



Whitepaper

# Population Health and Care Management Transformation

## Table of Contents

Executive Summary	3
What Does a Data Platform Offer?	4
The Fragmentation Problem	5
The Truly Connected Data Activation Platform	7
Enabling Superior Healthcare Transformation with FHIR	9
Optimising Care Management On a FHIR-enabled Data Activation Platform	10
Simplifying Population Health Management	12
About Innovaccer	13

## Executive Summary

Innovaccer's FHIR-enabled Data Activation Platform is at the heart of their best in class population health, care coordination and management suite of solutions. With a gamut of optimised business and technical data models, it can support a wide range of healthcare use cases, from compliance needs to core clinical operations and analytics applications at scale. The platform is built purposefully to bring disparate data sources together to conduct analytics, derive insights, and then act on those insights through other Innovaccer and third-party applications. It combines advanced big data technologies to deal with massive healthcare data volumes and unifies disparate silos of healthcare data together using its built-in connectors and visually enabled ETL (Extract-Transform-Load) processes to revolutionise population health. Built on the platform are Innovaccer's population health and care management solutions.

InCare, the care management solution allows users to coordinate proactive interventions for designing wellness management and outreach programs with ease. Innovaccer's analytics module InGraph comes with many built-in features, while also allowing flexibility. It offers state-of-the-art visualisation and dashboarding capabilities, making it the perfect population health management tool.

This paper discusses how the aforementioned solutions better fit a modern healthcare organisation's unique environment and offer technological finesse to make a significant impact on population health and care management.

## What Does a Data Platform Offer?

A modern data platform helps organisations properly store, manage, and access the data they collect. It has the ability to format data in a uniform manner to maintain consistency. That way, it can be viewed and analysed by stakeholders that need it, breaking down information silos across the workplace.

Healthcare organisations require a sophisticated infrastructure for efficient and scalable population health management. Among other things, their systems must be able to:

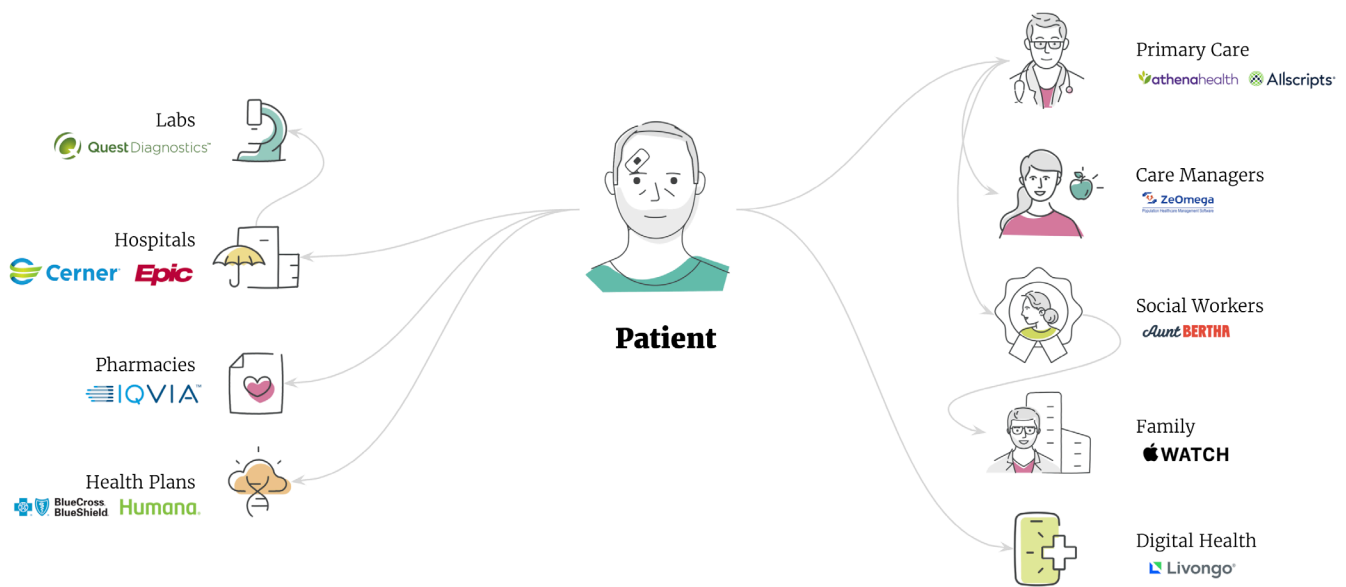
- Aid care managers with workflow support, clinical content, decision support, and information on community resources
- Coordinate care in real-time, including notification of care transitions
- Track chronic disease prevention and manage care
- Provide wellness and disease management reminders at the point of care
- Engage patients with educational content and lists of community resources
- Evaluate the performance of the organisation, its care delivery sites, and its individual providers
- Generate insights into the total cost of care, utilisation of services, and out-of-network costs
- Identify high-risk and rising-risk patient cohorts using predictive analytics
- Alert providers and other stakeholders about high-risk patients

