



Allegheny County Data Warehouse

February 2024

The Allegheny County Data Warehouse brings together and integrates client and service data from a wide variety of sources both internal and external to the County. It was created by consolidating publicly funded human services data (e.g., behavioral health, child welfare, intellectual disability, homelessness and aging) and, over time, expanded to include data from other sources (see **Appendix** for a list of sources). The Data Warehouse was made possible with support from the [Human Service Integration Fund](#), a flexible funding pool created by a coalition of local foundations for the purpose of supporting integration and innovation within DHS.

The Data Warehouse was designed primarily to improve services to clients, but also to improve the ability of workers to perform their jobs and to support management decision-making; it is also intended to be available as a community resource, making data and information publicly available whenever possible.

HISTORY

The Allegheny County Data Warehouse was originally conceived as a way to develop a common client management technology system across the disparate programs that were consolidated into a single Department of Human Services (DHS) in 1997. However, a group of Carnegie Mellon University students studied the problem and concluded that a fully integrated system was not possible. Instead, they — along with the Chamber of Commerce and a number of private sector stakeholders — presented a different approach: a Data Warehouse to link client-level data across systems without requiring that those individual systems share a common technology.

In 2000, the local community foundation released a Request for Proposals, and, with \$2.8 million in pooled foundation funding, signed a contract on behalf of Allegheny County with Deloitte Consulting to build the initial Data Warehouse. The Data Warehouse was operational in 2001 and able to integrate client data across DHS's program areas; in 2003, the first external source of data (from the Pennsylvania Department of Human Services) was integrated. A description of the technology involved in integrating data is provided in the **Appendix**.

Development of the Data Warehouse was possible because of a unique confluence of factors. Leadership, meaning (1) the political will to invest resources in the technology infrastructure and analysts to do the work and (2) willingness to put the findings into practice, was a key factor, as was a local political climate that was open to the changes required to support integration of human services in Allegheny County. Another key to the success of the initiative was the time and effort spent developing trust between DHS and its data partners. And finally, creation of the Human Services Integration Fund represented an unprecedented display of support for the newly integrated department and its integration and innovation efforts.

The cost of maintaining the Data Warehouse, including 29 analysts, seven data leads and technical support, is about \$6.5 million annually. This represents less than 1% of DHS's total budget, which is considered a worthwhile investment when taking into account all the ways in which it supports quality service delivery and more.

BUILDING PARTNERSHIPS TO INTEGRATE DATA

Sharing data within DHS and with other County departments (e.g., Housing Authority, Jail, Probation Office, Health Department, Medical Examiner) was relatively simple, as each is an organizational component of Allegheny County government and operates subject to oversight by the County Executive. Therefore, no formal agreements were determined to be necessary to allow for data sharing. This is not to say that data-sharing among these entities occurs without governance. DHS implemented data governance practices that allow for interoperability and cross-agency sharing. For more information, see [Sharing of Client Information for Service Coordination and Quality Improvement Activities](#).

Sharing data with non-Allegheny County government entities required more extensive data-sharing agreements. Establishing a Memorandum of Understanding (MOU) that outlines duties, responsibilities, compliance issues and safeguards requires careful negotiation, legal expertise and patience. The partnership with the Pittsburgh Public School district is a good example of what goes into such an agreement.

Public School/DHS Data-Sharing Agreement

After years of negotiation, a significant milestone in the use of the Data Warehouse occurred in 2009, with the creation of a *data-sharing agreement* with the Pittsburgh Public School (PPS) district. Since then, similar agreements have been established with 20 local school districts and education entities including charter schools and the Allegheny Intermediate Unit,¹ allowing for service and system activities designed to improve educational and well-being outcomes for school-aged children involved in human services. DHS and PPS attorneys focused on issues of confidentiality inherent in sharing student and client data, including the issue of how to legally obtain consent to use student records. After thinking through various options, the attorneys found a solution in a 2008 FERPA amendment that permitted the release of personally identifiable student data without consent to organizations interested in conducting research to improve student achievement as long as these organizations had a signed MOU that outlined confidentiality parameters and data use protocols. By tying the use of the data to actionable research, these attorneys found an innovative way to draft a legal agreement that met all of the requirements of FERPA and HIPAA. The agreement provides the framework for integrating student data, including confidentiality provisions, the responsibilities of each party, the type of information that can be shared and the purposes for which it can be shared. A key provision authorizes the use of the data for conducting “action research,” which means that 1) DHS will use the data to prepare analytical reports related to students in the school district who receive services from DHS and 2) DHS and the school district will create, implement and evaluate strategies developed from these statistical analyses.

¹ Although MOUs have been established with 20 districts, as of April 2018 only six have developed the technical capacity to share their data.

More information about these data-sharing agreements and the resulting analyses and strategies can be found [here](#).

