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# Prescription Medicines: Costs in Context

*North Dakota Interim Health Care Committee*

*August 4, 2021*

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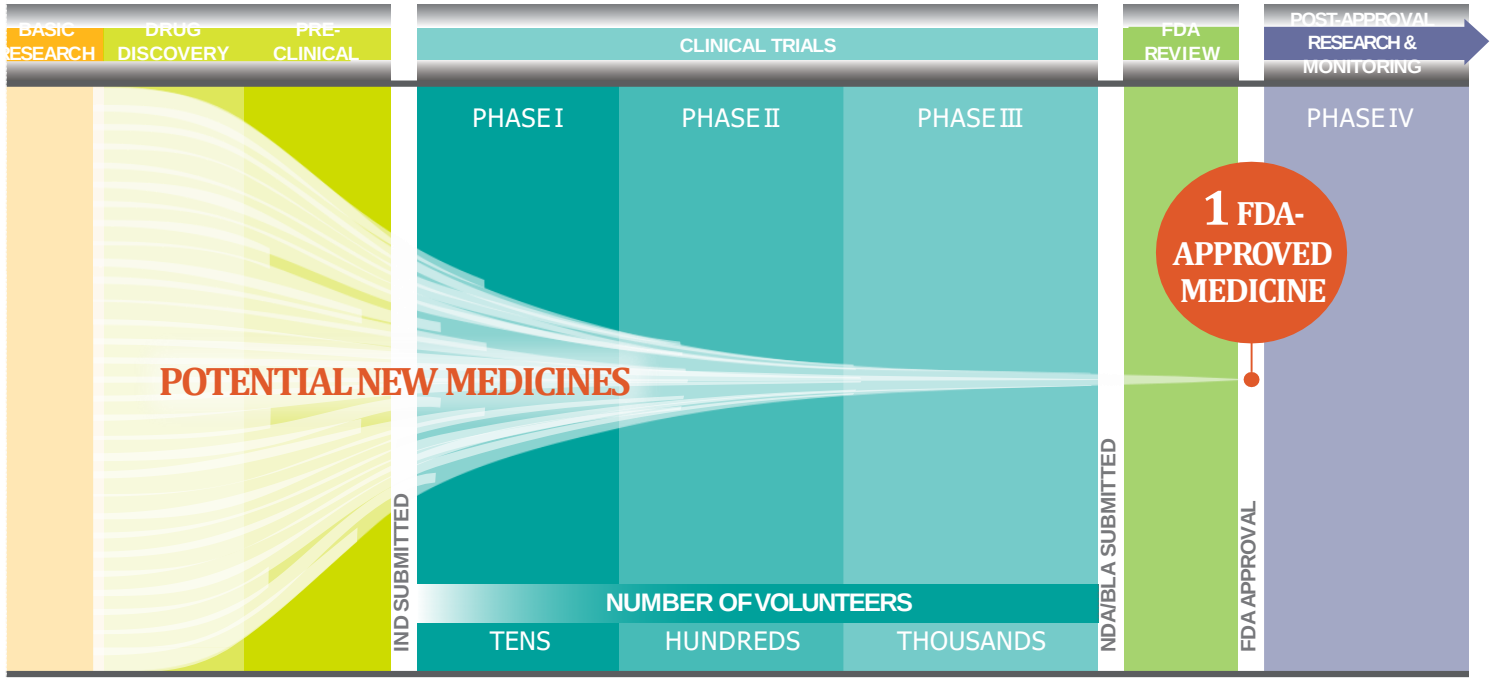
# The R&D Process for New Drugs Is Lengthy and Costly, With High Risk of Failure

From drug discovery through FDA approval, developing a new medicine on average takes 10 to 15 years and costs $2.6 billion.* Less than 12% of the candidate medicines that make it into phase I clinical trials are approved by the FDA.




Key: IND=Investigational New Drug Application, NDA=New Drug Application, BLA=Biologics License Application

*The average research & development (R&D) cost required to bring a new FDA-approved medicine to patients is estimated to be $2.6 billion over the past decade (in 2013 dollars), including the cost of the many potential medicines that do not make it through to FDA approval.

Sources: PhRMA adaptation of DiMasi JA et al.; Tufts CSDD[7]; FDA[8]

# About 4,500 Medicines in Development in the U.S.

Biopharmaceutical researchers are working on new medicines* for many diseases, including:



**CANCERS**
1,120



**HEART DISEASE &STROKE**
200



**HIV**
52



**ASTHMA &ALLERGY**
130



**SKIN DISEASES**
328



**MENTAL DISORDERS**
140



**RARE DISEASES**
566



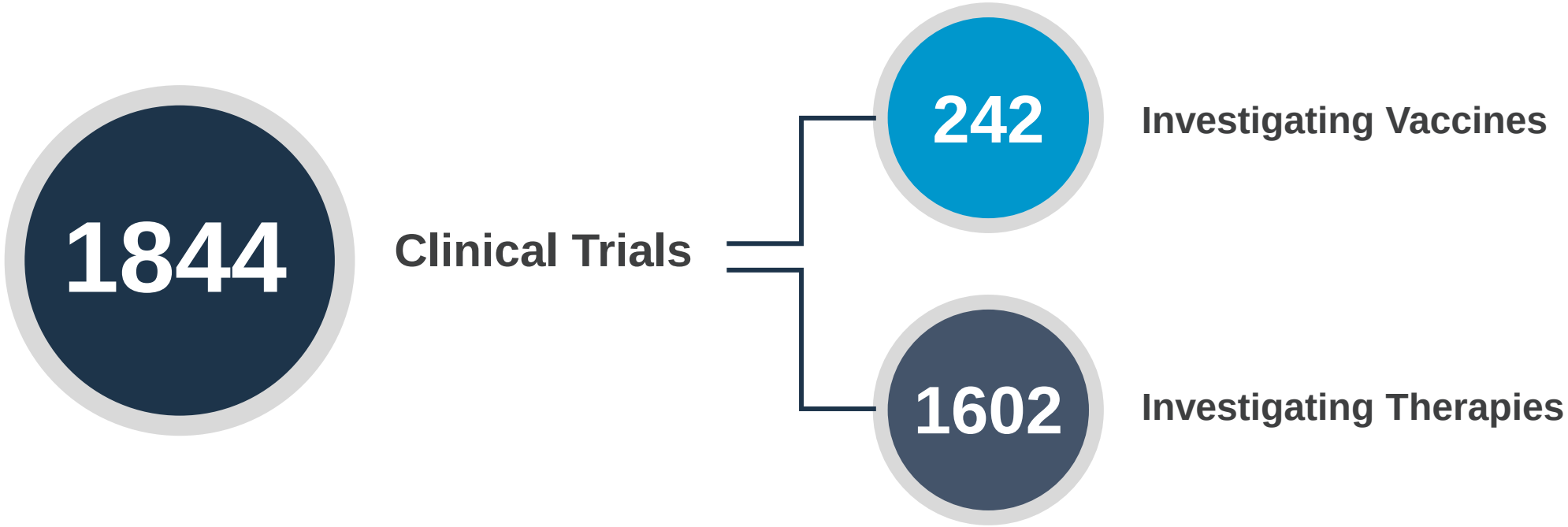
**NEUROLOGICAL DISORDERS**
537

*Defined as single products that are counted only once regardless of the number of indications pursued

Source: Adis R&D Insight Database[2]

# Developing Treatments and Vaccines to Fight COVID-19

There are **1844 clinical trials under way across the globe** for vaccinations and treatments.



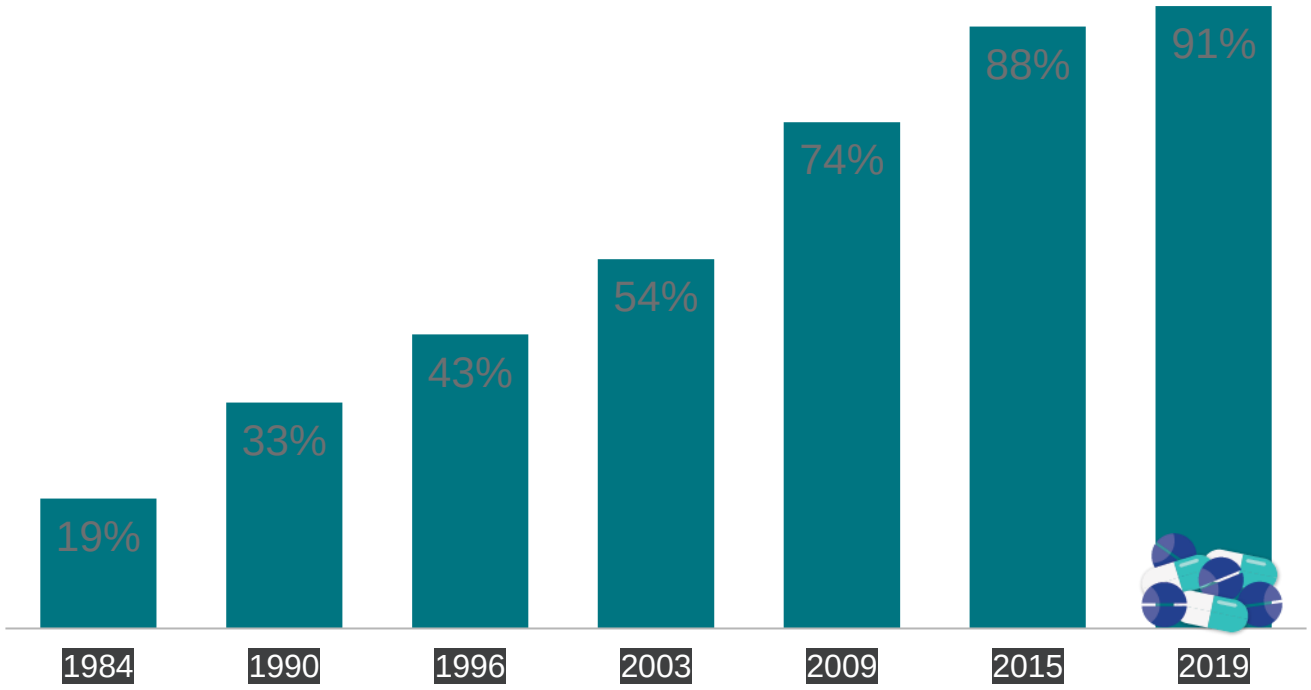

Data as of 7/9/2021

Source: World Health Organization International Clinical Trials Registry Platform (ICTRP)

# 91% of All Medicines Dispensed in the United States Are Generics

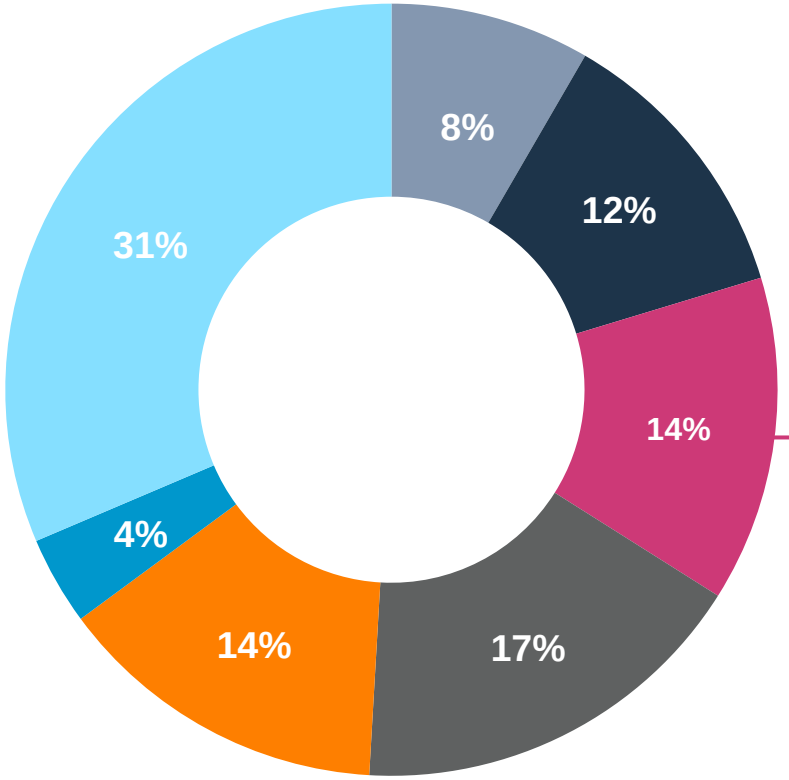
Between 2010 and 2019, use of generics and biosimilars saved nearly $2.2 trillion in US health care spending.[28]

Generic Share of Prescriptions Filled, 1984-2019[29,30]*




*Generic share includes generics and branded generics.

# Spending on Retail and Physician-administered Medicines Represents Just 14% of Health Care Spending




**7% Brand Manufacturers**
**2% Generic Manufacturers**
**5% Supply Chain Entities**

- Admin Costs
- Home Health & Nursing Home Care
- **Prescription Medicines**
- Physician & Clinical Services
- Other**
- Dental Services
- Hospital Care

Source: PhRMA analysis of CMS National Health Expenditures, Altarum Institute, and Berkeley Research Group data. May not sum to 100% due to rounding.

