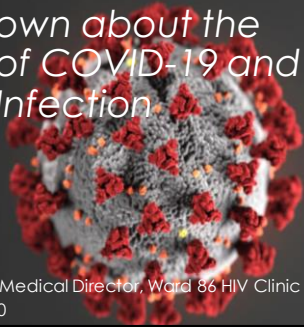


What's Known about the Intersection of COVID-19 and HIV Infection

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What's Known about the Intersection of COVID-19 and HIV Infection



Monica Gandhi MD, MPH
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IAS-USA course, June 29, 2020

Learning Objectives

After attending this presentation, learners will be able to describe what is known about COVID-19 in terms of:

- Current status of the pandemic
- HIV status and outcomes
- Impact on HIV treatment, PrEP, and access to care

Slide 4 of 30

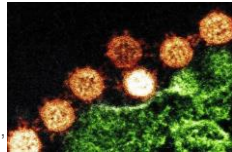
Outline of talk

- How did COVID-19 get here and where are we now?
- Why could HIV make COVID-19 outcomes worse?
- What could HIV make COVID-19 outcomes better?
- Studies from Italy, New York, Spain, South Africa on HIV impact on COVID-19
- Impact of COVID-19 on HIV outcomes, including
 - Treatment
 - PrEP
 - Access

Slide 5 of 30

How did we get here with COVID-19?

- Corona means “crown” in Latin
- Coronaviruses named that because spiky on outside
- Usually cause the “common cold” – sneezing, runny nose, mild sore throat, mild fever
- We had another coronavirus which came out in the world like this in 2002 and yet another in 2012 so this is the 3rd time



Slide 6 of 30

SARS came out in 2002-2003 with ARDS

- In 2002, there was another virus that came out of China called “SARS” - Severe Acute Respiratory Syndrome (SARS-CoV)
- Lasted about 9 months in the world until 2003; 8098 cases, 29 countries, 774 deaths
- 29 cases in U.S. but 0 deaths, more in Canada
- Horseshoe bat, then cat-like mammal called palm civet → human → human to human



Slide 7 of 30

Middle East respiratory syndrome coronavirus in 2012 (MERS-CoV)

- First came out in Saudi Arabia in 2012; all cases linked to Middle East
- Went around world from 2012-2019: 27 countries, 2494 cases, 858 deaths
- United States: 2 cases in May 2014 (Indiana, Florida) – both health care workers from Saudi Arabia
- Was originally in camel and then went to humans then human to human



Slide 8 of 30

What about this new coronavirus?

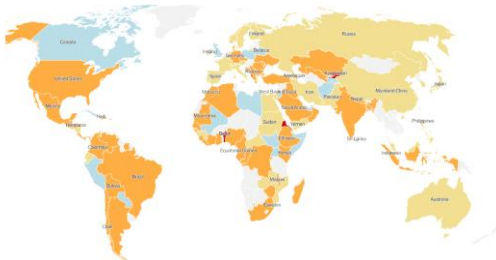
- Illness with fever, cough, pneumonia reported in Wuhan, China on New Years' Eve (December 31, 2019)
- People initially had been exposed to seafood and markets in "live markets"
- January 7, 2020: Identified etiology a new coronavirus
- Has been spreading around world since then
- January 30, 2020: WHO - "global health emergency"
- March 11, 2020: WHO - "Pandemic"



