

# *BETTER GOVERNMENT THROUGH DATA*

Using the Allegheny County Human Services Data Warehouse to design more effective results for clients and the public

*Jane Wiseman, Institute for Excellence in Government, October 2020*

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to design more effective results for clients and the public  
October 2020**

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# **Better Government Through Data: Using the Allegheny County Human Services Data Warehouse to design more effective results for clients and the public**

**October 2020**

## **Summary**

Allegheny County, PA hosts one of the nation's leading integrated data systems, which now links both human services data, and many related data sets that form a seamless flow of data to improve public service to vulnerable individuals. Case workers serving elders, individuals with disabilities, children in child welfare system and individuals experiencing homelessness and many more are provided with real-time client level data that lets them tailor services to best meet client needs, and in some cases to proactively anticipate needs.

For example, the Allegheny Family Screening Tool (AFST), a predictive analytics tool built using the data warehouse improved the accuracy of screening-in for children in need of services, and reduced racial disparities in case opening rates between black and white children<sup>1</sup>. Launched in 2016 and updated in 2018, this tool helps frontline workers make child welfare call screening decisions by calculating a risk score, integrating and analyzing hundreds of data points from across multiple data sources. The risk score predicts the long-term likelihood of out-of-home placement and adds some data insight to the human judgement necessary when making a decision about whether to investigate a call about potential child maltreatment.

In 2020, Allegheny County began using a risk model to help prioritize homeless services, a scarce resource which can be provided to about half of those in need in the county. The goal was to speed the process of establishing priority for services by creating a standard measurement of the need for services. The risk model leverages existing client level data in the data warehouse, so that individuals in need of services do not need to provide the data themselves again. This results in both more efficient processing, better quality data, and greater respect for human dignity, given that the data used was already in the system, and that the self-assessment process is not only time-consuming but can be fraught with inaccuracy owing to stigma and to the fact the individual may be in crisis. The risk prioritization system uses existing client data to automatically model future adverse outcomes, such as worsening mental health, incarceration, or emergency medical services. Identifying the individuals at greatest risk of these outcomes

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<sup>1</sup> [https://www.alleghenycountyanalytics.us/wp-content/uploads/2019/05/Impact-Evaluation-Summary-from-16-ACDHS-26\\_PredictiveRisk\\_Package\\_050119\\_FINAL-5.pdf](https://www.alleghenycountyanalytics.us/wp-content/uploads/2019/05/Impact-Evaluation-Summary-from-16-ACDHS-26_PredictiveRisk_Package_050119_FINAL-5.pdf)

allows them to be given priority for homeless services, improving their health and potentially lowering overall cost for the county.<sup>2</sup>

In another example of integration of data to solve an important public problem, to combat the opioid crisis, Allegheny County examined overdose death autopsy records and learned that over 2/3 (68.4%)<sup>3</sup> of those who died had a prior interaction with the county's human services agency. Deeper analysis showed that 18%<sup>4</sup> of the fatal overdoses having been incarcerated in the prior year, and 49%<sup>5</sup> had been incarcerated at some point in the past. Next they examined how long it had been between the fatal overdose and the last contact with DHS. For those who had contact with DHS in the year prior to their overdose, most had that contact in the 90 days before their fatal overdose, and many had contact with DHS in the 30 days prior to their fatal overdose. Based on this insight, DHS saw an opportunity to reach people as they exit service to protect them from a fatal overdose in the 30 and 90 day period following service.

Drug overdose risk rises for individuals who begin using again after a period of abstinence as their tolerance has decreased and they may not realize it – this can make it risky to go back to their prior drug dosage. This can be exacerbated if there has been any change in potency of street drugs during the time of incarceration or inpatient substance use disorder services. To combat this risk, DHS is now promoting distribution of overdose reversal drugs such as naloxone at discharge from the county jail and from county funded substance use disorder treatment. Further, drug treatment in jail is being increased along with transition services to help prisoners leaving jail access treatment after incarceration.

This case study describes the origins and development of this data system, its uses and the lessons learned from implementation.

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<sup>2</sup> [https://www.alleghenycountyanalytics.us/wp-content/uploads/2020/09/9-2-2020-AHA-methodology-report-without-comments\\_pdf.pdf](https://www.alleghenycountyanalytics.us/wp-content/uploads/2020/09/9-2-2020-AHA-methodology-report-without-comments_pdf.pdf)

<sup>3</sup> Karen Hacker, et al., "Linking Opioid-Overdose Data," *Public Health Reports*, <https://journals.sagepub.com/doi/pdf/10.1177/0033354918803938>

