IDI COVID-19 Science Summary Compiled by Dr Andrew Mujugira (1st May to 8th May 2020)

1st May 2020

"When banana plants are felled by a thunderstorm, the chickens have no protection from the eagle"

Relation between COVID-19 and other critical diseases

- Diabetes and COVID-19

A meta-analysis of 6,452 patients from 30 studies found that diabetes was associated with adverse COVID-19 outcomes including mortality (risk ratio [RR] 2.12), severe COVID-19 (RR 2.45), acute respiratory disease syndrome (RR 4.64) and disease progression (RR 3.31) ($p<0.05$ for all comparisons) [Diabetes Metab Syndr. 2020 Apr 17].

- Hypertension and COVID-19

In a meta-analysis of 419 patients with COVID-19 (62% male; mean age 55.6 years), hypertensive patients had a three-fold higher odds of death compared with normotensive patients (OR 3.36, 95% CI: 1.96- 5.74, $p<0.0001$) [J Infect. 2020 Apr 1].

- Obesity and COVID-19

Obese patients aged <60 years (body mass index 30-34) are twice as likely to be admitted to acute care than non-obese patients (RR 2.0; 95% CI: 1.6-2.6, $p<0.0001$) [Clin Infect Dis. 2020 Apr 9].

2nd May 2020

"The dried meat of an elephant is cooked in a small pot"

Convalescent Plasma Therapy for COVID-19

Of 21 patients with end-stage COVID-19 in China, 6 received convalescent plasma and 15 did not. Nineteen died; 5 of 6 in the convalescent plasma group and 14 of 15 in the control group ($p=0.18$). One in each group survived.

Undetectable SARS-Cov-2 (viral clearance) was observed in 6 of 6 patients in the convalescent plasma group compared with 4 of 15 in the control group (100% vs. 27%; $p=0.004$).

Convalescent plasma does not appear to decrease mortality in patients with severe COVID-19.

3rd May 2020

"An animal that mistrusts itself: does not deliver twins"

SARS-CoV-1 Vs SARS-CoV-2

SARS-CoV-1 and SARS-CoV-2 share 82% of their genome. Both are transmitted primarily through respiratory droplets and are characterized by fever, cough, and shortness of breath. Both infections develop a median of 5 days after exposure.

The epidemic trajectories of SARS-CoV-1 and SARS-CoV-2 are very different. SARS infected ~8,100 and was controlled within 8 months. COVID-19 has infected 3.6 million and is still spreading after 5 months.

SARS-CoV-2 is more infectious than SARS-CoV-1 because of the high level of asymptomatic shedding in the upper respiratory tract. By contrast, replication in SARS-CoV-1 mainly occurs in the lower respiratory tract. SARS-CoV-2 viral load peaks 5 days earlier than SARS-CoV-1 which makes symptom-based detection of COVID-19 less effective than SARS.

'Asymptomatic transmission of SARS-CoV-2 is the Achilles' heel of current public health strategies to control COVID-19'.

4th May 2020

"Support a banana tree: before a big bunch of matooke causes it to fall"

COVID-19, Unemployment and Suicide

Approximately 800,000 people die by suicide every year. The World Health Organization estimates that each suicide in a population is accompanied by more than 20 suicide attempts.

In the period 2000–11 (including the 2008 global recession), suicide risk was elevated by 20–30% when associated with unemployment.

As the global and national economy contracts, the number of mentally distressed people needing mental health services is expected to increase. They should not be forgotten as we focus on containing COVID-19.

Kawohl and Nordt, The Lancet Psychiatry, Vol. 7, No. 5

5th May 2020

"By crawling a child learns to stand"

COVID-19 in Children

Children of all ages can get COVID-19, but they account for only 1-5% of cases [Ludvigsson, Acta Paediatr. 2020]. COVID-19 appears to be milder in children than in adults, although severe cases have been reported [Castagnoli, JAMA Pediatr. 2020].

COVID-19 symptoms are similar in children and adults, but are less common in children than adults [Pediatr Infect Dis J. 2020;39(5):355]. Infants <1 year and children with chronic pulmonary disease (including moderate to severe asthma), cardiovascular disease and immunosuppression appear to be at greater risk for severe disease [MMWR Morb Mortal Wkly Rep. 2020;69(14):422]

Why does COVID-19 appear to be less common and severe in children than in adults?

- Less vigorous immune response (cytokine storm) to SARS-CoV-2 in children versus adults [Lancet. 2020;395(10229):1033; Pediatr Pulmonol. 2020;55(5):1085]
- Viral interference in the respiratory tract of young children leads to a lower viral load in children
- Angiotensin converting enzyme 2 receptor, the receptor for SARS-CoV-2, may be expressed differently in the respiratory tract of children [Brodin, Acta Paediatr. 2020 Mar 25].

6th May 2020

"An elephant can trip over a creeping plant"

COVID-19 in the United States

New models from the USA estimate that by 1st June, confirmed COVID-19 cases will increase to 200,000/day and mortality will increase to >3,000/day. The cumulative death toll is expected to reach 135,000 by 1st August.

The COVID-19 epidemic will shift from urban centres in New York, New Jersey, California and Washington State to rural counties where healthcare is scarce.

The largest increases in COVID-19 deaths are forecast in Alabama, California, Florida, Georgia, Illinois, Indiana and Texas, many of which are relaxing lockdown restrictions.

Outbreaks will be concentrated in meatpacking plants, nursing homes and prisons with community transmission from these hotspots.

Importantly:

- Human mobility patterns are trending upwards,
- Testing is not keeping pace with demand for lifting restrictions
- Contract tracing is virtually non-existent. Thus, the virus is likely to continue spreading through the summer and merge with the 2020 flu season in autumn.

Sources: Institute for Health Metrics and Evaluation; New York Times

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7th May 2020

"An elephant does not break a Mvule tree"

COVID-19 and HIV

The impact of HIV infection on the natural history of COVID-19 is not fully understood [Bianco Lancet HIV 2020].

Comorbidities associated with severe COVID-19 (like cardiovascular disease) are common among people with HIV.

Management of COVID-19 is the same irrespective of HIV status. Lopinavir-ritonavir is used for HIV treatment, but has not yet been shown to be effective in treating COVID-19 [Cao N Engl J Med. 2020 Mar 18].

8th May 2020

"The chicken says she cries to let the public know her condition not that her enemy will release her."

Patient Experiences of Severe COVID-19

"I woke up with a headache like someone inside my head was trying to push my eyes out"

“We got nasal swabs and it felt like they took a piece of our brain”

“I felt so beat up, like I had been in a boxing ring with Mike Tyson”

“All I could do was pray because my body had gone kaput”

“My brain wasn’t working very well. I was calling it the corona fog”

“It’s not like a common cold, where you feel a sore throat [and runny nose]. It just goes straight into your lungs”

Source: The New York Times