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# Uncover sub-national opportunity levers in oncology: Patient led growth strategy to fuel brand growth and optimize field action

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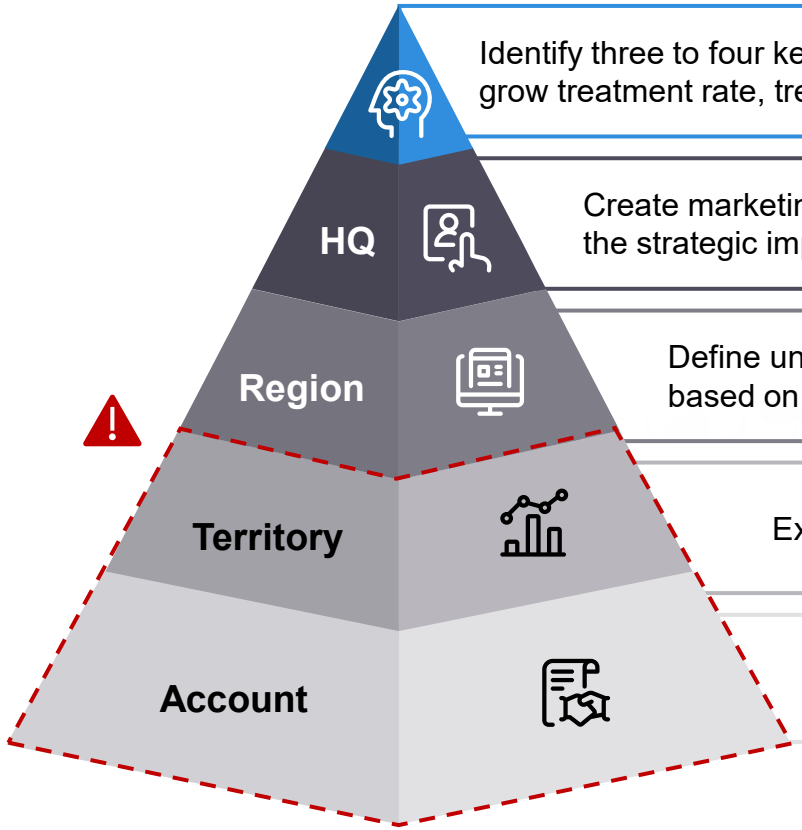
# Current commercial strategy focuses on a top-down approach centered around brand strategic imperatives which are executed uniformly across territories




Identify three to four key brand strategic imperatives at national level, such as grow treatment rate, treating rate and improve DOT.

Create marketing collaterals, field content and field training based on the strategic imperatives.

Define uniform growth goals and intensive care (IC) plans, based on current territory level performance.

Execute plans uniformly across accounts.

Health care professionals (HCP) engagement and field call based on common set of collaterals.

## Gaps in current approach

- Patient care gaps are generally not part of commercial strategy/
- Local nuances not harnessed.
- Uniform execution at national level leads to sub optimal physician interactions.
- Cross functional collaboration broken.

**Current top-down approach does not take into consideration the underlying diversity of the patient population which hinders execution.**

# Patient led growth strategy approach aims to harness sub-national nuances in opportunity


National level forecasts adjusted to consider additional growth by addressing pockets of opportunity.

Overall brand strategy defined based on the areas with the largest growth opportunity.

Growth areas identified based on individual gaps within territories and accounts; tactics defined to address these gaps.

Aggregate outcomes at account-territory level to identify levers for growth; benchmark account performance with respect to territory.

Identify unmet needs within patient journeys based on care gaps and patient outcomes.

## Impact

1. Optimized promotional strategy organized around opportunities to grow.
2. Field teams organized to dynamically focus on improving strategically important key performance indicators (KPIs) within their territories.
3. Added ambition to forecasts with increase accuracy and attainability.
4. Positive feedback loop across various brand functions.

**Basing commercial growth strategy on patient unmet needs and considering sub-national variations is critical to drive optimal promotional strategy in a focused manner.**

# Inputs from multiple functions of pharmaceuticals organizations are brought together to develop a unified strategy, increasing the competitive edge within the oncology market

## Identify deviation from guidelines

- Leverage real-world data to analyze longitudinal patient journey to identity dominant patient pathways and deviations from guidelines.
- Machine learning (ML) driven enrichments to mitigate know gaps.

*I&A, medical, brand and forecasters*

## Prioritize intervention areas

- Quantify impact of deviations on patient outcomes, such as clinical, financial and health care resource utilization (HCRU), to prioritize outcomes.
- Statistical model to understand significance of impact, drivers or barriers modelling to identify factors.

*I&A, medical, brand and headquarters (HQ)*

## Aggregate to get local themes

- Aggregate outcomes at Account level to identify patterns at local level.
- Deviations expressed as brand KPIs which align with strategic imperatives, such as patients not received treatment—treatment rate.

