



# DATA WAREHOUSING for SOCIAL WORKERS

BENEFITS AND CONSIDERATIONS



Real Data. Real People. Real Insight.

[eccovia.com](https://www.eccovia.com)

# Providers of social services are constantly looking to improve crucial care and support for vulnerable populations in their communities.

As new methods and technologies emerge, it's important to fully explore any given opportunity, understand its benefits and potential drawbacks, and discover whether it would improve outcomes, lower costs, and simplify workflows. One such technology in health and human services is data warehousing. So what is a data warehouse and what does it have to do with social services?

## What Is a Data Warehouse?

A data warehouse is a system that serves as a single source of truth for health and human services (HHS) organizations by integrating data from disparate databases used by various providers. When these data remain separated in silos, they present only one facet of the full picture, limiting the efficiency of care coordination and social service delivery.

Participating service providers feed their data into the data warehouse, which enables all stakeholders to pool their data and achieve a more holistic look—the vision necessary to see the whole picture of their communities' needs.

This data is then available for data analytics, so stakeholders can uncover patterns and stories in their data that can then inform better strategy and planning.

And when you can better understand the whole community, you will better be able to provide for the needs of the individual. This understanding helps communities respond more flexibly to needs and use their data better.

When your resources are limited and the needs of the people you serve are great, it's critical to make sure each resource can make the biggest impact possible. Data warehousing allows organizations to intelligently, strategically prioritize the most vulnerable and at-risk clients, which will result in:

- » More efficient use of funding and reduced costs,
- » Optimized workflows that reduce tedious work, and
- » Improved outcomes for their communities.

## Data warehouses provide four key benefits to social services organizations<sup>1</sup>

- 1 Data cleansing and uniformity.** In order to analyze data, the data must be collected and stored in a consistent manner. The data from each source being ingested by the data warehouse must be directly comparable if it is to be of any use to decision makers. A critical component of this is data cleansing, ensuring a standard of data quality and reducing duplicate client entries that may skew any analytics.
- 2 Superior business intelligence.** With the data gathered in a central location, cleansed, and standardized, it's ready for analysis. The ability to visualize the aggregated data enables decision makers to gain critical insights that inform superior strategies and help organizations deploy their resources with more precision.
- 3 Improve outcomes and reduce costs.** With this superior insight, organizations can solve problems and improve care delivery in ways that wouldn't be possible otherwise. With the strategizing power of data warehousing and business intelligence, social service organizations can anticipate problems before they become crises, reduce racial and other disparities, and significantly improve outcomes while reducing overall costs. These costs could include labor and expenditure of resources.
- 4 Improve care coordination.** Data warehousing gives organizations a single source of truth for participating organizations to coordinate care, offering the holistic vision necessary to provide targeted, strategic services where they will do the most good.

<sup>1</sup> Herzing Staff. [What is Data Warehousing and Why is it Important?](#)

Data is also time sensitive. Depending on the situation and what the data is being used for, the delay between collection and analysis can render it less relevant and less useful, which can have devastating consequences on at-risk populations.

The ability to have near-real-time access to data and ensuring it's available to decision makers is crucial. Further, the capacity to help organizations maximize effectiveness, make more data-driven strategy decisions, and solve problems in care delivery promise to make data warehousing an indispensable tool in HHS organizations' arsenal.

### How Is a Data Warehouse Different from an HMIS?

There is certainly a degree of cross-over between case management systems and data warehouses. For instance, both serve as a single source of truth for various participating providers, and both enable these providers to coordinate services. Both can facilitate data analytics and strategy.

But unlike the relational databases used by case management systems, the architecture of a true data warehouse is designed from the bottom-up for handling big data, complex reports, and business intelligence.

Choosing between a case management relational database and true data warehousing is about choosing the right tool for the right job—it depends on what an organization hopes to accomplish.

Data warehouses excel at breaking down data silos through their ingestion capabilities, which generally include data cleansing, providing powerful planning—which case management systems are less suited to provide—and enabling more effective allocation of resources.