USING INTEGRATED DATA

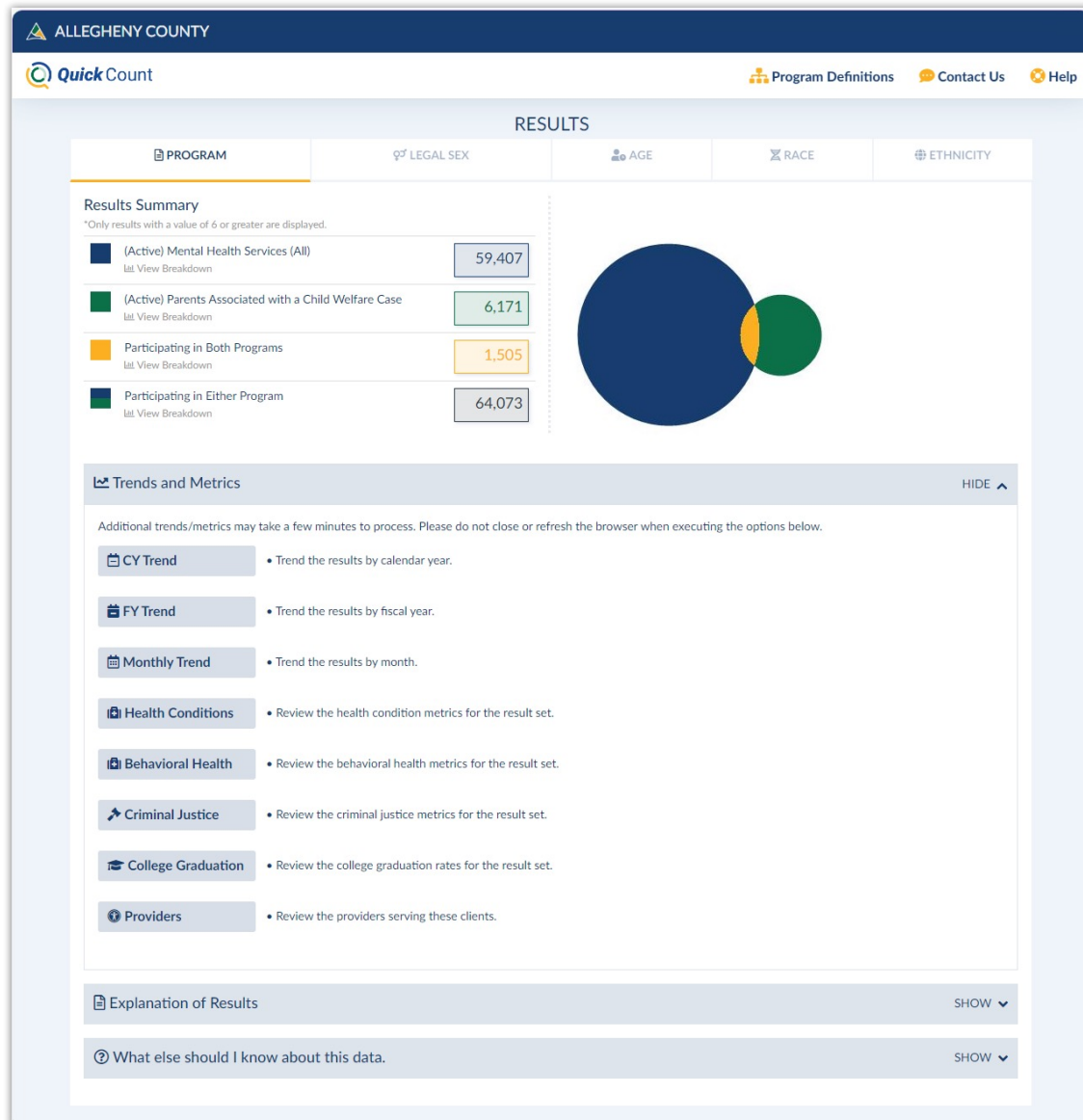
What makes the Allegheny County Data Warehouse unique? Unlike data warehouses that are developed for research purposes or “one-shot” analyses, Allegheny County’s Data Warehouse was designed to support integrated client service and decision-making. Its value is evident in the ways in which it has supported the development of a variety of analytic and decision-making tools that put the power of integrated data into the hands of staff and providers. But DHS leadership didn’t stop at creating tools — they also developed ways to make information and analysis widely available in the form of datasets, publications and visualizations housed on [Allegheny County Analytics](#).

QuickCount

[QuickCount](#) is a publicly available resource that allows for queries about participation in a wide range of services from data integrated in the Data Warehouse. In addition to the ability to compare two programs, users can sort by time period, view participation in multiple services, and filter counts demographically and geographically. QuickCount provides data that helps community groups, providers, researchers and other stakeholders to understand the types and scope of services utilized and to use this information for service planning.

QuickCount Search Screen — as seen below, users select a primary program and, if desired, a comparison program. Users indicate a specific time period and may also select demographic and geographic filters from the menu at the top.

QuickCount Search Results — the screen below shows the number of clients active in mental health services compared to the number of parents associated with a child welfare allegation, investigation or case; it also shows the overlap between the two. Users may view these results by program as well as any of the filters selected on the search screen (sex, age, race, municipality, neighborhood, school district, zip code and governmental jurisdictions). Users are able to click on information in the trends and metrics section to view activity over time in the selected services, behavioral health diagnoses, and chronic physical conditions of the selected clients.



While [Allegheny Analytics](#) and [QuickCount](#) are publicly available, the following tools and dashboards — for privacy and confidentiality reasons — were designed for use only by staff and contracted provider agencies.

Client View

Client View provides information about individual clients and their service involvement across all data sources in the Data Warehouse. Demographic information is also available, as well as service plans, assessments and electronic documents. Client View is available only to authorized users within DHS and contracted provider agencies. Individual clients are able to view their own service data through a resident portal called [AccessMyInfo](#).

Client View Search Screen — Users may search for a client by name or social security number or click on advanced search to search by other criteria.

Allegheny County
ClientView

New Search Recent Clients Saved Clients 11 Contact Us

Client Search

Last Name OR Social Security Number is required to search.

Last Name First Name Social Security Number

OR

▼ Advanced Search

If Last Name, SSN or Phone Number are unavailable, a Street Address or County MCI ID is required to search.

Street Address City Zip State

Last 4 Digits of SSN Date of Birth Approximate Age Phone Number

County MCI ID ⓘ

Search

Client View Demographics and Service Info Screen — the search provides demographic information about the client as well as their history of services. Users may choose to see the services in a timeline view or select from program specific tiles that contain documents related to the client, the client’s service plans and assessments, or a listing of the client’s workers.

Search Results / Doe, John

John Doe★

View Client Workers 0

View Addresses/911 1

▼ Basic Info

SOCIAL SECURITY #
xxx-xx-2190
[Show Full SSN](#)

DATE OF BIRTH
[REDACTED]

COUNTY MCI # ⓘ
[REDACTED]

