Modernizing Data Management in Public Health

Streamlining collection and consolidation of public health data enhances decision-making capabilities to boost overall population health.

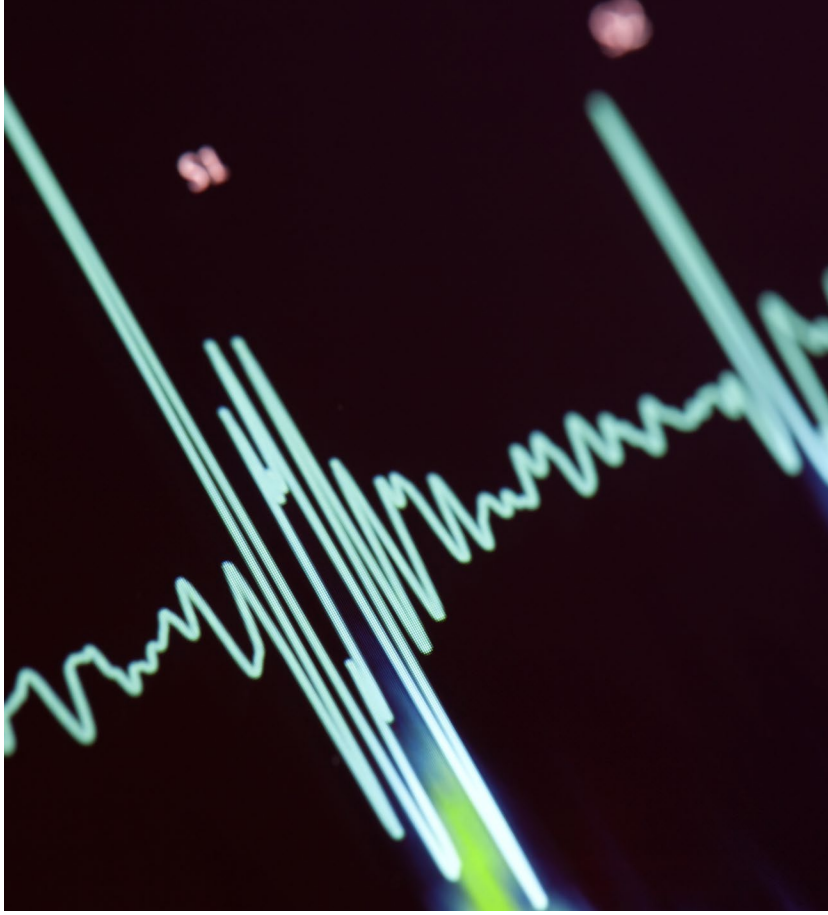
Thanks to the proliferation of technology in the healthcare sector, public health organizations now have access to vast amounts of data. New data streams provide opportunities to better understand diseases, recognize trends in society, and make decisions to improve the health of the population. Intelligent data analysis also allows public health organizations to make significant strides in three of the sector's core priority areas: monitoring, intervening in, and preventing disease progression.

But as the amount of data with potential to make a positive impact on population health continues to grow, collecting, consolidating, and managing the data is becoming increasingly complex.

Leading organizations are exploring ways to modernize practices and processes for better data availability, collection, and consolidation while continuing to maintain the security and privacy of health data.

Data Challenges Facing Public Health

In the public health space, organizations face data challenges ranging from the timeliness in which they receive data to the reluctance of counterpart organizations to share data. To better serve populations, public health organizations will need to overcome several obstacles to efficient data management.



Receiving Data from Clinical Sources in a Timely Manner

Public health organizations can often be kept waiting for days, weeks, or even longer to receive critical data from their many sources. Without gaining access to data at a much faster rate, it is difficult to make informed decisions in impactful timeframes.

Quality and Consistency of Data from Different Sources

Data analytics in public health has enabled significant improvements in the overall health of the population. For example, the Centers for Disease Control and Prevention's Center for Forecasting and Outbreak Analysis was able to anticipate the timing and impact of the COVID Omicron variant based on cases and hospitalizations.[1] However, data analytics relies on the quality of its data meeting certain levels of consistency and accuracy. Public health data must be accurate and up to date to ensure that analyses achieve desired outcomes.

Record Linkage and Consolidation

When health organizations receive information from different sources, such as clinical records and laboratory reports, it can be difficult to recognize that the separate, disconnected records are linked to the same patient. Data linkage and consolidation challenges may prevent public health organizations from operating at an optimum level and result in problems understanding and analyzing data. Duplicating records, keeping inaccurate track of the number of cases of a certain disease, and various other misinterpretations can hinder decision-making about important public health issues.

In addition, when patients cross states or other jurisdictional lines, the systems involved are not always capable of linking records across these boundaries. Without more modern, intuitive practices and processes for data consolidation and management, linkage issues will increase.

