to a

**Table 1. Demographic and Clinical Characteristics of 1250 Survivors of COVID-19 Hospitalization**

Characteristics	Value*
<b>Patient characteristics</b>	
Median age (IQR), y	62 (50-72)
Male	648 (51.8)
Race	
Black	445 (35.6)
White	466 (37.3)
Other/unknown	139 (11.1)
Ethnicity	
Hispanic	55 (4.4)
Non-Hispanic	1079 (86.7)
Unknown	116 (9.3)
<b>Residence before hospitalization</b>	
Home	1034 (82.8)
Congregate living facility†	190 (15.2)
Subacute rehabilitation facility	8 (0.6)
Other/unknown	18 (0.4)
<b>Chronic conditions</b>	
Hypertension	800 (64.0)
Diabetes	436 (34.9)
Cardiovascular disease	301 (24.1)
Moderate/severe kidney disease	287 (23.0)
Asthma	168 (13.4)
Congestive heart failure/cardiomyopathy	145 (11.4)
Chronic obstructive pulmonary disease	130 (10.4)
Cerebrovascular disease/paraplegia	130 (10.4)
Dementia	96 (7.7)
Cancer‡	89 (7.1)
No chronic conditions	179 (14.3)
<b>Hospitalization characteristics</b>	
Treated in an ICU	165 (13.2)
Treated with invasive mechanical ventilation	75 (5.9)
Treated with supplemental oxygen	865 (69.2)
Median length of hospitalization (IQR), d	8 (5-8)
Discharged to a health care facility	158 (12.6)

COVID-19 = coronavirus disease 2019; ICU = intensive care unit; IQR = interquartile range.

Data from 38 hospitals participating in the MI COVID19 initiative in Michigan

Nearly 1 in 3 patients died during hospitalization or within 60 days of discharge

Chopra V. Et al. Ann. Intern. Med 10.7326/M20-5661 (2020)

**Table 2. 60-Day Outcomes Among 1250 Survivors of COVID-19 Hospitalization, 488 of Whom Completed the Telephone Survey**

Outcome	Value*
<b>Mortality and rehospitalization</b>	
Died in the 60 d after discharge, n (% of hospital survivors)	85 (6.7)
Rehospitalized, n (% of hospital survivors)	189 (15.1)
<b>Primary care follow-up</b>	
Any follow-up primary care visit in the 60 d after discharge	382
Established PCP	352
New PCP	30
Visit type	
Clinic	77
Telephone	143
Videoconference	161
Days from discharge to visit	
<15	265
15-30	74
>30	37
Home health services	98
<b>New/worsened symptoms</b>	
Persistent symptoms related to illness	159
New or worsening symptoms related to illness	92
Continued loss of taste and/or smell	64
Cough	75
Shortness of breath/chest tightness/whooping	81
Difficulty ambulating due to chest problems	44
Breathlessness walking up stairs	112
Oxygen use	32
New use of CPAP or other breathing machines when asleep	34
<b>Return to normal activity</b>	
Unable to return to normal activity	188
New or worsening difficulty completing activities of daily living‡	58
<b>Return to employment</b>	
Employed full- or part-time before COVID-19 hospitalization	195
Able to return to work by 60 d after discharge	117
Median days from discharge to work return (IQR)	27 (13-42)
Reduced hours and/or modified duties upon return to work due to health	30
Unable to return to work	78
Because of health	45
Because of job loss	21
<b>Emotional impact</b>	
Emotionally affected at least mildly by health conditions	238
Emotionally affected at least moderately by health conditions	124
Health care use related to mental health	28
<b>Financial loss/impact</b>	
Financially affected at least mildly by health conditions	179
Financially affected at least moderately by health conditions	124
<b>Specific financial effects</b>	
Used up all or most of savings	47
Unable to pay for necessities, such as food, heat, and housing	29
Contacted by a collection agency	17
Skipped or delayed getting medical care because of cost	16
Took less medication than was prescribed because of cost	11

COVID-19 = coronavirus disease 2019; CPAP = continuous positive airway pressure; IQR = interquartile range; PCP = primary care physician.

\*Values are numbers of patients unless otherwise indicated.

Chopra V. Et al. Ann. Intern. Med 10.7326/M20-5661 (2020)

• For most patients ongoing morbidity, including the inability to return to normal activities, physical and emotional symptoms, and financial loss was common.

• 1 in 5 had no primary care follow-up visit within 60 days



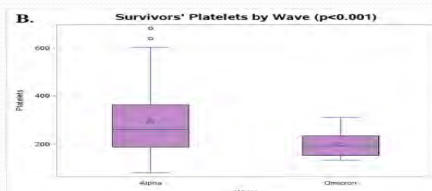
BRIEF REPORT

Open Access

### Comparing the demographics and laboratory biomarkers of the COVID-19 Omicron wave and the Alpha wave in a predominantly Afro-Caribbean patient population in New York City

Hye Won Shin<sup>1\*</sup>, Alecia James<sup>2</sup>, Theresa Feng<sup>3</sup>, Lillian Chow<sup>4</sup> and Robert Foronjy<sup>5</sup>

- Retrospective, single-center, observational study
- From 27 ICU admitted COVID-19 in Kings County NY
- “Omicron wave” (November 1, 2021, to January 31, 2022 ) Vs. first wave “Alpha wave,” from March 28, 2020, to April 30, 2020.
- UHD serves a predominantly **Afro-Caribbean**
- Patient population with African Americans representing 91.2% of the local population
- **women** constituting most of the Omicron related deaths.



**Table 1** Characteristics of Alpha and Omicron Waves

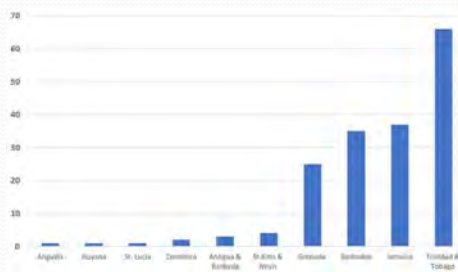
Characteristic	All Patients by Wave (n = 298)			All Non-Survivors by Wave (n = 197)			Omicron Wave by Survival Status (n = 27)		
	Alpha (n=271)	Omicron (n=27)	p-value	Alpha (n=162)	Omicron (n=15)	p-value	Survivor (n=12)	Non-Survivor (n = 15)	p-value
	n (%)	n (%)		n (%)	n (%)		n (%)	n (%)	
	271 (90.1%)	27 (9.06%)		182 (92.4%)	15 (7.61%)		12 (44.4%)	15 (55.6%)	0.56
Age (mean, sd)	66.6 ± 12.8	65.3 ± 11.4	0.60	69 ± 11.4	68.7 ± 10.4	0.91	61.2 ± 11.7	68.7 ± 10.4	0.09
Sex									
Male	157 (57.9)	11 (40.7)	0.08	112 (61.5)	5 (33.3)	0.03	6 (50.0)	5 (33.3)	0.38
Female	114 (42.1)	16 (59.3)		70 (38.5)	10 (66.7)		6 (50.0)	10 (66.7)	
Race									
Black	239 (88.2)	23 (85.2)	0.54	165 (90.7)	15 (100)	0.67	8 (66.7)	15 (100.0)	0.12
White	11 (4.06)	1 (3.70)		7 (3.85)	0 (0)		1 (8.33)	0 (0.0)	
Hispanic	6 (2.21)	0 (0)		2 (1.10)	0 (0)		0 (0.0)	0 (0.0)	
Asian	2 (0.74)	1 (3.70)		0 (0)	0 (0)		1 (8.33)	0 (0.0)	
Unknown	13 (4.80)	2 (7.41)		8 (4.40)	0 (0)		2 (16.7)	0 (0.0)	
Comorbidities									
Asthma	25 (9.23)	5 (18.5)	0.13	17 (9.34)	3 (20.0)	0.19	2 (16.7)	3 (20.0)	0.82
COPD	22 (8.12)	2 (7.41)	0.90	16 (8.79)	1 (6.67)	0.78	1 (8.33)	1 (6.67)	0.87
Diabetes	152 (56.1)	16 (59.3)	0.75	104 (57.1)	9 (60.0)	0.83	7 (58.3)	9 (60.0)	0.93
Hypertension	211 (77.9)	22 (81.5)	0.66	148 (81.3)	12 (80.0)	0.90	10 (83.3)	12 (80.0)	0.82
MI	8 (2.95)	1 (3.70)	0.83	7 (3.85)	0 (0)	0.44	1 (8.33)	0 (0.0)	0.25
CKD	41 (15.1)	7 (25.9)	0.15	29 (15.9)	5 (33.3)	0.09	2 (16.7)	5 (33.3)	0.33
Covid-19 Vaccination Status									
Yes							4 (33.3)	8 (53.3)	0.15
No							8 (66.7)	5 (33.3)	
Unknown							0 (0)	2 (13.3)	





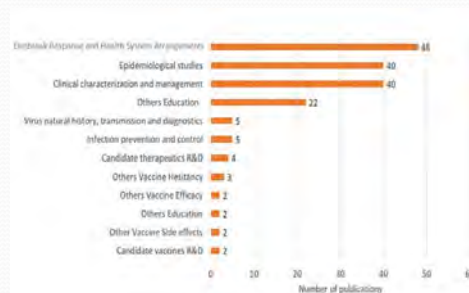
## Researchers from English speaking Caribbean have published articles on wide-ranging COVID topics

### COVID papers by country



University of the West Indies and its three campuses of medicine in Jamaica, Barbados, Trinidad, and Tobago

### 175 Papers on COVID between 2020-2022



knowledge gap exist on **long-COVID** syndrome in the region

Chatterjee, E., et al. (2022). "A Bibliometric Analysis of COVID-19 Scientific Literature From the English-Speaking Caribbean." *Cureus* 14(11): e30958.

## WHO is at a higher Risk for Long COVID?

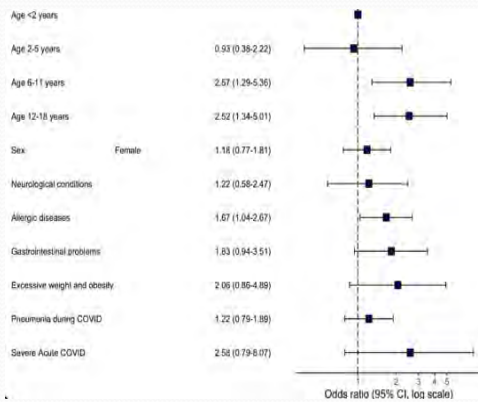
- The severity of illness during acute COVID-19
- Older age,
- Women
- **Black, Asian and minority ethnic**
- Pre-existing comorbidities (including obesity, diabetes, and chronic lung disease)

- Huang C et al. *Lancet* 397, 220–232 (2021).
- Halpin SJ et al. *J. Med. Virol* 93, 1013–1022 (2021).

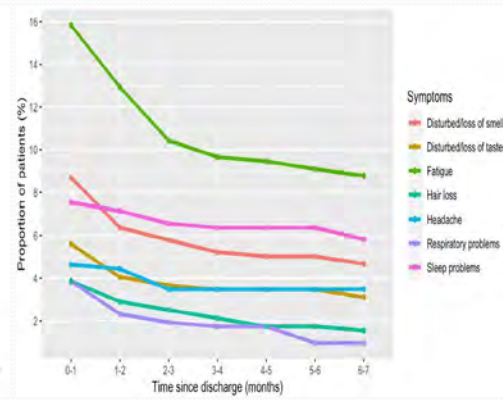


## Risk factors of post-COVID conditions in children previously hospitalized for COVID-19

### Risk factors include older age and allergic disease

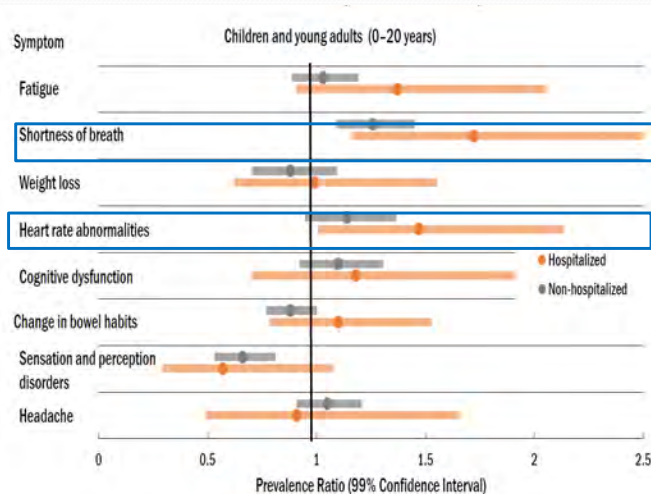


### Symptoms decrease over time



Osmanov et al. Eur Respir J 2022 Feb 3;59(2):2101341

## New symptoms 31-150 days after testing positive for SARS-CoV-2



Those who tested **positive for COVID-19** were more likely than patients who tested negative to have **shortness of breath and heart rate abnormalities**

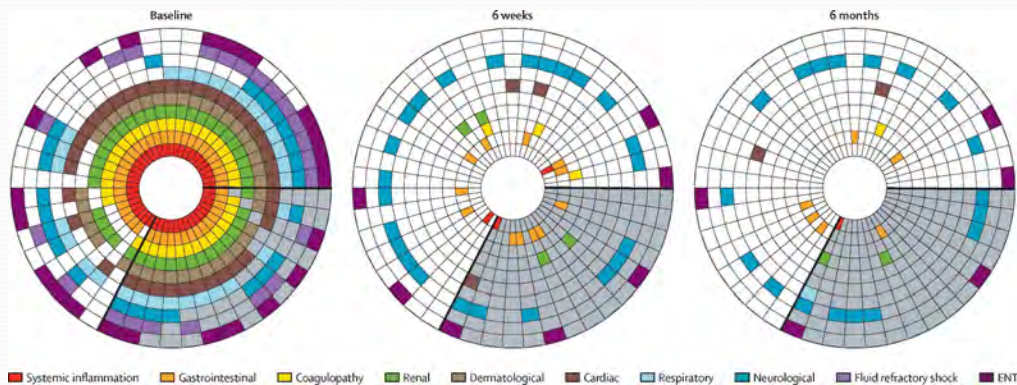
Prevalence ratio is the proportion with symptom & COVID-19 + divided by the proportion with the symptom & COVID-19 -

Hernandez-Romieu et al. JAMA Netw Open. 2022 Feb 1;5(2):e2147053



## Children with Multisystem Inflammatory Syndrome (MIS-C) appear to have higher risk of ongoing symptoms following MIS-C

- Continued difficulties at 6 months were reported by 35% of children and 21% of the children's parents
- Specific system involvement decreased by 6 months



Penner et al. Lancet Child Adolesc Health 2021; 5: 473-82

## Post-COVID conditions may be less likely to occur after vaccine breakthrough

- Less likely to have symptoms between 12 and 20 weeks after infection compared to persons unvaccinated (OR 0.22, 95% 0.20, 0.25)
- Lower the occurrence of post-COVID conditions in persons with infection after vaccination (who tend to have milder infections) than infections in persons who are unvaccinated

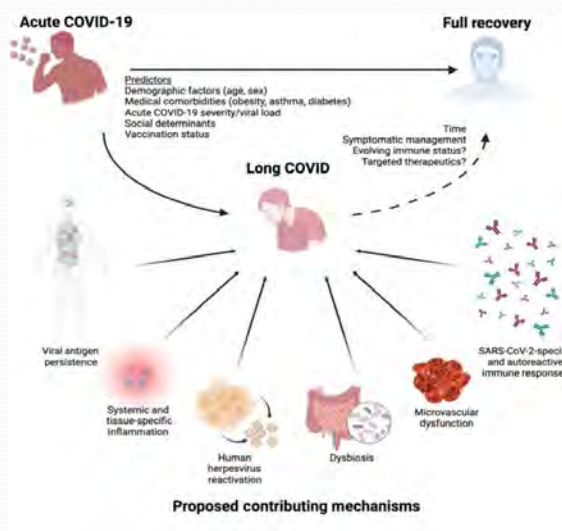
- Simon et al. / medRxiv 2022
- Tarequet et al. / medRxiv 2022



## Long COVID-Are there specific tests?

- Viral persistence- in fat cells, myeloid cells
- High level spike protein= associated with Long COVID
- Need to be tested, we need a biomarker.

