

Clinical Trial Operations Dashboard

Overview

This dashboard was developed as part of the Novartis Case Study Competition to address operational risk management in clinical trials. It transforms complex trial data into prioritized, actionable insights for Clinical Research Associates (CRAs) and Data Quality Teams.

What This Dashboard Does

- **Identifies high-risk subjects** automatically across all active studies
- **Calculates a Data Quality Index (DQI)** that scores each subject's operational risk
- **Detects risk signals** like missing data, overdue visits, and unresolved queries
- **Prioritizes work** so teams focus on what matters most
- **Maintains compliance** with full audit trails for regulatory requirements

Live Demo

- **Landing Page:** <https://novaratis-landing-page.vercel.app/>
- **Dashboard Application:** <https://novaratis-app.vercel.app/>

Dashboard Sections Guide

The following pages provide detailed descriptions of each dashboard section with screenshots showing how to navigate and use the platform.

1. Front Page – Control Center

The screenshot displays the Control Center dashboard with the following sections:

- Left Sidebar:** Clinical Ops (Quick Create, Control Center selected), Talk to Data, Sites, Actions, Governance, Documents, Data Library, More, Settings, Search, Dr. Analyst (analyst@novartis.com).
- Header:** Control Center, Snapshot Data Generated from Study 1-25 Operational Feeds, Snapshot Data, Studies 1-25 Generated Jan 29, 2026, Study: All Studies, Risk Level: All.
- Key Metrics:**
 - Subjects Under Monitoring: 1,398 (Total)
 - Critical Subjects: 18 (Critical)
 - Active Studies: 25 (Total subjects in scope)
 - Subjects with Open Issues: 1,398 (Active)
 - Data Readiness Risk: 5.2% (Risk)
- Operational Risk Trend:** A stacked area chart showing the count of subjects by severity (Critical, High, Medium, Low) over time from Jan 3 to Jan 29. The trend shows a steady increase in the number of subjects over time.
- Table:** CRA Assignments (Outline, Domain Analysis 2, CRA Assignments 1, Risk Overview 4, Customize Columns, Add Section). The table lists subjects assigned to different risk domains and their assigned CRAs.

Subject ID	Study	Primary Risk Domain	Risk Level	DQI Score	Signal Count	Assigned CRA
SUB-6133	STUDY-23	EDC Completeness	Critical	99.30	15	Unassigned
SUB-4886	STUDY-19	EDC Completeness	Critical	98.20	13	Unassigned
SUB-47	STUDY-1	EDC Completeness	Critical	97.90	13	Unassigned
SUB-83	STUDY-1	EDC Completeness	Critical	97.50	18	Unassigned
SUB-13835	STUDY-24	EDC Completeness	Critical	97.40	11	Unassigned
SUB-9118	STUDY-24	EDC Completeness	Critical	97.20	13	Unassigned
SUB-3567	STUDY-24	EDC Completeness	Critical	96.60	13	Unassigned
SUB-9382	STUDY-24	EDC Completeness	Critical	96.30	10	Unassigned
SUB-12	STUDY-1	EDC Completeness	Critical	95.80	14	Unassigned
SUB-9292	STUDY-24	EDC Completeness	Critical	92.90	8	Unassigned

0 of 1398 row(s) selected. Rows per page: 10. Page 1 of 140.

(Your main dashboard showing real-time portfolio health and high-priority subjects that need attention.)

2. Detailed Analysis on clicking the subject ID on the front page

The screenshot displays the Clinical Ops Control Center interface. On the left, a sidebar shows navigation links like Clinical Ops, Quick Create, Control Center, Talk to Data, Sites, Actions, Governance, Documents, Data Library, More, Settings, and Search. The user is identified as Dr. Analyst (analyst@inovatis.com).

The main area is titled "Control Center" with a subtitle "Snapshot Data – Generated from Study 1–25 Operational Feeds". It shows "Studies 1–25 Generated Jan 29, 2026". Key metrics include "Subjects Under Monitoring: 1,398" and "Active Studies: 25". A large "DQI: 99.30" is prominently displayed, categorized as "Critical Risk".

