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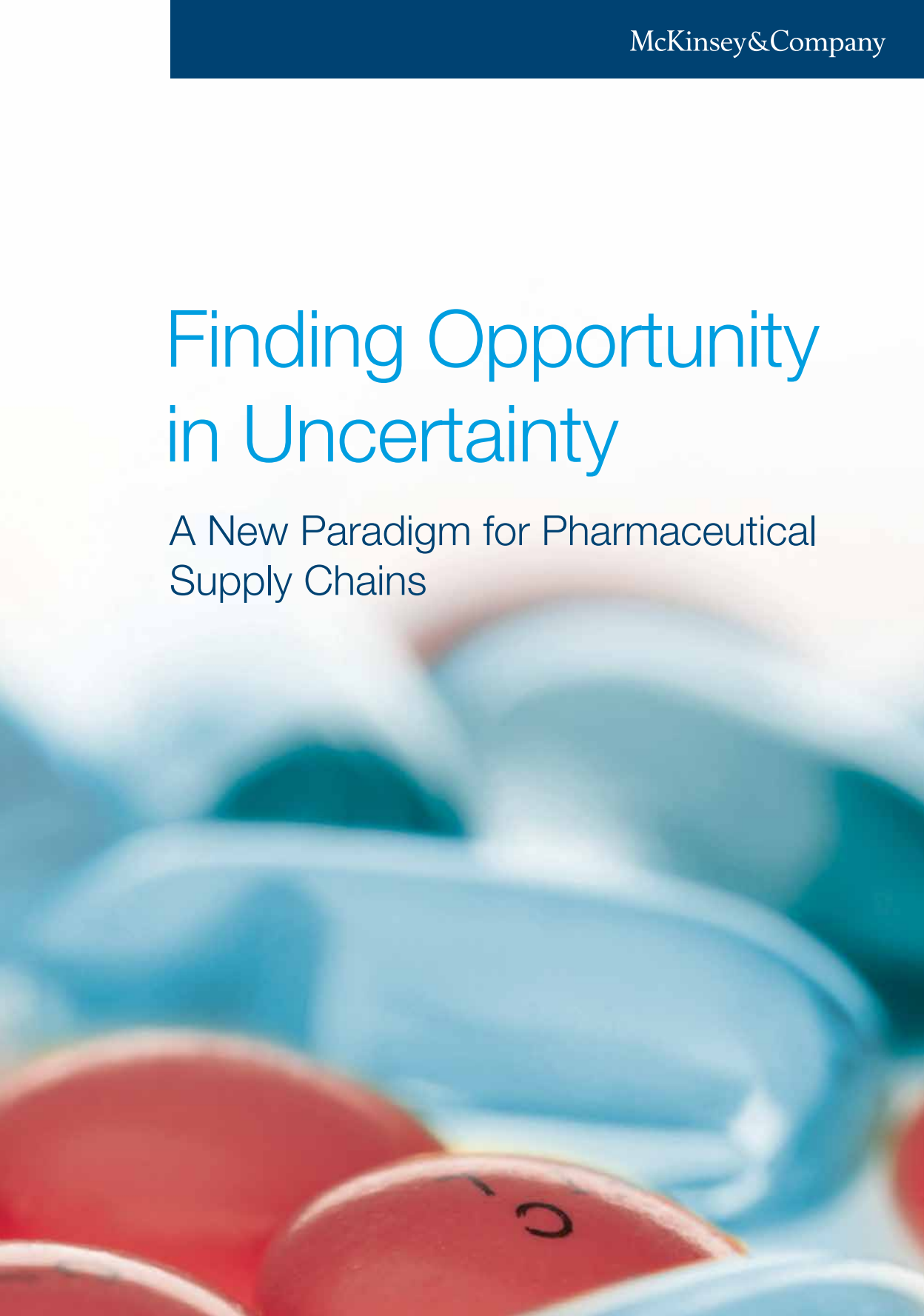
# Finding Opportunity in Uncertainty

## A New Paradigm for Pharmaceutical Supply Chains



# Finding Opportunity in Uncertainty

## A New Paradigm for Pharmaceutical Supply Chains

2014

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# Contents



## Robust strategy

## Solid execution



## Transformation approach

# Finding opportunity in uncertainty: A new paradigm for pharmaceutical supply chains

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Imagine the pharmaceutical industry a decade from now. What will the industry's supply chains look like? Consider these potential radical changes:

Modern drugs will reach many more patients than today. In emerging markets, the new middle class will add one billion patients who consume these state-of-the-art medications. Innovative private-public partnerships will create viable business models to serve even the bottom of the pyramid. Pharmacos will use unconventional channels to overcome poor infrastructure and reach patients in remote places.