STATE MCI # ⓘ
No Data

MA RECIPIENT # ⓘ
No Data

AGE / GENDER
42 / Male

RACE
Black/African
American

ETHNICITY
Unknown

MARITAL STATUS
No Data

VETERAN
Unknown

Source Client Records

Generate Access Code

Other Info ⓘ

Contact

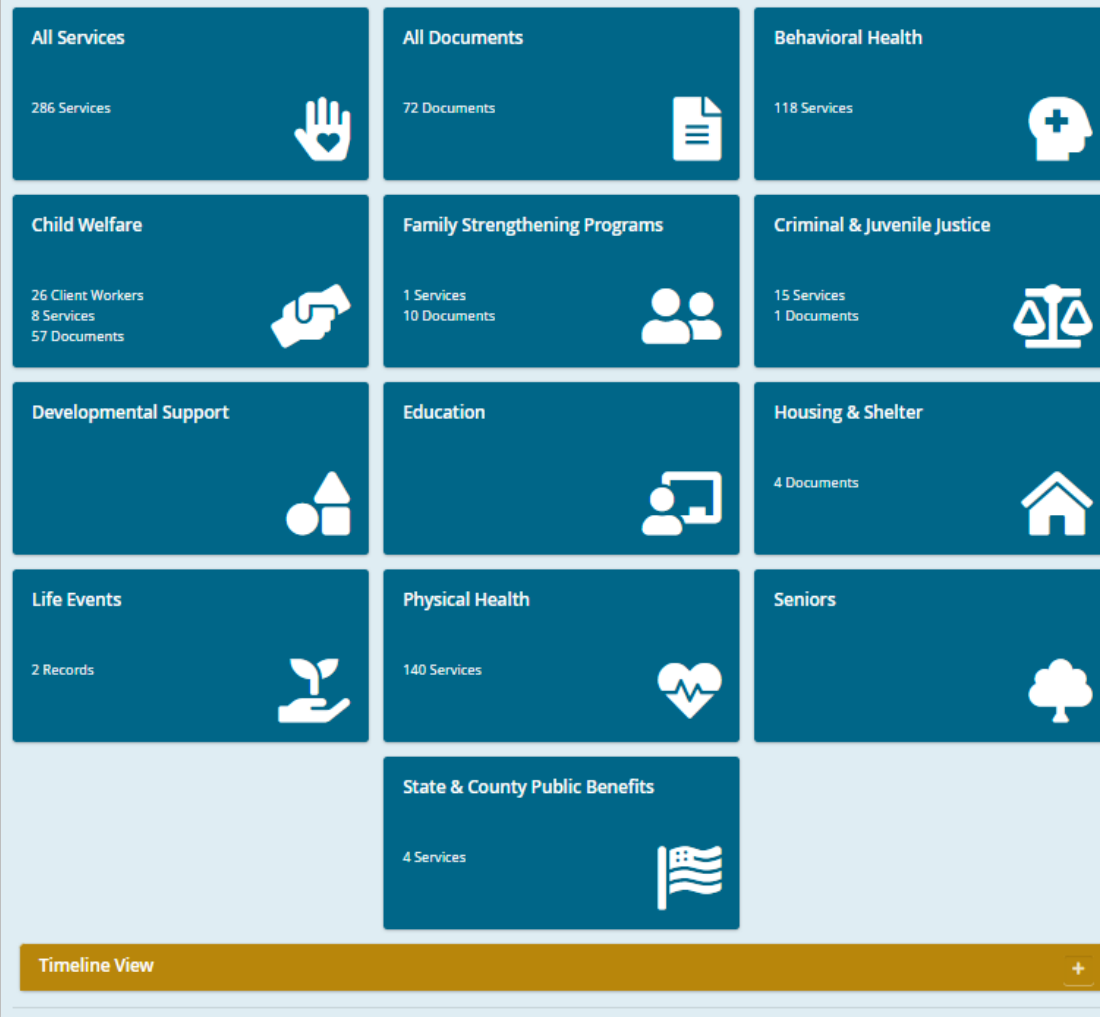
HOME ADDRESS
[REDACTED]

HOME
[REDACTED]

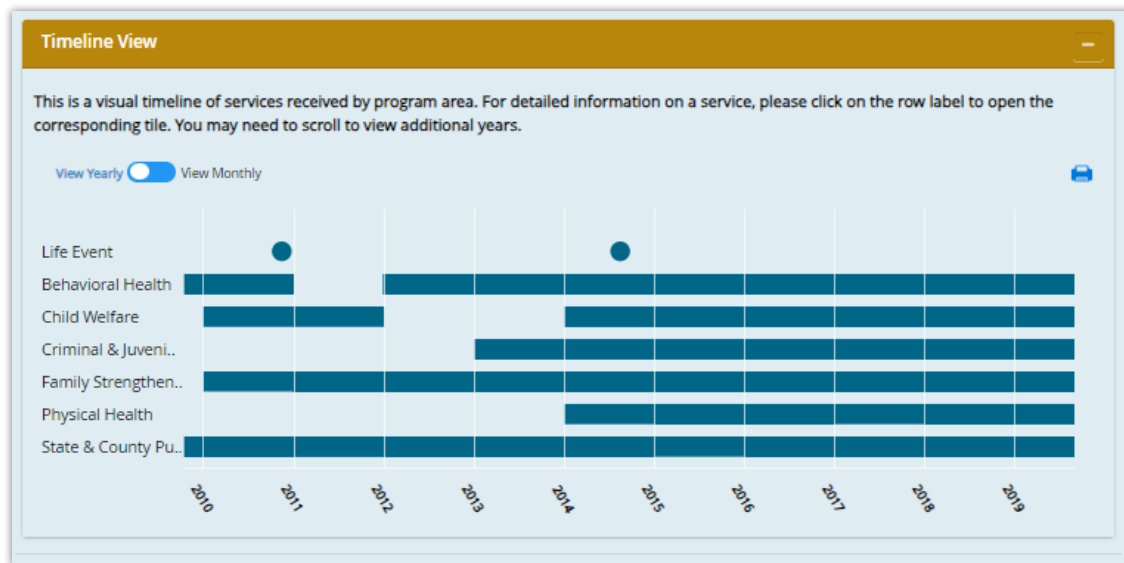
Search Address

Services & Documents

Select a category to view the documents, client workers and services received associated with that specific area. You can view all of these service categories combined by clicking the 'All Service' tile at the top.



The Client View Timeline Screen provides two viewing options (monthly or yearly). The below example provides a yearly view of life events (2 children born since 2010) and programs in which the individual was involved.



AccessMyInfo

[AccessMyInfo](#) is DHS's resident portal that allows users to view and access their own human services and health information and use it for self-directed case management. This tool improves users' ability to access their information easily, safely and securely. AccessMyInfo allows individuals to securely login and view their case history and service involvement across DHS Programs. They can see a history of caseworkers and providers as well as their service plans and assessments.

AccessMyInfo
Allegheny County Department of Human Services

Home / [Redacted]

[Redacted] [Redacted]

Preferred Name : [Redacted]

View My Workers ⁴ Update My Info My Family ¹

Basic Info

DATE OF BIRTH [Redacted] COUNTY MCI # [Redacted] STATE MCI # [Redacted] MA RECIPIENT # [Redacted]

RACE [Redacted] ETHNICITY [Redacted] MARITAL STATUS [Redacted] VETERAN [Redacted]

White Not Hispanic, Latino or Spanish Origin Never Married/Single Unknown

Report Incorrect Information

Other Info ¹⁴

Contact

CELL [Redacted] HOME [Redacted] EMAIL [Redacted]@gmail.com

Services & Documents

Select a category to view the documents, client workers and services received associated with that specific area. You can view all of these service categories combined by clicking the 'All Service' tile at the top.



