

# How the Medical Director Should Use Data Sources

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The life insurance industry is transitioning towards precision underwriting driven by increased data availability and access to advanced analytical tools. Effectively utilizing diverse data sources in life insurance underwriting presents an opportunity for medical directors to fully leverage their skillset in this evolving environment. By navigating these changes, balancing the value of data against its limitations, and fostering collaborative approaches to enhance risk assessment and underwriting processes, medical directors can maintain a pivotal role in the life insurance companies of tomorrow.

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## OBJECTIVES

In the ever-evolving landscape of insurance medicine, it's crucial for forward-looking insurance companies to understand and utilize diverse data sources effectively. Our aim is to guide medical directors in maximizing their contributions to their companies' data utilization journey.

We will explore how data strategies in life insurance underwriting can enhance understanding of current selection trends, delve into data sources beyond traditional labs, recognize emerging pitfalls, and position medical directors to bolster their company's success and ensure the sustainability of their role in this evolving landscape.

### The Context: Underwriting 3.0

The shift towards precision underwriting has been propelled by an exponential increase in data availability, from 2 zettabytes in 2010 to an astounding 2 zettabytes per week in

2022. This transformation, marked by a proliferation of data sources and improved analytical tools via predictive modeling, is equally evident in life insurance.

Enhanced data capture within the company, enrichment with relevant external sources, and, often, access to internal data science teams have facilitated the underwriting transition from rigid rules to comprehensive risk-scoring systems. However, this paradigm shift prompts a critical question: in this data-rich era, is there a shortage of analytical talent experienced in life insurance? To address this, medical directors can, and indeed should, play a pivotal role.

With the advent of Underwriting 3.0, data has become the cornerstone of improving risk selection and assessment. Collaborative efforts among actuaries, underwriters, data scientists, and medical directors, particularly in Accelerated Underwriting development teams, underscore the multidisciplinary approach required and now adopted by many companies.

Nevertheless, it is vital to discern that the available data might not always be the most suitable. Therefore, understanding the underlying aspects of data, its strengths, weaknesses, and limitations is imperative – a familiar task for the medical director. Within a data analysis team, the Medical Director's insight is invaluable in determining data appropriateness and knowing when to shift focus from seeking perfect data to what is appropriate for the task at hand.

### Exploring Nontraditional Data: A Tale of Two Data Sources

The life insurance industry's adoption of two new technologies, biometric data through fitness trackers and prescription history, presents a case study in evolving data usage. The two data sources have had very different receptions as can be attested by their relative penetration.

Fitness trackers, providing insights into an individual's activities over time – like steps and heart rate, and potentially mortality-predictive measures—starkly contrast with the swiftly adopted prescription histories, despite the challenge of integrating data from a fragmented pharmaceutical data field.

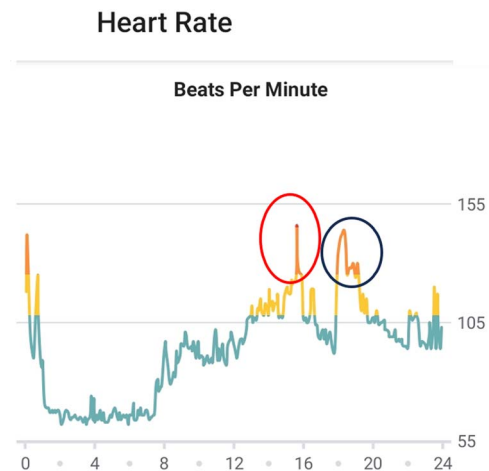
Biometric data, enabled by the Internet of Things (IoT), from devices such as CPAP machines, intelligent scales, BP monitors, and wearable devices offer extensive information on an individual's medical condition and fitness. However, their use in insurance also brings up privacy concerns and potential biases, even as they provide personalized health insights.

While fitness trackers add a new dimension to underwriting, integrating them into existing processes poses challenges. Controlling for cheating, ensuring data consistency, and answering privacy concerns come as counterpoints to the benefits of unbiased data collection and consumer engagement.

On the plus side, continuous monitoring over days or weeks provides a better picture

of the applicant's health than a single instantaneous snapshot. This extra data may be measured and synthesized in a prediction of mortality that goes beyond the traditional laboratory measurements<sup>(1)</sup>.