In developed markets, the vast majority of medical needs can be addressed with generic drugs that are produced and distributed at scale and with great efficiency. But, alongside these drugs, integrated solutions that combine diagnostics, devices, and drugs will create new businesses. Technologies such as cell and gene therapies will emerge, and personalized therapies in oncology and immunology will create a direct link between pharmacos and patients.

Distribution and patient services will further expand and help ensure patient health in areas that include care for the elderly and special chronic diseases (such as hemophilia, multiple sclerosis, and arthritis). A broad range of new players in home and hospital care delivery, patient services, and nursing will be integral parts of the future supply chain, further increasing the number of partners and handover points.

Finally, technology innovation will enhance the connections among industry players, providers, and patients. For example, "e-health"

applications will allow pharmacos to track inventory down to the patient's refrigerator and support drug administration in the patient's home with mobile applications. Sensors embedded in pills or their packaging will send signals to physicians, caregivers, or family members whenever a patient consumes the medication. Patient compliance will be a key argument to demonstrate the health economics of innovative and expensive treatments. Common data standards will allow pharmacos, distributors, pharmacies, and hospitals to track and trace products down to consumption, increase drug availability, reduce medication errors, and ensure fast and complete recalls of defective products. The information will be used to better understand how drugs work and will spark new research.

What does all of this mean for the supply chain? Well, it will be exciting to get there, to say the least. Creative solutions will be required to guarantee reliable supply even in remote areas of emerging markets. Regulatory changes, natural disasters, political instability, and global connectivity will be sources of volatility that repeatedly cause shocks to the system in all markets. To enable gene therapy, pharmacos will need to set up completely new supply chains, with single-piece flows, complex logistics, and high requirements for speed and reliability. Their supply chains will also need to manage the greater complexity of diverse product portfolios and work with an expanding network of outsourced manufacturers, logistics providers, and caregivers. And all this will happen in a context of increasing regulatory scrutiny and relentless pressure to reduce costs. Simply put, the next decade will be a supply chain era. The supply chain will become the "central nervous system" for pharmacos, an engine of growth, and a differentiator in the market. That is why we wrote this book!

Innovators from other industries have led the way. Wal-Mart Stores and The Coca-Cola company are examples of companies that have become market leaders not only because of their products but also because they have better supply chain strategies and more rigorous execution relative to the competition.

Wal-Mart's supply chain has set the benchmark for decades. The retailer has developed best practices for integrating suppliers, improving logistics, and making smart investments in information technology (such as the early piloting of radio frequency identification, or RFID). Many of Wal-Mart's core values, such as "being the store of the community" and "maintaining in-stock rates unequaled in the retail world," depend on the supply chain for success.

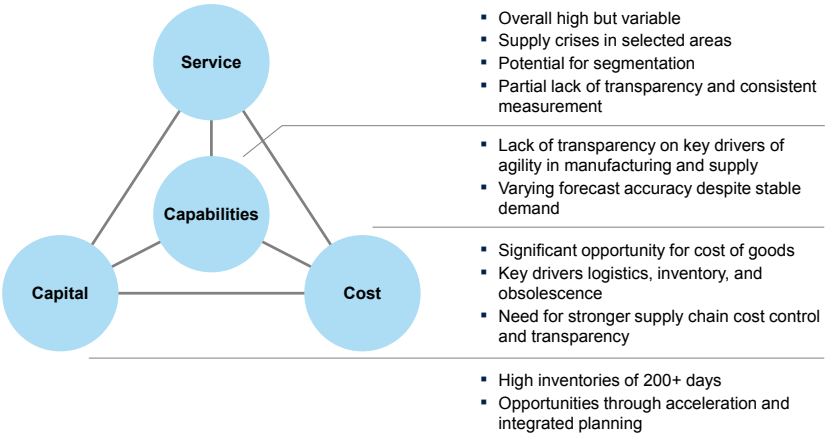
Coca-Cola's supply chain has likewise set the standard for fast-moving consumer goods (FMCG). Starting from its relentless focus on customer service (no stock-