## Potential Mechanisms of long-COVID.

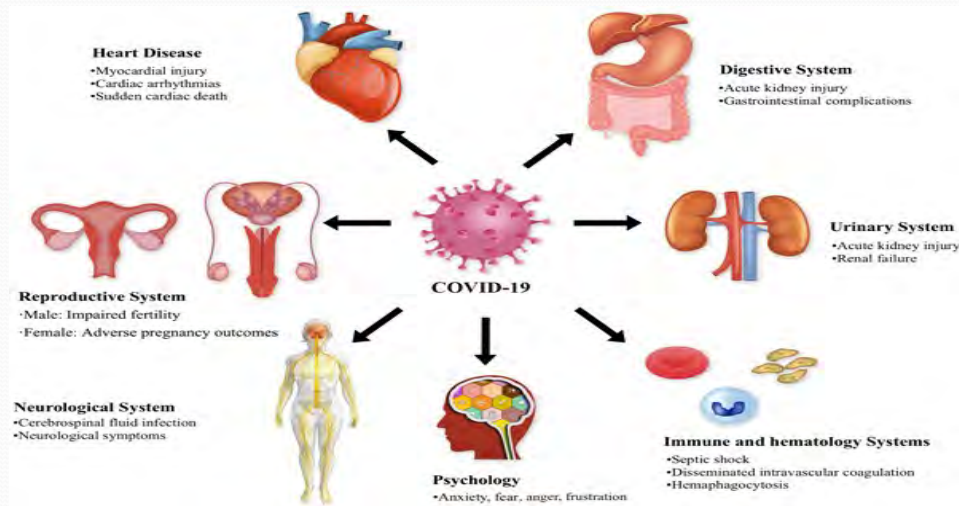


- Acute Viral infection with irreversible tissue damage
- Persistent viral infection and ongoing tissue harm
- Inflammation
- Auto-antibodies
- Microvascular disease( clotting, endothelitis)

Peluso, M. J. and S. G. Deeks (2022). Trends Immunol 43(4): 268-270.



## COVID-19 is a Multi-Organ System Disease Acutely....



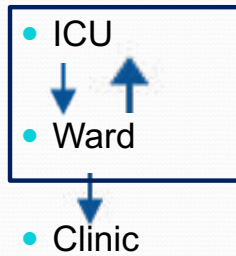
Zheng et al. J Med Virol. 2021 Jan; 93(1): 323–335

## ...And Long(er) Term Outcomes

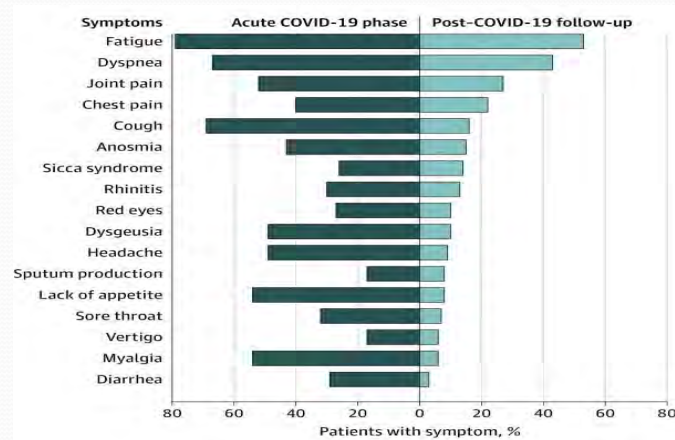
- Long- COVID syndrome
  - Waxing and waning
  - Fatigue
  - Paresthesia
  - Cognitive impairment
  - Dyspnea
  - Palpitations



## Patients Traverse Multiple Healthcare Contexts



## Illness Trajectory: What happens after Recovery



• Carfi. et al JAMA. 2020 Aug 11; 324(6): 603-605

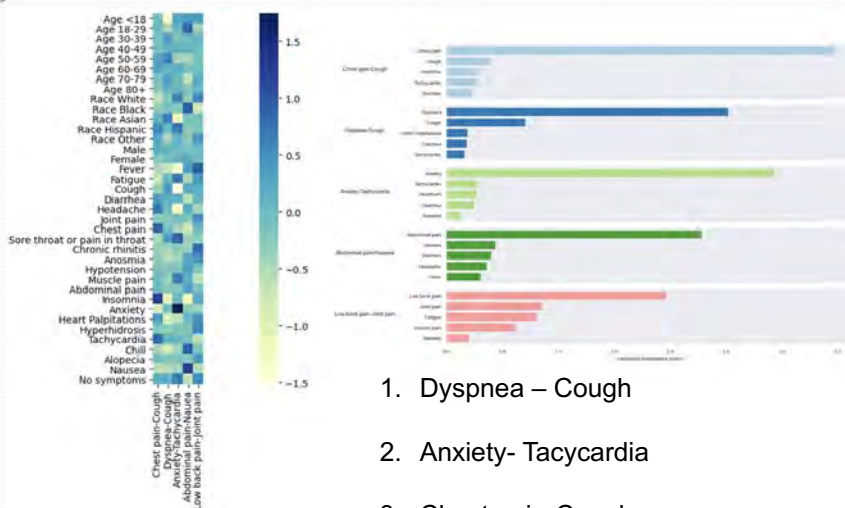




## Important to Note

- There is no one “ Long COVID”.
- Each patient is unique and there are some common **symptom Clusters**.
- symptom clusters are named based upon the two most prevalent symptoms reported with in each cluster.

## At Least 5 Main Symptom Cluster



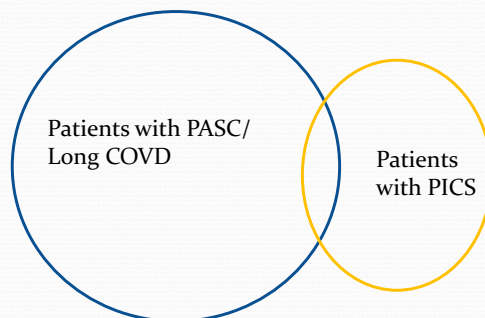
1. Dyspnea – Cough
2. Anxiety- Tachycardia
3. Chest pain-Cough
4. Backpain-joint pain
5. Abdominal pain-nausea

Huang et al . MedRxiv 2021





## PASC≠PICS, but some key Similarities and Lessons



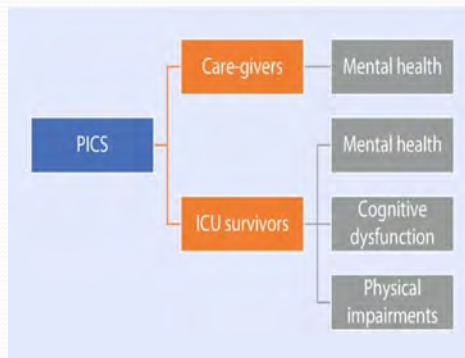
## All that “ Long –Hauls” is not COVID

- **Avoid anchoring** and keep broad DDX throughout
- Until we elucidate the biology and have Clinical Trials,
- Treatments are largely symptom -driven



## Post-Intensive Care Syndrome(PICS) Framework

- Holistic approach to caregivers and patients-translates to COVID
- Pulmonary impairment
- Physical impairments
- Cognitive dysfunction
- Mental Health



Flaatten, H, Waldmann, C. Post-Intensive Care Syndrome, 2020 ISBN : 978-3-030-24249-

## Post-COVID-19 clinics help survivors recover



- Post-COVID-19 clinics help survivors recover



- Post-Covid clinics get jump-start from patients with lingering illness



## Howard University hospital (HUH) Post COVID-19 Clinic

- At HUH we started a post covid clinic in 2020
  - 4 weeks post discharge follow-up those who were admitted to floor and ICU with COVID-19
- Any referral from the community
- Follow-up of Patients at 3,6,9 and 12 months and beyond post discharge
- Coordination with Research teams (local) and National- NIH- RECOVER
- US Congress recently allocated over \$1 billion dollars for the study of PASC
- NIH is now implementing a massive program [Researching COVID to Enhance Recovery (RECOVER )



## Post –Hospitalization outpatient Follow-up structure



- Hub with Collaborators
  - Pulmonary Rehab
  - Cardiology
  - Electrophysiology
  - Primary care
  - Nephrology



## Multidisciplinary Post-COVID-19 Clinic: Decreased ED Visits and Hospital Admissions

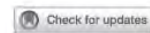
- In this retrospective cohort study of COVID-19 survivors discharged from a single academic medical center, attendance at a multidisciplinary follow-up clinic was associated with fewer hospitalizations and ED visits.
- Suggesting that multidisciplinary post-COVID-19 clinics may play a valuable role in post-COVID-19 care.

• Levan et al. Chest 2023 Jan 4;S0012-3692(23)00009-0

[ Education and Clinical Practice How I Do It ]

 CHEST

### Rapid Design and Implementation of Post-COVID-19 Clinics



*Lekshmi Santhosh, MD, MAEd; Brian Block, MD; Soo Yeon Kim, MD; Sarath Raju, MD, MPH; Rupal J. Shah, MD; Neeta Thakur, MD, MPH; Emily Pfell Brigham, MD, MHS; and Ann Marie Parker, MD, PhD*

Survivors of COVID-19 are a vulnerable population, with complex needs because of lingering symptoms and complications across multiple organ systems. Those who required hospitalization or intensive care are also at risk for post-hospital syndrome and post-ICU syndromes, with attendant cognitive, psychological, and physical impairments, and high levels of health care utilization. Effective ambulatory care for COVID-19 survivors requires coordination across multiple subspecialties, which can be burdensome if not well coordinated. With growing recognition of these needs, post-COVID-19 clinics are being created across the country. We describe the design and implementation of multidisciplinary post-COVID-19 clinics at two academic health systems, Johns Hopkins and the University of California-San Francisco. We highlight components of the model which should be replicated across sites, while acknowledging opportunities to tailor offerings to the local institutional context. Our goal is to provide a replicable framework for others to create these much-needed care delivery models for survivors of COVID-19.

CHEST 2021; 160(2):671-677

**KEY WORDS:** coronavirus; long COVID-19; outpatient care; post-COVID-19; post-ICU



## Long COVID: Mechanistic approach to therapy

- Acute Viral infection with irreversible tissue damage
- Persistent viral infection and ongoing tissue harm
- Inflammation
- Auto-antibodies
- Microvascular disease( clotting, endothelitis)

## Clinical trials on the Horizon

### Mehanism

- Acute Viral infection with irreversible tissue damage
- Persistent viral infection and ongoing tissue harm
- Inflammation
- Auto-antibodies
- Microvascular disease( clotting, endothelitis)

### Treatment

- Prevention: Post-acute vaccine, antivirals, anti-inflammatory drugs
- Antiviral drugs, monoclonal antibodies, therapeutic vaccine
- Anti-inflammatory drugs, anti-EBV, microbiome –specific therapies
- IVIG, B cell directed therapies
- Anticoagulants, thrombolytics, dialysis



Study We are for Clinical Practice

## Active research studies and questions pertaining to post-acute COVID-19

<u>Question</u>	<u>Study name and/or ID</u>
What are the long-term sequelae of COVID-19?	COVIDOM ( <a href="#">NCT04679584</a> ) CO-Qo-ICU ( <a href="#">NCT04401111</a> ) MOIST ( <a href="#">NCT04525404</a> ) LIINC ( <a href="#">NCT04362150</a> ) <a href="#">NCT04411147</a> <a href="#">NCT04573062</a> <a href="#">NCT04605757</a>
What are the immunologic, enzymatic, metabolic and radiographic predictors of post-acute COVID-19?	BIOMARK-COVID ( <a href="#">NCT04664023</a> ) MOIST ( <a href="#">NCT04525404</a> )
What are the long-term effects of COVID-19 on functional exercise capacity?	CO-Qo-ICU ( <a href="#">NCT04401111</a> ) COREG Extension ( <a href="#">NCT04602260</a> )

### **Pulmonary**

Is there a role for antifibrotic therapy for the prevention of development of pulmonary fibrosis and other respiratory complications in COVID-19 survivors?

[NCT04652518](#)

[NCT04282902](#)

[NCT04541680](#)

[NCT04527354](#)

Does pulmonary rehabilitation improve pulmonary outcomes in post-acute COVID-19?

[NCT04649918](#)

[NCT04365738](#)

[NCT04406532](#)

[NCT0464204](#)

### **Cardiovascular**

What are the medium- and long-term effects of COVID-19 on biventricular cardiac function?

CO-Qo-ICU ([NCT04401111](#))

MOIST ([NCT04525404](#))



## RECOVER: First Large RCT(NCT05595369)

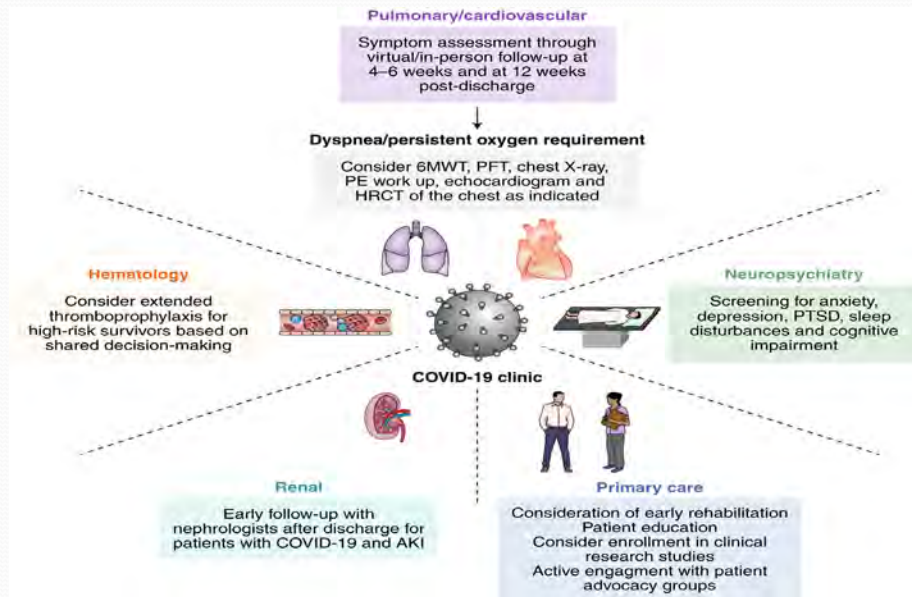
- Phase 3 randomized clinical trial(platform)
  - Paxlovid versus placebo
  - 15days
- Study population(N=1700)
  - At least one moderate cluster symptom(>4weeks since COVID-19, persisting>8weeks)
- Outcome: Patient reported outcomes (PROS)
  - Exercise intolerance symptom cluster: symptom frequency over 6 months
  - Cognitive dysfunction symptom cluster: PROMIS
  - Autonomic dysfunction symptom cluster: orthostatic hypotension questionnaire

## Basics of Clinical Management

- Rule out other causes of symptoms (CVD, Endocrinopathies)
- Holistic approach: medication, rehabilitation, Physical therapy, mental health support, social and financial support
- Orthostasis and dysautonomia : treatment available
- Off-label therapies often used: Antivirals, steroids, IVIG , others
- We desperately need funded centers of excellence with clinicians, physical therapies/physiatrists, social workers, and mental health experts(“Long COVID clinic”) that are accessible to all
- Telemedicine will likely be needed to reach everyone.



## Interdisciplinary management in COVID-19 clinics.



Peluso, M. J. and S. G. Deeks (2022). Trends Immunol 43(4): 268-270.