There are multiple challenges in developing or deploying an advanced data infrastructure capable of solving these challenges. To begin with, major healthcare organisations do not have their data housed in proprietary databases. The healthcare data is spread across dozens of separate systems or “data silos” that can’t communicate with one another. Different care givers use different kinds of EHRs, some with very limited interoperability that aggravate the problem of these “data silos”.

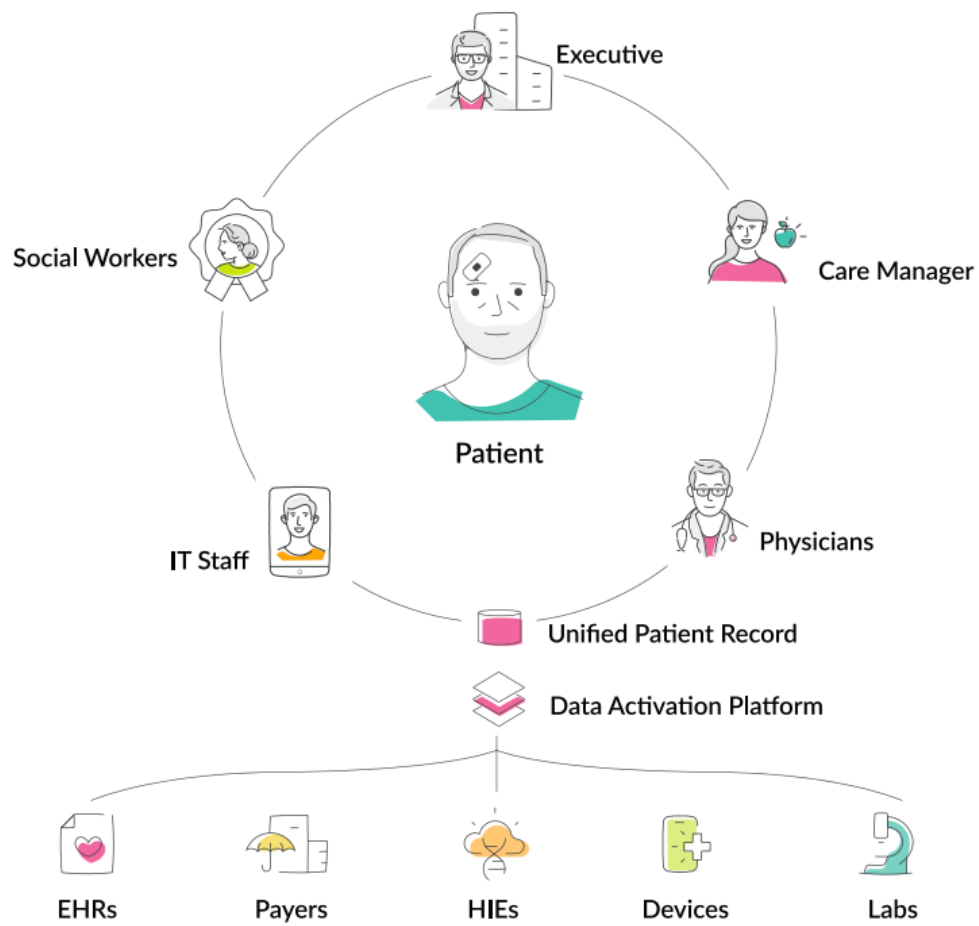
## The Fragmentation Problem

Healthcare, as we know it, is broken. The problem of data silos highlights the disjointed nature of care delivery. The various stakeholders involved in the care continuum are dependent on different third-party platforms and services.

