

## Application of Weighted Time-Series to Address Bias in Evaluation of Clinic- and Community-Level Research

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### Project Description

This study will use simulation to develop, test and apply new analytic methods (weighted time-series) for evaluation of community-level interventions. It will then compare results using weighted time-series and conventional methods within the context of a clinic-level intervention to provide family-centered HIV care, voluntary counseling and testing (VCT) and prevention services at Family AIDS Care and Education Services (FACES), a community-based organization in Kenya. Because FACES includes observational data on virtually all patients in care at participating clinics, it provides an excellent platform to evaluate the effectiveness of this intervention using both cohort and time-series methods. The results of this study will be used to seek funding to test the broader application of these methods in both community- and clinic-level interventions.

The specific aims of the proposed project are:

- To provide the rationale and framework for applying weighted time-series to serial cross-sectional data.
- To use simulation (created data) to apply and test the use of weighted time-series in a setting where the distribution of demographic characteristics and the health status of the population changes over time.
- To use existing clinical data to compare the effect of introducing family-centered HIV care, VCT and prevention services on the transmission of HIV among the families served by participating clinics using cohort analysis, time-series analysis and weighted time-series.

### Significance

The HIV pandemic continues to have a devastating impact in many nations throughout the world. As additional resources become available for prevention, testing and treatment of HIV, there is increasing emphasis on policy-level, community-level and clinic-level interventions to prevent the spread of HIV, identify HIV+ individuals, provide medications for people with HIV and improve the quality of HIV care. However, current methods to evaluate the effectiveness of these interventions are limited and can produce biased results. This problem is particularly relevant within communities heavily impacted by HIV where the distribution of age, gender, and health status changes dramatically before and after the introduction of antiretroviral therapy. Neither longitudinal studies which employ repeated measures on individuals over time nor serial cross-sectional studies which employ repeated observations on different individuals in the community over time are able to accurately assess the effectiveness of community-level interventions.

**Project End Date:** August 2009