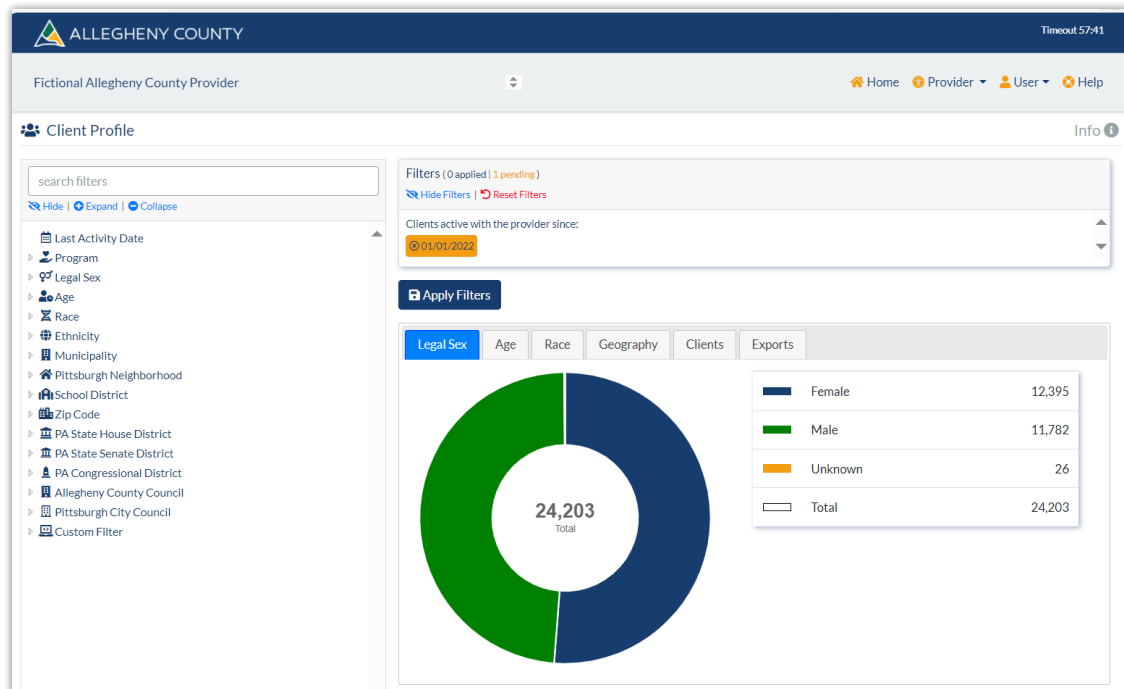
Provider Connect

Provider Connect is available to DHS providers and partners to allow DHS to more easily share information from the County back to providers on all the clients they are working with. It is offered to providers by DHS in an effort to improve business operations, quality improvement efforts and strategic planning. Specific views and downloads vary by provider type, but all providers have access to the Client Profile. The help page has videos of the tool for additional information ([Click here](#)).

The screenshot displays the 'Provider Connect (TFP)' dashboard for a 'Fictional Allegheny County Provider'. The interface features a dark blue header with the Allegheny County logo and a 'Timeout 59:45' indicator. Below the header, a navigation bar includes links for Home, Provider, User, and Help. The main content area is titled 'Provider Connect (TFP)' and contains five interactive cards:

- Client Profile**: My client data. Search, filter, and review clients for your provider. View breakdowns by demographics. Generate exports based on your clients. [Client Profile](#)
- Placement Profile**: My provider as compared to other providers. View data and graphs illustrating: placement service counts; and placement percentage over time. Export data related to placements. [Placement Profile](#)
- Behavioral Health Profile**: BH Service and Dx Data. View market share reporting by service or diagnosis. View breakdowns by demographics. [Behavioral Health Profile](#)
- Out of School Time Profile**: View Fictional Allegheny County Provider Out of School Time Profile. View metrics related to Out of School Time programs. [Out of School Time Profile](#)
- Provider Selection**: Admin Users: Change the current provider that is selected. View all of the providers available in the application. Select a provider and view the application from the perspective of that provider. [Select Provider](#)

In the **Client Profile**, users have access to demographics and geographics for their clients as well as downloadable data extracts.



Providers are able to *export* data from the platform. There are multiple exports available and new ones are easily added. To get more information on the data an export contains, click the “i” icon in the top left corner of the export tab.

The screenshot displays the Allegheny County Provider Connect interface. The header shows the Allegheny County logo, the user role 'Fictional Allegheny County Provider', and navigation links for Home, Provider, User, and Help. The main content area is titled 'Client Profile' and includes a search filters section on the left with a list of filter categories like Last Activity Date, Program, Legal Sex, Age, Race, Ethnicity, Municipality, Pittsburgh Neighborhood, School District, Zip Code, PA State House District, PA State Senate District, PA Congressional District, Allegheny County Council, Pittsburgh City Council, and Custom Filter. The right side of the interface shows a filters section with 'Filters (0 applied | 1 pending)' and a date range for 'Clients active with the provider since: 01/01/2022'. Below this is an 'Apply Filters' button and a tabbed interface with tabs for Legal Sex, Age, Race, Geography, Clients, and Exports. The 'Exports' tab is active, showing a list of export options categorized under 'Child Welfare' (CYF Caseworkers and Supervisors, KIDS Client Identifier), 'Involvement' (Client Golden Record Demographics, DHS Involvement - Summary Programs, DHS Involvement - Aging Programs), and 'Outreach' (Birth Record Relationships, DHS and Provider Caseworkers). Each export option has an information icon (i) and a download icon (down arrow).

© Copyright 2021. All rights reserved. - Allegheny County (TFP) | Provider Connect (TFP)

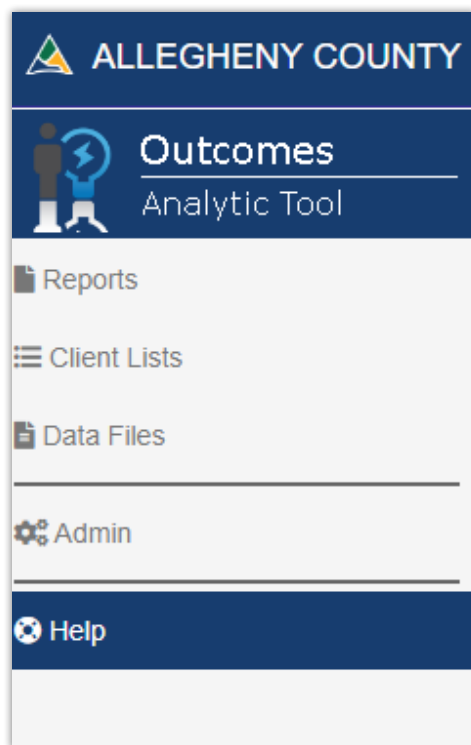
Data-driven decision-making

Allegheny County uses the Data Warehouse to develop models to predict adverse outcomes for individuals and to use those predictions to inform worker decision-making at the time of child welfare call screening ([Allegheny Family Screening Tool](#)), to do outreach and proactively offer supportive services to high-need new parents ([Hello Baby](#)), and to inform housing resource allocation decision-making ([Allegheny Housing Assessments](#)). The County is committed to creating and implementing these tools through community engagement and conversation, competitive procurement, monitoring, and a commitment to modification and improvement, evaluation and transparency. Information on these and future tools can be found on [Allegheny County Analytics](#).



Outcomes Tool

The **Outcomes Tool** is designed to help DHS staff monitor the outcomes of various programs or services. It allows users to upload or create a client list, to examine defined outcomes for those clients in criminal justice, education, behavioral health, homelessness and housing, and child welfare systems and to create data files for additional analysis.

The **Outcomes Tool Navigation Menu** allows a user to choose to view reports and lists that have already been created, create/upload client lists, and create new reports or data files. There are also guides, templates and data dictionaries to assist the user.










