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The Patient Flow Advantage: Building Forecasts That Don’t Collapse Under Review

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Introduction

Forecasting in oncology has always been difficult, but the modern landscape has pushed the old shortcuts well past their capabilities. Biomarker-defined indications have splintered once-monolithic populations. Treatment lines now sprawl across multi-year journeys. Recurrence and progression dynamics drive more commercial value than incident disease. Meanwhile survival continues to shift, sometimes gradually and other times abruptly, in ways that may reshape downstream patient counts.

Many forecasting models still begin with incidence and prevalence, an approach that is familiar and convenient, but systematically fails to capture the real drivers of oncology revenue. A forecast built on simplistic epidemiology may hold together during early reviews, but it will fall apart when teams attempt to reconcile it with real-world treatment patterns, competitive intelligence, and/or internal financial expectations. The problem is not the forecasters; the problem is the foundation.

This article explains why detailed, assumption-driven cancer epidemiology built on an advanced patient flow model provides the only defensible basis for modern oncology forecasts. It also highlights the commercial risk of relying on outdated inputs and shows how better epidemiology delivers more credible numbers for forecasting, strategy, and business development.

The Forecasting Risk Hiding in Basic Epidemiology

Many companies still lean on reported incidence numbers because they look authoritative and are easy to slot into a spreadsheet. The trouble is that they only describe how many patients are diagnosed, not how many can or will be eligible for a specific treatment option. The distinction is not a minor technicality because oncology markets are built around treatment events, eligibility filters, biomarker-defined subsets, and multi-year disease dynamics. Incidence says nothing about any of these critical factors.

A brand executive might assume that a conservative approach is safer, but in practice the opposite may be true. Oversimplified epidemiology introduces distortions that cascade into flawed forecasts, mispriced development deals, and directionally incorrect revenue expectations. In competitive review settings, these models collapse as soon as someone asks basic questions about relapse, progression, or biomarker penetration.

The solution is not to ‘‘add a few assumptions’’, but to rethink the epidemiology approach itself.

Why Many Oncology Forecasts Have Weak Foundations

Outdated epidemiology creeps into forecast modeling and creates fragility. Several recurring shortcuts generate most downstream forecasting problems.

Shortcut 1: Using incidence or prevalence as a proxy for the drug-treated population

> This is the most common and the most damaging shortcut. It assumes that every diagnosed patient moves cleanly from diagnosis to treatment and then into a hypothetical treated pool. It ignores the loss of patients because of comorbidity, treatment ineligibility, and non-treatment by choice. For many solid tumors, a sizable portion of incident patients never reach the line of therapy a company wants to model

Shortcut 2: Treating all subtypes or biomarkers as static percentages

Histology subtypes shift over time, as seen in the growth of adenocarcinoma in non-small cell lung cancers. Biomarker segments evolve quickly, and testing rates shift with guideline changes, reimbursement, and trial results. Applying a fixed global percentage for subtypes or biomarkers produces numbers that look stable on paper but can diverge sharply from the real world

Shortcut 3: Ignoring recurrence, refractory disease, and progression patterns

Relapsed and refractory patients often drive more annual treatment volume than incident disease. Yet many models focus almost entirely on the newly diagnosed patient. This creates underestimation in most cancer markets where recurrence and lack of response dominate patient outcomes

Shortcut 4: Assuming linear drop-off across lines of therapy

Real-world progression between lines of drug therapy is not linear. Attrition varies significantly by stage, subtype, and prior therapy. Using simple percentage decay understates or overstates the available population for specific lines of therapy. It is important to account for specific treatment rates by line and outcomes over time

Each shortcut by itself creates distortions, but when combined, they create a forecast that is simple to understand but may not reflect that actual marketplace.

Advanced Epidemiology: Simulating the Real Treatment Landscape

A modern oncology forecast needs epidemiology that mirrors how patients move through the disease experience and treatment process. This requires more than counting diagnoses, it

requires quantifying the entire treatment journey. The best way to simulate the treatment process is a detailed, advanced patient flow model designed to capture the full set of clinical and logistical transitions a patient experiences over time.

Key Components of the Patient Flow Model

Stage distribution and treatment eligibility

Stage at diagnosis determines both prognosis and treatment eligibility. Eligibility filters vary by country based on clinical practice and access. These filters meaningfully alter the treatable population, especially in early stages or locally advanced disease

Recurrence and progression dynamics over time

Recurrence is both common and commercially critical. Defining a recurrence window allows for capture of the long tail of disease dynamics that drive demand for later-line therapies. Recurrence curves differ by stage, subtype, and prior therapies, and they must be modeled explicitly rather than inferred from survival

Transitions across lines of therapy

Line of therapy transitions depend on prior treatment, stage, and patient response. Advanced models incorporate detailed estimates for response rates by by order of therapy to better calculate patient attrition, not using simple percentage filters for movement between lines of therapy. These types of filters usually do not accurately reflect future treatment assumptions

Survival curves that reshape treatment demand over time

Survival is not static but continuously changing based on all prior therapies and advances in treatment outcomes. When survival improves, the downstream patient pool grows. When survival stays static, the funnel narrows. In either case, survival must be a dynamic driver rather than an afterthought, especially when considering future scenarios for target market evolution

Subtype and biomarker penetrance

Histology subtypes can vary dramatically across geographies, impacted by genetics, environment, and culture. Testing rates and biomarker distributions may vary by geography, healthcare infrastructure, and local guidelines. A realistic model must incorporate these types of variations for each cancer being studied

The outcome of an advanced patient flow model is not a static number. Instead, it is a longitudinal reconstruction of the patient universe that drives real-world treatment decisions. It should also be flexible enough to account for anticipated changes in treatment approaches, response rates, recurrence and progression trends, and patient survival.