outs, for example, and an unlimited drop size), Coca-Cola has developed a unique replenishment system with its bottlers that offers a classic example of how agility can be used to find opportunity in uncertainty. The company has substantially reduced reaction times and increased delivery frequency, enabling it to eliminate volatility and reduce costs. One bottler in the United States has reduced inventory to two to three days while still avoiding stockouts and tailoring service levels to individual retailers. It offers delivery frequencies that range from 14 times per week (to Wal-Mart, for example) to once a week (to small stores). This was made possible by a flexible manufacturing setup that allows for four to five changeovers per shift.

Like these innovators, pharmacos that excel in supply chain strategy and execution have an opportunity to become the overall market leaders. In this book, we delve into how to make that happen—applying McKinsey & Company's experience working with pharmacos and other companies to achieve distinctive and sustainable change.

Exhibit 1

**Improvement opportunity—some observations**



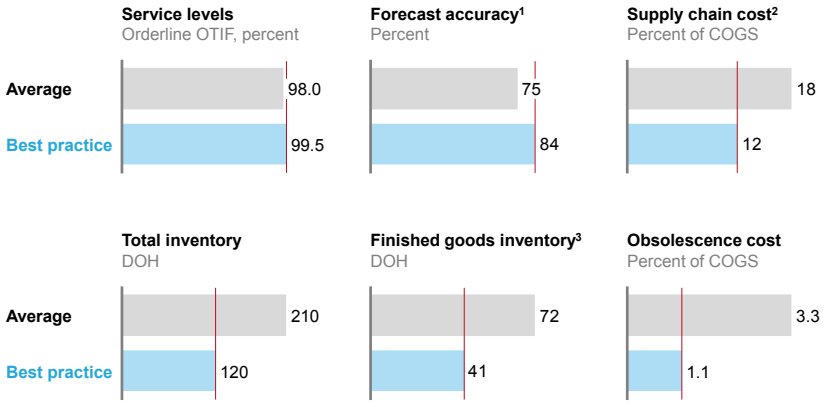
## The pharma supply chain today

Where do pharma supply chains stand today? Service: good. Cost and capital: poor. Capabilities: need improvement (see Exhibit 1). A report card like that won't win any awards, and it's not a recipe for success in an industry that's changing so dramatically and so quickly.

A select few companies are outperforming the rest in these dimensions. What sets apart these winners today? McKinsey & Company's Pharma Operations Benchmarking (POBOS) survey sought to find out. POBOS reveals some wide gaps between pharmacos that deploy best practices and average players across key performance metrics (see Exhibit 2). Lagging pharmacos will need to close these gaps in supply chain performance to stay competitive in the next ten years.

Exhibit 2

**Overview of supply chain metrics at originator pharmacos**




1 Based on 1-MAPE, 3 months out, volume-based, volume-weighted
2 Includes all warehousing, transportation, supply chain overhead staff, inventory holding, and obsolescence
3 Inventory in customer-facing DCs and in transit

SOURCE: POBOS Supply Chain; McKinsey analysis

**Service.** Pharmacos have historically measured success in terms of service performance, so it comes as no surprise that service levels are generally high. Our

POBOS benchmarking measured service levels in terms of delivery on-time in-full (OTIF). We found that top-quartile originator (Rx) pharmacos had service levels of 99.5 percent in developed markets, exceeding those of the top FMCG companies. Even average Rx pharmacos had service levels of 98 percent in key markets (most generics [Gx] pharmacos have significantly lower service levels). Without a doubt, these high service levels have been enabled by the high levels of inventory that pharmacos maintain.

But that doesn't mean all is well on the service front. Although service levels are high overall, they can also be quite variable—as low as 93 percent or 94 percent in some cases, for some products and some markets—which can result in a significant loss of sales. The variability of service is apparent in the serious supply crises experienced by some drugs, such as shortages of sterile injectables. By systematically segmenting service levels by products or countries, pharmacos have an opportunity to better align service with market demand.