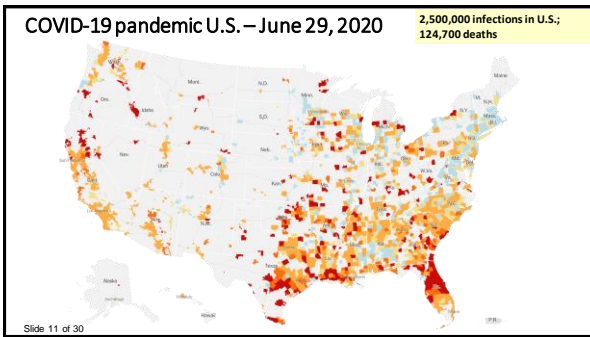
Slide 9 of 30

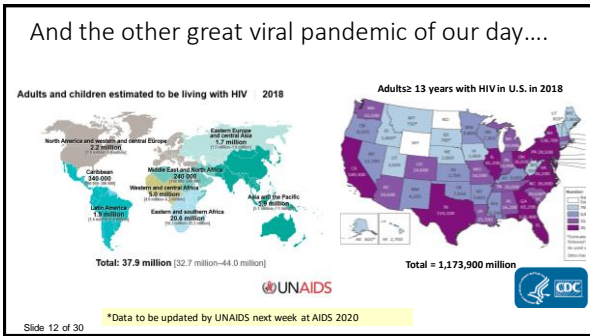
COVID-19 pandemic – June 29, 2020

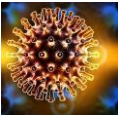
9,680,000 infections worldwide; 491,000 deaths



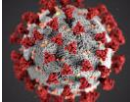
Slide 10 of 30







How will and are COVID-19 and HIV interacting?



Slide 13 of 30

First....

Does HIV increase susceptibility to SARS-CoV-2 or severe COVID-19 disease?

Slide 14 of 30

Are there reasons to think PWH could have worse outcomes with COVID-19

Theoretically yes

- PWH (especially those with low CD4 counts and high viral loads) are immunosuppressed, risk factor for ARDS in other viral infections
 - However, immunosuppression per se not a clear risk factor for SARS-CoV-2
- PLHIV have an increased frequency of some of the known risk factors associated with severe COVID-19¹
 - Nearly half of the PWH in the U.S. are >50 years²
 - PWH have a higher rate of cardiovascular disease and pulmonary disease, including chronic obstructive pulmonary disease, than general population^{3,4}
 - Higher rates of poverty and marginal housing among our safety-net populations

¹CDC. <https://www.cdc.gov/media/releases/2020/p0625-update-expands-covid-19.html>; ²CDC. HIV over 50. <https://www.cdc.gov/hiv/group/age/olderamericans/index.html>; ³Triant. Curr HIV/AIDS Rep. 2013; ⁴Fitzpatrick. AIDS 2028

Slide 15 of 30

Are there reasons to think PWH could have better outcomes with COVID-19?

Theoretically yes

- Tenofovir may inhibit replication of the SARS-CoV-2 virus¹ (looks like remdesivir which does work against SARS-CoV-2²)
- Lopinavir/ritonavir and atazanavir/ritonavir MAY have effects but not in studies so far³
- Maybe tenofovir or HIV itself suppresses immune effects and inflammation and could help all the inflammation in severe disease with COVID-19
- Study in Spain of HCW randomized to TDF/FTC versus placebo on susceptibility to SARS-CoV-2
- Those with HIV may be social distancing more from concern



Slide 16 of 30

¹Elffiky NEJM 2020; ²Beigel NEJM 2020; ³Goldman NEJM 2020; ⁴Cao NEJM 2020

Small studies on how HIV influences COVID-19 outcomes to date

- Only small case series on the risk of SARS-CoV-2 infection or severe COVID-19 disease among people with HIV (PWH) to date

Case series of 47 PLWH in Italy, COVID-19 hospitalization was reported to occur at ages an average of 10 years younger than people without HIV although the majority of PWH had at least one co-morbidity that could predispose to severe COVID-19¹

21 PLWH at NYU, when compared to 42 matched controls without HIV, greater ICU admission (29% vs. 17%) and need for intubation (24% vs. 12%)²



Slide 17 of 30 ¹Gervasoni C CID 2020; ²Karmen-Tuohy S. JAIDS 2020

Few other studies on how HIV influences COVID-19 outcomes to date

- Only small case series on the risk of SARS-CoV-2 infection or severe COVID-19 disease among PWH to date

Case report of pt with HIV, HCV, and COVID-19 showed RT-PCR repeatedly negative, IgM peak prolonged (42 days) & IgG titers blunted compared to those without HIV¹

Case series of 9 patients in Bronx COVID-19 had severe disease but all had co-morbidities¹

Mount Sinai- PWH admitted with COVID-19 (n = 88) matched to people without HIV (n=405) by age, race/ethnicity, sex, week of COVID-19 hospitalization admission: No differences in disease severity on admission or adverse outcomes (mechanical ventilation or death)³

