Multidisciplinary studies of African schistosomiasis: from preschool-aged children to women of child bearing age

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Schistosomiasis (like ALL other tropical diseases) needs multidisciplinary approaches and joined-up thinking.

Corsica noted in 4 yo child

Recent rise fostering cross-talk between research disciplines exploring links between well-being, economic resources & environment.
Large demand for PZQ for SAC by country, not fully serviced

Mean prevalence (static)  
Tablet requirements (annual)

What about the treatment needs of PSAC – totally ignored!

Why?...we are simply too busy to have 360 vision &
Merck 250M tablet donation ‘ring-fenced’ for SAC
sadly we create our own inequities from our best intentions
The global PZQ supply

- optimism or pessimism -

slides from Dr Amadou Garba (WHO)
218.8 Million people require PC for schistosomiasis (in 2015)

597 Million PZQ tablets needed per year to treat all the people in need for treatment globally in 2015

296.3 Million for SAC (267 for Africa) and 300.9 Million for Adults
The global fragility in PZQ can **distract** our attention from the PSAC problem but there are new actions.
Early infection and universal disease in some places

Access to some treatment

No access to treatment

A ‘health system’ success needing improvement?  A health system failure?
• Working in Liberia, Ghana, Nigeria & Cameroon

• Active research uptake/communications & 5 main research themes
Background

Paediatric schistosomiasis in Africa
- an ‘old’ overlooked topic in schistosomiasis

Activities on female genital schistosomiasis
- building awareness and clinical studies

Estimating water contact risk in PSAC and mothers
- Mapping, surveillance and GPS datalogging in Cameroon
Early infection likely leads to quicker overt morbidity in adolescence, some morbidity can be extreme in certain children (EMF case in Uganda).
New investigations needed

1. Poor surveillance
2. Limited primary literature
3. Plausible causality
4. Slow temporal associations

Case reports future ‘RCT’ not ethical
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COUNTDOWN implementation research

Connecting HIV/HPV/sub-fertility
(www.fgsworkshop.org)
Systematic review: FGS widespread but under-reported
Revising policy through time – where’s the gap?

At-risk groups outside of SAC

Access to PZQ

- adult women (WCBA) / men insufficient

- pre-school-aged children none

Awareness/surveillance in health system to genital aspects of S. haematobium

- access to colposcopy / questionnaire
Tackling genital schistosomiasis

Female genital schistosomiasis

- often ignored (everywhere)
- not reported in West Africa

How can we improve this

- social context
- women's daily behaviours
- capacity for health system change

Don’t overlook male genital disease
In Nigeria (like elsewhere) a lot of women likely have FGS but sadly don’t know it - a very cryptic health burden - better diagnostics needed (rtPCR) - a PC disease needing an IDM approach - economic forecasting for future resourcing
1. Gendered experiences of living in affected communities have often been ignored in policies and interventions for schistosomiasis.

2. Health workers lacked the capacity to effectively diagnosis and treat female genital schistosomiasis (*lack of awareness*).

3. Qualitative studies have given voice to women and explored their broader environment to assess ways to reduce transmission (*revealed stigma*).

4. New strategies and interventions are needed that reflect women and girls lived experiences with this disease (*encourage cross-sector dialogue*).

5. Key intervention areas include:
   - bespoke training and educational interventions
   - gender sensitive WASH interventions
   - integration into gynaecological screening (*HPV/cancers*)

**COUNTDOWN implementation research**

**In Ghana**

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Intensification of multisector actions for better impact

1) Precision mapping to better tailor treatment
2) Mapping snail distribution for control
3) Pinpointing key water contact sites

Precision mapping: An innovative tool and way forward to shrink the map, better target interventions, and accelerate toward the elimination of schistosomiasis

Louis-Albert Tchuem Tchuente, J. Russell Stothard, David Rollinson, Jutta Reinhard-Rupp

Calling time on Neglected Tropical Diseases
1) Precision mapping to better tailor treatment

2) Mapping snail distribution for control

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Intensification of multisector actions for better impact

Infectious Diseases of Poverty

Urogenital schistosomiasis and soil-transmitted helminthiasis (STH) in Cameroon: An epidemiological update at Barombi Mbo and Barombi Kotto crater lakes assessing prospects for intensified control interventions

Suzy J. Campbell, J. Russell Stothard, Faye O’Halloran, Deborah Sankey, Timothy Durant, Dieudonné Eloundou Ombede, Gwladys Djomkam Chuinteu, Bonnie L. Webster, Lucas Cunningham, E. James LaCourse and Louis-Albert Tchuem-Tchuente.
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Transactions of the Royal Society of Tropical Medicine & Hygiene
A pilot study using wearable global positioning system data loggers to compare water contact levels: *Schistosoma haematobium* infection in preschool-age children (PSAC) and their mothers at Barombi Kotto, Cameroon

Grace Macklin, Michelle C Stanton, Louis Albert Tchuem-Tchuente, J Russell Stothard
Intensification of multisector actions for better impact

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Trends in Parasitology

Opinion
Tailoring Water, Sanitation, and Hygiene (WASH) Targets for Soil-Transmitted Helminthiasis and Schistosomiasis Control

Suzy J. Campbell,1,6,∗ Nana-Kwadwo Britwum,2 Geordie Woods,3 Yael Velleman,4 Fiona Fleming,5 and J. Russell Stothard1
**Discussion and Future Outlook**

**FGS present in a sub-set of those with *S. haematobium* infection**

- *Infection > disease >...detection NB: annual treatment too late*

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<thead>
<tr>
<th></th>
<th>&lt; 6 months</th>
<th>&lt; 6 years</th>
<th>&lt; 14 years</th>
<th>adulthood (reproduction and senescence)</th>
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</thead>
<tbody>
<tr>
<td><strong>Schistosomiasis</strong></td>
<td>first infection</td>
<td>... egg accumulation in tissues</td>
<td>... chronic inflammation/organ fibrosis</td>
<td>increasing clinical significance</td>
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<tr>
<td><strong>PZQ treatment</strong></td>
<td>first PZQ treatment(s)</td>
<td>... MDA</td>
<td>... (?) prevention/reversion of morbidity</td>
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**Current window of regular treatment**

- **Genital disease**
  - epidemiological suspicion ... clinical confirmation (i.e. ultrasonography/colposcopy)

- **Reproduction**
  - ... sexual debut ... prima gravidæ

- **(Sub)infertility**
  - ... epidemiological suspicion ... confirmation

**Current MDA approach is an insufficient clinical intervention**

- *treat the PSAC now and expand access for WCBA!*
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