Some case management software providers claim that their relational database is equivalent to a data warehouse, but this can be a dangerous misunderstanding. Choosing between a case management relational database and true data warehousing is about choosing the right tool for the right job—it depends on what an organization hopes to accomplish.

Using a tool less suited to the need will ultimately cost you: Microsoft Word can create tables, but trying to use Word to parse and compare data will cost you a great deal of added work and yield poorer results than if you had used Microsoft Excel!

## Success in Data Warehousing

Don't just take our word for it. The benefits of data warehousing have already been put to the test for HHS organizations, and there's a lot of insight we can take from this new approach.

### Allegheny County Department of Human Services<sup>2,3</sup>

In Pennsylvania, the Allegheny County Department of Human Services (DHS) became one of the first social service organizations to use a data warehouse. The DHS Data Warehouse dates back to a 1995 initiative to address the lack of coordination between the wide range of human services provided by the County, as well as the inability to keep track of service recipients between departments. (Previously, client data were stored separately in 80 different databases.)

By consolidating health and human services, the County also hoped to eliminate duplicated functions and more efficiently deploy its resources.

For full and comprehensive case management, the best solution may be a combination of a case management system and data warehousing, giving social services providers the best of both worlds: the data cleansing, big data insights, data visualization, and reporting power of a data warehouse that can then inform and guide the more individual client-oriented efforts of case managers.

---

2 Erin Dalton, et al. [Data Warehousing, Flow Models, and Public Policy](#).

3 Jane Wiseman. 10/2020. [Better Government Through Data: Using the Allegheny County Human Services Data Warehouse to Design More Effective Results](#).

The DHS Data Warehouse has since become a major element of social service delivery in Allegheny County. Several critical successes include the following:

- ▶ In 2005, identifying gaps in care in child welfare services, boosting the number of children receiving needed mental health assistance from 26% to 44%.
- ▶ The Allegheny Family Screening Tool, which uses predictive analytics to better provide screening for children who require services and mitigate racial disparities in who received services.
- ▶ Improvements in processing and data quality, which enabled quicker service delivery to those in greatest need, via a homeless-services risk model.
- ▶ Programs to reduce overdose fatalities. In the opioid crisis, it was discovered that nearly 70% of all fatal overdoses had interacted with DHS, and most of these cases had interacted within the last 90 days before their deaths. DHS realized that for individuals who reduced their opioid tolerance during DHS treatment for substance abuse, recidivism could prove fatal if they returned to the same doses as before treatment. This presented an opportunity to protect clients from fatal overdoses by providing overdose reversal drugs as part of the exit process for DHS substance-abuse-disorder clients.

This final point underscores the importance of access to and availability of time-sensitive data. These interventions might not have been possible with siloed data, where caregivers and decision makers responsible for dispersing life-saving services don't have all the information they need.

DHS gained two critical insights: First, they learned the power of building incrementally and building on successes. The data warehouse began very humbly and built momentum and buy-in across Allegheny County agencies as it proved successful. Second, DHS discovered that the more agencies and participating databases feed into the data warehouse, the better the insight.

Data sharing yields better and higher-quality information than isolated data, and combining health services and justice data proved crucial to developing strategies that resulted in improved client outcomes and lives saved.

## Massachusetts Public Health Data Warehouse

Another early example is the Massachusetts Public Health Data (PHD) Warehouse.

The PHD Warehouse encompasses the data of 98% of the Massachusetts population, including data from over twenty-four different sources across agencies and departments. This makes the PHD Warehouse extremely powerful in providing useful and actionable insights. One of its primary areas of success is in addressing the opioid crisis.

