

# Trend Report

## Driving Precision Performance: Capitalize on Your Commercial Potential with the Right, Relevant Data

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To maintain the integrity and consistency of data and resulting analysis, all references to IMS data or QuintilesIMS data have been retained with mention of the IQVIA name as appropriate.

## Introduction: Driving Precision Performance

If the challenge of precision healthcare involves the proper treatment for a specific patient, the corresponding challenge for life science is focusing on the precise commercial approach to improve your performance. The right markets, the right physicians with the right communications, as conduits to the right patient populations.

Continuously changing and widely varying environments are generating unprecedented complexities in pharmaceutical markets around the globe. No longer is there one national market or single definition of stakeholder. Global and local dynamics are always moving, technologies constantly improving, and the pace of change only accelerating.

While not a full compendium of solutions available to commercial life sciences users, this report is intended to provide a path to advancing precision and performance based on four commercial drivers and the evolving trends of each. We're constantly adding to the world's largest curated healthcare data source. And, included here are many examples of how ongoing data investments are providing deeper, more precise perspectives into emerging markets, evolving channels, new stakeholders and better answers to more questions.

Our goal is to help global, regional and local pharmaco leaders keep pace with these changes—and with additional trends to be explored in the future. Here, we provide insights into what really matters to you, improving commercial strategies, tactics and performance.

We hope this report offers familiarity with the expanded information available to advance your commercial performance today and tomorrow.



Kevin Knightly  
President, Information and Technology Solutions  
IQVIA

*“... the corresponding challenge for life science is focusing on the precise commercial approach to improve your performance. The **right markets** and the **right physicians**, with the **right connections**, as conduits to the **right patient populations**...”*

\*More Real World Insights (RWI) are available from IQVIA beyond that included in the reference patient data throughout this report.

# Targeting the Right Markets:

*Portfolio optimization*

## Slower global spending growth



# THE RIGHT MARKETS

Current trends are varying demand for medicines and shifting the importance of markets at all levels.

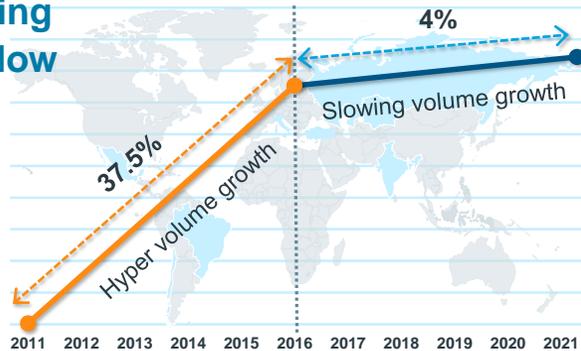
## Distribution Fragmentation

Shifts to control costs by product types, therapy, delivery, etc.

In the UK, hospital share is growing while retail pharmacy is stalling



## Pharmerging markets slow



## Oncology, diabetes & autoimmune diseases

Major therapy areas drive spending growth in developed markets

For top 3 therapy areas in aggregate, expect rise of \$104B - \$149B by 2021.

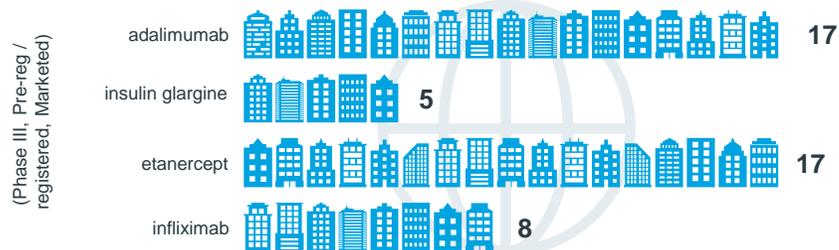


## Regional & local variances

Multinational Share: China Provinces & Municipalities



## Biosimilar development actively pursued by many companies

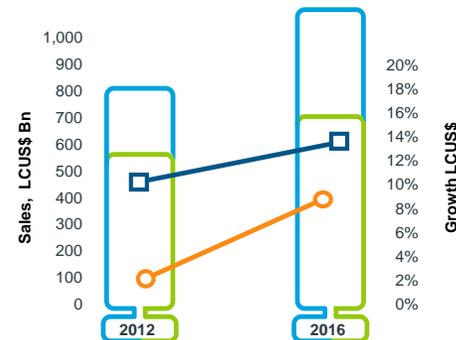


## Product Portfolio Evolution

### Global specialty market trends

Sales and Growth

- Specialty Sales
- Traditional Sales
- Specialty growth
- Total Global pharma growth



Niche population and orphan drug markets surge

**HOWEVER,**  
**54%** of orphan diseases have gaps in the pipeline and no drugs on market.

# Targeting the Right Markets: Portfolio optimization

While each geography is different, fluid market dynamics are changing the relative importance of regions, countries and markets—and requiring precise commercial strategies based on specificity and granularity to capitalize on shifting trends, therapies and markets.

Evaluating and re-evaluating continuously shifting markets at the national, sub-national and local level requires precise intelligence. To assess and act on a myriad of competing opportunities and challenges, you need increasing levels of detail specific to brands, sales territories and markets of interest. Yet demand for medicines varies significantly across and within markets, depending on trends in:

- Economic conditions
- Therapy areas
- Drug composition and
- Distribution, amongst other things.

Given emerging and shifting trends such as these, precise information with the right, relevant detail is critical to reaching your full potential and improving commercial performance.

## Slow Demand, Pharmedging Growth

Though the US remains the world's largest market, pharmedging countries will make up nine of the top 20 markets by 2021, with China continuing as number two. Current pharmedging markets include Brazil, Russia, India, Mexico, Turkey, Bangladesh, Chile, Kazakhstan and the Philippines. ↓

Variation in Spending and Volume Growth Across Global Markets

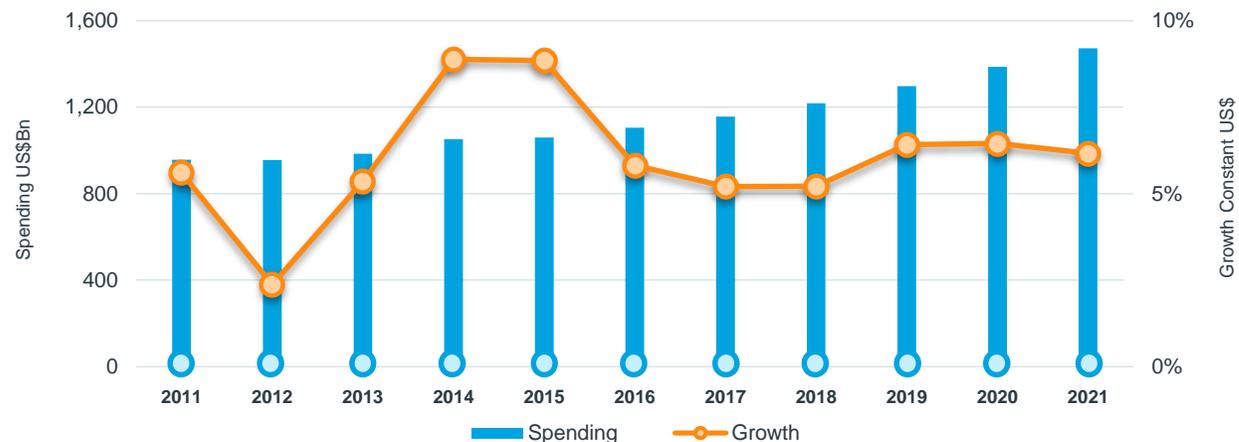


Exhibit M-1:

Spending and growth have shifted focus to volume-driven growth in pharmedging markets and specialty medicines. In the US, patent expiries and biosimilars will play a key role in the decline in spending growth. However, the next five years expect a continued boom in innovation across a range of diseases.

Source: QuintilesIMS Market Prognosis, Sept 2016; IQVIA (QuintilesIMS) Institute, Oct 2016

Top 20 Pharmedging Markets Forecast Growth Dynamics

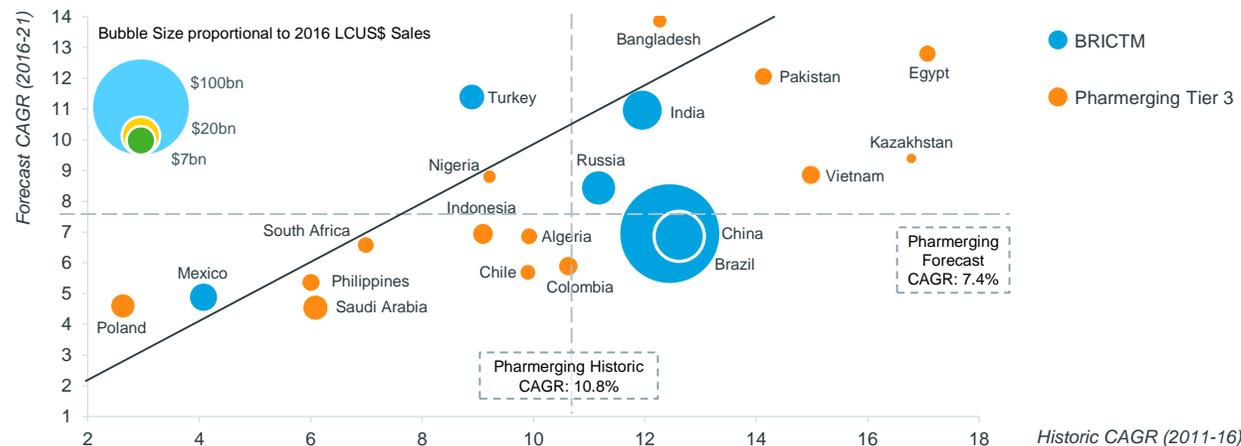


Exhibit M-2:

Leading pharmedging markets have seen GDP growth slow over the past decade, resulting in a wide dispersion in growth as the CAGR overall falls into single digits. The outlook for spending growth is expected to moderate from 10% CAGR over the past five years to 6% - 9% through 2021.

Notes: At ex-manufacturer price levels, not including rebates and discounts. Contains audited and unaudited data; Argentina excluded due to hyperinflation.

Source: QuintilesIMS Market Prognosis, Mar 2017

While global spending will reach \$1.5 trillion by 2021, global spending growth is slowing from 9% in 2015 to 4% - 7% over the next five years (Ex. M-1). Spending growth will be driven by increased pharmerging market volume, but the slower growth illustrates a direct correlation between medicine usage and affordability in some countries.

By volume, medicines consumed globally will increase 3% annually through 2021, but volume growth is slowing too. Since 2011, pharmerging market volume grew 37.5% over five years as prosperity accelerated—verses 2% in the same period in all other markets.

Pharmerging market growth is expected to slow to 4% through 2021, based on declines in China's economy. Countries projected to accelerate spending over the next five years are Turkey, Mexico and Poland (Ex. M-2). Romania, Argentina and Colombia are expected to grow by less than 5% through the year 2021.

Though growth in developed markets will be driven by patented brands and scientific advances, pharmerging markets will continue to be pushed by non-original brands (NOBs), accounting for 91% of pharmerging market volume and 78% of spending.

### Therapy Focus, Oncology-Driven

Spending growth in developed markets will be propelled by innovations in oncology (specifically immuno-oncology), diabetes and autoimmune therapies (Ex. M-3). Diabetes treatments will evolve with more convenient formulations, combinations and delivery. Treatments for autoimmune diseases, including rheumatoid arthritis, psoriasis, ulcerative colitis, Crohn's disease and related disorders will continue to rise in usage, with spending growth up 11% - 14%.

### Changing Product Profiles

Drug manufacturers have very different portfolios today than in previous decades, requiring precise granularity previously unavailable in some regions. Portfolios will continue to evolve as gene editing techniques, microbiome use, regenerative cell therapies and the like advance into the future.

R&D pipelines and demand in developing countries suggest continued movement to

specialty, niche and orphan medicines, while emerging nations find value in less expensive brands and options.

Continued portfolio evolution is expected as pharmeros seek opportunity driven by a few key developments:

- Specialty medicines and new biologics surge
- Biosimilars and non-originals increase
- Future cell and gene therapies advance
- Niche population & orphan drug rise ↓

Leading Therapy Areas Spending and Growth to 2021 (Constant US\$Bn)

Therapy Areas	Spending 2016	2011–16 CAGR	Spending 2021	2016–21 CAGR
<b>Oncology</b>	75.3	10.9%	120–135	9–12%
<b>Diabetes</b>	66.2	16.4%	95–110	8–11%
<b>Autoimmune</b>	45.1	18.2%	75–90	11–14%
<b>Pain</b>	67.9	7.1%	75–90	2–5%
<b>Cardiovascular</b>	70.5	-2.5%	70–80	0–3%
<b>Respiratory</b>	54.4	3.4%	60–70	2–5%
<b>Antibiotics &amp; Vaccines</b>	54.4	2.5%	60–70	2–5%
<b>Mental Health</b>	36.8	-5.0%	35–40	-1–2%
<b>HIV</b>	24.6	11.5%	35–40	6–9%
<b>Antivirals EX-HIV</b>	33.2	38.1%	35–40	0–3%

**Exhibit M-3:**

Key therapy areas driving spending and growth over the next five years will be led by oncology, reaching \$120 – \$135 billion in spending in major developed and pharmerging markets.

**Note:** Includes 8 developed and 6 pharmerging countries: US, EU5, Japan, Canada, China, Brazil Russia, India, Turkey, Mexico

**Source:** QuintilesIMS Therapy Prognosis, Sept 2016; IQVIA (QuintilesIMS) Institute, Oct 2016

### Specialty Medications Surge

Specialty's share of spending continues to rise from less than 20% ten years ago, to 30% in 2016 and 35% by 2021. While the US still leads growth in specialty drugs, roughly 82% of specialty sales growth is shared by seven developed countries and China. Globally, specialty medicines—more than 50% of which are small molecule—are increasing (Ex. M-4, M-5, M-6).

Though prioritization may be based on commercial potential versus composition, it's curious to note the coming five-years will see small molecules become increasingly important and biologics entering indications ↓

### Specialty Medicines Share of Spending Through 2021 (constant US \$)

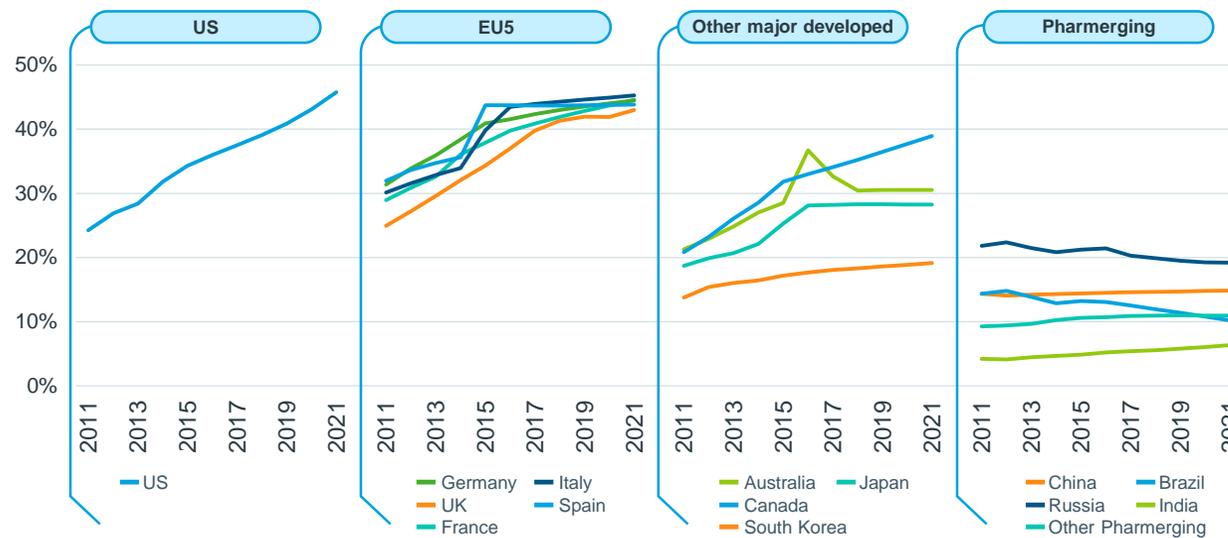


Exhibit M-4:

Specialty spending will approach half of total spending in the US and Europe by 2021. In pharmerging markets, specialty medicines continue but at lower shares—5% - 20% of spending.

Source: IQVIA (QuintilesIMS) Institute, Oct 2016

### Specialty Growth in Key Markets: Percentage Growth 2015/16

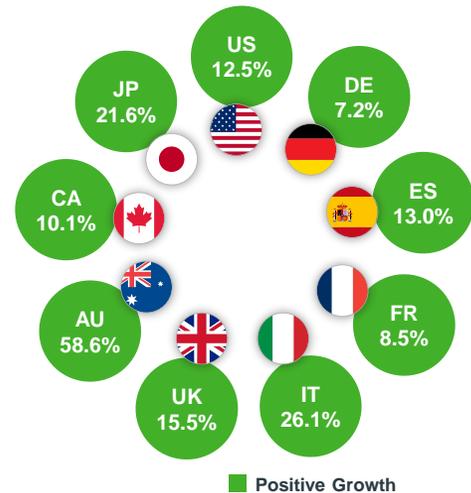


Exhibit M-5:

A few pharmerging countries also see growth in specialty sales, e.g. Turkey 20.1%, Brazil 17.2%, China 8.3% and Mexico 4%. Of the top 30 markets, Poland is the only country with zero specialty growth.

Source: QuintilesIMS MIDAS, MAT Sept 2016

### Specialty Spending Growth Rising Faster than Total Global Market



### Specialty: Region Market Share 2016

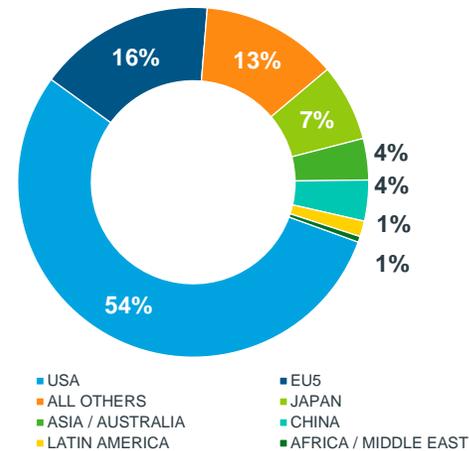


Exhibit M-6:

In the last five years, specialty medicines have grown seven times faster than traditional therapies, with Hep C medications driving significant growth in 2014/2015. Specialty growth is heavily concentrated in developed markets, and although re-balanced in 2016, it continues to grow.

Source: QuintilesIMS MIDAS, MAT Q4 2016

typically treated by small molecules. To date, the small molecule versus biologics mix is relatively even. Yet, small molecules are more than half of expected future approvals (Ex. M-7).

### Biosimilars & Non-Original Biologics

While the biosimilars market in the developed world has been somewhat subdued, new opportunities exist for biosimilars and non-original biologics (NOBs).

As patent expiries in developed markets contribute to slower growth, areas attracting interest include monoclonal antibody oncologics, modern insulins and anti-TNF mAbs (a therapy area larger than all previous therapy areas with biosimilar competition put together) (Ex. M-8).

Approval pathways for biosimilars, cleared over the past decade, will continue to offset branded growth and add to the credibility of biosimilars across major markets. The US, EU5 and Japan currently support biologic expenditures and will be key for biosimilar new opportunity.

Additionally, biosimilars will be available for several of the leading autoimmune products by 2021, potentially allowing wider use with lower spending. Two developed regions, Japan and Europe, make up 92% of biosimilar sales currently, with uptake slower in some major European markets.

Seen by many as the start of a new wave, infliximab biosimilars have had inconsistent

### Specialty Biologics and Small Molecules Today and in the R&D Pipeline

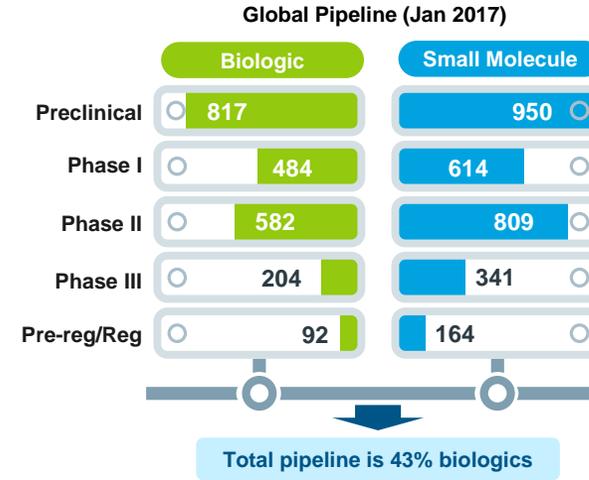
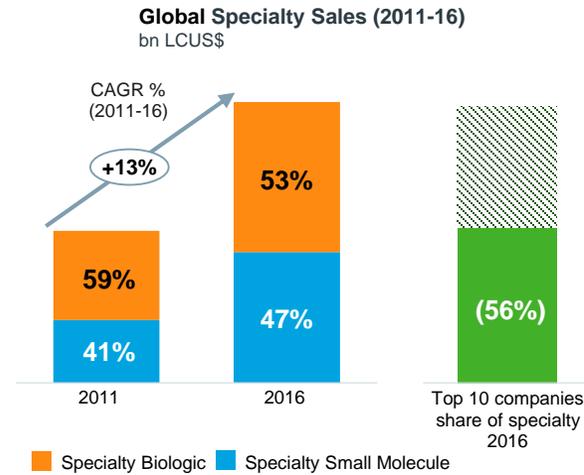


Exhibit M-7:

Today, the majority of specialty drugs are biologics, but looking at the pipeline, biologics make up less than half of all expected new medicines. Moreover, more than a quarter of the global pipeline is designated as orphan drugs.

Source: QuintilesIMS Market Prognosis Q4 2016; IQVIA (QuintilesIMS) Institute Feb 2017

### Biosimilar Development is Being Actively Pursued by Many Companies

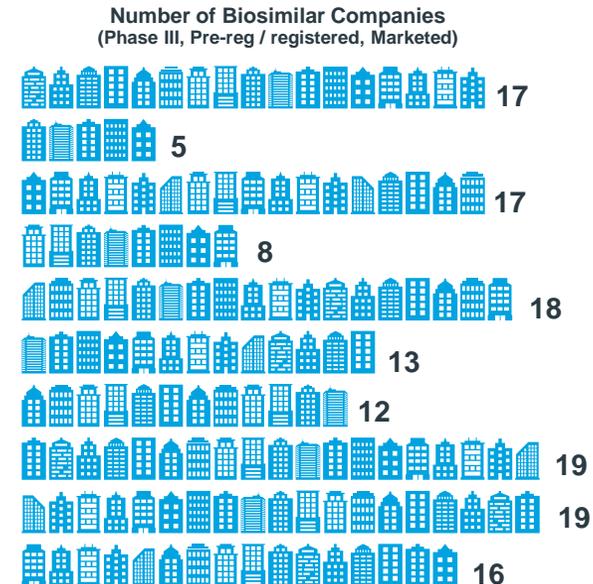
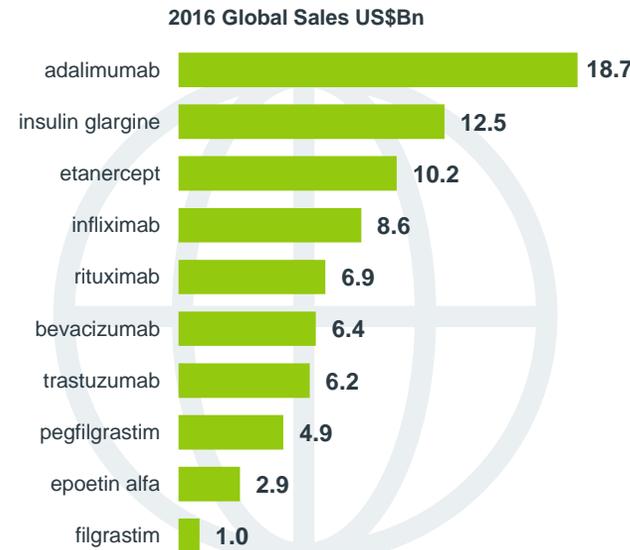


Exhibit M-8:

Biosimilars are attracting companies, large and small, based on global sales of greater than \$4.9 billion in 2016. Investments will accelerate market growth, with product positioning and pricing as some of the most critical challenges.

Source: QuintilesIMS MIDAS, Dec 2016

impact following launch. Uptake so far has been cautious in most European countries—with exception of the Nordics (Ex. M-9). Tender systems in the Nordics have led to a rapid uptake (up to 98% penetration) of biosimilars in comparison to EU5 countries.

However, as biosimilars take their place in the industry landscape, commercial models for biosimilars need to adapt. Since they have the same clinical profile as branded medicines, drug manufacturers need to better educate prescribers on the clinical benefits, while focusing payers and funding entities on potential cost-savings.

### Future Cell and Gene Therapies

For high unmet need diseases, cell and gene therapies are driving investments, signaling confidence in newer technologies.

The first cell therapy cancer vaccine has been launched in the US and the first gene therapy treatment has been approved for use in Europe. Launching in August 2017, the first CAR-T treatment has also been approved in the US to treat children and young adults with a recurrent form of the blood cancer, acute lymphoblastic leukemia.

In addition to these new treatments, we'll likely see the continued evolution of new platforms such as CRISPR, microbiomes and regenerative cell therapies.

A gene-editing technique, more powerful, rapid and less expensive than any previously invented, CRISPR-based therapies are expected to accelerate in the market in the next decade. In the case of these completely new technologies, it is difficult to determine the impact each will have on the specialty category.

CRISPR-based therapeutics and other regenerative technologies could stretch (and potentially break) the current definitions of pharmacotherapy, having device- or procedure-like characteristics and potentially creating a new class of therapeutic, with its own regulatory, financing and delivery challenges.

The speed of movement in the field also means that very rapid development should be expected in the next 5-10 years, with major pharma investments and increasing numbers of companies involved.