## The Disconnected Healthcare Journey



A fragmented care continuum



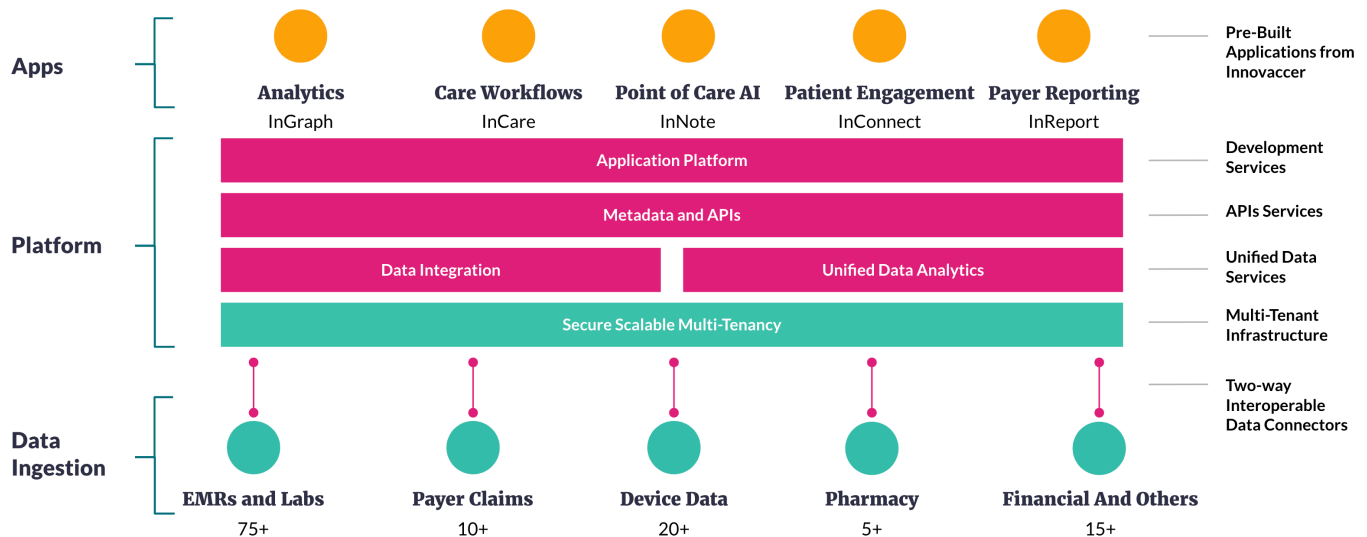
Innovaccer's unified care approach

Innovaccer helps obtain the true impact of care by joining all the disparate pieces of the puzzle. With activated data for smart analytics and decision support care teams, they have the crucial information they need to provide better care.

## The Truly Connected Data Activation Platform

Data is the focal point of the transition to a modern digital health future. Healthcare providers and payers transitioning to more collaborative digital care delivery models are increasingly realising the need for a new data architecture to support the demands of their move to value-based care. Foundational to this effort is having a healthcare data platform that can transform and unify data from across the patient care continuum.

Innovaccer's FHIR-enabled Data Activation Platform brings disparate data sources to one easy to use platform to conduct analytics, derive insights, and then act on those insights through other Innovaccer or third party apps with APIs. It combines advanced big data technologies to deal with population health data.



The FHIR-enabled Data Activation Platform follows a productised approach for data extraction, aggregation, normalisation, standardisation, and export of data. Below is the process of how different components work to generate the desired output.

### Data Extraction and Unification:

Through a lightweight windows application, connect securely with source systems. The modes of data extraction include, database, file systems (C-CDA, flat files, CCD, etc.), HL7 (TCP/IP) interface, or through API access. Raw data extracted is stored and pushed through the **Data Quality Assessment Tool (DQT)** tool.

