Community health monitoring of the Trident Copper Project in Zambia

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HIA for the Kalumbila Copper Mine

Project phases
- Feasibility and design phase (2008-2012)
- Construction phase (2012-2015)
- Operational phase (2016 onwards)

HIA steps
- 1. Screening and 2. Scoping
- 3. Risk assessment
- 4. CHMP design
- 5. CHMP implementation and M&E

HIA related activities
- Follow-up health survey 2015
- Follow-up health survey 2019
- Follow-up health survey 2023

CHMP: community health management plan; M&E: monitoring and evaluation

Follow-up health survey 2019
Follow-up health survey 2023

Interventions
- CHMP implementation and M&E
- Monitoring
- Evaluation
- Adapt + Act

Feasibility and design phase
- Literature review
- Health information system data
- Stakeholder engagement
- Baseline health survey 2011
- HIA report

Construction phase
- Follow-up health survey 2015

Operational phase
- Follow-up health survey 2019
- Follow-up health survey 2023
Survey methods
Impacted communities / sites

Considered directly impacted by the mine through e.g. resettlement, high influx, health interventions, etc.

Comparison communities / sites

Considered not/less impacted by the mine (although spill-over effects)

→ The same communities were surveyed every year
Biomedical indicator sampling

Health facility assessment

Knowledge, attitudes and practices

Environmental sampling

Direct observations

Socio-economic indicators

Health outcome and health-related indicators
Swiss TPH

Results: selected indicators
### Nutritional indicators in children aged under 5 years

<table>
<thead>
<tr>
<th>Prevalence of wasting (low weight-for-height) in children 0-59 months</th>
<th>Prevalence of stunting (low height-for-age) in children 0-59 months</th>
<th>Prevalence of underweight (weight-for-age) in children 0-59 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2011</td>
<td>2011</td>
</tr>
<tr>
<td>2015</td>
<td>2015</td>
<td>2015</td>
</tr>
<tr>
<td>2019</td>
<td>2019</td>
<td>2019</td>
</tr>
<tr>
<td>2023</td>
<td>2023</td>
<td>2023</td>
</tr>
</tbody>
</table>

- **Acute malnutrition**: Seemingly low but important increases in 2023.
- **Chronic malnutrition**: Decrease since baseline & steady levels since 2019.
- **Underweight**: Slight increases since 2019.

- Overall, there has been improvement in the nutritional status of children since 2011, esp. chronic malnutrition.
- However, the indicators are still below standards of a normally nourished population.
• Strong drops in ownership and utilization of bednets since 2019
• Mirroring country trends, malaria prevalence has increased since 2011
• Constantly significantly higher in comparison sites (except at baseline)
HIV testing uptake in women and men aged 15-49 years

- Proportion of people ‘ever tested’ increased steadily but reached a plateau

→ (‘Ever tested’) vs. ‘last test’ or ‘repeated testing’
→ Important to keep ‘repeated testing’ rates high
Syphilis prevalence

<table>
<thead>
<tr>
<th>Sentinel Site</th>
<th>2015 FUHS</th>
<th>2019 FUHS</th>
<th>2023 FUHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Kalumbila Town</td>
<td>30</td>
<td>6.7</td>
<td>32</td>
</tr>
<tr>
<td>N. Resettlement</td>
<td>43</td>
<td>2.3</td>
<td>36</td>
</tr>
<tr>
<td>Chisasa</td>
<td>66</td>
<td>3.0</td>
<td>77</td>
</tr>
<tr>
<td>Musele</td>
<td>95</td>
<td>0.0</td>
<td>86</td>
</tr>
<tr>
<td>Kankonzhi</td>
<td>39</td>
<td>5.1</td>
<td>39</td>
</tr>
<tr>
<td>Chovwe</td>
<td>32</td>
<td>6.3</td>
<td>37</td>
</tr>
<tr>
<td>Shenengene</td>
<td>32</td>
<td>9.4</td>
<td>34</td>
</tr>
<tr>
<td>Chitungu</td>
<td>36</td>
<td>5.6</td>
<td>38</td>
</tr>
<tr>
<td>Kasanzhi</td>
<td>38</td>
<td>10.5</td>
<td>37</td>
</tr>
<tr>
<td>Mukili Wantambo</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Impacted Sites</td>
<td>411</td>
<td>4.4</td>
<td>416</td>
</tr>
<tr>
<td>Nkenyawuli</td>
<td>30</td>
<td>6.7</td>
<td>39</td>
</tr>
<tr>
<td>Wamafwa</td>
<td>34</td>
<td>2.9</td>
<td>35</td>
</tr>
<tr>
<td>Jiundu</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kanzala</td>
<td>32</td>
<td>3.1</td>
<td>70</td>
</tr>
<tr>
<td>Mumbezhi</td>
<td>35</td>
<td>2.9</td>
<td>41</td>
</tr>
<tr>
<td>Comparison Sites</td>
<td>131</td>
<td>3.8</td>
<td>185</td>
</tr>
<tr>
<td>Overall</td>
<td>542</td>
<td>4.2</td>
<td>601</td>
</tr>
</tbody>
</table>

- Overall, insignificant but important increase since baseline
- Certain higher prevalence villages (esp. also increases since 2019)
- Wamafwa, Chovwe, Kankonzhi, Mukili Wantambo and Musele: located along the same road axis
**Summary findings**