The Commercial Impact: Better Epidemiology Produces Better Decisions

Executives care about numbers that survive internal review, competitive pressure, and financial scrutiny. Advanced cancer epidemiology does exactly that by ensuring the following areas are incorporated correctly and robustly built.

Sharper foundational inputs

A detailed patient flow model delivers accurate counts for:

- first-line initiations
- relapse and recurrence
- progression to later stages or metastatic disease
- transition to next line of therapy
- biomarker-eligible subsets
- treatment-eligible populations based on real-world treatment approaches

These inputs form the backbone of a forecast. When they are wrong, everything built on them is unstable.

More realistic scenario planning

Scenario analysis depends on understanding how changes in clinical practice affect patient flows. For example:

- Earlier-line drug usage may shift patients away from later-line target pools
- New biomarker assays expand or contract the eligible pool
- Survival improvements reshape the long-term tail of the market
- Changes in adjuvant/neoadjuvant treatment may improve survival and lower recurrence, significantly impacting potential target pools

These scenarios only make sense if the underlying epidemiology includes the right levers that can be easily modified to generate alternate future patient estimates.

More credible competitive insight

Competitive intelligence is meaningless without normalized patient flows. Comparing incidence-only forecasts to competitor-treated patient estimates produces strategic confusion. A flow-based model ensures that internal and external numbers sit on the same conceptual framework.

Higher confidence with leadership and finance

Finance teams need numbers that can stand up to scrutiny and are well cited and sourced. Senior leadership needs a clear narrative connecting disease dynamics to commercial opportunity. Advanced epidemiology creates that narrative with the treatment outcome details that are often missing from incidence-based models.

Reduced business development risk

Erroneous patient populations is one of the fastest ways to overpay for an asset or undervalue a partnership opportunity. Flow-based epidemiology reduces variance and uncertainty in valuation models.

Examples of the Potential Negative Outcomes from Simplified Epidemiology

These simplified examples illustrate the practical impact of using simplified epidemiology and forecast assumptions, instead of advanced, patient flow-based cancer epidemiology.

Example 1: A biomarker-driven solid tumor

A team might assume that if 25 percent of tumors test positive for a biomarker, then 25 percent of the total population is eligible for treatment. In reality, testing is inconsistent, penetrance differs by stage, and survival varies across biomarker-positive and biomarker-negative groups. The eligible population often ends up significantly different from the basic estimate

Example 2: A relapsed/refractory hematologic malignancy

A forecast based on incidence alone would treat the relapsed/refractory (R/R) population as a small subset. A flow-based model shows that R/R patients accumulate over multiple years. In many blood cancers, relapsed patients outnumber incident patients by a wide margin, particularly in markets with long survival. The difference can double or triple the expected market size

Example 3: Metastatic progression in solid tumors

In solid tumors where metastatic progression is a major driver of late-stage treatment eligibility, basic models may not accurately reflect the “newly

metastatic" population. An advanced model that addresses metastatic progression can prevent this error.

Executives do not need to understand the detailed mathematics or the technical mechanics of an advanced epidemiology model. They need to understand that these divergences exist and that if not appropriate modelled they may materially affect revenue expectations.

The Epidemiology Standards Every Forecast Should Demand

All epidemiology used to support an oncology forecast should meet these criteria:

- Cancer and subtype-specific incidence for each country
- Staging distributions by subtype and gender
- Treatment eligibility linked to treatment guidelines and real-world practice
- Multiple lines of treatment including response and maintenance estimates
- Recurrence and progression modeling with evidence-backed curves
- Survival curves by stage and subtype based on reported or registry data
- Annualized patient flows reconciling incidence, recurrence, and prevalence
- Full transparency on methodologies, assumptions, and data sources

When these standards are met, the forecast becomes structurally sound. When they are not, the model relies on hope.

Executives and brand teams gain several advantages when robust foundational epidemiology is utilized:

- Forecasts that survive leadership challenge
- Opportunity valuations that do not collapse under diligence
- Strategic plans anchored in realistic growth expectations
- Faster internal alignment across medical, commercial, and finance
- A competitive edge in markets where precision matters

In short, better epidemiology produces better decisions.

The Forecast Is Only as Good as the Epidemiology Behind It

Cancer markets are shaped by patient journeys, not by incidence. A company that models these journeys accurately will consistently outperform one that relies on simpler approaches. Advanced patient flow epidemiology does not eliminate uncertainty, but it removes the avoidable errors and forces forecasts to reflect clinical reality rather than general estimates.

Executives who insist on this level of rigor will build more credible forecasts, make smarter investments, and navigate oncology markets with clearer insight than their competitors. The industry is moving toward more complexity, not less. Building the right epidemiological foundation is no longer optional. It is a prerequisite for accurate forecasting and sound strategic decision-making.