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

## Background: the Allegheny County Human Services Data Warehouse

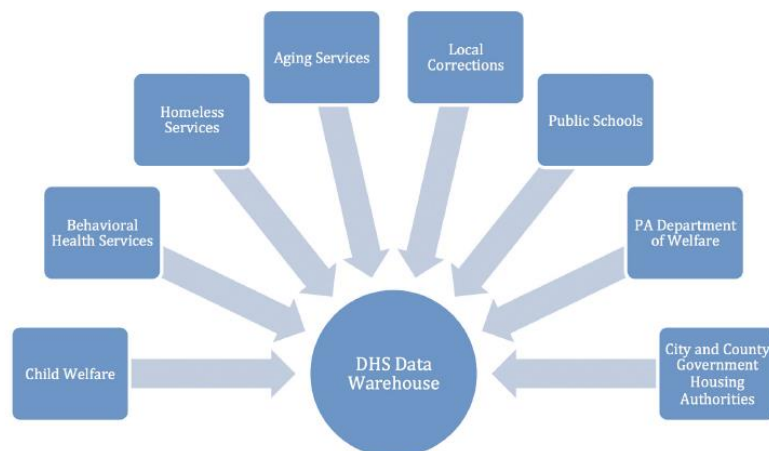
The Allegheny County, PA Department of Human Services (DHS) has developed a highly sophisticated integrated data warehouse with inputs spanning city, county and state sources. This data warehouse includes data from over 20 different sources across the full range of its services provided from childhood to aging, along with other sources such as county jail data, school data, and overdose data. All of the data can be matched across the different sources on an individual basis, allowing a level of research and insight rare in the public sector.

The data warehouse was created to improve the quality of service delivery to clients by leveraging data to enable frontline workers to perform their jobs better, and to support executive and management decision-making. There is a wide range of data in the data warehouse, including:

- Client demographic data such as name, social security number, date of birth, and address
- Service information such as the client’s past and present services (available to the client or parent/guardian if the client is under 14) and the cost of that service
- Service provider information such as the, location, type of provider, and the services they have delivered to clients.

Unique to this tool, from the start, it was intended to be used for both internal research and also external transparency and accountability – providing public value both to direct users and to a range of other interested stakeholders. As shown in the diagram below, both internal and external sources are incorporated into the warehouse.

**FIGURE 1. Internal DHS Data Sources (not inclusive)  
External Data Sources (not inclusive)**



Source: Kitzmiller, 2014.

## Origins of the data warehouse

This data warehouse has been the source of much press attention and has received widespread recognition. One could easily imagine that such a great success happened as a natural extension of a long period of excellence – but rather this exemplary integrated data system happened only after a series of reforms that sought to address serious problems. In the 1990s, Pittsburgh, the county’s largest city, was in economic decline and some of Allegheny County’s public services were struggling with limited resources. According to one source, the county’s child welfare agency was “known as a national disgrace.” In need of a reformer, the county brought in Marc Cherna to lead a turnaround for Children and Youth Services.

In 1996, a group of local community, business, and philanthropic leaders came together to discuss what was needed for the county to overcome its challenges and to prosper in the 21<sup>st</sup> century. Among other suggestions, they recommended consolidating the various disparate departments focused on child welfare services, behavioral health, disability, aging and other human services into a single Department of Human Services (DHS).

By 1997, Cherna had succeeded in improving child welfare and his efforts at transparency and community engagement garnered him widespread respect. When the county restructured and created a single, consolidated human services agency, Cherna was tapped to lead it. Cherna recalls how when asking any given director in the newly created Department of Human Services (DHS) how many clients they serve, “typically the number would be larger than the number of people living in the county” – a clear sign that duplication of systems and recordkeeping was preventing a clear view of the true demand for and supply of services to vulnerable populations in the county.

One of the difficulties with the consolidation was the fact that each individual system had its own fiscal management software and service/data tracking system. Rather than try to make these disparate systems fit together, and to create a more accurate view of client services and provide actionable intelligence across the newly consolidated system, Cherna and his partners decided to create a data warehouse. This data warehouse would not replace existing systems, but rather in a federated manner compile data from source systems into an easily accessible format for analysis at the client level, and with protections so that individual data is privacy-protected and used only for appropriate purposes. The data warehouse approach turned out to be far more efficient than creating entirely new systems for all the newly-connected agencies, and was up and running within a year of project initiation.

## Costs of the data warehouse

The initial cost was \$2.8 million, with philanthropic seed funding critical to success. Several local foundations created a pooled Human Services Integration Fund that provided greater flexibility than government funds for the initial costs and was used for the design and initial development of the warehouse.

Ongoing maintenance costs of the warehouse are now funded by DHS, at about \$6.5 million a year. This pays for 30 data analysts, seven data leads, an analytics manager, and technical support. Representing less than 1% of DHS's total budget, this investment is smart repurposing of dollars. As noted by Deputy Director, Erin Dalton, "It takes political courage to take a dollar that would have gone to child welfare or mental health services and invest it in data and analytics, but we get insight to improve operations and deliver better outcomes that we would never get from putting all the funds into direct service."

