

VIMC Request for Proposals

2020 – Typhoid and Cholera

Output specifications guidance

The burden outcomes modelled within the VIMC across all diseases include deaths, (severe) cases, and DALYs, and we also ask modellers to record the underlying population size assumed in the model. These outcomes are stratified by annual age cohort, year and country.

The standard burden estimate templates contain the following columns:

Table 1: Columns of the standard burden estimate templates, used for typhoid and cholera

Column name	Comment/explanation
disease ¹	Disease – will be constant across the file
year ¹	Calendar year – the default period is 2000 to 2100, but this may differ between models depending on the age range modelled
age ¹	Age in years of the birth cohort in the calendar year in question. The default age range is 0-100 years.
country ¹	3-letter ISO country code.
country_name ¹	Country name spelled out
cohort_size ²	The national population size of the cohort in question, irrespective of disease or vaccination status
deaths ²	Number of deaths in a given year and age group.
cases ²	Number of severe cases in a given year and age group. This should be incidence rather than prevalence.
dalys ²	Number of disability adjusted life years (DALYs) lost, associated with the incidence of severe cases and deaths in a given year and age group. For a death occurring in year y and age a, the total number of life years lost until the end of the life expectancy should be recorded in year y and age a, rather than spread across future years and ages. Similarly, years lived with a disability should also be accounted for at the time of infection.

¹ will be pre-filled

² model outcomes to be provided by the modellers

The default age and year range are as above. If you do not model the same ranges, please specify this in the cover sheet of your application, and delete the empty rows from the output template before uploading.

We provide the burden estimate templates as CSV files. Below is an example of the first few rows of a template:

Table 2: Example burden estimate template (for central estimates)

	A	B	C	D	E	F	G	H	I
1	disease	year	age	country	country_name	cohort_size	cases	dalys	deaths
2	Typhoid	2000	0	AFG	Afghanistan				
3	Typhoid	2001	0	AFG	Afghanistan				
4	Typhoid	2002	0	AFG	Afghanistan				
5	Typhoid	2003	0	AFG	Afghanistan				

Pre-filled columns

Output columns for modellers to complete.

Montagu (online delivery platform)

Montagu is our online delivery platform. To access the demographic data, the upload templates, and to submit the burden estimates generated by your model, please contact vimc@imperial.ac.uk to request an account which will enable you to log in to Montagu. Please provide your name, the organisation (if applicable), and the disease area.

Scenarios

For the RfP, applicants will need to provide burden estimates for two scenarios:

- Best estimate
- No vaccination

Uploads required

We require central estimates and probabilistic outputs. The central estimates should be either means or medians of stochastic runs or posterior distributions arising in the model fitting, ML estimates or similar or based on best estimate parameters. For the probabilistic outputs for this RfP, we require a small sample of 30 probabilistic realisations per scenario. For models explicitly fitted to data, probabilistic outputs can be a sample from the posterior distribution. If no explicit model fitting has taken place, input parameters should be sampled from reasonable ranges.

For this RfP, applicants will need to provide the following:

Table 3: Required uploads

Item	How to create	Where to upload complete file(s)
Central estimates (multiple files)	Download central burden estimate template from Montagu, use this to create one file per scenario	Montagu
Stochastic estimates (multiple files)	Download stochastic burden estimate template from Montagu, use this to create as many files as you need.	Dropbox

Parameter set (1 file per disease)	Download stochastic parameters template from Montagu, use this to create your parameter set.	Montagu
Parameter certificate (1 file per disease)	You will be able to download this from Montagu once you have uploaded your parameter set.	Dropbox

Central estimates (also known as deterministic estimates)

First, download your central burden estimate template from the Responsibilities page of Montagu (listed under 'Scenarios'). The template is illustrated in table 2.

You will need to use this template to create one file for each scenario, ensuring that you fill in all rows and columns.

Your scenarios are shown in the grey headings on the Responsibilities page of Montagu. Details of the coverage sets are shown after you click the '**Download coverage data**' buttons.

Once you have completed one output file for each scenario, you should upload each file to Montagu, using the '**Upload burden estimates**' buttons on the Responsibilities page.

There is no specific filename format to use. This is because when you upload through Montagu, the URL of the page you are on will determine the scenario.

Montagu will confirm whether each central burden estimate file uploads successfully and show you some quick diagnostic graphs.