The University of Massachusetts Amherst conducted an inclusive survey of a wide variety of those who use and interact with the PHD Warehouse, spanning race and gender categories. Their findings convey some of the key strengths of data warehousing and big data in social service delivery, and also illuminates several potential weaknesses of this technology.<sup>4</sup>

<sup>4</sup> Evans EA, Delorme E, Cyr KD, Geissler KH. [The Massachusetts public health data warehouse and the opioid epidemic: a qualitative study of perceived strengths and limitations for advancing research.](#)

Every second counts in crisis situations, and every obstacle to data access and care provision could have devastating consequences.



Some of the strengths participants identified included the following:

- ▶ Large sample sizes, which provide superior statistical power. The larger the sample size, the more findings will be representative of the actual population. This statistical power has allowed researchers to draw important findings about relationships and outcomes by gender, age, and other demographic classifications, which has allowed Massachusetts to learn crucial information about historically marginalized groups who often fall between the cracks.
- ▶ The ability to eliminate data silos, which allows for the tracking of individuals as they receive services from different agencies or move from one geographic region to another. This data also provided a fuller picture of the needs and risks faced by vulnerable populations, allowing for a more data-driven approach in providing more effective services and improving client outcomes.
- ▶ Geographic data helps guide strategy in identifying "hot spots," areas where there's an unusually high concentration of opioid overdose incidents. This data helps identify where providers need to focus their attention and where resources would be most effectively deployed.
- ▶ Big data can help eliminate human bias. Because of how data is ingested and aggregated in a data warehouse, it's harder to manipulate through "P-hacking" or other forms of statistical bias.
- ▶ Maybe most important of all is that data warehouse technology has a very high potential for having positive impacts on vulnerable communities. Insights gained from big data enable service providers to identify and strategically target interventions at the moment most likely to save lives.

However, the participants also noted limitations:

- ▶ There is a risk of oversimplification. The nature of HHS requires compliance with privacy laws like HIPAA, which makes less data available for analysis. While this is an unavoidable trade-off to protect privacy and confidentiality, it may also keep important insights hidden. Additionally, when information comes from a variety of sources, there is a risk that the data will not be uniform—race and ethnicity data, for instance, might not be present in some databases while it is present in others.
- ▶ The technology may not be user friendly, and the high level of technical expertise required to analyze the data may prove prohibitive for providers and agencies without access to data scientists and qualified researchers. With this comes the risk of data being misinterpreted and misused.
- ▶ The time between the recorded events in the data and the analysis can impact analysis. When ingesting data from a variety of sources, the data warehouse may be gathering data on events that took place years ago. Participants suggested the matter could be improved by shifting to a real-time model so data could be analyzed as soon as it was gathered.

## Observations

The benefits of a data warehouse for social service providers are compelling and powerful. Concerning the limitations noted in the Massachusetts study, the field of data warehousing has been working for years to improve the technology to overcome these challenges and pain points:

- ▶ **Oversimplification might be solved by:**
  - a partitioned data warehouse, with a deidentified warehouse used for public reporting to comply with HIPAA and similar regulations; and,
  - a separate, extremely secure database that preserves the richer data for analysis by authorized users.
- ▶ **Data warehouses may be integrated with advanced data analytics tools like Power BI and Tableau to improve user friendliness and to mitigate the learning curve, and some even provide integrated Power BI or Tableau directly within the data warehouse solution itself.**
- ▶ **Advances have been made that allow for real-time data analysis and bidirectional data flow, allowing for more immediate analysis and more useful insight. And critically, these advances allow compatible data warehouses to support local case management systems.**
- ▶ **Pairing a centralized data warehouse with case management systems allows big data to inform case management in real time, drastically improving the ability of a service provider to make the best use of their resources.**
- ▶ **Improvements in integration technology and approaches allow some data warehousing solutions to ingest data from virtually any source, without having to worry about preparing that data in advance. And as the technology continues to build on its successes and prove its value, further developments will doubtless continue to make data warehousing more valuable and less constrained by inherent limitations.**

## What to Look for in a Data Warehouse

As your organization begins to consider data warehousing, your organization should first consider these questions.

