



# ATLAS 3.0 Preview

What's new in Atlas 3.0 & WebAPI 3.0

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# Agenda

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## **User research**

What the community told us in interviews and five feature surveys

2

## **What's new in Atlas 3.0**

A complete rebuild of the frontend on a modern foundation

3

## **What's new in WebAPI 3.0**

A modernized, security-first backend

4

## **Try the preview**

How to run it and where to send feedback

5

## **Live demo**

Atlas 3.0 in action



# User Research

## Part 1

What the community told us about ATLAS today



# How we listened

5

**community surveys**  
one per functional area

78

**survey responses**  
to the opening survey alone

11

**in-depth interviews**  
from new users to 5+ year veterans

## **Feature surveys (OHDSI community calls)**

Walkthroughs of every Atlas 2.14 function — data sources & vocabulary, concept sets & cohorts, characterization / incidence / pathways, and administration — asking how often each feature is used and how important it is.

**Results decide what is carried forward into 3.x.**

## **User interviews (with Data4Life)**

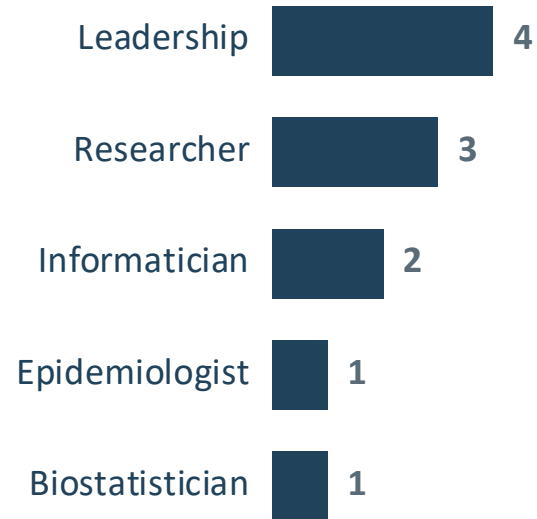
Four stages: framing & planning, hour-long explorative interviews on real workflows, thematic analysis into pain points / wants & needs, and sharing the results with the community.

**Goal: lower the entry barrier for novice and non-technical users.**

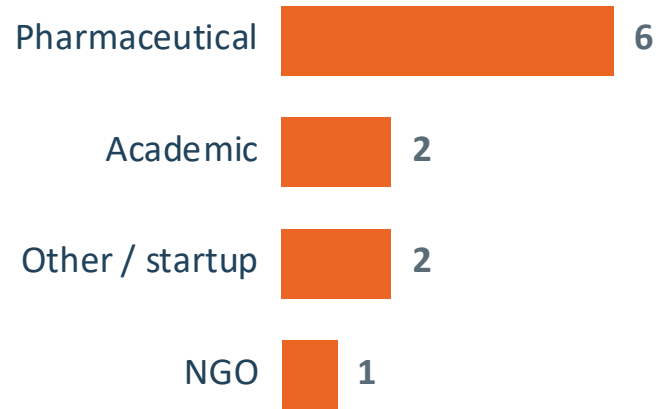


# Who we interviewed

## By role



## By institution



## By ATLAS experience



**11 interviewees:** from newcomers to 5+ year veterans — most use ATLAS to find concepts and build concept sets and cohort definitions, then export JSON for downstream analysis in R.



# What users value in ATLAS

## No SQL required

*“There was no front-end tool or nice user experience like ATLAS to click and drag and drop. It was all SQL based.”*

— Informatician

## Feature-rich cohort building

*“ATLAS is feature rich and great for robust cohort building.”*

— Epidemiologist

## Open source & community

*“It is free, open-source, and the community is amazing.”*







— Researcher

*“In general, the whole application is impressive — to be able to do all that in one place. I really would have loved to explore our data in Atlas.”*

— interviewed ATLAS user



# Pain points

-  **Hard to install & connect** Setup needs a lot of support; users want a clearer install guide and automated CDM conversion.
-  **Steep learning curve** Not intuitive enough for new users — sometimes unclear icons, links and save actions; features are hard to find.
-  **Disconnected navigation & flow** Constant back-and-forth between concept sets, cohorts and analyses breaks the workflow.
-  **Frustrating search** Stale search state; hard to find your own work among every user's assets.
-  **Missing guidance** Little in-tool documentation — users want examples and walkthroughs.
-  **Outpaced by HADES / R** R libraries moved faster — users export JSON and finish in R.



