Q: The Institute for Health Metrics Evaluation (IHME) model has been criticized for using a Gaussian error function, which fits a symmetrical curve. The experience from other countries seems to show a longer tail, particularly with deaths. Any comment on this assumption and is this the reason why the IHME model has the widest error bands in the near term and more narrow error bands further in time?

> A: I believe this is one reason IHME just updated their estimate of cumulative deaths. They are seeing in the data that daily deaths and new cases are not declining at the same pace that they increased during the early phase.

Q: Who is supporting IMHE model - a university, industry?

> A: The Institute for Health Metrics Evaluation is a research organization based in Seattle, WA mostly funded by the Bill & Melinda Gates Foundation

Q: Are there checklists that can help support the development of models so as to promote comparability of results?

> A: I don't know of anything specific, but the following might be helpful resources:

> The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach is considered the standard for grading evidence and recommendations, and is used in reporting modeling exercises. More details can be found here:

> https://www.bmj.com/content/336/7650/924

> https://www.bmj.com/content/336/7652/1049

> The International Decision Support Initiative (iDSI), a global network of health, policy and economic expertise, has a guide for planning, conducting and reporting of economic evaluations, and provides decisionmakers with relevant and reliable ways to determine the likely implications of implementing a treatment or health service in specific contexts. It is primarily designed for decisionmakers in LMICs.

> https://idsihealth.org/resource-items/idsi-reference-case-for-economic-evaluation/

> The guidelines below build on the iDSI reference case, with guidelines to encourage the conduct of high-quality benefit-cost analyses:

> https://sites.sph.harvard.edu/bcaguidelines/

> World Health Organization guide to generalized cost-effectiveness analysis:

> https://www.who.int/choice/publications/p_2003_generalised_cea.pdf

Q: Are there any simple tips, for lay people, to help determine whether a model is credible and sound? With the zone being so flooded with info, data, models - it is very confusing to lots of folks.

> A: In the course, we cover some key questions that you can ask about the models that will help you to look carefully at the model and determine in what context it was applied, what assumptions were used, etc. and to help you accordingly determine which model might be best applicable for your particular setting or need. These questions are detailed in a brief that we developed for the course, and we can share it after the webinar with the recording.

Q: I appreciate that the course will help with my earlier question, but are there things laypeople - who won't take this course - could be looking at to determine whether a model is legit, or not?

> A: How well does the model match the available data? Does it use parameters adjusted to the local conditions or just global values? How does it include the effects of responses such as social distancing and lockdowns?

Q: Would also like to hear more about the pitfalls of modeling we should be aware of.

> A. Projections are not predictions. Model projections show what could happen under a set of certain assumptions. But those assumptions could be wrong. Most models show an uncertainty range. It is important to take notice of the range and not just focus on the middle estimate.

Q: Any idea on COVID 19 mortality projection among HIV patients, particularly TB co-infected HIV patients?

> A: So far there are no data that indicate that how HIV infection may affect the change of becoming infected with COVID-19 or have a severe case. As in the general population, PLHIV who are older or have heart or lung problems may be at elevated risk of severe infection. We do not know the effects of co-infection of COVID-19 and TB. Certainly, TB treatment could be compromised if patients are unable to get their drugs.

Q: How have models which look at different intervention scenarios differentiated the effects of social distancing, school closure, hard lockdowns for example?"

> A: Through contact matrices, which show how many contacts people of each age have with people of other ages. School closure is modeled by reducing the contacts of children with other children. Social distancing is modeled as a reduction in the daily contacts of the adult population.

Q: Source of funding was noted as something to take into concern - are there any examples of models you can share where the source of funding clearly biased the model?

A: Not that I am aware of. Most of the models have been developed by university research groups that are responsive to the needs of policy makers for information but not influenced to develop specific results.

Q: What about the Spain data that showed that in HIV+ with CD4>340, there were few deaths?

A: WHO has said that available data indicate that people with well-controlled HIV did not have any elevated risk for COVID-19 compared to those that are HIV-negative.

Q: Is not a second wave inevitable anyway?

A: A second wave is certainly likely since immunity in most populations does not seem to reach very high levels, but this could also mean just endemic levels of infection at relatively low levels for a long time rather than a succession of serious waves.

**To watch the webinar *The Power–and Pitfalls–of Modeling for COVID-19 and HIV*,
visit: https://www.avac.org/event/modeling-covid-19-and-hiv**