



# Using Atlas in a federated network with remote databases

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## Background

When collaborating with other organizations or groups that use OMOP CDM and Atlas, it is often useful to be able to exchange cohort definitions and to gather the different results from the different instances. The standard Atlas implementation does support the distribution of cohort definitions by copying/pasting the generated JSON version of the cohort definition between instances. However, this functionality is not always obvious to figure out, particularly for new users.

The inclusion report that can be generated for a cohort definition in Atlas against the OMOP CDM database is often the outcome of interest for comparison between different OMOP CDM/Atlas instances. However, the standard Atlas implementation does not provide functionality for sending this information back to a requesting site.

In order to better support ongoing and planned collaborations where distribution of cohort definitions and gathering of inclusion report results are important processes, we set out to make adaptations to Atlas to provide easy to use functionality to support these processes.

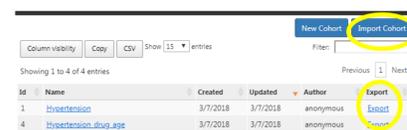
## Methods

The objective of the changes was to be able to export and import both cohort definitions and inclusion reports to/from local files with a single click for each step.

### Cohort definitions

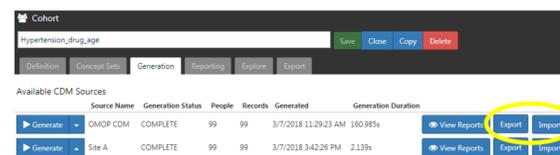
Each cohort definition row in the Cohort overview now has an **Export** link; clicking this link retrieves the cohort definition data from the database via WebAPI, packages it in a JSON format, and saves it to a local *\*.cohort* file.

To import a cohort definition, a new button in the Cohort overview (**Import Cohort**) allows a *\*.cohort* file to be selected; the content is then parsed, and a new cohort definition created using these details. The cohort ID is the only field that is not duplicated, as this is an internal ID generated separately in each Atlas/WebAPI instance.



### Inclusion reports

Once an inclusion report has been generated, under the Generation section of a cohort record, the results can be exported to a local file by clicking the new **Export** button for the report. The inclusion report result data is then retrieved from the database via WebAPI, packaged in a JSON format, and saved to a local *\*.results* file.



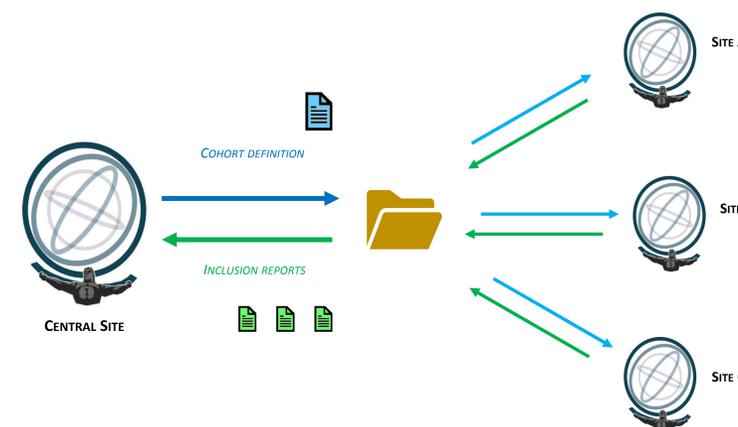
To import the inclusion report results, under the Generation section of the cohort record, the results can be imported by clicking the **Import** button for the relevant data source and selecting the *\*.results* file. The file is parsed, and the results uploaded to the database via WebAPI, substituting the cohort ID from the *\*.results* file with the cohort ID of the current cohort record.

All new functionality is abstracted and implemented as new REST endpoints in WebAPI. In addition, adaptations were made in WebAPI to facilitate records to be written to schemas other than the default schema in the backend webapi database.

## Results

The adaptations implemented in Atlas/WebAPI allows us to support a process flow in current and future projects where cohort definition and inclusion reports can easily be shared between collaborating sites.

A typical setup consists of a central Atlas instance, in which multiple data sources have been configured\*\*. Each data source in the central Atlas instance corresponds to a project collaborator with their own local Atlas instance.



The typical steps in the process flow are:

- Create cohort definition in central Atlas; export to a *\*.cohort* file.
- Distribute *\*.cohort* file to collaborators via Amazon S3, SFTP, e-mail, or other file exchange mechanism.
- The remote Atlas instance(s) imports the *\*.cohort* file, duplicating the central cohort definition locally.
- The inclusion report is generated at the remote Atlas site, and the report is exported to a *\*.results* file.
- The *\*.results* file is sent back to the central Atlas site via Amazon S3, SFTP, e-mail, or other file exchange mechanism.
- The central Atlas site opens the original cohort definition, and for each data source imports the corresponding *\*.results* file.
- The inclusion reports for each data source can now be viewed for the cohort definition in the central Atlas instance.

We have also implemented an Achilles exchange mechanism as a set of R scripts, which provides an easy process for submitting the Achilles results from the remote OMOP CDM/Atlas instances. The combination of the Achilles and Cohort exchange tools allows us to support a distributed network of collaborating sites.

## Conclusions

The adaptations to Atlas/WebAPI described here provide a lightweight approach for exchanging cohort definitions and inclusion reports in federated ecosystems.

A simple demonstration of the supported cohort exchange process can be viewed at <https://youtu.be/s9wLag9ltr0> or scan the QR code on the right.

The adapted WebAPI and Atlas sources are available in GitHub at

<https://github.com/solventrix/WebAPI> and <https://github.com/solventrix/Atlas>



\*\* See [http://www.ohdsi.org/web/wiki/doku.php?id=documentation:software:webapi:multiple\\_datasets\\_configuration](http://www.ohdsi.org/web/wiki/doku.php?id=documentation:software:webapi:multiple_datasets_configuration)