A "Risk Contribution by Domain" section shows EDC Completeness at 67% Contrib. and Visit Compliance at 33% Contrib.

An "Active Signals (Grouped)" section lists 10 issues under "EDC COMPLETENESS (10 ISSUES)". Each issue includes a signal ID, trace ID, and a "View Evidence" link. Issues include:

- Form 'Form 1' is missing for 87 days. (Critical)
- Form 'Form 2' is missing for 87 days. (Critical)
- Form 'Form 3' is missing for 87 days. (Critical)
- Form 'Form 4' is missing for 87 days. (Critical)
- Form 'Form 5' is missing for 87 days. (Critical)
- Form 'Form 7' is missing for 87 days. (Critical)
- Form 'Form 8' is missing for 87 days. (Critical)
- Form 'Form 9' is missing for 87 days. (Critical)
- Form 'Form 10' is missing for 87 days. (Critical)
- Form 'Form 11' is missing for 87 days. (Critical)

A "VISIT COMPLIANCE (5 ISSUES)" section lists "Visit 'EPI_Day2' is outstanding for 85 days." with a "View Evidence" link.

At the bottom, there are "Save Review" and "Close" buttons.

Subject ID	Study	Primary Risk Domain	Risk Level	DQI Score
SUB-6133	STUDY-23	EDC Completeness	Critical	99.30
SUB-4886	STUDY-19	EDC Completeness	Critical	98.20
SUB-47	STUDY-1	EDC Completeness	Critical	97.90
SUB-83	STUDY-1	EDC Completeness	Critical	97.50
SUB-13835	STUDY-24	EDC Completeness	Critical	97.40
SUB-9118	STUDY-24	EDC Completeness	Critical	97.20
SUB-3567	STUDY-24	EDC Completeness	Critical	96.60
SUB-9302	STUDY-24	EDC Completeness	Critical	96.30
SUB-12	STUDY-1	EDC Completeness	Critical	95.80
SUB-9292	STUDY-24	EDC Completeness	Critical	92.90

Detailed view of a single subject showing their DQI score (say 99.30 for SUB 6133), risk breakdown by domain, and all active signals with evidence links.

3. Talk to Data – Chatbot

The screenshot shows the Control Center interface with the 'Talk to Data' section highlighted. The main heading is 'Data Intelligence' with the subtext 'Uncover insights from your clinical trials using natural language.' Below this is a search bar labeled 'Ask a question about your study data...' and a toolbar with icons for file, search, and dashboard. At the bottom, it shows 'Chat Mode • Dashboard Mode'.

Natural language query interface to ask questions about your trial data and get instant answers without writing code or reports.

4. Sites

The screenshot shows the Control Center interface with the 'Sites' section highlighted. The main heading is 'Site Portfolio' with the subtext 'Operational triage board for CRAs and Study Managers.' On the right, there are filters for 'Risk Filter' (All Risks selected) and 'Sort By' (Flagged Subjects selected). The board displays three site cards: SITE-24-01 (29 flagged subjects), SITE-1-01 (12 flagged subjects), and SITE-16-01 (6 flagged subjects). Each card includes a risk status indicator (CRITICAL), site name, subject count, and a detailed description of flagged issues.

Site-level performance monitoring showing flagged subjects per site, risk status, and action readiness with filters to identify sites needing attention.

A close-up view of the 'Risk Filter' and 'Sort By' dropdown menus. The 'Risk Filter' dropdown shows 'All Risks' selected. The 'Sort By' dropdown shows 'Flagged Subjects' selected, with 'Site Name' as an alternative option.

5. Page that opens up on clicking “review and approve actions”

The screenshot displays the Control Center interface, specifically the Site SITE-21-01 (SITE-21-01) section. The top navigation bar includes 'Clinical Ops' (Quick Create, Control Center, Talk to Data, Sites, Actions, Governance), 'Documents' (Data Library, More), 'Settings' (Dr. Analyst, analyst@novartis.com), and a user icon.

