Pre-Exposure Prophylaxis (PrEP)

Built into the CEPAC Model's HIV Testing framework are a number of structural features that permit us explore outcomes associated with different HIV counseling, testing, and referral program designs and events. These include features to simulate prevention counseling, behavioral response (among both HIV-infected and HIV-negative persons, as well as between both tested and untested persons), and the aftermath of false-positive reports in uninfected persons. These features can also be employed to simulate a PrEP intervention. Specifically,

- The HIV Testing module permits us to assign unique costs, quality of life effects, and behavioral responses (e.g., acceptance and return rates), to the first-time HIV test. In simulating a PrEP intervention, these are used to assign a fixed cost to treatment initiation.

- The HIV Testing module permits us to modify test periodicity and return rates. In simulating PrEP, these are used to simulate the likelihood that individuals remain adherent to prophylaxis over time.

- The HIV Testing module's counseling component is adapted to accommodate PrEP uptake; and

- The HIV testing module includes a feature that assigns a quality of life decrement to capture the impact of false positive results. In simulating PrEP, we use this feature to assign both a quality of life decrement and cost to possible PrEP toxicity.

Users can specify variables governing the provision, suspension, performance, and cost of counseling services and PrEP. This framework has the flexibility to capture a range of program intensities, from no intervention to basic risk counseling and more elaborate behavioral and chemoprophylactic prevention. For patients receiving PrEP, the model tracks changes in risk-taking behavior, toxicity, occurrence of drug resistance in individuals who develop HIV infection and are subsequently treated with ART, quality of life, and cost of HIV-related care. The model can also capture the clinical and economic outcomes associated with HIV transmission, detection, and referral activities. The model estimates lifetime infection risk under alternative PrEP scenarios. The model also conveys information to the Disease Model on HIV infection status; whether and when HIV detection, follow-up, and linkage to care occur; and whether an infected person had previously received PrEP. The Disease Model then combines this information with its own output on the timing of complications to establish whether, when, and how an individual case of HIV infection will be treated.