**Cost.** When pharmacos operated in a more stable environment, they could live with relatively high costs and inventory levels. But those days are over. To remain competitive in today's exceedingly volatile environment, they must bring these levels under control.

Reducing supply chain costs should be a top priority. Our benchmarking found that these costs represent a significant portion of total COGS: 15 to 20 percent for average pharmacos, but as high as 30 percent for the bottom quartile. Top-quartile pharmacos have reduced this figure to 12 percent. The bottom-line opportunity from reducing supply chain costs is significant—a potential COGS improvement of up to 2 to 3 percentage points.

Where can pharmacos find the savings to achieve this impact? Leading pharmacos don't slash costs across the board. They find the main drivers of supply chain costs and focus on them first. Our benchmarking pinpointed inventory and obsolescence as the prime target—it represents almost 50 percent of the total supply chain cost for the average pharmaco. Transportation and warehousing are next, together constituting 40 percent of the total costs. Full visibility into end-to-end supply chain costs globally will be critical to finding the greatest cost reduction opportunities at a particular company.

**Capital.** Pharmacos hold very high levels of inventory: four months for leading Rx players, seven months for average players, and as many as nine to ten months

for the bottom quartile. Gx pharmacos maintain lower coverage—about five months, on average—mainly attributable to their smaller upstream inventories.

Some managers might not see inventory reduction as a top priority—and, in a way, they are right. Reducing high inventory levels won't fix the underlying problem: an inflexible and fragmented supply chain, with long throughput times and lack of agility in operational processes. Pharmacos need more flexible supply chains, and inventories will come down as a result. High inventories not only testify to inflexibility, they also mask problems and eliminate incentives to push for higher levels of agility. In that sense, the high inventories today are the stockouts of tomorrow!

Where should pharmacos focus to improve their throughput times? As with costs, it's essential to set the right priorities. Finished-goods replenishment should be first on the list. Our benchmarking found that finished goods make up about 40 percent of total inventory value for Rx pharmacos and about 50 percent for Gx pharmacos. Accelerating the speed of replenishment times is critical to reducing this level. The next priority should be drug substances and raw and intermediate materials, which together constitute about 40 percent of inventory. Pharmacos can achieve significant benefits by managing stock holding points more closely and reducing throughput times, as well as by optimizing the level of risk stocks. And, although bulk goods and excipients represent less than 20 percent of inventory, they are strategically important to address as well. For example, a decoupling strategy in which a pharmaco maintains higher levels of bulk goods can enable it to speed up the distribution of supply to countries.

**Capabilities.** While some quick wins can improve performance in service, cost, and capital, pharmacos will need to build critical capabilities to sustain superior performance over the long term. This requires raising the bar in areas such as manufacturing frequency, reliability, lead time and flexibility, measurements and controls, complexity management, and forecast accuracy.

Manufacturing frequency illustrates how pharmacos can drive improvements by more tightly integrating the manufacturing and supply systems. The manufacturing frequency index in packaging looks at the percentage of SKUs produced at high frequency—defined as every two weeks for pharmacos and each week for consumer goods companies. Our benchmarking found that top-quartile Rx pharmacos produce about 30 percent of SKUs at high frequency, whereas the average is about 10 percent. By contrast, top-quartile FMCG companies produce about

60 percent of SKUs at high frequency, even with a higher threshold of weekly production.

Sales forecast accuracy also illustrates the potential. Forecast accuracy can be further improved in many cases, because it is often low relative to the limited sales volatility. The average forecast accuracy[1] for Rx pharmacos is 75 percent; this figure rises to 85 percent for the best performers. A systematic demand review (on a regional level, for example) and a segmented forecasting approach can often help improve accuracy. This can include systematic use of statistical forecasting with the right parameters, while manual forecasting efforts focus on launches, tenders, and highly volatile products.

## Uncertainty, risk, and complexity are increasing …

Fixing what's broken in today's supply chain is just the starting point. To win in the long term, pharmacos must also anticipate how performance requirements will change in the coming years. Which trends are reshaping the operating environment? How will they affect uncertainty, risk, and complexity for pharma supply chains? And how high will the bar be raised for performance and capabilities?