While offering huge potential, regenerative technologies also pose significant regulatory challenge. They could trigger competition between countries and institutions in terms of location of highly specialized centers of excellence, funding for these technologies and how commercial return is realized.

While there will be further cell and gene therapy launches through the decade, companies may find navigating valuation, ↓

### Biosimilar Uptake, the Nordics Versus the UK

infliximab biosimilar uptake, % share of volume in terms of treatment days

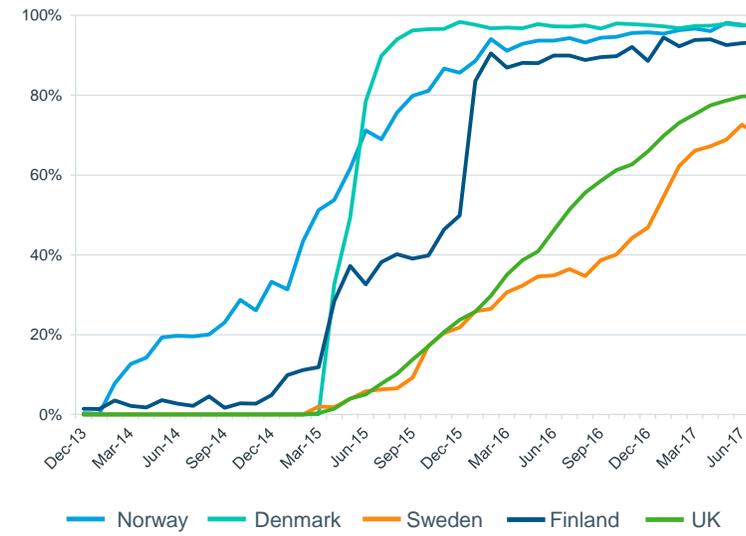
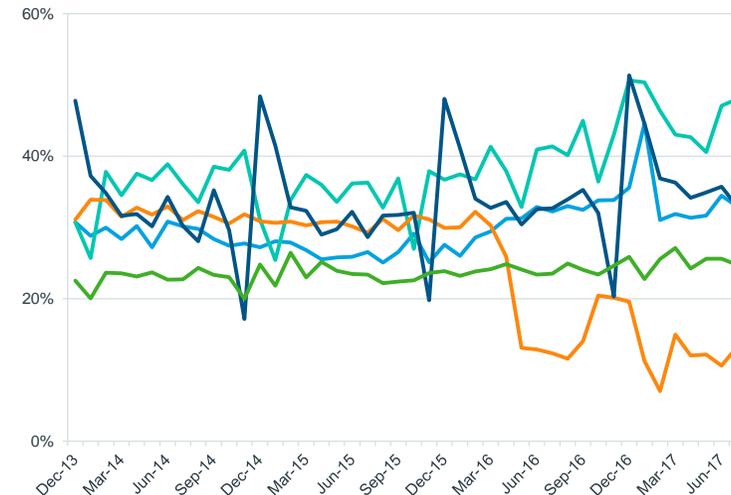


Exhibit M-9:

*In the Nordics, clinician acceptance has been high, meaning safety and efficacy evidence for switching has largely been accepted. Price reductions also became significant quickly and patients have not objected to being asked to switch or start on a biosimilar.*

infliximab as % of total anti-TNFs



Source: IQVIA (QuintilesIMS), European Thought leadership - Biosimilar tracker, Jun 2017; IQVIA (QuintilesIMS), Market Access, Biosimilars: Learning from Europe, Mar 2016

reimbursement, sales and manufacturing challenging as these therapies pose unique questions for players. High prices, reimbursement, market access, sales and training approaches and more will require strong and novel commercial models which may be ambitious and complex to navigate.

### Niche Population & Orphan Drug Focus

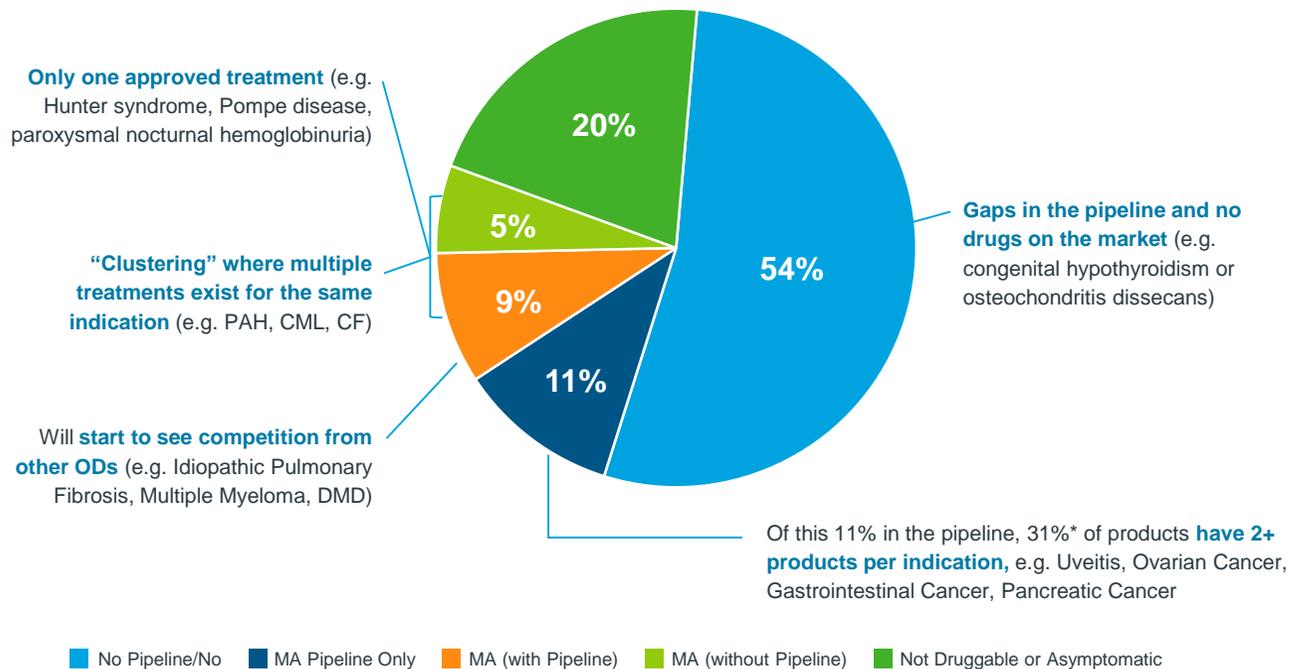
Orphan drugs are on the leading edge of the specialty medicines trend, thus driving even further need for precision and detail. With 6,000 to 8,000 rare diseases in existence and 30 million<sup>1</sup> people in Europe alone suffering from a rare disease, collectively, rare diseases are not really rare.

These populations offer opportunity as only 5% of orphan diseases have an approved drug treatment option (Ex. M-10). They are also a commercially attractive area due to patient advocacy, medical breakthroughs, regulatory delivery options incentives and venture capital investment.

In addition, many orphan drugs are biologics, which are less likely to have immediate competition from generic equivalents after patent expiration. Thus, despite the relatively small market available for orphans, there has been a surge in the

## Potential in Niche and Orphan Drugs is Complex and Dynamic

Clinical Landscape for EU Orphan Indications with 1-10/20,000 prevalence  
Total 243 Indications



#### Exhibit M-10:

Orphan disease drug approvals have increased dramatically in the EU, focused on oncology indications. Over a quarter of the entire late stage pipeline is focused on the development of oncologics.

Source: OrphaNet, SMA, IMS Health R&D Focus June 2015, OD: Orphan Drugs, MA: Marketing Authorization (only including those with orphan designation), PAH, pulmonary arterial hypertension; CML: chronic myeloid leukemia; CF: Cystic Fibrosis, DMD: Duchenne muscular dystrophy; products for the most prevalent orphan indications (1-10/20,000)

<sup>1</sup><http://www.eurordis.org/about-rare-diseases>

number of orphan drug approvals—because together they represent a large share of the medicines budget.

However, orphan drugs are increasingly subject to price scrutiny and will require strong justification for high price tags moving forward.

### Fragmented Distribution

Shorter shelf lives, cold supply chain requirements, parallel trade regulations and other issues are requiring more flexible distribution across the globe. Several issues are giving way to more fragmented channels, and adding to the precise metrics and complexity of demand by distribution channel.

These include:

- Different models for different product types and patient segments, with some bypassing wholesalers entirely
- New channels, including direct to patient
- Increasing specialty drugs and delivery options ↓

In some markets, such as Italy's blood coagulation market, distribution by product type has been implemented with some success. Within Italy, regional Local Health Authorities (LHA) have taken control of distribution, creating new models, impacting patient access to medicines, especially more costly drugs, and driving highly variable adoption rates among regions.

The need for precision in distribution can be seen in both Calabria's DPC channel and Sardegna's Direct Distribution where differing paths are used to bypass wholesalers in an attempt to control costs. DPC and Direct Distribution in Italian markets are both options for implementing "Direct to Patient" distribution, yet each has a very different drug flow (Ex. M-11).

A longer-term shift to hospital distribution is the result of not only medical need, but continuing efforts to control specialty prescribing. Across Europe as in Italy, budget concerns are driving efforts to avoid wholesalers and pharmacy margins, and gain greater influence in negotiating discounts and driving growth for hospital-prescribed markets (Ex. M-12).

In other hospital markets, such as in China, growth rate and share are highly varied by therapy area. Oncology maintains the highest growth rate of key therapeutic areas there—as in many developed countries (Ex. M-13). ↓

Italy's Blood Coagulation Market: Distribution Variances by Region



Regions	Direct Distribution <sup>1</sup>	Traditional Hospital	DPC <sup>2</sup>	Traditional Retail
Abruzzo	81-100%	0-20%	n/a	0-20%
Basilicata	81-100%	0-20%	n/a	0-20%
Bolzano – Provincia Autonoma	61-80%	0-20%	n/a	0-20%
Calabria	0-20%	0-20%	81-100%	0-20%
Campania	81-100%	0-20%	0-20%	0-20%
Emilia Romagna	81-100%	0-20%	n/a	0-20%
Friuli Venezia Giulia	0-20%	0-20%	81-100%	0-20%
Lazio	0-20%	0-20%	81-100%	0-20%
Liguria	81-100%	0-20%	0-20%	0-20%
Lombardia	81-100%	0-20%	n/a	0-20%
Marche	81-100%	0-20%	n/a	0-20%
Molise	0-20%	21-40%	61-80%	0-20%
Piemonte+Valle D'Aosta	81-100%	0-20%	n/a	0-20%
Paglia	81-100%	0-20%	n/a	0-20%
Sardegna	81-100%	0-20%	n/a	0-20%
Sicilia	81-100%	0-20%	n/a	0-20%
Toscana	61-80%	21-40%	0-20%	0-20%
Trento - Provincia Autonoma	81-100%	0-20%	n/a	0-20%
Umbria	61-80%	0-20%	n/a	0-20%
Veneto	61-80%	21-40%	0-20%	0-20%

Exhibit M-11:

In Italy, 70% of blood coagulation drugs go directly to patients via LHA access. Within Italy's 20 regions, high variability exists, with some adopting direct channels more readily than others.

Source: IQVIA (QuintilesIMS) Regional Integrated Dataview, 2016

<sup>1</sup>Direct Distribution indicates distributing drugs directly to patients through hospital pharmacies or dispensing structures managed directly by LHAs and bypassing intermediaries to control costs.

<sup>2</sup>DPC is also direct to patient distribution on behalf of LHA, however drugs price and quantity are defined via tender offers between manufactures and LHA without wholesalers or intermediaries, with distribution through retail channels.

In certain specialty therapies, using oncology again as an example, retail to patient channels are growing. Consider Australia, where approximately 45% of oncologics are distributed directly to retail pharmacies for patients. This requires the patient to assume responsibility for storage and transport to the care delivery site and brings with it additional considerations in pricing, reimbursement and safety for pharmaceutical manufacturers.

Delivery options also include precise and differing channels within a given country. In Brazil, where Pharmacy Benefit Managers are considered a channel, a significant decline related to economic slowdown has caused manufacturers to review investments in discount programs, sometimes eliminating them completely or reducing the number of products in the ↓

Hospital Pharmaceutical Sales Market Share vs. 10-year Value Growth (2007-2016)

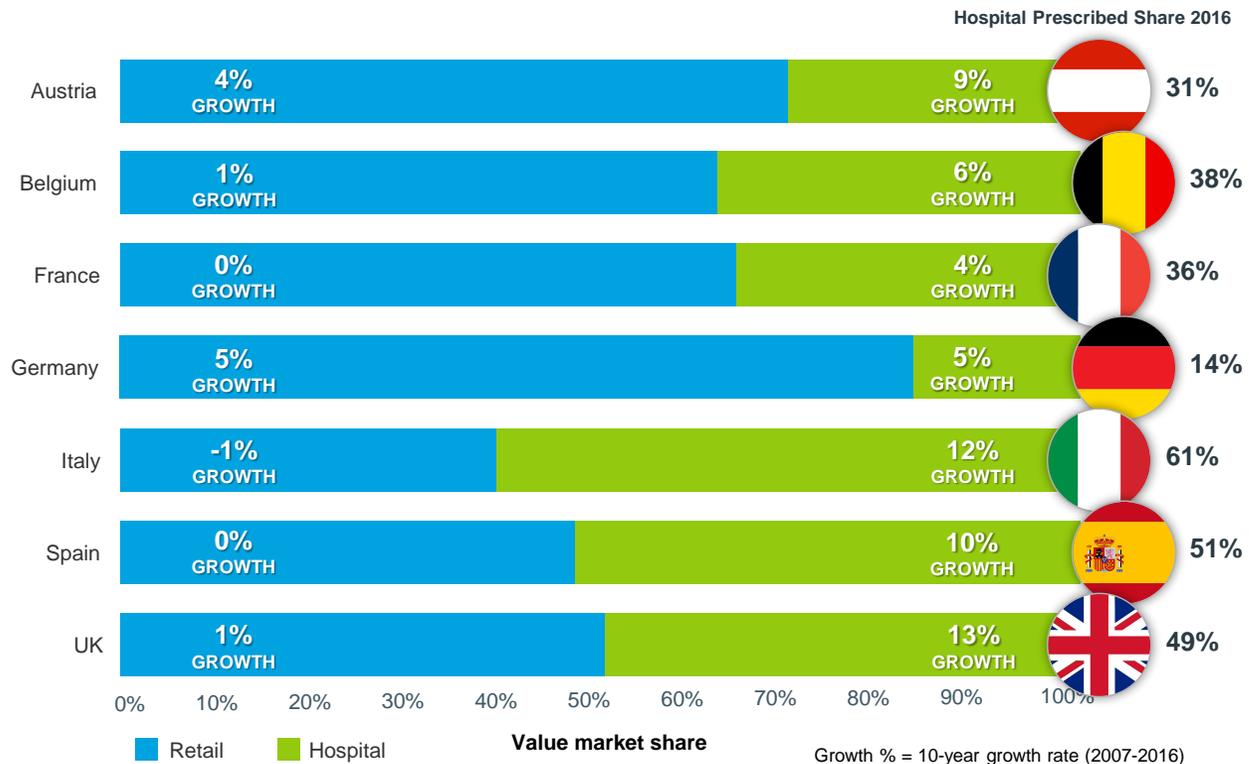


Exhibit M-12:

Longer-term shifts to hospital channels, specifically in Europe, are shown in the evolution of hospital prescription values across country markets.

Source: IQVIA (QuintilesIMS), at ex-manufacturer price levels, not including discounts and rebates, MAT Sept 2016

China Hospital Market: Value Share and Growth Rate by Therapy Area

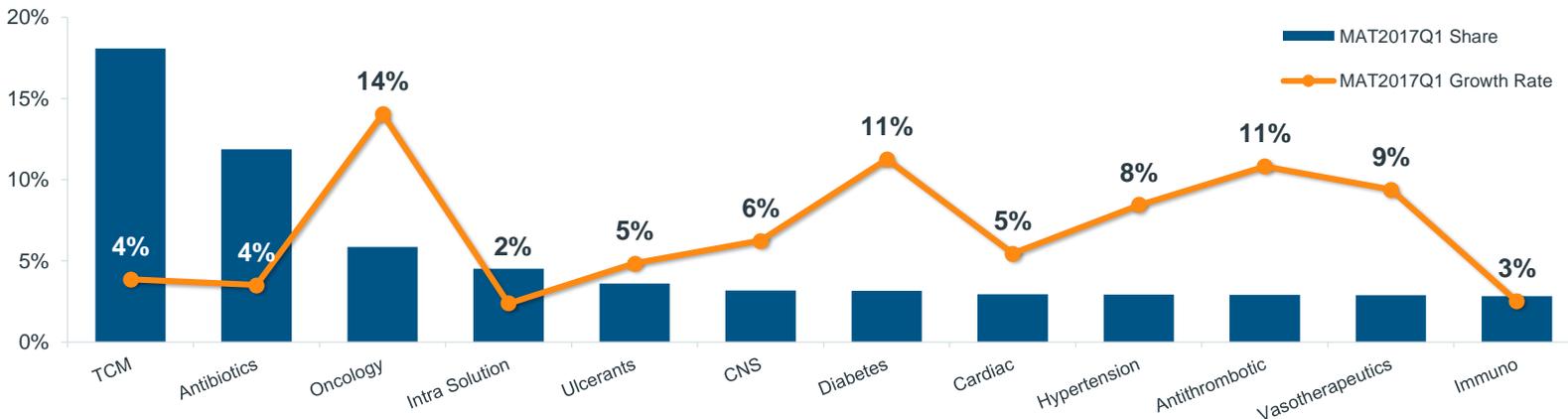


Exhibit M-13:

Key therapeutic areas account for 65% of China's hospital market.

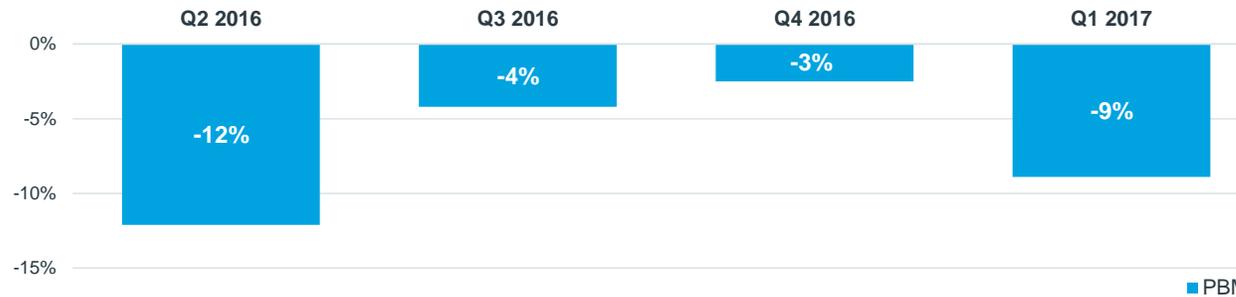
Source: QuintilesIMS, Hospital Audit (>=100 beds), 17M4

programs. Also high unemployment is reducing the number of people insured, therefore lives covered in these programs, thus reducing PBM demand (Ex. M-14).

In some regions distribution is a function of local versus multinational manufacturer (MNC). In China, MNCs have more market share contribution in municipalities and coastal developed provinces. Of the Chinese provinces, 15 provinces/ municipalities, coastal plus the land-locked Chongqing province, account for more than 65% of the country's pharma market. Therapeutic focus across China is also varied by MNC and local companies (Ex. M-15, M-16).

Regardless of the manufacturer or distribution channel, success in complex markets requires precision insights—sub-national views, regional intelligence and local detail to manage demand and ensure the right products reach the right people at the right type of care setting. 

### Brazil Distribution Fluctuations

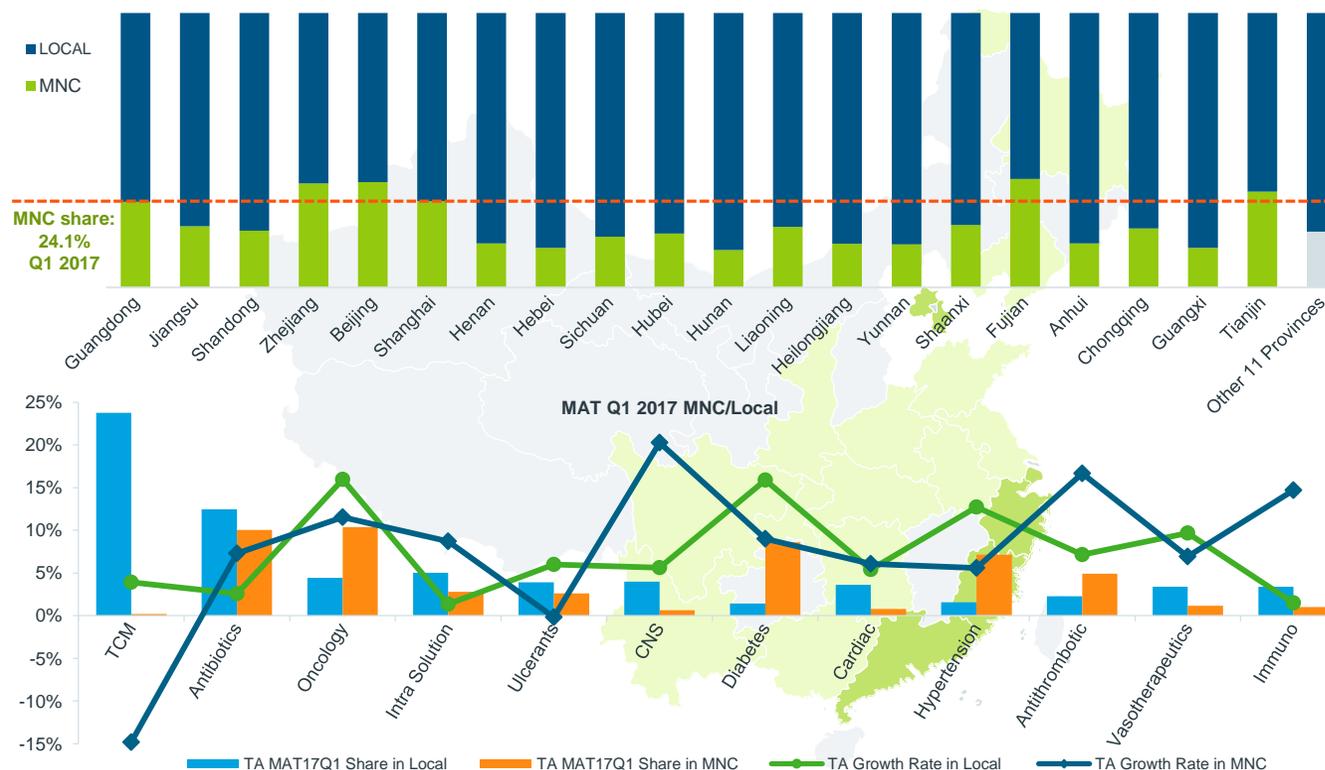


**Exhibit M-14:**

In Brazil, PBM tracking for specific products and markets provides unique views of non-visible physicians (+ range) only seen within granular prescription data for this country.

Source: QuintilesIMS, at ex-manufacturer price levels, not including discounts and rebates, MAT Sept 2016

### China's Local and Multinational Company Share by Region and by Therapy



**Exhibit M-15 & M-16:**

Across China's provinces, MNC market share continues to creep upward year over year, from 23.8% in 2016 to 24.1% for the same Q1 period 2017, with variances in growth rate by therapy focus.

Source: QuintilesIMS, Hospital Audit (>=100 beds), 17M4

# TARGETING THE RIGHT PHARMERGING MARKET: Indonesia

The challenges of this unique Asian market and its new healthcare policy, combine with its increasingly elderly population, a high prevalence of infectious diseases and growing incidence of chronic diseases to boost Indonesia’s pharmaceutical sector. However, diversity abounds throughout this island nation as do requirements for precise market information.

Indonesia, the world’s fourth most populous country, is also one of the most ambitious in terms of healthcare. In 2012, the central government declared it would provide affordable healthcare to all of its 250 million citizens within seven years. Known as the Jaminan Kesehatan Nasional, this effort was launched in 2014 with the potential to become the world’s largest social health insurance program.

The clock is ticking and turning the plan from will to reality presents particular challenges in a country of tremendous

human, economic and geographic diversity. Today, 150 million people are packed into Java, an island with the size of England, while the remaining 100 million Indonesians are spread across some 7,000 islands over a distance of 3,000 kilometers. Thus, healthcare access is significantly limited for the majority of Indonesians in rural areas.

While this dynamic was identified years ago and supposedly addressed with compulsory service and other incentives, it continues and has resulted in intensified competition within the steadily growing pharmaceutical

market (+7.49% year-to-year, according to 2016 IQVIA market indicators).

This concentration has ongoing implications for pharma commercial models locally as well. Saturated physician schedules require every minute spent during a medical representative visit to count. In urban Indonesia, honesty and product knowledge are seen as important attributes of a pharma field representative, as reported in a QuintilesIMS medical representative satisfaction survey in late 2016.

However, the ranking of key attributes differs by city. Thus, local geography and specialty play a role as expectations differ within countries and across markets. When assessed according to specialty, GPs, Internist and Pulmonologist, say honesty is the most important attribute, though GPs also want pharma representatives to be “Updated with the most recent information.” Anesthesiologists want reps to be “Knowledgeable on the disease area,” and “Knowledge on own product” is the most important attribute for Oncologists. ☺

Urban Indonesia: Location Impacts Physician Requirements on Pharma Medical Representatives



Exhibit M-A:

Medical representatives are one of the most important assets for pharma across Indonesia, yet it is becoming more difficult to gain attention due to intensified competition. Thus honesty, follow up and product knowledge are now differentiators and are generally most important to physicians in urban Indonesia.

Source: QuintilesIMS, Medical Representative Satisfaction Survey, Dec 2016

## Portfolio Optimization: Implications & impacts for life sciences management

Addressing commercial challenges by market requires increasing depth, precise dimensions and granular measures across geographic breadth and segment depth. Here are a few things to consider in assessing and adopting differing strategies for each market.