# Though Growth in Medicine Prices and Spending Remains in Line With Inflation, Many Patients Still Struggle to Afford their Medicines

| Brand Medicine Prices | Medicine Spending |
| --- | --- |
| declined | grew |
| **2.9%** | **0.8%** |
| in 2020 | in 2020 |

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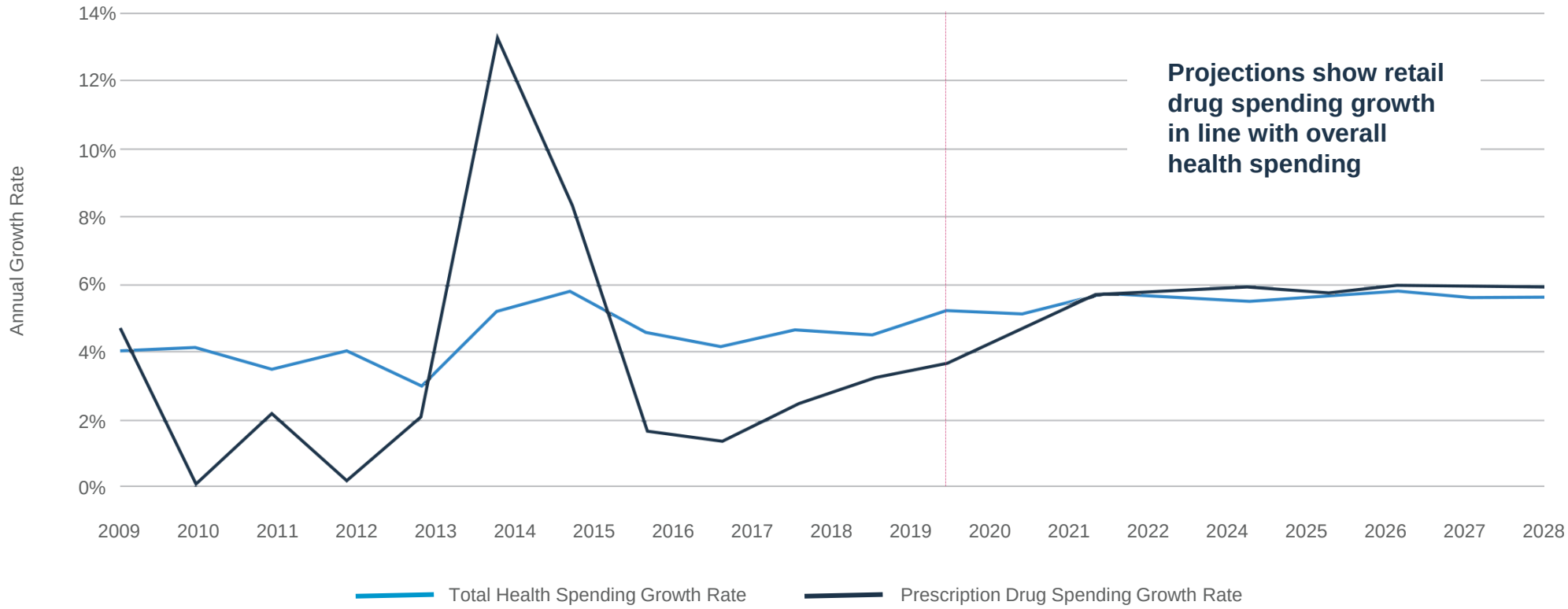
# Medicine Spending is Projected to Grow in Line with Health Care Spending Through Next Decade

## In 7 of the last 10 years, Retail Drug Spending Growth was below Total Health Spending Growth



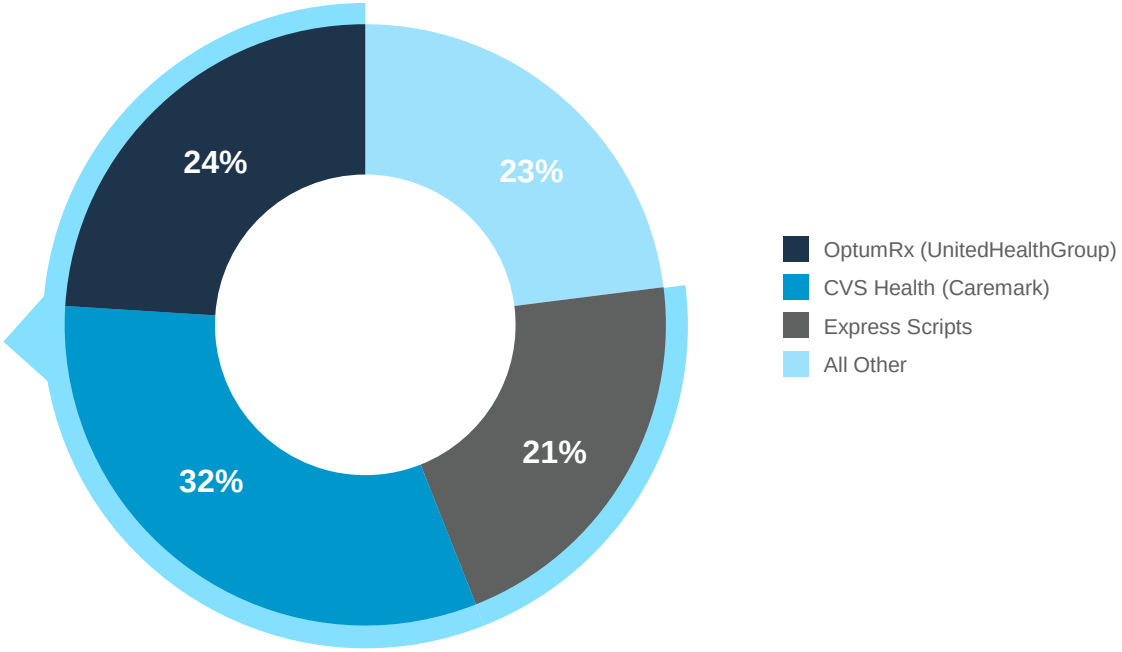

Source: CMS National Health Expenditures Report 2020
Note: Total retail sales include brand medicines and generics.

# Insurers and PBMs Have a Lot of Leverage to Hold Down Medicine Costs

**Negotiating power is increasingly concentrated among fewer pharmacy benefit managers (PBMs).**

Top 3 Market Share:

**77%**




## Insurers determine:

**FORMULARY**
if a medicine is covered

**TIER PLACEMENT**
patient cost sharing

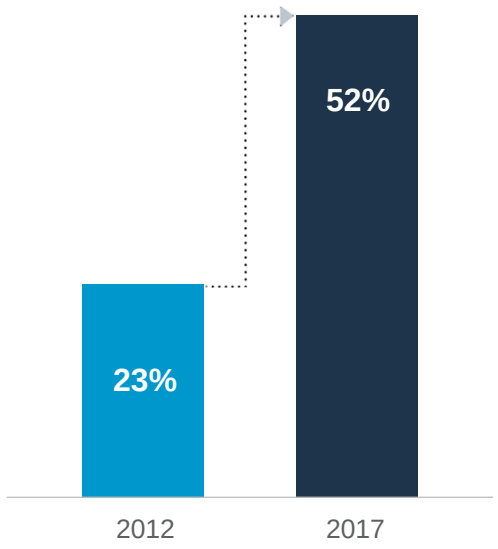
**ACCESSIBILITY**
utilization management through prior authorization or fail first

**PROVIDER INCENTIVES**
preferred treatment guidelines and pathways

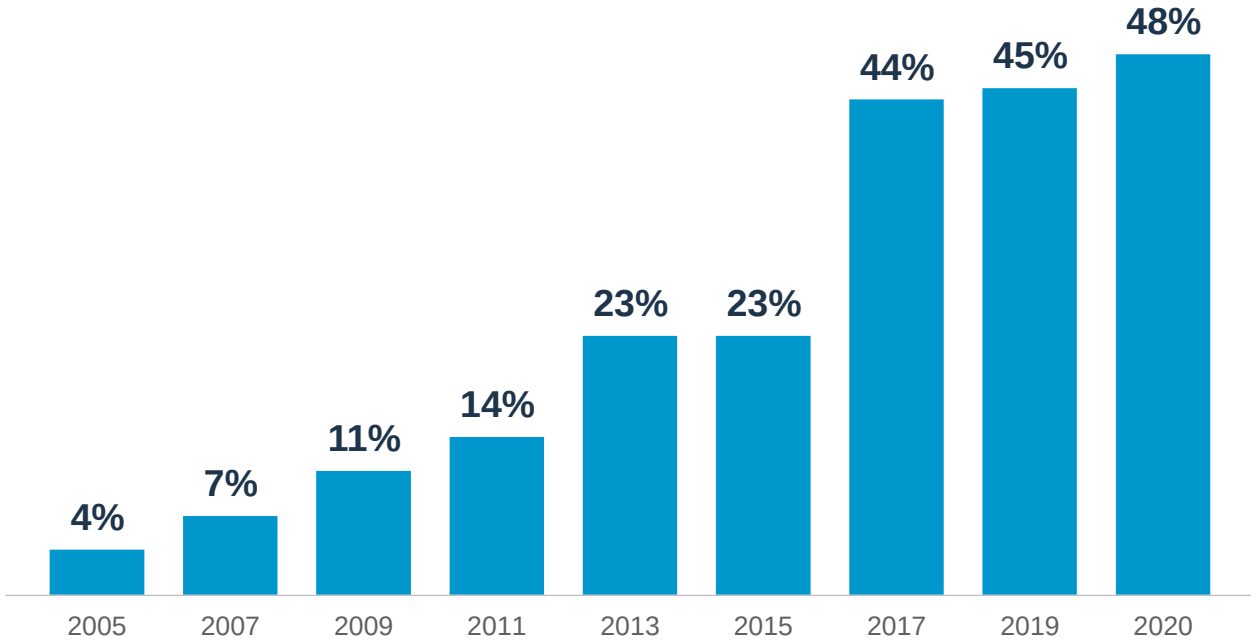
Source: Drug Channels Institute, March 2021.

# Insurers are Increasingly Shifting Costs to Patients Through the Use of Deductibles and Coinsurance

**Percent of plans with deductibles on prescription drugs**



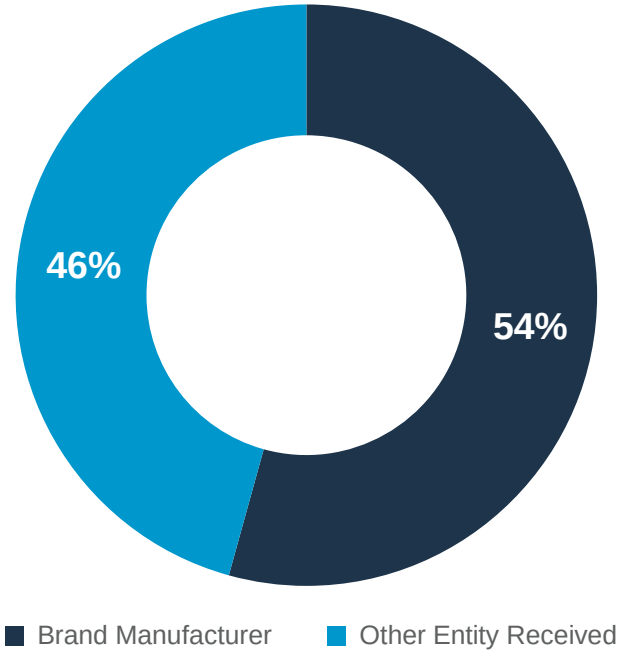

**The use of four or more cost-sharing tiers is becoming more common on employer plans**




Source: PWC, KFF

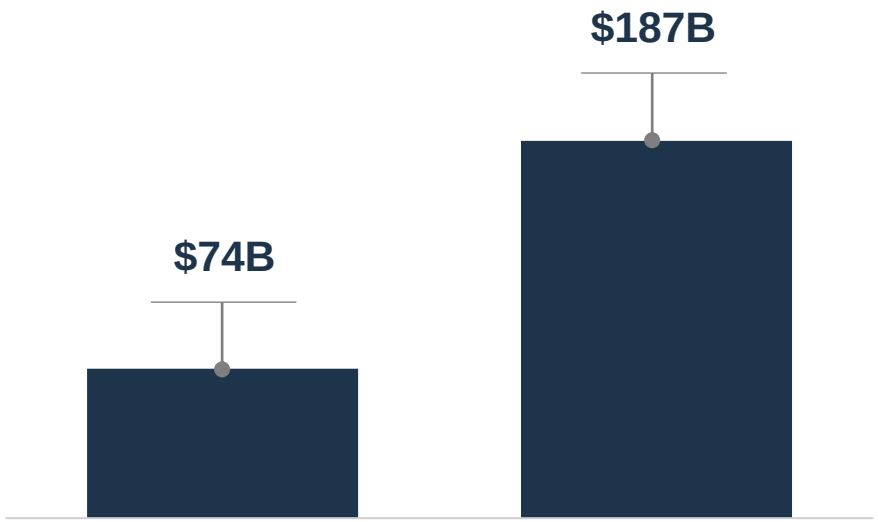
# Nearly Half of Spending on Brand Medicines Goes to Entities Other Than the Manufacturers Who Developed Them

## Percent of Total Spending on Brand Medicines Received by Manufacturers and Other Entities, 2018




Source: Berkeley Research Group, 2020.