*I&A, brand, HQ and field*

## Benchmark and quantify

- Benchmark account KPIs to territory and geography.
- Adjust based on drivers and barriers outcomes.
- Compare to get quantified opportunity on brand.

*I&A, field, brand and forecasting*

## Define execution strategy

- Prioritize list of opportunities at national level.
- Statistical trending to identify growth patterns and define scope.

*I&A, field, medical, brand and HQ*

**Functions involved**

**The proposed approach allows teams to dynamically focus on improving strategically important KPIs within their territories.**

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# Patient first approach—identifying gaps in care due to sub-optimal decisions is critical to ensuring better patient outcomes which enables commercial success

Illustration

## Identify deviation from guidelines

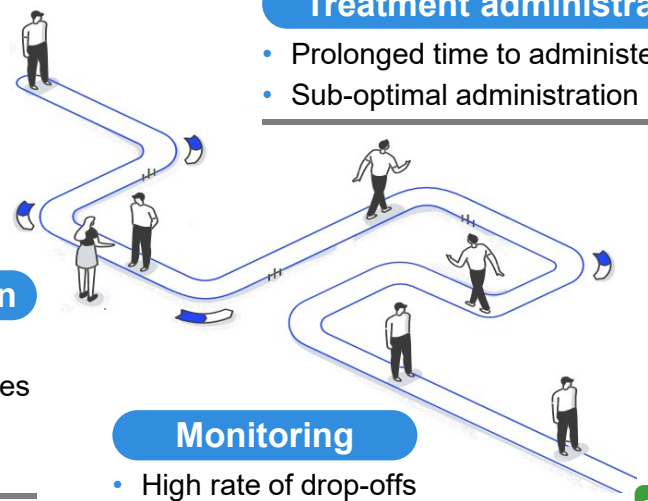
A **care gap** is a **disparity or deviation** in healthcare services or treatments that are necessary to manage a patient's health conditions as per approved guidelines.

### Diagnosis

- Sub-optimal screening
- Delayed referral
- Sub-optimal testing procedures

### Treatment selection

- Sub-optimal follow-ups
- Deviation from guidelines
- Sub-optimal treatment choice



### Treatment administration

- Prolonged time to administer
- Sub-optimal administration

### Monitoring

- High rate of drop-offs
- Lower persistence and adherence

PFS

QoL

## Impact of care gaps

**Patient health outcomes**

- 60% of deaths from cervical cancer in the United States are due to inadequate access to screening and treatment[1].
- Inadequate care coordination leads to 1.6 to 2.5x more emergency room (ER) visits and hospitalizations in cancer patients, worsening their health outcomes[2].
- 44% increased risk of death and a 30% increased risk of hospitalization in heart failure patients[3].

**Economic burden**

- Low adherence in diabetes patients led to approximately $2,000 additional annual cost per patient[4].
- Approximately $8 billion lost annually due to insufficient biomarker testing in oncology[5].
- Untapped business opportunity of $200 million in 2026 by addressing unmet needs and improving awareness and access to existing therapies for early-stage non-small cell lung cancer (NSCLC).

**And many more such examples…**

**Improving care gaps provides better patient care, ensures optimal patient outcomes and increases adherence which in turn enables brand success.**

# Identified deviations helps us define brand growth factors from patient journey perspective and prioritize these intervention areas nationally

## Identify deviation from guidelines

### Key outputs of the phase

#### Care gaps

**Diagnostic and staging**

- 25% Sub-optimal MDT interaction
- 20% Absence of Diagnostic tests

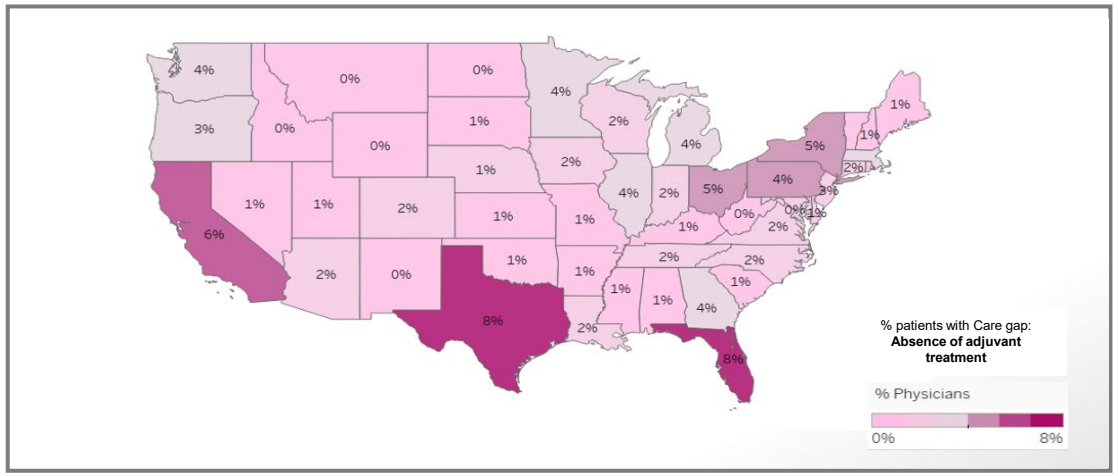
**A**

- 40% Delay in Surgery
- 45% Absence of biomarker test

**Post surgery**

- 20% Sub-optimal adjuvant treatment
- 30% Absence of Medical Oncologist interaction