Slide 18 of 30 ¹Zhao CID 2020; ²Suwanwongse K. J Med Virol 2020; ³Sigel. JID in press;

Western Cape Data- HIV and COVID-19



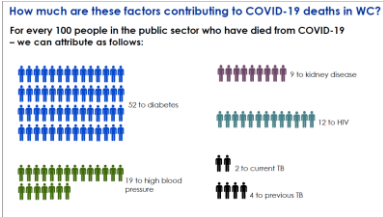
Health officials check a lot of people to be tested for COVID-19 as well as HIV and tuberculosis (TB) to determine who's most at risk for severe COVID-19 and TB infection rates. <https://www.who.int/news/2020/05/20200520-covid-19-tb-hiv>

HIV and TB increase death risk from COVID-19, study finds—but not by much

- 12,987 patients COVID-19 in Western Cape Town, South Africa
- After adjusting for other risk factors, HIV increased mortality with COVID-19 by factor of 2.75, and active TB by factor of 2.58

Slide 19 of 30 ¹Davies MA. AIDS 2020 Virtual (Nordling Science Mag 2020)

Western Cape Data- Interpretation



- Older age, comorbidities mostly increase risk of COVID-19 death
- Modest effect from HIV (<10% of COVID-19 deaths in setting of this generalized HIV epidemic due to HIV)

Slide 20 of 30

Next....

What about the effect of COVID-19 on HIV?

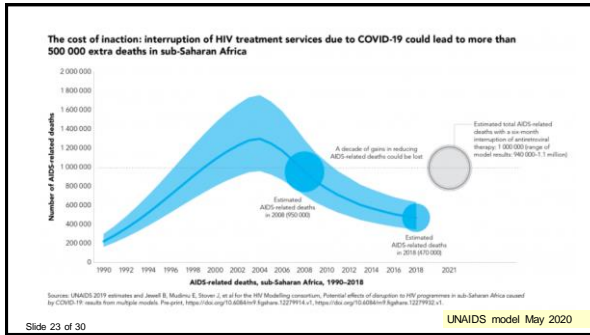
Slide 21 of 30

The Pandemic's Hidden Victims: Sick or Dying, but Not From the Virus

As the coronavirus overwhelms the health care system, people with other illnesses struggle to find treatment.

Impact of COVID-19 on HIV –
Expected to derail treatment,
PrEP, increase loneliness,
substance use, depression;

Slide 22 of 30



The impact of the COVID-19 response on the supply chain, availability and cost of generic antiretroviral medicines for HIV in low- and middle-income countries

June 24, 2020

- “Lockdowns have impacted both the transport of goods across the value chain of production and the distribution of HIV medicines”
- “Barriers to the supply chain and a forecasted economic shock indicate possible fluctuation in the availability of antiretroviral medicines and an increase in cost”
- “Coordinated action by governments is necessary to ease the supply chain and the distribution of medicines to facilities”

Slide 24 of 30

Tuberculosis and HIV responses threatened by COVID-19

As the first cases of COVID-19 affect Nigeria’s health-care workers, will the country’s HIV and tuberculosis responses weather the pandemic? Paul Adepoju reports.

Amimo et al. *Tropical Medicine and Health* 2020; 48:32
<https://doi.org/10.1186/s41182-020-00219-4>

Tropical Medicine and Health

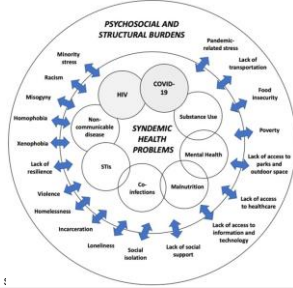
SHORT REPORT Open Access

What does the COVID-19 pandemic mean for HIV, tuberculosis, and malaria control?