## Rebates, discounts, fees and other price concessions have more than doubled since 2012

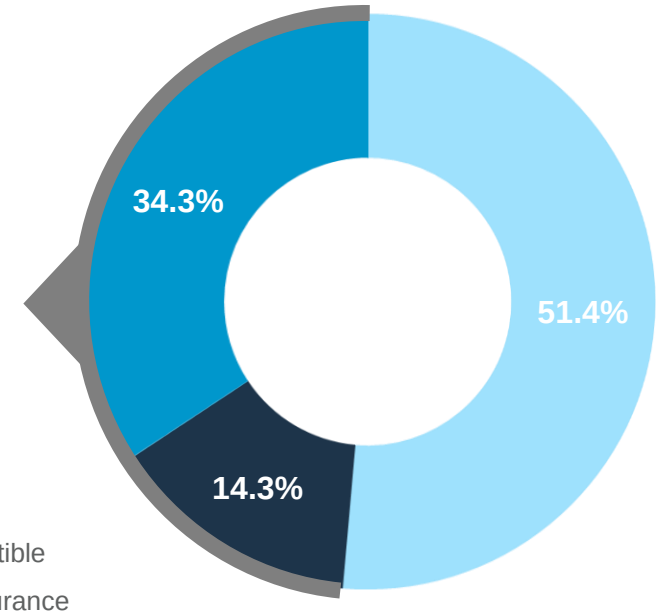



Source: Drug Channels Institute, March 2021.

# Too Often, Negotiated Savings Do Not Make Their Way to Patients at the Pharmacy Counter

**Half of commercially insured patients' out-of-pocket spending for brand medicines is based on the full list price**

**49%**

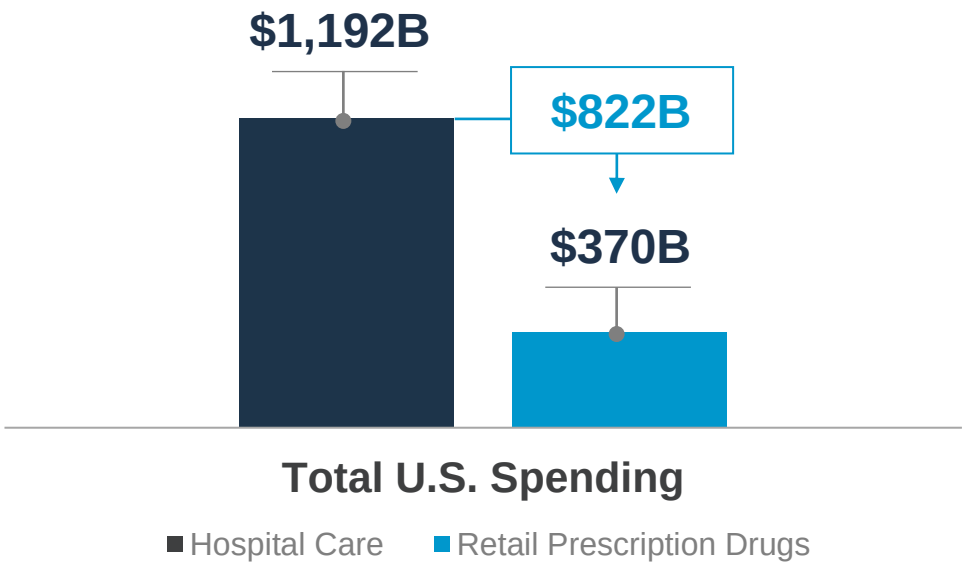



**Cost sharing for nearly 1 in 10 brand prescriptions is based on list price**

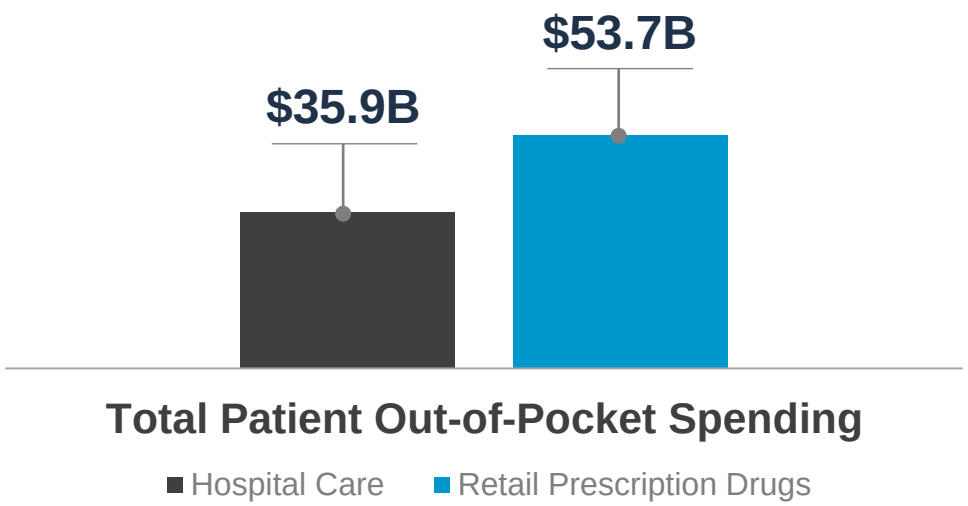
Source: IQVIA. August 2020.

# Patients Face High Out-of-pocket Costs at the Pharmacy Counter Even Though Total Spending on Other Parts of the Health Care System is Far Higher

**Hospital spending is much higher than prescription drug spending.**



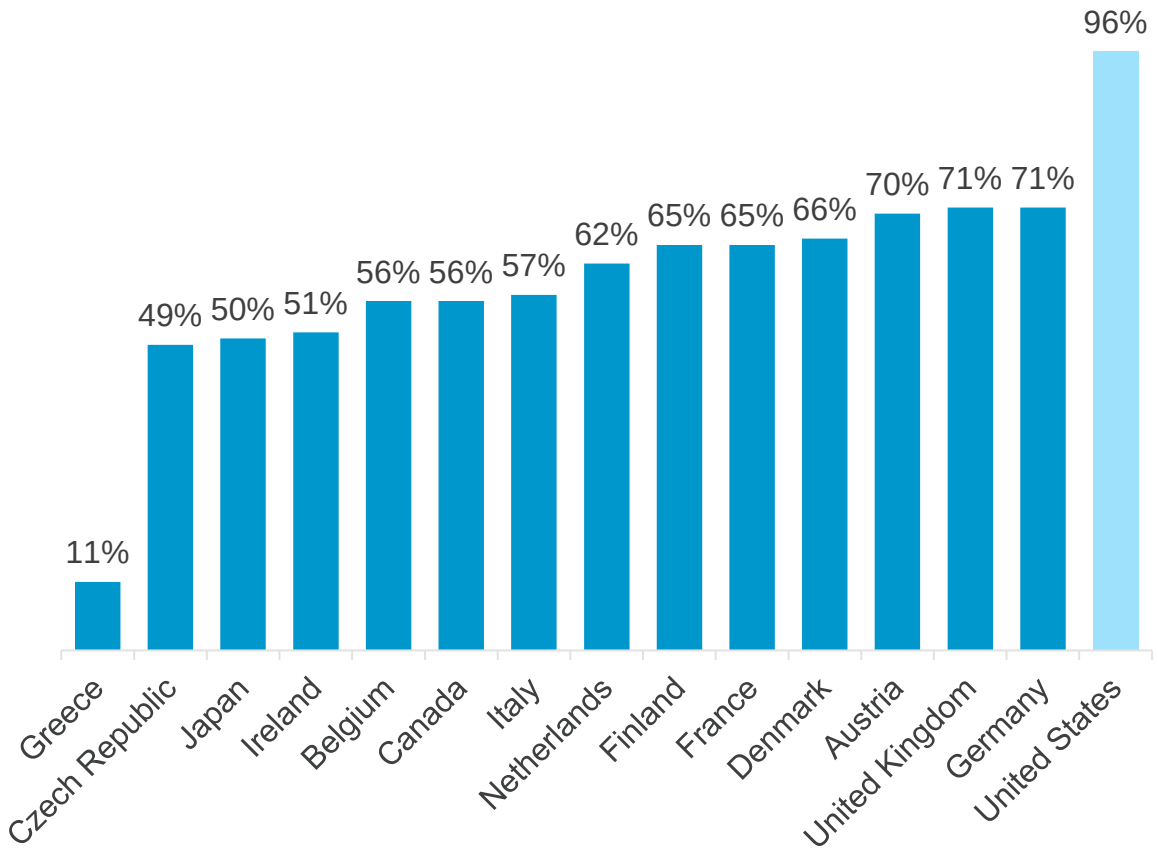

**Yet patients pay more out-of-pocket for medicines than for hospital care.**



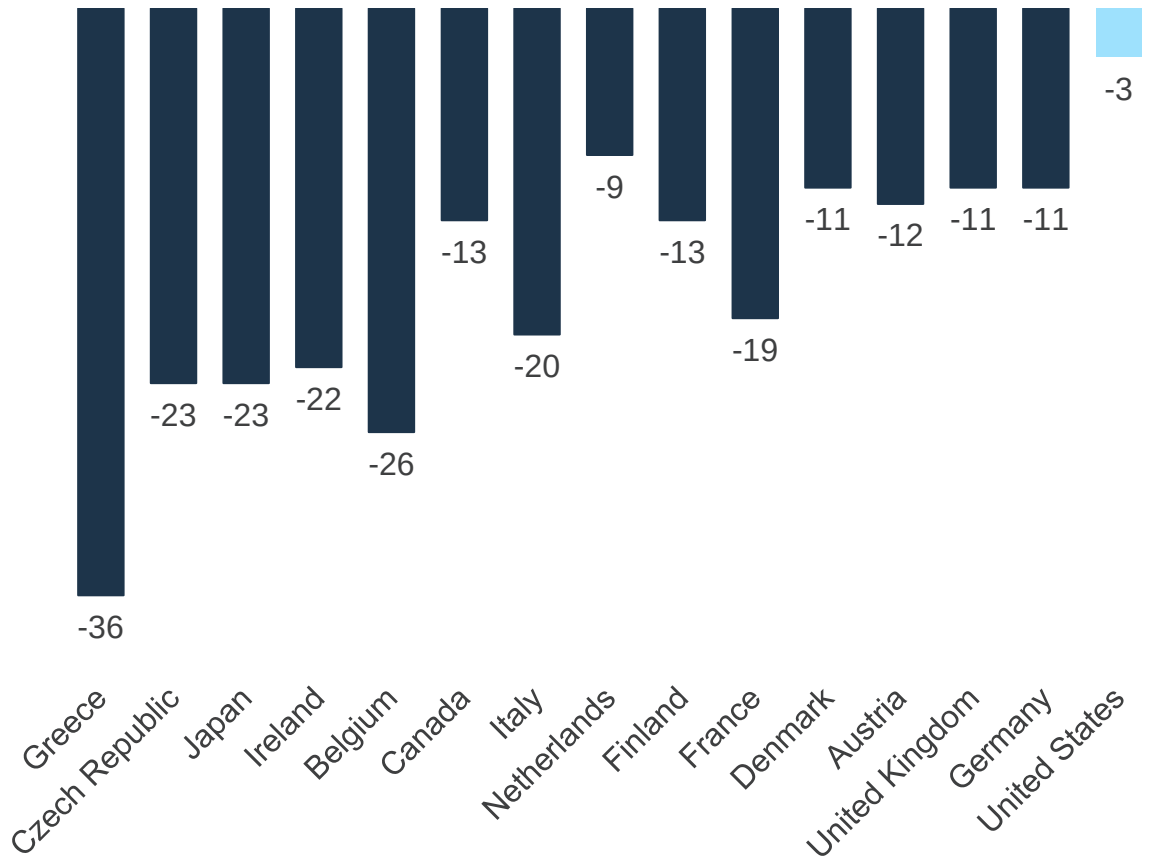

Source: Drug Channels Institute analysis of National Health Expenditure Accounts, Office of the Actuary in the Centers for Medicare & Medicaid Services, December 2020. Outpatient prescription drug figures exclude inpatient prescription drug spending within hospitals and nearly all provider-administered outpatient drugs. Figures in billions.