## Creating the data warehouse

When the project started, few examples existed of such wide-ranging data sharing in the public sector. As a result, some staff were skeptical. To facilitate adoption and use and to erode resistance to change, DHS cultivated internal champions in each functional area. As insiders, these internal champions could best nurture acceptance in their organizations. This early adopter group had input into system design and that played a significant role in building their buy-in. A wide range of users and functions were brought into the design phase including caseworkers, supervisors, analysts and management.

## Early successes of the data warehouse

It didn't take long for this data investment to pay dividends. One early success was a 2005 algorithm to identify unmet client needs. The algorithm identified children receiving child welfare services who needed but were not receiving mental health support, and boosted the number of children getting needed mental health support from 26 percent to 44 percent<sup>6</sup>.

## Current uses of the data warehouse

As seen in the chart below, the range of functions and uses of the data warehouse spans many types of users and purposes. Some are available to the public while others are available only to authorized client service staff and management. Authorization for use of data is role-based and governed by security and privacy protocols.

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<sup>6</sup> Tod Newcombe, "Software for the Social Good: One County's Model Warehouse," *Digital Communities*, Government Technology, December 1, 2017, <https://www.govtech.com/dc/articles/GT-December-2017-Model-Warehouse.html>

### Allegheny County DHS Data Warehouse Tools

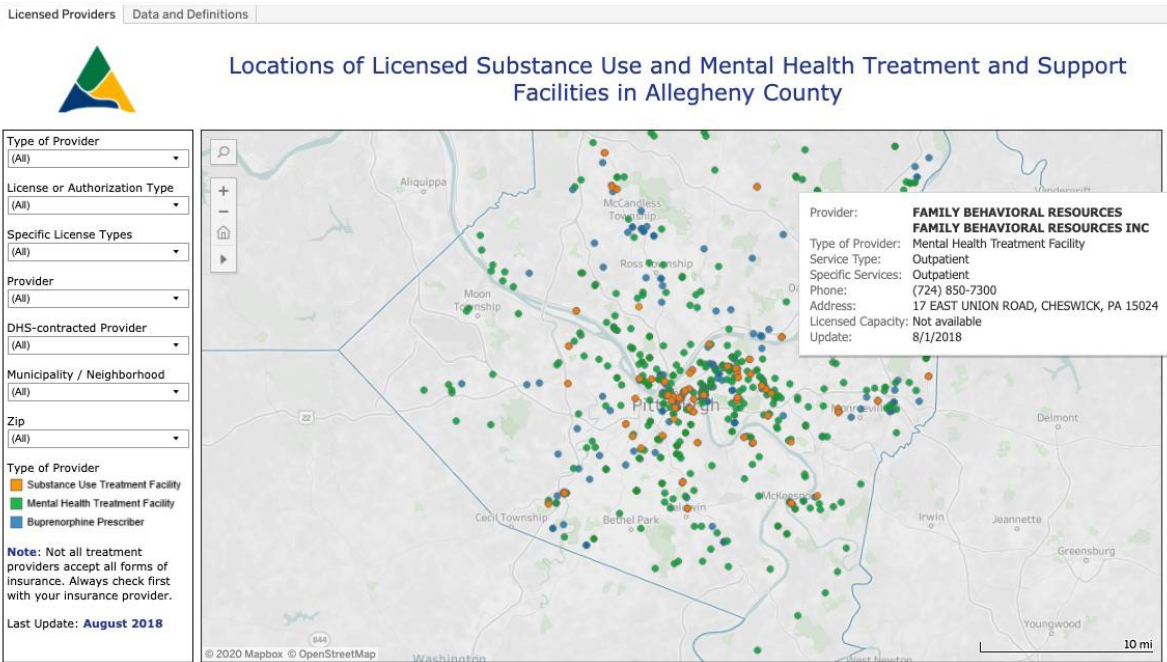
TOOL	PURPOSE	AVAILABILITY
<a href="http://www.AlleghenyCountyAnalytics.us">www.AlleghenyCountyAnalytics.us</a>	Hosts data sets, publications and visualizations	Publicly available
QuickCount	Allows for queries about participation in a wide range of services from data integrated in the DHS Data Warehouse.	Publicly available
Client View	Information about individual clients and their service involvement	Authorized DHS users, provider agencies and clients
Allegheny Family Screening Tool (AFST)	Predictive model to support child welfare call screening decision-making	Child welfare call screening staff and supervisors
Outcomes Tool	Monitor the success of various programs/ services by assessing the performance of participants	DHS staff
Alerts	Notification about clients' key life events	DHS staff
Reports Portal	Location for viewing automated reports and dashboards	DHS staff
Dashboards	Visualizations that show demographic, service and utilization information of a service or system; data can be manipulated by users to provide a custom view	DHS staff