Floriano Amimo^{1,2*}, Ben Lambert³ and Anthony Magai⁴

Slide 25 of 30

Physical, emotional, and social well-being of PLWH threatened



- Mental health
- Substance use
- Poverty
- Loneliness
- Medical mistrust
- Food insecurity
- Housing insecurity
- Racism, homophobia
-from COVID-19 public health response all likely to affect PLWH disproportionately

¹Shiau. AIDS and Behavior 2020

Also will affect PrEP, HIV testing, HIV risk

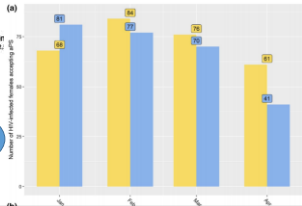
AIDS and Behavior
https://doi.org/10.1007/s13461-020-02938-7

NOTES FROM THE FIELD

Impact of the COVID-19 Pandemic on HIV Testing and Assisted Partner Notification Services, Western Kenya

Harrison Lagat¹, Monisha Sharma^{1,6}, Edward Karithi^{1,3}, George Otieno¹, Mary Mugambi¹, Beatrice Wamuti², Bryan Weiner², Carey Farquhar²

HIV testing in two communities in Western Kenya among women plummeted over last 4 months

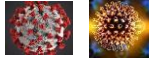


Slide 27 of 30

<p>SF: 07:30 RID: 13:30 JCHIAN: 16:30 BEIJING: 22:30</p> <p>SF: 08:00 RID: 13:00 JCHIAN: 17:00 BEIJING: 23:00</p> <p>SF: 13:30 RID: 19:00 JCHIAN: 22:00 BEIJING: 06:00</p> <p>SF: 17:30 RID: 23:00 JCHIAN: 02:00 BEIJING: 08:00</p> <p>SF: 00:00 RID: 06:00 JCHIAN: 09:00 BEIJING: 15:00</p> <p>SF: 01:30 RID: 07:30 JCHIAN: 10:30 BEIJING: 16:30</p> <p>SF: 01:40 RID: 07:40 JCHIAN: 10:40 BEIJING: 16:40</p>	<p>CHIEF Dr. Yohannes Abayehayew, WHO</p> <p>SPECIAL SESSION: MAKING SENSE OF THE SCIENCE Dr. Andrew G. Clark, HHS/NIH Prof. Sabin Adjuik, Boston, USA/WHO Arik Dokaebi, ICMC/WHO/International Consensus Conference</p> <p>IMPACT OF COVID-19 BEYOND HEALTH Mrs Mary Wakwani, former President of Kenya Prof. Pauli Njiru, Kenya Medical Research Institute Prof. Dr. Judith Mwangi, ICF Ms. Leasa Chikumbi, ICMC/WHO/International Consensus Conference</p> <p>IMPACT OF COVID-19 IN THE HEALTH SECTOR Dr. Amador Calonge, University of Texas Dr. Mohamed Njiru, ICMC Dr. Myrta Mungai, WHO Dr. Abena The Hard Owusu, ICMC</p> <p>COUNTRY POLICIES AND PRACTICES Prof. Peter Piot, ICMC Dr. Nancy Kibani, ICMC Dr. Gabriela Williams, WHO/University Dr. A. Kathryn Roddy, WHO</p> <p>PREPARING FOR TOMORROW Dr. BB Geeta, WHO</p> <p>CLINICAL</p>	<p>ABSTRACT SESSIONS (ON-DEMAND)</p> <p>Basic science, pathogenesis, virology, immunology, information Clinical science & care, testing & diagnosis, natural history & more</p> <p>Epidemiology, transmission dynamics, prevention, vaccines</p> <p>Public health responses</p> <p>Social, economic, political, human rights impacts</p>
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Conclusion



- COVID-19 spreading around the world now in areas of higher HIV prevalence (Africa, Europe, U.S.)
- People with HIV have higher rates of co-morbidities but is tenofovir protective?
- Studies to date in Europe/U.S. have not shown more severe outcomes or susceptibility to SARS-CoV-2 with HIV
- One study in South Africa shows COVID-19 mortality increased in PWH (need full date) by 2.75, but other co-morbidities much more significant
- Main effect of COVID-19 on HIV will be in treatment access, treatment outcomes, testing rates, PrEP access and outcomes, susceptibility to HIV
- Concerns regarding mental health effects, substance use, food insecurity, housing insecurity among PWH

Slide 29 of 30

Question-and-Answer Session