The **Outcomes Tool My Reports Screen** lists all of the user's existing reports and allows for:

 **editing** the name of the report  **creating** charts from the data  **deleting** the report




My Reports

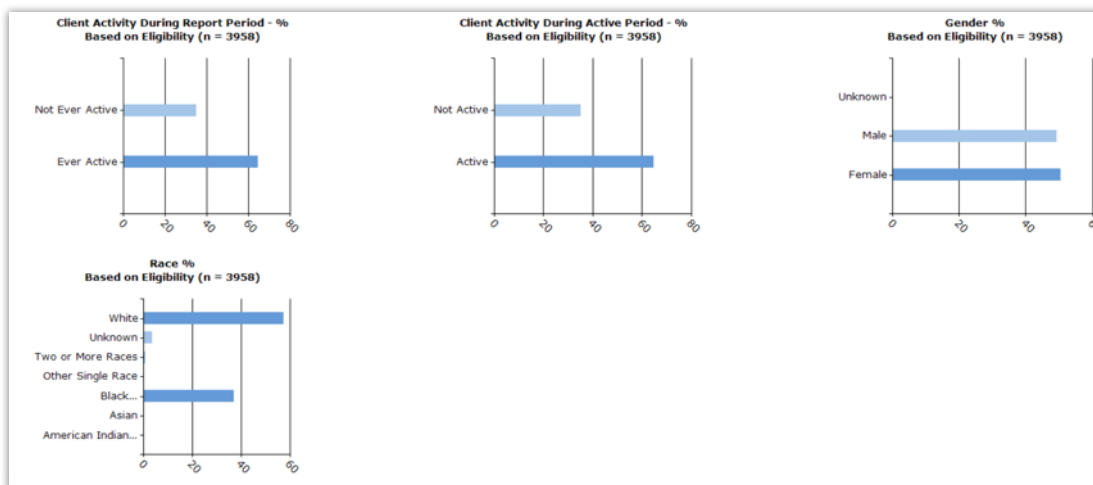
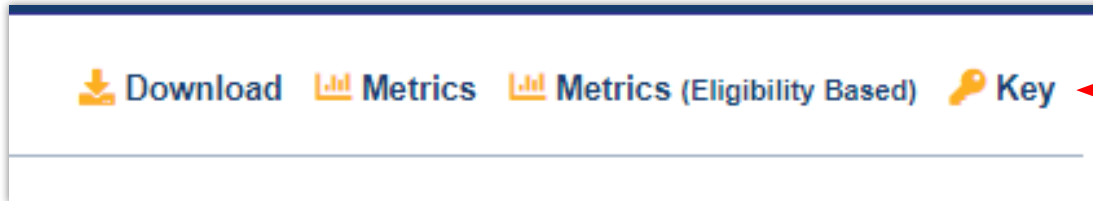
Create Report Refresh

Show 10 entries Filter:

ID	Report	Report Info	Created	Delete On	Options
901	Name: Demo Group: Program Analysis (Utility Tool) Outcome: Cross Program Analysis Program Count: 12	SUCCEEDED: 02/19/2018 11:24 [Run] List: (1104) Demo #1 Records Comment: N/A	02/19/2018	03/10/2018 [30 Days]	  
841	Name: Demo 2 Group: Criminal Justice Outcome: Re-Incarceration	RUNNING: 03/08/2018 15:25 [Stop Report] List: (843) cjdcc #7573 Records Comment: N/A	01/05/2018	06/06/2018	
837	Name: Demo 3 Group: Criminal Justice Outcome: Re-Booking	SUCCEEDED: 01/03/2018 15:55 [Run] List: (843) cjdcc #7573 Records Comment: N/A	01/03/2018	06/06/2018	  

Showing 1 to 3 of 3 entries Previous 1 Next

Below is an example of an **Outcomes Tool Report**, showing the percentage and number of clients involved in a specific program and breakdowns by gender and race. By clicking on the buttons (  ), users can view the actual data and additional metrics or download the data into an Excel file.



The **Outcomes Tool Create List Screen** allows the user to define the parameters of a new list and to use additional custom filters to select on multiple criteria. For example, a user may select a cohort of people using mental health services during a specific time period and use custom filters to narrow that list to members of the cohort who also had an episode of homelessness and a jail booking within a designated time period.

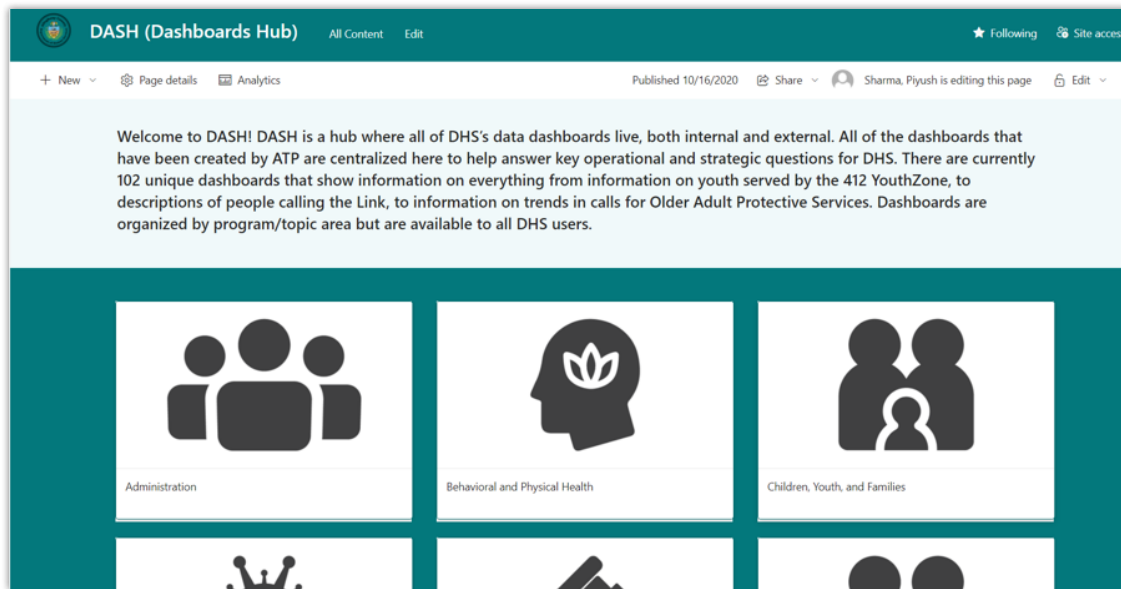
Alerts

Recognizing that there are a number of key events in a family's life that may have an impact on the safety of the home environment, we designed an approach, leveraging the Data Warehouse, to alert DHS staff and providers when any one of several key events occurs. The alerts show up when a user logs into a case management or workflow management application; they may also be texted or emailed to the user. Examples of events that may trigger an alert are birth of a child, charges filed against a parent or client, and school truancy. Alerts are categorized as immediate, urgent or informational and, whenever available, links are provided to documents that contain more information about the alert.

