NATIONAL QUALITY FORUM

Accurately Assigning Accountability for Patient Care:

NQF's Guide to Selecting an Attribution Model

INTRODUCTION:

As healthcare payers and consumers increasingly demand greater value from healthcare services, determining which clinician or provider ultimately is responsible for patient care quality and outcomes is paramount. NQF's Attribution Model Selection Guide helps healthcare stakeholders—specifically, measure developers, measure evaluation committees, and program implementers—develop, select, or evaluate an appropriate attribution model.

Created by an NQF Committee of public- and private-sector quality improvement and measurement experts, the guide includes a series of key questions to consider when choosing an attribution model. The guide is intended to improve the consistency with which attribution models are used and the ability to evaluate attribution models in the future.

Given that no single attribution model works for every patient care episode, the choice of a model should be based on the context in which it will be used and supported by evidence. This guide can help foster better understanding and trust among stakeholders by explaining the goals and purpose of measurement, a clear rationale used to identify the specific attribution methodology, and the considerations of intended and unintended consequences discussed during the selection process.

For more details regarding the NQF Attribution Committee's work, please access the Committee's report on **NQF's website**.

ATTRIBUTION MODEL SELECTION GUIDE

What is the context and goal of the accountability program?	• What are the desired outcomes and results of the program? • Is the attribution model evidence-based? • Is the attribution model aspirational? • What is the accountability mechanism of the program? • Which entities will participate and act under the accountability program? • What are the potential consequences?
How do the measures relate to the context in which they are being used?	• What are the patient inclusion/exclusion criteria? • Does the model attribute enough individuals to draw fair conclusions?
Which units will be affected by the attribution model?	• Which units are eligible for the attribution model? • To what degree can the accountable unit influence the outcomes? • Do the units have sufficient sample size to aggregate measure results? • Are there multiple units to which this attribution model will be applied?
How is the attribution performed?	• What data are used? Do all parties have access to the data? • What are the qualifying events for attribution, and do those qualifying events accurately assign care to the right accountable unit? • What are the details of the algorithm used to assign responsibility? • Have multiple methodologies been considered for reliability? • What is the timing of the attribution computation?

What is the context and goal of the accountability program?

Attribution models must be evaluated in the specific program context for which they are intended and take into account the context and goal of the program, the accountability mechanism used (e.g., payment or public reporting), and the intended behavior change. An attribution model must align with these three elements, since an attribution model that works in one program context may not work for another. Finally, the attribution model should advance the National Quality Strategy by improving care and outcomes for patients or making care more affordable.

What are the desired outcomes and results of the program?

Attribution is a powerful tool to increase accountability for outcomes. Tying outcomes to an accountable unit's reimbursement through a payment program or reputation through public reporting can catalyze improvement. Accountability programs are designed to foster specific improvement goals. An attribution model must support the outcomes that a program is trying to improve and tie the correct outcomes to the correct units.

Is the attribution model evidence-based?

Evidence should show that the accountable unit can influence the outcome. Attribution is an evolving science; however, there should be evidence that the accountable unit can influence the results by modifying underlying processes or structures.

Is the attribution model aspirational?

While some accountability programs (i.e., payment or public reporting programs) are designed to speed uptake of evidence-based care practices already in use, others are designed to incentivize fundamental shifts in how units understand and act on their responsibility for patient outcomes. The changes envisioned may reflect aspirations for health systems and care providers to better coordinate care. Such programs are not inherently good or bad, but in an aspirational program, the attribution model is central and should be fully vetted. The intended behavior change should be fully transparent and understood; the attribution strategy should align with the desired change in behavior; and the outcome measure's use should be fair to the accountable unit.

If aspirational programs achieve results, they generate evidence and gain acceptance over time. However, it can be challenging to develop attribution models for this purpose while being responsive to concerns about achievability.[1] Hence, it is important to consider explicitly the degree to which an attribution model is aspirational and guide its design and use accordingly.

What is the accountability mechanism of the program?

Attribution models used in payment, public reporting, or network design programs require a greater degree of accuracy than those used for quality improvement. An attribution model used for payment, public reporting, or network design can affect an accountable unit's reimbursement and reputation. This creates a tension between the desire for improvement shared by all stakeholders and the need to ensure that a model is holding the right unit accountable.

There is a tension between a desire to try new approaches to attribution that may not have had rigorous testing and to be fair to clinicians and facilities as to who is being held accountable for what. The tolerance of error or inaccuracy in the data, measurement, or attribution results may be higher for quality improvement applications and lower when attribution models are being used for accountability applications, such as payment and public reporting. The degree of tolerance for error may also depend on whether provider participation in the accountability programs is voluntary or mandatory. When clinicians or facilities are subject to mandatory accountability programs, greater accuracy in the data supporting the attribution model and attribution results may be needed.