Global / Regional / HQ



### Brand / Franchise / Marketing Directors and Leaders

- 1) Weigh pharmerging markets with granularity.** It's easy to recommend balancing geographic markets, yet difficult in practice. Strategies that work in one emerging market may not work in another, and not all regions of a country grow at the same rate. It may be better to define precise thresholds by market level or therapy area on volume growth, regulation elements, competitive landscape, etc., to maximize profitability.
- 2) Drive market precision.** Aim for local specificity as niche populations, orphan drugs, specialty medicines and pricing options require insights regarding sub-national anomalies and intricacies. Appropriate data can help track, trend and size opportunities, but local views should harmonize with global.
- 3) Prioritize product profiles.** Winning strategies depend on precisely the right information for your R&D pipeline, geographic presence, appetite for risk and willingness to invest. At the highest level, you need information that helps prioritize countries, set portfolio priorities and evaluate investments in commercial structures to support your company's current and future products.



### Sales Operations Leaders and Sales Directors

- 1) Harmonize sub-national with national insights.** Sales operations, targeting, territories and more, are specific to regions, cities or other local geographies. Using the right national and sub-national data is important, yet local views should roll up to harmonize global and local performance with minimal discrepancies and maximum accuracy.
- 2) Align incentive compensation design and strategy.** Data and metrics should incent the behavior you want. Matching data granularity with incentives can increase the consistency in how territory and national sales performance is reported and can lead to greater confidence in home office or headquarters' views.
- 3) Build networks and partnerships that leap beyond internal hurdles.** Local players can act as the commercial arm to leverage distribution and sales capabilities that deliver strong top-line results. Research options of existing entities (affiliations, partners or M&As) to build geographic cover and portfolio breadth that ensures the right balance of assets and expertise.



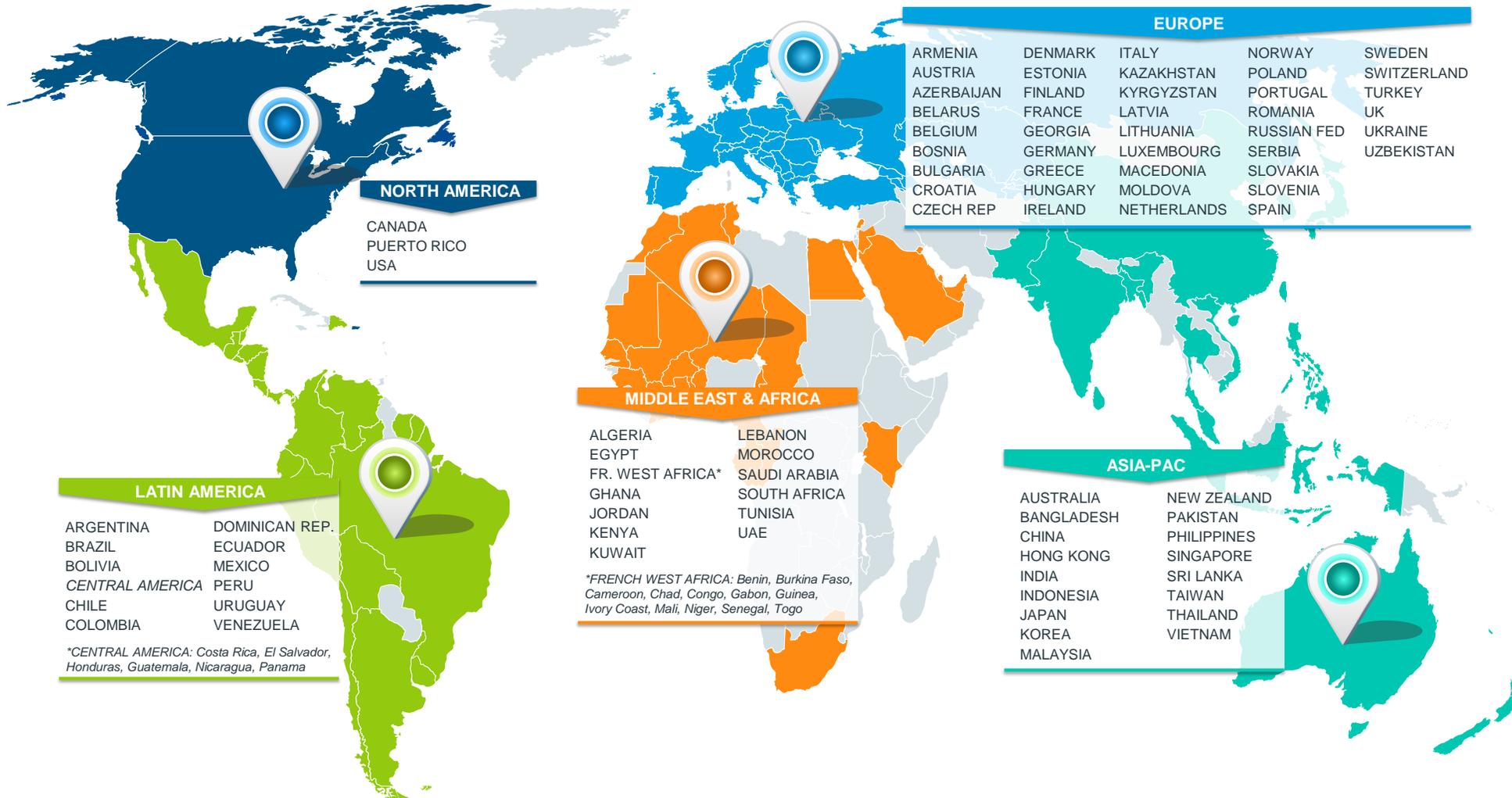
### Market Research Director / Business Intelligence

- 1) Recognize that not all markets are represented equally.** Data used routinely in developed countries are seldom available in all countries equally, and not all regions within a given country react similarly. Understand the local nature of the data you need and look to a partner who can help you with resources and insights that enable informed decisions.
- 2) Utilize secondary insights to make PMR go further.** Supplement or substitute primary market research (PMR) with secondary or syndicated information to guide and improve primary results. PMR coupled with secondary data can help better define research requirements and focus on efficiency and efficacy in attaining results.
- 3) Leverage data and analytic expertise.** As a resource for internal operations, MR and BI can provide greater impact by moving well beyond descriptions and interpretations of past performance by entering the realm of predictive and prescriptive analytics. Look for these embedded with rich data assets to enable advanced forecasting, specialty and therapy level understanding, machine learning and other advanced analytics.

+ Country or Local Directors and Leaders

# Sales & Prescription Data Availability by Region

Precision data can positively impact global, regional and local markets and business results



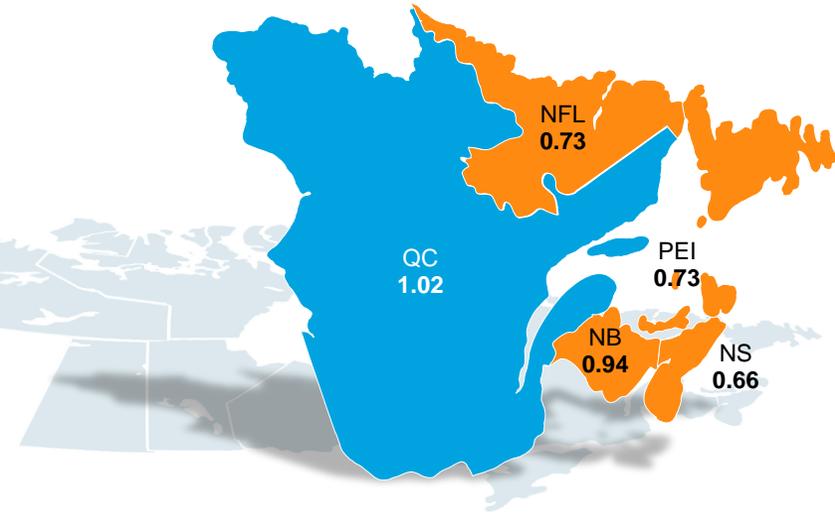
Sales & Prescription Data Types
Retail, dispensed Rx
Dispensed Rx at prescriber level
Movement of packs and prescriptions
All major channels: Retail, Mail, Hospital, Clinics, Long-term Care, HMOs, Others
Sourced from pharma, wholesalers, institutions
Direct & indirect sales
Daily, weekly, monthly, quarterly frequencies
National, sub-national
Multiple attributes

# Identifying the Right Influencers:

*Provider alignment*

## New faces drive treatment

Quebec and Atlantic provinces show higher prescribing rates from non-traditional writers than national per capita average of 0.57



Canada's non-traditional prescribers expanding

## New influences abound



67% physicians



74% hospitals

Integrated Delivery Networks affiliated with majority of US providers

# THE RIGHT INFLUENCERS

Broad changes are impacting healthcare professionals globally—though how these play out depend largely on the local landscape.

## US Nurse Practitioners & Physician Assistants

doubled Rx's written in the past 5 years.

NP & PAs = 22% of US HCPs (healthcare professionals)



## Transparency & compliance intensifying

Increasing regulations ensure ethical interactions with physicians

Q1 2016 41 DISCLOSURE TEMPLATES

VS

Q1 2017 72 DISCLOSURE TEMPLATES

Global growth in Disclosure Reporting

## Specialists concentrate by market

NEARLY 4 OF 10 PHYSICIANS IN BALTIC REGION PRACTICE IN 8 SPECIALTIES

Pediatrics, Obstetrics & Gynecology, Cardiology, Neurology, Psychiatry, General Surgery, Ophthalmology, Orthopedics



## HCPs are on the move

Physicians in Turkey and Tunisia illustrate rapid and regular shifts in care delivery sites



## Identifying the Right Influencers: Provider alignment

Across the globe, the profiles of healthcare professionals are fluctuating significantly over relatively short time periods, requiring precision information and alignment with the right prescribers. While healthcare delivery depends on a country's structure, economy and politics, a few common trends are changing the faces of prescribers globally—though how these play out depend largely on the local landscape.

For those delivering care on the front lines, change is not new. Yet, it underscores a complex challenge for those attempting to precisely track the details and definitions of this quickly shifting group. Based on our experience with healthcare professional (HCP) data in more than 100 countries, including more than 15 million HCPs, the following trends are having pronounced impact on pharma commercial models and are making precision alignment with the right HCPs an imperative.

- **Definitions of healthcare professional are broadening.** The definition of care delivery has expanded to embrace new types of clinicians as the global physician shortage grows, patients demand more and technology alternatives take hold.
- **HCPs are on the move.** In response to policy and market forces, physicians and other HCPs are switching affiliations and specialties in growing numbers, creating an increasingly dynamic marketplace.
- **New influences abound.** New stakeholders, policy makers, payers and organizations are increasingly mandating what doctors can prescribe, yet HCPs are asked to take a more active and accountable role than they have in the past.

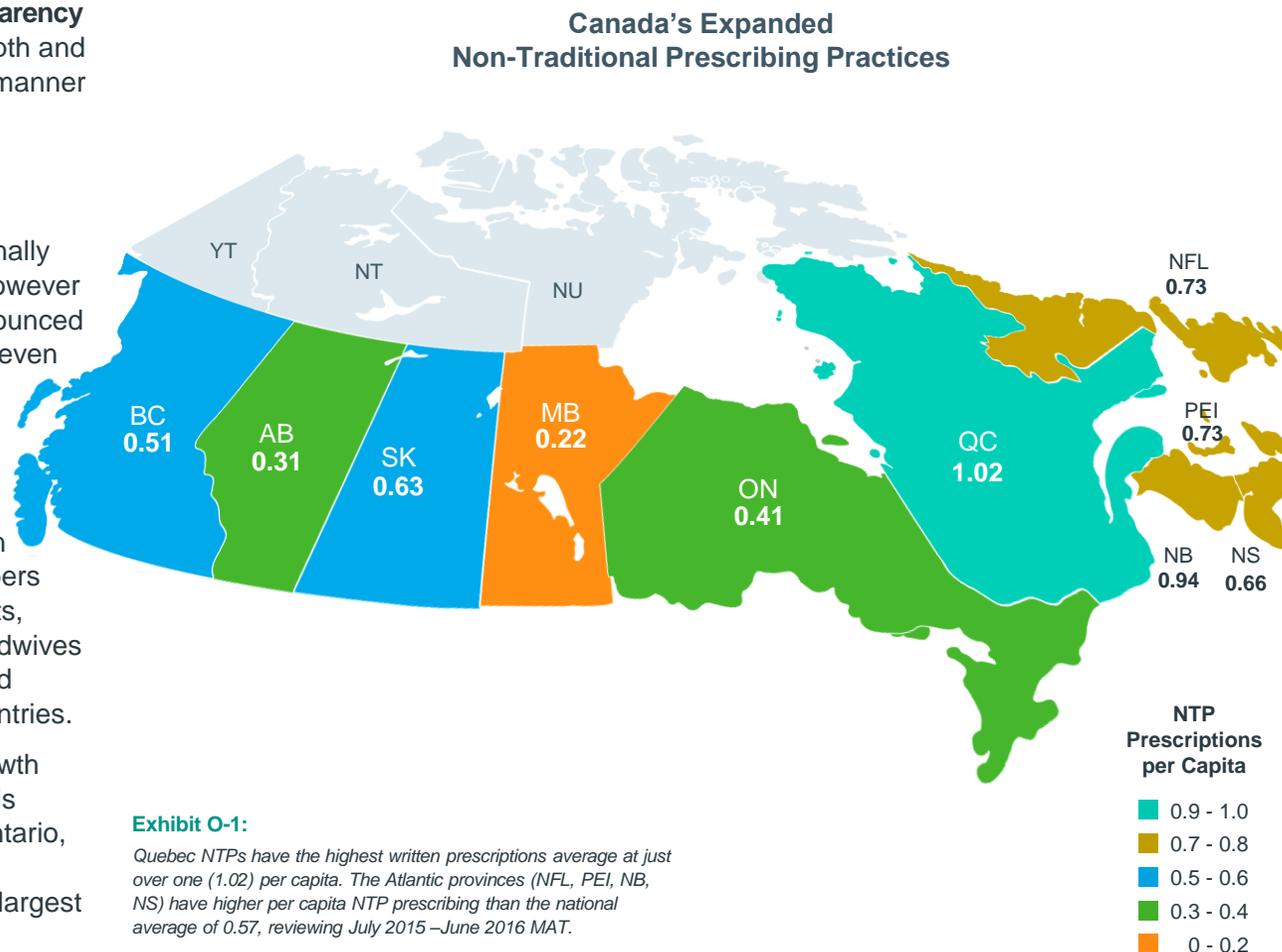
- **Regulatory compliance and transparency is spreading,** requiring precise depth and breadth to manage specificity in a manner that harmonizes both.

### The Changing Definition of Healthcare Professional

Safe, appropriate medication traditionally requires treatment by a physician. However emerging markets often have a pronounced lack of doctors in some regions, and even developed markets are experiencing physician shortages.

As a result, many countries have introduced legislation expanding prescribing authority to non-physician HCPs. These non-traditional prescribers (NTPs), including nurses, pharmacists, physician assistants, paramedics, midwives and others, are filling the demand and showing marked growth in many countries.

In Canada, an evaluation of NTP growth shows differing provincial legislation is resulting in a varied landscape. In Ontario, nurses are drivers of NTPs. While in Quebec, pharmacists have seen the largest NTP growth (Ex. O-1). ↓



#### Exhibit O-1:

Quebec NTPs have the highest written prescriptions average at just over one (1.02) per capita. The Atlantic provinces (NFL, PEI, NB, NS) have higher per capita NTP prescribing than the national average of 0.57, reviewing July 2015 – June 2016 MAT.

Source: IQVIA (QuintilesIMS) OneKey, Jun 2016

In the US, Nurse Practitioners (NPs) and Physician Assistants (PAs) have more than doubled the prescriptions written over the past 5 years. Nationally, NPs and PAs make up 22% of the HCP workforce, however not with equal prescribing authority in all states. The expansion of US prescribing authority has also begun in other HCP types, e.g. psychologists, pharmacists and naturopaths (Ex. O-2).

On the other side of the Atlantic, e-prescriptions and generics are impacting doctors' prescribing power and increasing the role of pharmacists especially for reimbursed drugs across Europe. In the Baltic region, Lithuanian pharmacists play a leading role in deciding which product is actually dispensed. And in Latvia, generics only are prescribed for newly diagnosed patients.

### HCP Shifts and Concentrations

Given healthcare reform across the globe, it's not surprising physicians and HCPs are looking to medical specialties for professional development, as well as stability and quality of life.

In terms of specialty concentrations, the numbers in the Baltics illustrate a growing trend. Though Estonia has roughly half the population of Lithuania, both have nearly 4 in 10 physicians concentrated in eight specialty areas. This leaves Lithuania with a little over one-quarter of its physicians in all other specialties combined—a trend expected to

continue and be seen in other EMEA countries as well (Ex. O-3).

In the Asian region, Indonesia's HCP concentrations are geographic in nature, challenging the central government's proposal to provide universal healthcare to its citizens by 2019. National coverage presumes physicians will be co-located with patients. Yet across Indonesia, the distribution of doctors is highly unequal, with specialists concentrated in the largest cities. Comparing the doctor ratio of 5:1 for general practitioners and 25:1 for specialists in Bali versus Jayapura illustrates the inequity. Thus healthcare access is significantly limited for the majority of rural Indonesians.

Looking at representative countries where the percentage of HCP movement is in the double digits shows significant shifts in a relatively short time. Notably, nearly 25% of physicians in the Baltic region have shifted over a one year period, with others in the EMEA region also showing considerable movement (Ex. O-4). While physicians move the most, nurses, pharmacists, midwives and dentists shift with regularity. As these represent only year-over-year deltas, it is reasonable to assume changes will compound with time, and therefore increase the requirements for precision alignment with HPCs and their organizations. ↓

### US Liberal and Limited Prescribing Practices by State

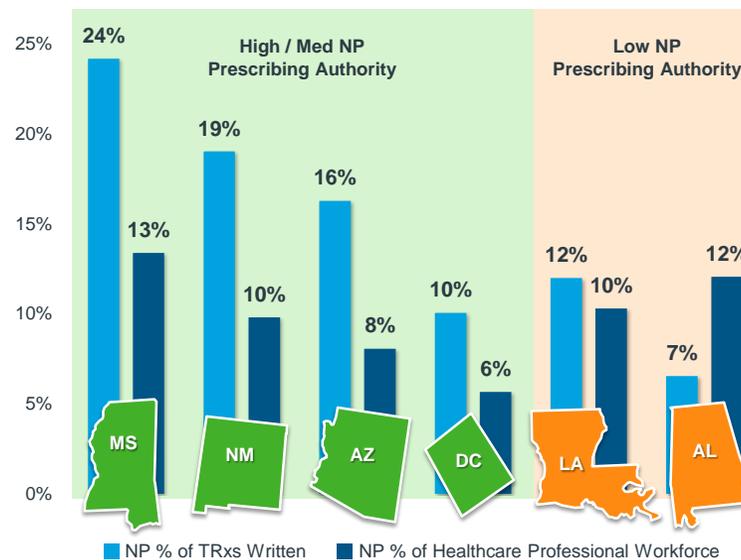


Exhibit O-2:

Many US states have expanded prescribing authority for Nurse Practitioners (NP), especially those with significant HCP shortages. More than 17% of states have fully expanded prescribing authority to NPs, though in some states prescribing remains restricted.

Source: US Census Bureau, Dec 2015; IMS Health, Xponent, Jan 2016; Healthcare Relational Services, IQVIA (QuintilesIMS) Institute, Mar 2016; HSRA, Dec 2015

### Concentration of Specialties in the Baltic Region

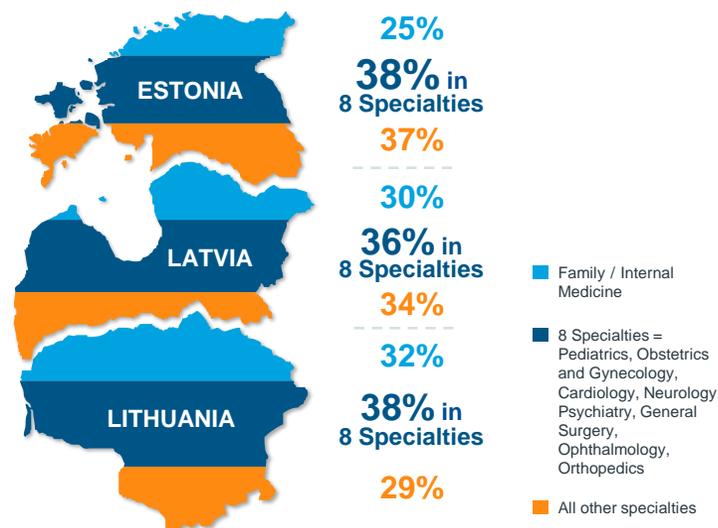


Exhibit O-3:

Though overall stability holds given the number of specialists versus traditional physicians over the past five years, deeper insights show concentration in eight specialties. In the coming years, the role of specialists in the Baltics will likely continue to increase as a result of increasing patient populations and innovative therapies.

Source: IQVIA (QuintilesIMS) OneKey. Apr 2017

### Healthcare Influences Grow

While individual patients and physicians may still make treatment decisions, they do so now under the influence of multiple stakeholders—many of whom are growing considerably in number and clout.

Physicians have options when prescribing treatments, however recommended protocols, pathways and formularies rely on top-down administrative mechanisms.

Although these can be overruled by individual doctors, often usage and treatment patterns vary from region to region, providing evidence of influence from regional provider administrators, policy makers, pharmacy benefit managers and payers (both private and public). Entities, such as Accountable Care Organizations and Integrated Delivery Networks (IDNs) in the US, are shifting power and requiring the industry to better align commercial approaches with these new influencers.

Most US states have seen HCPs increasingly affiliated with IDNs since 2010 (Ex. O-5). Ten states have experienced growth in HCP/IDN affiliations of 10% or greater in the last five years. In the US, 67% of all physicians are part of an IDN, as are 74% of all US hospitals. IDNs influence protocols with direct “class level” prescribing controls and indirect bottom-up conditions that impact brand pull through. IDNs often vary influence by disease and differ in “control” levels across the regions the central IDN serves. Some IDNs are more prevalent

in certain regions of the US, where they are expanding to payer roles as they become powerful catalysts for change.

Outside western countries, HCP affiliations are less structured, but links to hospitals, clinics and practices illustrate local intricacies. In a Baltic example again, half of all Latvian doctors work in Opencare Clinics and an additional 21% practice in both clinics and hospitals. Yet, Estonia’s hospital-only doctors are the highest portion in the region. Meaning, a large and growing number work

Percentage of HCPs on the Move in One Year (2015/2016)  
Sample of High Change Rate Data

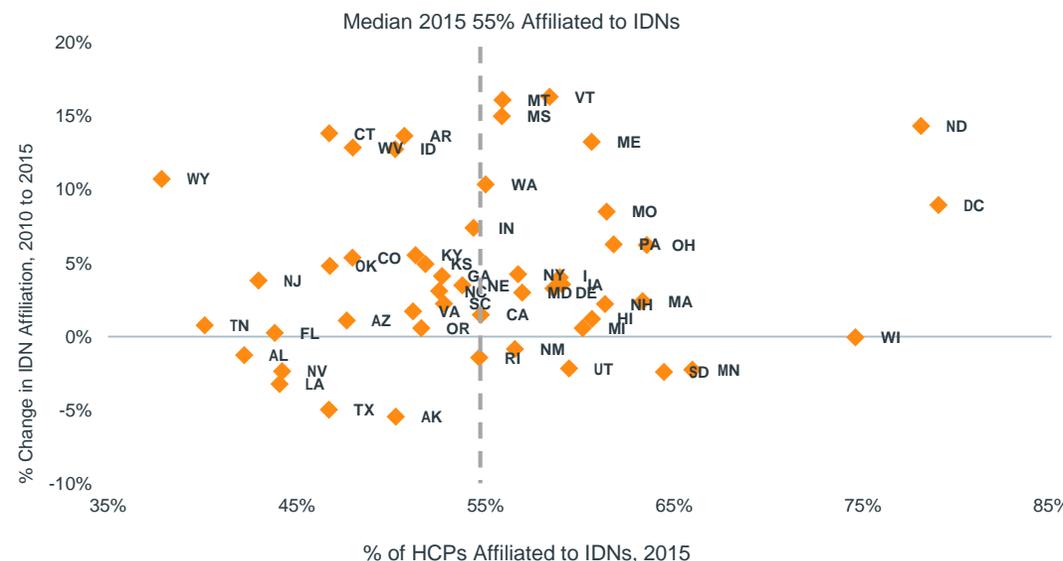
All HCPs	Baltic (LV, LT, EE)	Tunisia	Turkey	Greece
Physician	24.15%	17.08%	18.77%	14.90%
Nurse	18.66	1.10	2.04	6.46
Pharmacist	8.67	2.45	2.21	5.41
Midwife	14.97	7.22	1.33	2.68
Dentist	10.58	5.74	10.63	3.14
Paramedic	8.21	0	2.49	3.11
Administrative	0.64	11.46	0.72	7.79
Other	5.40	0	0.47	3.26
Veterinary	0.00	-	9.22	0.21
TOTAL MKT SHIFT	19.26%	13.25%	12.35%	10.60%

**Exhibit O-4:**

Looking at just year over year data, the movement of HCPs is sizeable and most significant within the physician category. This constant movement produces an increasingly dynamic marketplace for life science companies focusing on professionals in changing markets.

Source: IQVIA (QuintilesIMS) OneKey, Mar 2017

Affiliations of HCPs with Integrated Delivery Networks  
Continues to Grow in Most US States



**Exhibit O-5:**

Looking at a five-year change, 76% of US states increased the level of HCP affiliation to IDNs. This growth supports IDN efforts to increase negotiating power with insurers, leverage economies of scale and drive pay for performance initiatives.

Source: IQVIA (QuintilesIMS) Healthcare Organizational Services; IQVIA (QuintilesIMS) Institute, Mar 2016

only where specialty therapies are used and patient access is often limited (Ex. O-6).