#### Geographic assessment




**Prioritized hot-zones** *to identify areas with highest concentration of under served patients.*

#### Finalize intervention areas

| Care gap | Total patients impacted |
|---|---|
| *Absence of biomarker test* | **90K** |
| *Delay in surgery* | **80K** |
| *Sub-optimal adjuvant treatment* | **8K** |
| *Sub-optimal duration* | **5K** |

**Brand strategic imperatives will thus be focused on the addressing the largest impactable care gaps.**

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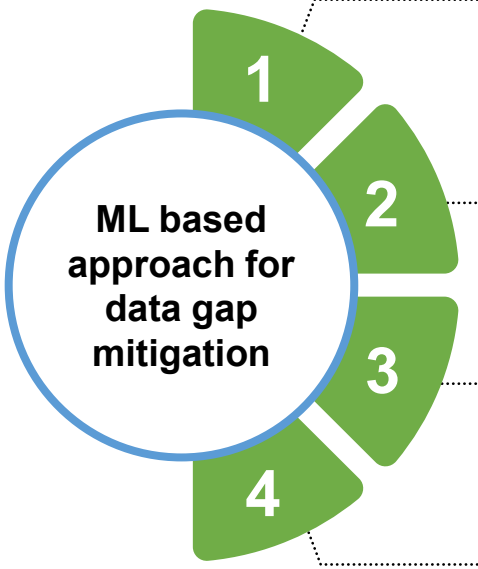
# Real-world patient claims data, enriched with ML methodology to mitigate inherent biases in data capture is the primary data source for identifying care gaps

**Identify deviation from guidelines**




**Identify "gold" standard patients**

Stringent conditions to identify patients with full longitudinal data available and label them as "training" data patients.

**Evaluation of "gold" standard patients**

Analyze clinically relevant procedures, treatment, referrals and patient attributes for such patients.

**Model training for feature evaluation**

Train machine learning model, such as positive unlabeled learning, using this confident pool of patients and then apply to "test" data patients.

**Predictive patient features**

Robust and interpretable models with high accuracy or precision provides visibility into predictive patient features leading to mitigation of data gaps.

**Once all the patients have been accurately classified into segments, the information would be used to answer subsequent questions on patient journey.**

**Close partnership between I&A and data science teams with medical, forecasting and brand ensure high accuracy and pull-through of ML outcomes.**

# Real-world data provides deep insights into the longitudinal patient journey allowing us to quantify deviations at a granular level

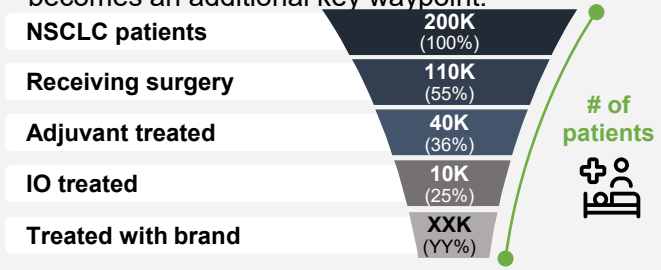
## Identify deviation from guidelines

### Business rules driven approach for identifying patient pathways

#### Step 1

**Identify key patient waypoints**

- **Leverage the National Comprehensive Cancer Network (NCCN) treatment guidelines.**
- **I&A, forecasters and brand team** provide key insights from primary market research on epidemiology funnel.
- **Medical inputs** key to identifying waypoints which are HCP driven, such as below, biomarker testing becomes an additional key waypoint.




#### Step 2

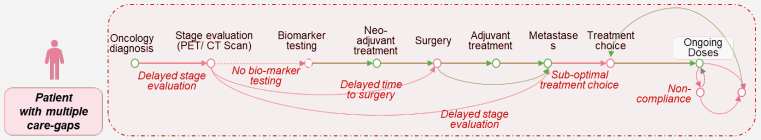
**Encode waypoints as business rules**

- **I&A team** develops **business rules** for identifying patients in claims data, such as *patients taking cisplatin or carboplatin + Etoposide cycles with at least one lung cancer diagnosis is a small cell lung cancer (SCLC) patient.*
- Business rules are validated by the **medical team** and the final outcomes crosschecked with SEER and other syndicated reports, such as percent of NSCLC patients should be 85 to 90% of lung cancer (LC).
- Multiple data sources can be combined to generate best insight, such as combining claims data with testing outcome.