## WHO has identified three “Rs” to help guide actions:

- **Recognition** – Given the wide variety of post-COVID symptoms and the stigma around the condition, countries must ensure that healthcare workers have enough training to recognize symptoms.
- **Rehabilitation** – Managing post-COVID condition requires a multi-disciplinary approach, with physical therapists, occupational and speech therapists, mental health professionals, nurses and doctors working together in a holistic manner.
- **Research** – We still do not know enough about post-COVID condition. We need scientists and research institutions to commit to closely following those with symptoms so we can learn more about this condition.





## Implications for health systems

- Burden of Long COVID is likely substantial of people with COVID-19
- Managing the long-COVID in the population will remain a major challenge for health services in the next stage of the pandemic
- Long COVID is a multifaceted disease that can affect nearly every organ system
  - Rise in burden of chronic diseases (cardiovascular disease, diabetes, kidney disease , etc)
- The understanding that there are distinct clusters of persistent symptoms is important for the recognition and clinical management of the condition outside of specialized services

## Implication for communities

- Best way to prevent Long Covid is to prevent primary infection or reinfection with SARS-COV2
- Misinformation, disinformation and gas lighting
- The power of patient advocacy

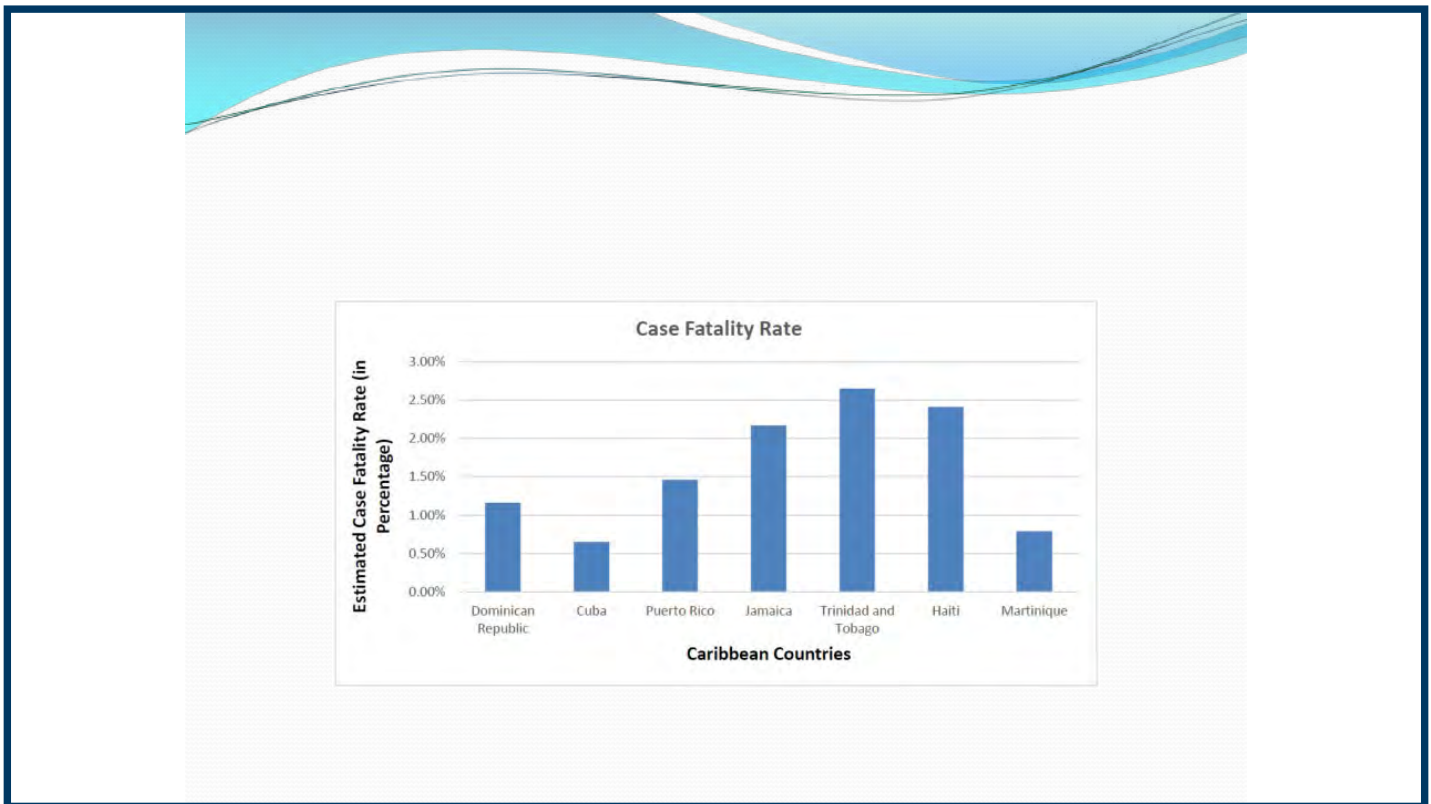


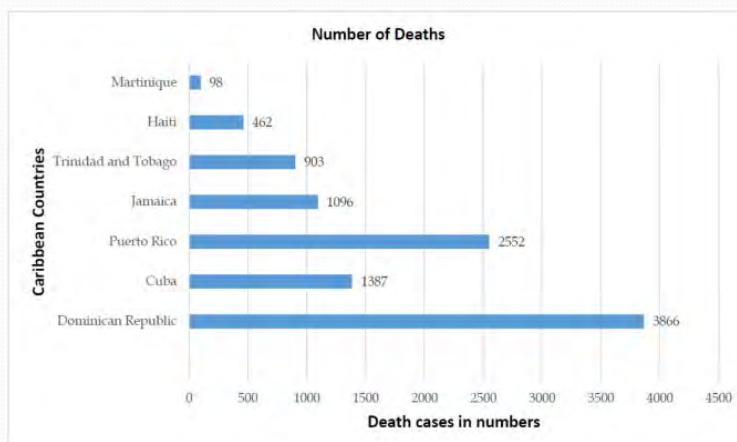
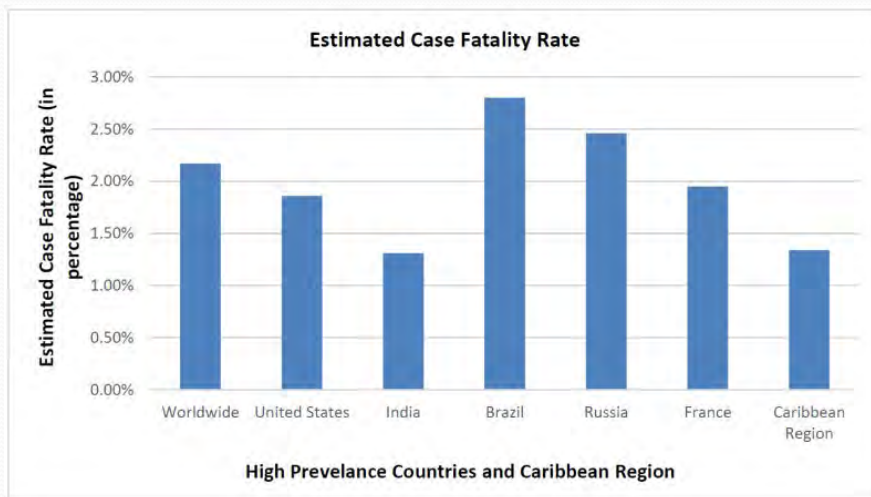
## Conclusion

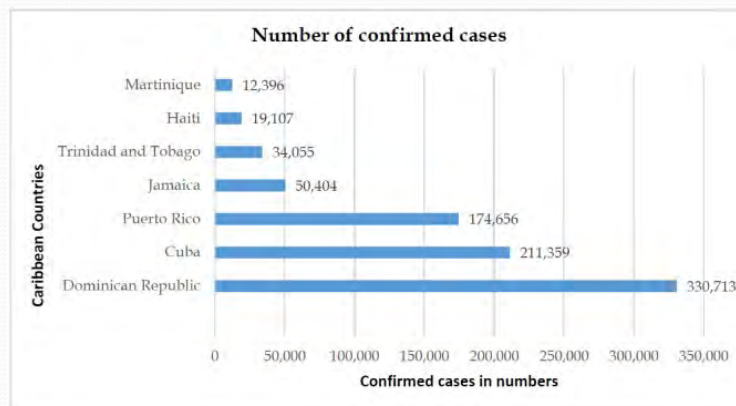
- Long COVID is a multifaceted disease; it can affect nearly every organ system
- The burden of Long COVID is around 4-7%
- Some Long COVID manifestations are chronic conditions that last a lifetime
- Governments and health systems must adapt quickly and establish Post COVID strategies
- Focus areas must be on equity, health promotion, and sustainable development, Invest sufficiently in public health
- Proven treatments urgently needed



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## Role of Caribbean Public Health Agency (CARPHA):

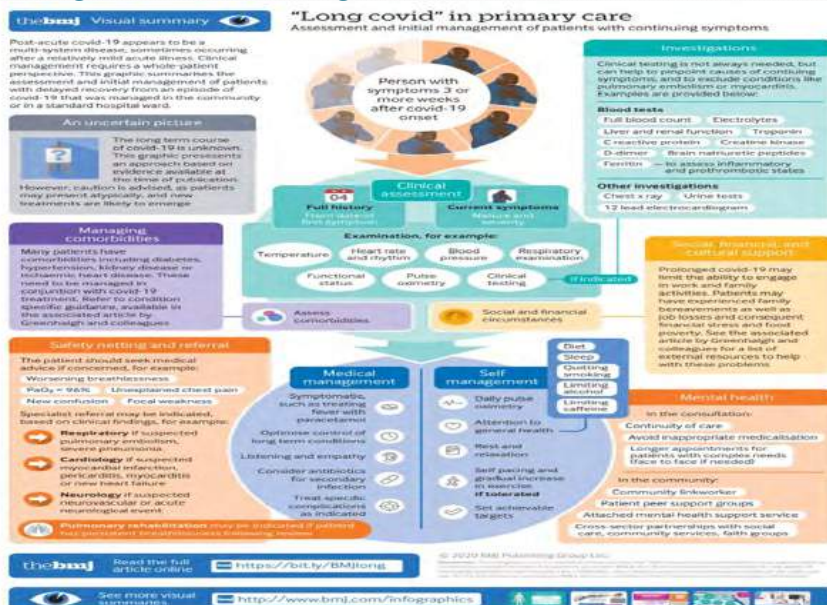
- Once WHO announced COVID-19, a pandemic, CARPHA upgraded the disease transmission risk as “very high” and initiated the following actions:
  - 1) coordinating regional preparedness and activating incident management team,
  - 2) issued situation reports to its members states,
  - 3) developed travelers' air and seaport guidelines,
  - 4) released updated case definitions, statistical and preventive strategies to the health authorities, and
  - 5) security cluster tracing of passengers from high-risk countries
- Caribbean Public Health Agency (CARPHA) Available from: <https://carpha.org/What-We-Do/Public-Health/Novel-Coronavirus>



## Integrating Health into Tourism for Recovery and Resilience in the Caribbean

- Travel and tourism are crucial to the sustainability and
- resilience of Caribbean economies, as they drive revenue, employment and foreign exchange.
- However, travel and tourism can also be a source of disease introduction and spread, and consequently, have negative impacts on Caribbean health.

## Long COVID-19 Pager



Greenhalgh et al. BMJ. 2020 Aug 11;370:m3026. doi: 10.1136/bmj.m3026.



# Cholera Resurgence During the Greatest Humanitarian Crisis in Haiti

Vanessa Rouzier, MD

Head of Pediatrics, GHESKIO Centers, PAP, Haiti

Assistant Professor, Weill Cornell Medical College, New York

June 16, 2023



**Weill Cornell  
Medicine**

## Purpose and Objectives

### PURPOSE

Discuss the resurgence of cholera in the context of Haiti's current massive humanitarian crisis

### OBJECTIVES

1. Review cholera epidemiology in Haiti and the Americas
2. Present the cholera response in Haiti and its impact on international policy
3. Discuss the impact of multiple political crises on the global resurgence of cholera

### FINANCIAL DISCLOSURE

None



## Outline

- Cholera in Haiti
  - 2010-2018
  - 2022
- World cholera outbreaks in 2022
- Political and environmental crises and cholera
- Reducing health disparities and improving models of care delivery

## GHESKIO Centers

- Haitian NGO, founded in 1982
- Mission: Address public health issues affecting Haitians with three pillars:
  1. Translational research aimed at developing public health models
  2. Training: largest post graduate training center in Haiti
  3. Clinical care: infectious and non-communicable diseases. One of the largest HIV and TB centers in the Americas
- Comprehensive model of care: primary school, vocational training, economic support
- Technical partner of the Ministry of Health and other local institutions
- Strong international collaboration for clinical care and research
- Continuous support from NIH since 1983







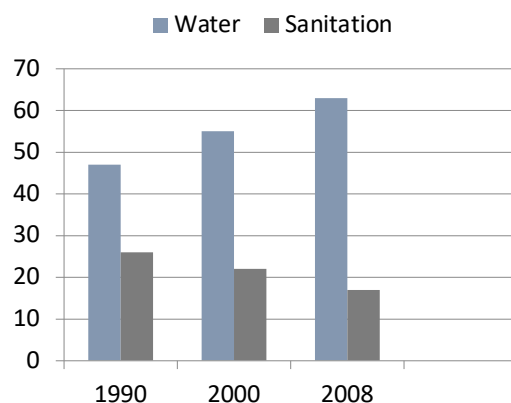
## Cholera Introduction in Haiti - 2010

- Ten months after the devastating January 2010 earthquake, Haiti was struck by a deadly cholera outbreak.
- Initial cases along a tributary of the Artibonite river, Haiti's largest, quickly overflowed downstream leading to a national epidemic of massive proportions.
- All conditions were present for a perfect storm:
  - Haiti is the poorest country in the region with the lowest health indices and access to potable water and sanitation
  - A weak healthcare infrastructure with limited epidemiological surveillance capacity
  - An immunologically naïve population with no prior immunity
  - Massive constant bolus of infectious agents in Haiti's largest river; river water traditionally used for bathing, cleaning clothes and drinking

## Cholera: A disease of Health Disparity

### □ Haiti's endemic poverty and WASH deficiencies:

- 54% Living on <\$1/day and 78% living on <\$2/day
- **63% Access to improved water** (2015 MDG = 73%)
- **17% Access to improved sanitation** (2015 MDG = 68%)



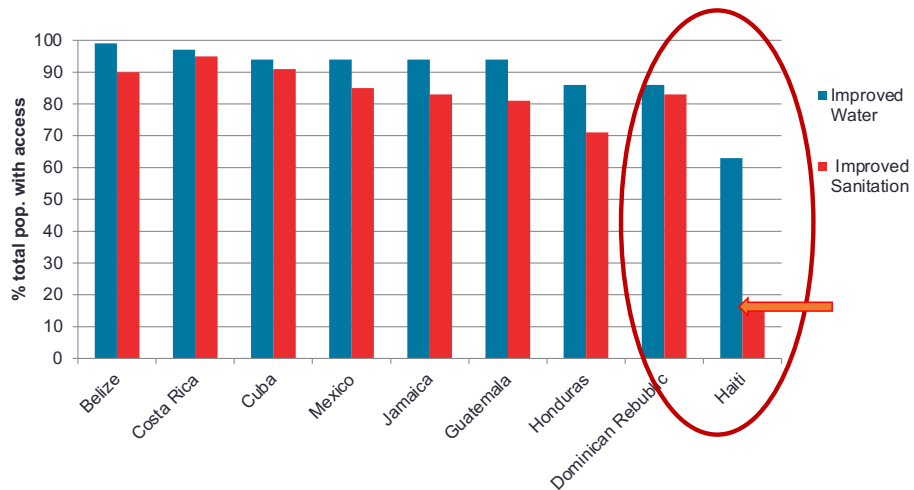
WHO/UNICEF Joint Monitoring Program, 2010.