In other developed markets, stakeholder influences are extremely complex as noted in this UK example (Ex. O-7). For a pharma building a business case for an intravenous iron anemia service, the difficulty was discovered in trying to follow the payment flow within the National Health Service (NHS).

Following primary market research, efforts uncovered that it wasn't clear which NHS entity was responsible for paying for different elements of the service. Influencer Mapping highlighted the need to precisely identify the key stakeholders and influencers of these health services to maximize the probability that therapeutic interventions would reach patients.

### Transparency in HCP/HCO Reporting

Across the globe, regulatory and compliance requirements stem from similar universal goals of ensuring ethical contact and interaction with HCPs and Healthcare Organizations (HCOs).

Though mandates differ by country, as do policy change frequency, interactions with HCPs/HCOs increasingly require tracking, monitoring and reporting with both local specificity and regional breadth. A quick view of the past four quarters shows how significantly the number of required templates has grown and indicates the increasing number of countries requiring disclosure reporting (Ex. O-8). ☺

### Practice Location Differences Across the Baltic Region

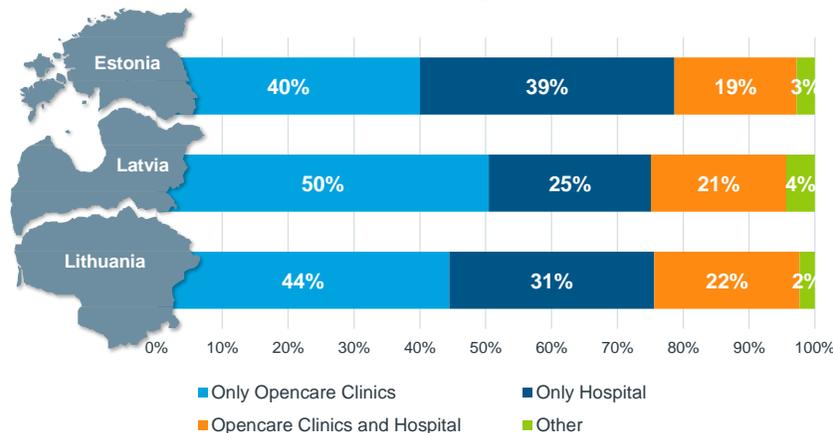


Exhibit O-6:

From one-quarter to more than one-third of Baltic region physicians practice only in hospitals settings, influencing patient therapy starts and follow up.

Source: IQVIA (QuintilesIMS) OneKey, Mar 2017

### Growth in Disclosure Reporting: Increased Geographical Coverage and Templates

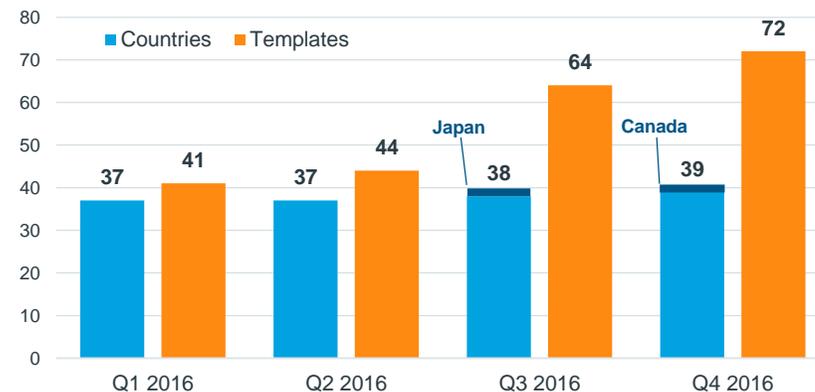


Exhibit O-8:

The evolution of countries and templates over the past 12 months shows transparency mandates growing significantly. Templates list the required information manufacturers must disclose on the transfers of value between the healthcare industry and HCPs/HCOs.

Source: IQVIA (QuintilesIMS) OneKey, Mar 2017; AggregateSpend360

### UK NHS Institutional & Professional Stakeholders: Intravenous Anemia Service

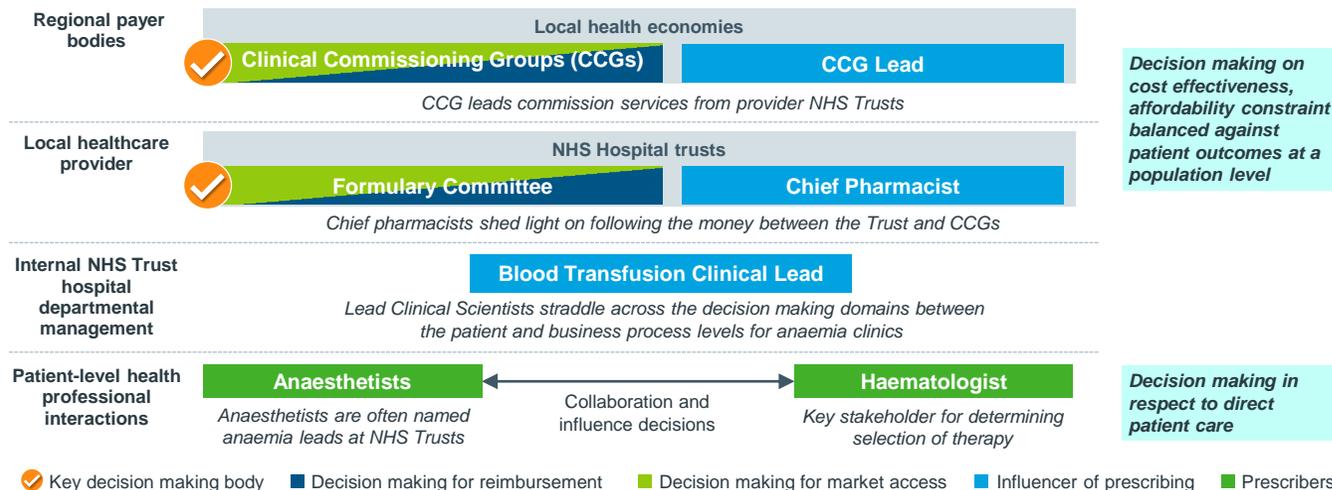


Exhibit O-7:

Within the single-payer system of the NHS, the influence of newly generated stakeholder entities or empowered professional groups can change rapidly and be difficult to follow. Often payer bodies make the final determination on funding of services within the NHS.

Source: IQVIA (QuintilesIMS) UK Market Access internal analysis, Jun 2017

# IDENTIFYING THE RIGHT RUSSIAN INFLUENCERS: Local provider turmoil in action

The Russian National Healthcare system has experienced upheaval since the move from the old Soviet Union's system. National changes have driven HCP turnover, by facility and by specialty. Morphing still, physicians continue to deal with government regulations and this shifting infrastructure.

Post-Soviet 1990s Russian healthcare was financed by federal and regional budgets that reimbursed hospitals, but did not cover costs. The bulk of reimbursements went to doctors as state employees. However, incentives for performance improvement and efficiency—and improved population health—were lacking given the low per capita health spending (and physician salaries) in comparison to developed countries.

By 2011, the Russian healthcare system was converted to single-channel insurance, with no government financing. Hospitals soon

began to experience financial troubles leading to the “May 2012 Decrees,” providing for privatization of state health services and physician salary increases by as much as 200% by 2018.

The majority of Russia’s regions were required to take unpopular measures, resulting in elimination of 35,000 beds, and closure of 76 clinics and 306 hospitals. Other actions included out-staffing, creating specialty hospitals, merging clinics and reducing staff, resulting in significant turnover in the Russian HCP base.

In 2015, another new regulation required patients to align to a medical institution and doctor (or a paramedic in rural areas). In this move to manage mergers, closures or expansions based on patient flow, hospitals and clinics were financed on a per capita basis and physician payment based on the number of people “attached” to each physician.

With 97% of insured Russians attached to a doctor, the Ministry of Health now believes its groundwork is strengthening doctor responsibility for patient health outcomes.

As Russian HCPs become more outcome-focused, medicine choice, prescribing and treatment recommendations will evolve as well. However, as patient alignment increases, physician time has become precious—allowing about 12 minutes per patient per visit. This is reducing medical representative access to HCPs and increasing the number of physicians refusing rep visits. Thus, global and local life sciences organizations are looking to remote detailing technology and other communication channels they had previously avoided. ☉

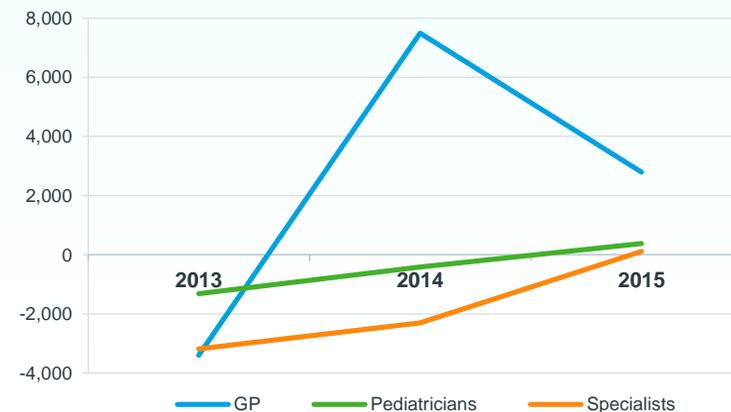
Russia: Top 5 HCP Specialties	%HCPs on the move (1 year)
Child and Youth Allergology	16.69%
Angiology	15.38%
Dialysis	14.57%
Urology	13.57%
Child Gastroenterology	13.25%

**Exhibit O-A:**

As a result of system upheaval, many GPs dismissed in 2013/2014 switched to a specialty. By 2015, a new pattern emerged, though specialties continue to shift even today.

Source: IQVIA (QuintilesIMS) OneKey, Jun 2017

**Shifting HCPs in Russia Based on Government Restructure**



**Exhibit O-B:**

By 2014, general practitioners and pediatricians began finding new employment, though not at a rate that matched earlier dismissals. Only specialists found employment at a higher rate than previous dismissals.

Source: IQVIA (QuintilesIMS) OneKey, Apr 2016

## Provider Alignment: Implications & impacts for life sciences performance

Commercial activities and analytics based on a precise picture of each provider not only enable intelligent reporting to inform the next best action across each commercial functions, but do so in real time with dependable accuracy and rich detail—regardless of level of specificity necessary.

Global / Regional / HQ



### Brand / Franchise / Marketing Directors and Leaders

- 1) Use dynamic profiling to track precise HCP details and corresponding market interactions.** As marketers move toward greater personalization, dynamic profiling is required to capture precise insights with regard to the prescribing potential of HCPs and their movement with and sensitivity to influencers, policies and market forces.
- 2) Ensure effective interface with CRMs and other systems.** Global and headquarter leaders must ensure HCP insights and corresponding CRM systems work with the level of specificity needed to effectively and efficiently use marketing automation, content deployment systems and websites, portals, call centers and other commercial systems. This may best be enabled via cloud-based technology.
- 3) Information management is foundational for orchestrated HCP interaction.** Work with IT to drive all HCP information into a common data warehouse, ensuring all have a consistent view with the precise details needed. This single version of the truth is critical to combining the automation of multichannel marketing with the human touch of field sales and advanced technologies, building to an Orchestrated Customer Engagement approach that can deepen HCP interaction and trust.



### Sales Operations Leaders and Sales Directors

- 1) Ensure a shared and integrated vision** and effective coordination across customer-facing functions and collaborators. A 360 degree perspective of each HCP with precise detail ensures informed views and aligned decisions.
- 2) Effective team selling and key account management are based upon comprehensive account intelligence.** Sale teams see value in data's ability to provide account profiling, pull through and account-based selling. Also, HCP attributes provide insight into the valuation and characterization of accounts.
- 3) Effective sales planning** relies on HCP data for sizing, territory alignment and other critical requirements. Globally or locally, a dynamic view of the precise healthcare ecosystem supports commercial activities and offers leaders the ability to link all aspects of an HCP.
- 4) Stay abreast of a constantly changing regulatory landscape.** Conforming to evolving regulatory guidelines across the globe is causing continuous realignment of pharma's compliance structures. Sales leaders should ensure field forces understand country-specific regulatory frameworks, as well as their own corporate strategy to drive understanding and efficiencies where possible.



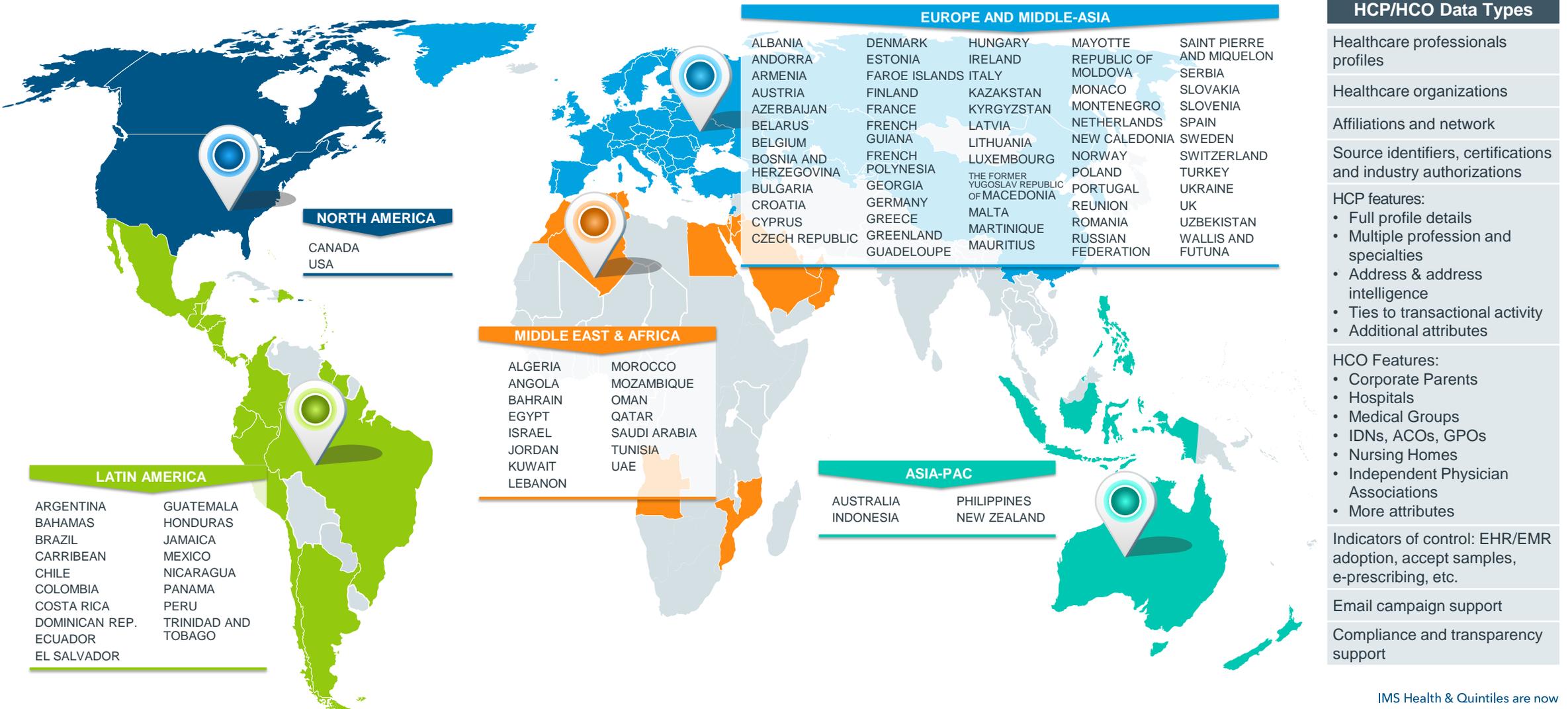
### Market Research Director / Business Intelligence

- 1) Take a holistic approach to defining HCPs, and harmonize global and local views.** A harmonized definition of HCPs is needed to determine best practices for understanding, targeting and measuring the right level of engagement across the HCP experience and across regions and entities—ideally in a common data warehouse. A harmonized 360 degree view of HCPs takes in global needs and accounts for local anomalies, so that local researchers work with the same profile data as global researchers for tracking, reporting, forecasting and other analyses.
- 2) Include a full 360 degree view at the HCP level—one that captures interactions,** both digital and traditional, in a master data driven system that allows tailored performance indicators in dashboard views for a variety of uses and internal clients. In addition, consideration must be given such that profile information remains compliant with all local and regional data privacy requirements.
- 3) Work with partners who can help you stay current** as regulation and transparency continue to impact nearly every brand. Individual nations and often regions seem to be drafting or adopting new legislation at an increasing pace.

+ Country or Local Directors and Leaders

# Healthcare Professionals & Organizations Data Availability by Region

Timely, precise insights into the specific healthcare professionals and organizations you need to make the most of opportunities in a complex, rapidly shifting environment



## HCP/HCO Data Types

- Healthcare professionals profiles
- Healthcare organizations
- Affiliations and network
- Source identifiers, certifications and industry authorizations
- HCP features:
  - Full profile details
  - Multiple profession and specialties
  - Address & address intelligence
  - Ties to transactional activity
  - Additional attributes
- HCO Features:
  - Corporate Parents
  - Hospitals
  - Medical Groups
  - IDNs, ACOs, GPOs
  - Nursing Homes
  - Independent Physician Associations
  - More attributes
- Indicators of control: EHR/EMR adoption, accept samples, e-prescribing, etc.
- Email campaign support
- Compliance and transparency support

# Making the Right Connections:

*Precision engagement*

## Sales force detailing reigns

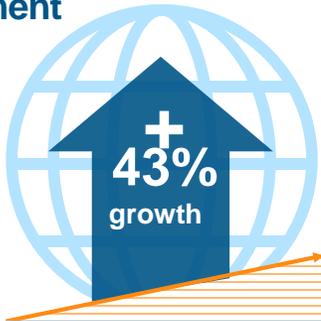
as principal channel of HCP engagement in all markets.



of marketing investment globally is spent on sales force support, despite their shrinking numbers.

## Digital investment rising, but adoption varies greatly across companies and geographies.

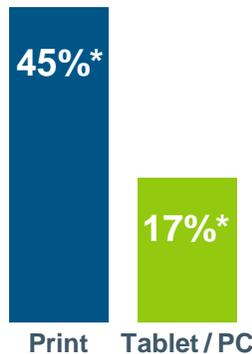
but adoption varies greatly across companies and geographies.



## Device uptake surprisingly slow in detailing

Sales reps continue to rely heavily on print versus tablets / PCs in face-to-face detailing.

\*18 country average (Europe, US, Brazil)



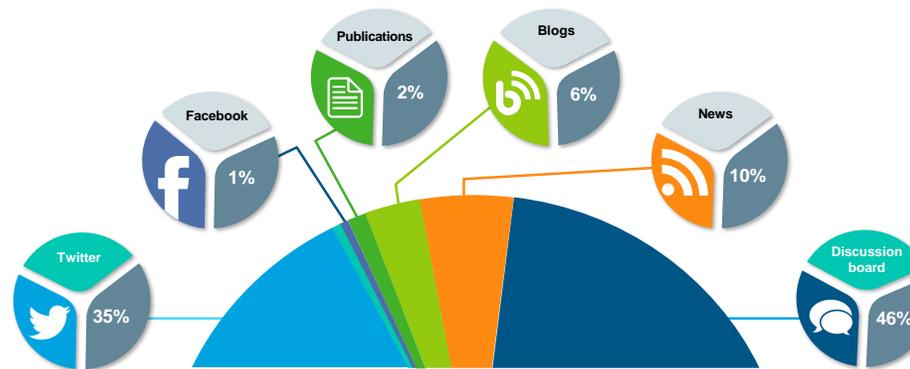
## Digital preferences vary widely

Physician access to and demand for digital is far from uniform across markets.



## Patients value real-time interaction

Patients are very open to accessing medical info online and using digital platforms to engage on healthcare topics.



# THE RIGHT CONNECTIONS

Many channels are used to engage customers, yet digital advances are showing promise, albeit slowly.

## Select digital channels show growth

Email widely used.

75%+

of digital contacts, except in Japan, China, Korea and Turkey



of virtual calls to Specialists took place at home

## Automated detailing is 81% OF THE DIGITAL MIX IN JAPAN

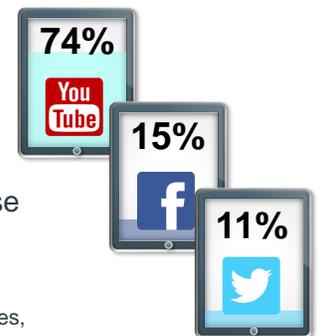
81%



## Pharmacos' use of Social Media is limited

Major companies use YouTube, less use Twitter & Facebook.

(Average across 18 countries, Europe, US, Brazil)



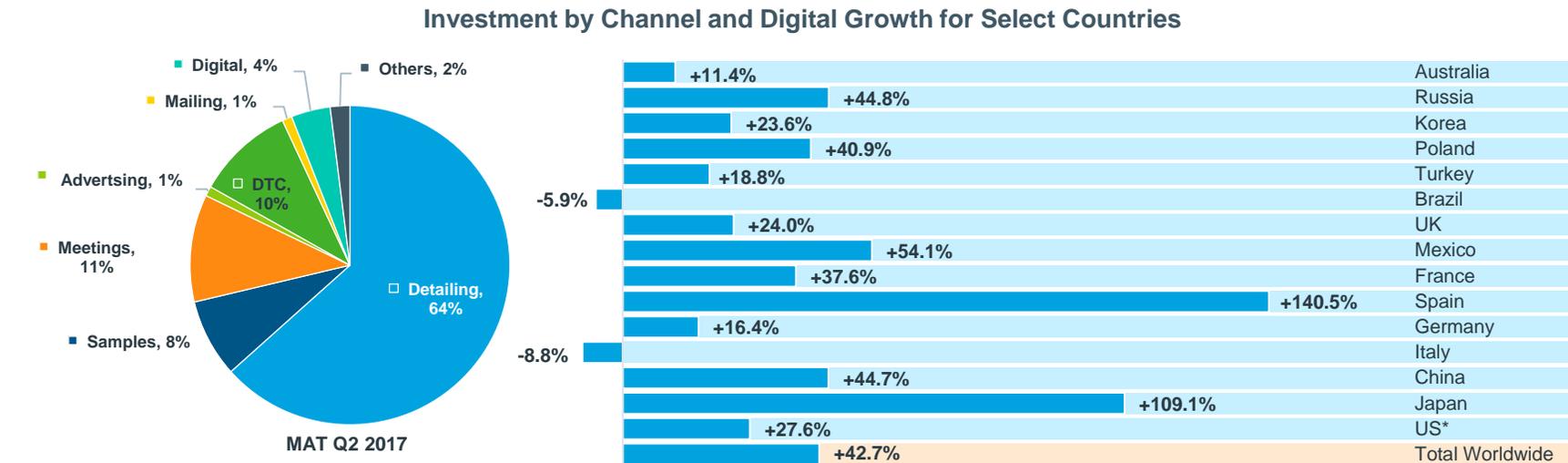
# Making the Right Connections: Precision engagement

Traditional commercial models are facing fundamental challenges and transformative opportunities with the rapid advances in digital communication technology. Enriched interaction options and easy access to content through digital channels offers pharma more ways than ever to engage with audiences with the precise connections they demand.

Digital resources are revolutionizing pharma—and the world—in ways other trends haven't, because they offer more information sources and open more channels for connection.

The past five years have seen an explosion of opportunity for digital interaction with healthcare professionals (HCP), patients, payers and the public, thanks to infrastructure growth. These advances have in turn spurred global responses and disparate local trends, two of which are notable.

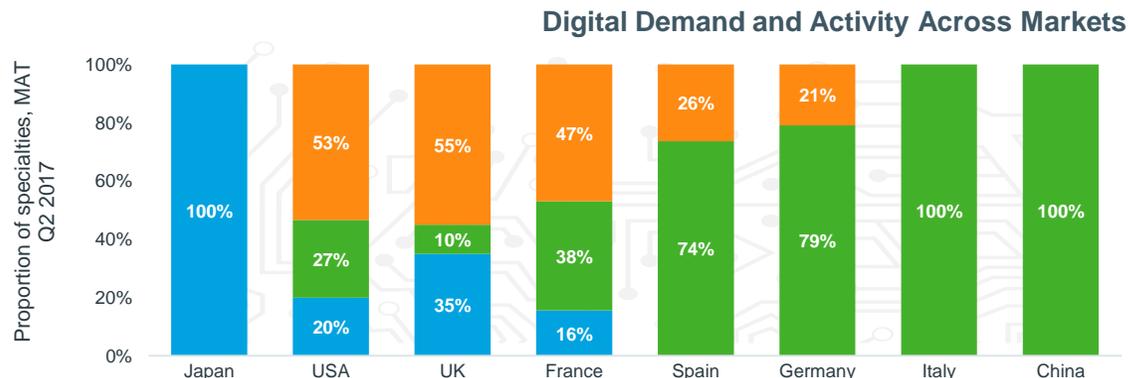
- **Preferences vary widely.** The share of digital interaction varies greatly between HCP groups and within countries.
- **Uptake of digital in pharma is still surprisingly slow.** While some companies, brands and campaigns are making inroads, there still appears to be sluggish growth and wide variation by country and by tactic in the digital channel mix. This is particularly interesting given the pace of HCP movement noted earlier, combined with the rapid technology advances of late. ↓



**Exhibit CD-1:**

Though sales force detailing is still very strong, digital investment has seen consistent double digit growth and increase through 2016 and into 2017 across all geographies. The pace may slow over the next few years as some markets reach saturation.

Source: IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017\* (\*2015 values)



**Exhibit CD-2:**

Evidence shows HCPs in general would prefer more digital interaction than they receive in 4 of 8 countries. Not only does each country's digital maturity impact demand, preferences within therapy areas also drive digital communication efforts and expectations.