DHS also leverages the Data Warehouse to do direct outreach to clients through text messages. These communications include timely alerts, public policy updates, client experience surveys and opportunities to participate in paid data collection activities. Clients may receive text messages automatically after qualifying service involvement or through a manual, staff-initiated action. Read more about text outreach at DHS [here](#).

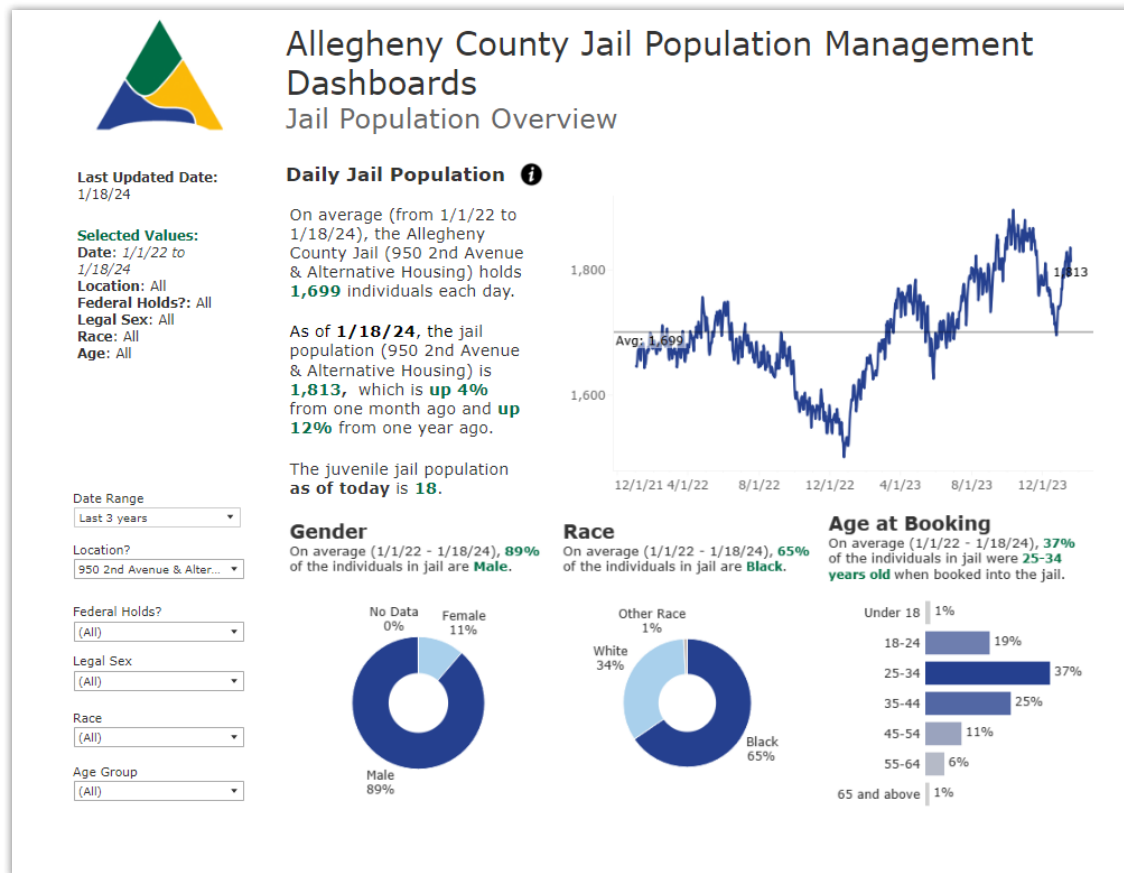
Dashboards

Dashboards are available on an internal dashboards hub (DASH) and on Allegheny Analytics. Dashboards are designed to support internal and external planning and decision-making, and allow the viewer to view demographic, service and utilization information. Dashboards can be manipulated to specify client demographics, service/diagnosis, year and cost as well as comparisons and trends over time.

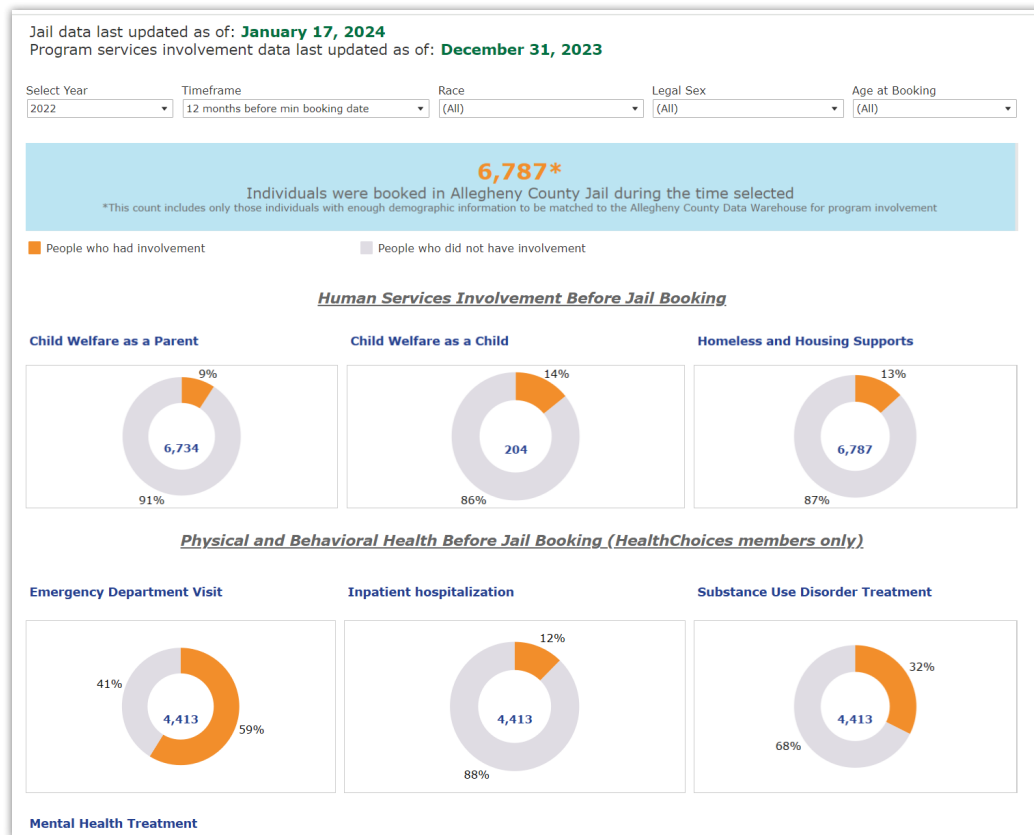


Examples of dashboards:

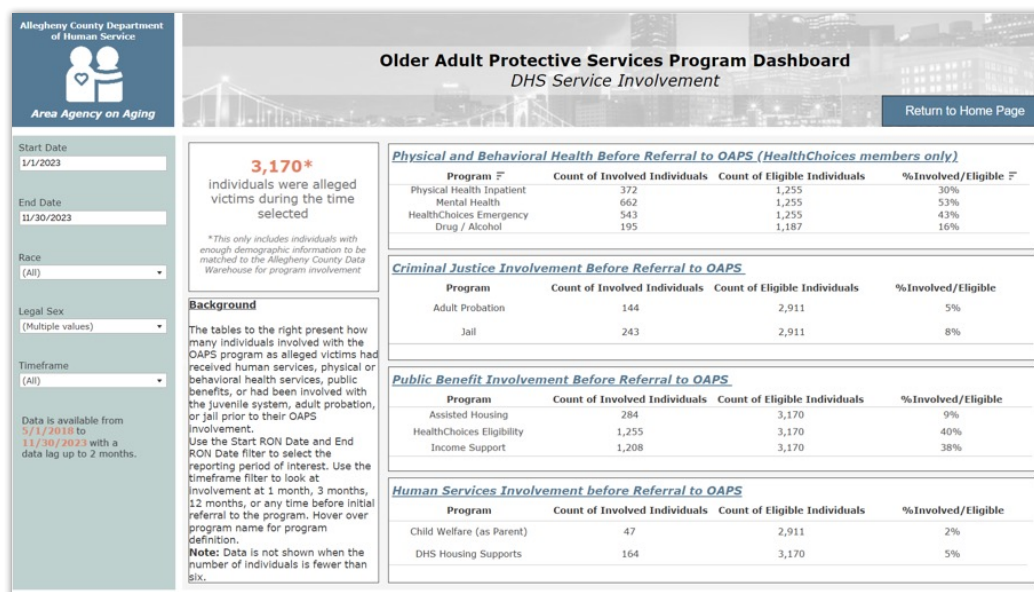
The [Allegheny County Jail Population Management dashboard](#) provides detailed information about people in the jail, why they are in jail, and their service involvement prior to jail entrance. Users are able to use filters along the lefthand side to change the date ranges and to examine specific demographic groups.



The dashboard also allows users to select specific jail booking cohorts by year and examine their program involvement in selected time frames prior to their booking. A user can examine the percentage of those booked in a given year who had substance use treatment in the 12 months prior to their booking.

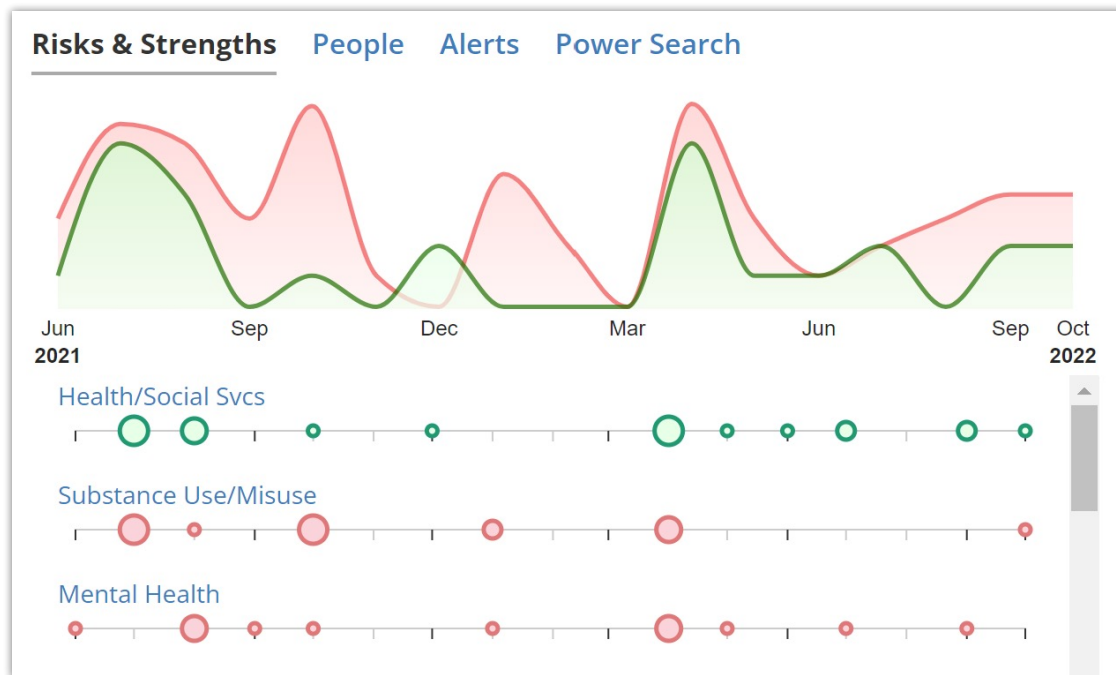


The **Older Adult Protective Services dashboard** provides integrated information about alleged victims of elder abuse. It allows the user to see rates of involvement in physical and behavioral health services, criminal justice, income supports, child welfare and homelessness services.



Unstructured data

In 2022, Allegheny County began using natural language processing on unstructured administrative data and case notes to help workers find the right information at the right time, to gain insights across cases, to expedite case review and to integrate case notes across service systems using the warehouse. The tool allows workers to see trends across notes and find information more easily.



Timeline



26 Results

- | | |
|---------|--|
| 10/2/22 | <p>DRUG Worker explained this is why attending drug and alcohol treatment and therapy is encouraged.</p> <p>DRUGS Ms. Dobson said, "Yes, I understand this, I know what the drugs did to my life and the kids. Show More</p> |
| 7/6/22 | <p>DRUGS Mrs. Preston stated she tried to console Ms. Dobson and encouraged her to fight the need to use drugs, but Ms. Dobson hung up on her. Show More</p> |
| 6/27/22 | <p>DRUGS She reported that Fatima didn't really comprehend too well and David just asked, "It was drugs, wasn't it?" Show More</p> |
| 4/29/22 | <p>HEROIN Ms. Hiller reported, "LaVerne is doing really well in treatment, although she admitted she had a strong heroin habit when she came in. Show More</p> |

WHAT'S NEXT?

The County continues to integrate new data sources, develop new and better tools for people to use that data, and innovate on methods to use that data most effectively to improve services and outcomes for people using those services. It is investing in improving how the Data Warehouse matches (and 'un-matches') people, creating tools for easier integration of new sources and creating more robust integration and linkages in areas like familial relationships. The County is improving how it uses its unstructured data, expanding its point-of-service data collection and use of client experience data, creating rapid-cycle evaluations for new projects, and implementing new models to prioritize people and to better match them to services that work.

TO LEARN MORE ABOUT THE DATA WAREHOUSE

The Data Warehouse has been studied extensively, written about in a number of publications and recognized for its innovation in information technology. A selection of articles that appeared in national publications, as well as a podcast and a DHS-presented paper about the Data Warehouse, are listed below.

