

# Fluence – API Research & Initial Testing

## Project Context

Fluence is a location-based disease data visualization app that allows users to explore current and historical disease trends via an interactive heatmap. A core technical requirement is reliable, up-to-date, and well-structured disease and population data sourced from external APIs.

This document covers the completion plan and outcomes for the following Jira tasks:

- **TM20-8 – Research APIs**
  - **TM20-24 – Discuss API options with team**
  - **TM20-25 – Test basic API calls**
- 

## TM20-8: Research APIs

### Objective

Identify viable public or partner APIs that provide disease, health, or epidemiological data suitable for geographic visualization and trend analysis.

### Evaluation Criteria

Each API was evaluated on:

- Data freshness and update frequency
- Geographic resolution (country, state, county, city)
- Disease coverage (COVID-19, flu, general outbreaks, etc.)
- Ease of access (authentication, rate limits)
- Cost and licensing restrictions
- Data format compatibility (JSON preferred)

### Candidate APIs Researched

- **CDC Public APIs** – Strong authority, reliable data, primarily U.S.-focused, sometimes delayed updates.
- **WHO Data APIs** – Global coverage, strong credibility, less granular at sub-national levels.

- **HealthData.gov** – Aggregated datasets with varied update frequency; good supplemental source.
- **Open Disease Data APIs (GitHub / OpenData)** – Useful for prototyping and historical analysis, but less guaranteed uptime.
- **Third-party disease trackers** – Often provide cleaner APIs and better geo granularity but may introduce cost or usage limits.

## Preliminary Conclusion

A hybrid approach is recommended:

- Use **CDC / WHO** for authoritative baseline data
  - Supplement with **open datasets or third-party APIs** for finer geographic resolution and faster updates
- 

## TM20-24: Discuss API Options with Team

### Objective

Align on which APIs best meet Fluence's technical and product goals.

### Discussion Summary

Key points discussed with the team:

- Preference for **free or low-cost APIs** during MVP phase
- Need for **consistent geographic identifiers** to support heatmap rendering
- Importance of **data reliability over sheer volume**
- Willingness to start U.S.-focused, then expand globally

### Team Decisions

- Proceed with **CDC-based data** for initial U.S. deployment
- Keep **WHO or third-party APIs** as expansion candidates
- Abstract API access behind a service layer to allow future swaps

### Open Considerations

- Handling missing or delayed data
- Normalizing disease counts by population
- Rate-limit handling and caching strategy

---

## TM20-25: Test Basic API Calls

### Objective

Validate that selected APIs can be accessed programmatically and return usable data.

### Testing Performed

- Executed basic GET requests to selected endpoints
- Confirmed JSON response structure
- Verified presence of key fields:
  - Location identifiers
  - Date/time stamps
  - Disease case counts

### Results

- API calls successfully returned data without authentication issues
- Response times acceptable for non-real-time usage
- Data structure compatible with backend parsing and storage

### Initial Findings

- Some endpoints require post-processing to aggregate by region
- Inconsistent naming conventions across datasets
- Heatmap-ready formatting will require a transformation layer

---

## Next Steps

- Finalize API selection for MVP
- Implement backend ingestion and caching
- Normalize data for heatmap rendering
- Begin integration with frontend map components

---

## Status Summary

- **TM20-8:** Completed – APIs researched and compared

- **TM20-24:** Completed – Team alignment achieved
- **TM20-25:** Completed – Basic API functionality validated

This document establishes the technical foundation for Fluence's data ingestion pipeline and supports continued backend and frontend development.