#### Step 3

**Identify deviations from guidelines**

- Undertake **sensitivity analysis to identify typical treatment patterns,** such as 80% of patients receive surgery within 55 days of primary diagnosis.
- Any **deviation from the guidelines or desired behavior is considered as a care gap,** such as Stage I or II patients not receiving surgery or receiving surgery after 100 days becomes a care gap.




**Active collaboration across medical, I&A and brand team to identify the key patient pathways of interest leads to robust actional outcomes**

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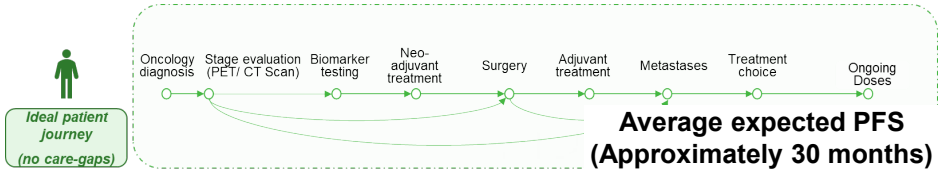
# AI or ML models in conjunction with NCCN guidelines, medical team and I&A inputs allow us to robustly identify key cohorts of patients with deviations

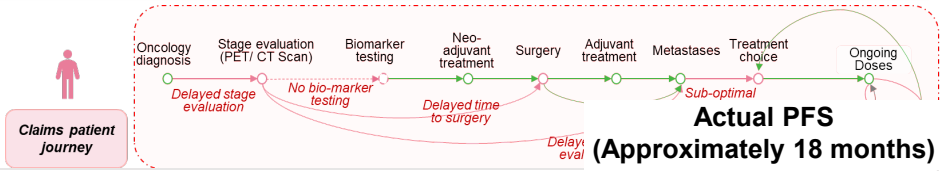
## Identify deviation from guidelines

### ML driven approach for identifying deviations

**Step 1: Create idea patient journey broken down by archetypes**
Inputs from I&A, medical and brand team considered along with NCCN treatment guidelines to develop idea and expected treatment journey.

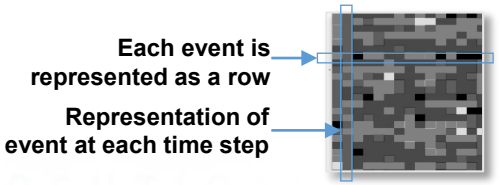



**Step 2: Create patient journey from claims data**
Analyze real-world claims datasets to create patient journey for required patient pool…

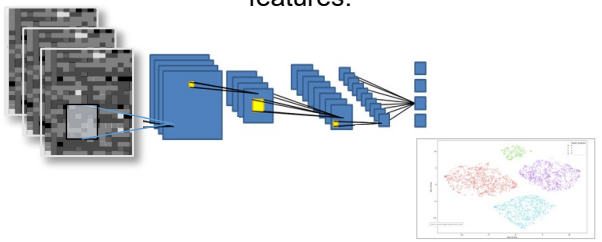



… multiple patient journeys within claims data analyzed to create a large cohort of patients. The social determinants of health (SDOH) and other metrics added for additional insights.

**Step 3: 3D patient images are formed based on event embeddings or intensities and time.**




Convolutional neural network (CNN) autoencoders are run on patient image to learn latent patient features; clusters are created based on these features.



**Step 4: Profile archetypes and compare with ideal patient journey to identify deviations from guidelines.**

| Profile |
|---|
| • Early adjuvant treated<br>• Epidermal growth factor receptor (**EGFR) positive patients receive IO**<br>• Biomarker testing within National average |
| • **Delayed Surgery or no Surgery**<br>• Younger patients with low comorbidities |
| • EGFR tested patients<br>• Delayed surgery<br>• Higher drop-offs within first six months |

**Active collaboration across medical, I&A and brand team to identify the key patient pathways of interest leads to robust actional outcomes.**

# Prioritization framework combines patient outcomes, brand strategic imperatives and sub-national drivers and barriers analysis to identify care gaps to focus on nationally

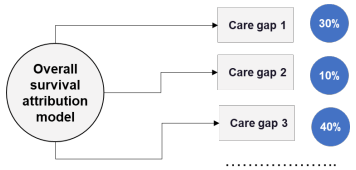
**Prioritize intervention areas**

Certain care-gaps have outsized impact on patient outcomes, with variations based on patient population; brand strategic imperatives also need to be focused on two to three intervention areas which have maximum impact on patient outcomes.