# IPI Model Would Put Patient Access to Treatment at Risk

## New Cancer Medicines Available



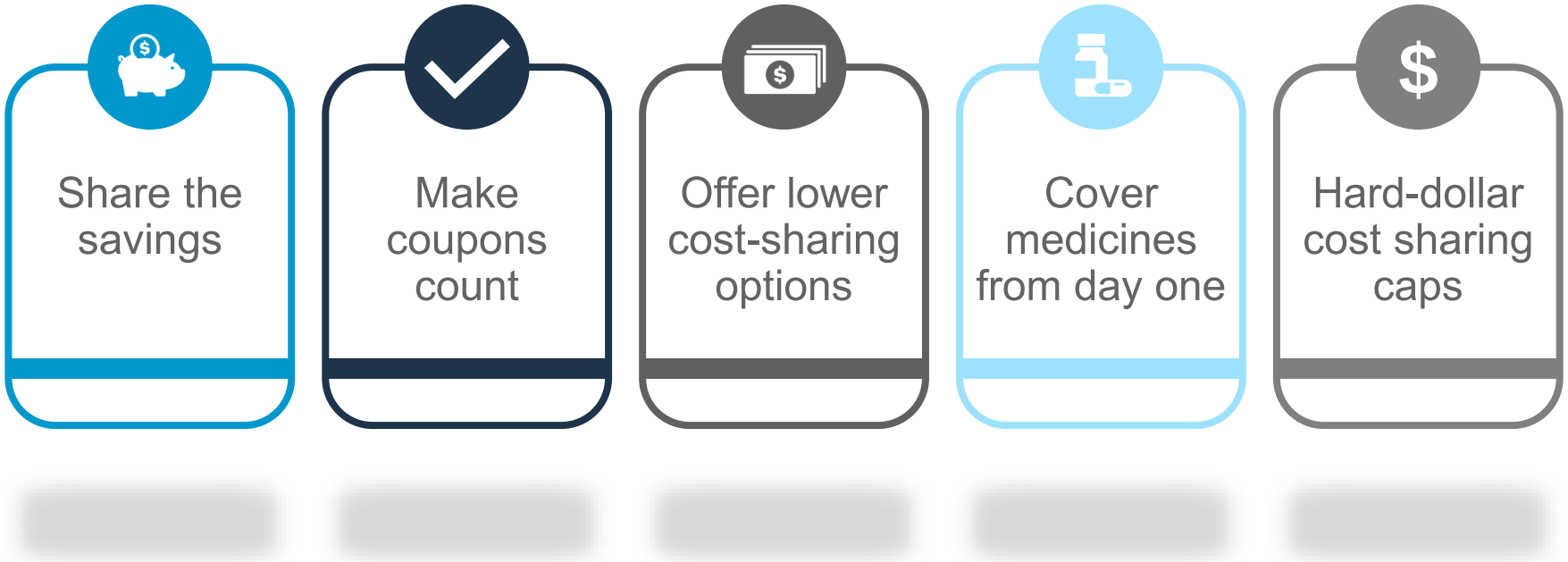

## Average Delay in Availability of New Cancer Medicines (in months)




Source: PhRMA analysis of IQVIA Analytics Link and FDA, EMA and PMDA data. January 2019.
Note: New Active Substances approved by the FDA, European Medicines Agency (EMA) and/or Japan's Pharmaceuticals and Medical Devices Agency (PMDA) and first launched in any country between January 2011 and September 2018. IQVIA reports only the retail channel for Greece.

# PhRMA Supports State-level Reforms

## Policies That Help *Patients Pay Less*



# PhRMA Created the Medicine Assistance Tool, or MAT, To Help Patients Navigate Medicine Affordability

**MAT makes it easier for those struggling to afford their medicines to find and learn more about various programs that can make prescription medicines more affordable.**

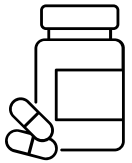
## The Medicine Assistance Tool Includes:

A search engine to connect patients with

**900+**

assistance programs offered by biopharmaceutical companies, including some free or nearly free options

Resources to help patients navigate their insurance coverage



Links to biopharmaceutical company websites where information about the cost of a prescription medicine is available

# Questions?

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# Policies to Help ***Patients Pay Less*** for their Medicines:

America's biopharmaceutical companies agree that, for too many Americans, the health care system is not working and needs to change. While medical innovation has made the United States a world leader in the discovery of new medicines, these treatments won't benefit patients who can't get them.

There are no easy solutions, but patients need real leadership from everyone involved in our health care system to make it work better. That's why our companies are calling for everyone in the health care system to join us in supporting common-sense reforms to make insurance work like insurance and ensure that patients can access and afford the medicines their doctors prescribe.

WE BELIEVE THE FOLLOWING POLICIES ARE THE BEST WAY TO ACHIEVE THESE GOALS AND MAKE SURE THAT ***PATIENTS PAY LESS*** FOR THEIR MEDICINES.

## Share the Savings

On average, pharmaceutical companies rebate 40 percent of a medicine's list price back to health insurance companies and middlemen like pharmacy benefit managers. Right now, these rebates and discounts aren't reaching patients at the pharmacy counter. They stay with the health insurers and pharmacy benefit managers. That's not right, and it needs to change. If insurance companies and middlemen don't pay the full price for medicines, patients shouldn't have to either. These rebates and discounts must be shared with patients at the pharmacy counter.

## Make Coupons Count

In some cases, health insurance companies are not allowing the coupons manufacturers provide to patients to count towards deductibles or other cost sharing burdens, meaning patients could be paying thousands more at the pharmacy than they should be. We need to end this practice and ensure that patients are getting the full benefit of programs meant to help them afford their medicines.

## Offer Lower, More Predictable Cost Sharing Options

Actual spending on medicines is growing at the slowest rate in years. Unfortunately, it doesn't feel that way for patients. Insurers are increasingly using high deductibles, coinsurance and formulary tiers that result in patients paying more for their medicines out of pocket. Patients should have more choices when it comes to their medicine coverage. Every state should require health insurers to offer at least some health plan options that exclude medicines from the deductible and offer set copay amounts instead of forcing patients to pay an amount based on the full list price of their medicines.

## Cover Medicines from Day One

Insurers are increasingly requiring patients to pay high deductibles before receiving coverage of their medicines. This can lead to patients rationing or not taking their medicine at all and suffering devastating consequences to their health. Patients should not have to pay a deductible at the pharmacy counter and instead, should have at least some of their medicine covered by their insurance from day one.

## Cap Patient Cost Sharing

Patients with commercial health insurance are facing increasing out-of-pocket costs for their medicines in the form of growing deductibles, copayments and coinsurance. High cost sharing is a barrier to prescription medicine access, especially for patients with chronic, disabling, or life-threatening conditions, who shoulder the largest share of the burden. Cost sharing should not be so burdensome that it prevents patients with insurance from accessing necessary prescription medicines.

# Policies to Help ***Patients Pay Less*** for their Medicines: ***Share the Savings***

Many patients with commercial health insurance are required to share in the cost of their prescription medicines. **The cost to patients is often much higher than the cost to their insurance company – for the same medicine on the same prescription.** That's because health insurance companies and pharmacy benefit managers (PBMs) negotiate significant rebates and discounts on the cost of the medicine and do not share these savings with patients.

## The Problem

Health insurance companies and PBMs often receive sizeable rebates from brand pharmaceutical manufacturers. **On average, manufacturers rebate 40 percent of a medicine's list price back to health insurers, PBMs, the government and other entities in the pharmaceutical supply chain.** In 2018, these rebates and discounts totaled $166 billion.

At the same time, patients are being forced to pay more out of pocket for their medicines due to an increase in deductibles and the use of coinsurance. Deductibles require patients to pay in full for their medicines before insurance coverage kicks in. And unlike copays, which are a fixed dollar amount charged per prescription, coinsurance requires patients to pay a percentage of the medicine's price.

Here's what unfair: **When patients are facing their deductible or paying coinsurance, the amount they must pay is often based on the full list price of the medicine** – even if their insurance company and PBM are only paying the discounted amount they negotiated with the manufacturer.

For example, for a drug with a $100 list price, a health insurance company or PBM may negotiate a discount or rebate of $40, for a net cost to them of $60. But a patient still in her deductible pays the full $100. A patient with a 25% coinsurance pays $25 for a medicine with a $100 list price (.25X100), rather than the $15 (.25X60) she would pay if the coinsurance was based on the discounted amount being paid by her insurance company. That extra money collected from the patient may go to the health insurance company or the PBM. It does not go to the manufacturer of the medicine.

What's worse is that **this situation is unique to health insurance coverage of prescription medicines, and it penalizes patients who need medicines the most.** Right now, patients receive the benefit of negotiated discounts when sharing in costs for doctor or hospital visits, but they do not always receive the same benefits for prescription drugs.

## The Solution: *Share the Savings*

**States can enact laws that would require health insurance companies and PBMs to share at least part of their negotiated savings with patients at the pharmacy counter.** Despite what health insurance companies claim, this will not drastically increase premiums. One study demonstrated that, even if health insurance companies were required to share all the negotiated rebates with patients, premiums would increase at most 1%, while patients could save up to $800 each year on their medicine costs. Fixing this broken part of the system and sharing these savings will give patients immediate relief and help them better afford the medicines they desperately need.

The federal government is already taking steps to crack down on insurers and pharmacy benefit managers from holding onto billions of dollars in Medicare Part D drug rebates that should directly benefit patients at the pharmacy counter. State legislation uses a different mechanism but seeks to achieve the same result for state-regulated commercial health insurance: making sure rebates are shared with patients, thus lowering what they must pay at the pharmacy.

# Policies to Help ***Patients Pay Less*** for their Medicines: ***Make Coupons Count***

For patients with commercial health insurance, the amount they pay for their medicines is determined by health insurance companies and pharmacy benefit managers (PBMs). **New tactics by these companies to block manufacturer cost-sharing assistance, also known as copay coupons, threaten to make it harder for patients to get important treatments** for chronic illnesses such as asthma, diabetes, HIV, arthritis, hemophilia and others.

## The Problem

In the commercial health insurance market, **patients are being forced to pay more out-of-pocket for their medicines due to an increase in deductibles and the use of coinsurance instead of copays.**

Deductibles require patients to pay in full for their medicines before insurance coverage kicks in. And unlike copays, which are a fixed dollar amount charged per prescription, coinsurance requires patients to pay a percentage of the medicine's price. When patients are facing their deductible or paying high coinsurance, they will often have higher out-of-pocket costs than when their plan requires a copay because **deductibles and coinsurance are often based on the list price of the medicine and not the discounted amount the insurance company and PBM have negotiated to pay.** This higher cost sharing can impact patients' ability to adhere to their prescribed treatment, which can be devastating for patients with chronic conditions who rely on medicines to keep their symptoms in check.

**To help patients better afford their medicine and stay adherent, many third-party entities, including pharmaceutical manufacturers, offer cost-sharing assistance such as copay coupons.** Historically, commercial health insurance plans have counted these coupons towards a patient's deductible and maximum out-of-pocket limit, providing relief from high cost sharing and making it easier for patients to get their medicines.

Unfortunately, health insurance carriers and PBMs have adopted policies, often referred to as "accumulator adjustment programs," that block manufacturer coupons from counting towards deductibles and maximum out-of-pocket limits. This means **patients could be paying thousands more at the pharmacy than they should be.**

Many patients who have relied on this assistance to afford their medicines have no idea that health insurers and PBMs are no longer counting coupons toward their out-of-pocket limits. This can result in unpleasant surprises at the pharmacy counter, where patients may face thousands of dollars in charges because manufacturer coupons don't count towards their deductible and maximum out-of-pocket limit.

## The Solution: *Make Coupons Count*

**States should enact laws that protect third-party cost-sharing assistance, including copay coupons, to help protect patients and enable them to better afford their medicines.** Specifically, it will decrease patient out-of-pocket costs and reduce the risk of patients going without needed medicines. Eleven states have already enacted legislation to address this issue, and we encourage other states to follow their lead to help patients pay less.

# Policies to Help ***Patients Pay Less*** for their Medicines: ***Offer Lower, More Predictable Cost Sharing Options***

**For many patients with commercial health insurance, the amount they pay for medicines continues to increase, even as the amount insurance companies pay continues to grow more slowly, if at all.** Unfortunately, when patients must pay more out of pocket for their medicines, they often fail to fill the medicines their doctors prescribe or ration medicines to make them last longer. This can lead to serious complications and worse health for patients, which could ultimately lead to higher overall health care costs.

## The Problem

Historically, more patients paid fixed-dollar copays for their medicines – one price for a generic and another for a brand medicine. **In recent years, however, the use of deductibles and coinsurance for prescription drug coverage has risen dramatically.**

First, let's take deductibles. Deductibles require patients to pay in full for their medicine, sometimes up to thousands of dollars, before their insurance coverage kicks in. **Between 2012 and 2017, the percentage of health insurance plans that employed deductibles for prescription drugs almost doubled from 23% to 52%.**

In addition to employing deductibles for prescription drug coverage, insurers have increasingly replaced fixed-dollar copays with percentage-based coinsurance, which requires patients to pay a percentage of the medicine's price.

