

ParaDrug

Bruno Levecke

28 June 2016

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ParaDrug

Import of data

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General Information

Disease:

Anthelmintic drug:

Baseline information

S. haematobium eggs per 10 ml of urine:

S. mansoni eggs per gram of stool:

S. japonicum eggs per gram of stool:

Follow-up information

Days between baseline and follow-up survey:

Introduction My data Baseline statistics Drug efficacy Report

Background

Schistosomiasis (*Schistosoma haematobium*, *S. mansoni*, *S. japonicum* and *S. mekongi*) and soil-transmitted helminthiasis, including roundworms (*Ascaris lumbricoides*), whipworms (*Trichuris trichiura*), hookworms (*Ancylostoma duodenale* and *Necator americanus*) are among the most prevalent neglected tropical diseases. To fight against these worms, large-scale deworming programs are implemented in which anthelmintic drugs are administered (see WHO et al., 2011). These pledges of drug donations are at place, but this world wide upscale of deworming programs also creates the need for thoroughly designed monitoring systems that allow detection of any changes in anthelmintic drug efficacy that may arise through the evolution of anthelmintic drug resistance in these worms. This is in particular when there is a paucity of anthelmintic drugs licensed for the treatment of worm infections in humans. Therefore, the WHO has recently developed guidelines on how to assess drug efficacy of anthelmintic drugs used against schistosomiasis and soil-transmitted helminthiasis (see WHO et al., 2013).

Goal of ParaDrug

ParaDrug aims to further standardize reporting of anthelmintic drug efficacy data obtained along deworming programs. It supports program managers in analysing, interpreting and summarizing drug efficacy data obtained without any prior knowledge on statistical softwares.

How to use ParaDrug

ParaDesign works in six consecutive steps

Step 1 : verify whether your data meets the requirements in the My data-tab

Step 2 : upload your data in the top left corner of the side panel

Step 3 : indicate which disease has been targeted and which anthelmintic drug has been administered in the general information section of the side panel

Step 4 : match both baseline and follow-up information in the side panel with those listed in your data set

Step 5 : verify the baseline statistics and the drug efficacy results in the corresponding tabs

Step 6 : customize and download your report at the report-tab

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Check data requirements

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General Information

Disease:
Schistosomiasis

Anthelminthic drug:
Praziquantel (1x 40 mg/kg)

Baseline information

S. haematobium eggs per 10 ml of urine:

S. mansoni eggs per gram of stool:

S. japonicum eggs per gram of stool:

Follow-up information

Days between baseline and follow-up survey:

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Required data

Egg counts

The tool analyses egg count data collected during trials designed to assess the efficacy of drugs by means of egg reduction rate (= the reduction in egg excretion after drug administration), and hence the file should contain at least egg counts before and after drug administration.

Since egg counts can be performed using a variety of different egg count methods the data should be expressed in number of eggs per gram of stool in case of *Schistosoma mansoni*, *S. japonicum*, and the soil-transmitted helminths, and in number of eggs per 10 ml of urine in case of *S. haematobium*.

Follow-up period

The follow-up period is the number of days between the drug administration and the examination of a follow-up stool/urine sample. Although this information is not required to calculate the drug efficacy, it is important to readily interpret the drug efficacy results. The recommended follow-up period to assess the efficacy of an anthelminthic drug is between 7 and 21 days. Any values outside this interval may undermine the interpretation of the results.

Required format

File extension

ParaDesign can analyse data entered in either xls orxlsx files. At this stage, no other format will be recognised.

Identification of the worksheet

There is no need to provide a specific name to the worksheet containing the data. ParaDesign will always select the first worksheet in your xls(x) file. Hence, in case you have multiple worksheets in your file, you will need to place the worksheet containing the raw data as first.

Headers

Once uploaded, ParaDesign will identify the first row of each column as a header, and will read the remaining rows as data entries. It is therefore essential that each column can be identified with one unique name.

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Choose Disease

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ParaDrug

Import of data

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Choose File ParaDesignData.xls
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General Information

Disease:

Schistosomiasis
Soil-transmitted helminthiasis

Baseline information

S. haematobium eggs per 10 ml of urine:

S. mansoni eggs per gram of stool:

S. japonicum eggs per gram of stool:

Follow-up information

Days between baseline and follow-up survey:

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Choose drug

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ParaDrug

Import of data

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General Information

Disease:
Soil-transmitted helminthiasis

Anthelmintic drug:
Albendazole (1x 400 mg)
Albendazole (1x 400 mg)
Mebendazole (1x 500 mg)
Other
Not recorded

Whipworm eggs per gram of stool:
Not recorded

Hookworm eggs per gram of stool:
Not recorded

Follow-up information

Days between baseline and follow-up survey:
Not recorded

Introduction My data Baseline statistics Drug efficacy Report

Background

Schistosomiasis (*Schistosoma haematobium*, *S. mansoni*, *S. japonicum* and *S. mekongi*) and soil-transmitted helminthiasis, including roundworms (*Ascaris lumbricoides*), whipworms (*Trichuris trichiura*), hookworms (*Ancylostoma duodenale* and *Necator americanus*) are among the most prevalent neglected tropical diseases. To fight against these worms, large-scale deworming programs are implemented in which anthelmintic drugs are administered (see WHO et al., 2011). These pledges of drug donations are at place, but this world wide upscale of deworming programs also creates the need for thoroughly designed monitoring systems that allow detection of any changes in anthelmintic drug efficacy that may arise through the evolution of anthelmintic drug resistance in these worms. This is in particular when there is a paucity of anthelmintic drugs licensed for the treatment of worm infections in humans. Therefore, the WHO has recently developed guidelines on how to assess drug efficacy of anthelmintic drugs used against schistosomiasis and soil-transmitted helminthiasis (see WHO et al., 2013).

