Malawi 4th Follow-Up Impact Survey 2017
Recommendations Report
1 Programmatic recommendations

This reports reviews the 4th year of follow-up (FU4) impact survey which was conducted in Malawi, in February-April 2017 following four rounds of mass preventive chemotherapy (PC) for schistosomiasis (SCH) and soil-transmitted helminths (STH). The following programmatic recommendations are:

Table 1: Observations and corrective actions from the impact survey

<table>
<thead>
<tr>
<th>Finding or observation</th>
<th>Interpretation</th>
<th>Programmatic action</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Schistosoma mansoni</em> prevalence decreased from baseline.</td>
<td>PC is reaching target populations in these areas.</td>
<td>Ministry of Health (MoH) control programme works to maintain these gains.</td>
</tr>
<tr>
<td><em>S. haematobium</em> prevalence decreased from baseline.</td>
<td>PC is reaching target populations in these areas.</td>
<td>MoH control programme works to maintain these gains.</td>
</tr>
<tr>
<td>Prevalence of heavy-intensity infection &lt;1% across sentinel sites.</td>
<td>Treatment is reaching the schools and is having an impact on intensity of infection and consequently reducing and preventing morbidity in infected individuals.</td>
<td>The MoH is currently in the process of re-assessing all districts of Malawi to determine if impact has been replicated elsewhere in the country and to review treatment strategies. The reassessment will provide evidence to optimise the effective allocation of resources to where they are needed. Reassessment has been undertaken in 23 districts in 2017 and 2018, and will be completed in the remaining 5 districts in early 2019.</td>
</tr>
<tr>
<td>Statistically significant difference in prevalence of <em>S. haematobium</em> between males (2.6%) and females (2.1%).</td>
<td>Boys are more likely to be infected than girls i.e. are more pre-disposed to SCH due to behavioural and physiological factors. Treatment coverage may be gender equal (evidence from Malawi coverage evaluations) but frequency, coverage and compliance may need to be higher in males to have an equal effect on prevalence and intensity.</td>
<td>The MoH to develop strategies to ensure girls and boys are reached equally in treatment, including through social mobilisation, development of messages and training of Health Surveillance Assistants in the lead up to annual mass drug administration. Going forward, this should be incorporated into annual planning processes.</td>
</tr>
<tr>
<td>Finding or observation</td>
<td>Interpretation</td>
<td>Programmatic action</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Increase in prevalence of <em>S. mansoni</em> in two schools since FU3 (2016) despite overall reduction in both since baseline (2013).</td>
<td>At such low prevalence this variation is within the margin of error for this survey.</td>
<td>MoH and SCI to review the coverage in all the sentinel site schools and monitor those that are having &gt;2 years of increasing or higher prevalence.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MoH and SCI to continue to monitor any changes, particularly any increase in heavy intensity in all age groups.</td>
</tr>
</tbody>
</table>

## 2 Methods

All methods described in associated protocol:
[https://imperiallondon.sharepoint.com/:w:/r/sites/fom/schisto/mer/2_Country_M%26E/MWI/Impact/FY_1718/1_Protocol_%26_pre-survey/MWI_Impact_Country_M%26E_MWI_Impact_Protocol_FU4_EN.docx?d=w5aca5a71a14b42ac8f3a2c2f937875d9&csf=1&e=2qO1gb](https://imperiallondon.sharepoint.com/:w:/r/sites/fom/schisto/mer/2_Country_M%26E/MWI/Impact/FY_1718/1_Protocol_%26_pre-survey/MWI_Impact_Protocol_FU4_EN.docx?d=w5aca5a71a14b42ac8f3a2c2f937875d9&csf=1&e=2qO1gb)

### 2.1 Field methods

The survey schedule was interrupted by national and school holidays during data collection. Catch up days were used to finish visits to the sentinel sites.