## Prioritize based on patient outcomes

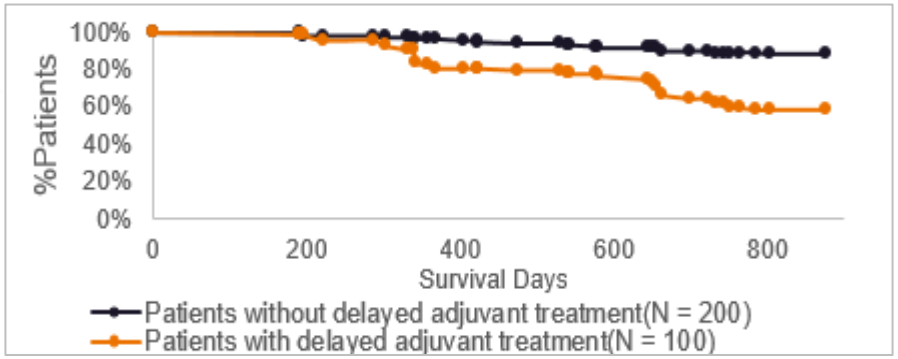
### Outcome impact assessment

**Clinical:** Deep-learning based multi-touch attribution model which uses bi-directional long short-term memory (LSTM) model to understand the impact of individual care gaps on the outcomes such as overall survival, treatment free survival and time to metastatic.




**Economic:** T-test analysis and clustering to establish statistically significant differences in lifetime HCRU of patients **with** and **without** care gaps.

### Outcome impact assessment




Propensity score modelling are leveraged to ensure accurate test and control patient cohorts.

### Reprioritized care gaps with higher impact on patient outcomes

| Care gap | Total patients impacted | Rank based on impact |
|---|---|---|
| Absence of biomarker test | 90K | #3 |
| Delay in Surgery | 80K | #2 |
| Sub-optimal adjuvant treatment | 8K | #1 |
| Sub-optimal duration | 5K | #4 |

**Prioritized care gaps are expressed as KPIs at account, territory and national level for easy comparison actionability.**

# Prioritization framework combines patient outcomes, brand strategic imperatives and sub-national drivers and barriers analysis to identify care gaps to focus on nationally

Illustration

**Prioritize intervention areas**

Certain care-gaps have outsized impact on patient outcomes, with variations based on patient population; brand strategic imperatives also need to be focused on two to three intervention areas which have maximum impact on patient outcomes.

**Prioritize based on impactable drivers and barriers**

## 1 Care-gaps

- Sub-optimal screening
- Patient misclassification
- Deficient diagnostic assessment
- Delayed referral to specialist
- Delayed initiation of first line treatment
- Deviation from guidelines
- Sub-optimal treatment choice
- Prolonged time to administer
- Sub-optimal post-treatment follow-ups, inconsistent monitoring
- High rate of drop-offs
- Lower persistence and adherence

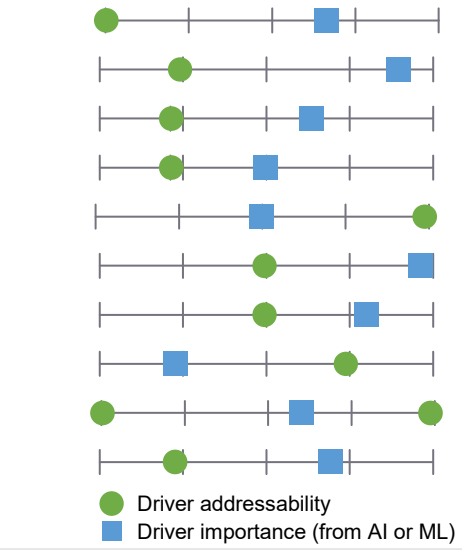
## 2 Drivers

**Across segments**

- High comorbidity burden
- HCP awareness
- Access to center of excellence (COE)
- Physician experience
- Account control
- Genetic disparity
- Old age
- State healthcare spending
- Health literacy or hesitancy
- Payer coverage

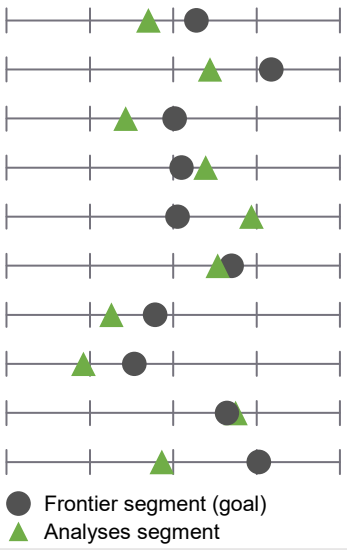
## 3 Ability to impact

**Importance**




## 4 Impact on outcome

**Performance**




**Prioritized care gaps are expressed as KPIs at account, territory and national level for easy comparison actionability.**

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# Sub-national analysis helps tease out the inherent diversity of treatment paradigms across states, geographies, territories and accounts

**Aggregate to get local themes**

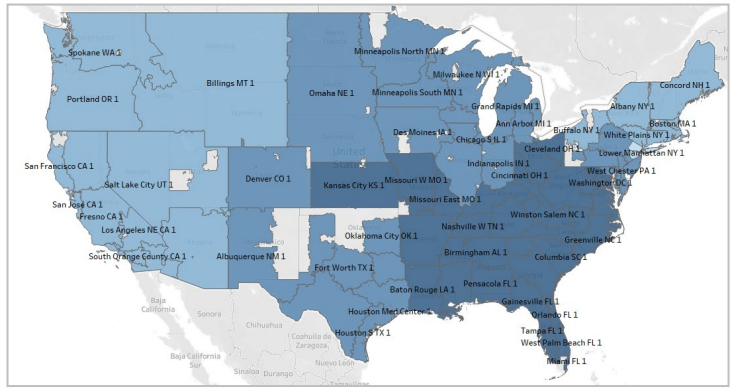
Sub-national identification of performance drivers and barriers—enables custom action plan to drive growth across clusters of territories.