Source: Allegheny County Department of Human Services

Tools available to the **public** include:

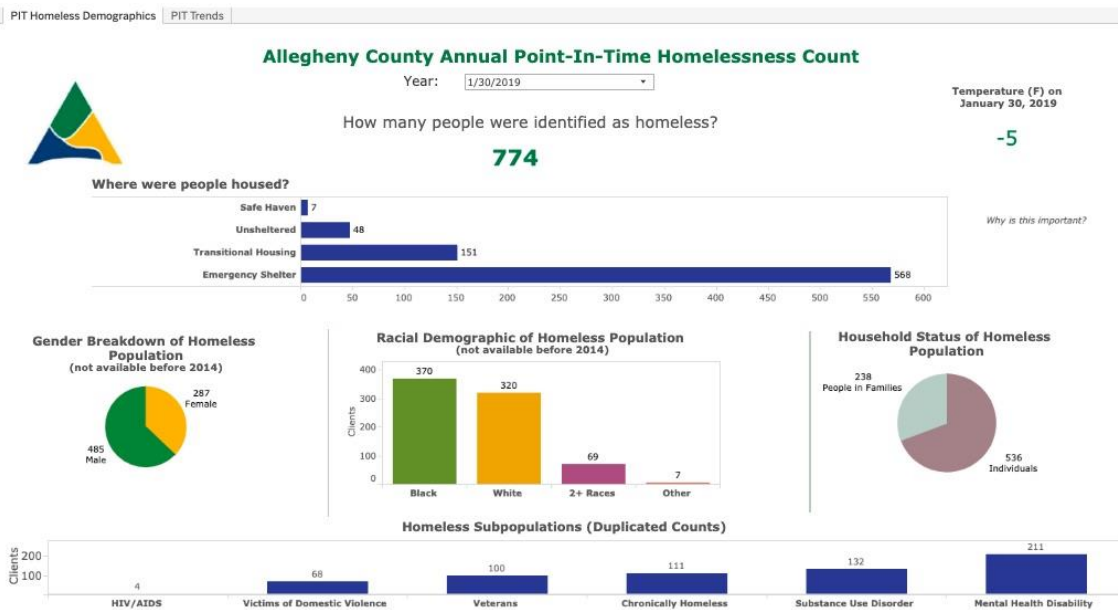
- The website [www.AlleghenyCountyAnalytics.us](http://www.AlleghenyCountyAnalytics.us) provides the public with a wide range of data sources, dashboards, and data visualizations offering summary level rather than individualized data and showing trends over time for a variety of topics ranging from truancy and jail population to foster care placements. A vast trove of DHS-created research and other publications are available at this link as well. Data have been made available for things people might be interested in like homicides, suicides and overdoses. As can be seen from the sample dashboards that follow, DHS has made public interest a priority in this public-facing site.
- The QuickCount tool is user-friendly and allows the public to explore the vast data held by DHS on an aggregate level. No client-level data is shared, and protections are in place so that de-identified data cannot be re-identified. Users can compare multiple services delivered by DHS, can count the number receiving one or more services, and can look at the overlap between the two. Views allow drill-down by demographic groups (age, gender, race) and geography (zip code, city council district, school district, etc.) for each category.

## Sample Interactive Dashboard: Locations of Licensed Substance Use and Mental Health Treatment Facilities



Source: Allegheny County Department of Human Services.

## Allegheny County 2019 Point in Time Homelessness Count Interactive Data Visualization



Source: Allegheny County Department of Human Services.

## Sample Interactive Dashboard from Quick Count Tool Showing Client Overlap of Mental Health and Housing Voucher Program

### Results Summary

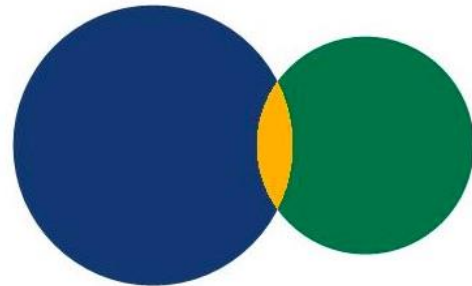
\*Only results with a value of 6 or greater are displayed.

	(Active) Mental Health Services (All) <a href="#">View Breakdown</a>	60,277
	(Active) Housing Choice Voucher Program (Section 8) <a href="#">View Breakdown</a>	33,133
	Participating in Both Programs <a href="#">View Breakdown</a>	5,588
	Participating in Either Program <a href="#">View Breakdown</a>	87,822



Additional trends and metrics may take a few minutes to process.