**Data Quality Check:**

Ingested data runs through DQT to identify gaps and errors in the ingested data and generate a **Data Quality Report** that contains a detailed quality report of the identified dataset including missing and duplicate values and deviations from coding standards for 62+ data fields like clinical, demographic, and financial codes.

**Data Transformation:**

Post data quality check, raw data undergoes a transformation in pipelines. The pipelines govern the flow of data from one end to the other and required standardisations, modifications, and other operations are performed to provide clean and accurate data. Processed and clean data is mapped to the master schema and stored in the Integrated Data Lake.

**Export of Data:**

Processed and clean high-quality data, available in the Integrated Data Lake, can be accessed through our library of pre-built APIs which can be leveraged to power customer applications. Processed data can be requested by the users, via RESTful API calls in XML / JSON format or SQL Query.

**EMPI:**

The FHIR-enabled Data Activation Platform's EMPI engine helps in uniquely identifying members (patients) across disparate healthcare IT systems, as an imperative for any downstream applications. It employs a proprietary Bayesian-based flexible matching algorithm that produces an accuracy rate of more than 95% to create a Patient 360° longitudinal view. Innovaccer's EMPI module assigns a value to every patient in the platform, assuring that every patient is unique. Our approach is to first cleanse every field to ensure the utmost data quality in these variables.

**Patient Attribution:**

Innovaccer's FHIR-enabled Data Activation Platform enables providers to filter their patient population by utilising patient eligibility files and applying multilevel attribution logic and filters like EMR, time, number of visits and more, so that they can track and view their performance for the population as per the specified attribution logic and view records of the patients. Innovaccer typically uses the attribution files shared by the customer along with the claims data. If these files aren't available as a part of a payer's data, Innovaccer runs its own attribution logic or maps the patients according to the customer's provided attribution logic.

**Longitudinal Patient Record (LPR) :**

Innovaccer's FHIR-enabled Data Activation Platform is designed to aggregate, normalise, and cleanse data from multiple sources to create a real-time longitudinal record, including calculated or derived information from disparate data sources. The platform features the ability to access a Patient 360° view and has a unique capability of merging data from multiple systems and displaying all of them together in a holistic patient view. Clinical data are shown together in the form of cards that can be customised as per customer's requirements.



## Enabling Superior Healthcare Transformation with FHIR

Innovaccer's data activation platform provides a rich set of capabilities such as scalable FHIR application programming interfaces (APIs), optimised FHIR data lake, best-in-class API gateway and cloud infrastructure, among other features. The Platform supports a large network of FHIR connections, enabling healthcare to care as one. Innovaccer's vision of true interoperability is supported by years of healthcare experience and goes well beyond simple data exchange.

The FHIR-enabled Data Activation Platform supports critical FHIR API resources and enables the most efficient implementation to solve multiple data-exchange challenges of providers and payers. With more than 65 pre-built connectors to electronic health records and more than 200 connectors to information technology vendors, the data platform ensures real-time integration without additional engineering requirements. The platform complies with the latest version, FHIR v4.0.1 and includes more than 400 search parameters and more than 800 analytical enrichments to clinical and claims data. The breadth of data that the platform provides allows it to serve as a foundation upon which custom applications can be designed and built by any healthcare organisation.

The platform is HIPAA-compliant and provides enterprise-grade security for data exchange by enabling secure connections through OAuth 2.0 and Smart on FHIR authorisation protocol. Additionally, the platform supports a real-time interactive developer environment and sandbox environments with de-identified data to rapidly build FHIR applications. The open framework of the platform enables a plug-and-play integration with other components and services with little to no coding required.

The FHIR framework is designed to coordinate care across provider organisations. How does Innovaccer's platform bring it all together to help you achieve better outcomes and improve care management? Let's take a closer look.

