

Cohort Definition Validation in Atlas

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Background

OHDSI Atlas has long been an effective tool for developing rule-based cohort definitions in observational data. In the public version of Atlas, thousands of cohort definitions have been created. While patient record verification is a common method of cohort definition validation, it is not without difficulties, including but not limited to the need for clinical experts to access data, a tool to review all in-cohort patients, a method to gather review data, and a system of tabulation to determine in-cohort (case/no-case) participation or not¹. Until now, there has not been an Atlas-based system for clinical expert review. For this effort, we introduce the Atlas Cohort Definition Validation tool (ACDV). This tool aims to solve some of the primary concerns around cohort definition validation, while having the chief benefit of being cohesively integrated into the OHDSI Atlas stack. Additionally, the tool allows for creation of more complex validation question sets, beyond the standard case/no-case assessment.

Methods

We designed and developed two modules around cohort definition validation. The first (1) allows for validation study creation and management, and the second (2) allows for validation of study questions for clinical reviewers in the Atlas Patient Profile tool.

The ACDV tool introduces a 'Validation' section to Atlas cohort definition creation, which allows for cohort managers to complete a cohort definition validation workflow. This workflow begins by the creation of question set. Question sets in the ACDV tool, shown in Figure 1, allow for common types of questions (including text, radio, checkbox, numbers, and dates). Multiple questions in a question set can be created and a case/no-case distinction can be selected at the question level. After a question set has been created, it can be linked to a cohort definition sample, this creates the validation study.

After a validation study is created, cohort managers can assign patients for review in the Atlas Patient Profile tool to clinical reviewers. Study questions are displayed to clinical reviewers at the patient level in a collapsible sidebar (see Figure 2). The study question set at the patient profile-level can be accessed via the Cohort Definition tool, the Patient Profile tool, or via a customized link. Once reviewers have viewed patient profiles and answered study questions, study results can be viewed by cohort managers in Atlas or exported to CSV (Figure 3).

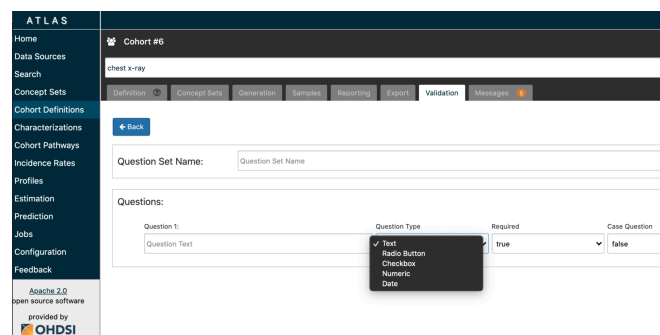


Figure 1. Question Set Creation



Figure 2. Profile-Level Validation

Cohort ID	Cohort Name	Source	Sample ID	Sample Name	Set ID	Set Name	Patient	Question	Answer Value	Answer Text	Case Status
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	98	Does this person have HTN?	1	No	true
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	98	If yes, how severe?			false
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	697	Does this person have HTN?	0	Yes	true
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	697	If yes, how severe?			false
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	906	Does this person have HTN?	1	No	true
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	906	If yes, how severe?			false
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	785	Does this person have HTN?	0	Yes	true
8	Hypertension Take 2	OHDSI-CDMV5	17	Study Patients	854	HTN Case Verification	785	If yes, how severe?			false

Figure 3. Study Results

Results

Primary development efforts of the ACDV tool are complete, and final modifications and integrations to the tool are being prepared for inclusion in an upcoming OHDSI release. We have validated the tool internally with a clinician-informaticist.

Conclusion

The Atlas Cohort Definition Validation tool will provide an integrated way for clinical chart reviewers to validate cohorts well beyond the question of cohort inclusion or not. This tool will support research in the OHDSI community by living firmly within the active OHDSI Atlas ecosystem of tools. Additionally, this tool will continue the OHDSI legacy of open and community-driven tools to advance research in observational health data.

References/Citations

1. [Observational Health Data Sciences and Informatics. The Book of OHDSI; 2020](https://ohdsi.github.io/TheBookOfOhdsi/). Available from: <https://ohdsi.github.io/TheBookOfOhdsi/>