Source: IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017; QuintilesIMS ChannelDynamics Channel Preference Survey June-July 2017

- Digital activity exceeding demand
- Digital activity falling short of demand
- Digital activity meeting demand (within ± 10%)

**Variability of Digital Preference & Activity**

As evidenced by investments, digital engagement is rising, however it's far from uniform (Ex. CD-1). Where digital channels have become mainstream—Japan, the US and the UK, many HCPs still prefer nondigital channels. In Italy, Spain, Germany and China (an emerging market), demand is not met (Ex. CD-2).

Japan, the most digitally advanced market, shows signs of digital saturation—most

HCPs prefer less digital interaction according to research<sup>1</sup>. Conversely, EU countries see limited digital activity, revealing a lack of sophistication despite high demand among HCPs for more digital.

Engagement preferences are also seen by therapy area. Diabetologists, cardiologists and rheumatologists see particularly high levels of digital activity in the US. Yet, these groups reveal demand for digital resources is not being met. Meanwhile, internists in

Germany report more digital than preferred, though other German specialists want more than currently received.

In countries where digital activity is not meeting demand, the challenge may include buy-in from sales representatives. Digital is often seen as a challenge to carefully built physician relationships and sales functions. However, ROI is not a question of personal versus digital. Solid multichannel marketing (MCM) enhances rep activity. What's more,

convenience and the ability to fit into busy schedules are among the reasons HCPs like digital engagement, specifically e-detailing (Ex. CD-3). This opens more hours and connections to sales reps with greater opportunities to share content.

Ultimately, the goal of digital strategies is to enable expanded coverage and contact frequency—ideally more effectively via a choice of engagement channels and connections. Nevertheless, research<sup>1</sup> ↓

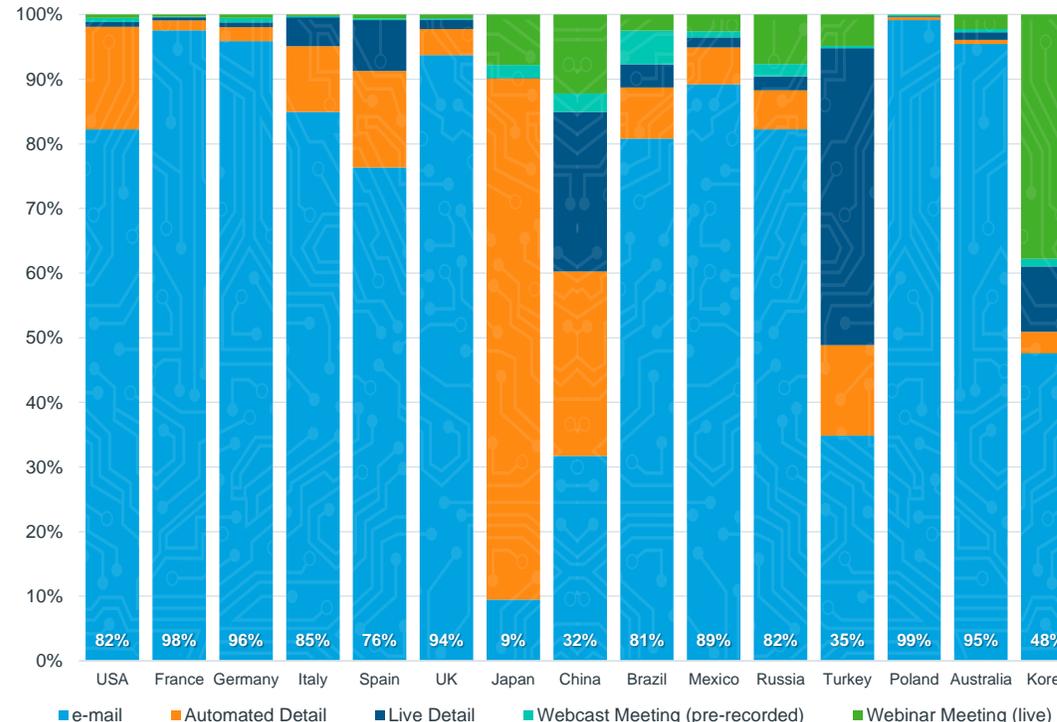
**Benefits of e-Detailing with HCPs in the UK and Spain**



**Exhibit CD-3:**  
Digital options appeal to doctors at home and at work, given mobile access, workload, regulation and convenience. Increase is expected, especially in the EU and "pharmerging" countries as digital sophistication increases.

**Source:** HCPs surveyed by QuintilesIMS as part of four QuintilesIMS e-rep projects in the UK and Spain; IQVIA (QuintilesIMS) Whitepaper: Channel Preference Versus Promotional Reality, The core challenge of multichannel marketing, 2016

**Digital Channel Mix Varies by Country (MAT Q2 2017)**



**Exhibit CD-4:**  
Automated digital channels generally show the highest volume of interactions, but there is variance. Email represents most of the digital contacts except in Japan, where automated detailing is disproportionately high.

**Source:** IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017

suggests this isn't happening—not in countries with strong digital share (Japan), nor in those with low digital share (Italy, Germany, China).

### Slow Digital Transformation

While debate about multichannel marketing and “omnichannel” experience continues in other industries, pharma’s use of digital tactics appears relatively nascent. The most-used

digital contacts include email, e-detailing and webinars/webcasts (Ex. CD-4). Preference rates for certain digital channels could be a function of the technologies of pharmacos in a given country, shifting prescriber preferences and/or relative channel costs.

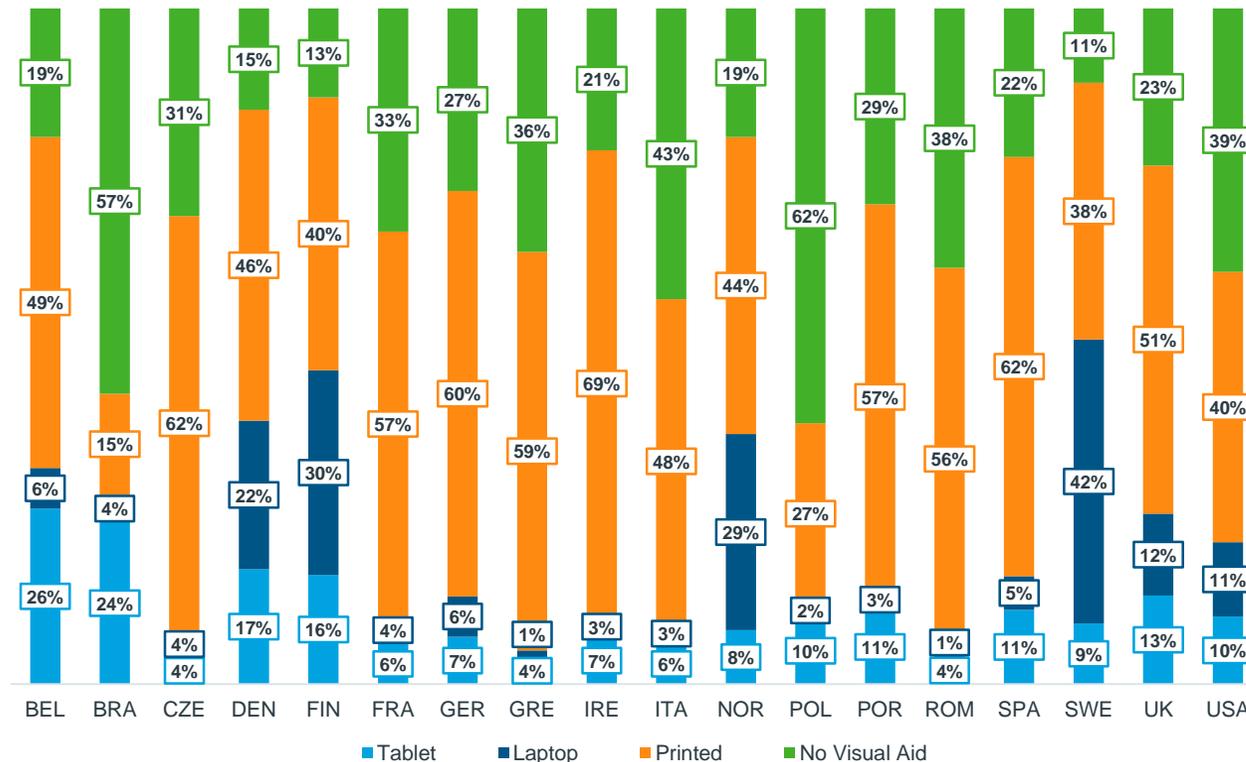
In Japan, as elsewhere, automated details may be delivered via pharma-owned web sites or via dedicated doctor portals. One such portal sees high physician engagement in

Japan leading many to route automated details via this platform. Automated details are also a growing share of volume in the US, Spain and Italy.

Looking at face-to-face detailing, the frequency of mobile device use by sales reps remains low according to IQVIA research<sup>1</sup>. While most sales forces are equipped with such devices, survey data reveal their use has by no means replaced paper support.

Belgium (32%) and the Nordic countries (37%-51%) show increased levels of PC /tablet use in calls. Other developed countries, such as the US and UK, show lower levels of tablet/laptop use, about 21% and 25% respectively—especially interesting given their digital maturity (Ex. CD-5). Regardless, results reveal device use positively impacts prescription intent (Ex. CD-6). ↓

Tablets vs Paper: Reps Use Printed Material More



**Exhibit CD-5:**  
Printed material remains widely used as detail support and far surpasses tablet detailing—an indicator of preference and convenience.

Source: IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017

Impact of Detail Support Material on Rx Intent (MAT Q2 2017)

	Visual Aid Type			
	Tablet	Laptop	Printed	No Visual Aid
BEL	58%	57%	56%	46%
BRA	50%	46%	60%	44%
CZE	49%	52%	47%	24%
DEN	56%	56%	51%	45%
FIN	52%	54%	50%	48%
FRA	55%	41%	47%	36%
GER	43%	48%	47%	30%
GRE	42%	60%	47%	38%
IRE	65%	46%	70%	46%
ITA	57%	59%	62%	49%
POR	63%	63%	45%	52%
ROM	63%	57%	68%	62%
SPA	55%	43%	54%	42%
SWE	46%	51%	59%	63%
UK	46%	51%	51%	39%
US	55%	59%	74%	65%

**Exhibit CD-6:**  
The majority of HCPs report higher intent to prescribe following laptop or tablet detailing interactions. Most HCPs report higher intent based on paper detailing, except in Denmark, France, Greece and Portugal where laptops or PCs are preferred by a margin of more than +2%.

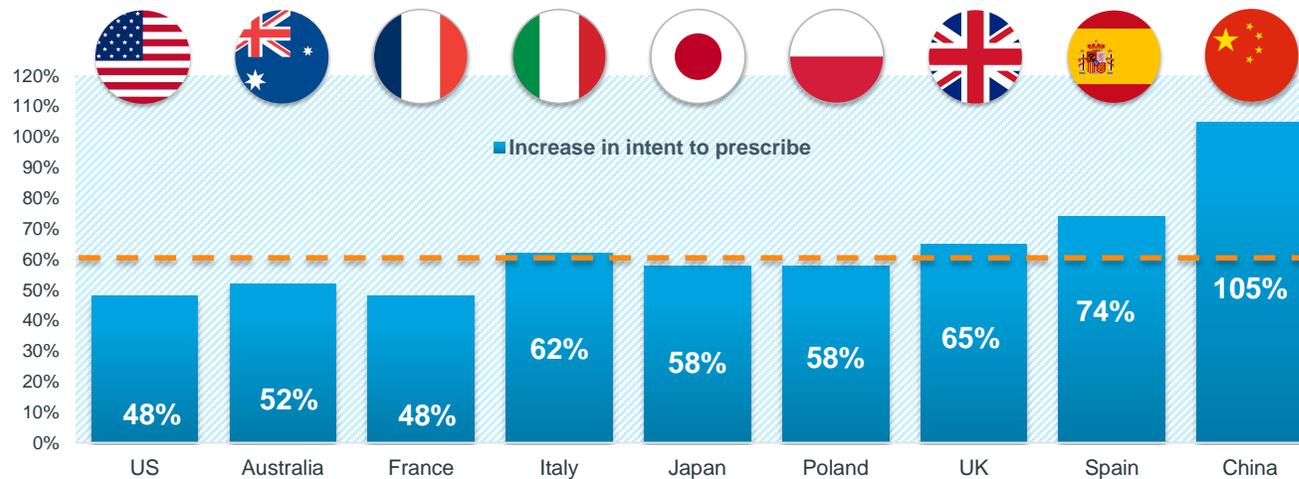
Source: IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017

Research also shows variations between countries on the effectiveness of digital engagement across countries (Ex. CD-7). There are only two major countries for which the effectiveness of digital is below half that of traditional contacts, the US and France. At the upper half of the spectrum, six countries see digital contacts near or more than 60% as effective as traditional connections. The pharmerging example, China, shows digital impact much higher than traditional contact (it should be noted China is not alone among pharmerging markets in this respect. Mexico and Brazil do also, by 137% and 97% respectively.)

While digital use is growing at different rates, it's worth noting here that some life sciences companies are beginning to go the extra mile to engage HCPs in more meaningful ways using Orchestrated Customer Engagement (OCE). This strategy helps align sales and marketing functions, and integrate HCP-engagement activities across the organization, supported via a foundation of robust information management.

OCE combines the automation of multichannel marketing with traditional sales efforts using advanced technology to improve and deepen HCP engagement. In doing this, companies gain the ability to manage an increasingly complex mix of communication channels, run effective campaigns using precise HCP preferences and use data and analytics to provide targeted messages. ↓

### Effectiveness of Digital Contacts Across Select Markets (MAT Q2 2017)

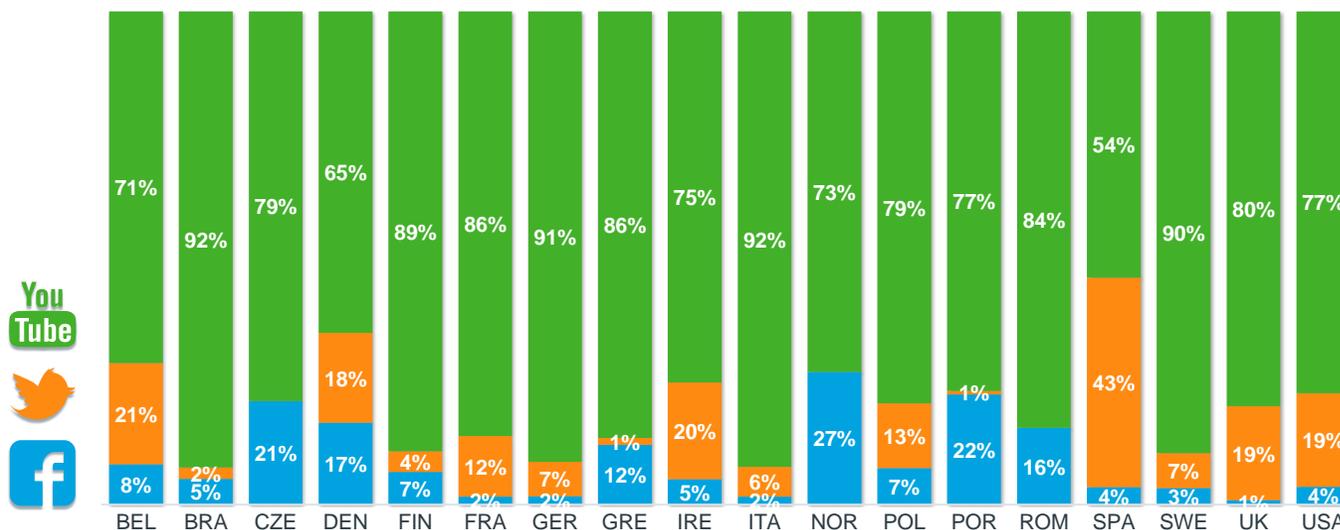


**Exhibit CD-7:**

The impact of digital contacts on intent to prescribe relative to traditional contacts shows that digital contacts proved to have about 60% or greater effectiveness versus traditional contacts in most markets. What could the effectiveness be if combined with sales force efforts?

Source: IQVIA (QuintilesIMS) whitepaper, The Essential European Revolution: Why Multichannel is Vital to Europe, 2016, with data updates of 2017

### Social Media Spending in Select EU and US Markets (MAT Q2 2017)



**Exhibit CD-8:**

Most major pharma companies make use of dedicated YouTube channels to distribute disease area and PR content. Twitter and Facebook are also in broad use, but brand level communication is typically limited.

Source: IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017

### Limited Use of Social Media Continues

Use of other digital channels, such as social media—even for the most popular Twitter and Facebook apps—are far from becoming integrated standards. However, use of YouTube to stream content for both HCPs and patients is significant with nearly all big pharma companies using dedicated YouTube channels (Ex. CD-8).

For digital connections with patients, social media and networking sites provide significant amounts of rapidly evolving content. The key difference with patients in accessing digital content is the nature of information “pull” from channels versus the traditional “push” of content from pharma-owned sites and promotions.

Patients also value real-time interaction as discussion boards, followed by Twitter, are

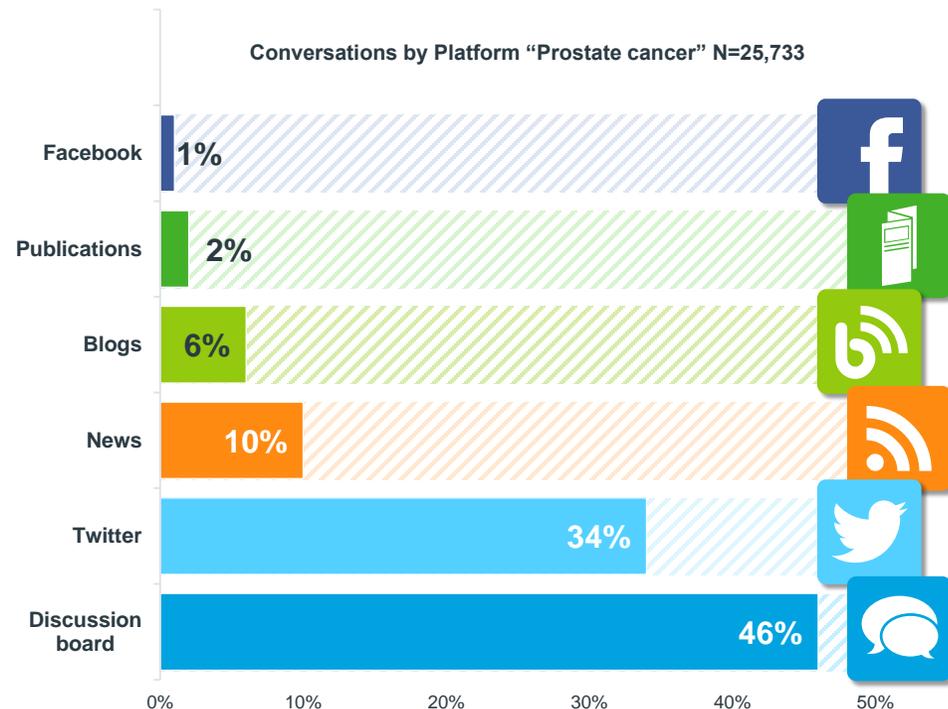
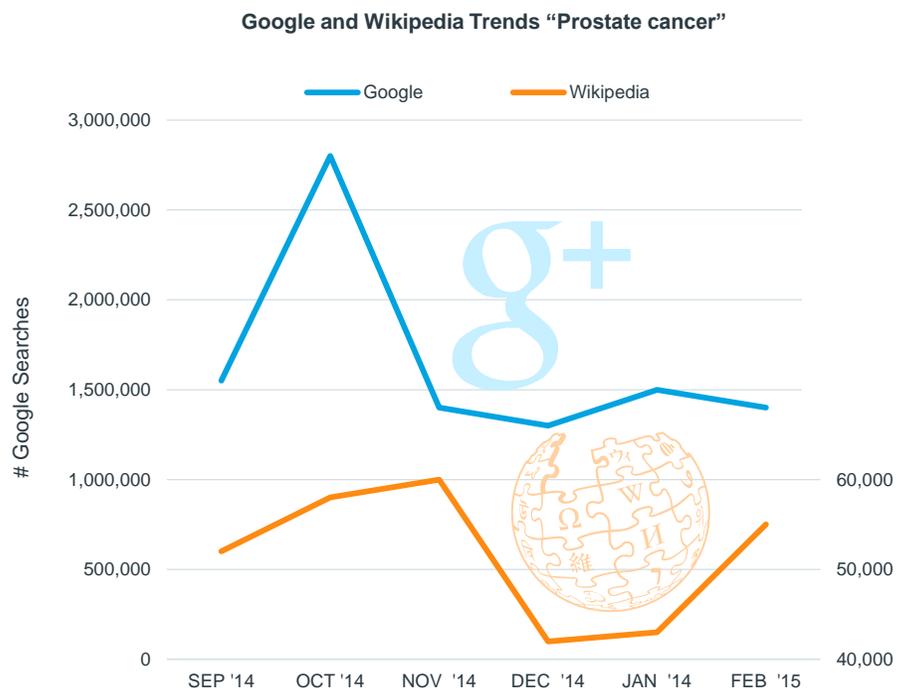
the leading channels for drug brand conversations (Ex. CD-9).

Ultimately, mobile, connected and “always on” customers will increasingly demand high quality digital engagement. This means reworking commercial models embedded in the pharma industry for more than five decades.

What’s more, the pace of technological advancements will challenge

organizations—and budgets—to keep pace. However, technology will not be the change agent. HCPs, patients and the public will push for a constantly improving digital environment, requiring pharma to focus on the customer experience in an integrated manner that includes both digital and non-digital channels. ☉

### A Range of Social Media Sites Used by Patients Pulling Information



#### Exhibit CD-9:

Using prostate cancer as an example, Wikipedia and Google searches show varying volumes of social media activity. Interactive discussion boards and Twitter show highest use.

Source: IMS Health: Nexus Social, Sept 2014-Feb 2015

<sup>1</sup> IQVIA (QuintilesIMS) ChannelDynamics™ survey of a range of HCPs across 35 countries; IQVIA (QuintilesIMS) Channel Preference Versus Promotional Reality, The core challenge of multichannel marketing., 2016

# MAKING THE RIGHT CONNECTIONS IN BRAZIL: Innovative engagement is on the rise

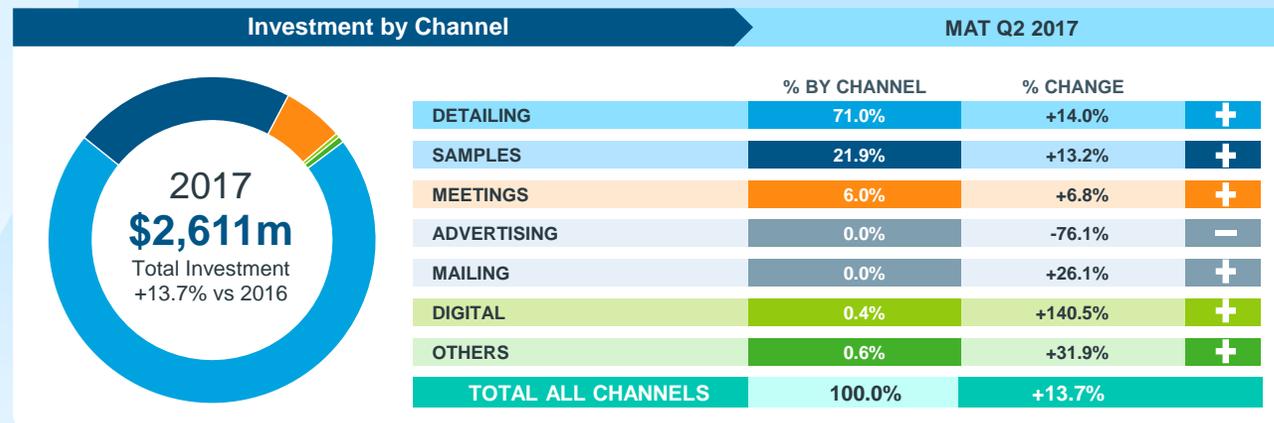
The use of digital channels for HCP engagement in Brazil remains relatively limited. Nevertheless, increased deployment and successful case studies in recent years herald a promising outlook for multichannel connections in this market.

In Brazil, the pharmaceutical industry has shown steady progress with regard to the use of digital in medical promotion. However, adoption is evolving with traditional tactics remaining firmly in place. For example in face-to-face interactions, the use of mobile devices and laptops haven't quite exceeded printed material as most commonly used detail support, but they have exceeded the use of no materials.

Meanwhile, access to digital content has increased rapidly in recent years and has seen many physicians take advantage of online resources. As a result, pharma are now experimenting with non-traditional channels. Pharma webcasts, webinars and e-mail marketing are helping to propel multichannel promotion and are generating prescribing intent at similar, and sometimes higher, rates than traditional interactions.

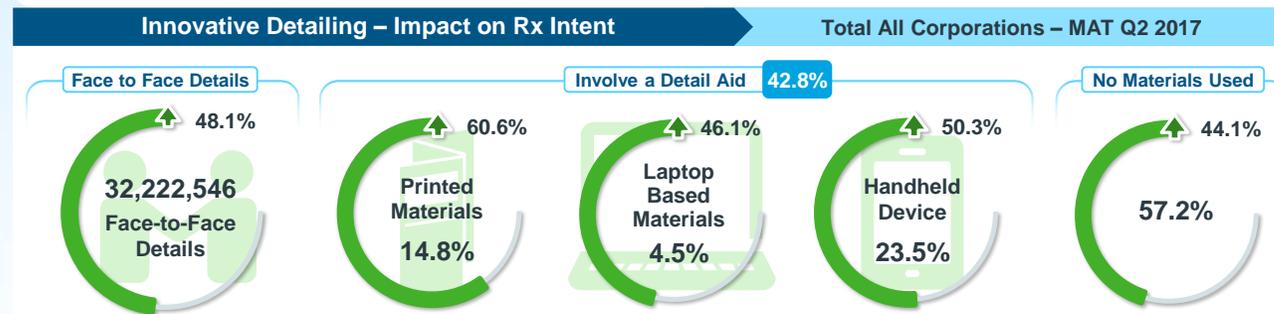
Despite favorable figures, the amount invested in digital remains low in Brazil. In this expansive and geographically-diverse country where distances are often a barrier for traditional sales teams, there is much opportunity for digital development.