[Better Government Through Data: Using the Allegheny County Data Warehouse to design more effective results for clients and the public.](#)

Institute for Excellence in Government, Harvard University, October 2020

[Software for the Social Good: One County's Model Warehouse](#)

Government Technology, December 1, 2017

[How Allegheny County's Data Warehouse is improving human services through integrated data](#)

GovInnovator podcast, February 17, 2016

[Data Warehouses: Using New Technology to Improve Human Services Administration](#)

Re-issue of June 11 article below

Government Technology, June 12, 2014

[Allegheny County, Pennsylvania: Department of Human Services' Data Warehouse](#)

Data-Smart City Solutions, Harvard University, June 11, 2014

[Gaining Ground: A Guide to Facilitating Technology Innovation in Human Services](#)

Data-Smart City Solutions, Harvard University, May 28, 2014

[Allegheny County's Data Warehouse: Leveraging Data to Enhance Human Service Programs and Policies](#)

University of Pennsylvania, May 2014

[Human Services: Sustained and Coordinated Efforts Could Facilitate Data-Sharing While Protecting Privacy](#)

U.S. Government Accountability Office, February 2013.

APPENDIX A

APPENDIX: DATA WAREHOUSE SOURCES

1. **Aging** — publicly-funded services and supports provided to individuals ages 60 and above
2. **Substance Use** — publicly funded services and supports designed to treat substance use disorders
3. **Mental Health** — publicly-funded services and supports for individuals with a mental health diagnosis
4. **Child Welfare** — children and youth 18 years old or younger, and their families, associated with a child welfare allegation, investigation, or case
5. **Independent Living** — youth ages 14 to 24 who had at least 30 days of placement services with child welfare on or after their 14th birthday and are receiving publicly funded services designed to prepare them for living independently as adults
6. **Allegheny County Jail Collaborative** — data on services and supports for offenders, including the Reentry program, designed to prevent recidivism and improve community safety, developed through a partnership of County agencies, the Courts and community organizations
7. **Homeless and Housing Supports** — individuals or families receiving housing and supportive services provided by DHS and DHS-contracted providers due to a housing crisis. Services include housing assistance, case management, prevention and outreach.
8. **Childcare Works (Early Learning Resource Centers)** — Children (age 13 and under) and their families receiving a childcare subsidy.
9. **Early childhood** — Children receiving early head start, head start or Pre-K counts services through the Allegheny County Intermediate Unit or Pittsburgh Public Schools.
10. **Early Intervention** — infants, toddlers and young children up to three years of age who are receiving Early Intervention (EI) services. EI provides developmental and social emotional screenings, supports and services for young children who have a developmental delay or are at risk for developmental delay.
11. **Family Support Centers** — publicly funded services provided to children (age 5 and under) and their families through any of Allegheny County's family support centers
12. **Out of School Time** — Children and youth receiving out-of-school time services provided by DHS and DHS-contracted providers.
13. **Intellectual Disability** — publicly funded services provided to individuals over the age of 18 with intellectual disabilities
14. **Public Housing** — low-income individuals receiving housing assistance through the Housing Authority of the City of Pittsburgh and the Allegheny County Housing Authority
15. **Public Benefits** — individuals who receive public benefits from the Pennsylvania Department of Human Services (PA DHS). PA DHS public benefits include cash assistance and the Supplemental Nutrition Assistance Program (SNAP).
16. **Medicaid Enrollment** — any person enrolled in Medicaid in Allegheny County.
17. **Birth records** — birth certificate records of births that occurred among mothers who resided in Allegheny County at the time of delivery

APPENDIX A

- 18. Community College of Allegheny County** — any individual enrolled (part-time or full-time) in the Community College of Allegheny County.
- 19. Public Schools** — children and youth enrolled in kindergarten through twelfth grade in one of the DHS data-sharing partner school districts:
- a. Pittsburgh Public School District
 - b. Elizabeth Forward School District
 - c. Baldwin Whitehall School District
 - d. East Allegheny School District
 - e. Highlands School District
 - f. South Allegheny School District
 - g. South Park School District
 - h. Sto-Rox School District
 - i. West Mifflin School District
 - j. Clairton City School District
 - k. Duquesne School District
 - l. Penn Hills School District
 - m. Woodland Hills School District
 - n. Propel Charter Schools
- 20. Allegheny County Jail** — individuals who are admitted to the Allegheny County Jail and assigned a jail bed.
- 21. Adult Probation** — data on cases, charges, sentences, violations and detainers for adults supervised by Allegheny County Adult Probation
- 22. Pretrial Services** — data on assessments and pretrial supervision for adults charged with a new crime in Allegheny County.
- 23. Courts** — information on court cases — such as filings, charges, dispositions and sentences — collected by Magisterial District Courts and the Court of Common Pleas in Allegheny County.
- 24. Juvenile Justice** — data on allegations, charges, disposition and placements, as well as assessments, for youth under the age of 18 who are supervised by Allegheny County Juvenile Probation.
- 25. Physical Health** — any individual insured through Medicaid who received a physical health service in the County. Includes dates of service and diagnoses for all emergency department visits, inpatient admissions and outpatient appointments.
- 26. Autopsied Deaths** — individuals who died in the County and whose deaths were recorded in autopsy reports by the Allegheny County Medical Examiner's Office. The Medical Examiner investigates cases of homicide, suicide, overdose, accidental deaths and natural deaths that are sudden, unexpected or medically unattended.
- 27. Labor and Industry** — employment, earnings and unemployment insurance benefits information

APPENDIX B**APPENDIX B: INTEGRATING DATA**

Each new data source added to the Data Warehouse involves a process that requires the development of trust and a shared vision as well as coordinating details such as the form in which data will be provided. Most partners send information weekly, and it is loaded into the Data Warehouse through an Extract, Transform and Load (ETL) Platform. The ETL is set up to accept data in different formats and load them into the central data area. At DHS, a team of programmers use IBM DataStage to create each ETL, and Oracle database management software to store it. Setting up the ETL is the most complex function involved; it accounts for about 80 percent of the technological work of the Data Warehouse.

Once client data are loaded into the Data Warehouse, each client is assigned a unique identifying number. In this way, all client-specific information can be pulled together to provide a comprehensive picture of client needs. It also ensures that individuals are not counted more than once.

The Data Warehouse requires ongoing data quality management. This is accomplished by an administrator who coordinates data, a support team that loads information, and an operational team that does weekly maintenance and performs data archiving.

Data Warehouse Composition

CLIENT DEMOGRAPHICS	PROVIDER INFORMATION	SERVICE INFORMATION	FISCAL INFORMATION
<ul style="list-style-type: none"> • Name • SSN • Gender • DOB • Address • Race • Marital Status • Education/ Employment • Living Arrangement 	<ul style="list-style-type: none"> • Services and Specialized Services Offered • Location of Services 	<ul style="list-style-type: none"> • Service Type • Service Location • Clients Served 	<ul style="list-style-type: none"> • Units of Service • Cost of Services