



Connecting the Dots:

**Building a holistic healthcare
record for whole person care**

Introduction

Healthcare generates a vast amount of data every second - an estimated 30% of the world's data. This number is expected to reach 36% by 2025.¹ The Internet of Medical Things alone will generate roughly 25 billion gigabytes of data annually by 2025.² From wearables to mobile apps and connected medical devices to EHR systems, healthcare organizations are seeing a massive increase in the volume of data they collect.

Managing the data accurately and efficiently represents a major challenge for organizations. Much of today's patient and consumer data is housed across disparate hospital, clinic, and laboratory systems and contains missing, incorrect, and duplicate information. Further, valuable real-world data, like a person's access to transportation or healthy food, is often missing and lacks connectivity to traditional healthcare data sets. Each of these data sets may have different identifiers for each patient, making it difficult to link them together.

"Your patient engagement and clinical research efforts are only as good as your data," says Jonathan Shannon, Associate Vice President of Healthcare Strategy at LexisNexis Risk Solutions. "If you have 30 million records in your database because people enter through multiple care settings and have duplicate records without a common identifier, trying to piece together a longitudinal patient record is wildly inefficient. Managing the data and creating a single, holistic view is fundamental."



Accurate and complete patient and population data can help your organization answer essential questions like:

How do I identify patients at risk for chronic conditions and proactively manage them?

How do I incorporate diverse socioeconomic, cultural and community contexts into clinical research?

How do I gather accurate and complete population data to identify and address barriers to care?

How do I best deploy resources to high-needs populations?

Has this person visited other care settings for prescriptions or lab tests that may impact my recommendations?

The implications of inaccurate data

Each year in the U.S., 27 million people move, 50,000 name changes are requested, and an estimated 21 million annual employment changes are reported.³ With such a large volume of rapidly changing data, it's no surprise that healthcare organizations face data management challenges. A survey of 100 healthcare executives found that only 20 percent of healthcare organizations fully trust their data.⁴

Inaccurate, outdated, duplicate, and incomplete patient and consumer data has a host of implications:



Patient care and outcomes: Inaccurate records can prevent providers from identifying at-risk patients who need medical interventions or follow-up care. It can also hamper patient outreach for population health initiatives. In the pharmacy, patient identification mix-ups can result in patients receiving the wrong information or medication.



Health plan member outreach: Incorrect member data can contribute to poor health outcomes, preventing members from receiving information and reminders for a health condition. Inaccurate data also costs payers in returned mail processing expenses, increased operating costs when members cannot use digital channels, wasted time calling incorrect phone numbers, and manual efforts by employees to fix the discrepancies. Breakdowns in communications and inconsistent service experiences also dampen member experience.



New drug and therapy development: Clinical researchers working with de-identified data need a complete picture of people's varied patient journeys, unique lifestyles, socioeconomic factors, comorbidities and more to develop life-saving treatments efficiently. Existing tools struggle to accurately de-identify healthcare

"The ability to aggregate the best, most up-to-date information on an individual and understand their identity in a fundamental way creates a much more efficient system," notes Shannon.

Moving toward next-generation data aggregation and linking

Amid rapid digital transformation, managing ever-increasing volumes of data is more challenging than ever. What served as a go-to solution in the past may jeopardize data integrity and security, lack scalability, and limit the ability to make data-driven decisions.

For decades, small-scale databases and spreadsheets have been a trusted data management tool. However, they lack critical capabilities that help ensure data security and integrity. Manual input, frequent validation checks, and manual data manipulation and analysis also limit productivity, data-driven insights, and decision-making.

Today, many organizations rely on probabilistic patient matching algorithms within their electronic medical records and master data management solutions. The algorithms are likely matching records as well as they can within a solution, but the limitation is the data itself.

That's why switching to referential matching through a trusted data partner is critical for better patient care and meeting regulatory requirements. Referential data matching with a single token creates a master member identifier that links the right files together for a complete view of a patient's healthcare journey. A sophisticated solution enhances an organization's existing data with information from third-party sources, including health equity and inclusion intelligence, consumer behavior intelligence, geography and environment and more. The ability to process and link disparate datasets helps an organization stay on top of constantly changing identity information.

“The rules and algorithms that power probabilistic matching are only as smart as the data within the organization’s four walls,” says Shannon. “And given the sensitivity of healthcare data, the algorithms lean toward underlinking data. So, if you have a Sam Smith and a Samuel Smith with the same date of birth but two different addresses, a probabilistic matching algorithm may not link those.”