Data interpretation is not always straightforward, as illustrated in Figure. In this extract from the author's personal fitness tracker, the black oval on the right indicates increased activity due to exercise. However, the red oval on the left is not related to exercise but rather to the author conducting a webcast. . .



*Extract of a fitness tracker heart rate output.*

In addition, figuring out the logistics of getting the data and integrating it into the underwriting process highlights the challenges inherent in adopting new technologies. The easier road for fitness device data may not be for underwriting but for customer engagement and potential encouragement towards better health behaviors.

In contrast, the quick adoption of prescription history in underwriting illustrates the importance of fitting within the traditional underwriting paradigm. Despite the initial challenge of poor hit rates, substantially improved by the constant effort of dedicated vendors despite an inherently fragmented data collection, a prescription history fits comfortably within the traditional skillset of underwriters and

medical directors. As this data becomes more integrated, additional applications emerge, like identifying discrepancies between reported and actual physicians consulted by the applicant.

Familiarity with prescription history data eased the transition to incorporating risk scores based on that information in the company's own risk selection models. Nonetheless, the evolution of mortality scoring and the need to understand different versions of these scores are crucial in maximizing their utility. Some versions, especially incorporating financial factors, have been much more difficult to integrate.

### Provide Your Own Data Sources

For medical directors, the choice isn't simply between adopting or rejecting new data sources; it's about maximizing their value while minimizing drawbacks. Being informed, sharing opinions, and engaging collaboratively are key components of this process.

Exploring data sources like historical lab values, credit attributes, electronic health records (EHR), and new medical technologies (e.g., liquid biopsies, epigenetics) raises important questions about data origin and best integration into current workflows. Questions that the medical director is well equipped to discuss with the team.

The medical director should also be familiar with the information and limitations of external resources like cancer registries, the Human Mortality Database, CDC's WONDER and WISQARS databases, and surveys from NIH and CDC that offer rich population data for more accurate risk assessment and understanding.

### Appreciate Emerging Pitfalls

Speed, simplicity, sophistication, individualization, and leveraging underwriting values to benefit the customer, whether from an educational or engagement perspective, are the new hallmarks of Underwriting 3.0.

Capturing and utilizing data effectively is central to this evolution.

This brings to the fore critical pitfalls beyond the ever-present legitimate use and bias questions. Awareness of basis risk is probably the next most important: what are the differences between the applicant pool and the source population used to calibrate the data provided? How similar are they and how could that impact the conclusions?

An additional issue familiar to insurance practitioners, whether actuaries, underwriters, or medical directors, is the sensitivity to antiselection. Will the financial incentive built in an insurance transaction distort the behavior of the applicant in significant ways preventing a fair assessment of the risk?

Finally, usability, understandability, and explainability of data are critical to consider in any data project.

### Position the Medical Director for Success

A medical director must possess knowledge, perspective, critical thinking skills, and an understanding of the cost/benefit tradeoff. The insights the medical director provides on causal relationships, especially biological, are important although they may not always be beneficial for underwriting. Sometimes strong correlation is good enough as long as there is a logical link between the data used and the result desired.

Staying informed of scientific and industry developments, identifying relevant data sources, understanding data limitations, and being aware of legal ramifications are crucial. Participation in industry initiatives and applying common sense and plausibility are also key.

Building a network within the company and the industry at large is vital to both establishing your credibility and having your opinions challenged by others in a way that will enhance your knowledge. Over time, establishing credibility and openness with underwriters, actuaries,

data scientists, reinsurers, vendors, and peers is essential for a medical director in this data-driven era.

## Conclusion

The role of the medical director in the modern landscape of insurance medicine is multifaceted, requiring a nuanced understanding of various data sources and their implications. By intelligently leveraging data, acknowledging

its limitations, and fostering collaborative relationships, medical directors can maintain a pivotal role in the life insurance companies of tomorrow.

## REFERENCE

1. <https://www.businesswire.com/news/home/20201217005343/en/Gen-Re-Study-Finds-PAI-Health-Metric-Supplements-Protective-Value-of-Traditional-Life-Insurance-Underwriting>