COUNTDOWN on WHO 2020 Targets: A focus on helminthiasis

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Background

Background on NTD control landscape

- from 2002 onwards to 2030 perspectives

Introducing COUNTDOWN implementation research

- why are multi-disciplinary approaches needed?

Focus on schistosomiasis & soil-transmitted helminthiasis

- issues about scale-up and accelerating towards targets
Several NTDs are amenable to preventive chemotherapy

- Preventive chemotherapy (PC) is a rapid impact ‘health’ package (i.e. tool ready)
- Donated medicines, promoted access, often with integrated drug administration(s)
- PC typically a ‘vertical-programme’ although may use ‘horizontal-platforms’ at periphery

2020 challenges – scale-up, performance, impact, demand & sustainability
Preventive chemotherapy becomes the front-line tool

Actual treatment coverage (year on year) $\textit{homogeneous}$ or $\textit{heterogeneous}$ respondents?

an important indicator but only a \textit{proxy} of impact
WHO’s scale-up of future PC to reach 2020 targets

Projected % of people receiving PC for at least one disease
(including LF, ONCH, SCH and STH) out of the total number that require PC

Urgent need to address bottlenecks in scale-up of PC

and
to accelerate towards WHO 2020 targets

The development of the NTD scorecard
4th NTD scorecard shows un-even progress across diseases

<table>
<thead>
<tr>
<th>London Declaration NTDs</th>
<th>Coverage and Impact Milestones</th>
<th>Program Support Milestones</th>
<th>Drug Requests Filled</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LYMPHATIC FILARIASIS</strong></td>
<td>2</td>
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<td><strong>ONCHOCEDEIASIS</strong></td>
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<td><strong>SCHISTOSOMIASIS</strong></td>
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<tr>
<td><strong>SOIL-TRANSMITTED HELMINTHS</strong></td>
<td>1</td>
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<td><strong>TRACHOMA</strong></td>
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</table>

Progress Reports

1st: 2  2  2  2
2nd: 1  2  2  3
3rd: 2  3  3  3
Current: 2  1  1  2

?
4th NTD scorecard shows un-even progress across diseases

Three reasons why schistosomiasis is placed in the RED?

<table>
<thead>
<tr>
<th>First</th>
<th>Second</th>
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<tr>
<td>PC is not a complete solution</td>
<td>PC stretches health system performance</td>
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[Diagram showing various stages of treatment and prevention of schistosomiasis with a map of Africa showing different color coding for treatment needs.]
4th NTD scorecard shows un-even progress across diseases

Three reasons why schistosomiasis is placed in the RED?

Third
Policies & practices are lagging behind technology, especially at micro-spatial

Infectious Diseases of Poverty

Elimination of schistosomiasis: the tools required

Moving from control to elimination of schistosomiasis in sub-Saharan Africa: time to change and adapt strategies
4th NTD scorecard shows un-even progress across diseases and more widely

the NTD implementation landscape is becoming more
dynamic (*parasite/human/vector*)
complex (*mixed targets*)
fragmented (*communications*)
and
fatigued (*donors*)
The 2016 NTD intervention landscape

Since 2002 it has changed and grown to be complex

- ‘Donated’ drug deliveries with different treatment schedules

- Mixed agenda: control (morbidity) to elimination (transmission)
NTD intervention landscape

Flux of stakeholders & interests

https://www.infontd.org/

Disease focused (pharmaceutical industry)
http://eliminateschisto.org/

An A to Z of agencies

Alliance for Disability-Inclusive Development (ADID) ....

WVI - World Vision International
Introducing COUNTDOWN, an implementation research consortium for PC NTDs.
In 2008, DfID committed £50M for to support control of NTDs

Implementation portfolio including:
Sightsavers (Trachoma)
Schistosomiasis Control Initiative (ICOSA)
Centre for NTDs (LSTM)
UNITED (Nigeria)

....with The Research and Evidence Division supporting

Programme of implementation research to inform the effective and sustainable scaling-up of integrated Neglected Tropical Disease (NTD) control initiatives

OJEU: 2013/S 181-312697

Open tender: one final application for £8M in the Nov. 2014 - Oct. 2019 period
• Working in Liberia, Ghana, Nigeria & Cameroon

• Active research uptake/communications & 5 main research themes
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2030 Ensure healthy lives & promote well-being for all at all ages

How do NTDs fit in across this agenda? both pro and con aspects
COUNTDOWN activities set across five major themes

Mass Scale-up Theme 1: Evidence Synthesis

Mass Scale-up Theme 2: Applied Social Science

Mass Scale-up Theme 3: Health Economics

Integrated Complementary Strategy Theme 1: Macrofilaricides & Vector Control

Integrated Complementary Strategy 2: Schistosomiasis/STH & Diagnostics
NTD interventions need better gender programming, reporting & analysis.