For prescription drugs, **these increasing out-of-pocket costs are further exacerbated by the fact that, while health insurance companies often receive substantial rebates and discounts from prescription drug manufacturers, the amount patients subject to a deductible or coinsurance must pay is typically based on a drug's list price, not the discounted price being paid by their health insurance company.** For example, for a drug with a $100 list price, the health insurance company may negotiate a discount or rebate of $40, for a net cost to them of $60. But a patient still in their deductible pays the full $100. That $40 rebate may go to the health insurance company, which has paid nothing on that patient's claim. It does not go to the manufacturer of the medicine.

The same is true for coinsurance. A patient with a 25% coinsurance pays $25 for a medicine with a $100 list price (.25X100), rather than $15 (.25X60). The additional $10, paid by the patient, does not go to the manufacturer of the medicine and instead may go to the health insurance company or others in the supply chain.

## The Solution: *Offer Lower, More Predictable Cost Sharing Options*

**Patients should have more choices when it comes to their medicine coverage.** States can help patients immediately by requiring each insurer to have at least 50% of its health insurance plans offered in a given market to include the following cost sharing options for patients:

1. **No deductible:** Medicines must be covered by insurers from day one – without subjecting patients to deductibles;
2. **Copayment-only cost sharing:** patients pay only a flat-dollar copay per prescription, not percentage-based coinsurance; and
3. **Limited copayments:** the highest-allowable copayment may not exceed 1/12 of the patient's annual out-of-pocket spending maximum.

While health insurance companies would still have flexibility to offer different plan designs to meet various patient preferences, requiring each insurer to offer at least 50% of its plans to include these three features would provide patients with lower, fairer and more predictable prescription drug coverage options.

# Policies to Help ***Patients Pay Less*** for their Medicines: ***Cover Medicines from Day One***

**For many patients with commercial health insurance, the amount they pay for their medicines continues to increase, even as the amount insurance companies pay continues to grow more slowly, if at all.** Unfortunately, when patients must pay more out of pocket for their medicines, they often fail to fill the medicines their doctors prescribe or ration medicines to make them last longer. This can lead to serious complications and worse health for patients, which could ultimately lead to higher overall health care costs.

## The Problem

Historically, more patients paid a fixed-dollar copay for their medicines or had coinsurance for their medicines, which requires patients to pay a percentage of the medicine's price.

In recent years, however, **the use of deductibles for prescription drug coverage has risen dramatically.** Deductibles require patients to pay in full for their medicines before insurance coverage kicks in, which can cost thousands of dollars. Between 2012 and 2017, the percentage of health insurance plans that employed deductibles for prescription drugs almost doubled from 23% to 52%.

Compounding the challenge, these deductibles are usually structured to reset at the beginning of each calendar year, when Americans face post-holiday financial stress, tax bills and winter utility costs. This burden is further exacerbated by the fact that, while health insurance companies receive substantial discounts from prescription drug manufacturers, **the amount patients subject to a deductible must pay is often based on a drug's list price, not the discounted price being paid by their health insurance company.** For example, for a drug with a $100 list price, the health insurance company may negotiate a discount or rebate of $40, for a net cost to them of $60. But a patient with a deductible pays the full $100. That $40 rebate may go to the health insurance company, which has paid nothing on the claim. It does not go to the manufacturer of the medicine.

## The Solution: *Cover Medicines from Day One*

**States can help patients immediately by simply requiring that certain medicines be covered by insurers from day one – without subjecting patients to deductibles.** The Internal Revenue Service recently issued guidance allowing high-deductible health plans to exclude certain drugs, such as those for the treatment of some chronic conditions, from requirements that deductibles be met before those medicines are covered. Because of the federal guidance, states can now require plans to exclude those medicines from the deductible in high-deductible health plans.

States may also choose to require other state-regulated plans to eliminate deductibles for all drugs. While health insurance companies would still have flexibility to offer different plan designs, limiting or eliminating deductibles in this way could help to smooth out patients' expenditures over the calendar year and could provide immediate relief to patients at the pharmacy counter.

# Policies to Help ***Patients Pay Less*** for their Medicines: ***Cap Patient Cost Sharing***

Patients with commercial health insurance are facing increasing out-of-pocket costs for their medicines in the form of growing deductibles, copayments and coinsurance. Health insurers continue to shift costs to patients, despite evidence that high cost sharing can lead patients to ration medicines or fail to fill their prescriptions altogether, resulting in worse health outcomes for patients and higher health care costs overall. **Without capping this cost sharing burden, patients will continue to struggle to afford the medicines they need.**

## The Problem

Spending on medicines is growing at the slowest rates in years, yet insurers keep requiring patients to shoulder more and more of the cost of their medicines. Patients pay on average 12% out of pocket for drugs, compared to just 4% for hospital care. **Commercial health plans have increased patients' average out-of-pocket cost sharing for brand medicines by over 50% in some therapeutic areas since 2015.** The share of prescriptions for which health plans require cost sharing greater than $125 has also increased for patients with chronic diseases like HIV and depression.

**The sickest patients taking several medicines shoulder the largest share of the burden of high cost sharing.** A 2019 analysis of medicine spending and affordability found that 9% of all new prescriptions were abandoned at retail pharmacies due to patients being unable to afford the cost sharing. That same analysis showed **the rate of new prescriptions abandoned at the pharmacy going up to 45% when the cost was over $125 and 60% when the cost was over $500**. Increasing out-of-pocket costs are further exacerbated by the fact that, while health insurance companies often receive substantial rebates and discounts from prescription drug manufacturers, the amount patients must pay is typically based on a drug's list price, not the discounted price being paid by their health insurance company.

## The Solution: *Cap Patient Cost Sharing*

**Insurance should work like insurance, and not make cost sharing so burdensome that it prevents people from getting the lifesaving medicines they need.** Several states have enacted laws that limit the amount a patient pays out-of-pocket for a 30-day supply of a single prescription, before and after a patient reaches their deductible. Several studies have demonstrated that out-of-pocket caps on cost sharing for prescription medicines can save patients money without drastically increasing premiums. Capping the cost sharing patients must pay out of pocket will help reduce the financial burden on patients who need it most and provide patients immediate relief at the pharmacy counter.

# PASSING REBATES DIRECTLY TO PATIENTS: GRACE'S STORY

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**Pharmaceutical manufacturers paid $187 billion in rebates and discounts on prescription medicines in 2020**. While these savings could be used to lower medicine costs for patients at the pharmacy counter, they are often kept by health insurance companies and pharmacy benefit managers (PBMs).

For people whose cost sharing is based on a deductible or percentage coinsurance, like Grace, their out-of-pocket cost at the pharmacy is typically calculated based on the full "list" price–without accounting for rebates received by the insurer or PBM. The prices patients pay out-of-pocket (at the pharmacy counter) are determined by health insurance companies and their PBMs. The pharmacy receives this pricing electronically from the PBM and informs the patient how much to pay.

Many states are proposing a simple solution to this problem by sharing these savings directly with patients at the pharmacy counter. They would do this by requiring health insurance companies and their PBMs to automatically deduct the rebates they receive from the patient's "price" at the point-of-sale.

This would not generally affect pharmacists' reimbursement or require them to make changes in their current practice.

## Here's how this solution would save money for someone like Grace:

### Grace's cost at the pharmacy counter today:

$100 – *List, or non-discounted price*

**$40** – *Rebate from manufacturer pocketed by insurance company*

$60 – *Insurance negotiated cost*

**$100** – *Grace's payment at the pharmacy*

Grace, who is still in her deductible, does not share in any rebates. **She pays the full $100 for her medicine** while her **insurance company pockets the $40 discount** they negotiated with the manufacturer.

### Grace's cost *if rebates are shared with her* at the pharmacy counter:

$100 – *List, or non-discounted price*

**$40** – *Rebate from manufacturer passed to Grace*

$60 – *Insurance negotiated cost*

**$60** – *Grace's payment at the pharmacy*

Sharing the negotiated savings with Grace **directly lowers her cost to $60**. Now Grace benefits from the negotiation between her insurer and the manufacturer.

## SUPPORT SHARING THE SAVINGS DIRECTLY WITH PATIENTS

# The United States vs. Other Countries: Availability of Medicines Varies

The Lower Drug Costs Now Act would set U.S. prices for medicines based on the pricing policies of six foreign governments that restrict patient access to medicines.

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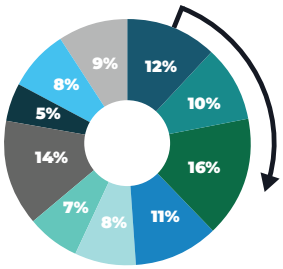
| | United States | Australia | Canada | France | Germany | Japan | United Kingdom |
|---|---|---|---|---|---|---|---|
| Of the **356 new medicines** approved globally since 2011, what percentage are available? | 87% | 39% | 46% | 50% | 63% | 51% | 59% |
| Of the **95 new cancer medicines** approved globally since 2011, what percentage are available abroad? | 96% | 49% | 59% | 68% | 74% | 59% | 71% |
| Of the **52 new anti-infectives and antivirals** approved globally since 2011, what percentage are available abroad? | 88% | 48% | 48% | 62% | 62% | 52% | 63% |
| Of the **14 new respiratory medicines** approved globally since 2011, what percentage are available abroad? | 100% | 64% | 64% | 57% | 79% | 50% | 79% |
| Of the **14 new cardiovascular medicines** approved globally since 2011, what percentage are available abroad? | 71% | 36% | 57% | 57% | 64% | 71% | 64% |

Source: PhRMA analysis of IQVIAAnalytics Link and U.S. Food and Drug Administration (FDA), European Medicines Agency (EMA) and Japan's Pharmaceuticals and Medical Devices Agency (PMDA) data. June 2020. Note: New active substances approved by FDA, EMA and/or PMDA and first launched in any country between January 1, 2011, and December 31, 2019.
Many launched medicines are subject to additional government coverage restrictions. Updated March 2021.

# BIOPHARMACEUTICAL SECTOR IMPACT ON NORTH DAKOTA'S ECONOMY

## Biopharmaceutical Sector Supported Jobs in North Dakota

283 Direct Sector Jobs + 531 Jobs Supported in Other Sectors = **814** Total Jobs




### Variety of Jobs in North Dakota's Biopharmaceutical Sector

- Life, Physical and Social Science (STEM)
- Production
- Office and Administrative Support
- Management
- Business and Financial Operations
- Architecture and Engineering (STEM)
- Sales and Related
- Computer and Mathematical (STEM)
- Transportation and Material Moving
- Other*

### Biopharmaceutical Sector's Contribution to North Dakota's Economy

#### ECONOMIC OUTPUT

**$207M**

Total Value of Goods and Services Supported by Biopharmaceutical Sector

#### REVENUE GENERATED

**$10M**

Total State and Federal Taxes Paid

#### EMPLOYEE PRODUCTIVITY

**$416,378**

Per Employee in Direct Biopharmaceutical Sector Jobs

VERSUS

**$177,885**

Per Employee Across All North Dakota Jobs

#### AVERAGE COMPENSATION

**$80,097**

Per Employee in Direct Biopharmaceutical Sector Jobs

VERSUS

**$58,226**

Per Employee Across All North Dakota Jobs

*Other occupations include areas such as Installation, Maintenance, & Repair, Healthcare Practitioners, Arts, Design, & Media, and Building & Grounds Maintenance, among others.

Source: TEConomy Partners, The Economic Impact of the Biopharmaceutical Industry: U.S. and State Estimates. Report prepared for PhRMA in September 2019 and reflects 2017 data.

# The Impact of Industry-Sponsored Clinical Trials

## North Dakota

**90**
Clinical trials

**1,324**
Clinical trial participants

**$16.4 Million**
Investments at clinical trial sites

**$37.8 Million**
Total economic impact of clinical trial sites

The biopharmaceutical industry brings profound value to patients through new treatments and cures for society's most devastating and costly diseases and conditions, providing millions of patients with treatment options they would not otherwise have. Since 2000, PhRMA member companies have invested over $800 billion in the research and development of new treatments and cures, including an estimated $71.4 billion in 2017 alone.

Developing innovative new medicines is a complex process taking an average 10-15 years. Less than 12 percent of candidate medicines that make it into clinical trials will be approved by the U.S. Food and Drug Administration. Clinical trials are the most time- and resource-intensive part of the research and development process for a new medicine, and biopharmaceutical manufacturers support and conduct the majority of this important work. Yet, without clinical trials, new medicines could not be approved and–most importantly–made available to patients who need them.

## Frequently Asked Questions

### Which clinical trials are included?

All industry-sponsored clinical trials of a potential new medicine that were active at any point in 2017. This includes Phase I through Phase IV trials.

### What do investments at clinical trial sites include?

The overall economic impact of the biopharmaceutical industry on the U.S. economy is substantial. This number reflects the direct investments made by biopharmaceutical manufacturers to identify and operate clinical trial sites; hire staff and contractors; recruit, retain and treat participants; and conduct clinical trial protocols and activities, including monitoring research sites.

### What is not measured?

These estimates focus solely on the investments made at clinical trial sites by America's biopharmaceutical companies and do not capture all of the trial-wide work that occurs across sites, companies' substantial investments in basic and preclinical research, or the nationwide economic impact associated with the non-R&D activities of the industry. Altogether, the industry supports more than 4 million U.S. jobs and $1.3 trillion in annual economic output.