Winning pharmacos will stay ahead of the curve due to several trends:

**The global market's center of gravity is shifting.** The shift of economic activity toward emerging markets is well known, as GDP growth in emerging markets has outpaced that of the United States and Europe in recent years. But what has this meant for the growth of spending on health care and pharmaceutical products? The numbers point to a dramatic shift in growth opportunities. For example, between 2008 and 2018, we expect the compound annual growth rate (CAGR) of the pharma markets in China and India to increase by 17 percent; over the same time period, CAGRs in Germany and the United Kingdom will be on the decline. And spending on pharmaceuticals is forecast to increase by 11 percent per year from 2011 to 2021 in the BRIC countries (Brazil, Russia, India, and China), versus only 2 percent per year in the United States and -0.1 percent per year in Europe (see Exhibit 3). In this environment, supply chains have become more global—perhaps more so for pharma than other industries. Regional trade

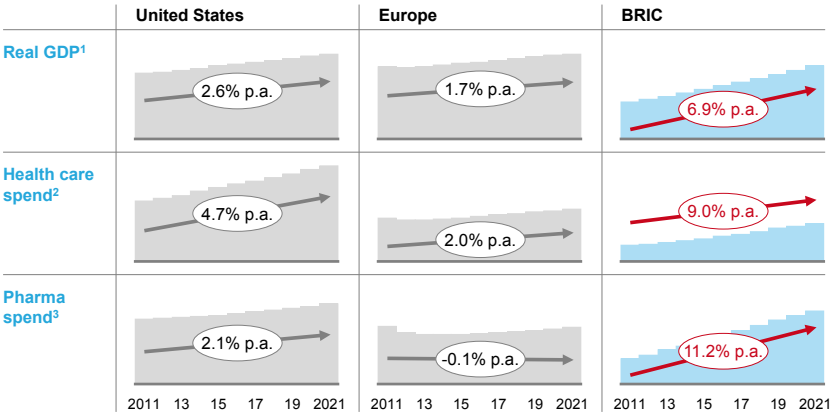
1 Based on mean absolute percentage error, three months out, volume-weighted.

balances for pharmacos increased fourfold from 2000 through 2010, whereas they only doubled for the manufacturing sector as a whole.

Exhibit 3

**Emerging markets are driving growth**

GDP, health care spend, pharma spend, $ billions




1 Source: IHS Global Insights
2 Source: World Health Organization (WHO), national statistical offices
3 Source: BMI, (FDA), AESGP

SOURCE: As given in footnotes, not exhaustive

**Supply chains are becoming more complex.** What does serving more diverse markets mean for pharmacos' supply chains? Supply chain managers probably already know the answer: greater complexity. For example, our POBOS benchmarking found that the number of SKUs per packaging line was 54 percent higher in 2011 than from 2006 through 2008.

**Volatility has increased along with the number of tenders.** Pharmacos also need to cope with volatility arising from the increased use of tenders. In many countries, including major European markets, tenders are prevalent for both major channels—the hospital channel as well as the retail, outpatient, and pharmacy channel. Payers use tenders to reduce costs for products that are interchangeable, such as generics, vaccines, and "me too" drugs. In Germany, for example, the number of tenders for generics molecules tripled between 2008 and 2011.

And pharmacos are feeling the impact: when a German Gx maker won a significant number of tendered molecules, the volume it needed to supply to the market increased by about 50 percent within just two months.

**Regulators' scrutiny has intensified.** Adding to the challenges, regulators are devoting more resources to the oversight of pharmacos—and their scrutiny is both broader and more intense. In the United States, for example, the FDA's budget increased by $500 million between 2008 and 2012. At the same time, its field force expanded by nearly one-third and the number of inspections increased by more than 40 percent. FDA inspectors are now instructed to target the most problematic manufacturing sites, regardless of location, and non-U.S. facilities are increasingly in their sights. From 2008 through 2011, the number of non-U.S. inspections increased by 25 percent per year, while the number of domestic inspections increased by only 7 percent. Half of all GMP warning letters issued in 2011 were for non-U.S. facilities, and the FDA now shares and exchanges its inspection reports and findings with other national or regional agencies globally. Regulatory sanctions resulting from quality issues are also on the rise. In the United States, drug recalls increased by 54 percent from 2008 through 2012, and the number of GMP warning letters increased from 15 to 40.[2]

One area in which regulators have ramped up their attention is logistics. The European Commission's new guidelines for good distribution practices, issued in 2013, are a case in point. The guidelines have led to higher costs by tightening regulations applicable to all stages and players in the distribution chain. This includes stricter regulations on temporary storage areas and temperature monitoring.

