



# APPLIED STATISTICS WORKSHOP

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## Two-stage equation model to control for informative attrition in mortality analysis: use of longitudinal data from demographic surveillance systems

### Abstract

*“An individual who is censored at  $c$  should be representative of all those subjects with the same values of the explanatory variable who survive to  $c$ ” (Cox and Oakes, 1984)*

The hypothesis of independence between attrition and event is rarely confirmed when attrition is mainly due to out-migration from health and demographic surveillance site (HDSS). Migration could be related to respondents' health behaviour and that would constitute a serious drawback for analysing site-specific mortality risks. The proposed solution is a two-stage equation model with out-migration at the first stage (Cox model, using two instruments) and mortality by cause at the second stage (Fine & Gray competing risk model). At the second stage attrition is controlled through indicators of observed and non-observed heterogeneity. Models are tested using data on adult aged 15-79 who lived in 2004-2010 in two Nairobi slums covered by APHRC HDSS. Preliminary results confirm hypothesis that out-migration is selective on (often unknown) health status: effects shows only for non-violent (expected, preceded by disease) deaths and unknown characteristics of out-migration are more important than observed ones to explain mortality in HDSS. Way forward is indicated.

**February 10, 2012 - 14:30 - Room c 115**

You are welcome at the coffee break (room : c 105)

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