Control Center (Snapshot Data - Generated from Study 1-25 Operational Feeds)

Site SITE-21-01 (SITE-21-01) Medium Risk

62 Subjects Enrolled | 4 Flagged | 4 Pending Actions

ACTION READINESS HIGH | **PATTERN CONFIDENCE** 89% | **EVIDENCE** 100%

SELECT SUBJECT FOR ANALYSIS: SUB-25553 (Flagged)

Operational Insight for SUB-25553

AI analysis indicates data anomalies consistent with other subjects at this site. Review the evidence below before approving actions.

AI Operational Analysis Generated Draft

Automated analysis of signal patterns for Subject SUB-25553

Narrative | **Pattern** | **Hypotheses**

Operational Summary

Subject SUB-25553 has a critical data quality issue with Form 10 missing for an extended period, ranging from 903 to 979 days. This persistent absence indicates a significant gap in EDC completeness that requires immediate attention to ensure data integrity.

SUB-25553 | Form 10

Recommended Actions (Review Required)

Select All Drafts

Request for Immediate Action on Missing Form 10 (High)

Draft an email to the site coordinator to address the missing Form 10 for subject SUB-25553.

Subject: Urgent: Missing Form 10 for Subject SUB-25553
Dear [Site Coordinator's Name],
I hope this message finds you well. We have identified

Expected Impact: Reduce open visit queries by ~20% (Est.)

Why this action?

Edit | Reject | Approve

Review Site Training and Workload (Medium)

Assign a task to review the site's training records and workload to identify potential causes for the missing form.

Conduct a thorough review of the site's training records and current workload to determine if there are any gaps or overloads that could have contributed to the missing Form 10 for subject SUB-25553. This review should include checking for any recent staff changes or

Expected Impact: Clarify protocol deviation within 24h

Why this action?

Edit | Reject | Approve

Query Site for Additional Information (Medium)

Draft a query to the site to gather more information about the missing form and any potential barriers to completion.

Please provide additional information regarding the missing Form 10 for subject SUB-25553. Specifically, we are interested in understanding any barriers that may have prevented the completion and submission of this form. This information will help us address any

Expected Impact: Instant resolution expected for missing fields

Why this action?

Edit | Reject | Approve

Escalate to Study Management (High)

Prepare an escalation to study management due to the critical nature of the missing form.

Due to the critical risk level associated with the missing Form 10 for subject SUB-25553, it is necessary to escalate this issue to study management. The form has been missing for over 900 days, and immediate intervention is required to mitigate any potential

Expected Impact: Improve site compliance score

Why this action?

Edit | Reject | Approve

EVIDENCE DENSITY (High Confidence)

Domains Analyzed: EDC, Visits | Records Traced: 37 records

Time Span: 21 days | Missing Data: None

Analysis based on Form.csv and visit.csv ingestions.

All actions are logged in the immutable audit trail. No external communication is sent without explicit approval.

Deep dive into a specific site showing AI-generated operational insights, recommended actions with expected impact, and workflows for review and approval. (This is where Human-in-loop comes in)

6. Actions (Global insights and actions)

The screenshot shows the 'Control Center' interface under 'Clinical Ops'. On the left, a sidebar lists various clinical operations like 'Control Center', 'Talk to Data', 'Sites', 'Actions' (which is selected), 'Governance', 'Documents', 'Data Library', and 'More'. A user profile for 'Dr. Analyst' is shown. The main area is titled 'Global Insights & Actions' with a subtitle 'Cross-study AI inbox. Review emergent risks and triage draft actions.' It displays three sections: 'ACTION INBOX' (72 Drafts awaiting review), 'EMERGING RISKS' (6 Critical Sites requiring attention, +2 from last week), and 'DOMINANT PATTERNS' (EDC Completeness: 1343, Visit Compliance: 870). Below this is the 'Draft Action Queue' table:

Type	Target Site	Severity	AI Reason (Draft Context)	Status	Action
	Site SITE-8-01 SUB-911	Critical	Visit 'Week120' is outstanding for 29 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3323	Critical	Form 'Form 13' is missing for 650 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3275	Critical	Visit 'Week84' is outstanding for 37 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3179	Critical	Form 'Form 8' is missing for 57 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3179	Critical	Form 'Form 5' is missing for 57 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3041	Critical	Visit 'Week84' is outstanding for 31 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3032	Critical	Visit 'Week72' is outstanding for 29 days.	Draft	<button>Review →</button>
	Site SITE-8-01 SUB-3030	Critical	Visit 'Week84' is outstanding for 62 days.	Draft	<button>Review →</button>

At the bottom, there are status indicators for 'Governance Status' (28% of drafts reviewed today) and 'Automated Validation' (0 blocked items in queue).

AI-powered cross-study action inbox showing 72 draft actions awaiting review, 6 critical sites requiring attention, and dominant risk patterns across the portfolio.

7. Governance

The screenshot shows the 'Control Center' interface under 'Clinical Ops'. The sidebar includes 'Control Center', 'Talk to Data', 'Sites', 'Actions', 'Governance' (selected), 'Documents', 'Data Library', and 'More'. A user profile for 'Dr. Analyst' is shown. The main area is titled 'Governance Log' with a subtitle 'Audit trail of all subject risk reviews. Read-only record for compliance and accountability.' It features tabs for 'Manual Reviews' and 'AI Actions Audit'. Below is a table of 'Review Status' and 'Risk Level' for various subjects:

Review Status	Risk Level	Subject ID	Study	DQI Score	Risk Level	Review Status	Reviewed By	Reviewed On	Notes
All Statuses	All Risk Levels	SUB-1001	CLN-2024-001	72%	Critical	▲ Needs Follow-up	Eddie Lake	1/29/2026, 10:30:00 AM	
		SUB-1042	CLN-2024-001	88%	Medium	● Reviewed	Jamik Tashpulatov	1/28/2026, 4:45:00 PM	
		SUB-1089	CLN-2024-002	65%	Critical	▲ Needs Follow-up	Dr. Smith	1/28/2026, 9:15:00 AM	
		SUB-1120	CLN-2024-001	94%	Low	● Reviewed	Emily Whalen	1/27/2026, 2:20:00 PM	
		SUB-1155	CLN-2024-003	81%	High	● Reviewed	Eddie Lake	1/27/2026, 11:00:00 AM	

Complete audit trail of all subject risk reviews showing who reviewed what, when, and their decision status for regulatory compliance and accountability.

8. Data Library

The screenshot shows a dashboard titled "Control Center" with a sub-section "Data Library". The left sidebar includes links for Clinical Ops, Quick Create, Control Center, Talk to Data, Sites, Actions, Governance, Documents, and Settings. The main area displays "Raw Data (Phase 1)" (206), "Canonical (Phase 2)" (109), "Signals (Phase 3)" (2), and "DQI (Phase 4)" (1). A section titled "Ingested Study Files" lists "Study 1 Input Files" with 9 files, each with a preview icon, file name, size, and last modified date.

File Name	Size	Last Modified
Study_1_EDC_Metrics.xlsx	504.01 KB	2025-11-25 17:49:00
Study_1_EDRR.xlsx	18.24 KB	2025-11-25 17:49:00
Study_1_Inactivated_Records.xlsx	207.19 KB	2025-11-25 17:49:00
Study_1_Lab_Discrepancies.xlsx	19.84 KB	2025-11-25 17:49:00
Study_1_MedDRA.xlsx	68.51 KB	2025-11-25 17:49:00

Repository of all ingested study files organized by processing phase (Raw Data, Canonical, Signals, DQI) with file previews and metadata.

Conclusion

This dashboard demonstrates a comprehensive approach to clinical trial risk management by combining automated risk detection, AI-powered insights, and governed workflows. By prioritizing subjects based on data quality metrics and providing clear evidence trails, the platform enables clinical operations teams to focus their efforts where they matter most, ultimately improving data quality, reducing monitoring burden, and ensuring regulatory compliance throughout the trial lifecycle.

For Questions or Feedback:

Contact the development team or refer to the detailed methodology report accompanying this submission.