Patient attribution systems, used by payers and health systems to implement alternative payment models (APMs), are inconsistent and inaccurate, resulting in confusion for physicians and patients. The goal of APMs—to pay for value over volume and improve population health management—can be better met by ensuring more accurate patient attribution methods.

The goal of the Centers for Medicare & Medicaid Services is to convert 100% of Medicare and 50% of Medicaid and commercial payments to APMs by 2025. Patient attribution methods are used to assign physician accountability for patients to assess quality and cost performance, as well as assist with population health management efforts to deliver, track, and improve care. However, a best practice framework has not been created to help develop a more standardized and accurate patient attribution system. The absence of a reliable patient attribution system creates a gap between the promise of value-based approaches and the reality of the mechanisms currently used to implement APMs.

We discuss several shortcomings in patient attribution systems from the perspective of physicians and patients, then propose strategies to improve patient attribution accuracy to better advance the goals of APMs. These comments are based on lessons learned from a 6-year initiative working with a subset of the physician network in the Arizona Medicaid program, which serves more than 2 million members across 7 health plans, each using a different patient attribution model.

Shortcomings of the Current Patient Attribution System

More than 170 different attribution models have been developed in the last 2 decades with at least 30 methods implemented. Each method has a wide array of design elements, resulting in hundreds of algorithm permutations that impute a physician-patient relationship, or assign a relationship if none exists. The wide variability in how the physician-patient relationship is identified by various payers creates several system inefficiencies for physicians and patients.

First, attributed patients may not correctly reflect the established relationship between patients and physicians in a specific clinic. The accuracy of payer-derived attribution ranges from 20% to 69%, and these findings may overreport attribution accuracy if they do not consider both types of attribution errors: false positives (patients who are attributed to a physician but not established) and false negatives (patients who are established with a physician but not attributed). Second, the timing design element of patient attribution methods is of critical importance: whether the physician-patient relationship is identified before (prospective attribution) or after (retrospective attribution) the performance period. Almost 90% of attribution models depend on retrospective attribution. As a consequence, a physician often does not know who is included in the payer-derived attribution patient roster until several months (or years) after the close of the performance period. This makes patient engagement efforts and performance improvement activities unrealistic. Third, quality and cost performance measures include patients that the physician has never seen or treated. This results in a distorted reporting system that unreliably reflects the physician's performance. Fourth, physicians typically serve a patient panel consisting of multiple payers; each payer employing a unique attribution method using a distinct patient roster reporting and distribution system. These roster distribution systems are uncoordinated and inconsistent with respect to roster access, timing, frequency, format, and error correction capabilities. Fifth, attribution methods are not currently...
designed to detect equity gaps. Sixth, current patient attribution systems are insensitive to patient preferences and behavior. While payer attribution systems typically allow patients to self-select a physician, the complexity and nuance of patient use are not accurately captured in a claims-based patient attribution system.  

**Redesigning the Patient Attribution System**

Patient attribution methods were originally created to allow for patient choice of their physician in APMs, and there are many strengths to the current attribution methods in use. However, the current patient attribution system designed by payers may, in the eye of physicians, be unreliable, inaccurate, and untimely. It is also insensitive to patient preference. This interferes with the ability of physicians to effectively manage a patient population, improve quality, reduce costs, and create better value for patients. The patient attribution system can be improved in close partnership with physicians, patients, payers, and policy makers.

We propose 6 recommendations to improve the patient attribution system to advance the goals of APMs. First, develop attribution model standards to be used uniformly across payers to eliminate the widespread variability in the current system and more accurately identify true positives. Current attribution methods are not transparent and impede effective care management, resulting in tremendous inefficiency of clinic resources to identify and notify patients who are incorrectly assigned.

Second, create a new generation of attribution methods relying on prospective attribution. The current attribution methods predominantly use a retrospective claims-based approach. A prospective attribution approach can be created by leveraging predictive techniques such as machine learning, which offers an alternative set of algorithms that enable the attribution model to learn and adapt by using a variety of features (such as claims data, enrollment data, socioeconomic data, electronic medical record data, and so forth) to predict outcomes of interest.

Third, ensure that quality and cost reporting accurately reflect a physician’s true patient care performance. This includes attributing care delivered by advanced practice clinicians, such as nurse practitioners and physician assistants.

Fourth, design a standard roster reporting system to be used by all health plans with the following features: (1) patient lists are available to the physicians using the same report format and distribution method, with consistent online accessibility; (2) roster reporting systems enable seamless error correction when false positive and false negative assignment/attribution errors occur. These 2 changes would dramatically improve attribution validity and relieve the administrative burden on clinics.

Fifth, incorporate the social and medical needs of vulnerable populations. Medical claims do not completely capture equity gaps, and a more holistic approach to patient care requires consideration of the health-related social needs that can be assessed through social risk screening and the use of more inclusive coding practices.

Sixth, capture patient preference by supplementing claims data using multifaceted data sources. The optimal patient assignment/attribution method would be responsive both to patient selection of a physician and actual health care utilization behavior. Incorporating information from alternate and innovative data sources, such as the electronic health record, closed-loop referral systems, and the health information exchange, will provide a more holistic picture of patient activity through and across the health system.

**Conclusions**

Accurate and fair patient attribution is essential for the success of APMs. The wide array of attribution models interferes with effective patient care management and is counterproductive for
achieving the intended goals of APMs. The patient attribution system can and should be redesigned
to more accurately assign patients to their accountable physicians and improve system optimization.
Physicians, patients, payers, and policy makers can work collectively to undertake this redesign to
streamline population health management efforts and advance the goals of APMs.

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