*Source: TEConomy Partners, Biopharmaceutical Industry-Sponsored Clinical Trials: Growing State Economies, April 2019.*

# THE INNOVATIVE BIOPHARMACEUTICAL INDUSTRY'S SUPPORT FOR STEM EDUCATION IN:

# NORTH DAKOTA

The Biopharmaceutical Industry's Sustained Commitment to Inspiring and Advancing Tomorrow's STEM Workforce

*A high-skilled technical workforce that is proficient in science, technology, engineering, and mathematics (STEM) is increasingly important to sustained economic growth and U.S. global competitiveness. However, as the U.S. continues to lag behind other countries in terms of STEM literacy and expertise, there are legitimate concerns in the nation's ability to produce enough qualified workers to meet the demands of the global knowledge-driven, STEM-intensive economy and to develop workers with the relevant skills needed for the jobs of the future.* ***Inspiring and developing the next generation of STEM talent is critical to the economic success of North Dakota.***

STEM talent is especially important to the success of the nation's biopharmaceutical industry, one of the economy's most innovative sectors employing more than five times the level of STEM workers compared with the overall U.S. economy. **In North Dakota, the biopharmaceutical industry directly employs 283 and has a total economic impact of more than 800 state jobs and $206 million in total economic output.**[1]

**North Dakota will need to fill nearly 23,000 STEM jobs by 2028.** Although an analysis of a series of STEM education indicators finds that North Dakota students generally rank highly in terms of their proficiency in STEM, opportunities for improvement remain.

**To help inspire and develop the next generation of STEM workers, the innovative biopharmaceutical industry supports 10 programs in North Dakota and nationwide.**

Number of National STEM Programs Open to ND Students and Teachers: **10**

Projected STEM jobs to Fill in ND by 2028[3]

**22,710**

National Assessment of Educational Progress State Ranking for ND Students[4]

| | 4th Grade | 8th Grade |
|---|---|---|
| Math | 13 | 9 |
| Science | 5 | 6 |

Share of Graduating ND High School Students Interested in STEM Major or Career[5] (U.S. = 48%): **46%**

Biopharmaceutical Industry Economic Footprint in North Dakota[6]

| 283 | $206 M |
|---|---|
| Direct Jobs | Total Output |

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## Biopharmaceutical Industry-Supported STEM Education Programs in North Dakota and Nationwide

The **Amgen Foundation** offers programs that encourage STEM education for students of all ages:

- **LabXchange**, a free online science education platform that provides users with access to personalized instruction, virtual lab experiences and networking opportunities across the global scientific community.
- **Khan Academy**, where the Amgen Foundation's support as Science Partner helps create comprehensive new biology lessons for students and teachers worldwide, featuring videos, articles, and practice exercises.
- The **Amgen Scholars Program**, which identifies promising science undergraduates from across the country and matches them with research scientists and laboratories at top-tier universities for a hands-on summer internship designed to fuel their passion for STEM.

**AstraZeneca** is a founding partner of **Generation Health: How Science Powers Us**, an initiative offering experiential learning resources for middle school students to educate on preventative measures and innovative solutions to key health concerns, helping to make the connection between student well-being and the science behind the prevention and treatment of disease.

**Bayer** supports multiple nationwide efforts to improve STEM education, with an emphasis on rural areas, underserved school districts, and improving science literacy:

- The Bayer Fund supports the America's Farmers' **Grow Rural Education** program, where farmers nominate their local school districts for grants to improve STEM education facilities and programming.
- The **STEM+ Families Initiative**, a partnership with the National Parent and Teacher Association (PTA) provides grants to local PTAs to plan STEM + Families Science Festivals, events that are especially helpful in bringing STEM education opportunities to low-income and underserved communities.
- **Making Science Make Sense**, a company-wide STEM education initiative dedicated to advancing science literacy across the United States through hands-on, inquiry-based learning, purpose-driven volunteerism, community-focused partnerships, and a public education campaign.

The **Genentech Foundation** offers financial support to students from across the country interested in STEM research:

- The **Summer Research Scholars** program selects promising students of color from universities around the country to participate in summer research programs at top-tier institutions nationwide.
- The Foundation's **Fellowship Program** supports undergraduate, graduate, and postdoctoral students that are pursuing research in basic science at top-tier universities nationally.

**Johnson & Johnson's WiSTEM2D** initiative (Women in Science, Technology, Engineering, Math, Manufacturing and Design) provides support for girls and women of all ages, helping them pursue STEM2D studies and careers no matter where they are located through, fun, hands-on activities.

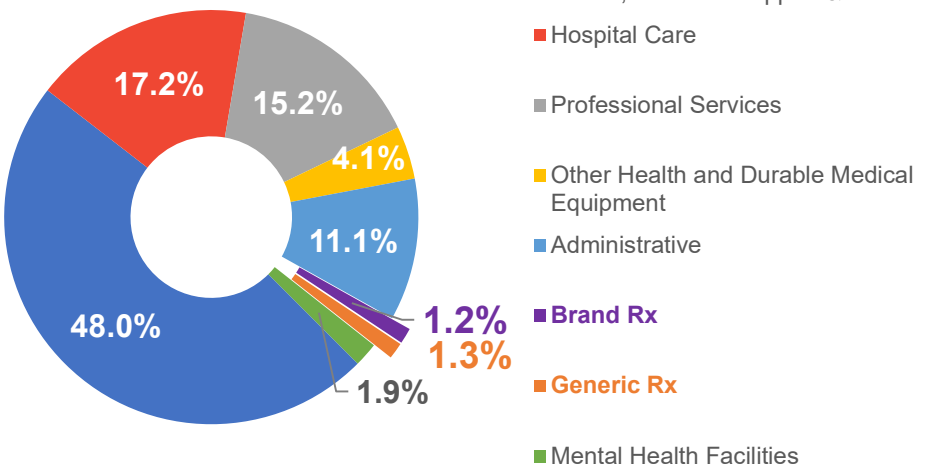
1 *The Economic Impact of the U.S. Biopharmaceutical Industry: 2017 National and State Estimates, PhRMA and TEConomy Partners, December 2019.*
2 *PhRMA-TEConomy "The Biopharmaceutical Industry's Sustained Commitment to Inspiring and Advancing Tomorrow's STEM Workforce" 2020.*
3 *TEConomy's Analysis of Projections Managing Partnership Occupational Employment Projections for 2018-2028. Projections data reflect the 2016-26 period for the following states: AL, AZ, CT, KS, KY, MA, NM, OK, TX, VT, WA, WV.*
4 *U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Mathematics Assessment and 2015 Science Assessment.*
5 *Percentage of ACT-Tested High School Graduates Scoring Expressing Interest in STEM Majors, Occupations, and/or Activities; ACT: The Condition of STEM 2017 State Profiles.*
6 *The Economic Impact of the U.S. Biopharmaceutical Industry: 2017 National and State Estimates, PhRMA and TEConomy Partners, December 2019.*

# The Facts About Medicaid in North Dakota

Medicines provide great value to Medicaid patients and society by saving and extending lives and preventing unnecessary hospitalizations and other costly health care services. According to National Health Expenditure estimates, national Medicaid spending on prescription drugs will grow roughly in line with overall national Medicaid spending growth from 2018 to 2027.[1]

## Breakdown of FFY2018 Medicaid Spending in North Dakota[2]

**Only 2.5%** of the total Medicaid budget in North Dakota is spent on retail brand and generic prescription drugs.




## How Medicaid Pays for Drugs

All 50 states and the District of Columbia elect to cover prescription drugs as a benefit under the Medicaid Drug Rebate Program (MDRP). The MDRP is a federal-state-drug manufacturer program that provides significant rebates to Medicaid programs that offset the costs of prescription drugs while ensuring patients can access needed medicines. States, and managed care organizations or pharmacy benefit managers administering the prescription drug benefit on behalf of states, may also negotiate supplemental rebates with drug manufacturers, further reducing spending.

Manufacturers rebate **$41 million** back to North Dakota and the federal government, which is **55%** of the total Medicaid spending on drugs in the state.

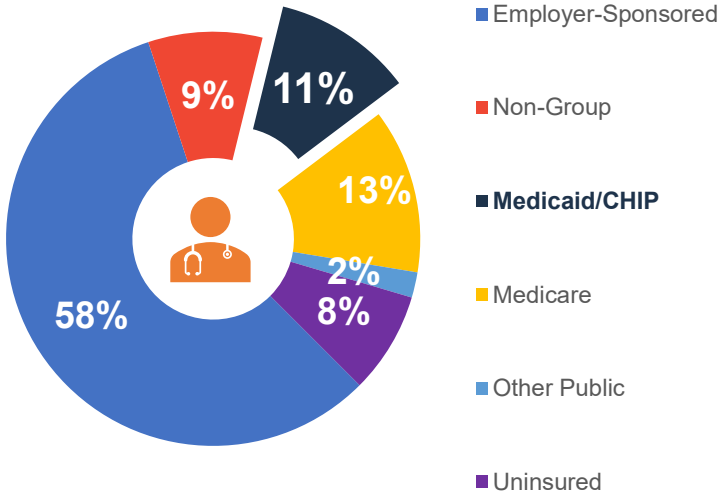
1. Based on average spending growth between 2018 and 2027 according to US Department of Health and Human Services, Centers for Medicare & Medicaid Services, Office of the Actuary 2019 National Health Expenditure Data (source: NHE Projections 2018-2017 - Tables 3 and 11)
2. Menges Group analysis of FFY2018 CMS Financial Management Reports (FMR) and State Drug Utilization (SDU) data files. Brand/generic expenditure totals net of rebates. Data predominantly derived from CMS FMRs. Brand/generic prescription drug costs derived through tabulations performed by Menges. Pre-rebate expenditures tabulated using FFY2018 CMS SDU data files and CMS brand/generic indicators for each NDC. Statutory rebates and fee-for-service supplemental rebate information obtained from CMS FMRs. MCO supplemental rebates available in FMRs for several states and estimated in remaining states at similar percentages as the published FMR data indicate. Generic rebates assumed to always be at the statutory 13% level – no supplemental rebates assumed. Total brand rebates are therefore derived as the difference between total rebates and the generic statutory rebates. Post-rebate expenditures derived through Menges tabulations using above information.

# The Facts About Medicaid in North Dakota

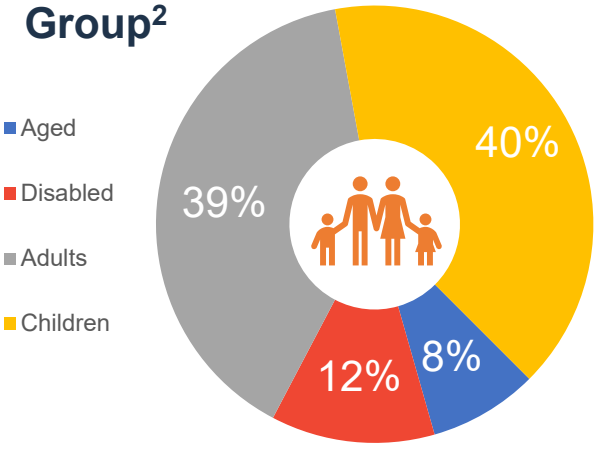
Medicaid and the Children's Health Insurance Program (CHIP) provide health care coverage to low-income, aged, and disabled individuals and families. Over one-in-five Americans are covered by Medicaid and CHIP.[1] Without Medicaid and CHIP, millions of Americans would not have access to necessary health care services including prescription medicines.

## Breakdown of Health Insurance Coverage in North Dakota[1]

**11%** of North Dakotans were primarily covered by Medicaid or CHIP in 2017.

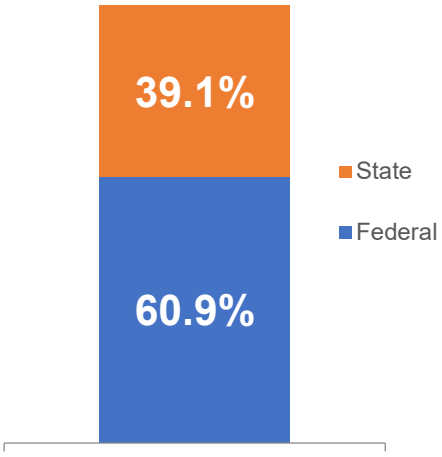



## North Dakota's Medicaid Population by Enrollment Group[2]




## North Dakota's FFY2018 Spending on Medicaid Services[3]

North Dakota spent **$482 million** on Medicaid




1. Kaiser Family Foundation. State Heath Facts: Health Insurance Coverage of the Total Population, FFY17. Estimates based on the Census Bureau's American Community Survey, 2008-2017. Note: Individuals reporting more than one type of coverage were sorted into one category only.
2. Kaiser Family Foundation. State Heath Facts: Medicaid Enrollees by Enrollment Group, FFY14. Estimates based on analysis of data from the 2014 Medicaid Statistical Information System (MSIS).
3. Kaiser Family Foundation. State Health Facts: Federal and State Share of Medicaid Spending, FFY18. Estimates based on data from CMS (Form 64), as of August 2019. Note: Medicaid expenditures do not include administrative costs, accounting adjustments, or the U.S. Territories.