**Spending on outsourcing has increased.** To cope with the surge in volatility and complexity, many pharmacos are focusing on core competencies while outsourcing other functions. In a 2009 survey of pharma executives, 39 percent of respondents said that they expected to spend more on outsourcing than in the previous year—this number rose to 51 percent in a 2012 survey.[3] This trend has made contract manufacturers increasingly important players in the industry: the share of drugs they produce is forecast to double between 2004 and 2016, reaching 25 percent of the pharma market's total value.[4]

2 FDA Web site and budget reports, The Gold Sheet.
3 Contract Pharma Outsourcing Surveys.
4 BMI, January 2012; BCC Research, 2005/2007/2009/2011.

The risk of counterfeit drugs is growing. The rapid growth of the pharma market in emerging economies has had an unintended consequence: a significant increase of the prevalence of counterfeit drugs. For patients, the impact can be devastating. Counterfeit drugs may lead to low treatment efficacy, increased medication resistance, adverse side effects, and even death. They also cut into manufacturers' sales and government tax revenue. Although it is difficult to pinpoint the counterfeit-drug rate, estimates range from 2 to 10 percent globally, with significant variations across countries. Many experts estimate the rates to be 1 percent or less in developed countries and anywhere from 10 to 30 percent in developing countries. These estimates, based on isolated studies and extrapolations, must be treated with caution, but the penetration of counterfeit drugs is likely to increase if not dealt with. In parts of Africa, Asia, and Latin America, more than 30 percent of medicines could be counterfeits.

What can pharmacos do to address the risks of counterfeits? Direct communication between pharmacos and patients will be critical. For example, patients could have the ability to scan a bar code on a package to directly confirm with a pharmaco that a drug is authentic. This direct communication will create the opportunity for other interactions—not only relating to product safety but also for marketing.

**Pharmacos face greater pressure on costs.** Maintaining profitability when faced with the aforementioned wide-ranging challenges would be daunting enough, but pharmacos must also cope with increasing pressure on margins.

In Europe, for example, governments continue to pursue austerity measures in response to the debt crisis, and health care organizations haven't been immune from the impact. Price cuts, the introduction of benefit assessments, expanded use of tenders, reference pricing, and other measures are taking a toll on reimbursement levels. During the past several years, major pharmacos have seen prices fall by 2 to 8 percent, on average, across the continent.

## … but opportunities arise at the same time

So far, we've painted a bleak picture for the pharma industry: performance lags behind that of other industries, and all sorts of challenges have intensified. But there is another way to look at this situation. It offers major opportunities to companies that are agile enough to quickly recognize and capture them. Pharmacos with robust and agile supply chains can often respond more rapidly than their

competitors when circumstances change abruptly, and grab substantial market share as a result. These opportunities can arise from shocks on either the supply or the demand side. What are the possibilities? Consider a range of challenges and opportunities arising from tender volatility, quality-related actions, medical issues, government interventions, and natural disasters:

**Tender volatility.** Volatility arising from tenders is increasing, and the stakes are high. Whether a company wins or loses a tender can have a significant impact on its supply chain operations. Tenders in the German market illustrate the potential scope of the impact. The German public payer AOK covers approximately 24 million patients, which is more than the entire population of Australia. The AOK approves tenders on the basis of molecules, and these approvals are usually valid for two years. Currently, as of October 2013, 116 molecules are supplied under tender contracts (on a regional basis) with a sales volume of €2.1 billion. If a pharmaco wins a tender, it must rapidly ramp up its production to serve demand from patients who use the drug. But if it loses the tender for the same molecule in the next round, it must ramp down from serving this large population just as quickly.