### 2.2 Deviations from protocol

- At the school level there was a substantial protocol deviation: the protocol called for the collection of WASH indicators as well pupil registration data (numbers of boys and girls registered for each grade taught at the school). Only the pupil registration data was collected.
- The only significant protocol deviation at pupil level occurred in the school Amazing Grace PvT. Here only 15% of the sampled pupils participated on the second day of data collection (17 out of 114 pupils in the first day). The survey team reported that the pupils involved refused to participate on the second day and they were unable to convince them otherwise.
- The proportion of girls sampled ranged from 46% to 58% which is an acceptable range of variation (protocol called for 50%) except for one school, Likuni Boys which is a single sex school.
- On average, 93% of the sample size was achieved. Most schools managed over 95% however 4 schools, Young Ambassadors, Mphete, Kanyerere and Kambuku only sampled 75% to 78% of the required 120 pupils. This was due to the size of the schools and the numbers of pupils attending at the correct age range.
2.3 **Ethical approval**

Ethical approval was granted by Imperial College Research Committee ICREC_8_2_2. In Malawi, the National Health Sciences Research Committee has advised that evaluation activities related to existing programs of the Ministry of Health are exempt from scientific and ethical review.

3 **Survey Recommendations**

**Table 2:** Observations and corrective actions for the survey process

<table>
<thead>
<tr>
<th>Finding or observation</th>
<th>Interpretation</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>There was a significant delay between the completion of the survey and receipt of survey data.</td>
<td>Data were collected on paper forms, which were then collated and subsequently manually entered onto excel spreadsheets.</td>
<td>Future surveys to be conducted on smartphones with data uploaded daily to the shared MoH-SCI server.</td>
</tr>
<tr>
<td>The data initially received contained information from the incorrect schools.</td>
<td>The team was conducting two surveys simultaneously, phase one of a national reassessment as well as FU4 impact survey data. This resulted in the survey supervision team being overburdened and unable to adequately organise and manage paper forms. Therefore, when the data were initially entered there had not been suitable separation of impact and reassessment data.</td>
<td>The timing of data collection activities should take into account the supervision capacity of the country team. If possible avoid running multiple surveys simultaneously. Use of smartphones will also facilitate a clear separation of survey data.</td>
</tr>
<tr>
<td>In the data initially received the pupil dataset did not contain a unique school ID which meant it could not be linked with either school data or previous years’ data.</td>
<td>Insufficient guidance and supervision provided to data entry team.</td>
<td>Where paper forms are used for data collection, provide pre-formatted data entry sheets with clear data validation guidelines. Use of smartphone based data collection platform will mitigate the risk of this re-occurring.</td>
</tr>
</tbody>
</table>
4 Results

4.1 Dashboard

Overall, the prevalence of S. mansoni has had an 83% reduction from baseline, going from 2.2% to 0.4%. Although two schools show an increase since F2, the prevalence for those schools is lower than at baseline. At such low prevalence this variation is within the margin of error for this survey. The increase in the prevalence of heavy infection from F2 to F4 is caused by one child who was found to be heavily infected from the total sample (no heavily infected children were found in F4).

The prevalence of S. haematobium has reduced by 74% from baseline, 9.2% to 2.4% in F4. Prevalence of heavy infection has also reduced from 1.6% to 0.5%, a 69% reduction from baseline. While overall prevalence shows a steady decrease, year on year, the prevalence of heavy infection has remained fairly consistent since F2 (0.9%). The mean intensity of infection has reduced by 84% from baseline, 36 epg to 8 epg.
In F4, the only STH infection observed was one case of hookworm, with light infection. The overall level of STH infection is sufficiently low that the variation observed between years is within the margin of error for a study of this size.

One of the schools (806-023) had 100% prevalence for E. I. In this situation only 2 observations were recorded, both of which tested positive for hookworm. This school was dropped from the plot of STH prevalence as the result was misleading.

**Commentary:**

There is a slight difference observed between the prevalence for boys and girls at F4, 0.5% for S. mansoni and 2.0% for S. haematobium. The difference in prevalence for S. mansoni is not significant (p = 0.052); however, the difference is significant for S. haematobium, with boys being more likely to be infected (p = 0.001).

The table below shows the change from baseline to F4 for prevalence, prevalence of heavy infections, and mean intensity for S. mansoni, S. haematobium, and hookworms.

