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# Modeling time taken to HIV testing and uptake of test results: application of extended PWP model

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## ABSTRACT

Improving HIV testing among the most at risk populations (MARP) is one of the first steps to achieve the Sustainable Development Goal target of ending AIDS by 2030. Factors affecting time taken to HIV testing and subsequent clinic visits to uptake the test result are important inputs for development of HIV prevention programmes. This study aims to develop multivariate statistical models to describe HIV testing behavior of MARP. HIV testing data of 5667 Female Sex Workers registered with the National HIV Prevention Programme in 10 districts of Sri Lanka during 2016 and 2017 were modelled using univariate and multivariate survival analysis techniques. Results showed that the Prentice, Williams & Peterson gap time model (PWP-GTM), and all univariate Cox Proportional Hazard Models together generated consistent results. However, higher number of effects of the factors and interaction effects were detected in the PWP-GTM compared to other models. Further, PWP-GTM generated more precise estimates with lower standard errors. In all the models, most of the factors were identified as time dependent covariates. Study concludes that the extended PWP-GTM is the more appropriate technique to model time taken to HIV testing and subsequent clinic visit to uptake of test results among MARP.

## ARTICLE HISTORY



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## KEYWORDS

HIV testing; multiple ordered events; PWP model; time-dependent covariates; multivariate survival model

## 1. Introduction and background

Globally, all nations work hard to realize the Sustainable Development Goal (SDG) of ending the AIDS epidemic by 2030 [1]. One crucial part of this plan is early detection of HIV cases and bringing HIV treatment to all who need it. Research indicates that, by 2012, less than 50% of key populations in many Asian and African countries do not know their HIV status [2]. It usually takes a few days to a few weeks to get the results of an HIV test, especially in developing countries. Therefore, follow-up clinic visits to receive HIV test results are also important to know the HIV status and act on it [3]. Studies have shown that in traditional HIV programs nearly one-third of the patients screened for HIV usually fail to

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