Tokenization unlocks actionable individual and population insights

Many healthcare and life sciences organizations are not covered entities under HIPAA and are limited to working with deidentified patient data. That poses a challenge for researchers who need to use real-world data (RWD) while maintaining patient privacy. Real-world data (RWD) can help generate real-world evidence (RWE) that informs appropriate and effective patient care and supports impactful clinical research. RWD captures a fuller picture of what happens to individuals and populations outside of clinical settings and can include individuals and communities often underrepresented in clinical trials.

While today's RWE-generation tools can securely de-identify healthcare data and link datasets, they fail to create a full picture of every patient's journey. This is because first-generation de-identification technology is not coupled with sophisticated linking capabilities found only with a smart token using referential matching.

Today, next-generation tokenization uses a referential data layer to help ensure a patient's records are precisely matched and linked over time to a tokenized identifier for each patient. That means even as people change addresses, switch providers and change their names, the technology continues to link de-identified data while maintaining strict data privacy standards to produce a unified patient record.

"Next-generation tokenization of real-world data is moving big data in healthcare closer to actionable insights," adds Zuskov. "The technology overcomes some previous obstacles and allows stakeholders to link disparate datasets – to layer in context like social determinants of health, medical claims data and mortality information while maximizing health data privacy."

"Previously, certain types of data were almost impossible to use in research settings. For example, imaging and genomics data are challenging to de-identify in a way that makes them available for research," says Diana Zuskov, Associate Vice President of Healthcare Strategy at LexisNexis Risk Solutions.

CASE STUDY

How Next-Generation Tokenization Impacts David's Journey

David is a young adult male who was struggling with undiagnosed depression, anxiety and an eating disorder. He has tried multiple medications, which have been ineffective, and has an unstable housing situation.

David shares a name and previous address with his father, David Sr., who has a history of heart disease. With probabilistic matching, the records were inaccurately matched. Due to the mismatch, David wasn't qualified for a clinical trial for a novel anti-depressant medication. His medical file is never flagged, and his doctor never refers him.

Millions of people can be impacted by mismatched datasets, making the precision and accuracy of a token backed by a referential data layer more critical than ever. Identifiable data can be de-identified on a patient-centric token and linked with provider, payer, clinical, and device data to provide a comprehensive view of the patient. Including social determinants of health (SDoH) is necessary to round out the picture of an individual's health status and likelihood of accessing, affording, and benefiting from care.



CASE STUDY

Improving medication adherence with SDoH data

Limited data on new members hinders medication adherence models. A global healthcare organization needed to quickly identify eligible populations to optimize resource allocation and accelerate assistance when needed.

They analyzed Socioeconomic Health Attributes and Scores alongside clinical and claims data using two modeling approaches: baseline and SDoH-inclusive data with historical patient records. Including SDoH data attributes increased patient identification by 20%. As claims began to accrue in the second quarter, the comprehensive models showed a 10-percentage point increase in recall compared to the baseline model.



Fuel data-driven decisions

Accurate information on consumers is essential for all healthcare organizations. It's vital to have a way to match and link disparate records to the correct patient identity, de-identify data when necessary and enhance profiles with up-to-date insights to inform care planning and engagement workflows.

Find out how LexisNexis Risk Solutions can help connect the dots to solve your data challenges.

¹ Wiederrecht, PhD, Greg; Sasson, Darwish; Callaway, Andrew. "The healthcare data explosion" RBC Capital Markets.

² Dwivedi, Ruby; Mehrotra, Divya; Chandra, Shaleen. "Potential of Internet of Medical Things (IoMT) applications in building a smart healthcare system: A systematic review." National Library of Medicine, 2021 Dec. 11, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8664731/>.

³ U.S. Census Bureau. Retrieved on 2023, Oct. 19 from <https://www.census.gov/topics/population/migration/guidance/calculating-migration-expectancy.html>

⁴ "The High Cost of Bad Data and Analytics on Strategic Healthcare Decisions." Sage Growth Partners. 2021, Oct. 14.

About LexisNexis Risk Solutions

LexisNexis Risk Solutions harnesses the power of data and advanced analytics to provide insights that help businesses and governmental entities reduce risk and improve decisions to benefit people around the globe. We provide data and technology solutions for a wide range of industries, including insurance, financial services, healthcare and government. Headquartered in metro Atlanta, Georgia, we have offices worldwide and are part of RELX (LSE: REL/NYSE: RELX), a global provider of information-based analytics and decision tools for professional and business customers. For more information, please visit risk.lexisnexis.com and www.relx.com

Our healthcare solutions combine proprietary analytics, data science and technology with the industry's leading sources of provider, member, claims and public records information to deliver insights that improve cost savings, health outcomes, data quality and compliance.

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