Which entities will participate and act under the accountability program?

Accountability programs may target different levels of the healthcare system. An attribution model should align with how the program assesses quality and the goals it is trying to achieve while recognizing the locus of control of each unit.

What are the potential consequences?

Attribution models can have consequences, both intended and unintended. The potential consequences of an attribution model should be identified and considered. In particular, the potential negative implications for patients should be identified and mitigated. To mitigate concerns that vulnerable and complex patients may be avoided, use safeguards such as proper risk adjustment and outlier exclusions.

Measures and incentives may have the intended effect of catalyzing improvement, but may also have unintended effects. Attribution has the potential to take resources away from underserved areas if clinicians and providers are held accountable for outcomes that are outside their control.

How do the measures relate to the context in which they are being used?

Attribution happens at both the program and measure levels. An accountability program will likely only reflect a subset of a unit's patients, and an attribution model is needed to determine which patients attributed to the accountable unit by the program will be included in the results of each quality or cost measure in the program. Likewise, each measure within a program has an attribution model within it that attributes the measure outcome for the included population to the accountable unit. It is critical to have alignment between the accountability mechanism, goal of the program, measures being used, and ability of the accountable unit to influence the outcome.

What are the patient inclusion/exclusion criteria?

Ensure that the outcomes addressed by the measures in the program are driving towards the ultimate improvement goal. Measures being used for accountability purposes should have an appropriate degree of scientific rigor. In particular, there should be accurate data to support the measure and the attribution of its results.

It is important to ensure fair comparisons between units; measures used for accountability purposes should be appropriately risk-adjusted and have adequate exclusion criteria to ensure outlier management. Such outlier management is essential to remove randomness from the sample that could lead to incorrect inferences about a unit's performance, especially when the results of a measure are being used for accountability purposes.[2] NQF's Consensus Development Process (CDP) can ensure the scientific acceptability of performance measures.

Does the model attribute enough individuals to draw fair conclusions?

Accurate measurement depends on having a large enough sample size for results to be meaningful. An attribution model must include enough individuals to draw fair conclusions while appropriately excluding outliers and employing proper risk adjustment to compare the performance of attributed entities accurately. Performance measures employ exclusion criteria and risk adjustment within the measure but there must be alignment between the specifications of the measure and the program. An attribution model may require its own rules outside of the measures being used to ensure fair comparisons. Attributing enough individuals to draw fair conclusions is a particular concern for rural clinicians or providers or other entities facing issues with small numbers.

The reliability of a measure depends on an adequate sample size, and some measures may have groups of providers that do not have enough cases for a reliable measure score. Avoid rating specific accountable units with an inadequate denominator rather than not using a measure because some units may have small sample sizes.

Which units will be affected by the attribution model?

Increasingly, healthcare is being provided in a team-based environment, making it important to attribute results to the right players. Attribution is a tool to create groups for comparison. An attribution model should identify who is expected to take action based on the goals and purpose of the program or measure balanced with the ability of the accountable unit to influence the measure result.

Which units are eligible for the attribution model?

Attribution models can assign accountability to individual clinicians, groups of clinicians, facilities, or ACOs. The goal of the attribution model should define its breadth, as some circumstance may require attributing results to individual clinicians, while others favor greater aggregation. While the greater number of patients that can be assigned to larger entities can improve the reliability of a measure, this must be balanced with the action-ability of results. Models that assign accountability to smaller units may allow for more ability to pinpoint where specific improvements are needed. Entities eligible to receive attribution must be able to meaningfully influence the outcomes of the patients they are being held accountable for.

Attribution models that assign patients to clinicians may also specify what types of clinicians those patients are attributed to. There are particular challenges that attribution to certain types of clinicians may entail. Many attribution models depend on attribution to a primary care provider (PCP). However, clinicians other than those who are considered to be PCPs may provide primary care. For some chronic conditions, a specialist may drive the care plan, or the patients may consider a specialist to be the PCP. Attribution to a specialist involves challenges including scope of practice and holding a specialist responsible for outcomes well beyond what he or she can meaningfully influence.

Measures used in an accountability program must be tested at the level of analysis of that program. Measures, and measure concepts, may be taken from one program where they were attributed to one accountable unit or set of entities and used in different programs. When a measure is adapted for new program contexts or different accountable units, the attribution model must be tested at the level for which it is being proposed or used. It is essential to consider whether the measure performs adequately in this new context before it is used to evaluate the performance of an accountable unit.

To what degree can the accountable unit influence the outcomes?