- Fixed point approaches:
  - Health post clinic/distribution point
  - Drugs are distributed by CDDs or health workers at a fixed point

- School-based programmes
  - Teachers and/or others distribute drugs in the schools

But there are several current gaps in gender & age-related equity (maternal & child health - SCH)

Coverage improvement activities for example, mop up
Additional ‘pro-equity’ activities undertaken to try to ensure everyone is covered

Child (under 5) health/special events
Particularly common in the African context, drugs are provided within these gatherings

Theobald (2017) et al.
R F Burton FRGS (1821-1890)

first cultural anthropologist & cartographer of Africa

very likely had schistosomiasis

but still had a very colourful life

Multi disciplinary examples

Nature's special issue probes how scientists and social scientists are coming together to solve the grand challenges of energy, food, water, climate and health. This special scrutinizes the data on interdisciplinary work and looks at its history, meaning and funding. A case study and a reappraisal of the Victorian explorer Richard Francis Burton explore the rewards of breaking down boundaries. Meanwhile, a sustainability institute shares its principles for researchers who work across disciplines. Thus inspired, we invite readers to test their polymathy in our lighthearted quiz.
Breaking across boundaries is not easy and requires:

- at individual-level patience & respect
- at group-level effective communications

but

- is very rewarding holistic ‘team’ insight
- has broader appeal pragmatic outcomes
Preventive chemotherapy needs intensification

How can NTD treatments be scaled-up to meet the demand?

What bottlenecks need to be opened?
COUNTDOWN is a multi-country research consortium reporting logframe of impact, outcomes, outputs meshed within a theory of change model and indicators...generates research evidence to respond to priority information needs of NTD policy makers and program managers...supports incorporation of evidence to improve policies and operational plans and practices for scale-up of NTD control...strengthens capacity for evidence-based decision making and planning through learning by doing amongst its staff, associated partners and country based research communities.
Dynamic NTD landscape: policies with practicalities

5-points to consider:

1. A move from a single disease to addressing multiple NTDs through a coordinated health systems approach

2. Strategic partnerships amongst multiple stakeholders

3. Robust and appropriate data for evidence-based action

4. A strong equity stance and focus upon addressing poverty and achieving universal health coverage

5. Strong women’s leadership and roles in health

- Promoting community ownership is central but is dynamic sometimes, often with local complex power structures evolving as programmatic integration ensues, thus adaptive programme reflecting the realities of the communities they serve are needed
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‘access / equity’ of interventions (better STH surveillance systems)
Better molecular surveillance for STH (& schistosomiasis)

JID 2014

Molecular Epidemiology of Ascariasis: A Global Perspective on the Transmission Dynamics of *Ascariis* in People and Pigs

Martha Betson,1,4 Peter Nejsum,2 Richard P. Bendall,2 Rinki M. Deb,2 and J. Russell Stothard6

1Department of Production and Population Health, Royal Veterinary College, Harfield, Hertfordshire, United Kingdom; 2Department of Veterinary Disease Biology, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark; 3Department of Clinical Microbiology, Royal Cornwall Hospital, Truro, and Department of Parasitology, Pembroke Place, Liverpool School of Tropical Medicine, United Kingdom

IGE 2017

Ascaris phylogeny based on multiple whole mtDNA genomes

Peter Nejsum a,b,1, Mohamed B.F. Hawash c,h,1, Martha Betson d, J. Russell. Stothard e, Robin B. Gasser f, Lee O. Andersen g

www.countdownonntds.org
https://countdownonntds.wordpress.com
Expanding molecular diagnostics of helminthiasis: Piloting use of the GPLN platform for surveillance of soil transmitted helminthiasis and schistosomiasis in Ghana
Cunningham et al. (in press)

NOTE: real-time DNA diagnostics has several untapped applications
e.g. eDNA monitoring (WASH) or interruption of parasite transmission
clinical investigations in tissue biopsy for FGS in cervical screening
Expanding molecular diagnostics of helminthiasis: Piloting use of the GPLN platform for surveillance of soil transmitted helminthiasis and schistosomiasis in Ghana
Cunningham et al. (in press)

Results of qPCR analysis of GPLN faecal samples

Selection of faecal samples

Bead-beating treatment of sample

DNA extraction

Real-time PCR analysis

It has helped put Strongyloides on the map
COUNTDOWN activities set across **five** major themes

Mass Scale-up Theme 1: **Evidence Synthesis**

Mass Scale-up Theme 2: **Applied Social Science**

Mass Scale-up Theme 3: **Health Economics**

Integrated Complementary Strategy Theme 1: **Macrofilaricides & Vector Control**

Integrated Complementary Strategy 2: ‘**access / equity**’ of SCH interventions

Schistosomiasis/STH & Diagnostics

(noting historical roots of the problem)
Peripatetic nature of tropical medicine studies

SPECIAL ISSUE REVIEW  Parasitology

A centenary of Robert T. Leiper’s lasting legacy on schistosomiasis and a COUNTDOWN on control of neglected tropical diseases

J. Russell Stothard¹, Narcis B. Kabateriene², John Archer¹, Hajri Al-Shehri¹, Louis Albert Tchuem-Tchuente³, Margaret Gyapong⁴ and Amaya L. Bustinduy⁵

exposure

PZQ

contamination

Peri-urban areas of Ghana
Crater Lakes of Cameroon

“What do they know of helminths
Who only England know?”  Stanley Alstead.