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Upload data

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Import of data

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General Information

Disease:
Soil-transmitted helminthiasis

Anthelminthic drug:
Albendazole (1x 400 mg)

Baseline information

Roundworm eggs per gram of stool:
Not recorded

Whipworm eggs per gram of stool:
Not recorded

Hookworm eggs per gram of stool:
Not recorded

Follow-up information

Days between baseline and follow-up survey:
Not recorded

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Import of data

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Choose File ParaDesignData.xls
Upload complete

General Information

Disease:
Soil-transmitted helminthiasis

Anthelmintic drug:
Albendazole (1x 400 mg)

Baseline information

Roundworm eggs per gram of stool:
preAL

Whipworm eggs per gram of stool:
Not recorded

postAL
preAL
postAL
preHK
postHK
preTT
postTT

Introduction My data Baseline statistics Drug efficacy Report

Background

Schistosomiasis (*Schistosoma haematobium*, *S. mansoni*, *S. japonicum* and *S. mekongi*) and soil-transmitted helminthiasis, including roundworms (*Ascaris lumbricoides*), whipworms (*Trichuris trichiura*), hookworms (*Ancylostoma duodenale* and *Necator americanus*) are among the most prevalent neglected tropical diseases. To fight against these worms, large-scale deworming programs are implemented in which anthelmintic drugs are administered (see WHO et al., 2011). These pledges of drug donations are at place, but this world wide upscale of deworming programs also creates the need for thoroughly designed monitoring systems that allow detection of any changes in anthelmintic drug efficacy that may arise through the evolution of anthelmintic drug resistance in these worms. This is in particular when there is a paucity of anthelmintic drugs licensed for the treatment of worm infections in humans. Therefore, the WHO has recently developed guidelines on how to assess drug efficacy of anthelmintic drugs used against schistosomiasis and soil-transmitted helminthiasis (see WHO et al., 2013).

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Baseline statistics

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General Information

Disease:

Soil-transmitted helminthiasis

Anthelmintic drug:

Albendazole (1x 400 mg)

Baseline information

Roundworm eggs per gram of stool:

preAL

Whipworm eggs per gram of stool:

preTT

Hookworm eggs per gram of stool:

preHK

Follow-up information

Days between baseline and follow-up survey:

fol

Roundworm eggs per gram of stool:

Number of subjects

In total, 500 subjects enrolled this drug efficacy trial. Roundworm infections were observed in 294 subjects (58.8 %), whipworm infections in 294 cases (58.8 %) and hookworms in 294 (58.8 %). Mixed STH infections were observed in 310 subjects (62 %). In total, 449 infected subjects provided a sample at both baseline and follow-up, including 265 cases of roundworms, 261 cases of whipworms, and 265 cases of hookworms.

Intensity of infections

The distribution of the baseline egg counts across the subjects who completed the trial are illustrated in the figures below. The mean (25th quantile; 75th quantile) roundworm egg counts equalled 848.3 (10 ; 756) eggs per gram of stool. The mean whipworm egg counts equalled 849.2 (10 ; 732) eggs per gram of stool. The mean hookworm egg counts equalled 858.1 (14 ; 784) eggs per gram of stool. Low, moderate and heavy intensity roundworm infections were observed in 208 (78.5 %), 51 (19.2 %) and 6 (2.3 %) cases, respectively. For whipworms, these numbers were 207 (79.3 %), 43 (16.5 %) and 11 (4.2 %), respectively. For hookworms, these numbers were 240 (90.6 %), 11 (4.2 %) and 14 (2.8 %), respectively.

Roundworm Whipworm Hookworm

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Drug efficacy

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Soil-transmitted helminthiasis

Anthelminthic drug:

Albendazole (1x 400 mg)

Baseline information

Roundworm eggs per gram of stool:

preAL

Whipworm eggs per gram of stool:

preTT

Hookworm eggs per gram of stool:

preHK

Follow-up information

Days between baseline and follow-up survey:

fol

Introduction My data Baseline statistics Drug efficacy Report

Egg reduction rate

The egg reduction rate (95% confidence intervals) of the intervention against roundworms equalled 87.1 % (75.7 ; 95). For whipworms, the egg reduction rate equalled 84.1 % (71.6 ; 93). For hookworms, the egg reduction rate equalled 85.7 % (76.2 ; 92.7). The figures below classify the egg reduction rate estimates according to the WHO thresholds (WHO, 2013). Any value in the green zone indicates that the efficacy of the drug is satisfactory, any value in the grey zone indicates that the drug is doubtful and any value in the red zone indicates that the drug is reduced.

Roundworms

Whipworms

Hookworms

Conclusions

The efficacy of the administered drug is satisfactory against whipworms, but is below the expected efficacy for both roundworm (<95%) and hookworm infections (<90%). Please contact World Health Organization (wormcontrol@who.int or Dr. A. Montresor (montresora@who.int) and its collaborating centre for the monitoring of anthelminthic drug efficacy for soil-transmitted helminthiasis (Dr. B. Levecke: bruno.levecke@ugent.be) to discuss further actions.

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Customize Report

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Soil-transmitted helminthiasis

Anthelminthic drug:
Albendazole (1x 400 mg)

Baseline information

Roundworm eggs per gram of stool:
preAL

Whipworm eggs per gram of stool:
preTT

Hookworm eggs per gram of stool:
preHK

Follow-up information

Days between baseline and follow-up survey:
fol

Customize report

To further customize the report we would like to ask you to complete the sections below.

The name of your institution
Ghent University

Country in which the trial was conducted
Belgium

District/province in which the trial was conducted
Flanders

Write report

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