 CY Trend  FY Trend  Monthly Trend



Source: Allegheny County Department of Human Services.

Tools available only to **authorized users**, per role-based permissions, privacy and security protocols include the following:

- The Client View tool, in its updated and streamlined version now called AccessMyInfo, provides case workers, supervisors and managers the information they need to do their jobs - information about individual clients and their service involvement across all data sources in the data warehouse. The tool also has the ability to see into supporting documentation across multiple DHS offices, programs and locations. This tool is available only to authorized staff and to the clients themselves and provides detailed history of client services provided dating back to 2002, depending on the service.
- The Allegheny Family Screening Tool (AFST) is DHS's first predictive analytics tool built using the data warehouse. This tool helps frontline workers make child welfare call screening decisions. The tool calculates a risk score to help make decisions about child safety by integrating and analyzing hundreds of data points from across multiple data sources. The risk score predicts the long-term likelihood of out-of-home placement and adds some data insight to the human judgement necessary when making a decision about whether to investigate a call about potential child maltreatment.
- The Alerts tool enables an automatic notification to a case worker for specific dates or events that may trigger family stress or require attention, such as a court appearance date, a jail release, school truancy, birth of a new child and so on. Alerts appear when a caseworker logs into their system, but can also be pushed out as notifications via text message.

The screenshot below shows how public and authorized users can access the various tools.

#### PUBLIC TOOLS



##### QUICKCOUNT

QuickCount allows for queries about participation in a wide range of services from data integrated in the DHS Data Warehouse. Users can sort by time period, view participation in multiple services, and filter counts demographically and geographically. If you require assistance, please contact [ServiceDesk@AlleghenyCounty.us](mailto:ServiceDesk@AlleghenyCounty.us)

#### AUTHORIZED USERS ONLY



##### CLIENT VIEW

Client View provides information about DHS clients and their service involvement, including involvement across multiple DHS program offices. Demographic information is also available, as well as service plans, assessments and eDocuments.



##### OUTCOMES TOOL

The purpose of this tool is to help users determine the outcomes of various programs or services. That information can then be used to measure a program's success. Current outcomes include: re-bookings and re-convictions in the area Criminal Justice, home removals and parent or child active in the area of Children, Youth and Families and performance and attendance rates in the area of Education.



##### REPORTS PORTAL

The reports portal provides one convenient location for viewing automated reports and dashboards in areas such as: Basic Needs, Children and Families, Disabilities, Behavioral Health, Older Adults and Cross System Involvement.

Source: Allegheny County Department of Human Services

## Data sharing agreements

Data that an outsider to government might assume is routinely shared – for example whether or not an individual in a county jail has been treated in a county detox facility – has too often and for too long been walled off and not shared outside the boundaries of the agency delivering the service. The DHS data warehouse has intentionally broken down boundaries such as these so that a full picture of a client can be created, and appropriate services provided.

One example is informing mental health or substance use disorder service providers when one of their patients has died from a drug overdose. To anyone not in government, this may seem like an obvious point of data sharing, but doing this in Allegheny County was not simple. According to Erin Dalton, Deputy Director for DHS, “It seems straightforward, but there have been legislative and regulatory barriers, historically and funding-wise, creating real walls between mental health and substance services.”

Building the data warehouse meant slowly, gradually building relationships with other parts of county government, and later state and city government as well. In some cases, statutory

restrictions on data sharing had to be addressed, and in other instances the resistance to sharing data was rooted in fear and status quo bias rather than a true legal prohibition against data sharing.

Because the data warehouse includes human services and health data, there are legal requirements related to protected health information (PHI) and other information subject to privacy and confidentiality laws such as the Health Insurance Portability and Accountability Act (HIPAA). Data sharing agreements were not required for data sharing among county departments, because they all fall under the supervision of the county executive and thus are part of the same organization.

One example of a key external data sharing partner is the Pittsburgh Public School District (PPS), serving over 20,000 children. Eager to connect data on child welfare and family homelessness with school attendance and to develop ways to increase school stability for children at risk of falling behind, DHS wanted to share data with PPS. The data sharing agreement between DHS and PPS took 18 months to negotiate. School systems are often protective of their data, and PPS was no different. The Memorandum of Understanding (MOU) that resulted from this negotiating process outlines the roles, duties, and responsibilities of each party and specifies the governance, compliance, and privacy safeguards that are put in place to protect student data.

## **Data integration for criminal justice reform**

Allegheny County is among a handful of jurisdictions funded for an innovative data-driven justice (DDJ) approach to reducing incarceration by targeting the so-called “frequent utilizers” of jails, homeless shelters, and behavioral health services. The effort aims to divert from jails individuals better served with behavioral health or substance use disorder services. The intended result is lower cost to the public and better outcomes for individuals experiencing homelessness, or in need of behavioral health or substance use disorder treatment.

