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Better use of resources in global HIV programs: Informing policy through evidence-based modeling

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The fight against HIV has been a hallmark of global health efforts in the last decade. Spurred by unprecedented funding increases and vigorous implementation, global HIV programs have achieved major successes (e.g. 9.7 million people in low- and middle-income countries are now on antiretroviral treatment (ART), up from 300,000 in 2002). This progress has been achieved in an environment where advocacy, evidence and policy continuously push and pull each other. Evidence about the efficacy of HIV interventions emerges at a rapid pace from clinical trials. Pressure for revising policies (such as when to initiate ART) grows quickly from advocacy groups. And the policy community struggles to match aspirations with resources in a new environment where global economy continues to be sluggish. In this highly dynamic environment, well-reasoned models can clarify our intuition about the consequences of translating clinical evidence into population-level policy. For instance, one of the most celebrated pieces of evidence to emerge in the last few years was from the HIV Prevention Networks Trial 052 (HPTN 052) in 2011. It showed that ART can reduce the chances of HIV transmission in sero-discordant couples (where only one partner is HIV-infected) by 96%. This was quickly hailed as a game-changer in the fight against HIV leading to significant momentum around using HIV treatment-as-prevention (TasP). The resources required would be much more than were available, but modeling studies showed that TasP would still be cost-effective compared to an absolute benchmark of an intervention's cost-effectiveness (e.g. three times the GDP per capita). In this presentation, we will present a model that allowed us to assess the cost-effectiveness of TasP not against an absolute benchmark but against combinations of other HIV interventions, such as ART and medical male circumcision (MMC). This model suggested that TasP is not a game-changer as similar health benefits are obtainable by combinations of ART and MMC at a lower cost. A second, and ongoing, stream of work extends this model to analyze the implications of the HPTN 052 results on human resources required for providing universal ART coverage. Previous studies had painted a pessimistic picture that almost unachievable increases in human resources would be required to achieve universal coverage, based on the evidence available then. Our new results paint a more optimistic picture, but also point out some policy pitfalls to avoid in implementing policies such as TasP. Finally, if time permits, we will quickly discuss how modeling opportunities exist for fundamentally rethinking the issue of optimal allocation of resources between HIV treatment and prevention interventions.

Salal Humair is a Research Scientist at the Department of Global Health and Population, Harvard School of Public Health. Previously, he has served as an Associate Professor and as Associate Dean at the School of Science and Engineering (SSE) established in 2008 at the Lahore University of Management Sciences (LUMS) in Pakistan; and as a Principal Software Engineer at Optiant Inc., a startup company that focused on supply chain optimization software. He obtained his doctorate in Operations Research from the Massachusetts Institute of Technology in 2001, and transitioned from industry to academia in 2007, first helping launch LUMS SSE (2007-2009), and then pursuing global health research at the Harvard School of Public Health (2009-). His current work spans a range of public health policy questions such as: investigating the cost-effectiveness of different HIV interventions and optimal allocation of resources among them; investigating the mechanisms through which new technology drives healthcare costs inflation; and modeling the macro-economic benefits of family planning programs. He also continues to work in traditional operations areas such as supply chain optimization theory and practice.

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