Territories will be segmented into ‘high’, ‘medium’, and ‘low’ based on delta between current KPI ad national average.

## Territory archetypes by care gap occurrence

| | |
|---|---|
| | Brand indication Share: 16% (+2%) |
| R3M growth rate +3% | CM growth rate +1% |
| R6M growth rate -3% | R3M delta wrt forecast -10% |

| Demand metric | | Velocity metric | |
|---|---|---|---|
| NPS | TRx | Growth | Share |




## Clustered on gap to national level and drivers

| High | Medium | Low |
|---|---|---|
| 20 · 20% · 15% · 300 | 18 · 15% · 9% · 200 | 15 · 12% · 7% · 100 |
| 15 · 10% · 7% · 250 | .. | .. |
| 15 · 8% · 7% · 220 | .. | .. |

### Cluster composition

| Number of territories | Percentage of care gap occurrence | Percentage of addressable |
|---|---|---|
| | | |

### Performance drivers categories

- HCP promotion
- HCP Tx patterns
- HCP characteristics
- Patient characteristics

**TBD**

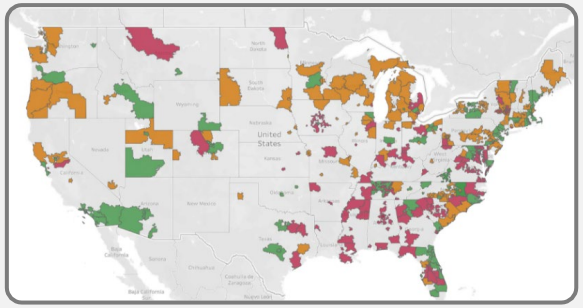
# Realistic and actionable goal setting is done via appropriate benchmarking of sub-national performance based on brand-indication lifecycle stage

**Benchmark and quantify**

HCPs, accounts and territories are benchmarked their immediate neighborhood (either geographic, or similar SDOH profiles) to define actionable and achievable goals.

## Approach: ML driven clustering

- **Cluster accounts, territories, counties and geographies** based on SDOH factors, drivers and barriers, account size, number of patients, HCP affinity and access.
- **Drivers for a particular care gap may differ across various regions**, requiring tailored interventions for each.
- Regions with a high concentration of care-gaps and local hot-spots require significant attention.
- Considers **inherent diversity of the reasons** for sub-optimal performance; requires **change management in execution planning.**



**High income, mostly non-hispanic white neighborhoods**

**Rural neighborhoods with low testing centers**

**Low income neighborhoods with low HCP coverage**

## Outcomes

**Care gap: Low biomarker testing**
**KPI: EGFR testing rate (number of EGFR tested and number of early-stage NSCLC)**

| | Current KPI value (average) | Goal (average) |
|---|---|---|
| Cluster 1 | *68%* | *77%* |
| National average | *60%* | *70%* |
| Cluster 2 | *58%* | *65%* |
| Cluster 3 | *62%* | *70%* |

**Prioritized care gaps are expressed as KPIs and benchmarked based on underlying drivers; based on current lifecycle (new verses mature), thresholds are varied.**

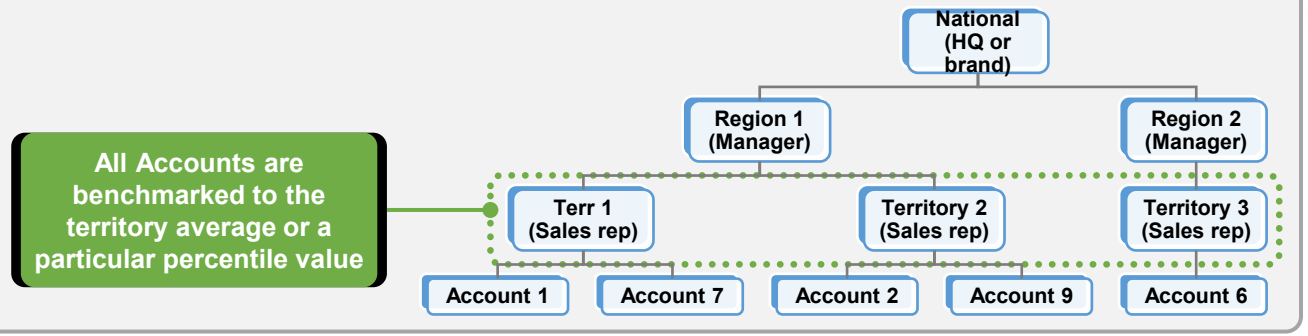
# Realistic and actionable goal setting is done via appropriate benchmarking of sub-national performance based on brand-indication lifecycle stage

**Benchmark and quantify**

HCPs, accounts and territories are benchmarked their immediate neighborhood (either geographic, or similar SDOH profiles) to define actionable and achievable goals.