Figure 1. (From Supplement to J. Helminth. In honour of R. T. Leiper on the occasion of his 80th birthday, 1961.)
How we should be thinking of WASH and indicators

**RESEARCH ARTICLE**

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. Campbell¹, J. Russell Stothard¹*, Faye O’Halloran¹, Deborah Sankey¹, Timothy Durant¹, Dieudonné Eloundou Ombede², Gwladys Djomkam Chuinteu², Bonnie L. Webster³,⁶, Lucas Cunningham¹, E. James LaCourse¹ and Louis-Albert Tchuem-Tchuente²

**SCOPING REVIEW**

Towards interruption of schistosomiasis transmission in sub-Saharan Africa: developing an appropriate environmental surveillance framework to guide and to support ‘end game’ interventions

J. Russell Stothard¹, Suzy J. Campbell¹, Mike Y. Osei-Atweneboana², Timothy Durant¹, Michelle C. Stanton¹, Nana-Kwadwo Britwum³, David Rollinson⁴, Dieudonné R. Eloundou Ombede⁶ and Louis-Albert Tchuem-Tchuente⁵
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

Trends in Parasitology

Opinion

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

Suzy J. Campbell, Nana-Kwadwo Britwum, Geordie Woods, Yael Velleman, Fiona Fleming, and J. Russell Stothard
CHINA AND AFRICA JOIN FORCES IN FIGHT TO ELIMINATE SCHISTOSOMIASIS

by Prof Louis-Albert Tchuem Tchuente, Pamela Bongkiyung, Prof Russell Stothard

In the fight against Neglected Tropical Diseases (NTDs), it has become obvious that
Research uptake: targeted activities playing into policy action...

• Drivers of national policy change
  - advocate for increased PZQ supplies
  - accelerate towards public health goals
  - widen health system engagement (NB academia)

• Indicators of environmental transmission
  - WASH factors, e-DNA tracers of NTDs
  - PZQ MDA + biannual / expanded access
Summary from TES meeting

1. To expand general access to praziquantel treatment supplemental to current school based preventive chemotherapy campaigns by extending to pre-school-aged children & adults and increasing the availability of medicines in health centres and treatment stations throughout the year. This is to ensure that all those who seek treatment can receive it. Specific mention is made to management of female genital schistosomiasis, encouraging gender equity.

2. To complete precision mapping to provide high resolution information, at the local level (i.e. by individual school), to better focus and tailor preventive chemotherapy. This is to all demographic groups (pre-school-aged children, school-aged children and adults), to ensure a minimum of annual treatment. Whereby, strengthening routine treatment as integrated to local development projects.

FGS hits a blind-spot: reveals many weaknesses in the health system at all levels.

3. To encourage community ownership of the programme with appropriate communication and health education tools that nurture a closer partnership between local and national stakeholders engaged in cross-sectoral actions against disease (Ministries of Education, Water & Energy, Agriculture, etc.).
COUNTDOWN implementation research

Connecting HIV/HPV/sub-fertility
(www.fgsworkshop.org)
COUNTDOWN implementation research

Systematic review: FGS widespread but under-reported

CALLING TIME ON UROGENITAL SCHISTOSOMIASIS

I spent many of my teenage years living in Malawi, enjoying swimming in beautiful Lake Malawi. Wind on to age 30, and I was struggling to get pregnant. Eventually, following illness, I was diagnosed with schistosomiasis by a consultant and colleague at the Liverpool School of Tropical Medicine. I was told that I had probably been infected for a while and that it might be affecting my fertility. So I took praziquantel, the only available drug against the parasite, and soon after I was pregnant. Today my first born daughter is 10 years old. Whilst the links between urogenital schistosomiasis, sub-fertility and HIV have become increasingly well-established over my first born daughter’s lifetime, a combined and robust health systems action that brings together neglected tropical disease, sexual and reproductive health and HIV communities to address and scale up treatment for urogenital schistosomiasis is sadly lacking.

Also MGS in Malawi
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 diagnose 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*)

In Ghana
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
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Communications are vital for building strong networks
At the very least you need a solid e-footprint to be visible

www.countdownonntds.wordpress.com

www.countdownonntds.org

@NTDCOUNTDOWN
Encourage networking and fresh interest across topics

- 2018 special issue in Parasitology

2014 “Advances in diagnostics for parasitic diseases”

- 2017 various blog outlets

2016 “Scottish encounter with parasitic diseases”
Conclusions (in three Cs)

Communicate (whatever language)

Cross-talk (break down silos)

Collaborate (teams reach targets)
Acknowledgements

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