Photo by Chuck Holton

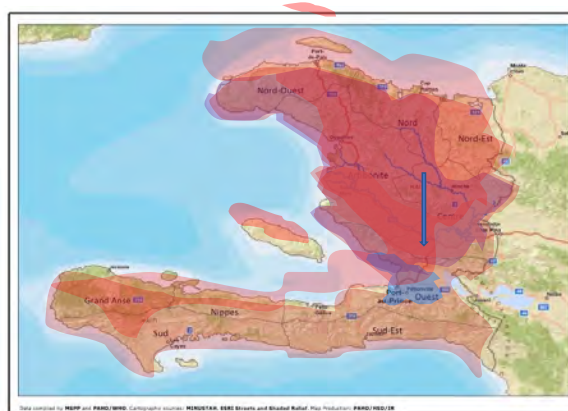


## Health Disparities within Latin America and the Caribbean: % Total Population with Access to Improved Water and Sanitation (2008)



Source: WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation

## Cholera: Nationwide Spread in 60 Days



- **2010 - 2018: 818,861 cases, 9,753 dead**
- **2017: 13,681 cases, 159 deaths**



## Haiti Cholera Epidemic in 2010



## GHESKIO's Response



### **Establish Treatment Centers:**

- 1<sup>st</sup> two cholera treatment centers in the West departments with capacity for 250 patients
- 10 Oral Rehydration Points in the community

### **Integrated Prevention Model:**

- Water: distribution, chlorination, testing, chlorine factory (provides for 100,000 persons)
- Sanitation and hygiene
- Education and Training: community workers, leaders, health personnel
- Implement model in tent cities and major markets
- First introduction of oral cholera vaccine

### **Research:**

- Describe epidemiology
- Impact of integrated package of care





## Cholera Treatment Centers



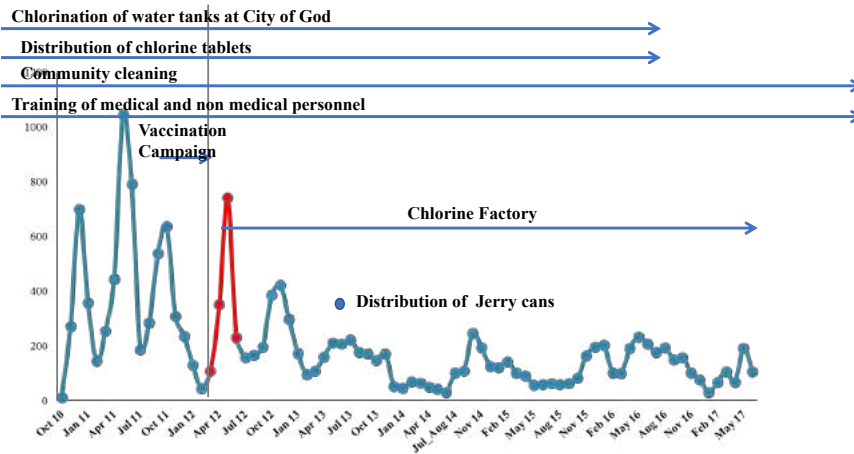
## GHESKIO CTC



Capacity: 100 beds; Bio digester sterilize human waste on site using Anaerobic digestion



## Patients admitted with severe diarrhea to the GHEKIO CTC: October 2010 – June 2017 N = 16,063

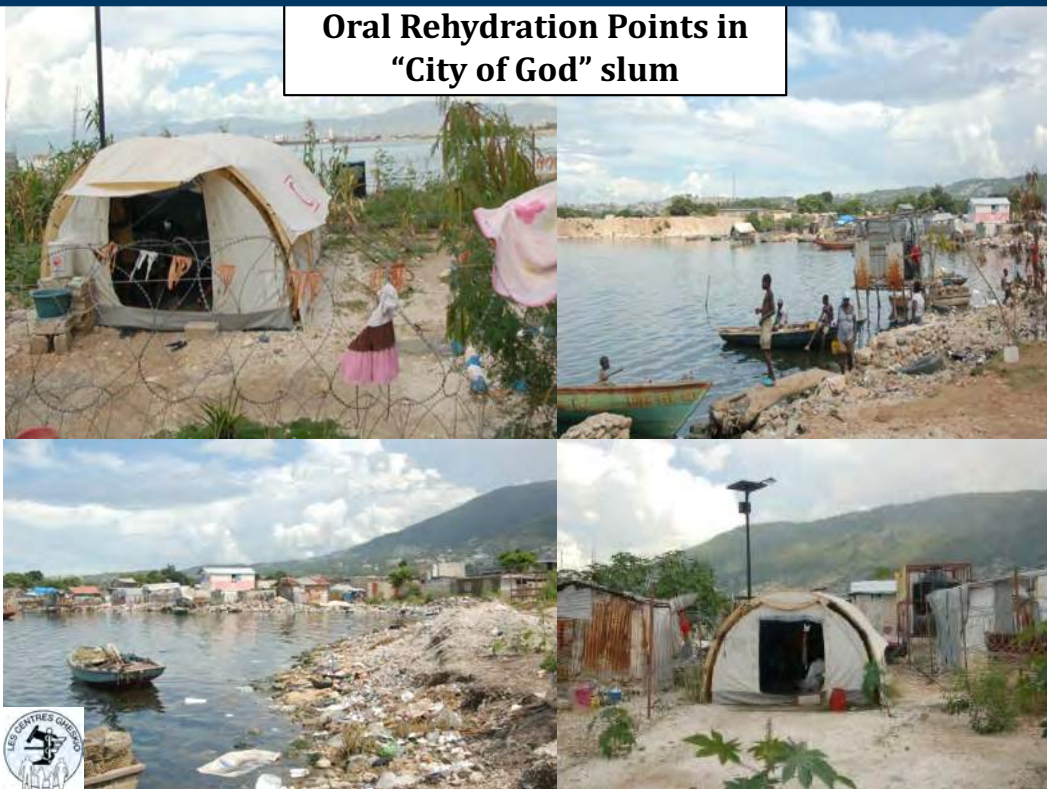


## GHEKIO and Surrounding Slums





### Oral Rehydration Points in "City of God" slum



### WASH: Chlorine factory, distribution of Jerry canes, hand washing, street cleaning





## First Introduction of Oral Cholera Vaccine

- GHESKIO and partners led introduction of oral cholera vaccine (OCV) as outbreak control strategy
- First outbreak campaign in world despite opposition
- Highly successful despite post earthquake challenges
- Led to World Health Organization change in policy recommendation to integrate OCV in outbreak package of intervention
- Scale up of vaccine production and distribution



Partners in Health



MSPP



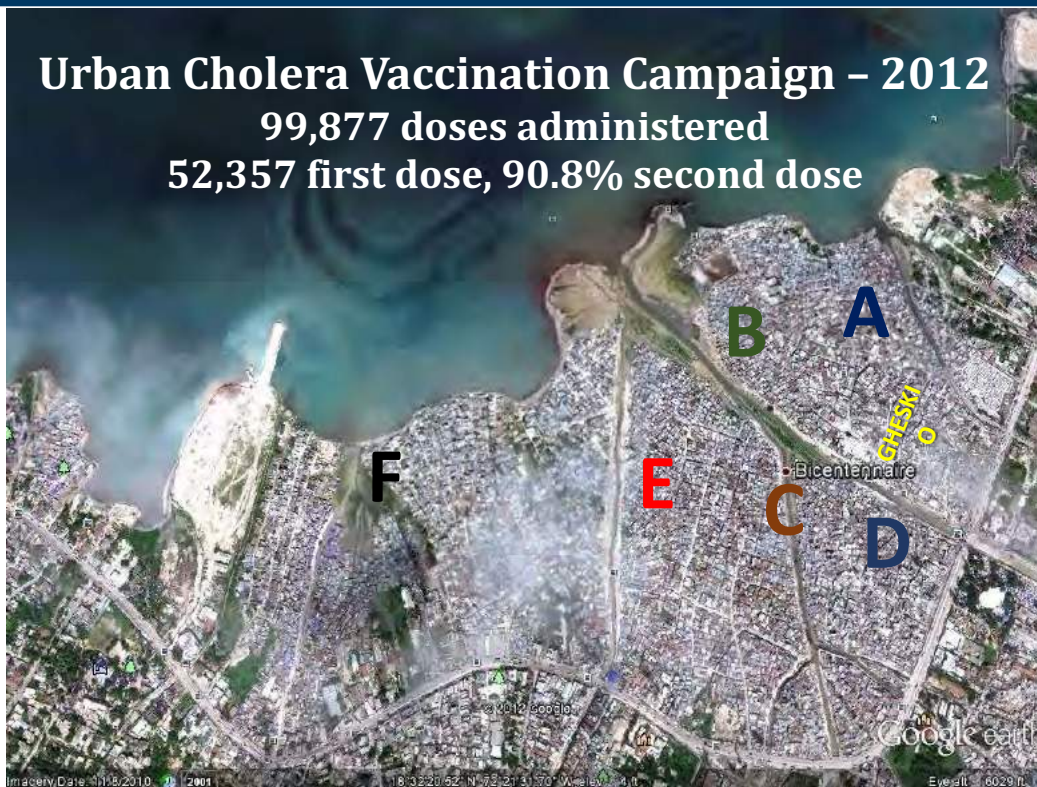
### VACCINE "OPPONENTS" CONCERNS

- |                                   |   |
|-----------------------------------|---|
| • two-dose regimen                | <i>"it is not feasible to deliver the vaccine</i>           |
| • 'high' cost                     | <i>"..... in midst of epidemic"</i>                         |
| • cold chain                      |   |
| • limited supply                  | <i>"..... in rural Haiti"</i>                               |
| • 60-70% protection for 2-5 years | <i>"people won't come back for the 2<sup>nd</sup> dose"</i> |
| • Not used or studied widely      |   |
| • Herd immunity data new          | <i>"they will stop washing their hands"</i>                 |



## Urban Cholera Vaccination Campaign – 2012

99,877 doses administered  
52,357 first dose, 90.8% second dose



## OCV is Acceptable in Urban and Rural Haiti: 91% received 2 doses

The highly successful Haiti OCV Pilot lead the WHO to change their guidelines to include OCV during cholera epidemic (reactive vaccination)



*Am. J. Trop. Med. Hyg.*, 89(4), 2013, pp. 671-681

doi:10.4269/ajtmh.13-0171

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### Cholera Vaccination in Urban Haiti

Vanessa Rouzier, Karine Severe, Marc Antoine Jean Juste, Mireille Peck, Christian Perodin, Patrice Severe, Marie Marcelle Deschamps, Rose Irene Verdier, Sabine Prince, Jeannot Francois, Jean Ronald Cadet, Florence D. Guillaume, Peter F. Wright, and Jean W. Pape\*

*Am. J. Trop. Med. Hyg.*, 89(4), 2013, pp. 617-624

doi:10.4269/ajtmh.13-0183

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### Use of Oral Cholera Vaccine in Haiti: A Rural Demonstration Project

Louise C. Ivers,\* Jessica E. Teng,\* Jonathan Lascher, Max Raymond, Jonathan Weigel, Nadia Victor, J. Gregory Jerome, Isabelle J. Hilaire, Charles P. Almazor, Ralph Ternier, Jean Cadet, Jeannot Francois, Florence D. Guillaume, and Paul E. Farmer





## Effectiveness of OCV in urban and rural areas slums

### GHESKIO in urban slums – Major Impact



#### Effectiveness of Oral Cholera Vaccine in Haiti: 37-Month Follow-Up

Karine Sévère,\* Vanessa Rouzier,\* Stravinsky Benedict Anglade, Claudin Bertil, Patrice Joseph, Alexandra Deroncelay, Marie Marcelle Mabou, Peter F. Wright, Florence Duperval Guillaume, and Jean William Pape

*Groupe Haïtien d'Étude du Sarcome de Kaposi et des Infections Opportunistes Centres, Port-au-Prince, Haiti; Center for Global Health, Department of Medicine, Weill Cornell Medical College, New York, New York; Division of Infectious Disease and International Health, Geisel School of Medicine at Dartmouth, Hanover, New Hampshire; Ministry of Public Health and Population, Port-au-Prince, Haiti*

### PIH rural areas 62% effective at 2 years

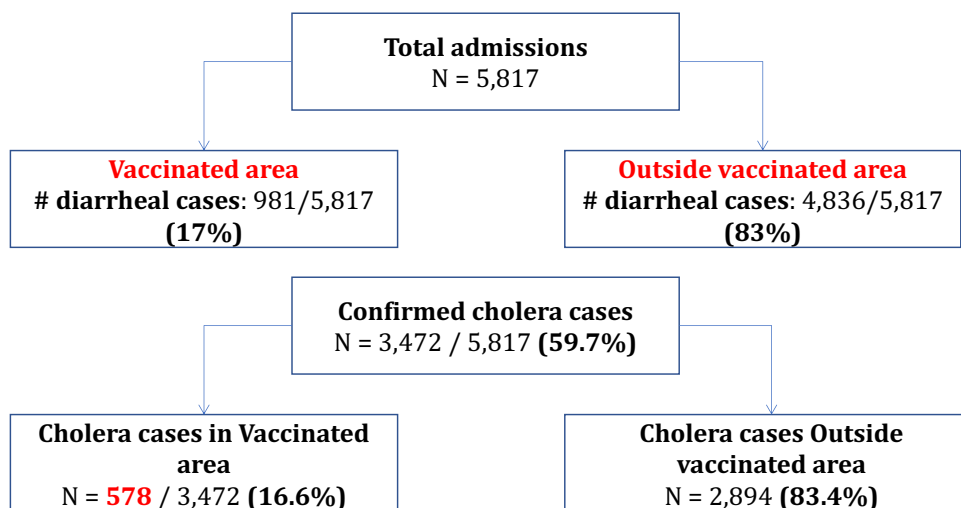
#### Effectiveness of reactive oral cholera vaccination in rural Haiti: a case-control study and bias-indicator analysis

*Louise C Ivers, Isabelle J Hilaire, Jessica E Teng, Charles P Almazor, J Gregory Jenome, Ralph Ternier, Jacques Boncy, Josiane Buteau, Megan B Murray, Jason B Harris, Molly F Franke*

##### Summary

**Background** Between April and June, 2012, a reactive cholera vaccination campaign was done in Haiti with an oral inactivated bivalent whole-cell vaccine. We aimed to assess the effectiveness of the vaccine in a case-control study and to assess the likelihood of bias in that study in a bias-indicator study.