# What users asked for

## Effortless setup

- Easier installation and database connection
- Less dependence on IT support

## Improved usability

- Intuitive navigation, tooltips, examples & walkthroughs
- Read-only views to understand cohort definitions

## Faster insight

- Quick statistics on cohorts: Table 1, attrition plots
- Configurable characterization dashboards
- Patient profiles without running full analyses

## Extensibility

- Plugins to add new modules and use cases
- Custom algorithms in prediction & estimation
- Tighter integration with R / HADES libraries



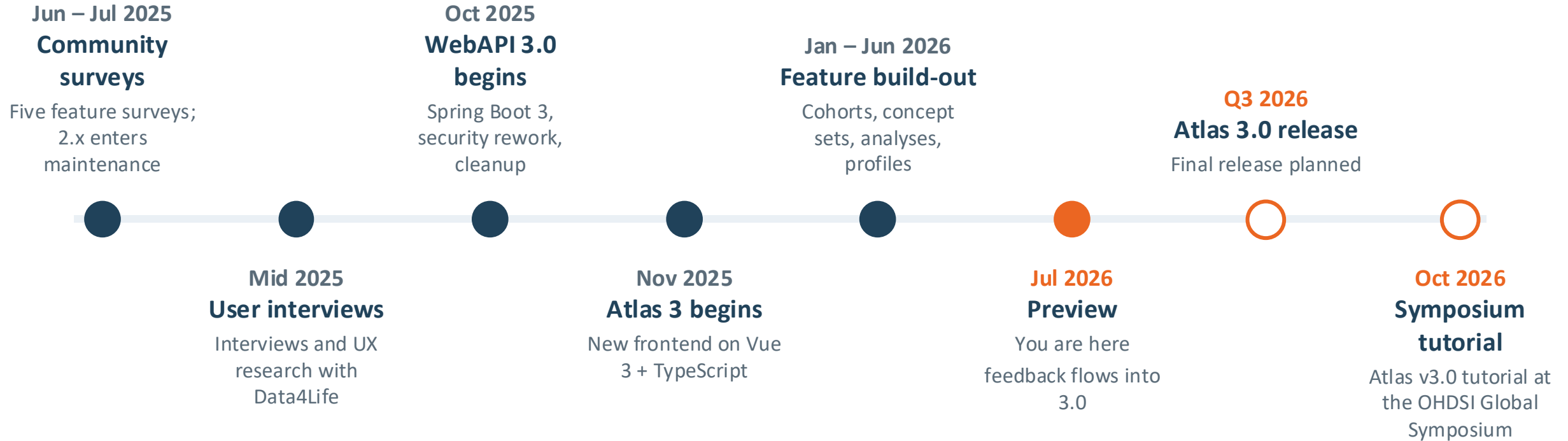
# What's new in Atlas 3.0

## Part 2

A complete rebuild of the frontend — informed by that research



# The road to Atlas 3.0





# Rebuilt on a modern foundation

	Atlas 2.15	Atlas 3.0
Framework	Knockout.js 3.5 + jQuery	Vue 3 (Composition API)
Language	ES5 JavaScript	TypeScript, strict mode
Build tooling	RequireJS + custom scripts	Vite 5 — instant hot reload
UI components	Bootstrap 3	Vuetify 3 (Material Design)
State management	Ad-hoc view models	Pinia stores
Charts	D3 v4 (custom)	ECharts 6
Automated tests	<10% coverage	>90% coverage
Backend	WebAPI 2.x	WebAPI 3.0



# More than a facelift

## One-command setup

Like in Broadsea docker compose up brings up Atlas, WebAPI and a demo database.