## Approach: Geographic benchmarking

- Each **sub-national entity benchmarked to its immediate upward entity,** such as accounts benchmarked to territory level average; territories to geographic.
- Geographic proximity is good indicator of underlying drivers; similar key opinion leaders (KOLs), common HCPs across close knit group of accounts requires consistent messaging.
- **For launch and underperforming indications—**choose **higher benchmark,** such as the 80th percentile, instead of average.
- **Simplifies execution strategy**, benchmarking in line with field team hierarchy ensuring accountability.




## Outcomes

**Care gap: Low biomarker testing**
**KPI: EGFR testing rate (number of EGFR tested and number of early-stage NSCLC)**

| Care gap | Nation | Territory 1 | Territory 2 |
|---|---|---|---|
| ***Absence of biomarker test*** | **60%** *90K* | **70%** *20K* | **57%** *12K* |
| ***Delay in surgery*** | **30%** *80K* | **25%** *12K* | **35%** *23K* |
| ***Sub-optimal adjuvant treatment*** | **60%** *8K* | **75%** *2.5K* | **45%** *1K* |
| ***Sub-optimal duration*** | 14m *5K* | 12m *1K* | 11m *1K* |

*The goal for the sales rep in territory 1 would be to move the EGFR testing rate of all below average account to the average of 70%. This would mean that there is no focus on top performing account to improve testing rate—however there will be other opportunities to drive growth.*

**Prioritized care gaps are expressed as KPIs and benchmarked based on underlying drivers.**

# Automated recommender identifies top actionable drivers for intervention at account level; benchmarking of performance with potential to aid prioritization

Illustration

## Sub-national opportunity dashboard—field rep view

National level | Cluster level | Account level | IDN level

**Sub-national deep dives**

Brand-indication ▼

| | | |
|---|---|---|
| Brooklyn NY | Jersey City NJ | New York NY |
| Edison NJ | Nassau NY | Paterson NJ |

*Growth segment* High ▼

*Cluster* Cluster 1 ▼

Auto-recommender engine provides insights into top three drivers for actioning

Brand-indication share—16% (+2%)

R3M growth rate +3% | CM growth rate +1%

R6M growth rate -3% | R3M delta wrt forecast -10%

| Sr. No | Parent account | Total potential | Penetration (% achieved) | Opportunity by care gaps #1 | #2 | #3 | Performance gap |
|---|---|---|---|---|---|---|---|
| 1 | New York Cancer And Blood Specialists | 2,054 | 45% | *Absence of biomarker test N = XX* | *Delay in surgery* | *Sub-optimal duration* | +06 |
| 2 | Memorial Sloan Kettering Cancer Center | 1,693 | 55% | *Sub-optimal adjuvant treatment* | *Sub-optimal duration* | *Absence of biomarker test* | +02 |
| 3 | Mount Sinai Health System | 1,337 | 37% | *Absence of biomarker test* | *Delay in surgery* | *Sub-optimal duration* | +05 |
| 4 | Texas Oncology | 1,336 | 64% | *Absence of biomarker test* | *Delay in surgery* | *Sub-optimal duration* | +07 |

**Opportunity conversion brings all the different care gaps to a single common base, allowing field teams to easily prioritize actions.**

# The final step involves working with different cross-functional teams within the commercial function to design appropriate intervention strategies

Illustration

**Define execution strategy**

Dynamic, localized execution strategy focuses on addressing systemic barriers within individual accounts based on prioritized opportunities.

**Key drivers identified**

- **Absence of biomarker test**
- **Delay in surgery**
- **Sub-optimal adjuvant treatment**
- **Sub-optimal duration**

| HQ or brand marketing | | Medical | | First Line Managers | | Field reps |
|---|---|---|---|---|---|---|
| Create Education resources and tools | Logistic support for testing | Real-world evidence (RWE) generation to drive testing | Medical science liaisons (MSL) to engage KOLs | Multidisciplinary team (MDT) and KOL engagement | Local campaigns | Identify top opinion leaders |
| Counselling programs | Digital marketing campaigns | Patient resource messaging | Curated scientific content | Account management planning | Drive cross learning across territories | Share point of view (POV) on managing AE |
| Patient access programs | Diagnostic programs | Design strategies for managing adverse events (AE) | | | | Optimize plan around care gaps |

**Opportunity conversion brings all the different care gaps to a single common base, allowing field teams to easily prioritize actions.**

# Effectiveness of the approach is tracked actively by monitoring key KPIs spanning multiple categories

Sub-national opportunity is typically quantified every six month to consider movements in patient and HCP behavior and changes in market landscape.