## Patients with acute diarrhea admitted to CTC Apr 13, 2012 – Feb 10, 2017

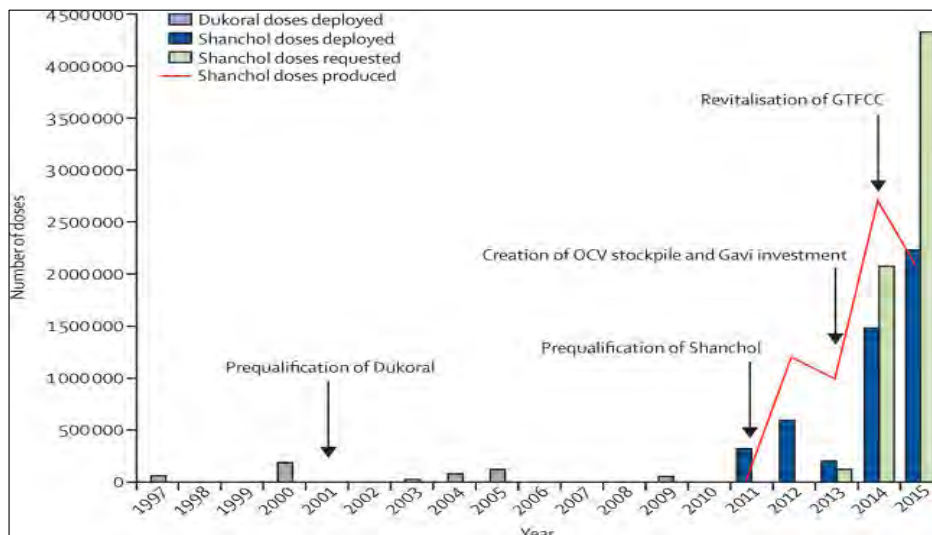


**19**/52,357 (0.036%) among vaccinees vs. **559**/17,643 (3.16%) among non-vaccinees



## Revolutionized Cholera Response

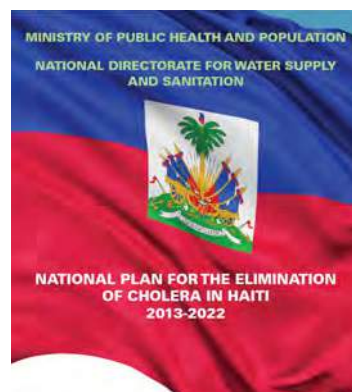
**Cholera vaccine demand, use, and production 1997–2015**



*Sachin N Desai et al, Lancet 2016*

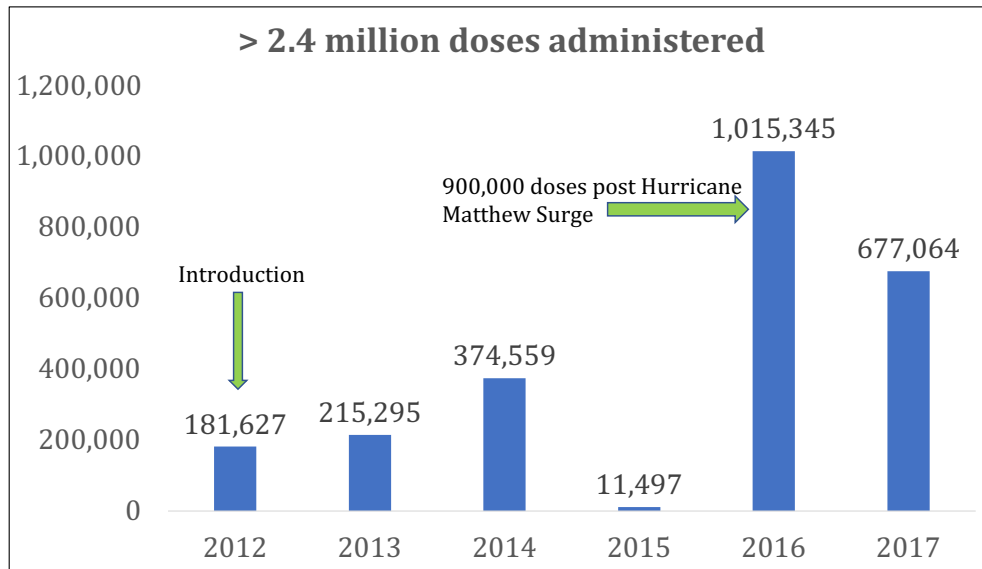
## Cholera Eradication Plan 2013-2022

- Education, hygiene promotion, improve access to drinking water
- Epidemiological surveillance
- Rapid response to outbreaks
- Vaccination in high-risk areas
- Programs to improve access to water and sanitation (DINEPA and partners)
- Leadership from the Ministry of Health!





## Cholera Vaccine Scale-up in Haiti: 2012-2017



## Bridge to South Pre/Post Hurricane Matthew



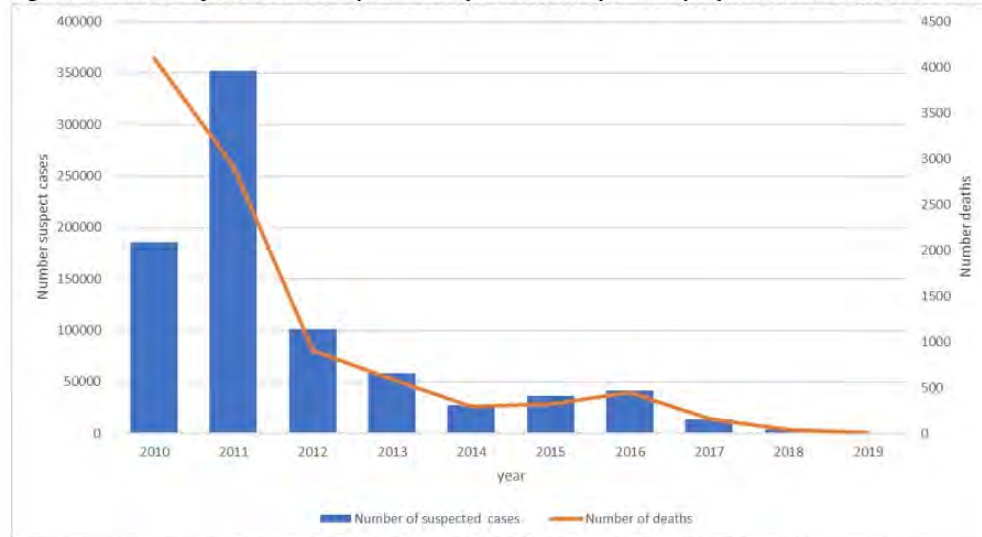
**900,000 received 1 dose of OCV and Stop Spread**





## Haiti Eliminates Cholera 2019-2022

Figure 4: Number of cholera cases (n=820 000) and deaths (n= 9792) reported in Haiti, 2010-2019



Data Source: Sitrep Cholera 9 October 2022, Haiti Ministry of Public Health and Population

## The Making of a Humanitarian Crisis

### Political discord

- Competing parties support small gang groups initially for power and control of certain areas
- Culminated in assassination of president in July 2021
- Inability to come to consensus

### Gang violence

- Related to drug and gun trafficking
- Terrorize population, neighborhood control and population displacement

### Natural disasters

- Impact of climate crisis with alternating severe droughts and floods
- Earthquakes (2010 and 2021)





## Spiraling to a Breaking Point – Verge of Collapse

### Political:

- Total country lockdown since Sept. 2022 with blockage of fuel and food and commodities imports

### Humanitarian:

- 4.7 million Haitians are currently facing acute hunger
- Wartime levels of infant malnutrition rates

### Security:

- Displacement from gang violence
- Kidnapping for ransom to import guns and ammunition
- PAP is currently the kidnapping capital of the world (Haiti>>>Mexico> Afghanistan)

### Economic:

- Inflation and negative economic growth
- Massive brain drain and strained human resources

### Education and Healthcare:

- Shutdown of schools for most of last 3 years
- Hospital closed





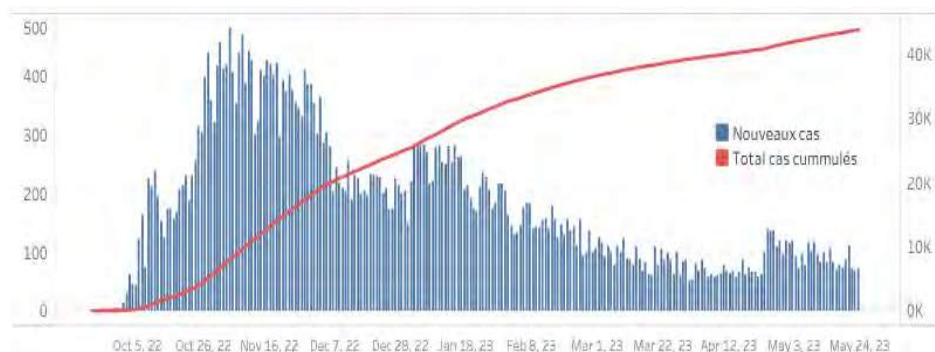
## Perfect Storm Leading to Cholera Resurgence

- Shutdown of water purification plants and halt of potable water distribution
- People forced to drink unclean water
- Unsanitary conditions – no city trash removal
- Severe flooding
- People living in displaced, crowded conditions or refugee camps



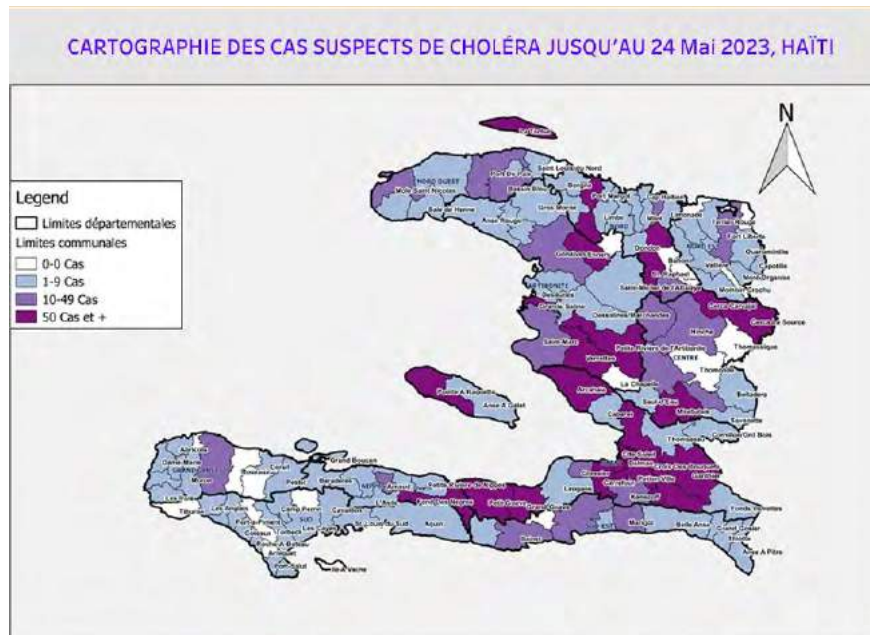
## Resurgence of Cholera – Oct 2022

- Oct 2022 – new cases confirmed in over 3 years
- Rapid surge of cases in Port-au-Prince hard hit by limited access to potable water and fuel shortage

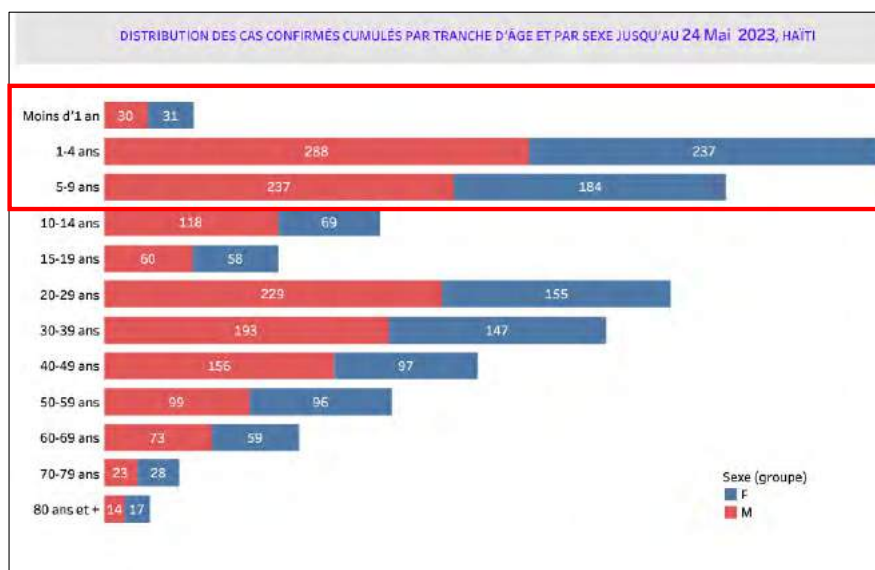




## Widespread Resurgence



## Children < 5 years Most Affected





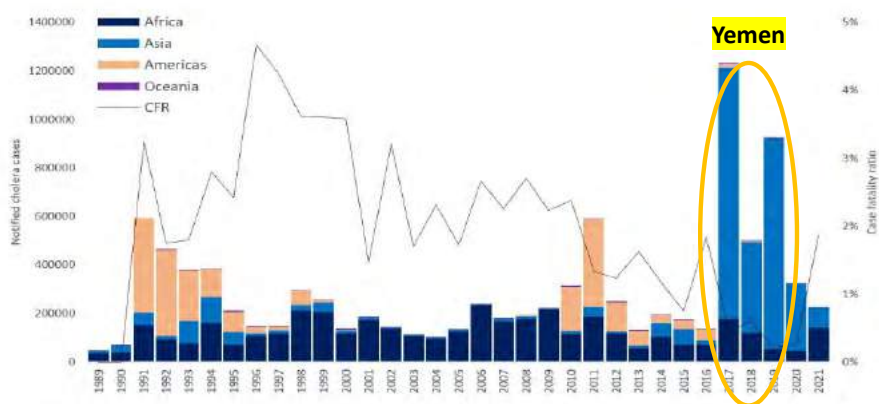
## Managing a Cholera Outbreak during a Crisis

- Reactivated 2 CTCs (downtown and Tabarre) within 72 hours
- Urgently deployed clinic staff to CTC, hire new staff and train
- 24-hour shifts to meet need and decrease transport burden with no fuel
- Procure urgent supplies to provide care to exponential number of adults and children presenting to the CTC
- Coordinate with local and UN agencies to coordinate response
- Restart laboratory testing with culture and rapid testing



## Increasing Cholera Outbreaks in the World since 2017

Figure-2: Cholera cases\* reported to WHO by year and continent, global CFR, 1989-2021\*\*



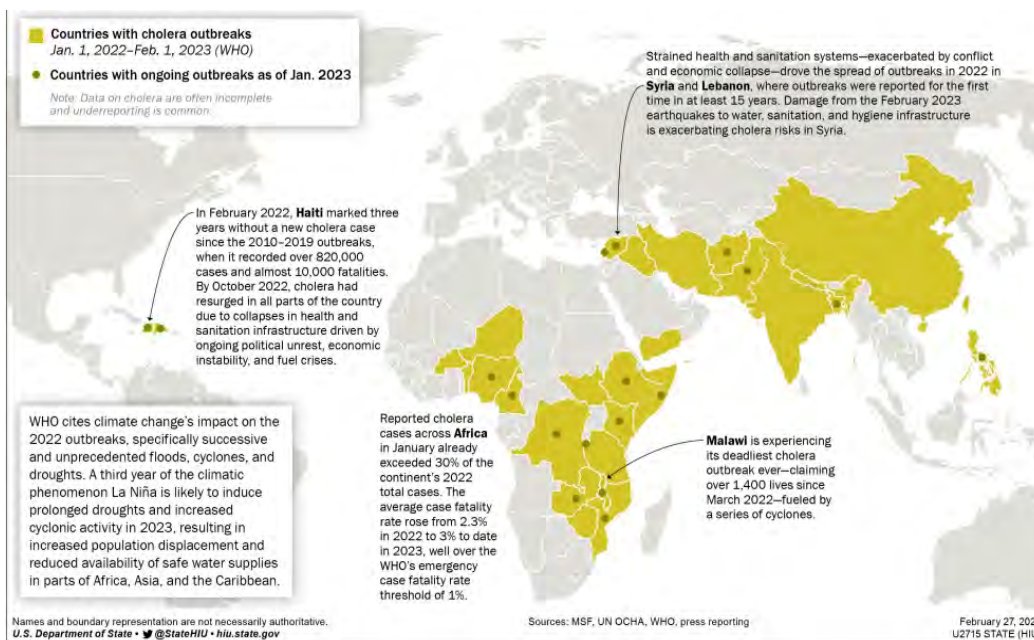
\* In 2017 and 2019, Yemen accounted for 84% and 93% of all cholera cases respectively (Weekly Epidemiological Report 2018, 2020).

\*\*The data for 2022 is not included in the epidemic curve due to (i) incompleteness (data available until 30 November 2022), (ii) provisional estimates. Official reporting of case counts per country to WHO is expected at the end of the year.