Along with other jurisdictions in the DDJ initiative, Allegheny County is developing ways to align justice, health and human services systems using data insights to divert frequent utilizers to the most appropriate services, rather than using jail to address their issues.

Allegheny County is also participating in the MacArthur-funded Safety and Justice Challenge, with a goal of reducing incarceration by 20%<sup>7</sup>. The data to track progress toward that goal is from the data warehouse.

Central to these justice reform efforts is the Allegheny County Jail Collaborative (ACJC), formed in 2000, which includes county government agencies, not-for-profit organizations and other key

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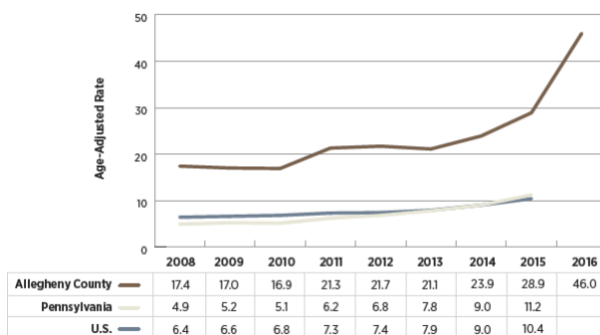
<sup>7</sup> Department of Human Services, *Safety and Justice Challenge: Allegheny County Year One Report*, Allegheny County, December 9, 2019, <https://www.alleghenycountyanalytics.us/index.php/2019/12/09/safety-and-justice-challenge-allegheny-county-year-one-report/>

community stakeholders. This group meets monthly to identify innovative approaches to reducing incarceration and to divert, treat and support people with behavioral health conditions.

## Addressing the opioid crisis with integrated data

One of the vexing public problems of the past decade is the opioid crisis. Allegheny County has taken a data-first approach, leveraging the data warehouse and mining its data on overdoses and deaths. The county has provided opioid data on public dashboards, and created public status reports in 2016<sup>8</sup> and again in 2018<sup>9</sup>. Key to this approach is the partnership between the Allegheny County Health Department (ACHD) and the Allegheny County Department of Human Services (DHS). The county is now integrating data across health, public safety and emergency response and holds Opioid Stat meetings to develop cross-departmental solutions to the problem. As a result of this approach, the county achieved a 40% drop<sup>10</sup> in fatalities in 2018 and expects that when 2019 data are released in the spring of 2020 that the trend will continue. As can be seen in the chart below, the opioid problem in 2016 in Allegheny County was tracking far worse than that of the state of Pennsylvania and the US as a whole.

**Age-adjusted Opioid-related Overdose Rates (per 100,000) in Allegheny County 2008-2016**



Source: Allegheny County Department of Human Services and Allegheny County Health Department

<sup>8</sup> Eric Hulse, et al., *Opiate-Related Overdose Death in Allegheny County Risks and Opportunities for Intervention*, Allegheny County Department of Human Services and the Allegheny County Health Department, July 2016, <https://www.alleghenycountyanalytics.us/wp-content/uploads/2017/04/Opiate-Related-Overdose-Deaths-in-Allegheny-County.pdf>

<sup>9</sup> Department of Human Services, *Opioid-Related Overdose Deaths in Allegheny County: Report and Maps*, Allegheny County Analytics, February 15, 2018, <https://www.alleghenycountyanalytics.us/index.php/2018/02/15/opioid-related-overdose-deaths-allegheny-county-report-data-visualizations/>

<sup>10</sup> Aubrey Whelan, "Drug overdose deaths dropped 40% last year in the Pittsburgh area. Why can't Philadelphia do the same?", *The Philadelphia Inquirer*, updated December 9, 2019, <https://www.inquirer.com/health/opioid-addiction/opioid-overdoses-philadelphia-pittsburgh-naloxone-20191209.html>

The year 2016 was the tenth consecutive year<sup>11</sup> of rising fatal overdoses, and the rate of overdoses per 100,000 population roughly doubled<sup>12</sup> in two years (from 2014 to 2016 the rate increased from 23.9 to 46.0). The problem was also found to be hyper local with geographic clusters of deaths, and a pattern of individuals who overdose close to home, with 82%<sup>13</sup> dying within a mile of their home.

## Data-first approach

Beginning in 2015, the Allegheny County Department of Human Services (DHS) and the Allegheny County Health Department (ACHD), jointly took a deep dive into the data to better understand the problem. An initial report was published in 2016, with a follow up<sup>14</sup> web-based interactive report with dashboards and maps released in February 2018. The dashboard allows users to define their own criteria and sort, explore, and download data on a wide range of opioid issues, such as overdose deaths and death rates per 100,000 population for each municipality and for every Pittsburgh neighborhood. Demographics of victims – by age, age and race, and by age and legal sex are also provided on a dashboard that can be customized by neighborhood, municipality, and type of drug found.

