Mapping soil-transmitted helminth parasite infection in Rwanda: estimating endemicity and identifying at-risk populations

Supplementary File 1

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**Figure S1**: Semivariograms of observed and residual spatial dependence.

|                  | Observed | Residual |
|------------------|----------|----------|
| **Panel A:**     |          |          |
| *A. lumbricoides*| ![Graph](image1.png) | ![Graph](image2.png) |
| **Panel B:**     |          |          |
| *T. trichiura*   | ![Graph](image3.png) | ![Graph](image4.png) |
| **Panel C:**     |          |          |
| *Hookworm*       | ![Graph](image5.png) | ![Graph](image6.png) |
Figure S2: Map of Rwanda’s provincial districts. This figure was produced in R version 3.5 using a shapefile representing Rwanda’s current administrative units (obtained from the data warehouse DIVA GIS (www.diva-gis.org/Data)).
Table S1: Prevalence of soil-transmitted (STH) helminth infection, represented as proportions of surveyed individuals found to be infected with at least one STH parasite (STH), *A. lumbricoides*, *T. trichiura* and hookworm, in Rwanda across two survey periods

| District   | 2008 STH | 2008 Ascaris | 2008 Hookworm | 2008 Trichuris | 2014 STH | 2014 Ascaris | 2014 Hookworm | 2014 Trichuris |
|------------|----------|--------------|---------------|---------------|----------|--------------|---------------|---------------|
| Bugesera   | 0.43     | 0.028        | 0.402         | 0.036         | 0.10     | 0.064        | 0.028         | 0.036         |
| Burera     | 0.95     | 0.865        | 0.015         | 0.663         | 0.80     | 0.734        | 0.046         | 0.542         |
| Gakenke    | 0.67     | 0.496        | 0.347         | 0.373         | 0.46     | 0.403        | 0.071         | 0.183         |
| Gasabo     | 0.15     | 0.052        | 0.100         | 0.013         | 0.05     | 0.029        | 0.017         | 0.014         |
| Gatsibo    | 0.54     | 0.078        | 0.519         | 0.053         | 0.24     | 0.180        | 0.048         | 0.052         |
| Gicumbi    | 0.68     | 0.322        | 0.462         | 0.136         | 0.52     | 0.486        | 0.011         | 0.223         |
| Gisagara   | 0.58     | 0.279        | 0.467         | 0.067         | 0.29     | 0.240        | 0.047         | 0.037         |
| Huye       | 0.72     | 0.614        | 0.305         | 0.127         | 0.45     | 0.439        | 0.016         | 0.053         |
| Kamonyi    | 0.42     | 0.100        | 0.342         | 0.038         | 0.19     | 0.128        | 0.028         | 0.048         |
| Karongi    | 0.67     | 0.542        | 0.136         | 0.301         | 0.72     | 0.589        | 0.031         | 0.374         |
| Kayonza    | 0.45     | 0.013        | 0.431         | 0.016         | 0.17     | 0.067        | 0.080         | 0.063         |
| Kicukiro   | 0.07     | 0.040        | 0.000         | 0.049         | 0.02     | 0.008        | 0.008         | 0.004         |
| Kirhe      | 0.79     | 0.008        | 0.779         | 0.088         | 0.16     | 0.040        | 0.100         | 0.040         |
| Muhanga    | 0.75     | 0.300        | 0.563         | 0.057         | 0.25     | 0.193        | 0.043         | 0.027         |
| District       | 2008 STH | 2008 Ascaris | 2008 Hookworm | 2008 Trichuris | 2014 STH | 2014 Ascaris | 2014 Hookworm | 2014 Trichuris |
|----------------|----------|--------------|---------------|----------------|----------|--------------|---------------|----------------|
| Musanze        | 0.947    | 0.795        | 0.210         | 0.705          | 0.771    | 0.655        | 0.033         | 0.552          |
| Ngoma          | 0.533    | 0.004        | 0.521         | 0.050          | 0.105    | 0.095        | 0.007         | 0.003          |
| Ngororero      | 0.789    | 0.620        | 0.413         | 0.112          | 0.588    | 0.508        | 0.064         | 0.124          |
| Nyabihu        | 0.915    | 0.847        | 0.119         | 0.617          | 0.884    | 0.824        | 0.004         | 0.424          |
| Nyagatare      | 0.657    | 0.240        | 0.492         | 0.157          | 0.225    | 0.053        | 0.143         | 0.073          |
| Nyamagabe      | 0.822    | 0.744        | 0.157         | 0.467          | 0.563    | 0.535        | 0.020         | 0.220          |
| Nyamasheke     | 0.922    | 0.611        | 0.336         | 0.725          | 0.563    | 0.417        | 0.051         | 0.257          |
| Nyanza         | 0.494    | 0.085        | 0.464         | 0.055          | 0.128    | 0.080        | 0.032         | 0.020          |
| Nyarugenge     | 0.203    | 0.031        | 0.114         | 0.095          | 0.060    | 0.052        | 0.000         | 0.012          |
| Nyaruguru      | 0.874    | 0.824        | 0.167         | 0.531          | 0.799    | 0.779        | 0.028         | 0.225          |
| Rubavu         | 0.955    | 0.827        | 0.000         | 0.909          | 0.896    | 0.779        | 0.003         | 0.842          |
| Ruhango        | 0.544    | 0.194        | 0.435         | 0.017          | 0.120    | 0.092        | 0.012         | 0.016          |
| Rulindo        | 0.718    | 0.564        | 0.174         | 0.386          | 0.468    | 0.456        | 0.004         | 0.116          |
| Rusizi         | 0.715    | 0.559        | 0.254         | 0.361          | 0.754    | 0.549        | 0.096         | 0.549          |
| Rutsiro        | 0.935    | 0.805        | 0.264         | 0.687          | 0.877    | 0.835        | 0.005         | 0.599          |
| Rwamaganana    | 0.701    | 0.027        | 0.683         | 0.016          | 0.077    | 0.012        | 0.056         | 0.008          |