## Extreme Weather, Conflict, and Strained Health Systems Fueling Global Outbreaks



## Global Cholera Outbreaks

- 2022: 30 countries reported outbreaks, including war-affected areas in Syria and Lebanon (new in over 15 years)
- 2023: 18 countries have ongoing outbreaks
- Extreme weather: unprecedented flooding, cyclones and droughts resulting in population displacements with reduced access to potable water and sanitation in Africa, Asia, Caribbean
- Conflict and economic collapse are straining health and sanitation systems
- Global vaccine shortage and lack of investment not meeting global demand



## **Implications and Lessons Learned**

- While cholera is easily preventable and treatable, it remains an important cause of morbidity and mortality in the world
- There is a real risk of resurgence of diseases of poverty, with many outbreaks in 2022 linked to war/turmoil/politics
- Fragile successes in global health are quickly undermined by natural and man-made disasters
- Role of preparedness and applying lessons learned from pandemics: communication/messaging, role of vaccination
- Equity – need to promote health access, inclusion of vaccination as routine, water as basic human right!!!

## **Conclusion**

- Even during crises and most difficult circumstances, successful interventions can be implemented to save lives in partnership with governments and local organizations.
- Importance of international support to local outbreak response considering globalization.
- Integrated cholera response, strengthening health systems and promoting political peace are essential to reducing health disparities and improving models of care delivery for vulnerable populations living in poor areas affected by cholera and other diseases of poverty.



## Acknowledgments

- Dr Pape, Dr Deschamps
- GHESKIO colleagues:
  - Cholera treatment center
  - Pediatric clinic
  - Cholera research team
  - Laboratory
- Research partners:
  - University of Florida: Dr Glenn Morris
- Ministry of Health partners

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3. Sévère K, Rouzier V, Pape JW et al. [Effectiveness of Oral Cholera Vaccine in Haiti: 37-Month Follow-Up](#). Am J Trop Med Hyg. 2016 May 4;94(5):1136-42.
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5. Bi Q, Ferreras E, Pezzoli L, Azman AS; Oral Cholera Vaccine Working Group of The Global Task Force on Cholera Control. [Protection against cholera from killed whole-cell oral cholera vaccines: a systematic review and meta-analysis](#). Lancet Infect Dis. 2017 Oct;17(10):1080-1088.
6. Severe K, Alcenat N, Rouzier V. [Resurgence of Cholera in Haiti amidst Humanitarian Crises](#). N Engl J Med. 2022 Dec 22;387(25):2389-2391.



# Childhood Malnutrition and Adult Obesity in Haiti – The Paradox of Poor Countries

Vanessa Rouzier, MD  
Head of Pediatrics, GHESKIO Centers, PAP, Haiti  
Assistant Professor, Weill Cornell Medical College, NY  
June 16, 2023



**Weill Cornell  
Medicine**

## Purpose and Objectives

### PURPOSE

Discuss the challenges of childhood malnutrition and adult obesity and needed models of care for LMICs

### OBJECTIVES

1. Review epidemiology of malnutrition and obesity in Haiti and the Americas
2. Present the current humanitarian crisis and its impact on childhood malnutrition
3. Present the current adult obesity crisis and complications

### FINANCIAL DISCLOSURE

None



## Outline

- Childhood malnutrition and care during a humanitarian crisis
- Adult obesity and the non-communicable disease epidemic
- Reducing health disparities and improving models of care delivery

## GHESKIO Centers

- Haitian NGO, founded in 1982
- Mission: address public health issues affecting Haitians with three pillars:
  - Translational research aimed at developing public health models
  - Training: largest post graduate training center in Haiti
  - Clinical care: infectious and non-communicable diseases. One of the largest HIV and TB centers in the Americas
- Comprehensive model of care: primary school, vocational training, economic support
- Technical partner of the Ministry of Health and other local institutions
- Strong international collaboration for clinical care and research
- Continuous support from NIH since 1983

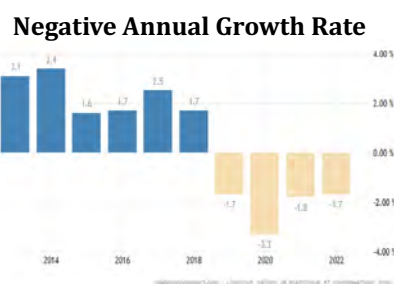
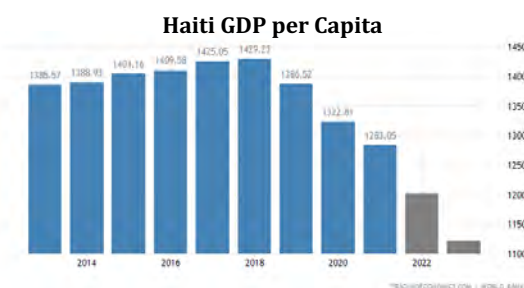




## Current Humanitarian Crisis in Haiti

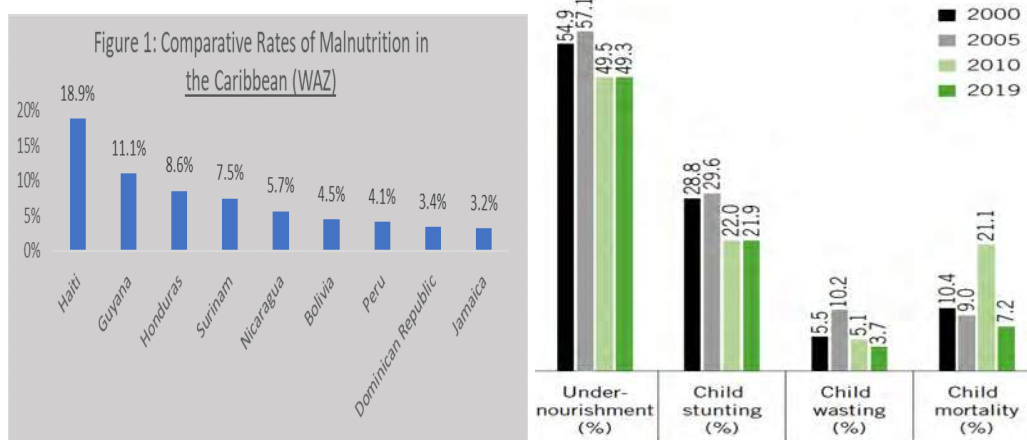


- Haiti, poorest country in Western Hemisphere
- Fragile country plagued by multiple natural catastrophes (earthquakes, hurricanes, flooding and droughts) and man-made disasters in recent years
- Shrinking economy, plummeting GDP
- Negative economic growth in past 5 years
- 50% inflation rate



## Childhood Malnutrition Trends

- Highest rates of malnutrition in Latin America and Caribbean: global malnutrition ~18-22%
- Was improving until political instability since 2018 and extreme weather events





## Haiti Instability

1. Political discord
  - Competing parties support small gang groups initially for power and control of certain areas
  - Culminated in assassination of president in July 2021
  - Inability to come to consensus
2. Gang violence
  - Related to drug and gun trafficking
  - Terrorize population, neighborhood control and population displacement
3. Natural disasters
  - Impact of climate crisis with alternating severe droughts and floods
  - Earthquakes (2010 and 2021)



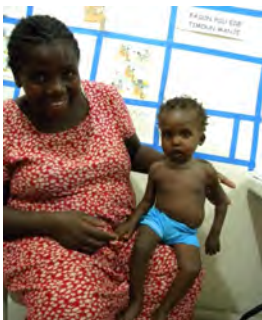
## Spiraling to a Breaking Point – Verge of Collapse

- **Political:**
  - Total country lockdown since Sept. 2022 with blockage of fuel and food and commodities imports
- **Humanitarian:**
  - 4.7 million Haitians are currently facing acute hunger
  - Wartime levels of infant malnutrition rates
- **Security**
  - Displacement from gang violence
  - Kidnapping for ransom to import guns and ammunition
  - PAP is currently the kidnapping capital of the world (Haiti>>>Mexico> Afghanistan)
- **Economic:**
  - Inflation and negative economic growth
  - Massive brain drain and strained human resources
- **Education and Healthcare:**
  - Shutdown of schools for most of last 3 years
  - Hospital closed



## Deteriorating Living Conditions

- Shutdown of water purification plants and halt of potable water distribution
- People forced to drink unclean water
- Unsanitary conditions – no city trash removal
- Severe flooding
- People living in displaced, crowded conditions or refugee camps



## GHEKIO Maternal Child Nutrition Center

- Implemented in 2009
- Largest outpatient nutrition center in downtown PAP
- Services:
  1. Preventative integrated services to HIV-exposed infants and their mothers
  2. Rehabilitative outpatient program for children with moderate and severe malnutrition



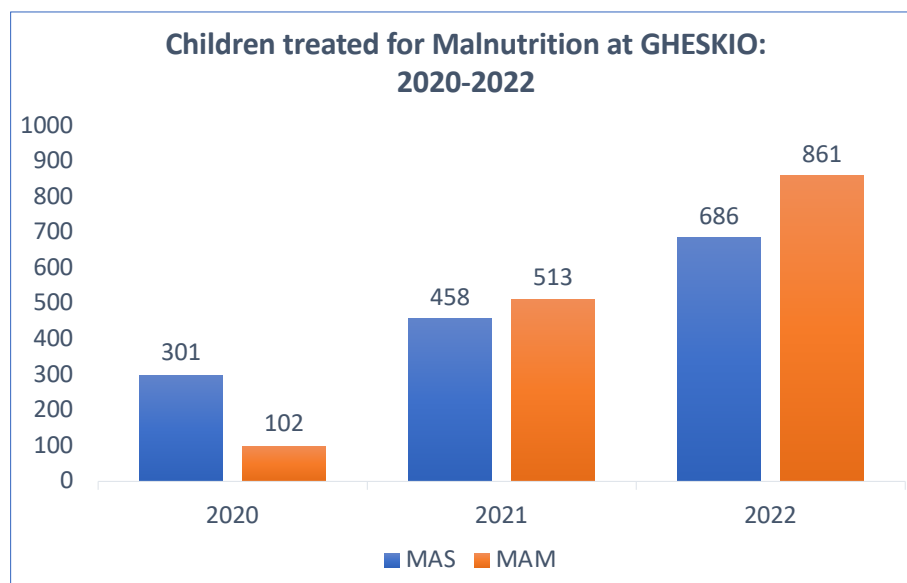


## GHESKIO Rehabilitative Program for SAM



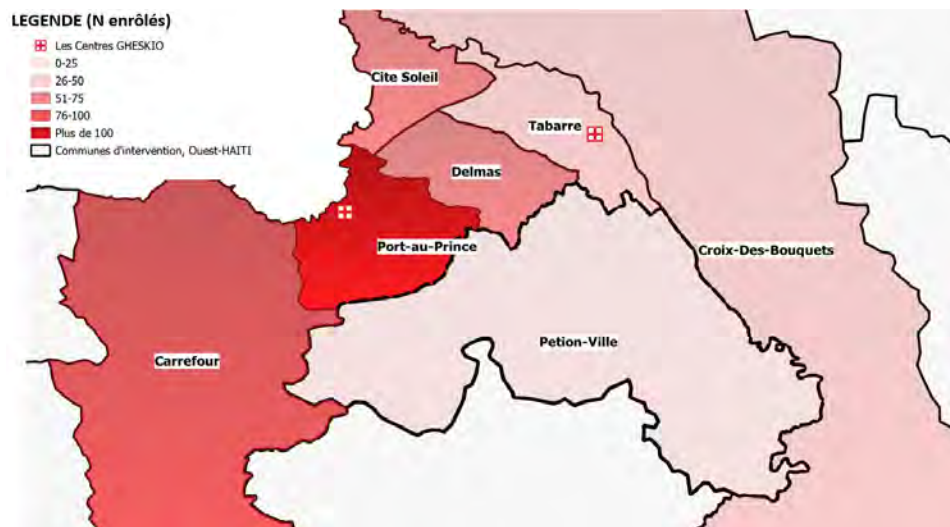
- Referrals from pediatrics, community clinic, CTC
- Weekly visits (average 8 wks until goal weight reached) with nutritional supplementation, growth monitoring and preventative services, health, nutrition education and diarrhea prevention, treatment: ORS, zinc
- Outcomes: 410 children
  - 10% currently active
  - 55% attained goal weight,
  - 4.0% non-respondent
  - 1.7% died,
  - 29.3% abandoned

## Rising Childhood Malnutrition Rates





## Community Screening and Treatment of Childhood Malnutrition



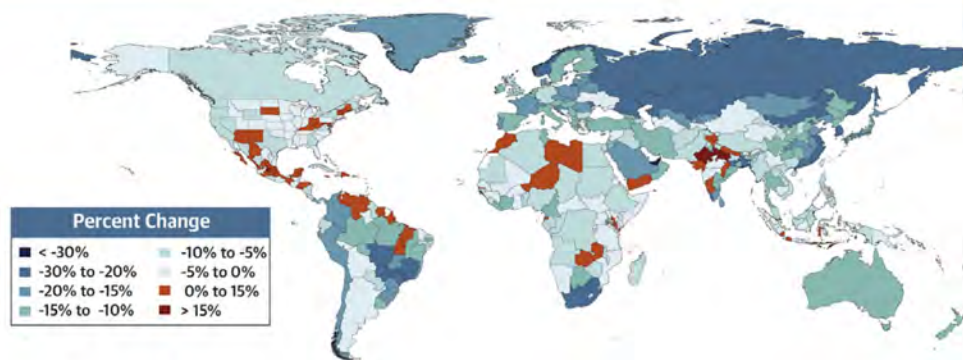
## Poverty and the Paradox of Adult Obesity - Cardiovascular Diseases in LMICs



## Global Burden of Cardiovascular Diseases

- CVD is the leading cause globally of mortality and reduced quality of life
- Low Middle-Income Countries bear 80% of the global burden of CVD
- 70% of preventable CVD events in LMICs are attributable to modifiable risk factors, led by hypertension

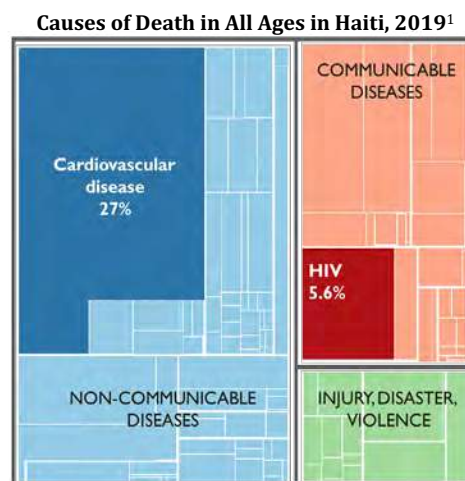
Percent Change in Age-Standardized CVD Death Rate from 2010-2019



Roth et al, *JACC* 2020, Global Burden of Disease 2020, INTERHEART, 2004

## CVD Epidemic in Haiti

- Epidemiologic shift: HIV → CVD
- Cardiovascular disease (CVD) is now the most common cause of adult death in Haiti
- HTN leading CVD risk factor
- Data primarily in LMICs from case series, clinical cohorts and modeling estimates rather than primary population data

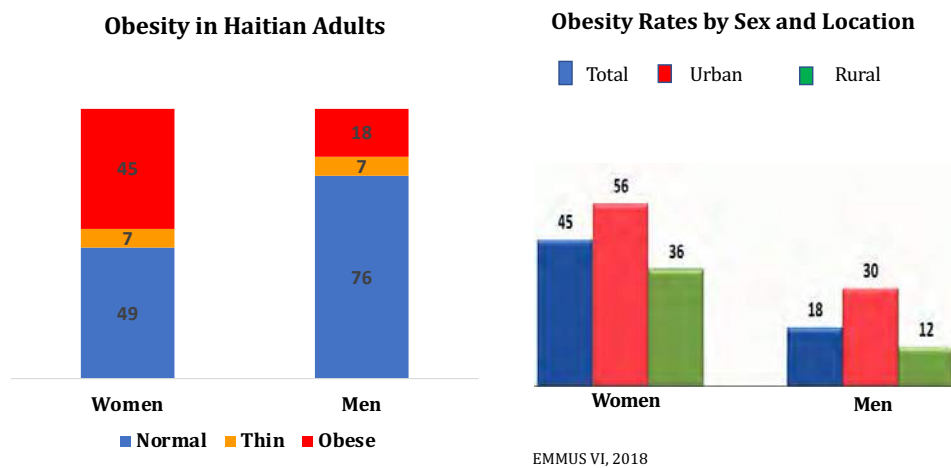


<sup>1</sup> Institute for Health Metrics and Evaluation.  
GBD Compare Data Visualization Tool: <http://vizhub.healthdata.org/gbd-compare/>; 2019.



