In the labour force (LF) was defined as those self-reporting being currently employed, self-employed, unemployed (looking for work or waiting to start new work) or working in own agricultural work. ‘Not in the labour force’ (NILF) included homesteaders, students, retirees and others not looking for work. Those self-reporting being permanently sick or disabled were excluded from the analysis.

**ADDED VALUE OF THIS STUDY**

This study is the first to analyse the association between excess PDLs and HIV infection in informal sector workers, which make up nearly 90% of the labour force in Sub-Saharan Africa. This study undertook a direct comparison with HIV-negative persons, which constitutes the benchmark population of average PDLs.

**STATISTICAL ANALYSIS**

- Multivariate negative binomial regression (NegBin) models with variance explained equal to the mean of the function were used to evaluate the effect of HIV status on PDLs.
- Multivariate models, by age, ethnic group, education, use of recreational drugs and community fixed effects were estimated separately for Zambia and South Africa.
- PDLs in our sample are over-dispersed with a variance greater than its mean and the Poisson density is likely to predict a smaller proportion of a low outcome of PDLs compared to observed data (Table 1).
- Results are presented as both marginal effects and predicted values evaluated at the means of all other covariates. A positive marginal effect represents the additional or ‘excess’ PDLs that HIV-positive individuals lose due to illness and/or accessing health care over three months when compared to HIV-negative individuals.
- To evaluate model fit, we examined whether the NegBin model reduced differences between the observed distribution of PDLs and the distribution predicted by the model for each count, compared to the Poisson model.

**FINDINGS**

**TABLE 1. Distribution of PDLs by HIV status and country**

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV status</th>
<th>PDLs</th>
<th>HIV positive</th>
<th>HIV negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>HIV negative</td>
<td>1.01</td>
<td>0.95</td>
<td>0.92</td>
</tr>
<tr>
<td>South Africa</td>
<td>HIV negative</td>
<td>1.02</td>
<td>0.95</td>
<td>0.92</td>
</tr>
</tbody>
</table>

- Predicted productive days lost over 3 months by HIV status
- The full survey sample included:
- Responses from 19,760 (83%) of 23,676 randomly selected individuals in Zambia and 18,941 (88%) of 21,568 randomly selected individuals in South Africa.

**TABLE 2. Excess days lost disaggregated by ART status**

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV positive</th>
<th>Excess productive days lost by HIV status and ART status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>HIV positive</td>
<td>1.97</td>
</tr>
<tr>
<td>South Africa</td>
<td>HIV positive</td>
<td>3.2, SD: 3.67</td>
</tr>
</tbody>
</table>

- There is a significant burden in lost work and home productivity due to HIV in the general population, but it is smaller than existing estimates for samples dominated by formal sector workers. Productive days lost need to be considered when evaluating the balance between lost work time and a societal perspective. The findings will support policy makers in building an investment case for HIV interventions.

**MODEL PREDICTIONS**

- In Zambia, the 2% of individuals who were HIV-positive had 0.74 more PDLs than HIV-negative individuals over three months. The 22% HIV-positive women in South Africa had 0.31 more PDLs than HIV-negative South African women.

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**REFERENCES**


- authors

- the personal interests of the authors and does not necessarily represent the official views of the NIAID, NIMH, NIDA, PEPFAR, the Bill & Melinda Gates Foundation.