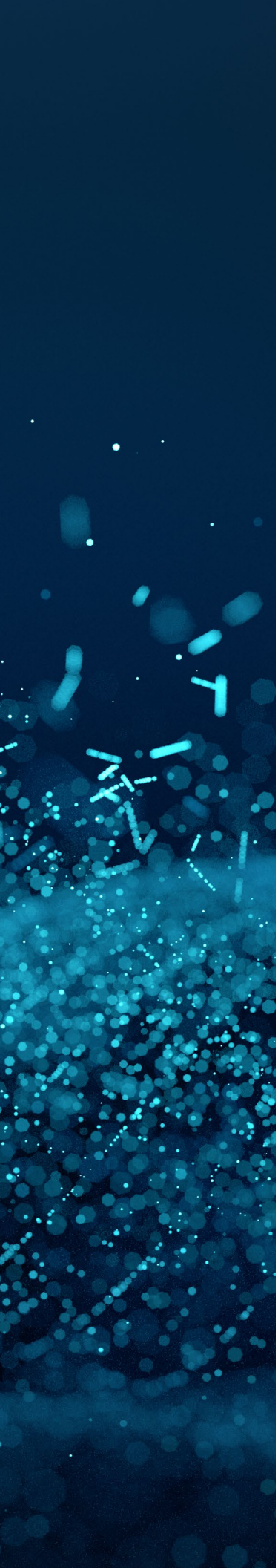
Legal Concerns and Data Privacy Implications

Challenges around data record linkage and data consolidation must also be viewed through the lens of legal implications for data sharing. Many public health organizations restrict data sharing as a legal precaution even in situations where it is acceptable. Taking a more conservative position toward cross-organization and cross-jurisdiction data sharing may limit vital improvements.

Data sharing decisions are primarily driven by privacy and security concerns, but record linkage must also become more intelligent so that organizations can securely use data to make smarter decisions for the benefit of population health. Greater education and understanding about the value of data modernization—as well as about the critical importance of such an initiative—is needed across the public health sector.

Relationships and Reluctance to Share Data

Underpinning these data challenges are shortcomings in managing the vital relationships between public health agencies and third-party organizations. When it comes to data not legally mandated to be shared, there must be a cultural shift toward relationships that encourage data sharing to improve analysis and decision-making in public health, while maintaining the public's privacy.



Improving the Collection, Consolidation, and Management of Data

Before public health organizations can use data to make a positive impact on public health, there are numerous data management and data governance challenges that must be addressed. The following steps are necessary for organizations to modernize data management processes and set the stage for improved data analytics.

Break Down Silos and Foster a Culture of Collaboration-First

Public health organizations traditionally operate in a siloed manner, both internally across departments and between fellow agencies. However, the data practices and processes that can deliver true value to an organization require the establishment of a more collaborative culture to allow data to flow seamlessly through various data streams.

Public health organizations have an opportunity to build a holistic mindset that encourages people to work together more interactively from a data perspective.

Of course, this cultural shift must also go hand in hand with a security-conscious, privacy-aware set of practices for data sharing. While collaboration is key to increasing the value public health can gain from data, there must be reassurance that data privacy standards will be upheld.

Modernize Data Standards to Improve Consistency and Usability

With a more data-centric culture, another important shift must come in the form of more modern and consistent data standards.

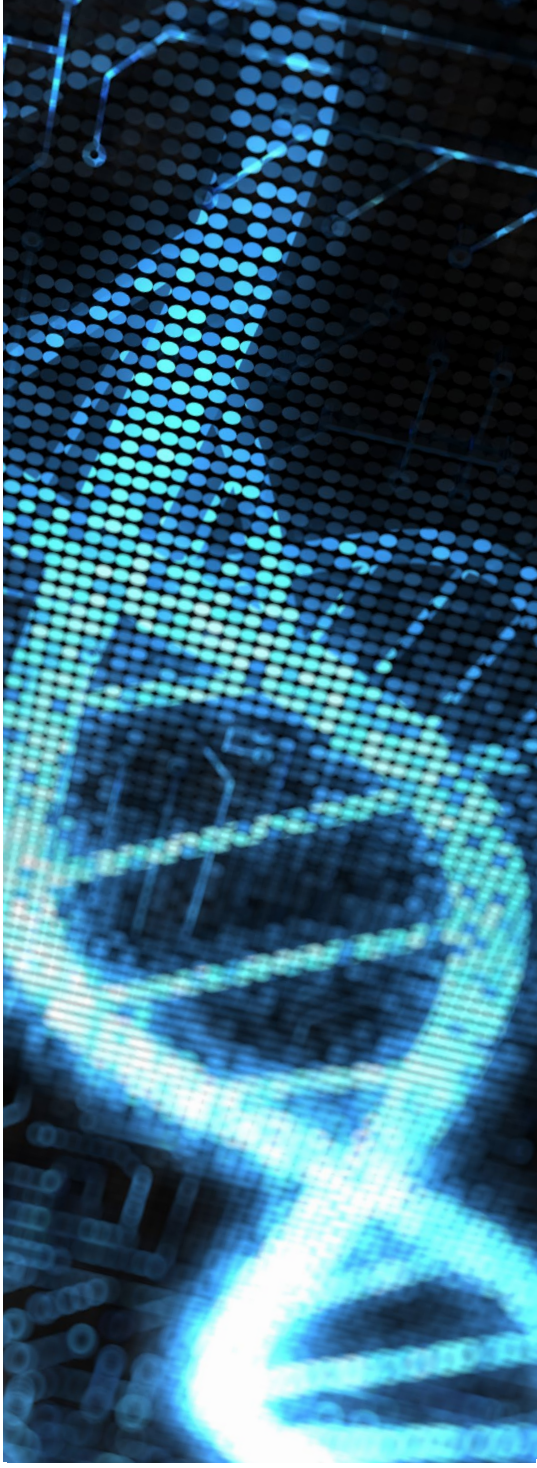
When organizations do not manage and share data in a consistent way, the quality and integrity of the data may be compromised and the opportunity to gain actionable insights from analytics suffers. For example, certain public health systems have inconsistent standards for entering various demographics, such as races and ethnicities for patients, resulting in skewed findings regarding these metrics. Similarly, the way lab results are delivered can vary by agency.