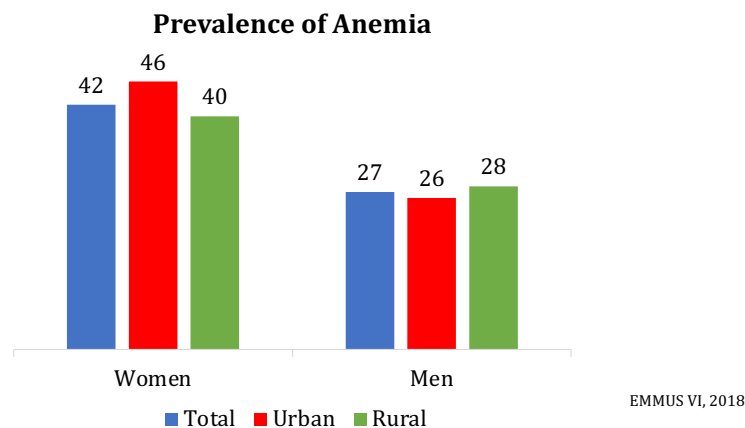
## Obesity Rates in Haitian Adults

- Women are 2.5 x more obese than men
- Both in rural and urban settings



## Anemia in Adults

- Despite higher rates of obesity, women have ~ 2x more anemia than men
- Suggests poorer diets, access and economic inequities

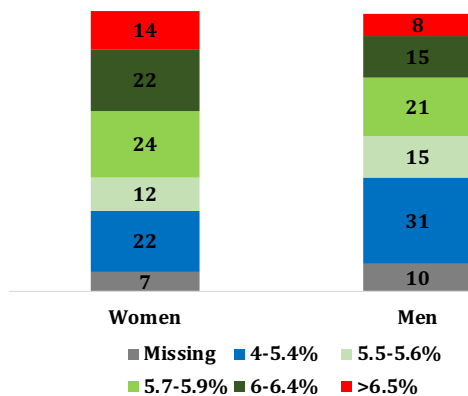




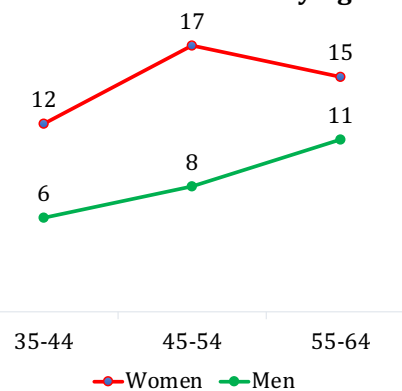
## Prevalence of Diabetes

- High prevalence of diabetes and pre-diabetes
- Women ~2x as affected as men

HgA1C and Diabetes Risk



Diabetes Prevalence by Age

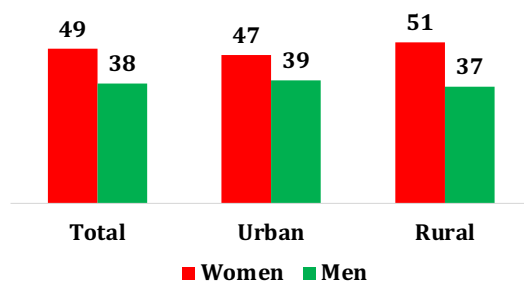


EMMUS VI, 2018

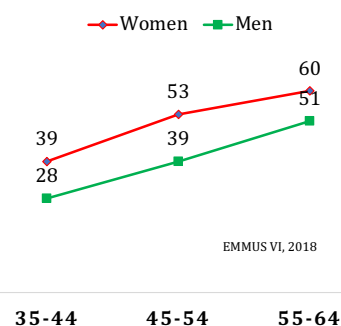
## Prevalence of Hypertension

- Elevated BP (>140/90 mmHg) is the most prevalent risk factor for cardiovascular diseases in Haiti
- 49% of women and 38% of men 35-65 years affected

Hypertension Rates by Sex and Location



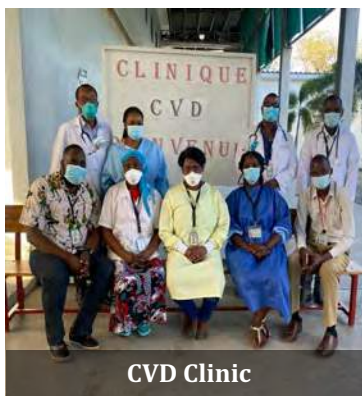
HYPERTENSION BY AGE



EMMUS VI, 2018



## Building CVD Research and Clinical Care infrastructure



CVD Clinic



BP Measurement



ECHO and technical training

## GHESKIO: Community based CVD care



Trained Field Workers

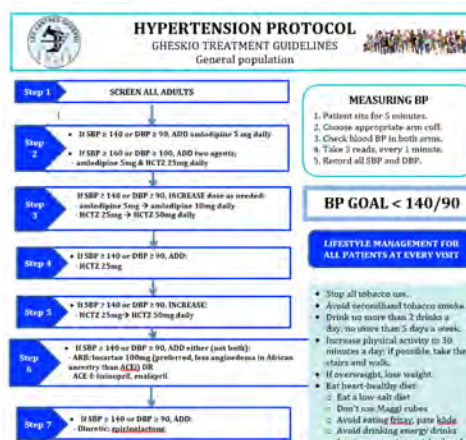


Home BP measurements and symptom screening



## Creation of National HTN Primary Care Guidelines May 2019

- First consensus guidelines on HTN criteria, BP measurement, risk factors and simple management algorithms adapted to local context



## The Haiti CVD Cohort Study (R01 HL143788, 2018-2023)

Population-based CVD data in low-income countries are needed to guide action for CVD prevention, treatment and control

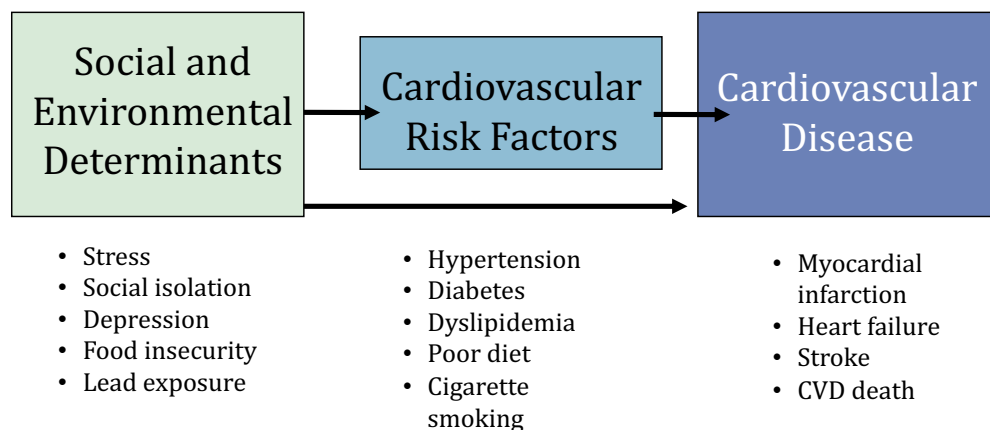
- Goals:
  1. Define the clinical epidemiology, social determinants and modifiable risk factors of CVD in Haiti
  2. Translate findings into pragmatic interventions to reduce CVD-morbidity and mortality in Haiti and similar lower-income populations globally



## The Haiti CVD Cohort Study Aims

1. Establish a cohort of 3,000 adults from the general population of Port-au-Prince and measure the prevalence of CVD risk factors and disease and their association with social and environmental determinants.
  - a. CVD risk factors: diet, exercise, smoking, alcohol, fruits/vegetables
  - b. CVD events includes myocardial infarction, heart failure, and stroke
  - c. Determinants include stress, depression, food insecurity, and lead exposure
2. Determine the incidence of CVD risk factors and disease during 2-3.5 years of follow up and their association with social and environmental determinants.

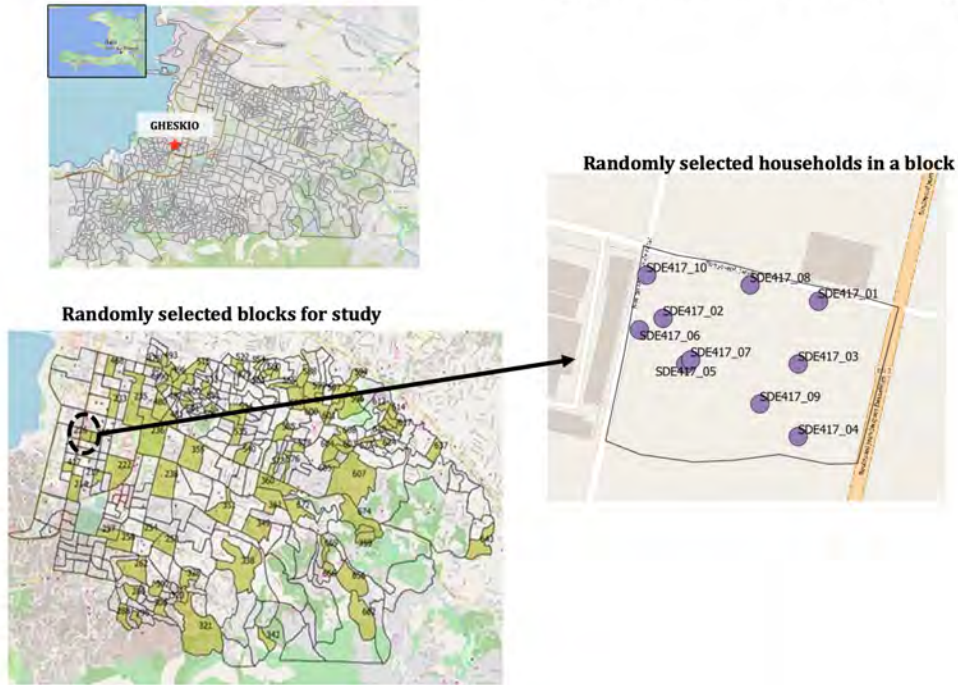
## Relationship between Poverty related factors and CVD in Haiti



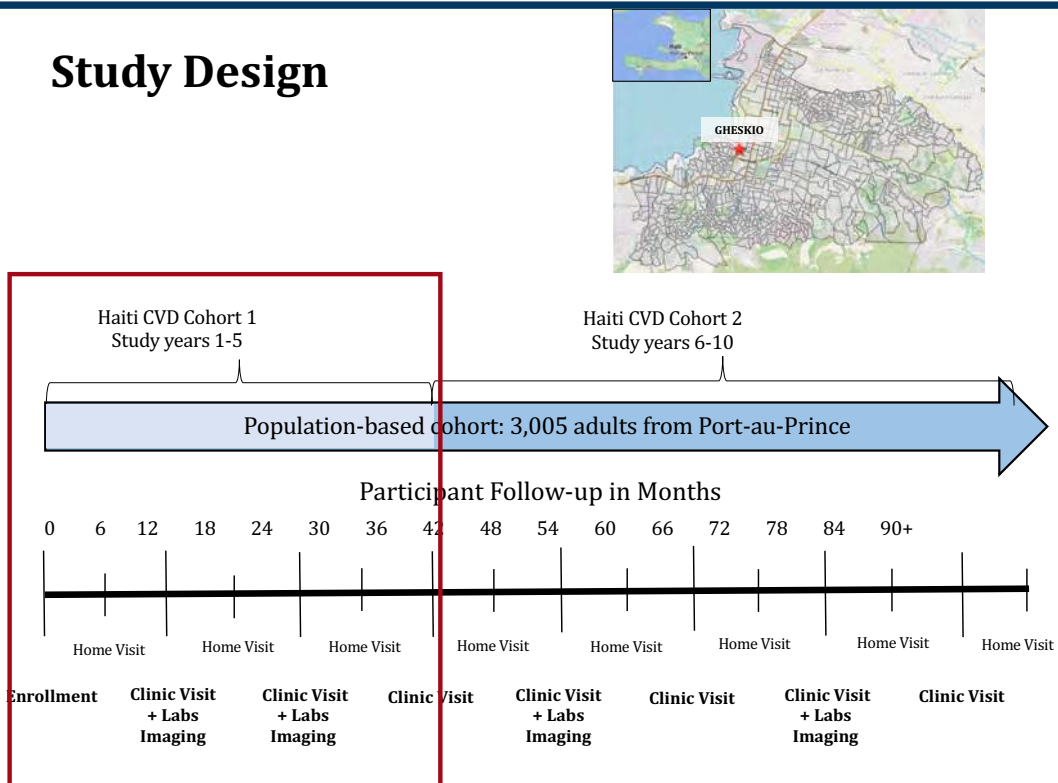




## Study Population: multistage random sampling



## Study Design





## High Impact findings to date

### Haiti CVD Cohort: Demographic characteristics

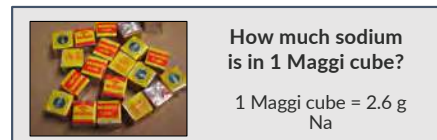
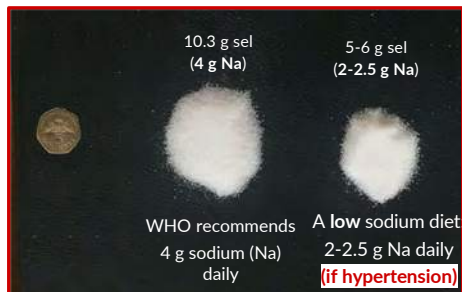
<b>Population</b>	<ul style="list-style-type: none"><li>• 3,005 adults</li><li>• Median age: 40 years</li><li>• 58% Female</li></ul>
<b>Education</b>	<ul style="list-style-type: none"><li>• 36% with Primary Education or Lower</li></ul>
<b>Income</b>	<ul style="list-style-type: none"><li>• 70% earn less than 1 USD / day</li><li>• 32% formally employed</li></ul>
<b>Stress</b>	<ul style="list-style-type: none"><li>• 13.6% report high stress</li></ul>
<b>Depression</b>	<ul style="list-style-type: none"><li>• 12.5% have moderate to severe depression</li></ul>
<b>Neighborhood Violence and Cohesion</b>	<ul style="list-style-type: none"><li>• High levels of perceived neighborhood cohesion, low levels of perceived violence. Neighborhood violence associated with higher stress and higher depression</li></ul>



## Health behaviors

<b>Smoking</b>	• 4% current smokers
<b>Alcohol</b>	• 4% drink $\geq 1$ drink a day
<b>Physical Activity</b>	• 50% exercise $\leq 150$ min a week (WHO recommendation)
<b>Fruit/Vegetable Intake</b>	• 99% eat less than 5 servings of fruits or vegetables a day (WHO recommendation)
<b>Food Insecurity</b>	• 82% have high food insecurity
<b>Salt Intake</b>	• 87% with high salt intake