Remote detailing and digital engagement efforts have the potential to be cost effective and serve as a valuable complement to traditional channels in a truly integrated multichannel commercial strategy. ☉



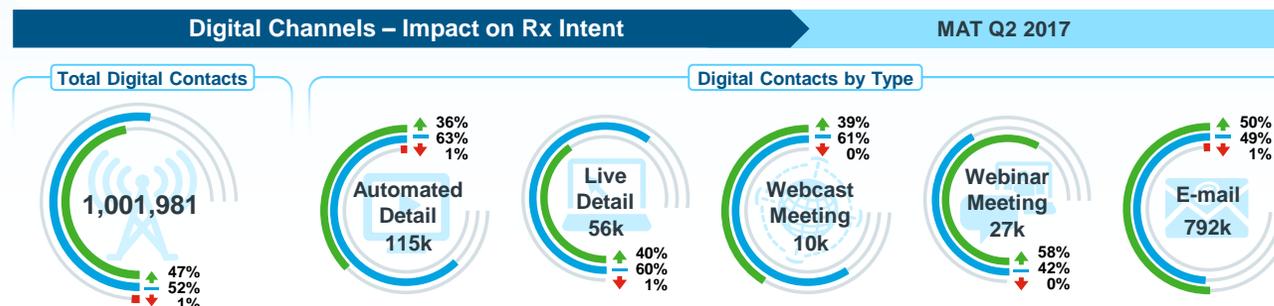
**Exhibit CD-A:**

While representing only a small portion of overall promotional investment, digital channels grew at a significant pace, increasing over 140% year over year.



**Exhibit CD-B:**

For detailing aids, handheld devices appear to be taking hold, up 23.5%, changing intent to prescribe by more than 50%.



**Exhibit CD-C:**

As a result of digital interactions, changes in prescribing intention are very positive, with most digital activities increasing intent to prescribe (green) by significant amounts or having neutral impact (blue).

Source: IQVIA (QuintilesIMS) ChannelDynamics MAT Q2 2017, Brazil

# Precision Engagement: Implications & impacts for life sciences management

Clearly, there is an appetite among HCPs in many countries for a greater level of digital engagement. However, achieving a high “share of digital” is by no means a measure of maturity. At the core of a truly multichannel commercial strategy is continuous adjustment based on feedback of what HCPs want and what works in terms of channels, connections and preferences.

Global / Regional / HQ



## Brand / Franchise / Marketing Directors and Leaders

- 1) **Make customer insight more precise and personal.** The “segment of one” concept may be cliché, but it’s still valuable. With specialty drug trends targeting limited patient populations and associated HCPs, understanding and engaging with those few, but highly valuable influencers will be essential to success.
- 2) **Collect feedback and revise preferences precisely and continuously.** Channels that worked well in the past may be rejected by HCPs if over used or lacking useful content. Responsiveness to specific channels and content should be tracked and used to make adjustments where experimentation costs are low and the reward potentially high.
- 3) **Build out capabilities and keep evolving.** Expand and improve on multichannel marketing and sales force effectiveness technologies to make full use of data and linked systems, all with an eye toward Orchestrated Customer Engagement. Work in stages to reimagine a more efficient and productive approach, and adjust and add new capabilities until full orchestration is operational.



## Sales Operations Leaders and Sales Directors

- 1) **Meet digital demand while leveraging sales rep presence.** Enable sales teams, who will always be a core part of the mix, by keeping them fully informed of feedback from digital channels—what’s working, what’s not. Accomplishing this requires both precise insights into HCPs as customers and of sales teams as enablers of digital strategies.
- 2) **Dash preconceptions of digital replacing Sales reps.** Whether it’s an executive who doesn’t endorse multichannel initiatives or sales reps who equates the introduction of digital with the loss of their jobs, outdated and negative perceptions die hard and cause significant damage. Feedback on what HCP customers want and what works best is at the core of the journey toward a truly effective integrated commercial strategy.
- 3) **Think of digital as a Sales enabler.** ROI is not a question of face-to-face versus digital channels, but a question of the best mix of digital and traditional, where solid digital options augment and enhance rep activity.



## Market Research Director / Business Intelligence

- 1) **Take a holistic approach.** Research and BI can cut across all channels and all commercial teams to ensure insight is included and shared continuously. Researchers can also help ensure the full universe of relevant HCPs is covered.
- 2) **Build an integrated, precise picture of each HCP’s channel and relationship preference.** Customer insights will be a complex, continuously developing picture. For HCPs with multiple therapies and disease areas of interest, don’t assume uniformity across therapy areas. Build a full picture of each HCP’s preferences precisely, by therapy, practice, facility and affiliation.
- 3) **Measure activity and impact, and share feedback.** The key to valuable digital performance metrics is not just in measuring individual engagements, but in measuring holistic impact. Measure as much as possible, as precisely as possible and look for areas where new monitoring possibilities are increasingly feasible, such as social media listening.

+ Country or Local Directors and Leaders

# Marketing Channel Data & Metrics Availability by Region

Improve the promotional performance of your sales force and marketing channels worldwide with precision performance information



\*17 countries where a specific focus on oncology is available.

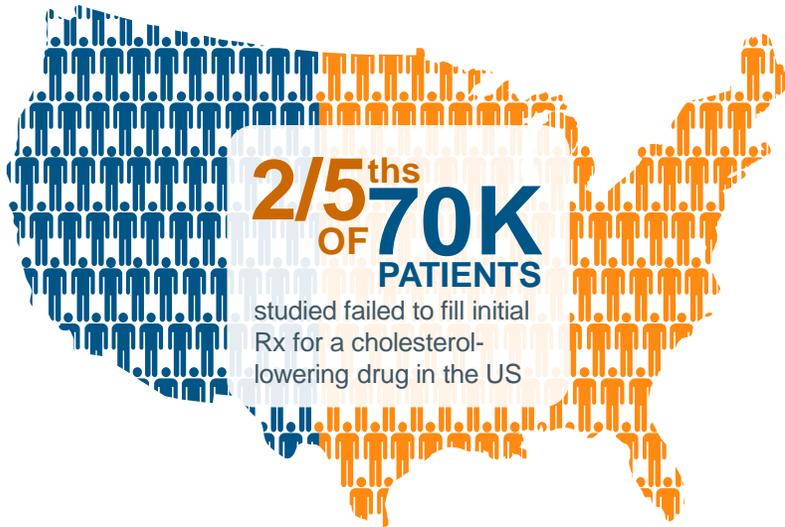
ChannelDynamics Data Types
Sales force & marketing channel investment
Channel impact and effectiveness
Message recall – HCP perception of interaction quality and impact on Rx intent
Multichannel: digital channels, remote detailing
GPs and major specialist groups
Share of Voice, Share of Investment
Additional data points
Monthly & quarterly updates, weekly bespoke reports
5+ years history

# Reaching the Right Patients:

*Patient population potential*

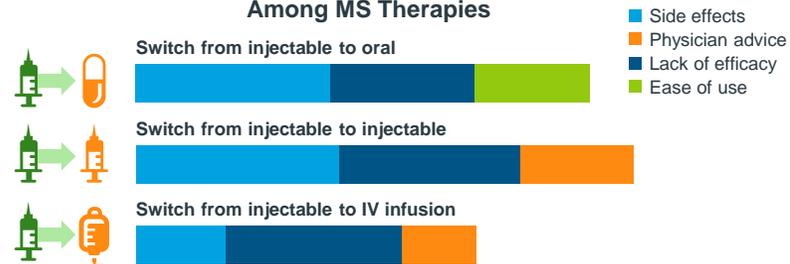
## Persistence and adherence are far from maximized

Longitudinal Rx and EMR data embedded in a predictive model show **failure to fill initial prescriptions.**



## Social Media analyses offer explanations for switching

Among MS Therapies

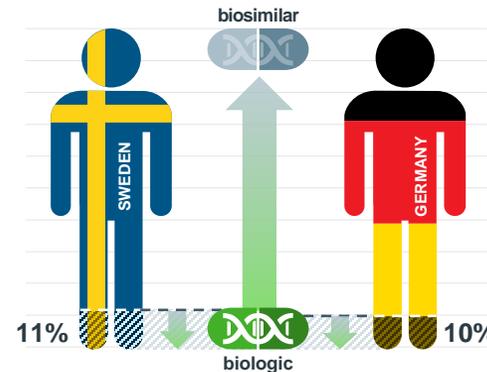


# THE RIGHT PATIENTS

Understanding how patients respond to therapy—physically, financially and digitally—is critical in this new patient centric reality.

## With switching, less expensive options don't always win

11% of all patients in Sweden & 10% of all in Germany who switched to a biosimilar, **switched back** to original biologic **after 55 days and 75 days**, respectively.



## Growing data points highlight rare connections

Anonymized patient and HCP data in a predictive algorithm offers a highly effective tool and improves rare disease detection from



## Cost factors continue as a determining factor

Patient adherence improved by

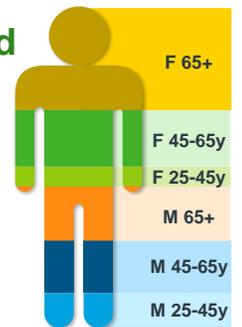


When drug prices reach US \$125-\$250+, copay cards have the largest impact.



## Patient profiles and diagnoses matter

Shifting patient profiles can lead to new segment models, updated targets, refocused messaging.



## Reaching the Right Patients: Population potential

Healthcare globally is experiencing an unprecedented shift in power dynamics throughout the industry. Today's patients are players in their own right, who are taking greater responsibility for their own health. Consequently, healthcare consumer loyalty represents the supreme measure of success for pharma commercial strategies.

The growth of "patient power" is largely thanks to online resources, social media, advocacy groups and other shared communities. Understanding how patients responds to a therapy—physically, financially and digitally—is critical in this new reality. Patient-centric strategies and tactics are already driving the pharma industry as they adapt to evolving trends and attempt to use more precise information from trends, such as:

- Switching giving rise to complexity
- Understanding patient profiles and diagnoses matter
- Persistence and adherence are far from maximizing opportunity
- Costs continuing as a determining factor
- Growing data points highlighting valuable connections

### For Patients, Switching is Not Always As It Seems

Breakthrough treatments, personalized medicines, biosimilars and other factors are expanding treatment options around the world. And while volumetric data are helpful in monitoring adoption of new products, added precision becomes apparent only

when anonymized patient-level analysis sheds light on unexpected complexities.

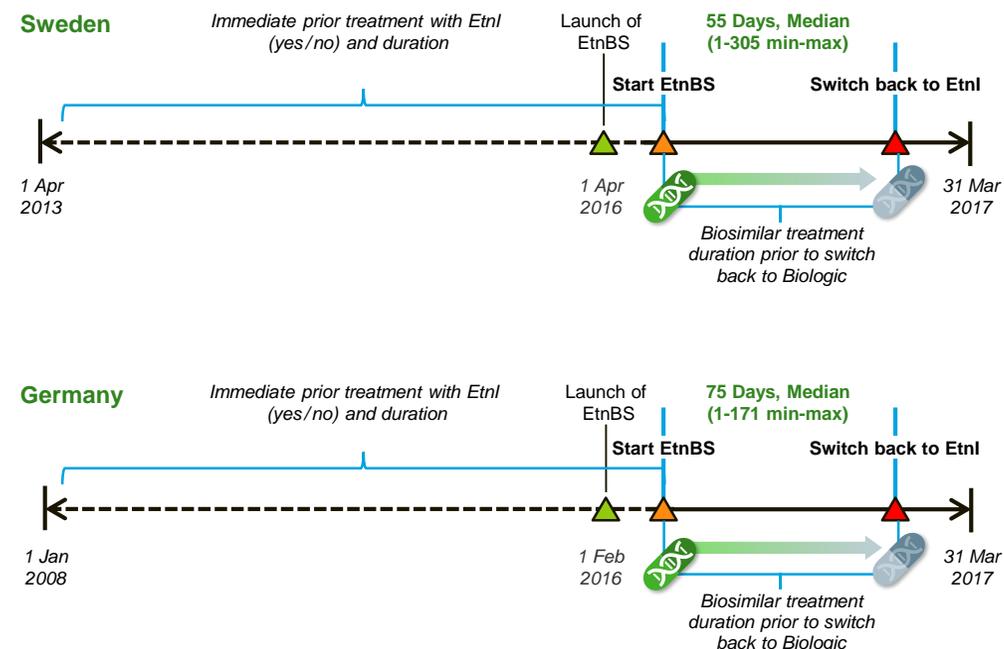
For example, the rheumatic diseases market is expanding, with the original etanercept (Etn) as the most popular drug. However, in 2016 the first EtnI biosimilar (EtnBS) launched in Sweden and Germany as a less expensive option.

Since then, 11% of all patients in Sweden and 10% of all patients in Germany who switched to EtnBS, switched back to the innovator after only a short time—55 days in Sweden and 75 days in Germany. For patients having had any prior biologic treatment, not only EtnI, 15% in Germany and 14% in Sweden switched from EtnBS back to a biologic. Compare that to an 8% switch rate from the biosimilar in both countries for those with no prior treatment of any kind (Ex. P-1).

While the first change was likely made for economic reasons, uncovering the rationale for switching back requires further investigation as this phenomenon is repeating across other European markets. In some instances a different approach, such as Social Media listening, is required to uncover factors influencing switching. ↴



### Switching Dynamics Between Biologic and Biosimilar



#### Exhibit P-1:

The European Medicines Agency (EMA) has led the world in development of regulatory guidelines for less expensive biosimilar options. However, increasing but widely varying uptake is occurring across EU countries, as evidenced by patients in Sweden and Germany who are switching back to biologics despite the cost.

Sources: IQVIA (QuintilesIMS) MIDAS 2016/2017; "Preliminary Real World Data on Switching Dynamic, ...," (Sweden) poster, EULAR Annual European Congress of Rheumatology, Jun 2017, Madrid, Spain and (Germany) poster, ISPOR 20th Annual European Congress, Nov 2017, Glasgow, Scotland

For example, early post-launch tracking of an oral multiple sclerosis (MS) treatment suggested variations in discontinuation and switching that raised questions for a brand team. To more precisely identify drivers behind switches, a study using social media intelligence helped to identify factors (Ex. P-2).

From Twitter, Facebook, online discussion forums and blogs, data were collected by monitoring “conversations” related to switching. Sample sizes showed an active social media population switching between therapies in real life.

Findings indicate that patients on injectable therapies switch because of side effects more than those on oral medications. Also, patients are more willing to try other oral drugs than to switch back to injectable or IV alternatives. Among all observed switches, side effects, lack of efficacy and physician advice were the most common reasons for switching. Only about 14.5% of MS patients switched from injectables to oral therapies due to ease of use as originally hypothesized.

### Social Media Analysis Uncovers Reasons for Switching in MS Therapies

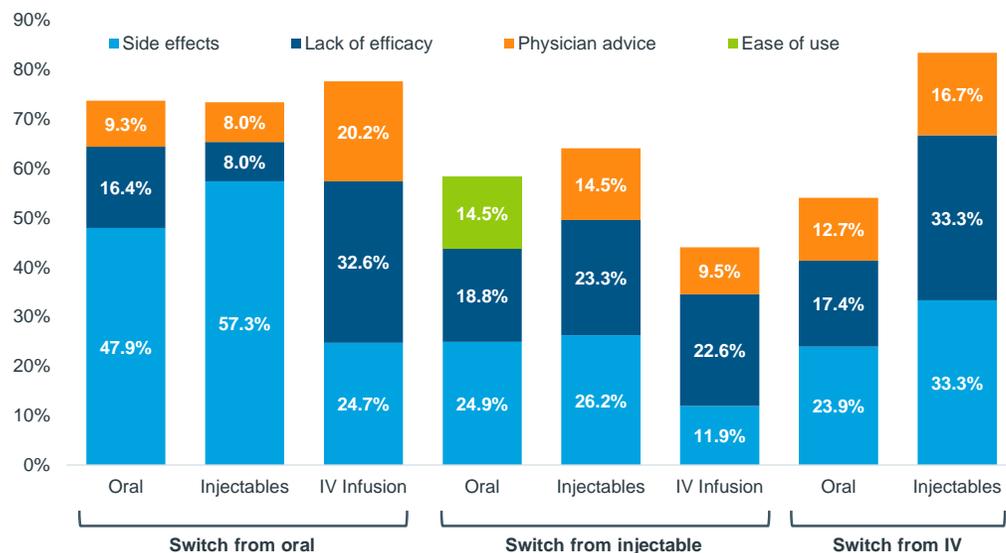


Exhibit P-2:

While social media analytics are able to quantify switching patterns and identify motivations, opportunities to link social media data to real world patient and claims databases offer unique ability to validate, enrich and fill gaps in other information sources.

Source: IQVIA (QuintilesIMS), Validation of Social Media Analysis for Outcomes Research, poster presented at ISPOR 18th Annual European Congress, Nov 2015, Milan, Italy

### Understanding Patient Profiles and Diagnoses Matter

In some pharmerging markets where patient data are not readily available, indication-based audits are often the only source of patient-level insight (i.e. about 25 countries where longitudinal/anonymous patient-level data is not accessible). Indication-based audits focus on diagnosis and patient profiles, offering added precision to your commercial analyses.

Specifically, diagnosis insights offer differing perspectives, as in this migraine example. When traditional views showed declining markets, decomposing by diagnosis highlighted secondary indications and alternative treatments through products classified as anti-epileptic and anti-depressant (Ex. P-3).

In other situations, diagnosis insights can identify conflicts in patient positioning versus actual use. Looking at specialties responsible for prescribing a type ↓

### Migraine Market: Different Views Produce Different Outcomes

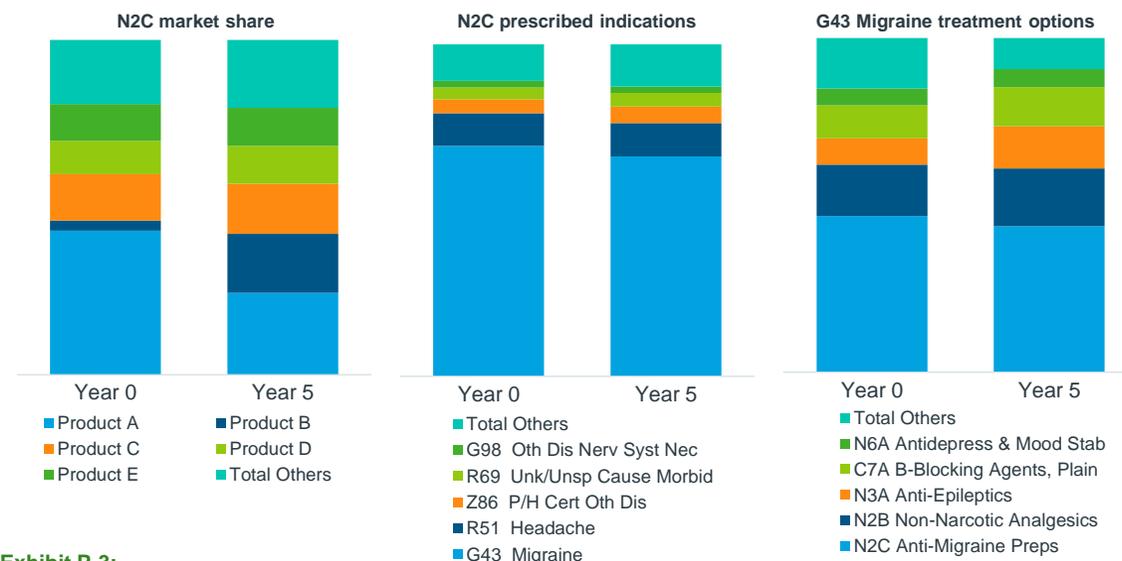


Exhibit P-3:

In the N2C retail market, about 75% of prescribing is for migraine. Using a G43 code, 90+% of patients are treated with anti-migraine products, a view that may lead to new insights and support more powerful product positioning.

Source: IQVIA (QuintilesIMS) Diagnosis Insights, Dec 2015

2 diabetes drug in Turkey, for example, showed that a product's positioning was intended for middle-aged patients, however data told a different story. The introduction of newer products resulted in gradually pushing the drug into a position as a switch or add-on mainly with elderly women.

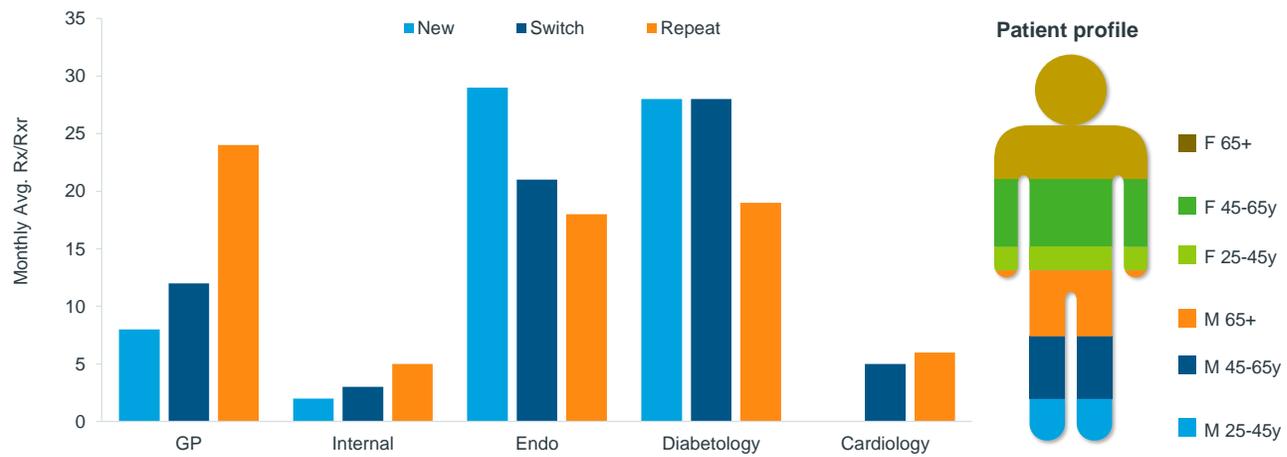
In addition, virtually no presence was noted in internal medicine and cardiology, and limited usage with diabetology/ endocrinology specialists (Ex. P-4). This led the pharmaco to develop a new segmentation model and update specialties, refocusing messaging against identified competitors in new segments.

**Maximizing Persistence / Adherence**

Undisputedly, patient compliance remains an area of opportunity. Using anonymized patient data to determine adherence based on diagnosis, age, gender and costs, for example, enables intervention based on how, when and where medicines are used.

Anonymized patient data embedded in a predictive model is yielding valuable insights for a cholesterol-lowering drug (Ex. P-5). The manufacturer wanted to better understand patients who fail to fill initial prescriptions. Using longitudinal prescription (LRx) data and electronic medical record (EMR) data in the US, almost two-fifths of patients were found to be non-adherent based on analysis of about 70,000 anonymized patients. With a predictive model, anonymized data were ↓

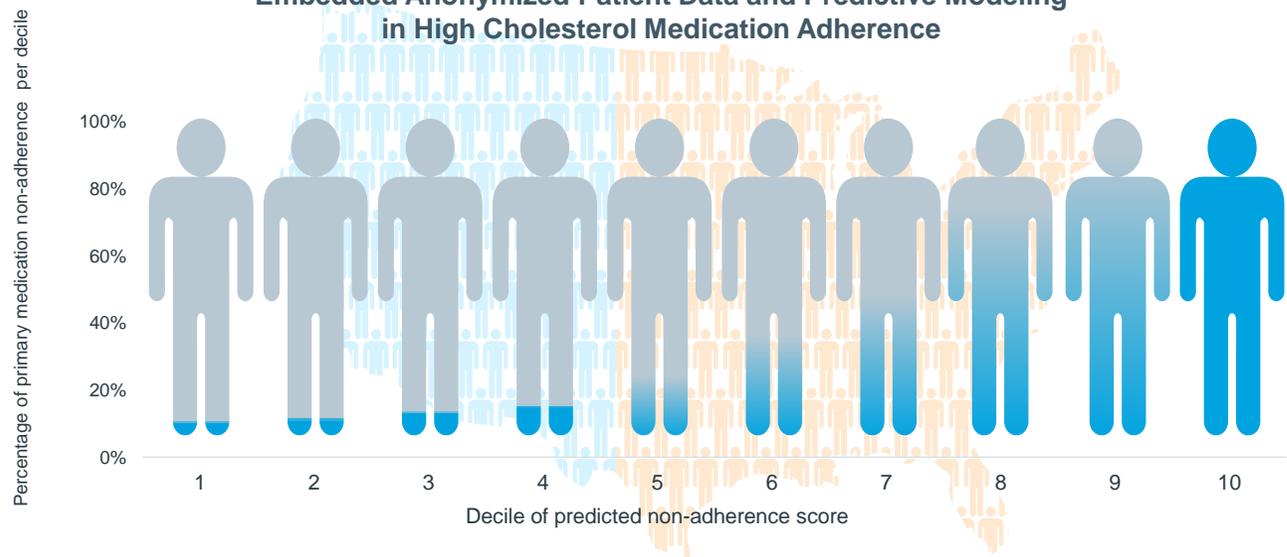
**Turkey: Diagnostic Insights into Anonymized Patient, Diseases and Prescribing Profiles**



**Exhibit P-4:** Adjusting patient segments and product positioning improved sales metrics for this diabetes medication. Patient profiles showed a majority of patients age 65+ for this drug and very few prescriptions written in key specialties.

Source: IQVIA (QuintilesIMS) Diagnosis Insights, medical audits, December 2015

**Embedded Anonymized Patient Data and Predictive Modeling in High Cholesterol Medication Adherence**



**Exhibit P-5:** Patients at the highest risk of cholesterol prescription non-adherence had low levels of LDL cholesterol, a history of non-adherence in chronic conditions and were relatively elderly.