# How Will International Reference Pricing Affect You?

**International reference pricing** is a form of government price setting in which U.S. bureaucrats could determine the value of our medicines based on how foreign governments and politicians value these treatments and cures. Not only does international reference pricing allow foreign politicians to decide what your medicines are worth and what diseases are worth investing in, but it lets policies set by foreign politicians influence how our government makes decisions for American patients.

## By outsourcing decision making about the value of our medicines, international reference pricing could create risks for American patients.

**LONG DELAYS & REDUCED ACCESS** TO LIFESAVING MEDICINES

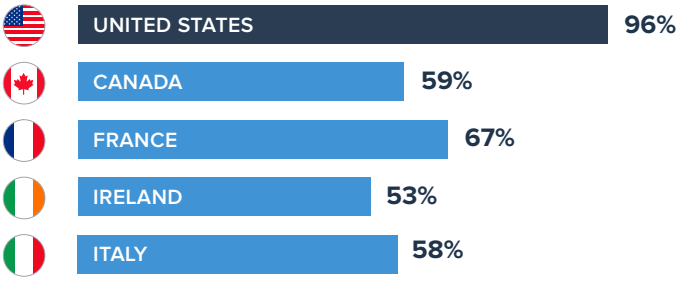
**FEWER NEW TREATMENTS & CURES** IN THE FUTURE

**WEAKER U.S. LEADERSHIP** IN BIOPHARMACEUTICAL INNOVATION

## The numbers from countries where international reference pricing is used speak for themselves.

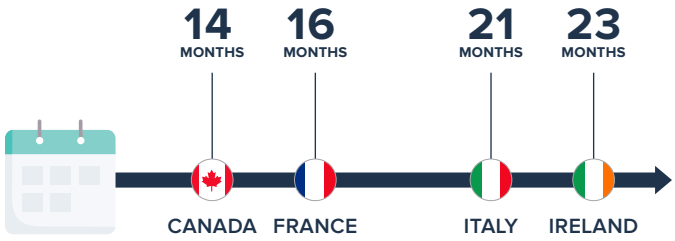
In countries where the government sets prices, patients have much less access to new medicines.

### PERCENT OF NEW CANCER MEDICINES AVAILABLE




### AVERAGE DELAY IN AVAILABILITY OF NEW CANCER MEDICINES

(As compared to U.S. patients)




## The consequences of international reference pricing take on an even greater meaning as the world waits for COVID-19 vaccines and treatments.

Now, more than ever, we need policies that foster innovation and help usher in the treatments and vaccines the world is waiting for. There are better solutions that would deliver real savings for Americans at the pharmacy counter without sacrificing innovation.

**Policymakers should protect U.S. innovation and make sure Americans don't have to rely on other countries to decide the value of treatments. Don't jeopardize American patients' access to today's medicines and tomorrow's cures.**

Learn more at **PhRMA.org**

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# KEY FACTS ABOUT PRESCRIPTION MEDICINE COSTS

- Prescription medicine costs are a small and stable share of overall health care spending, accounting for just **14%** of total U.S. health care spending.[1]

- In 2020, total net spending on prescription medicines increased just **0.8%.** And over the next five years, net medicine spending is projected to increase 0 to 3% annually.[2]

- Net prices for brand medicines declined **2.9%** in 2020. For the last five years, net price growth for brand medicines has been in line with or below inflation, even as many new treatments reached patients.

- Between 2021 and 2025, annual net price growth for brand medicines is projected to be **-3 to 0%.**[3]

- In **7 of the last 10 years**, retail prescription medicine costs grew more slowly than total health care costs – and, on average, spending growth for retail prescription medicines has been lower than for total health expenditures.[4]

- Total spending growth for other health care is projected to be more than **6 times** that of prescription medicines through the next decade.[5,6]

- Over the past 10 years, net per capita spending on medicines has remained effectively flat, increasing just **0.5%,** on average, per year.[7]

- Biopharmaceutical companies negotiate substantial rebates and discounts with PBMs and health plans, and these price concessions are not reflected in list prices. The magnitude of these rebates, discounts, and other reductions in price have more than doubled since 2012, totaling **$187 billion** in 2020.[8]

- Distribution costs account for a growing share of prescription medicine spending.[9] In 2018, **nearly half** of all spending on brand prescription medicines went to someone other than the biopharmaceutical manufacturers who researched, developed, and manufactured the medicines.[10]

- More than 9 in 10 prescriptions (91%) filled in the U.S. are for generic medicines.[11] U.S. brand medicine sales are projected to be reduced by **$128 billion** due to competition from generics and biosimilars between 2021 and 2025.[12] There is no similar type of cost containment for other health care services.

- According to CBO data, total **Medicare Part D** spending is 45% ($349 billion) lower than the initial projections for 2004 -2013.[13] The Medicare actuaries report that the Part D base beneficiary premium in 2020 is only $0.54 higher than it was in 2006, the first year of the program's operation. According to the 2020 Medicare Trustees Report, over the past 10 years, Part D benefit payments have increased by an annual rate of 2.0% on a per enrollee basis.[14]

- Average sales price for **Medicare Part B** drugs has remained steady year-over-year and is below overall medical inflation.[15] Part B drugs have been a small and stable share of overall Part B spending (10% in 2018) and total Medicare spending (5% in 2018), and the share of Part B spending attributable to drugs is expected to grow only modestly over the next 10 years.[16]

- Prescription medicines account for a small share of total **Medicaid** spending. Between 2019 and 2028 retail and nonretail prescription medicines will account for less than 9% of total Medicaid spending.[17]

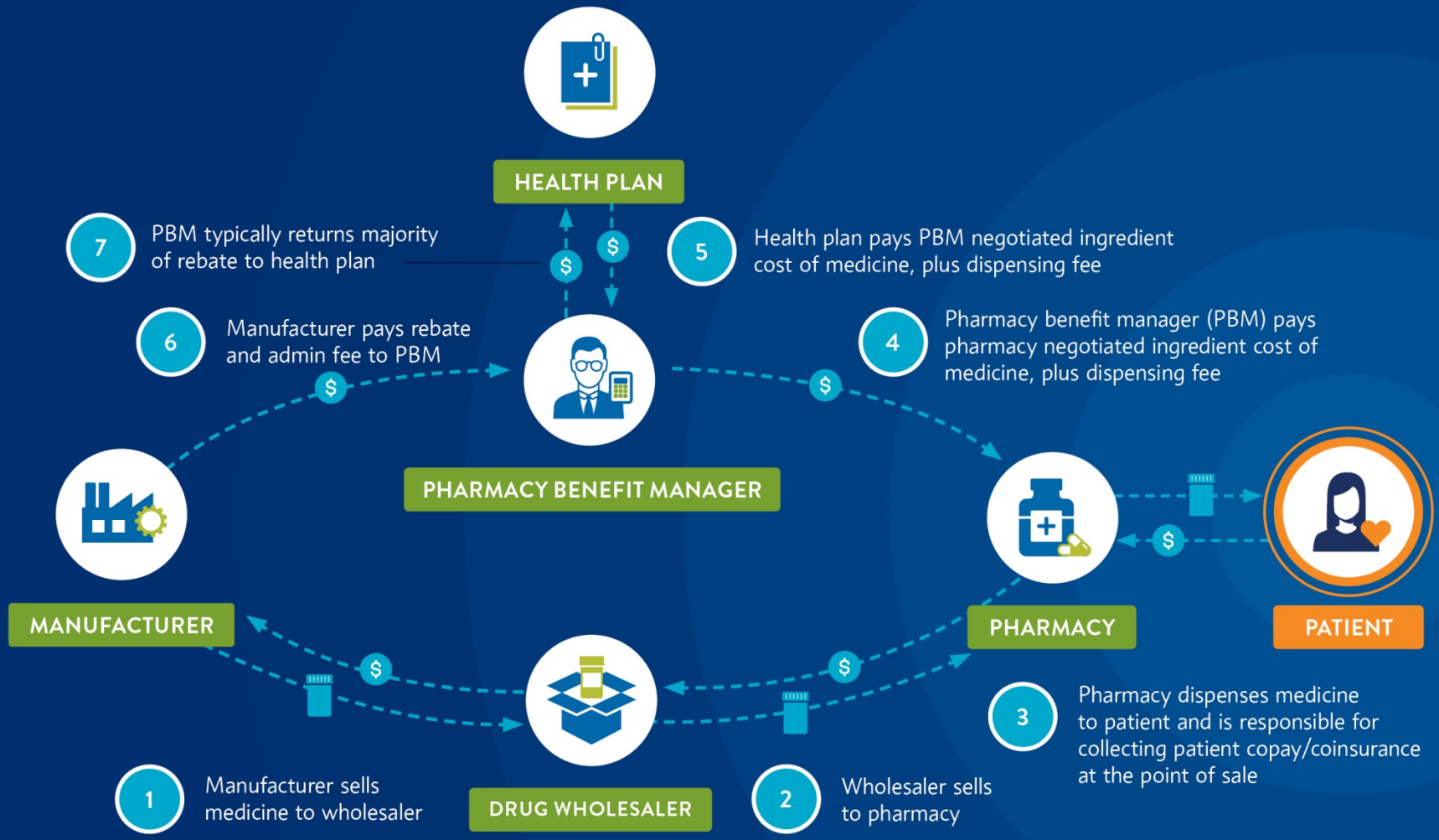
- Researchers have found that every additional dollar spent on medicines for adherent patients with congestive heart failure, high blood pressure, diabetes and high cholesterol generated **$3 to $10 dollars in savings** on emergency room visits and inpatient hospitalizations.[18]

- In countries where governments set medicine prices, patients have access to fewer treatment options. For example, the U.S. has access to nearly 90% of all medicines launched between 2011 and 2020, while just 64% are available in Germany, 60% in the U.K., 52% in Japan, 48% in France, 46% in Canada, and 38% in Australia.[19]

[1] Altarum Institute. "Projections of the Non-Retail Prescription Drug Share of National Health Expenditures." August 2020.
[2] IQVIA. "Use of Medicines in the U.S.: Spending and Usage Trends and Outlook to 2025." Published May 2021.
[3] *Ibid.*
[4] Centers for Medicare & Medicaid Services. National Health Expenditures Data.
[5] Altarum Institute. "Projections of the Non-Retail Prescription Drug Share of National Health Expenditures." August 2020.
[6] Centers for Medicare & Medicaid Services (CMS). National health expenditure (NHE) data. NHE projections 2019-2028. February 2020.
[7] IQVIA. "Use of Medicines in the U.S.: Spending and Usage Trends and Outlook to 2025." Published May 2021.
[8] Fein, A. "The 2021 Economic Report on U.S. Pharmacies and Pharmacy Benefit Managers," Drug Channels Institute. March 2021.
[9] Berkeley Research Group, "The Pharmaceutical Supply Chain: Revisited," January 2020.
[10] *Ibid.*
[11] Fein, A. "The 2021 Economic Report on U.S. Pharmacies and Pharmacy Benefit Managers," Drug Channels Institute. March 2021.
[12] *Ibid.*
[13] PhRMA analysis of data from Congressional Budget Office Medicare Part D Baselines, Components of Mandatory Outlays, for 2004-2013. Data available at www.cbo.gov.
[14] 2019 Medicare Trustees Report
[15] The Moran Company. "Trends in Weighted Average Sales Prices for Prescription Drugs in Medicare Part B, 2007-2017." December 2017.
[16] Analysis of 2019 Medicare Trustees Report and June 2020 MedPAC Databook by PhRMA, August 2020.
[17] PhRMA Analysis of Centers for Medicare and Medicaid Services' 2019 to 2028 National Health Expenditure Data and Altarum Institute. "Projections of the Non-Retail Prescription Drug Share of National Health Expenditures." August 2020.
[18] M.C. Roebuck et al. "Medical Adherence Leads to Lower Health Care Use and Costs Despite Increased Drug Spending." *Health Affairs*, January 2011.
[19] PhRMA analysis of IQVIA Analytics Link and U.S. Food and Drug Administration, European Medicines Agency, Japan Pharmaceuticals and Medical Devices Administration, Health Canada and Australia Therapeutic Goods Administration data. Note: Sample includes new active substances launched globally from January 1, 2011 to December 31, 2020. Updated May 2021.

*Distribution and Financial Flow*

# FOR RETAIL BRAND DRUGS




Source: Adapted from Pembroke Consulting

# UNDERSTANDING THE PHARMACEUTICAL DISTRIBUTION AND PAYMENT SYSTEM AND HOW IT COULD WORK BETTER FOR PATIENTS

A medicine's path from the biopharmaceutical company to the patient is complex and involves many entities across the biopharmaceutical supply chain. Examining how money flows through this system – which includes wholesalers, pharmacy benefit managers (PBMs), pharmacies and insurers – and how that impacts what patients pay at the pharmacy can help consumers and policymakers find answers to their questions about affordability and access to medicines.

