ParaDesign 2.0: an improved E-tool to identify the most cost-effective survey design to monitor deworming programs targeting soil-transmitted helminthiasis

Levecke B[1*], Ghebretinsae AH[1], Anderson RM[2], Berkvens D[3], Cools P[1], Devleesschauwer B[4], Speybroeck S[5], Vercruysse J[1], Vlaminck J[1] and Van Aelst S[1,6]

[1]Ghent University, Merelbeke, Belgium; [2]Imperial College, United Kingdom; [3]Institute of Tropical Medicine, Belgium; [4]Scientific Institute of Public Health, Belgium; [5]Université catholique de Louvain, Belgium; [6]University of Leuven, Belgium; *bruno.levecke@ugent.be

Background

- There is a worldwide upscale in deworming programs to combat soil-transmitted helminthiasis
- Periodically assessment of epidemiology is essential to monitor progress programs
- Guidance is needed, but not straightforward

Goal ParaDesign 2.0

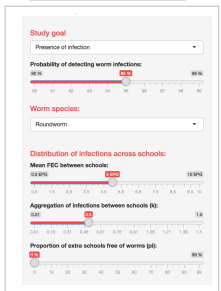
- To support program managers in identifying the most cost-effective study design, without the need of prior knowledge on statistics/ mathematics

Mathematical backbone

- 3-level hierarchical model describing the variation in fecal egg counts (FECs)
  - ✓**Level 1**: variation in mean FECs across schools from the same district/province
  - ✓**Level 2**: variation in FECs between children from the same school
  - ✓**Level 3**: variation in FECs within the same child due to the egg counting procedure.
- The model also accounts for variation in drug efficacy both at the level of school and child. el).

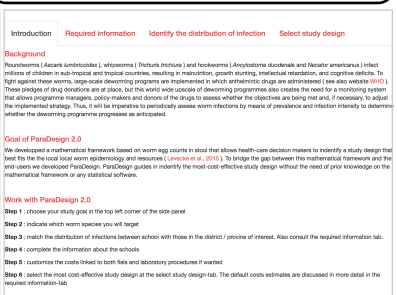
User interface – www.starworms.org/tools

Side panel



- 4 sections
  - ✓ study goal; worm species; distribution of infections across school; school information
- Drop down lists & sliders

Main panel



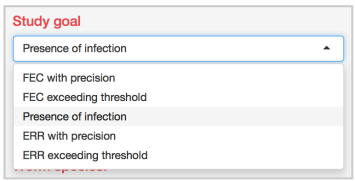
- 4 tabs
  - ✓ background; required information; identify the distribution of infection; select study design;
- Built-in links to WHO documents
- Reactive sample size calculator

Software

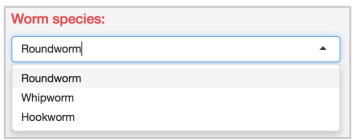
- ParaDesign was developed using the *Shiny* package of R studio
- R studio is an open source software for R

Work with ParaDesign

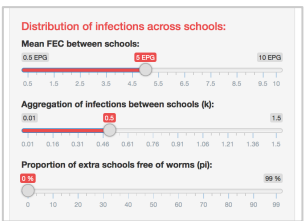
Step 1: Choose your study goal

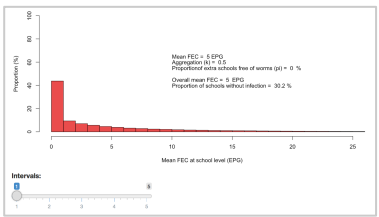


Step 2: Select the worm species targeted

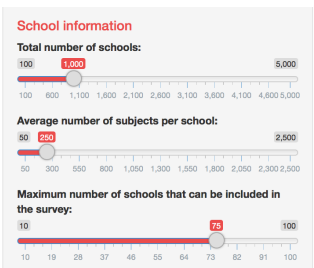


Step 3: Define the distribution of infections





Step 4: Provide information on the schools



Step 5: Select the most cost-effective study design

Show 25 entries Search:

Technique	N_of_schools	N_of_subjects	Pool_size	N_of_days
FLOTAC	45	10	1	71.5
FLOTAC	45	15	5	66.8
FLOTAC	45	20	10	70.9
FLOTAC	45	20	20	69.2
Mini-FLOTAC	45	13	1	73.0
Mini-FLOTAC	45	20	5	72.1
Mini-FLOTAC	45	20	10	69.9
Mini-FLOTAC	45	40	20	92.5
Kato-Katz	45	15	1	73.8
Kato-Katz	45	20	5	71.2
Kato-Katz	45	30	10	81.6
Kato-Katz	45	40	20	92.0

The development of ParaDesign is financed by the Bill & Melinda Gates Foundation (www.starworms.org)