## Salt intake is high, and associated with higher SBP in young adults



<b>Salt Intake</b>	• Mean daily intake of 5.0 grams
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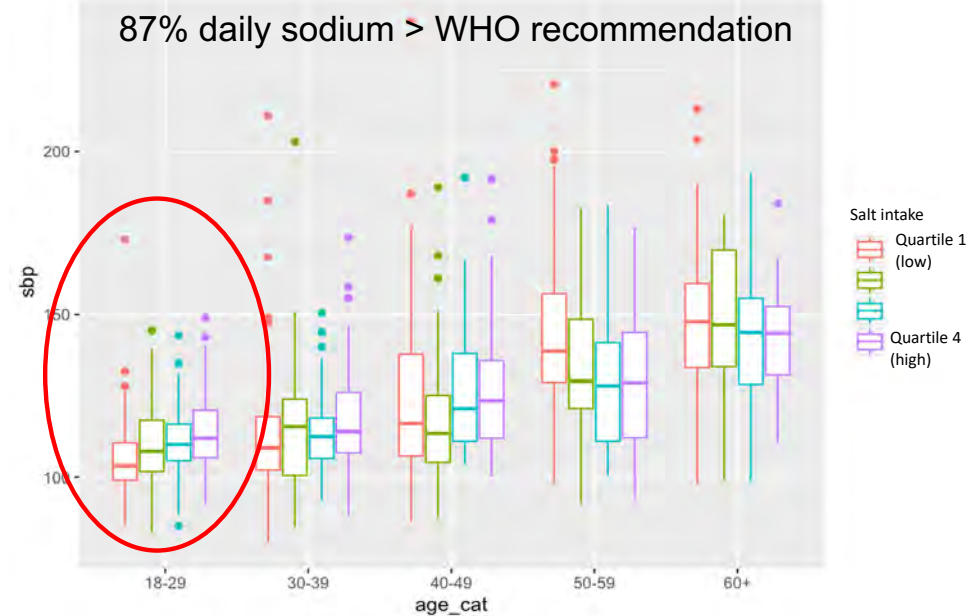
High Dietary Sodium, Measured Using Spot Urine Samples, is Associated with Higher Blood Pressure among Young Adults in Haiti

GLOBAL HEART

Authors: Adrienne Clermont, Vanessa Roudier, Jean Lourens Pieter, Rodney Sufra, Elzezer Dade, Fabiola Prevail, Stephano St-Pierre, Marie Marcelle Deschamps, Alexandra Apollon, Kathryn Dupont, Miranda Hertz, Yanique Duffin, Shalom Subans, Lily D. Yang, Myung Hee Lee, Lawrence C. Palmer, Linda M. Gerber, Mark S. Pecker, Samuel J. Mann, Monika M. Safford, Daniel W. Fitzgerald, Jean W. Pape, Margaret L. Michary



## Salt intake is high, and associated with higher SBP in young adults

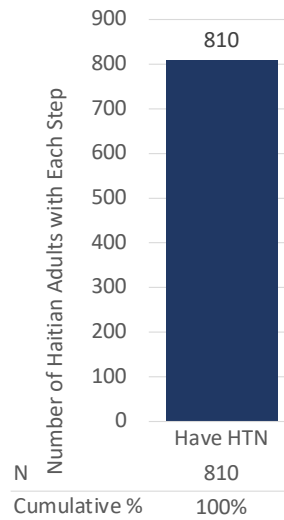


## CVD Risk Factors

<b>Hypertension</b>	<ul style="list-style-type: none"><li>• 29% have hypertension</li></ul>
<b>Obesity</b>	<ul style="list-style-type: none"><li>• 17.2% have obesity, 26.1% overweight</li></ul>
<b>Hyperlipidemia</b>	<ul style="list-style-type: none"><li>• 12.4% have high cholesterol</li></ul>
<b>Diabetes</b>	<ul style="list-style-type: none"><li>• 5.3% have diabetes mellitus</li></ul>
<b>Kidney Disease</b>	<ul style="list-style-type: none"><li>• 8.8% have kidney disease (eGFR&lt;60 or ACR ≥30 mg/g)</li></ul>



## Hypertension Care Cascade: only 45% on treatment, 13% controlled BP

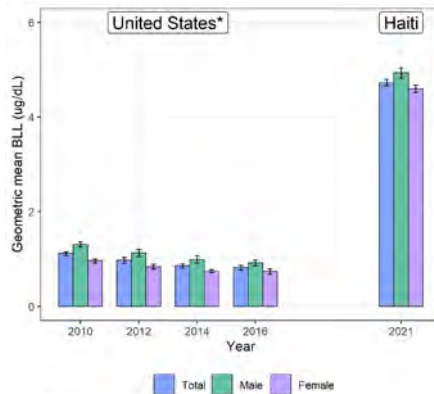


Hypertension continuum of care: Blood pressure screening, diagnosis, treatment, and control in a population-based cohort in Haiti



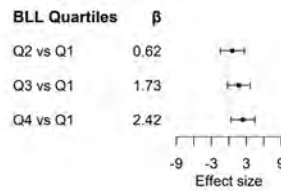
Miranda Metz BS<sup>1</sup> | Jean Lookens Pierre MD<sup>2</sup> | Lily Du Yan MD<sup>1,3</sup> |  
Vanessa Rozier MD<sup>1,4</sup> | Stephano St-Pierre MS<sup>1</sup> | Serfine Exantus BS<sup>1</sup> |  
Fabiola Preval BS<sup>1</sup> | Nicholas Roberts MPH<sup>1</sup> | Olga Tymoczny PhD<sup>1</sup> |  
Rodolphe Malebranche MD<sup>1</sup> | Marie Marcelle Deschamps MD<sup>1</sup> | Jean W. Pape MD<sup>1</sup> |  
Margaret L. McNairy MD<sup>1,5</sup>

## Blood lead levels in Haiti are five times greater than in the US, and associated with higher blood pressure

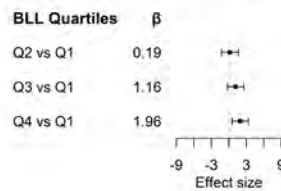


\*Fourth National Report on Human Exposure to Environmental Chemicals Update. CDC 2019

### Systolic Blood Pressure



### Diastolic Blood Pressure



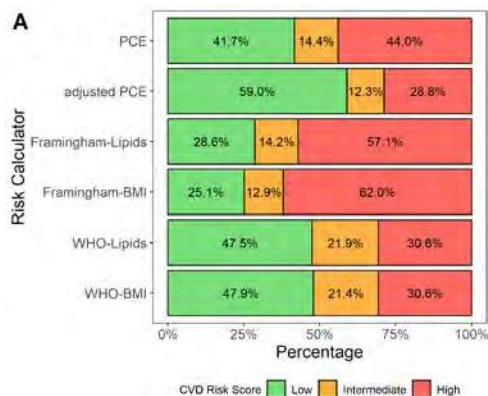
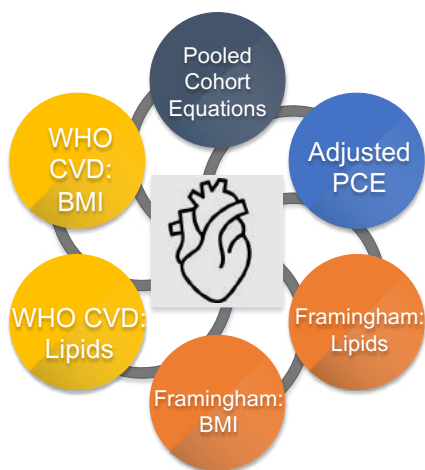
### Hypertension

High Lead Exposure Associated With Higher Blood Pressure in Haiti: a Warning Sign for Low-Income Countries

Lily D. Yan<sup>1</sup>, Miranda Metz<sup>1</sup>, Jean Lookens Pierre<sup>2</sup>, Myung-Hyun Lee<sup>3</sup>, Paul MacIntyre<sup>4</sup>, Patricia J. Flanagan<sup>5</sup>,  
Alexandra Aguiar<sup>6</sup>, Stephanie St-Pierre<sup>1</sup>, Rodrigue Malandain<sup>7</sup>, Genevieve Exantus<sup>1</sup>, Dawn Hunt<sup>8</sup>,  
Justin Hengge<sup>9</sup>, Kathleen A. Heston<sup>10</sup>, Craig S. Smith<sup>11</sup>, Marisa Nery<sup>12</sup>, Olga Tymoczny<sup>13</sup>, Marie Deschamps<sup>14</sup>



## CVD Risk Prediction is Poor in Haiti using existing models



### BMC Public Health

Comparing six cardiovascular risk prediction models in Haiti: implications for identifying high-risk individuals for primary prevention

Lily D. Yan<sup>1,2</sup>, Jean Loukms Pierre<sup>1</sup>, Vanessa Rozier<sup>2,3</sup>, Michel Thibaut<sup>1</sup>, Alvantris Apollon<sup>1</sup>, Stephano St. Phus<sup>4</sup>, Justin R. Kingery<sup>5</sup>, Kenneth A. Janssen<sup>6</sup>, Marie Deschamps<sup>7</sup>, Jean W. Pape<sup>8</sup>, Mokila M. Saffioti<sup>9</sup> and Margaret L. McManis<sup>10</sup>

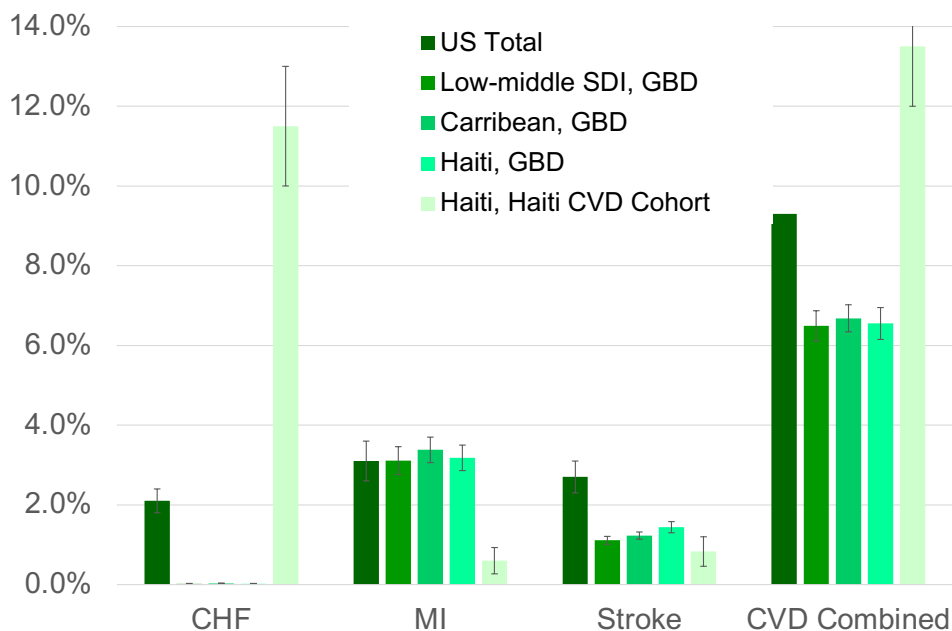
## CVD Outcomes: Prevalence\*

<b>Cardiovascular Disease</b>	<ul style="list-style-type: none"> <li>14.7% have CVD</li> </ul>
<b>Heart Failure</b>	<ul style="list-style-type: none"> <li>11.7% have heart failure, 9.4% have heart failure with preserved ejection fraction</li> </ul>
<b>Stroke or TIA</b>	<ul style="list-style-type: none"> <li>2.9% have stroke or TIA</li> </ul>
<b>Myocardial Infarction or Angina</b>	<ul style="list-style-type: none"> <li>2.4% have myocardial infarction or angina</li> </ul>

\*Adjudicated outcomes, using clinical exam including signs, symptoms, physical exam, imaging

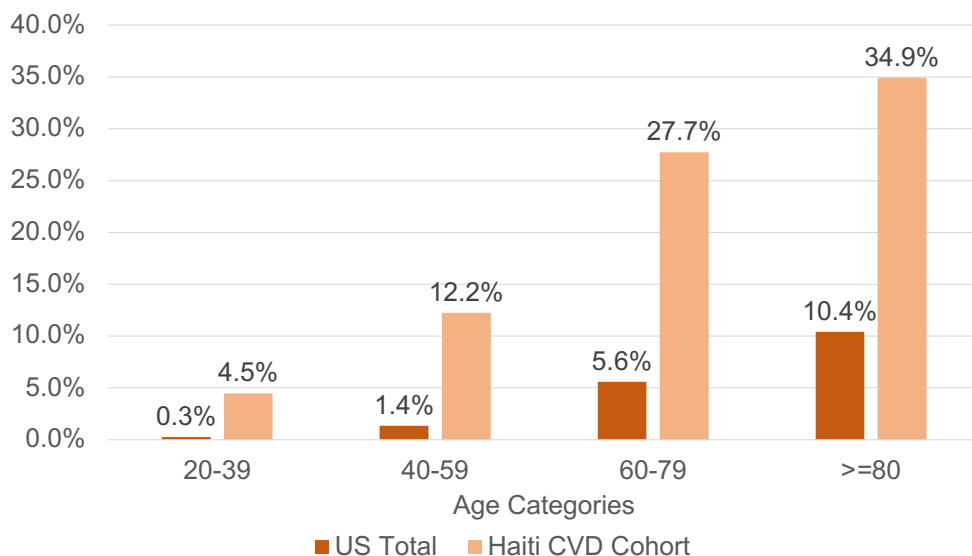


## CVD Prevalence in Haiti



## CHF Prevalence in Haiti, by age

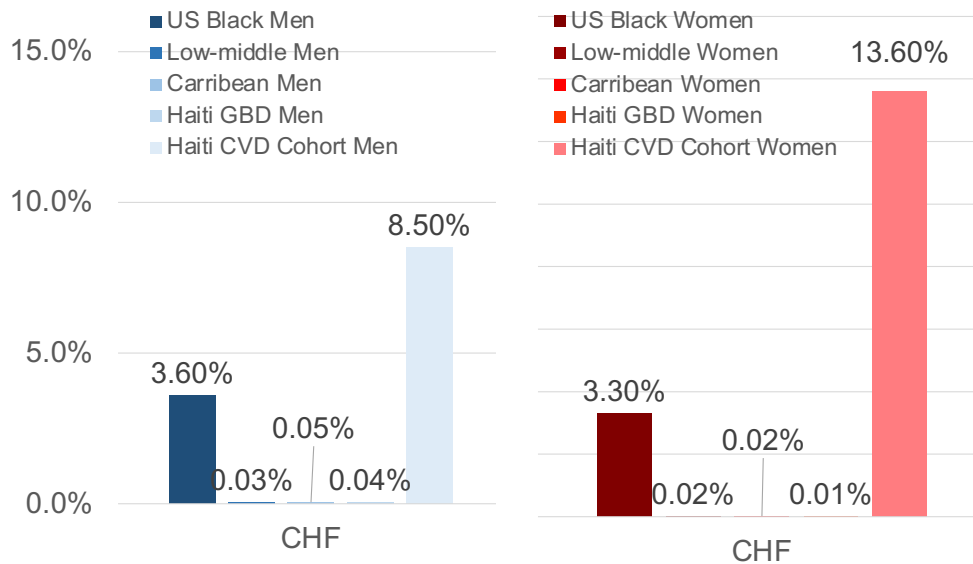
CHF occurs earlier and at younger ages in Haiti vs the US





## CHF Prevalence in Haiti, by sex

CHF occurs more in Haitian women



## Summary

- Rates of childhood malnutrition have dramatically increased in Haiti during this unprecedented humanitarian crisis
- Urgent help is needed to avoid famine
- Adult obesity is becoming more prevalent with women bearing the burden of the CVD epidemic with higher risk factors and prevalence of CVD disease complications
- International aid, economic and agricultural policies locally and internationally are fueling the CVD epidemic
- More research is needed to better understand the different drivers of obesity and CVD epidemic in Haiti and locally adapted prevention and treatment guidelines
- Models of care, prediction tools and treatment algorithms need to be informed by locally derived epidemiologic data.





## Acknowledgments

- Dr Pape, Dr Deschamps
- GHESKIO colleagues:
  - Pediatric clinic
  - Nutrition center
  - Cardiovascular disease center
- Research partners:
  - Weill Cornell University : Dr Margaret McNairy, Dr Lily Yan, Dr Daniel Fitzgerald
- Ministry of Health partners