## Research insights

To better understand how DHS might intercept the pathway from use of opioids to misuse to overdose and death, they partnered with the County Medical Examiner, who provided data from autopsy reports of individuals who died of opioid overdoses. The intent was to identify where DHS had touched individual's lives, to discover if there were touchpoints where DHS could take actions that might change the trajectory toward overdose and death. Touchpoints considered included use of mental health services and substance use disorder services, Medicaid enrollment, incarceration in the county jail, involvement with child welfare services, and use of homelessness services from the county.

Examining overdose deaths reported via autopsy records from the Medical Examiner uncovered some interesting insights, most importantly that over 2/3 (68.4%)<sup>15</sup> had a prior interaction with DHS. Digging deeper and looking at the types of services individuals who suffered fatal overdoses had received, of those who had received services from DHS in the year prior to their

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<sup>11</sup> Department of Human Services, *Opioid-Related Overdose Deaths*, Allegheny County, <https://www.alleghenycountyanalytics.us/index.php/2018/02/15/opioid-related-overdose-deaths-allegheny-county-report-data-visualizations/>

<sup>12</sup> Karen Hacker, et al., "Linking Opioid-Overdose Data to Human Services and Criminal Justice Data: Opportunities for Intervention," *Public Health Reports*, November 2018, <https://journals.sagepub.com/doi/pdf/10.1177/0033354918803938>

<sup>13</sup> Ibid.

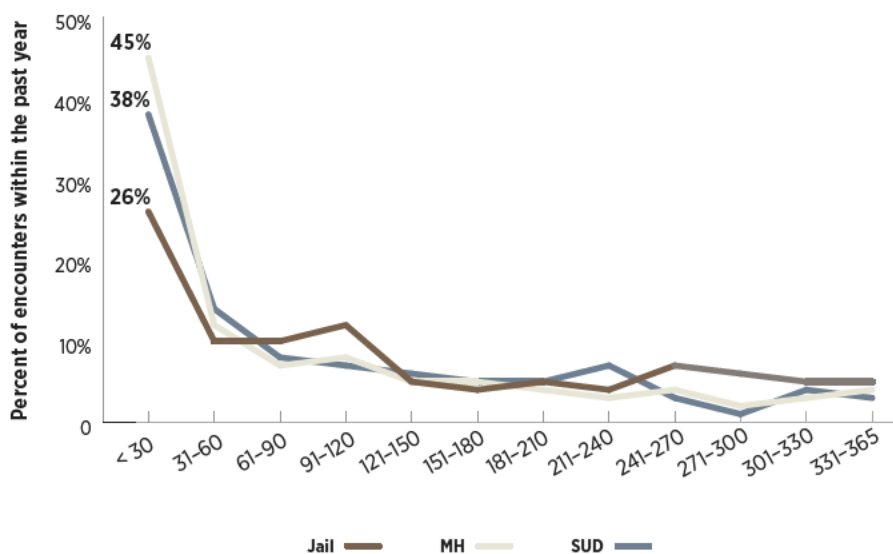
<sup>14</sup> Department of Human Services, *Opioid-Related Overdose Deaths*, Allegheny County, <https://www.alleghenycountyanalytics.us/index.php/2018/02/15/opioid-related-overdose-deaths-allegheny-county-report-data-visualizations/>

<sup>15</sup> Karen Hacker, et al., "Linking Opioid-Overdose Data," *Public Health Reports*, <https://journals.sagepub.com/doi/pdf/10.1177/0033354918803938>

overdose, the most common was mental health service, which was present for 34%<sup>16</sup> of the overdose deaths. Next most common was having used a substance use disorder service, at 28%<sup>17</sup>. Also common was incarceration, 18%<sup>18</sup> of the fatal overdoses having been incarcerated in the prior year, and 49%<sup>19</sup> having been incarcerated at some point in the past.

Next in the analysis they examined how long it had been between the fatal overdose and the last contact with DHS. For those who had contact with DHS in the year prior to their overdose, most had that contact in the 90 days before their fatal overdose, and many had contact with DHS in the 30 days prior to their fatal overdoses, as shown in the graph below:

**Time between Overdose Death and Jail Release or Most Recent Mental Health or Substance Use Disorder Encounter Among Those with Past Year Encounters (2015-2016)**



Source: Allegheny County Department of Human Services and Allegheny County Health Department