Accountable units receiving attribution should be able to influence the outcomes they are being held accountable for. Accountability applications (e.g., public reporting, payment, network design) may require more certainty that the accountable unit can influence the results compared to quality improvement programs. Attribution models can help drive progress towards aspirational goals such as

improved care coordination. However, attribution models should identify accountable entities that are able to meaningfully affect measured outcomes directly or through collaboration with partners whom they can reliably influence.

Do the units have sufficient sample size to aggregate measure results?

There is a need to be transparent about the minimum sample size needed to support the attribution model and measure computation. Performance measures have greater reliability when a large number of patients are attributed to accountable entities. While this increases the ability to distinguish performance across clinicians or facilities, it risks including patients that may have received the majority of their care from a different clinician or facility and compromises the validity of the attribution model. Increasing the validity of the attribution model may result in leaving out some patients or cases.

In order to compare the performance of attribution entities fairly, an adequate sample size is needed to achieve sufficient rigor in the measure computation, with outliers excluded and/or risk adjustment performed. In some cases, however, it may not be possible to achieve an adequate sample size. For example, small group practices and small rural and urban hospitals with lower patient volumes—where there may be fewer clinicians with a larger scope of services—will still require attribution and attribution models. These "nonperfect" cases, in which adequate sample size or accurate data are lacking, are a reality of our diverse healthcare system, and these cases require consideration when developing and selecting an attribution model.

Are there multiple units to which this attribution model will be applied?

Attribution models may attribute patients to one accountable unit or multiple accountable units. The majority of current models only attribute to a single unit, but attribution to a single unit may not recognize the role that other units play in a person's care.[3] Attribution to multiple entities may help to foster shared accountability and recognizes that multiple units may contribute to the care a person receives. Future models should consider ways to attribute to multiple units in ways that are proportional to their involvement, such as weighting schemes. Alternatively, programs could focus on a defined set of "proximal outcomes" that are specific to each type of accountable unit but contribute to the achievement of a larger aspirational goal. Future models should better reflect an accountable unit's scope of practice and locus of control.

How is the attribution performed?

There are varying attribution methods currently performed, and there is a lack of objective evidence to recommend one approach over another. The questions in this section represent key considerations that should be taken into account when developing an attribution methodology. The methodology must be developed to fit the context of its use. A methodology that works for a quality improvement program may not work for an accountability application. The attribution methodology should help drive the goal of measurement but must take into account the clinical circumstances, an accountable unit's ability to affect the measured outcomes, and scientific rigor.

What data are used? Do all parties have access to the data?

Data availability and quality are fundamental to the design of an attribution model. Use the most accurate and timely data possible. An attribution model must demonstrate sufficiently accurate data sources to support the model in fairly attributing patients to accountable entities.

Medical claims are the most commonly used data source for current attribution models.[4] Potential advantages of claims data include accessibility and larger sample sizes. However, data do not need to be limited to administrative claims. Alternative data sources that would support more accurate and timely attribution models should be developed. Data from electronic health records (EHRs) are promising, but could be limited by data blocking, inability to access records from other organizations, and lack of interoperability.

There is a current desire to move to patient attestation as a data source for attribution models. While patient attestation can advance a more person-centered system, there are concerns about this data, including data collection burden, accuracy, and availability. Engaging patients can improve data about what care was provided for them and help provide a more complete picture of the relationship. Clinician attestation would allow clinicians and providers an opportunity to confirm the relationship as well.

Promising new data sources could improve attribution, such as the development of the Centers for Medicare & Medicaid Services (CMS) patient relationship codes and categories required by the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), increased use of the National Provider Identifier, and integration of registry data.

What are the qualifying events for attribution, and do those qualifying events accurately assign care to the right accountable unit?

Visits and spending are two commonly used events to trigger attribution. Visits can differ depending on the purpose and the services provided, while spending could lead to increased attribution to specialists who may have limited involvement in the clinical decisions that lead to that spending.

What are the details of the algorithm used to assign responsibility?

An attribution model is based on a series of rules used to determine accountability. Current attribution models use different algorithms to assign responsibility. The algorithm could be based on attestation, assigning accountability to the unit identified by the patient. While this approach is patient-centered, it must be balanced with the accuracy of the data provided as patients may see multiple clinicians, change health plans or primary care providers over the course of the measurement period, or may attribute to a clinician who may not have had control over the majority of their care. Patient and clinician attestation can help to verify the relationship and ensure that the attribution model reflects the care provided. Prospective approaches can also help a unit to understand which patients they are responsible for in advance and work with those patients proactively to manage their health—a significant potential positive for a population-based payment model.