## **Optimising Care Management On a FHIR-enabled Data Activation Platform**

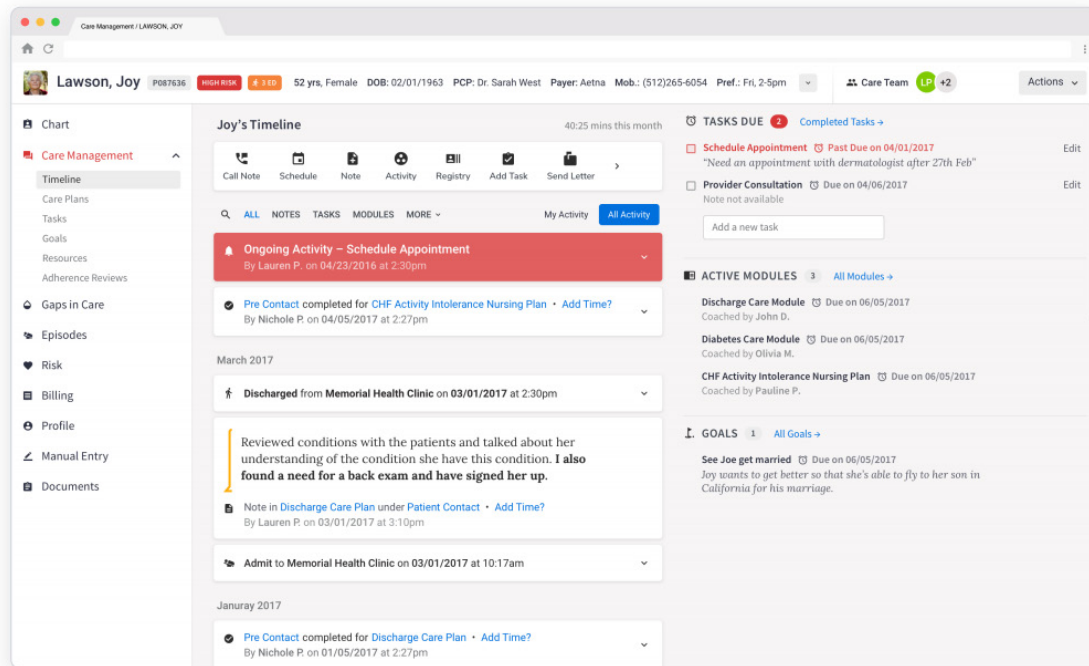
Care management goes beyond managing a set of patients and ensuring reduced costs and better quality of care. The ultimate goal is to ensure patients get the right care at the right time. InCare, a holistic, end-to-end care management based on the FHIR-enabled Data Activation Platform encompasses a wide range of solutions intended to improve patient care, reduce the need for medical services, contain costs, and more effectively manage health conditions.

InCare organises many moving parts into an efficient workflow and brings order to the complex, disconnected healthcare system. InCare has a modular, lego-based structure that incorporates several disjointed services including data integration, analytics, patient engagement, etc. and offers a harmonisation between the fragmented healthcare systems through coordinating workflows, scheduling appointments, and facilitating communication between patients and providers. InCare's micro-service architecture provides the required flexibility in care management plans and meets your needs by fitting your organisation rather than having your organisation fit the product.

The data pertaining to a patient comes from multiple EMRs, claims, lab tests, immunisation, ADT feeds, wearable devices, etc. InCare leverages Integrated Data Lake, a Hadoop-based big data repository, that can ingest data from multiple sources - structured, semi-structured, as well as unstructured - without having to write a single line of code. The Data Lake can ingest raw data and can grow as the amount of data increases, collecting data from various feeds that include:

- CCDAs documents
- Connectivity from FHIR sources
- EMRs
- X12 837/835 files
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- ADT feeds
- Flat file dumps/CSV files
- HL7 feeds

Furthermore, it identifies data gaps, cleanses, and normalises raw data and verifies the data transformations pre- and post-ingestion.