## Redesigned workflows

Cohort builder, concept sets and search rebuilt around the interview feedback.

## Live patient counts

TrexSQL query cache gives immediate feedback while building cohorts.

## Plugin architecture

Micro-frontend (single-spa) plugins e.g. a Pythia AI plugin — without forking Atlas.

## Design system

Design tokens for consistent styling, theming and accessibility.

## Multi-language UI

Internationalization built in.



# What's in the ATLAS 3.0

## Available

- ✓ Cohort definitions — fully redesigned builder
- ✓ Concept sets, vocabulary search & exploration
- ✓ Data sources: CDM dashboards & reports
- ✓ Characterization & feature analyses
- ✓ Incidence rates & cohort pathways
- ✓ Patient profiles
- ✓ Roles, permissions & version history
- ✓ Auth: DB, LDAP/AD, OAuth, SAML, OpenID

## Removed — not carried forward

- ✗ Population-level estimation
- ✗ Patient-level prediction
- ✗ Heracles-era reports & legacy cohort analysis

*In line with the interview feedback: Atlas focuses on cohort design and characterization; population-level analyses live in the R / HADES ecosystem.*



# What's new in WebAPI 3.0

## Part 3

A modernized, security-first backend



# A decade of technical debt paid down

**92**

commits vs. develop

**1,539**

files changed

**-89k**

lines of legacy code removed

**Java**

8 → **21 LTS**

**Spring Boot**

1.5 → **3.5**

**Hibernate**

5.4 → **6.5**

**Tomcat**

8.5 → **10.1**

**Flyway**

4.2 → **11.7**

**Cleanup:** Heracles reports, legacy cohort analysis, ActivityTracker and other obsolete modules removed; Jakarta EE migration; ETag caching and Micrometer metrics added.



# Security, rebuilt from the ground up



## **Apache Shiro → Spring Security 6**

The legacy security stack is fully replaced by the actively-maintained industry standard.



## **Default-deny authorization**

Every REST endpoint carries an explicit @PreAuthorize rule — nothing is accessible by accident. Anonymous role exist to grant access to unauthorized users.



## **Entity-level access control**

Permissions are enforced per cohort, concept set or analysis — not just per page.



## **API keys & OIDC token exchange**

First-class machine-to-machine access and modern SSO (OIDC, SAML, LDAP/AD via pac4j 6).



## **129 authorization tests in CI**

Guardrail tests verify endpoint coverage on every build.



# Planning your upgrade

## Runtime

Java 21 required; Spring Boot 3 / Jakarta EE (javax → jakarta).

## Configuration

application.properties becomes application.yaml, with external config file support.

## Authentication

Shiro settings don't carry over — LDAP / OIDC / SAML are reconfigured in Spring Security.

## Database

New sec\_\* security tables; Flyway baseline available for fresh installations.

## Permissions

Legacy roles map onto the new entity-level access model via the admin UI.

## Frontend

Atlas 3 requires WebAPI 3.0 — Atlas 2.x keeps working against WebAPI 2.x (hotfix support).



# Try the preview

1

## Run it

Spin up the full preview stack with a single docker compose up — Atlas 3, WebAPI 3.0 and a demo database.

2

## Give feedback

The user surveys have closed — the conversation continues in the GitHub Discussions of the repo.

3

## Contribute

We need the community: test more login providers and databases, and help complete the UI translations.

4

## Join us

ATLAS Working Group — first Thursday of every month, 10 AM EST. New features, release updates, open discussion.

[github.com/OHDSI/Atlas3](https://github.com/OHDSI/Atlas3) — code · discussions · issues



# Live Demo

Atlas 3.0 in action

Thank you — questions welcome!

[atlas-preview.ohdsi.org/atlas](https://atlas-preview.ohdsi.org/atlas)