**Indicators**

<table>
<thead>
<tr>
<th>Determinants of health at the household level</th>
<th>Baseline data year</th>
<th>n</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>Impacted communities</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household with solid housing structure</td>
<td>2011</td>
<td>993</td>
<td>1.57 (0.91-2.71)</td>
<td>0.108</td>
<td>1.58 (1.01-2.46)</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td>Household with access to safe drinking water in the dry sea</td>
<td>2011</td>
<td>793</td>
<td>5.93 (2.58-30.9)</td>
<td>0.001</td>
<td>14.98 (4.41-50.85)</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Household with access to safe drinking water in the wet sea</td>
<td>2011</td>
<td>793</td>
<td>10.69 (3.09-37.03)</td>
<td>0.000</td>
<td>15.0 (4.41-50.85)</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Household with at least 1 person employed</td>
<td>2015</td>
<td>993</td>
<td>1.95 (0.67-4.37)</td>
<td>0.105</td>
<td>10.1 (5.14-20.0)</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

**Health outcomes in women aged 15-29 years**

<table>
<thead>
<tr>
<th></th>
<th>Baseline data year</th>
<th>n</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>Impact vs. comparison communities</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of anaemia</td>
<td>2011</td>
<td>993</td>
<td>0.63 (0.25-1.48)</td>
<td>0.275</td>
<td>0.69 (0.25-1.39)</td>
<td>0.229</td>
<td></td>
</tr>
<tr>
<td>Prevalence of thinness</td>
<td>2015</td>
<td>1,211</td>
<td>0.96 (0.53-1.74)</td>
<td>0.887</td>
<td>0.78 (0.27-0.84)</td>
<td>0.100</td>
<td></td>
</tr>
<tr>
<td>Prevalence of overweight</td>
<td>2015</td>
<td>1,211</td>
<td>1.95 (0.87-4.40)</td>
<td>0.107</td>
<td>4.29 (2.10-8.74)</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Prevalence of high blood pressure</td>
<td>2015</td>
<td>1,237</td>
<td>0.81 (0.52-1.27)</td>
<td>0.360</td>
<td>1.35 (0.92-1.97)</td>
<td>0.123</td>
<td></td>
</tr>
<tr>
<td>Prevalence of syphilis</td>
<td>2015</td>
<td>1,182</td>
<td>2.61 (0.95-7.22)</td>
<td>0.064</td>
<td>1.16 (0.42-3.18)</td>
<td>0.777</td>
<td></td>
</tr>
</tbody>
</table>

**Health outcomes in children aged 9-14 years**

<table>
<thead>
<tr>
<th></th>
<th>Baseline data year</th>
<th>n</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>Impact vs. comparison communities</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of children with no parasites seen</td>
<td>2011</td>
<td>793</td>
<td>5.74 (1.90-17.30)</td>
<td>0.002</td>
<td>3.12 (1.07-9.14)</td>
<td>0.038</td>
<td></td>
</tr>
<tr>
<td>Prevalence of children with S. haematobium</td>
<td>2011</td>
<td>792</td>
<td>0.26 (0.11-0.60)</td>
<td>0.002</td>
<td>0.09 (0.04-0.17)</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Prevalence of children with hookworm</td>
<td>2011</td>
<td>790</td>
<td>0.32 (0.15-0.71)</td>
<td>0.005</td>
<td>1.18 (0.57-2.43)</td>
<td>0.662</td>
<td></td>
</tr>
</tbody>
</table>

**Health outcomes in children aged 0-59 months**

<table>
<thead>
<tr>
<th></th>
<th>Baseline data year</th>
<th>n</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>Impact vs. comparison communities</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of malaria</td>
<td>2011</td>
<td>1,283</td>
<td>2.4 (1.2-4.8)</td>
<td>0.013</td>
<td>0.41 (0.21-0.82)</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>Prevalence of anaemia</td>
<td>2011</td>
<td>1,259</td>
<td>0.68 (0.35-1.34)</td>
<td>0.287</td>
<td>0.48 (0.25-0.94)</td>
<td>0.031</td>
<td></td>
</tr>
<tr>
<td>Prevalence of wasting</td>
<td>2011</td>
<td>1,296</td>
<td>2.3 (0.29-18.2)</td>
<td>0.430</td>
<td>0.94 (0.12-7.6)</td>
<td>0.950</td>
<td></td>
</tr>
<tr>
<td>Prevalence of stunting</td>
<td>2011</td>
<td>1,296</td>
<td>0.56 (0.30-1.04)</td>
<td>0.064</td>
<td>1.40 (0.78-2.53)</td>
<td>0.260</td>
<td></td>
</tr>
</tbody>
</table>

Baseline data year represents the first year of data collection.

**Comparison analyses**

**Interpretation**

- Better since baseline
- Worse since baseline
- Better in the impacted
- Worse in the impacted

Swiss TPH
Conclusions – results

- Overall, three general* trends (*means not for all indicators):
  - Pre-dominantly improvements in determinants of health
  - Pre-dominantly improvements in health outcomes
  - Impacted communities are better off than comparison communities (inequity)
- Malaria remains a major challenge, locally and nationally
- The STI (incl. HIV) situation warrants close surveillance and continued high coverage of interventions is of utmost importance
Conclusions – Just Transition

• Demand in minerals and metals will increase heavily for the energy transition

• Health benefits not only in the green energy consumer regions, but also in the producer regions (incl. raw materials)
Let’s continue the conversation!
Post questions and comments in the IAIA24 app.

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 & local community members

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