When uploading your central estimates, you will need to register how these have been calculated. If possible, please generate your central estimates as the average of your stochastic estimates. If this is not possible, please specify in your answer to the registration questions how your central estimates have been calculated. If your answers to the registration questions change between uploading your central estimates and your stochastic estimates, you should complete this registration step again and re-upload your central estimates to Montagu.

Stochastic estimates (also known as probabilistic estimates)

For the stochastic runs, we require 30 model runs for each scenario, each of which represents a random sample from the uncertainty distribution of your model outputs. Optimally, this would be samples of a posterior distribution representing all the parameter uncertainty in your model. As we want to compare the runs across scenarios to calculate the impact, the same parameter samples must be used across all scenarios, and the runs labelled to ensure we can identify them.

The aim of the stochastic estimates is to help us understand the drivers of uncertainty. The stochastic estimates should therefore represent the full range of uncertainty, and include any parameters that may affect burden estimates, not just efficacy

parameters; e.g. case fatality ratios. Please note you must not vary demography or vaccine coverage; instead you should use only the standardised demography and coverage provided.

The format of the stochastic burden estimate is almost identical to the central burden estimate template, but there is one additional column: 'run_id'. This column labels the particular run, and should link the run to the parameter value detailed in the parameter set file. Importantly, the runs across all scenarios with the same run id should be based on the same parameter values.

For the RfP, we require 30 independent realisations for the stochastic estimates. The stochastic estimate template only contains all rows for a single realisation, so you will need to generate 30 times as many rows.

You will need to use the stochastic burden estimate template to create one or more files for each scenario, ensuring that you fill in all required rows and columns. If you choose to break the data up into multiple files it does not matter how you distribute the rows among files (e.g. by country, by run_id, by year or even randomly), as long as the data are complete, and scenarios are kept separate. The scenarios are the same as for your central estimates.

Next, rename your stochastic estimate files. The filename format should be, for example, *stochastic_burden_est_typhoid-IC-Smith_typhoid-default_1.csv*. The first part is from the template filename, the second part is the scenario ID (as it appears in Montagu), the final number is an arbitrary way to distinguish between different files for the same scenario if you choose to split the estimates across several files.

Once you have completed all files for each scenario, you should upload each one to Dropbox, to the specific folder that we will email you. We will then use scripts to automatically process the uploaded files and import them into Montagu.

Parameter set

First, download your stochastic parameters template from the Responsibilities page of Montagu. You should use this template to create one file (a parameter set) that will show us the underlying parameter values of your stochastic runs.

It is essential that the runs across all scenarios with the same 'run id' are based on the same parameter values.

Your parameters file should contain 30 rows (i.e. in addition to the row showing the column headings).

The column headings in the template are labelled <param_1> and <param_2> but you should rename these to the actual parameters you are using, and add extra columns if necessary.

Once you have completed your parameter set, you should upload this file via Montagu.

Montagu will then give you a 'parameter certificate'. After you have downloaded this, please upload it to Dropbox, to the specific folder that we will email you.

You should only upload one parameter certificate to Dropbox. This must correspond to the exact parameters that underlie your stochastic estimates. If you discover a mistake in your stochastic files or parameter set after you have uploaded these to Dropbox, please let us know (montagu-help@imperial.ac.uk).

Age groups

The age groups in your burden estimate templates must be 1-year age groups. If your model uses larger age groups, you will need to disaggregate these.

DALYs guidance

[Download report with detailed guidance on DALYs](#) (includes disability weights for typhoid and cholera)

Cohort size

The cohort size is the number of people alive in a given birth cohort specified by the calendar year and age during that year – so it will be the same across all scenarios. We will then be able to calculate the number of FVPs (fully vaccinated persons) by multiplying this with the relevant coverage. The cohort size should be comparable to the interpolated population provided on Montagu. The cohort size should reflect the age range, time range and gender (female, male or both) for which your model is tracking the population.

Checklist for avoiding errors when uploading to Montagu:

- Your file should not contain any empty columns
- Values should not contain commas (e.g. 1395 not 1,395)
- The demographic/coverage data may include years that are outside the scope we are asking you to provide estimates for. Therefore, you should go by the years that appear in the burden estimate templates (or the ages/years you have indicated on your cover sheet).

If you have any questions or any problems uploading your burden estimates, please email montagu-help@imperial.ac.uk.