**Quality actions.** Payers' actions are just one source of volatility. Regulators can also cause big headaches for some pharmacos—and thereby open the door for their competitors. Regulatory authorities are increasingly taking action in response to quality issues, and the corresponding effects, such as plant closures, can cause drug shortages that have an immediate impact on patients' safety. One pharmaco's quality issues can create opportunities for competitors to fill the void that results from drug shortages. Several cases show how competitors can seize the opportunity:

In 2009, the FDA imposed an import ban on drugs produced by Apotex, Canada's biggest drugmaker, after a plant inspection identified deviations from manufacturing rules. The import ban primarily affected drugs that could be replaced with competitors' products. Within the ban's first ten months, monthly prescriptions for Apotex products in the United States dropped from 9 to 1 million. Other manufacturers seized the opportunity to take market share—for example, Teva Pharmaceutical Industries increased its monthly prescriptions by 6 million during the same period. Apotex estimated that the ban cost it $520 million in lost sales.

Several European countries banned the use of flu vaccines manufactured by Novartis in 2012 out of concern that particles in the vaccines could trigger allergic reactions. In Germany, where Novartis had won exclusive tenders from major payers,

750,000 doses were recalled. To help replace these, GlaxoSmithKline agreed to provide 560,000 doses, and Abbott Laboratories said it would provide another 60,000.

In 2011, the interruption of market supplies from an Ohio production facility of Boehringer Ingelheim's Ben Venue Laboratories because of manufacturing and quality concerns led to shortages of two cancer-treatment drugs: Johnson & Johnson's chemotherapy drug Doxil (doxorubicin) and preservative-free methotrexate. To respond to the shortage of Doxil, the FDA approved the temporary importation of Sun Pharmaceutical Industries' Lipodox (pegylated liposomal doxorubicin) from India as an alternative. The FDA also worked with many firms to assist in maintaining supplies of methotrexate. For example, generics manufacturer Hospira expedited the release of 31,000 vials of the product, representing more than one month's worth of demand.

Opportunities like these may arise even in markets for patented drugs. For example, when quality problems led the FDA to shut down the Genzyme plant producing Cerezyme (used to treat Gaucher's disease), supply shortages resulted. To address this, the FDA gave fast-track approval to alternatives—for example, a product marketed jointly by Protalix Biotherapeutics and Pfizer, which had to set up their supply chain faster than normally required.

**Medical issues.** In addition to quality actions, medical issues can also create an unanticipated void in the marketplace. Unlike the foreseeable demand change stemming from exclusivity expirations, a pharmaco's decision to withdraw a drug because of medical issues can abruptly impact production. The pharmaco withdrawing the drug faces the challenges of rapidly ceasing production, while competitors have an opportunity to rapidly fill the void.

For example, Actos, a medicine for type 2 diabetes from the Japanese drugmaker Takeda, rapidly gained market share after Avandia, made by GlaxoSmithKline, was linked to heart problems. Although the two products had comparable sales figures before the FDA raised concerns about Avandia, Actos succeeded in seizing a dominant market share after the concerns arose. Actos's share of the United States market as measured by dispensed prescriptions increased to 69 percent in 2009 from 44 percent in 2005, while Avandia's share fell to 13 from 46 percent.

**Government interventions.** Government agencies can make decisions affecting demand and supply that open opportunities for pharmacos or force them out of the market—literally overnight. For example, in 2009, the Russian agency responsible

for overseeing product quality announced that it was asking pharmacos in Russia to produce an additional 40 million doses of flu vaccines by the end of the year. This number of doses is more than the entire population of Argentina. The main beneficiary of the increased demand was the Russian pharmaceutical company Pharmstandart, which had the flexibility required to ramp up production rapidly.

**Natural disasters.** Disruptions and the related opportunities can also occur suddenly without human intervention or decision making. Events such as the 2011 earthquake and tsunami in Japan have shown the extent to which global supply chains are vulnerable to natural disasters. Entire supply chains were disrupted as Japanese companies experienced energy outages and extensive damage to transportation infrastructure, as well as export delays arising from the need to screen products for radiation. Eight pharmaceutical plants stopped operations, and recovery times ranged from a few days or weeks to several months. The Roche subsidiary Chugai estimated costs of approximately $110 million related to the damage.

## A new paradigm for pharma supply chains

There's a simple lesson from these examples: when some pharmacos lose, others win. The winners have the speed and flexibility to outmaneuver their competitors and snare the opportunities arising from uncertainty. And, with margins eroding in the base business, these opportunities will be substantial contributors to companies' overall financial results.