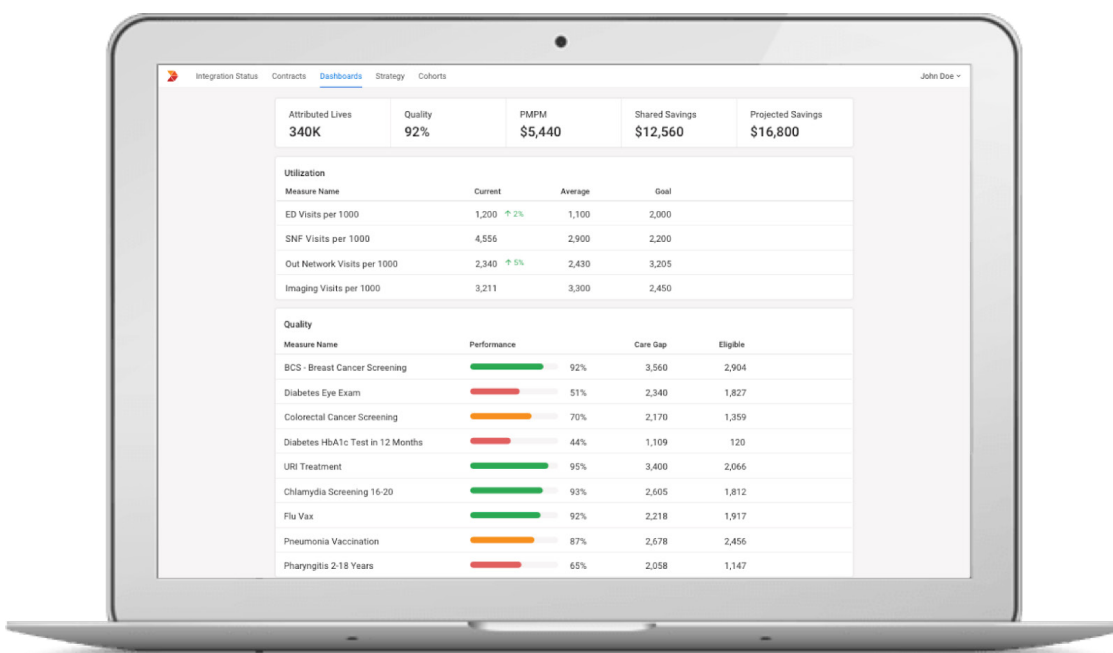
Care management's overarching goal is to improve every patient's health. While a sum total of care improvement efforts leads to a healthier populace in general. To improve population health, providers need to improve care coordination, reduce hospital visits and boost patient engagement and closely monitor outcomes with advanced analytics. Let's take a look at how the FHIR-enabled data activation platform can significantly support healthcare providers to meet these goals.

## Simplifying Population Health Management

InGraph, built on Innovaccer's FHIR-enabled Data Activation Platform, is a comprehensive state-of-the-art analytics solution to better manage population health. InGraph brings together integrated data captured in real-time to enable enhanced trend analysis and reporting for healthcare organisations. It assists providers with real-time tracking and monitoring of measures from a library of 800+ measures. The users are provided the flexibility to customise dashboards and visualisations as per their requirements and track selective measures. Additionally, to gain a deeper understanding of population health and network performance, providers are empowered with analytics on leakages and opportunities aligned with their goals.

Healthcare providers can leverage InGraph to study the holistic population health status based on various measures. Providers can look for the impacts of ongoing care programs and overall health on episodes such as joint replacements and cardiac episodes, among others. Providers can stratify the attributed patient population based on robust and custom-built risk scoring methodologies and prioritise care operations to drive better clinical outcomes.

InGraph with the functionalities of the FHIR-enabled data activation platform also allows providers to study the underlying patterns in network utilisation across measures such as ER visits, IP visits, SNF visits, and more. The healthcare providers can drill down to understand network trends and contract-based performance from an aggregate level to an individual facility. Providers can work on improving their efficiency and reduce costs through the monitoring, analysis, and benchmarking of operational indicators. InGraph also helps providers enhance the speed and accuracy of quality reporting through automated analytics, manual data entry, and report compilation.



## About Innovaccer

Innovaccer Inc. is a leading San Francisco-based healthcare technology company committed to helping healthcare care as one. The Innovaccer Health Cloud unifies member data across systems and care settings and empowers healthcare organisations to rapidly develop scalable, modern applications that improve clinical, operational, and financial outcomes. Innovaccer's solutions have been deployed across over 1,000 care settings in the U.S., enabling more than 37,000 caregivers to transform care delivery and work collaboratively with commissions, payers and life sciences companies. Innovaccer has helped organisations integrate medical records for more than 24 million people and generate more than £500 million in savings. Innovaccer is recognised as a Best in KLAS vendor for 2021 in population health management and a No. 1 customer-rated vendor by Black Book.

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