Claims-based approaches have the benefit of reflecting the care that was actually provided. An algorithm based on plurality may assign accountability to the clinician with the greatest number of a patient's evaluation and management (E&M) visits.[5] This approach allows for the greatest number of patients and their visits to be counted.[6] However, it can have significant drawbacks and could lead to a clinician being attributed an entire episode when that clinician had only limited interaction with the patient. The desire to attribute highest number of patients must be balanced with what is in a unit's control and the actual clinical circumstances.

Other retrospective claims-based approaches include a majority approach, which might attribute responsibility to the clinician who billed greater than 50 percent of E&M visits. This stricter approach may help prevent attributing patients to a clinician who has limited interaction with them but may result in a smaller sample and could affect reliability. This approach could exclude some patients with whom the clinician does have a relationship.[7]

Other approaches may attribute responsibility to multiple units. These include a "one-touch" rule, attributing the patient to anyone who provided care, or a multiple approach, attributing the patient to all clinicians billing more than a certain percentage of E&M visits. These approaches could help to foster shared accountability but could also result in less specificity, making results less actionable.

Have multiple methodologies been considered for reliability?

Use transparent, clearly articulated, reproducible methods of attribution. Currently, little information is available about the reliability testing of attribution models, and the choice of attribution model can have a significant impact on the measure or program score. Multiple methodologies should be tested and compared to see how the results would differ. Program implementers and measure developers should choose a reliable approach that aligns with the improvement goals they are trying to achieve.

There is a desire for greater guidance around what methods of reliability testing could be used and what acceptable standards of reliability could be. Future work is needed to determine appropriate testing of an attribution model, including appropriate ways to test its validity. As a first step, it is important to make the attribution algorithm and how results are calculated transparent.

What is the timing of the attribution computation?

There are multiple relevant time periods that should be considered: one for performing the attribution and then the measurement period during which outcomes are tracked.

First, consider the advantages and disadvantages of retrospective versus prospective attribution. Retrospective attribution allows for assignment based on how care was actually delivered but does not allow clinicians to know which patients will be assigned to them until after care has been provided. Prospective attribution removes this uncertainty but raises concerns about the possibility of gaming or providing differential levels of care based on attribution status. Additionally, there are concerns that patients can seek care from units other than the ones they are attributed to, and this could lead to inaccurate representations of the care provided.

Next, consider the measurement period during which outcomes are tracked. It is important to consider the relationship between the measurement period and the period in which patients are attributed to an accountable unit and the need to align the performance periods for payment and quality measures.

It is also important to consider the measurement period and the defined time period for which an accountable unit is held responsible. A longer time period increases the ability to identify a relationship between a patient and an accountable unit.[8] Longer time periods may also increase the likelihood that the patients attributed to a unit accurately reflect the patient pool.[9] However, using a longer time period may introduce the risk of including patients that only received low levels of care. Patients may frequently change clinicians or providers, making longer time periods potentially inaccurate. Attribution models must balance these concerns and ensure that the time period holds the correct units accountable.

ENDNOTES

1 Ryan A, Linden A, Maurer K, et al. *Attribution Methods and Implications for Measuring Performance in Healthcare* [commissioned paper]. Washington, DC: National Quality Forum; 2016.

2 National Quality Forum (NQF). *Risk Adjustment for Socioeconomic Status or Other Sociodemographic Factors*. Washington, DC: NQF; 2014.

3 Ryan A, Linden A, Maurer K, et al. *Attribution Methods and Implications for Measuring Performance in Healthcare* [commissioned paper]. Washington, DC: NQF; 2016.

4 Ryan A, Linden A, Maurer K, et al. *Attribution Methods and Implications for Measuring Performance in Healthcare* [commissioned paper]. Washington, DC: NQF; 2016.

5 Ryan A, Linden A, Maurer K, et al. *Attribution Methods and Implications for Measuring Performance in Healthcare* [commissioned paper]. Washington, DC: NQF; 2016.

6 Pham HH. Approaches to attribution for measuring physician performance. Presented at RQI Data Collection and Reporting Workgroup meeting: February 25, 2008. Available at http://www.chcs.org/media/Mai_Pham_Presentation.pdf. Last accessed December 2016.

7 Pham HH. Approaches to attribution for measuring physician performance. Presented at RQI Data Collection and Reporting Workgroup meeting: February 25, 2008. Available at http://www.chcs.org/media/Mai_Pham_Presentation.pdf. Last accessed December 2016.

8 Ryan A, Linden A, Maurer K, et al. *Attribution Methods and Implications for Measuring Performance in Healthcare* [commissioned paper]. Washington, DC: NQF; 2016.

9 AcademyHealth. Research Insights: What Works in Care Coordination? Activities to Reduce Spending in Medicare Fee-for-Service. Orlando, FL: AcademyHealth; 2012.