What will it take to be one of the agile winners? Becoming agile will mean making radical changes to your organization and culture—think in terms of revolution, not evolution. This book looks at how to do it from the perspectives of strategy and execution and how to train and educate your people to make it happen.

**Robust strategy.** A robust strategy is the starting point for an agile supply chain. How should a supply chain be configured to optimally serve the customer? How can it be aligned closely with the business strategy? How can a supply network become agile enough to capture opportunities before competitors in a volatile world?

To provide the right service levels to customers, pharmacos must make a range of strategic decisions. How should channels and the route to market be designed? How should emerging markets (such as Africa) be developed and served? What is the most effective model for collaborating with customers?

Pharmacos must also make strategic decisions in setting up the supply chain function itself. For example, what is the right operating model to create accountabilities and provide incentives?

**Solid execution.** A robust strategy requires solid execution to drive value. This starts with getting the basics right. For example, what are the best approaches for promoting transparency and flawless fulfillment? How can pharmacos use process automation to create value?

Beyond these table stakes, pharmacos will need to build advanced execution capabilities in demand planning and forecasting and in measuring performance. How can an organization gain full visibility into the factors that determine inventory needs, such as manufacturing frequency, flexibility, stability, and cost to serve? What are the right things to measure and the right ways to measure them?

As pharma operations grow increasingly more complex, the need for more agile, data-based supply chain management becomes correspondingly more urgent. How can pharmacos prepare themselves to capture emerging opportunities in big data and analytics? What IT systems will they need to handle the challenges?

**Transformation enablers.** It's not enough to address the visible symptoms of performance problems by analyzing and resolving operational issues. Organizations must also find ways to rally behind aspirational targets and achieve breakthroughs, and to make the changes last. What does it take to drive sustainable change programs? What should organizations do to focus on their "health" as well as their performance? How can an organization be built to execute and renew itself faster than its competitors?

Managing the day-to-day aspects of the transformation effectively is also critical. How can the organization use cross-functional collaboration to accelerate the transformation? What new core capabilities does it need to succeed in a rapidly changing industry? What approaches to talent management and incentives will help it sustain success?

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In this book, we offer ideas for framing an agenda to address these issues, benchmarks and best practices for gauging current performance, and approaches that will help your organization join the ranks of the industry leaders.

# Setting the transformation agenda

To assess their starting point and priorities, supply chain leaders can consider their organization's current level of performance in the following areas:

**Instilling a customer-focused mind-set.** Are you leading the supply chain to capture new opportunities or merely managing it in response to issues that arise? Have you considered the distinction between identifying and pursuing growth opportunities versus simply ensuring that products are delivered?

**Encouraging active CEO involvement.** How actively is the CEO involved in supply chain design? How effectively does the top leadership manage the cross-functional topics that must be addressed to achieve excellence in supply chain operations?

**Creating transparency.** How carefully do you monitor and seek to improve total cost to serve in the supply chain? What metrics do you use to provide transparency into performance? Is a performance management system in place? Finally, have you identified your performance gaps relative to peers within the industry as well as companies outside the industry that you can learn from?

**Building agility.** Do you understand your supply chain risks and the areas where agility is required? Have you exploited the no-regret moves for creating more agility while reducing costs? Do you have a clear understanding of which areas require investments in agility even though costs will increase?

**Adopting an end-to-end operating model.** Does your supply chain operating model follow an end-to-end approach or does the organization work in silos? Are you achieving the level of collaboration needed for success?

**Attracting talent.** Do you have the best talent available in your supply chain function? How does the level of talent in the supply chain compare with that in other functions, such as marketing, R&D, manufacturing, and quality? What is your approach to attracting people with the capabilities required for seizing the opportunities we have discussed?

**Deploying an effective IT strategy.** Do you have a strategy for using IT to drive supply chain improvements? How well positioned is your organization to capture growth opportunities unleashed by, for example, enterprise resource planning (ERP) systems, tracking and tracing consumption, serialization, electronic prescriptions, and intelligent pills? Does the organization have the capabilities to effectively and efficiently manage significant investments in IT?