Source: "Predicting 30-day primary medication non-adherence for patients newly prescribed statins," IQVIA (QuintilesIMS), Hill, J., Wade, R.L., Rigg, J. and Jayanti, H., Feb 2017

effective at stratifying patients at risk of not filling, i.e. 97% of those predicted to be at high risk failed to fill prescriptions, whereas just 6% predicted to be at low risk failed to fill. Based on more precise insights like these, targeted interventions may improve prescription fills and cardiovascular outcomes for patients.

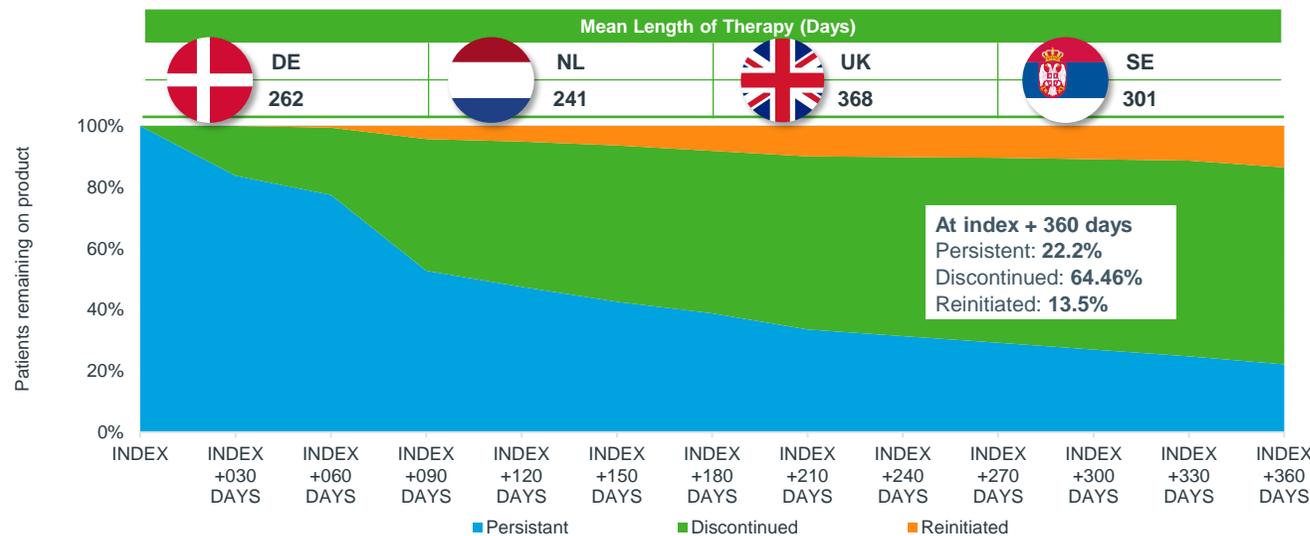
In an ADHD case, adherence analyses offered evidence of treatment duration and rates of re-initiation to the EMA for a pharmaco that needed to show patients remain on therapy only for limited periods. Leveraging LRx in Germany and the Netherlands, and integrating third-party data in the UK and Sweden, substantiation was delivered to support its claim (Ex. P-6).

In an Alzheimer's example, insights on persistence and therapy length enabled a pharmaco to calibrate global forecasts based on adherence across Germany, France and the UK (Ex. P-7). Using LRx data, they were able to see the magnitude of persistence across a three-year period and identify potential intervention solutions and patient profiles by country, as Germany was markedly different from France and the UK.

### Healthcare Costs, a Determining Factor

For the majority of patients in developed countries, access to life-saving medicines has improved measurably. The situation is more complicated, though for patients with conditions requiring specialty medications. ↓

### Multi-country Adherence Analysis in ADHD

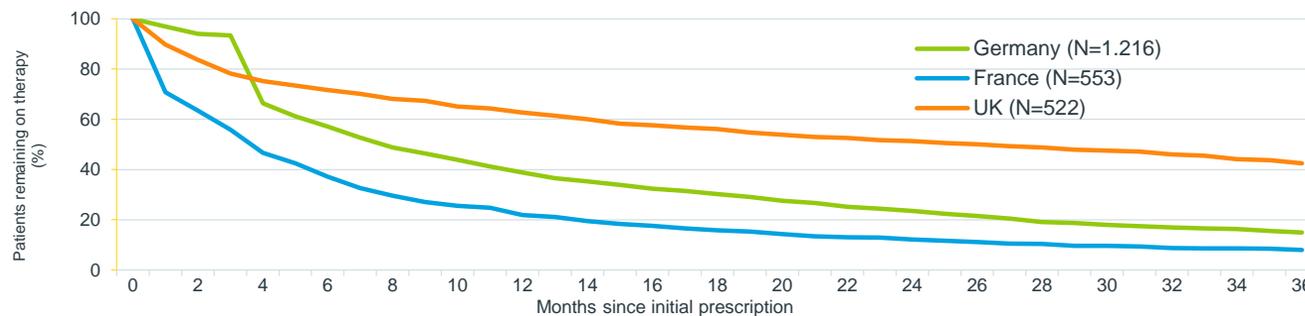


**Exhibit P-6:**

Adherence analysis delivered insights on the number of initiators, comorbidities, mean length of therapy, persistence and adherence to provide evidence to the EMA for this pharmaco.

Source: Pharmacoepidemiology and Drug Safety, 2012; 21: S427

### Persistence and Length of Therapy in Alzheimer's Patients



**Exhibit P-7:**

Persistence and adherence questions are not simply opportunities for more sales—but openings to better understand patient profiles and intervention options as in this Alzheimer's case.

Source: IQVIA (QuintilesIMS), "Persistence and Patient Dynamics Tracking," Dec 2016

Patients remaining on therapy in % (gaps are allowable) after			
Country	1 YEAR	2 YEARS	3 YEARS
GERMANY	64.8	54.1	43.6
FRANCE	82.3	74.9	66.0
UK	81.8	73.0	64.3

Publicity around prices for specialty drugs has fueled perceptions of premium pricing across US and EU markets. When analysis compared new drugs launched in 2015 in the EU to their nearest clinical comparators, some 60% were indeed priced at a premium—with the nearly half adopting a premium of more than 36%. However, closer analyses suggests that drugs with larger premiums tend to be highly innovative medicines in therapy areas where low-priced generics are either the current standard of care or clinical comparator, as in the case of heart failure drugs and anticoagulants (Ex. P-8).

It's also important to recognize price premium analysis is only a partial view of drug prices. Public prices are often used without confidential discounts or rebates applied during price negotiations. Also, analysis doesn't account for incremental clinical or economic value relative to the nearest comparator. Surprisingly, premiums for orphan drugs were generally in line with other innovative therapies—except for a few outliers—and the average cost of orphan drug therapies has not increased over the past few years.

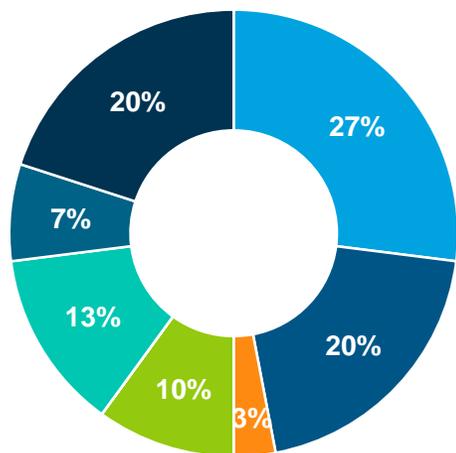
Whether on a collective basis or individual view, cost is often a key determinant in access to medicines. US patients regularly benefit from differential pricing, discount coupons, loyalty cards or other assistance schemes developed by a manufacturer. Patient advocates say these bring down out-of-pocket expenses for those facing high copays and deductibles as costs shift increasingly to consumers. These discounts have increased consumption volumes somewhat as well.

More importantly, research and experience suggests patients with copay discounts are

more likely to stay on medication than those without them. When analyzing by cost increment, patients using a copay card are more adherent than those with an e-voucher or e-coupon and are significantly more adherent than those with no program at all.

When drug prices begin to reach US \$125-\$250+ per month, copay cards have the largest impact. On average across all cost bands, patient adherence improved by 67 days when using a copay card as compared to only 15 days with an e-voucher (Ex. P-9). ↓

### Comparative Launch Prices of 2015 EMA-approved New Medicines



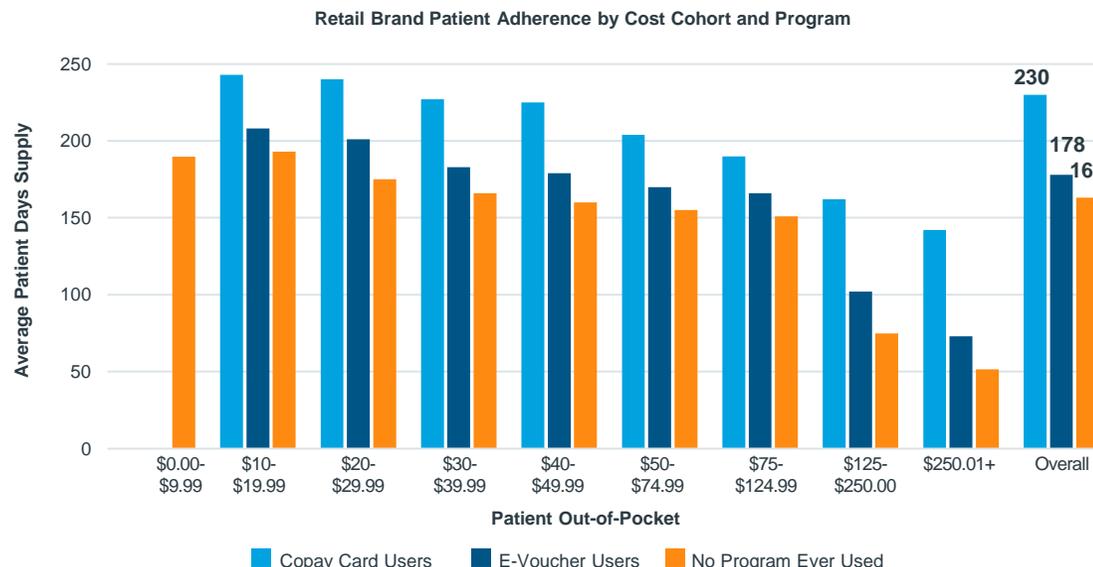
- Very high premium (>100%)
- High premium (36-99%)
- Moderate premium (21-35%)
- Low premium (6-20%)
- Parity (+/-5%)
- Low discount (6-20%)
- Moderate discount (21-35%)
- High discount (36-99%)

#### Exhibit P-8:

As the number of approved molecular entities (NMEs) has increased to more than 40 per year in 2015, up from only 12 NMEs in 2012, cost concerns take center stage. Although payers recognize the benefit new developments bring, there are concerns about already stretched budgets.

Source: IQVIA (QuintilesIMS) Consulting Services; Pricing and Market Outlook Magazine, "Facts versus fiction of 2015 product launches: Analysis of price premiums and time to market," 2017 edition

### Patients Using a Copay Card are More Adherent Than e-Coupon Patients



#### Exhibit P-9:

Specific to the US multi-payer system, patient out-of-pocket costs, payer restrictions and adjudication, and patient assistance program development requires complex data assets and models, i.e. LRx data integrated with other anonymous patient data and formulary information, to maximize payment assistance and adherence while maintaining pharmaco ROI.

Source: QuintilesIMS (IQVIA) Formulary Impact Analyzer, 2015; IQVIA (QuintilesIMS) Analysis

While affordability is an issue in developed markets, it is of concern in emerging markets as well. Together, pharma and healthcare providers are collaborating to address barriers along the patient journey, including cost. Pharma companies can be expected to move in this direction in the future, especially those leading in a particular therapy area.

However, it's important to note that in emerging markets other barriers effect treatment beyond simply cost. These

include access to care, diagnostics and medicines, low awareness by both patients and healthcare professionals (HCPs) of diagnosis and treatment protocols, and patient adherence, which is often poor. Consequently, patients do not fully benefit from innovative treatments, and therefore don't see the full clinical value of medicines.

**Connecting Growing Data Points**

As healthcare data continue to grow exponentially, there's no end in sight to the

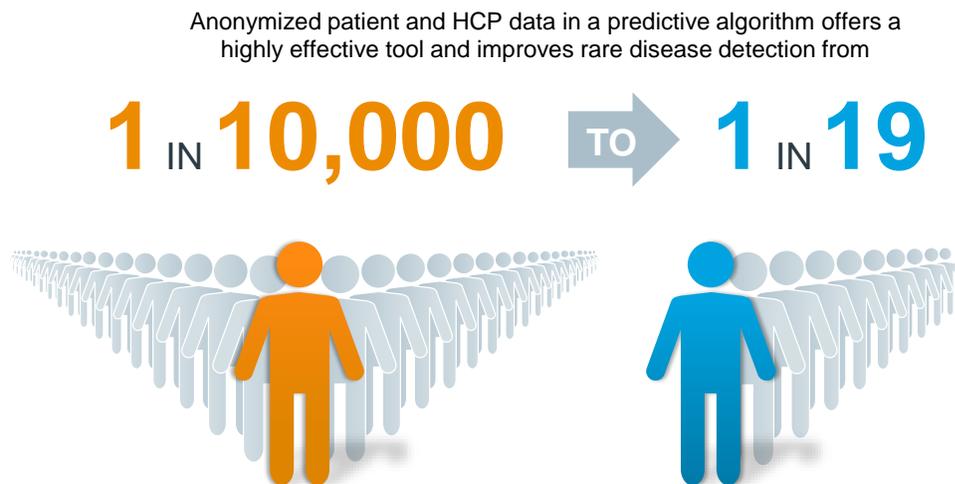
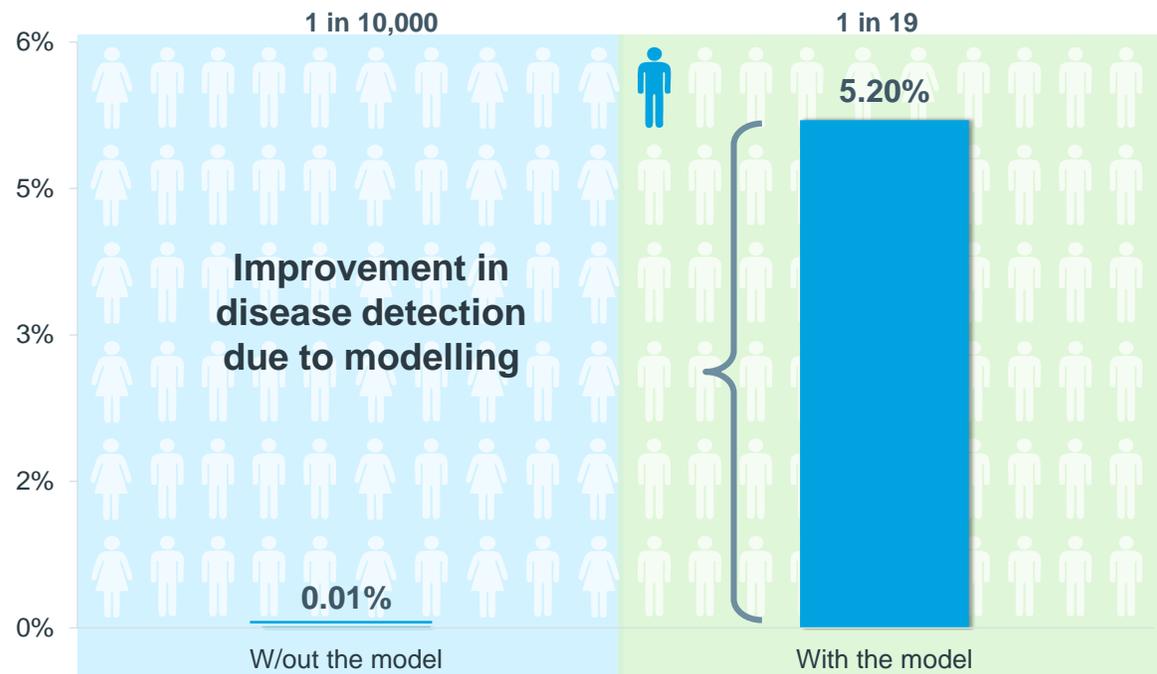
massive amounts of data created with every healthcare transaction, service, illness and inquiry. And, as drug development becomes more focused on specialty and precision medicine, tailored commercialization approaches are required to bring relevant information to key prescribers.

Opportunities uncovered using anonymized patient data linked to other data insights and analytic models have the potential to help identify physicians likely to have the right patients and significantly improve outcomes.

In an interesting rare disease example, a drug manufacturer was confounded by low HCP awareness resulting in frequent misdiagnoses, inappropriate treatments, high costs and negative patient outcomes.

The company was interested in identifying HCPs in a position to diagnose patients with this rare condition, with the goal of raising disease awareness in a targeted way and speeding the time to diagnosis (Ex. P-10). ↓

**Combining Anonymized Patient Data with HCP Data Sources and Predictive Analysis for Disease Detection Among High Risk Patients**



**Exhibit P-10:**

Using anonymized patient data combined with HCP insights, this predictive algorithm could be deployed as a highly effective screening tool for finding high-risk undiagnosed patients, bringing life-changing medicines to those in need.

Source: IQVIA (QuintilesIMS) Predictive Analytics, Rigg, J., 2017

The first step was to build a predictive model that could be combined with patient insights. In this case, data on 100+ medical and demographic predictors were included in a model used to score a universe of 100 million patients to identify those highly likely to have the rare disease. The second step identified relevant HCPs linked to potential patient populations.

Finally, a target list of HCPs with potential patient populations was generated for a disease awareness campaign.

In another case, a drug for a rare multi-system disease in oncology was plagued by diverse symptomatology and low physician awareness resulting in under / late diagnosis and low market penetration.

A predictive algorithm developed using the unique patterns of the disease in patients' pre-diagnosis medical history was tested against other methods in order to help find undiagnosed patients by identifying physicians with potentially undiagnosed patient populations (Ex. P-11).

Based on linked primary care and specialist data in the UK, an algorithm was developed to assess 5.5 million anonymized patients, about 350 of whom were diagnosed with the rare disease.

Results indicate that an algorithm may be highly effective in accelerating time to diagnosis and our machine learning model performed about 2.5 times better than logistic

regression, almost five times more precisely than Key Opinion Leader (KOL) rules and 300 times better than random assessments.

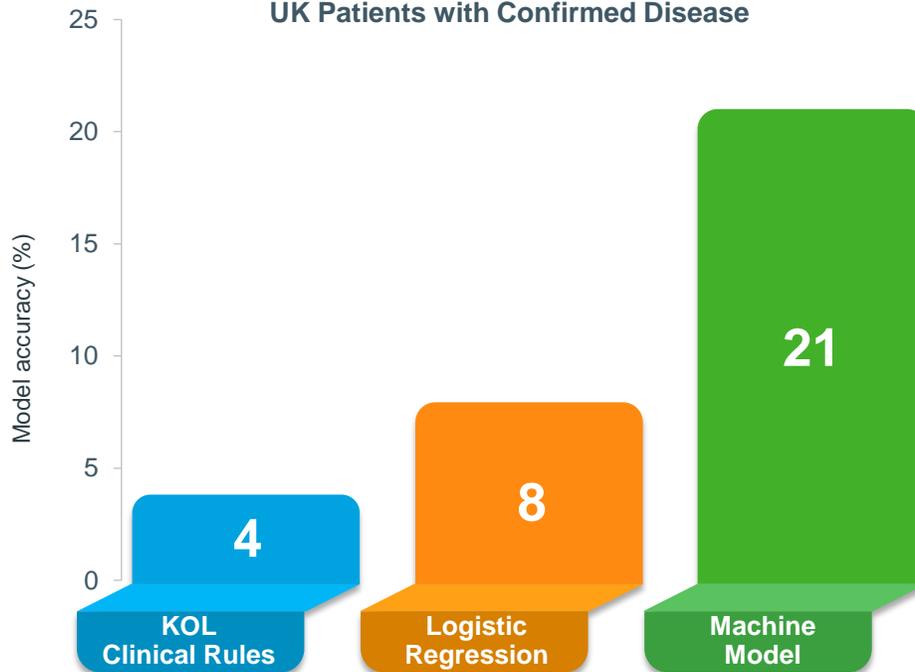
Based on this evidence, a program is being evaluated by the pharma which would flag physicians treating potentially undiagnosed patients. Other options include Web-tools for patients and/or physicians to promote risk assessment and alerts in EMR systems to flag at-risk patients.

**A note on patient privacy concerns**

Patient-centric solutions use non-identified patient-level data for a clearer picture and consistent understanding of how healthcare is delivered in the real world. Re-affirming our longstanding practice of safeguarding patient privacy, we utilize secure, integrated data and analytics platforms with leading technology solutions, as well as administrative and physical safeguards for creating non-identified healthcare

information. Globally, respect for privacy demands that stakeholders across the healthcare landscape assess data privacy controls to meet or exceed regulatory requirements and industry best practices. As an industry, protecting patient privacy requires shared responsibility for the continued development of safe, secure and efficient technology and privacy processes to foster secure public and private management of electronic patient data across the globe. 🌐

**Accuracy of Analytical Approaches in Identifying UK Patients with Confirmed Disease**



**Exhibit P-11:**

*In the study, 1 patient was correctly identified for every 5 potential patients flagged by the model—impressive given disease prevalence of 1 in 15,000. Combined machine learning and clinical domain knowledge performed best at 21% accuracy. Test sample for assessing model accuracy comprised 50 patients with confirmed disease and 70,000 without.*

**Source:** IQVIA (QuintilesIMS) "World Precision Medicine Congress," presentation, Rigg, J., May 2017, London, UK

# REACHING THE RIGHT US ONCOLOGY PATIENTS: Combining data sets improve accuracy of market share projections

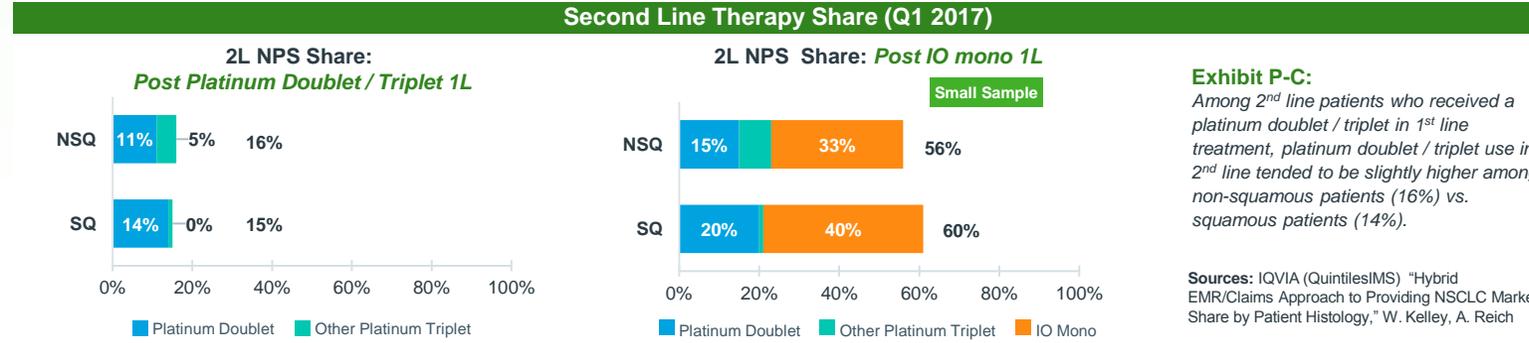
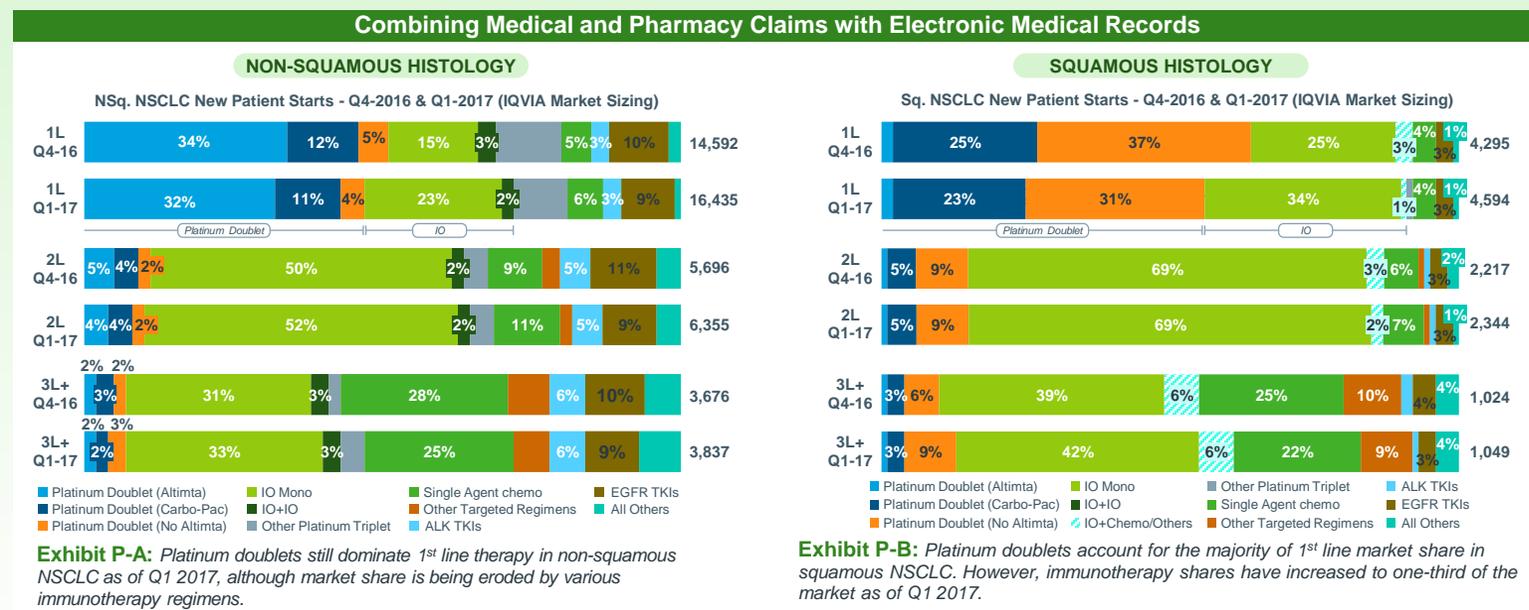
Incorporating anonymized EMR and patient claims data leverages the strengths of both to more accurately calculate market share. By defining patients types and tumor types where histology-specific indications demand particular analyses, this combination approach is beneficial and may be useful in tracking other biomarkers or genomic profiles of interest.