Based on this insight, DHS saw an opportunity to reach people as they exit service to protect them from a fatal overdose in the 30 and 90 day period following service. Drug overdose risk rises for individuals who begin using again after a period of abstinence as their tolerance has decreased and they may not realize it – this can make it risky to go back to their prior drug dosage. This can be exacerbated if there has been any change in potency of street drugs during the time of incarceration or inpatient substance use disorder services. To combat this risk, DHS is now promoting distribution of overdose reversal drugs such as naloxone at discharge from the county jail and from county funded substance use disorder treatment. Further, drug

<sup>16</sup> Department of Human Services and Health Department, *Opioid-Related Overdose Deaths in Allegheny County, 2015–2016 Update*, Allegheny County, February 2018, [https://www.alleghenycountyanalytics.us/wp-content/uploads/2018/08/17-ACDHS-22\\_Opioid\\_Overdose\\_082018.pdf](https://www.alleghenycountyanalytics.us/wp-content/uploads/2018/08/17-ACDHS-22_Opioid_Overdose_082018.pdf)

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

<sup>19</sup> Ibid.

treatment in jail is being increased along with transition services to help prisoners leaving jail access treatment after incarceration.

Comparing data for opioid-related overdose deaths and data on the county Medicaid program showed that 51%<sup>20</sup> of those who died of an overdose were enrolled members 90 days prior to their death. Of those who died and were Medicaid members, nearly one-quarter (23%)<sup>21</sup> had filled a prescription for an opioid within 90 days before their death and nearly half (45%)<sup>22</sup> had filled a prescription for medicines such as those to treat depression in the 90 days before their death. These insights point out overlaps among the substance use disorder and mental health populations, and identify areas where proactive identification of potential misuse could occur.

## Lessons learned

Lessons learned from the development, implementation and ongoing sustainment of the Allegheny County DHS data warehouse include:

- **Strong executive leadership is needed.** The consolidation of all human services functions into a single agency, and the technology challenge of creating a single view of the client across all services took strong executive leadership by Marc Cherna. He made the data warehouse one of his key priorities. As Deputy Director Erin Dalton notes, “It’s not enough to just want to use data analytics. You need to invest in the infrastructure and in hiring analysts to do the work. Most counties only have a couple of analysts and they don’t have time to do management support as they’re pulled in different directions for federal reporting and for responses to urgent inquiries.” Cherna and Dalton both invested their time in developing the analytic capabilities of the data warehouse and in using the insights to drive change. Putting the findings into practice and changing policy and behavior turned out to be the most difficult and the most valuable part.
- **Leverage grant funding.** Seed funding for the data warehouse was provided by a network of local foundations who came together to create the Human Services Integration Fund. Subsequent special projects for data analytics have been funded via a combination of philanthropic and federal grant sources; for example, a private foundation funded a recent opioid predictive analytics program.
- **Build incrementally over time and celebrate milestones of success along the way.** The DHS data warehouse didn’t begin as an intergovernmental effort, but rather as a cross-agency effort within one department. The success of this initial effort is what provided momentum and credibility as the effort expanded to other county agencies and to state and city agencies as well. The early win in 2005 of being able to provide mental health services to children in need, who would otherwise have fallen through the cracks of the system helped build credibility for the system.

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<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> Ibid.

- **Analyzing data across government boundaries magnifies insight.** Data sharing across departments can open up great insight not available in any one domain alone. DHS is fortunate to already have a consolidated department of human services with integrated client-level data. Adding health services and jail data within the same data warehouse made it even more powerful. Key additional data sharing with the Pittsburgh Public Schools and with the Medical Examiner have unlocked new insights on truancy, school retention, and opioid overdoses.
- **Trust takes time.** To establish data sharing agreements takes trust, and it typically takes a long time to develop working relationships in which the partners trust each other to use the data properly. The 18 months that it took to negotiate the data sharing agreement between DHS and the Pittsburgh Public Schools was a long-term investment that paid off when other school districts followed the precedent set by Pittsburgh and also began to share data with the county.
- **Bring the lawyers in early to facilitate data sharing.** In forging the integrated data warehouse, and in adding critical additional data sources such as school, court, and death records, the key players were not the data or technology professionals, but the lawyers. It took creativity, insight, and dedication to the important public outcomes to get from “no” to “yes” on data sharing and agreement on privacy and access policies. Without lawyers who were able to surmount obstacles and challenges, the data sharing would never have happened and insight would not have been possible.

## Conclusion

Vision, hard work, patience and persistence enabled the establishment of the data warehouse at the Allegheny County Department of Human Services. What has led to continuous improvement of the platform and continuous improvement in services is the leadership and organizational commitment to providing data-driven and client-responsive services that benefit both the clients and the public that pays for and expects efficient and effective government. This case study demonstrates that excellence in government is possible, with the right combination of vision, leadership and dedication to providing responsive government to clients in their time of need. As 2020 unfolds with increasing levels of despair and disparity made evident, this shining light of excellence in government offers a ray of hope to public servants everywhere.

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