<table>
<thead>
<tr>
<th>Key infection</th>
<th>S. mansoni</th>
<th>S. haematobium</th>
<th>Hookworm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence (%)</td>
<td>1.15</td>
<td>0.13</td>
<td>0.15</td>
</tr>
<tr>
<td>Pre-heavy inf.</td>
<td>-0.05</td>
<td>-0.12</td>
<td>N/A</td>
</tr>
<tr>
<td>Mean egg. pd.</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>
### 4.2 Results tables

**Table 3.** Impact survey results

Prev. = Prevalence; % RBF = % reduction from baseline; † = prevalence percentiles (25th, 50th (median), 75th) across all schools; p-value = p-value of difference from baseline; Mean inten. = Mean intensity (epg / ep10ml); †† = Mean intensity percentiles across all schools

<table>
<thead>
<tr>
<th>Infection</th>
<th>Characteristics</th>
<th>Prevalence</th>
<th>Prevalence of heavy infections</th>
<th>Mean Intensity (epg / ep10ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prev.</td>
<td>†</td>
</tr>
<tr>
<td><strong>S. mansoni</strong></td>
<td>BL</td>
<td>9</td>
<td>537</td>
<td>2.23%</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>776</td>
<td>0.39%</td>
</tr>
<tr>
<td><strong>S. haematobium</strong></td>
<td>BL</td>
<td>22</td>
<td>2064</td>
<td>9.21%</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>22</td>
<td>1819</td>
<td>2.36%</td>
</tr>
<tr>
<td><strong>Any STH</strong></td>
<td>BL</td>
<td>9</td>
<td>537</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>776</td>
<td>0.13%</td>
</tr>
<tr>
<td>Infection</td>
<td>Year</td>
<td>No. Schools</td>
<td>No. Pupils</td>
<td>Prev.</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>-------------</td>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>A. lumbricoides</strong></td>
<td>BL</td>
<td>9</td>
<td>537</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>776</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Hookworm</strong></td>
<td>BL</td>
<td>9</td>
<td>537</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>776</td>
<td>0.13%</td>
</tr>
<tr>
<td><strong>T. trichiura</strong></td>
<td>BL</td>
<td>9</td>
<td>537</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>776</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Table 4. Impact survey results by sex

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. mansoni</td>
<td>baseline</td>
<td>9</td>
<td>257</td>
<td>280</td>
<td>3.50%</td>
<td>1.07%</td>
<td>0.39%</td>
<td>0.00%</td>
<td>3.97</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>398</td>
<td>378</td>
<td>0.25%</td>
<td>0.53%</td>
<td>0.00%</td>
<td>0.26%</td>
<td>0.02</td>
<td>2.14</td>
</tr>
<tr>
<td>S. haematobium</td>
<td>baseline</td>
<td>22</td>
<td>916</td>
<td>1148</td>
<td>7.21%</td>
<td>10.81%</td>
<td>1.31%</td>
<td>1.83%</td>
<td>3.00</td>
<td>4.06</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>22</td>
<td>887</td>
<td>932</td>
<td>2.08%</td>
<td>2.62%</td>
<td>0.23%</td>
<td>0.77%</td>
<td>0.40</td>
<td>0.72</td>
</tr>
<tr>
<td>Any STH</td>
<td>baseline</td>
<td>9</td>
<td>257</td>
<td>280</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>398</td>
<td>378</td>
<td>0.25%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>A. lumbricoides</td>
<td>baseline</td>
<td>9</td>
<td>257</td>
<td>280</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>398</td>
<td>378</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Hookworm</td>
<td>baseline</td>
<td>9</td>
<td>257</td>
<td>280</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>398</td>
<td>378</td>
<td>0.25%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>T. trichiura</td>
<td>baseline</td>
<td>9</td>
<td>257</td>
<td>280</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>FU4</td>
<td>9</td>
<td>398</td>
<td>378</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Calculation of p-values of differences between sexes incorporated clustering at the school level. Statistical methodology is available from SCI on request.

4.3 Pdf of dashboard

MWI_Impact2017_B_LtoFY4_dashboard.pdf