### Is a Data Warehouse Right for Us?

Your organization's needs might not need what a data warehouse can offer. A small nonprofit focusing on one specific community will have different needs than those of a coalition of service providers representing an array of behavioral and health services.

At the same time, consider whether your existing systems are actually costing you money by creating inefficiencies and extra work. Upgrading does represent an initial cost, but for many organizations, the long-term gains and savings achieved by replacing a less effective system turn this cost into a critical investment.

### What Impact Would a Data Warehouse Have on Our Work?

Consider what a data warehouse would help you accomplish. How would it impact your workflow? How would it affect your strategy and decision-making process? Would it change how different providers coordinate services?

If you determine that a data warehouse is suited to your organization's needs and goals, you should ask the following of potential data warehousing products.

#### What Privacy and Security Protections Does This Solution Provide?

Does the data warehouse solution comply with HIPAA in how it handles personally identifiable information (PII)? If your organization provides services for survivors of domestic violence, for instance, does the solution comply with VOCA and VAWA and other applicable laws?

#### How Does This Solution Integrate Data?

What is the vendor's method for integrating data from various sources? What are the compatible data sources and connectors? Will you be required to prepare or standardize your data before it can be ingested into the data warehouse, will the vendor do this for an added cost, or can the solution natively handle data from any source?

#### Does the Solution Provide Built-In Data Analytics?

For an organization with on-site data scientists or that already uses tools like Tableau or Power BI, you may be able to perform advanced data analysis without the need for integrated data analytics tools. For many organizations that don't have that option, integrated tools can save time and money and make the system more accessible.

#### Does the Vendor Specialize in Social Services?

Many larger data warehousing solutions are specific to for-profit organizations, which may present challenges to organizations focused on social services.

A data warehousing solution built by a vendor with expertise in social services and case management will be more likely to provide interoperability between the data warehouse and case management. It's far easier to perform the vital work of case management and service provision with a tool that was built for the task rather than having to bend a solution to fit those needs.

## Taking the Next Step

Even after answering these questions, the way forward can be daunting. The technology is only useful if your organization is able to use it. It's critical to learn how to piece together the puzzle and understand how to connect the different providers within your community so you can form a complete picture. Newcomers must navigate data management best practices, effective privacy agreements, how to integrate various community partners, and more.

At Eccovia, we pride ourselves on our practitioner expertise. Our staff offers decades of experience as providers of social services, in database management, and working within communities. We know what is required to implement a data warehouse and connect all participants to it, following industry best practices. Contact our team today so we can help you take the next steps.



# We Are Eccovia



**eccovia**<sup>®</sup>

REAL SOLUTIONS • REAL PERSON IMPACT

From our humble beginnings in the 1980s as Data Systems International, Eccovia has been constantly evolving and transforming. Consequently, our mission, our purpose, and our values have grown to meet our current vision, and we understood that our branding needed to better reflect that. We adopted the lotus flower as our logo, symbolic of improving the human condition, to reflect our customers' efforts to improve the lives of vulnerable populations in their communities. Our name, too, speaks to these values—Ecco, an anagram for Efficiency, Collaboration, Compliance, Outcomes; and Via, meaning “the way” in Latin.

## Our Purpose

---

We provide essential support for the vulnerable people in our communities.

## Our Vision

---

Continuous growth and innovation as the industry leader of care coordination platforms.

## Our Mission

---

Provide health and social service agencies with technologies and actionable data to better serve their communities.



Eccovia, Inc.  
2150 W. Parkway Blvd, Suite A-101  
Salt Lake City, UT 84119



[eccovia.com](http://eccovia.com)



**eccovia**<sup>®</sup>  
REAL SOLUTIONS • REAL PERSON IMPACT



Address:  
Eccovia, Inc.  
2150 W. Parkway Blvd, Suite A-101  
Salt Lake City, UT 84119  
United States



Online:  
[eccovia.com](http://eccovia.com)