Staff must be encouraged to remain within consistent standards when working with data in order to improve the outcomes that can be achieved with the data. This will significantly reduce time and manual effort in correcting differently formatted data.

Use Software to Gain Operational Advantages

To outwit the complexity involved in modern data management, collection, and consolidation, technology must be introduced to help simplify data processing. Public health organizations should establish an agreement with their local health information exchange to support and host technology that can automatically transfer authorized data to the public health authority. This can automate the flow of data from disconnected sources and allow the appropriate records to be delivered to the public health authority with reduced delay or restriction, allowing them to more efficiently determine how to use the data to improve the public health.

Automating data flows can be done on a conditional basis for specific areas, diseases, types of patients, and other variables, passing on the data records to the most relevant people.



Strengthen Data Governance

Not only will stronger data governance improve collection, consolidation, and consistency, but it will also help relieve the related security and privacy concerns.

It's crucial to introduce a strong data governance framework into an organization as the modern public health data landscape grows increasingly complex. This can serve as the guiding principle to help those working within public health to use, treat, and own their data in the most effective and efficient ways.

Introducing a robust data governance policy requires clear best practices for how data can be used and shared internally and externally including questions, such as:

- How do we collect and store data?
- What systems and processes do we use?
- How do we analyze the data?
- How do we interpret the data?
- How do we share the data internally and externally?
- How do we communicate the results or outcomes of our data analysis?
- How do we protect the privacy of our data and keep it secure?

Once a data governance strategy is established, develop processes, from both cultural and technical perspectives, to ensure data governance standards are being met and maintained.

Embrace Automation Cautiously and Strategically

Automation is a strategic solution to many complex technical problems. Automation can speed the delivery of information to public health organizations from a wide range of relevant sources and can facilitate the routing or delivery of that information to the most appropriate people. The approach can also adjust data that is received to comply with accuracy and consistency standards.

When automation is deployed to accelerate the analysis of data and improve accuracy, additional quality control measures will help ensure the correct decisions are being made.

Automating critical data processes should be driven by an incremental strategy that takes small steps rather than big leaps. It's also wise to involve specialists with experience and expertise in successful process automation, to ensure that organizations can avoid pitfalls and minimize risks.

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More Impactful Analysis and Decision-Making

Significant improvements in the secure sharing of data will enable public health organizations to conduct more actionable data analyses. They will be able to link disparate data sources together in meaningful ways, which will allow public health practitioners to elucidate trends that otherwise would have remained hidden. For example, the efficacy of an intervention can depend on social factors, which requires linking health data with social determinants of health.

Consolidating data from multiple sources also allows public health organizations an opportunity to find patterns in the data that can only be unearthed with larger sample sizes. For example, machine learning techniques become more practical as samples sizes increase. Applying these advanced analytics techniques allows the organization to make data-driven decisions.

The benefits of implementing data processes that improve data collaboration and management include:

- Exponential increases in efficiency for mission-critical processes
- Reduced costs and better use of resources
- More secure and privacy-aware data practices
- Greater strategic, data-driven decision-making
- Faster intervention in, or prevention of, public health problems
- Improved public health services for citizens

Guidehouse helps organizations navigate the complexities of implementing a modern data infrastructure while ensuring the privacy and security of data. Improved data availability and collaboration enable organizations to harness the true value of data analytics.

[1] The Center for Forecasting and Outbreak Analysis, n.d., About Us (cdc.gov).

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