In the US oncology market, where indications and labels are frequently tied to specific biomarkers, targeted approaches are garnering attention. In non-small cell lung cancer (NSCLC), in particular, histology plays an important role in determining the appropriate therapy. Thus, the ability to segment markets by clinical details presents a challenge to market sizing and share estimation in the commercial operations of pharma manufacturers.

Although claims data offer a projectable base for most cancers, they are not rich in clinical histology detail needed to assess patient and prescription volume for the NSCLC market, particularly squamous (SQM) and non-squamous (NSQM) histology types.

Additionally, the use of drug proxies to determine share within NSCLC can lead to inaccuracies. EMR data, on the other hand, provide the missing clinical details, but are often limited in sample size and not projectable to a national population.

Rather than relying solely on either, a hybrid approach offered the best solution to a client active in the NSCLC market. To avoid the low match rates of EMR data, a methodology was used to retain sample size and overall share accuracy of claims data along with histology detail found in EMRs. By using histology ratios derived from the EMR sample and applying weighting from the claims, advantages inherent in each dataset were retained and a reliable NSCLC market share was achieved. 



Sources: IQVIA (QuintilesIMS) "Hybrid EMR/Claims Approach to Providing NSCLC Market Share by Patient Histology," W. Kelley, A. Reich

## Population Potential: Implications & impacts for life sciences management

Although not always available in every market, country or area, the promise of patient data is becoming a reality in some markets and is illuminating the path of potential in others. While linking evidence and analytics to refreshing new solutions may sound familiar, the novelty is in how these pieces can be put together and how precise ways of working can apply new insights. The success of this change is predicated upon the ability to move decisions away from perceptions and broad extrapolations to more precise facts about patient journeys and real world outcomes.

Global / Regional / HQ



### Brand / Franchise / Marketing Directors and Leaders

- 1) Support about-to-launch and launched products.** The largest immediate value of anonymized patient and real world data is in improving launch planning and tracking with accurate segmentation and rapid adjustment of messaging and resource allocation at launch. This enables refinement of launch strategies, including many decisions related to identifying targets, contracting and pricing strategies, and other commercial decisions.
- 2) Product positioning is about patients first.** Analysis of market dynamics and future market potential allows companies to size the addressable market, identify opportunities and understand the potential place for a new agent in the patient journey.
- 3) Optimize commercial effectiveness with more targets, more precision.** Brand growth via LRx-enabled marketing, improved promotion via physician-patient segments and better forecasting via disease progression models offer opportunities to optimize commercial budgets and strategies. Ultimately, franchise leaders are best positioned to champion longer-term investments in patients.



### Sales Operations Leaders and Sales Directors

- 1) Optimize sales effectiveness.** Sales efforts can be transformed by focusing on specific points along the patient journey, in the physician decision-making process, or by a deeper understanding of unmet (rather than relative-to-competitor) sales opportunity.
- 2) Boost sales performance with LRx-enabled field alerts.** Go beyond national trends and monitor new-to-brand prescription volumes. Enable reps to receive alerts on physicians' new patient starts and add-on therapies and spend less time asking doctors what they do and more time discussing why they do it.
- 3) See what's really happening.** Analyses of granular, yet anonymized, patient data and EMRs enable reps and management to see (via lab test results, for example) if the proportion of patients passing through a physician's office who are eligible for a treatment actually receive the product, thus uncovering even more valuable insights.



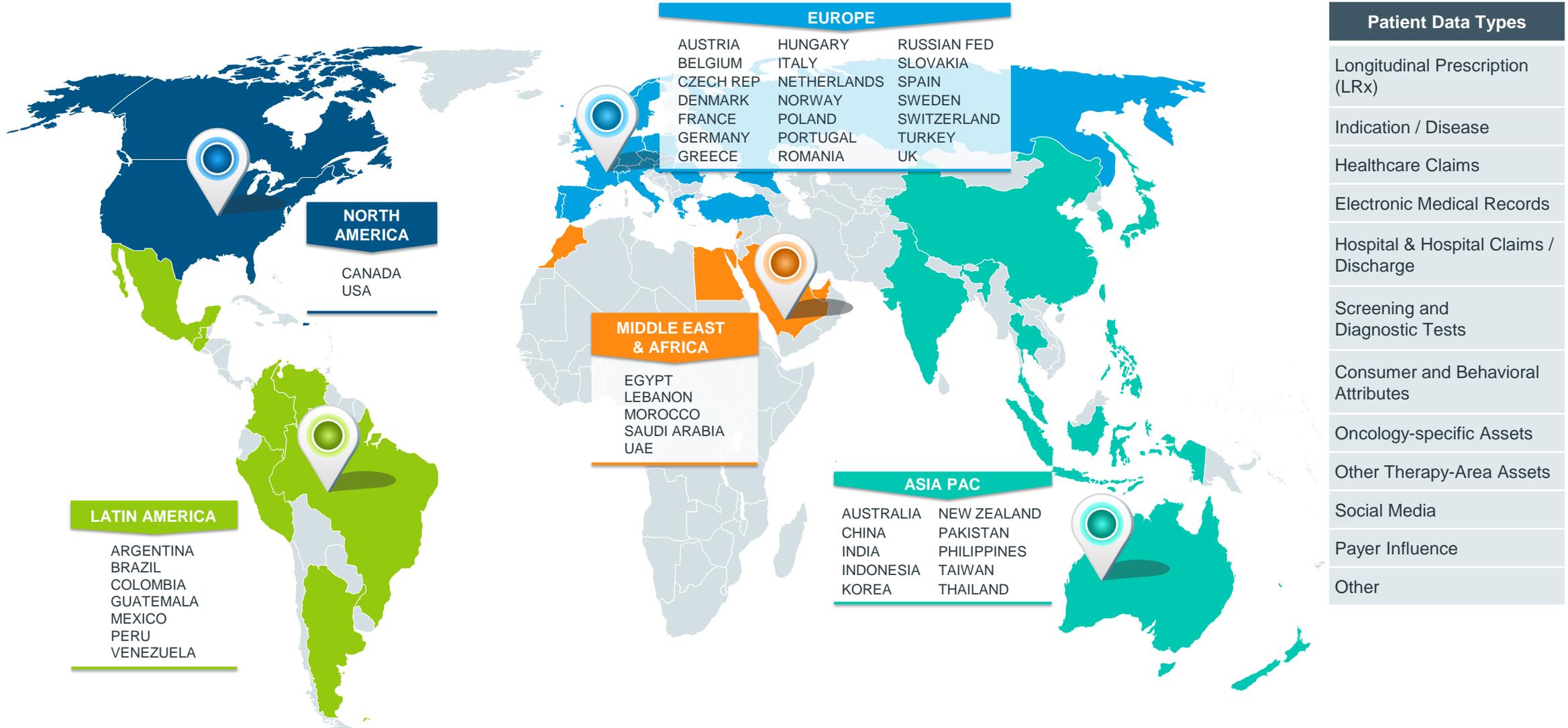
### Market Research Director / Business Intelligence

- 1) Connect data streams and reduce silos.** Where regulatory governance allows, pharma can benefit from the ability to connect disparate, anonymized patient-level data streams. Linked data enables answers to more questions and a deeper understanding of treatment choices and factors impacting choice.
- 2) Take advantage of speed.** More timely insight can make a huge difference in decision-making options. If market events are pending, i.e. switching with biosimilar entry, patent expiry, publication timing, weekly information provides a much clearer picture of how quickly something is happening and what options are available given near real-time insights and rapid decision making capability.
- 3) Increase productivity and identify cost savings.** Reduce primary research spending and other impact factors. Scientific disciplines often favor a narrower range of research options (such as primary observational research and registry building) rather than directional insight reflecting commercial value of patient data.

+ Country or Local Directors and Leaders

# Anonymous Patient Data Availability by Region

Real-world data and data science support that positively impacts commercial results and patient outcomes worldwide



# Conclusions on Performance Best Practices:

*Precision insights and  
applications you can use*

## Conclusions on Commercial Performance Best Practices: Precision insights and applications you can use

So what does it all mean for pharmaceutical leaders? How do you deliver the right information to the right decision makers at the right time to develop, implement and monitor commercial strategies?

How do you address multiple stakeholders, scale across countries, franchises and business units, enable proactive interventions and support go-to-market strategies across channels?

The simple truth is, it's not simple. Many key roles are just not equipped to make informed decisions and act with the timely intervention needed in today's swiftly moving environment. Ongoing evolution of multi-stakeholder and multi-channel environments has heightened complexity leading to a need for diverse multi-disciplinary roles to collaborate in a way not formerly necessary.

### Organization Alignment & Single Source Truth

The ability to rapidly identify key areas for risk mitigation and focused interventions is crucial, though it mandates diverse users have a common vocabulary and a shared understanding of performance. This requires a "single source of the truth" that aligns to broader franchise and geographic strategies, and to the critical factors needed for success.

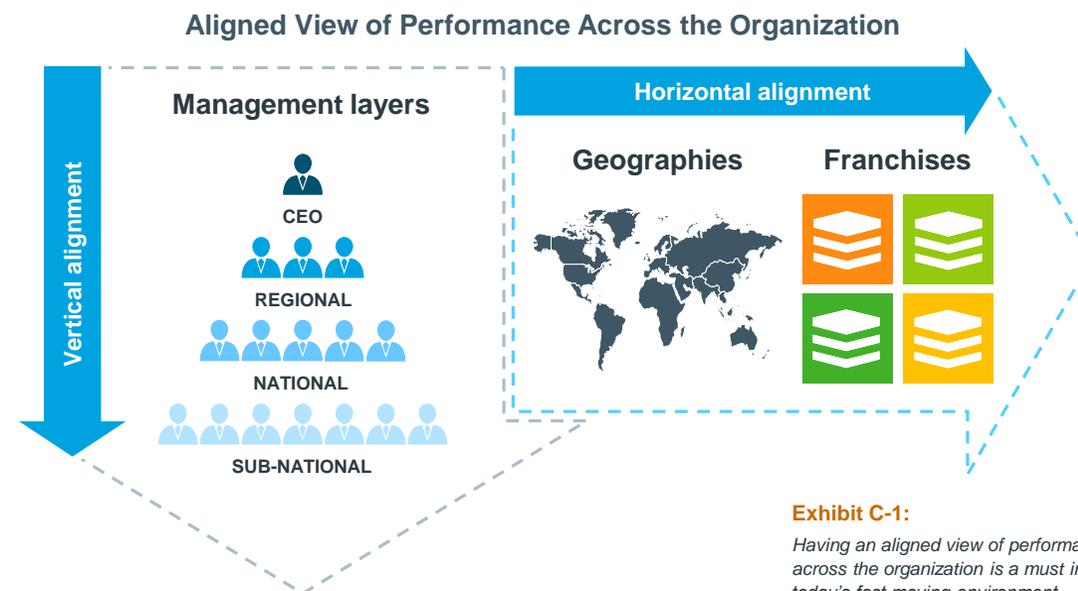
Yet, many pharmacos struggle with establishing performance frameworks that align goals, not to mention executing on those goals given their diverse geographic, franchise and in-field perspectives.

Aligned execution is driven by information and insight that are no longer a nice-to-have. It requires executive sponsorship, organizational discipline, data science, and technology and analytic capabilities to:

- **Establish a strategic insights framework** – an enterprise-level strategic key performance indicator (KPI) framework with guiding principles that help identify and measure relevant KPIs. This must reflect critical success factors and consider:
  - a. Engagement approaches with diverse external stakeholders
  - b. Impact resulting from perceptions of these stakeholders
  - c. Patient outcomes, and
  - d. Financial outcomes.

- **Ensure the inter-operability of data** – the ability to source and apply consistent, relevant business rules, along with the capability to manipulate high volumes of diverse data to provide meaningful KPI insights and patterns.

- **Leverage a flexible and scalable platform** – that serves different users (e.g. field sales force, brand teams, executives, business intelligence teams). And evolve the platform to reflect ongoing changes in strategies and business structure. ↓



**Exhibit C-1:**  
Having an aligned view of performance across the organization is a must in today's fast moving environment.

Source: IQVIA (QuintilesIMS) Thought Leadership

## Empowering Business Users to Make Timely Decisions

Best-in-class solutions take integrated approaches that combine a strategic insights framework with inter-operable data and flexible, scalable platforms to support diverse users.

These solutions increasingly provide pre-defined frameworks that leverage industry expertise, yet are configurable. This results in reduced implementation time to improve deployment, but allows for specific organizational needs and preferences.

## Ease for Senior Commercial Leaders

For decades, senior leaders, at global, regional or country management levels have struggled to conduct meaningful reviews based on “one version of the truth.”

Premier executive applications provide users with an intuitive solution allowing them to appraise their business, in an aligned manner across the entire commercial organization. These solutions are easy to use and offer senior leaders the ability to consume insights or easily deep dive as needed.

## Unique Launch Teams Requirements

Undisputedly, market success is defined very early in the product launch cycle, specifically in the first six months. However, even perfectly planned launches require course corrections along the way.

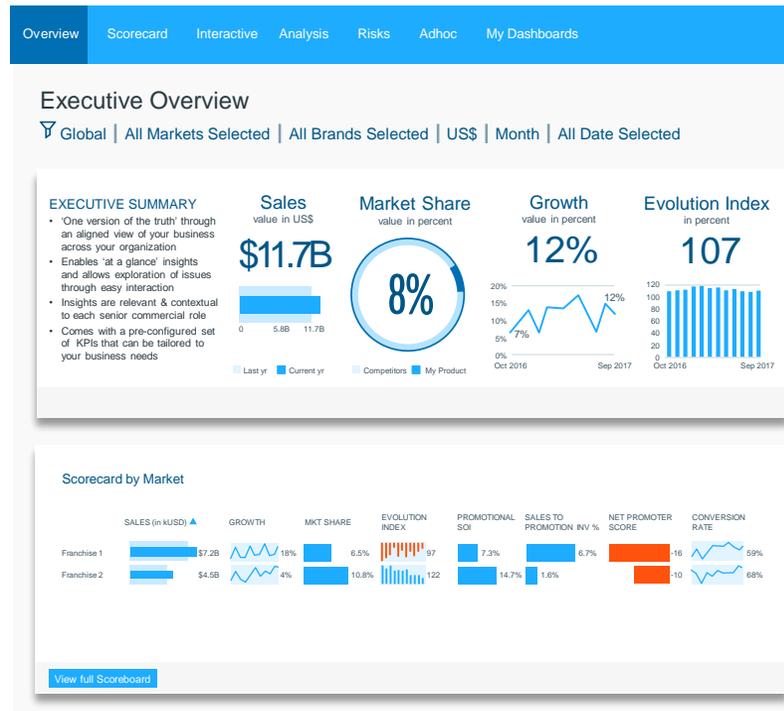
Exceptional applications for launch performance support provide insights across multiple geographies based on expert understanding of critical factors and processes, and best-in-class benchmarks.

Launch performance tracking requires the ability to integrate diverse assets (i.e. sales

data, patient data, PMR, social media, CRM, multi-channel data, etc.) to provide early warnings based on leading indicators. Here, guidance may relate to investments, resources or strategies, and the early impact each has on physicians, payers, patients and the like.

These solutions are based on a well-established understanding of what it takes for a winning launch, yet enable launch teams to reflect their specific critical success factors and therapy area needs. ↓

### Senior Leadership: At-a-glance Insight

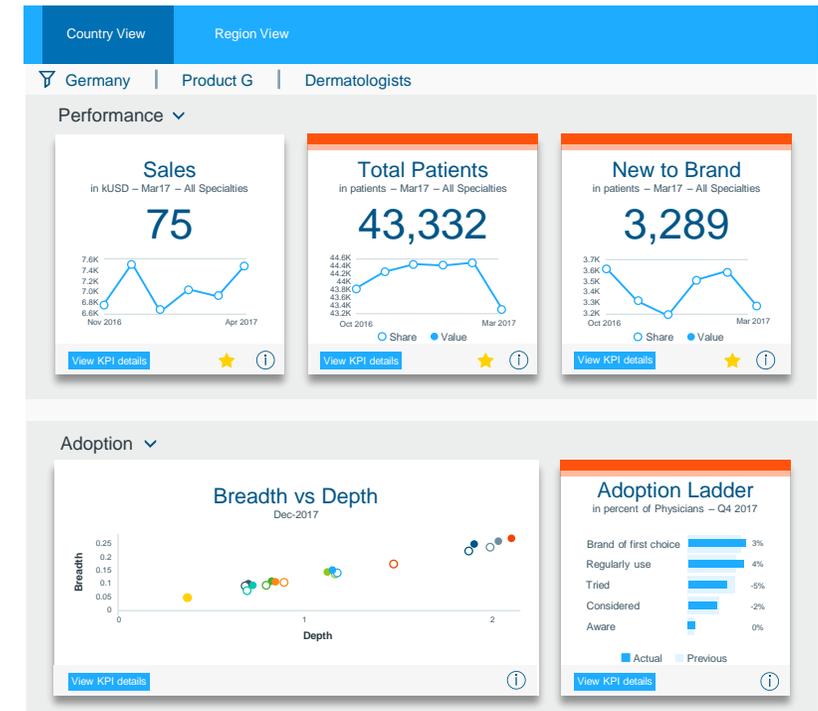


Source: IQVIA (QuintilesIMS) Performance Management - Executive Insights Accelerator

#### Exhibit C-2:

Data integration frameworks deliver actionable insights to the right audience based on role-specific access to sales performance, trends and drivers, opportunities and risks, competitor comparisons, brand performance against KPIs and performance at national levels.

### Launch Teams: Early Warning Signals



Source: IQVIA (QuintilesIMS) Performance Management - Launch Tracking Accelerator

#### Exhibit C-3:

Embedded data and launch KPIs provide views across countries that require less analysis time. Faster decisions and timely counter-measures can be derived from early warning systems with typical risks flagged and possible interventions identified.

## Sales Force Performance Frameworks

Increasingly, sales representatives, managers, analysts and marketers alike all need to track execution against the strategy and how well that strategy is working. And, they need to do so with near real-time speed, based on insights from integrating diverse information, such as sales, CRM, multi-channel, patient views or internal data.

In the past, many pharmacos favored local solutions, though now there are moves toward some level of centralized multi-country frameworks to drive efficiencies.

Best-in-class sales force applications offer these insights to reflect a variety of different needs. These also reflect a growing desire to adopt a more integrated workflow approach, drawing from different salesforce

applications—such as CRMs, marketing automation platforms, performance analytics, incentive compensation and more.

## Empowering Business Intelligence With Meaningful Value

Business intelligence (BI) teams are relied upon more than ever before to provide meaningful insights in an increasingly

complex environment. But, they also face unprecedented resource constraints.

There are two key ways to shift the balance of seemingly conflicting priorities. One way is to drive efficiencies by moving towards an aligned enterprise-wide strategic insights framework. This in turn can drive efficiencies by eliminating multiple, diverse and competing reporting applications. ↓

### Sales Management: Holistic View of In-field Performance



Source: IQVIA (QuintilesIMS) Performance Management Sales Force Online Desktop App

#### Exhibit C-4:

All field force stakeholders can access an online tool to help understand performance summaries, marketing strategy, sales and performance figures, and data insights

### In-field Teams: Relevant and Contextual View of Geographical Performance



Source: IQVIA (QuintilesIMS) Performance Management - Sales Force Mobile App

#### Exhibit C-5:

Sales reps can benefit from offline capabilities to manage performance on the move, with information relevant to each representative's specific territory.

BI teams can also make use of specially developed, built-for-pharma platforms and accelerators that bring together diverse data assets to provide BI teams with a high-quality, scalable reporting platform for enterprise-wide brand reporting, either fully outsourced or on a self-service basis.

These platforms and accelerators provide significant flexibility for BI and analytics teams to determine where to focus their

capabilities and maximize insights for their internal customers.

**Improve Commercial Performance with Greater Visibility**

While there is no silver bullet to improving performance commercially, a few critical efforts—including integrating data, leveraging technology platforms and escalating analytics—can help capitalize on opportunities and improve commercial measures.

It starts with capturing the right insights from diverse data sources: yours, ours or a third party's. Having the right information with the right level of granularity about the right targets for the right markets is essential, but precision insight doesn't end there.

Intelligent analytics, advanced methodologies and the technology know-how to ensure offerings work in concert allows users to share data and insights across the organization.

In the end, the right, relevant data assets have the greatest potential as an enabler to your business decisions and commercial success—offering improved commercial strategy, informed execution and better performance management across your company, your markets and your brand. ☉

**Brand Management & Business Intelligence: Self Service & Service of Others Options to Drive Analytics and Reporting**



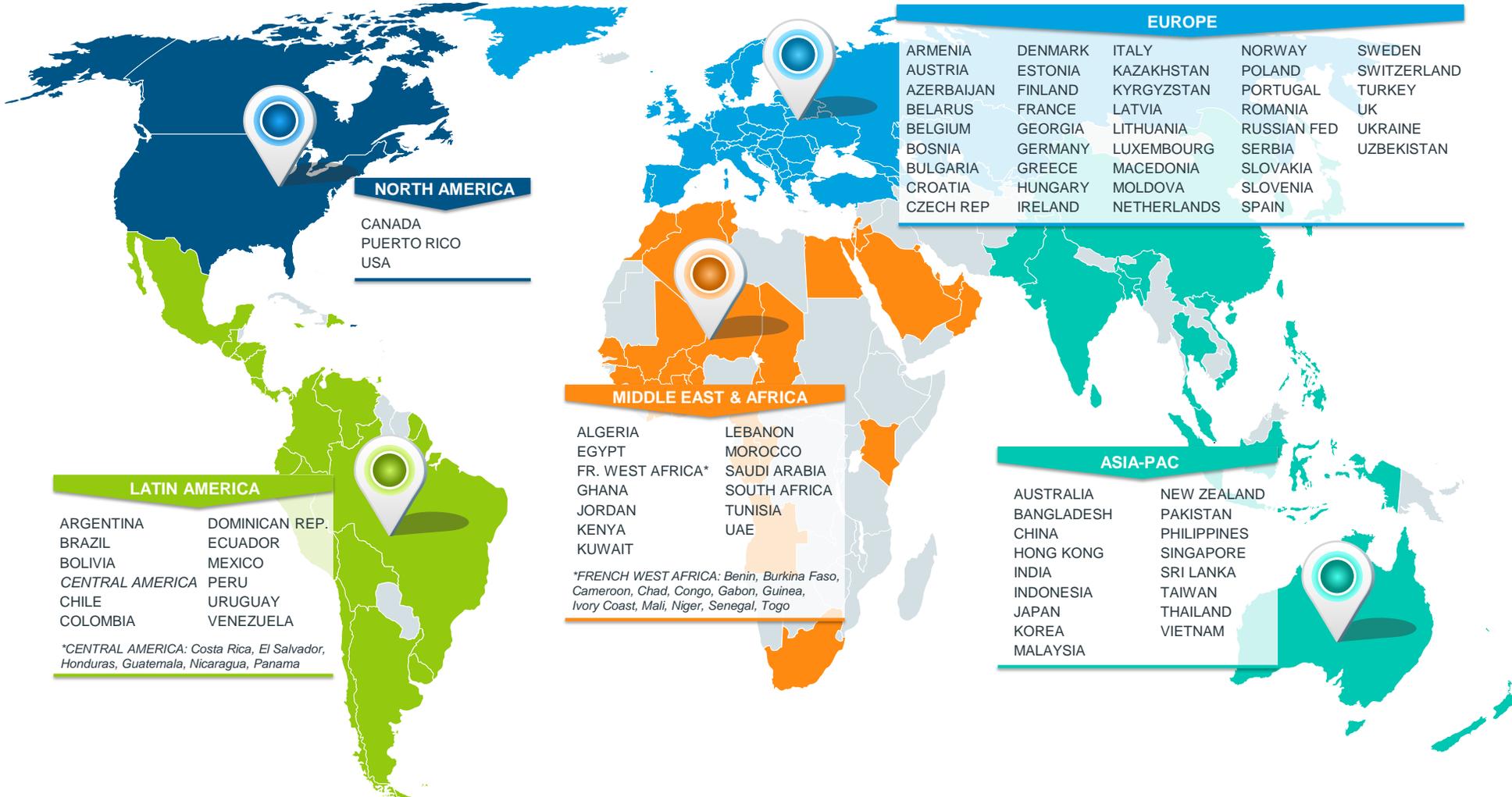
**Exhibit C-6:**

*Business intelligence and brand teams can quickly and easily generate self service or professional standard reports for others, as well as explore and analyze the underlying data to surface insights—all in a single touchpoint to drive alignment and collaboration.*

Source: IQVIA (QuintilesIMS) Performance Management Brand Management Accelerator

# Overview: Data Availability by Region

Data types & granularity vary by country



Commercial Data Types
Prescription
Sales
Physicians / Healthcare Professionals / Organizations
Promotion / Digital Channel
Anonymous Patient
Indication / Disease
Payer
Specialty Pharma
Medical
Hospital / Clinic / Office
Social Media

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Alan serves as Director of Information Offerings, where he focuses on developing, evolving and expanding IQVIA's information portfolio globally, including commercial sales and prescription data assets.

With more than 17 years experience at IQVIA (formerly QuintilesIMS), he previously lead the company's global market measurement portfolio, supporting clients in performance management, market opportunity assessment and competitive positioning. He also works closely with clients and industry groups, such as EphMRA, to develop information offerings and maintain relevance for the industry.

Prior to joining IQVIA, Alan gained experience in business information publishing at a global media company, following roles in the telecommunications and financial services sectors.

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