## A Patient outcomes (Lagging indicator)

- Percent increase in progression-free survival (PFS)
- Reduction in hospitalization rate
- Decrease in number of patients with care gap

## B Performance (Near real-time)

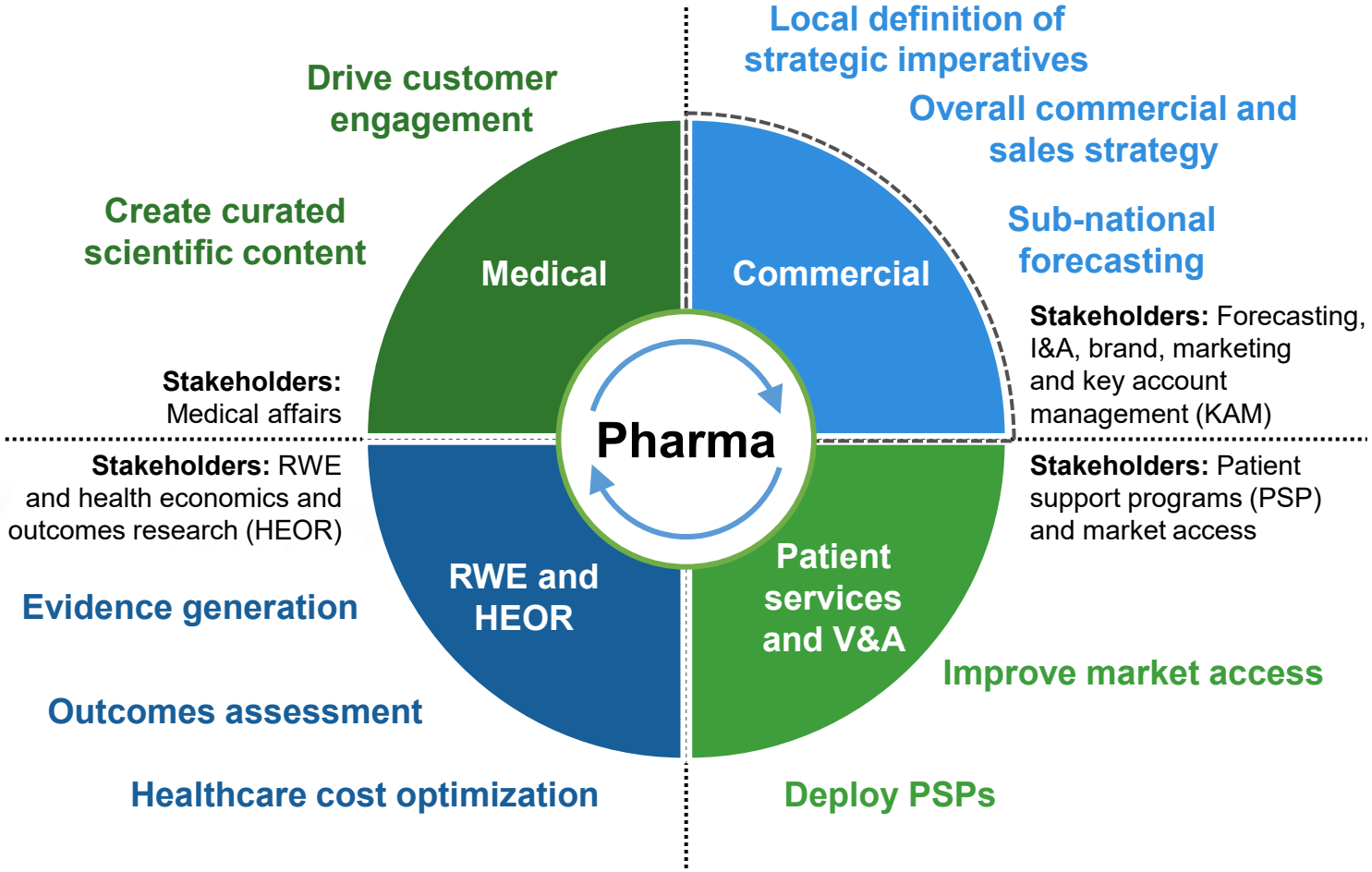
- Increase in sales—net promoter score (NPS), brand
- Increase in KPIs—biomarker testing rate, treatment rate,
- Forecast accuracy
- Trend analysis to see if there is an uptake

## C Marketing execution (Real time)

- Number of calls and visits to top opportunity accounts
- Share of voice
- Average length of calls
- HCP engagement

**Continuous monitoring creates a positive feedback loop with focused field action driving increase in sales which in drives higher confidence and execution.**

**Driving growth with patient led strategy helps in creating a cohesive and inter-connected activities across functions. Sub-national opportunity drivers framework enables dynamism in targeting the customers and developing inter-connectedness across strategies.**




**Key decisions and use cases across pharma function teams.**

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