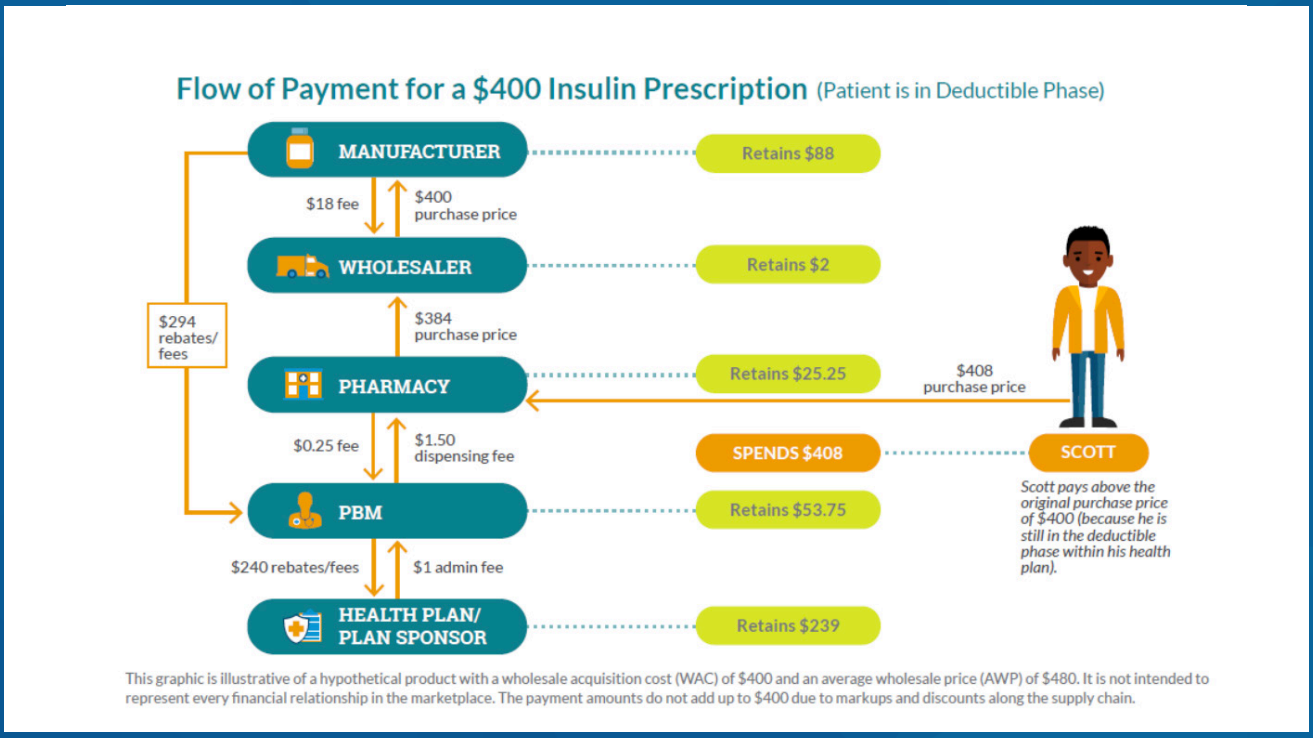
The prices wholesalers, pharmacies, PBMs, insurers and patients pay for a medicine all vary and are shaped by negotiations among supply chain entities. In recent years, rebates negotiated between payers and biopharmaceutical companies have increased significantly. On average, over 40% of a brand medicine's list price is rebated back to health plans or the government or kept by other stakeholders.[I] Continued growth in rebates, discounts, and other reductions in price provided by biopharmaceutical companies—which now exceed $160 billion per year—have kept payers' prices for brand medicines climbing at modest rates, despite more rapid growth in publicly reported list prices.[II]

After accounting for all discounts and rebates, prices for brand medicines grew just 0.3% in 2018 – the slowest rate in years and slower than the rate of inflation.[III] But even though discounts and rebates for brand medicines are growing each year, insurers increasingly require patients to pay for a larger share of their medicines out-of-pocket. At the pharmacy, commercially insured patients with a deductible have seen their out-of-pocket costs for brand medicines increase 50% since 2014. One reason that it seems as if the costs of medicines are going up is because discounts and rebates provided by biopharmaceutical companies do not flow directly to the patients taking the medicine. Large deductibles and prescriptions that require coinsurance pose particular challenges, as these types of cost sharing are typically based on a medicine's full, undiscounted price. More than 50% of patients' out-of-pocket spending on brand medicines in 2017 was for prescriptions filled in the deductible or with coinsurance rather than with a fixed copay—a 20% increase since 2013.[IV]

The hypothetical patient profile below illustrates how patients often do not benefit from discounts and rebates negotiated between biopharmaceutical companies and payers, and how patients may end up paying more than their insurer for their medicine as a result.

## PATIENT PROFILE: SCOTT

*Scott takes insulin for his type 2 diabetes and has a health plan with a high deductible. Prior to meeting his deductible each year, he pays $408.00—more than the full undiscounted cost of his medicine—even though his health plan receives a rebate from the biopharmaceutical company that reduces the list price by 65 percent. Although the health plan does not pay for Scott's insulin while he is in his deductible, it still receives the negotiated rebate and earns $239 per prescription. The PBM earns $53.75, including fees and a share of the rebate it negotiated, while the manufacturer retains $88.00.*




A medicine's rebate—rather than its list price—generally determines if it is covered or where it sits on a formulary. This creates an unfair system in which patients are often paying based on higher list prices, regardless of the discount their insurer receives. The system can incentivize PBMs and others in the supply chain to favor medicines with high list prices and rebates.[V, VI] Cost sharing based on the list price can hurt patients and increase costs. This must change. Alleviating distortions in the current supply chain could help the system work better for patients.

- In Medicare Part D, ensuring discounts are reflected in patient cost sharing at the pharmacy counter would lower patient out-of-pocket costs for many beneficiaries. For example, a typical diabetes patient taking five medicines could save about $1,000 a year in out-of-pocket costs.[VII]
- Sharing rebates with patients at the pharmacy could save certain commercially insured patients with high deductibles and coinsurance $145 to more than $800 annually, while increasing premiums by just about 1% or less.[VIII]
- Lower cost sharing would lead to improved adherence and lower costs for Medicare. A recent study by IHS Markit found that passing through a share of rebates just for diabetes medicines alone could reduce overall health care spending (including Parts A and B) for Medicare beneficiaries with diabetes by $20B over the next 10 years.[IX]

Rebates and other price concessions that payers negotiate with biopharmaceutical companies should be used to lower cost sharing for medicines at the pharmacy. Additionally, reforms to prevent PBMs and others in the supply chain from being compensated based on the list price of a medicine—and to instead receive a fee based on the value their services provide—could address misaligned incentives in the supply chain and help the system work better for patients.

I Health. U.S. brand Rx net price tool- 1Q19. Accessed May 2019.

II Fein, Adam J., The 2019 Economic Report on U.S. Pharmacies and Pharmacy Benefit Managers, Drug Channels Institute, 2019. .

III IQVIA Institute for Human Data Science. Medicine use and spending in the U.S.: A review of 2018 and outlook to 2023.https://www.iqvia.com/institute/reports/medicine-use-and-spending-in-the-us-a-review-of-2018-and-outlook-to-2023. Published May 09, 2019. Accessed May 2019.

IV IQVIA. Patient Affordability Part One: The Implications of Changing Benefit-Designs and High Cost Sharing. May 2018 https://www.iqvia.com/locations/united-states/patient-affordability-part-one

V Removal of Safe Harbor Protection for Rebates Involving Prescription Pharmaceuticals and Creation of New Safe Harbor Protection for Certain Point-of-Sale Reductions in Price on Prescription Pharmaceuticals and Certain Pharmacy Benefit Manager Service Fees. 84 Fed. Reg. 2340, 2341 (Feb. 6, 2019)

VI Medicare Payment Advisory Commission. Report to the Congress: Medicare Payment Policy. Chapter 14: The Medicare Prescription Drug Program (Part D): Status Report. March 2018; Contract Year 2019 Policy and Technical Changes to the Medicare Advantage, Medicare Cost Plan, Medicare Fee-for-Service, the Medicare Prescription Drug Benefit Programs, and the PACE Program. 82 Fed Reg, 56336 (Nov. 28, 2017).

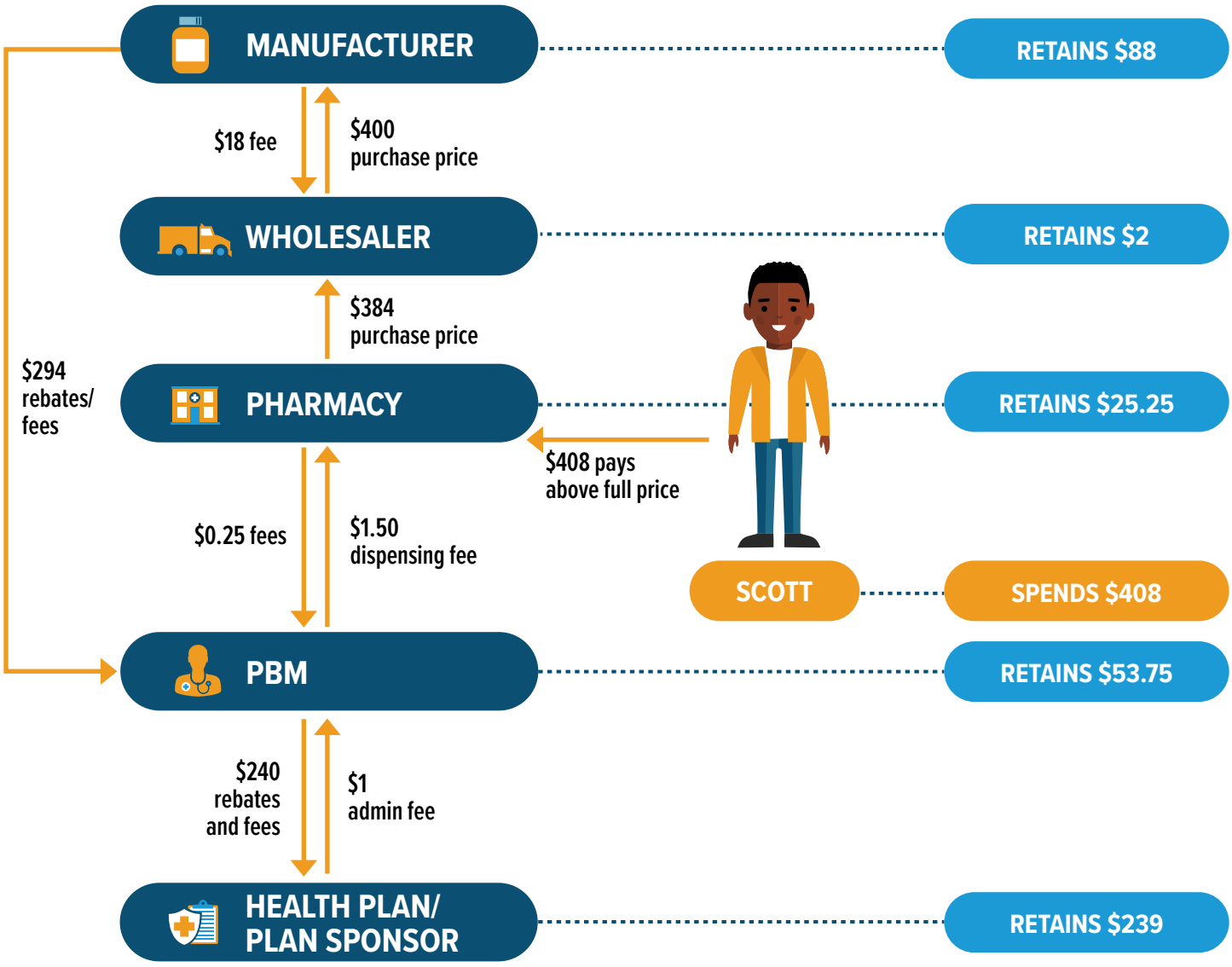
VII Holcomb K, Klein M. Medicare Part D Diabetic Member Cost-Sharing: Impact on Non-Low Income Members. Milliman. February 2019. Available at: http://www.milliman.com/uploadedFiles/insight/2019/medicare-part-d-diabetic-cost-sharing.pdf

VIII Milliman. Point of Sale Rebate Analysis in the Commercial Market: Sharing Rebates May Lower Patient Costs and Likely Has Minimal Impact on Patients. October 2017. https://www.phrma.org/reports/milliman-sharing-rebates

IX IHS Markit. Passing a Portion of Negotiated Rebates Through to Seniors with Diabetes Can Improve Adherence and Generate Savings in Medicare. May 14, 2018.

# FOLLOW THE DOLLAR

## Flow of Payment for a $400 Insulin
## (Patient is in Deductible Phase)




*This graphic is illustrative of a hypothetical product with a WAC of $400 and an AWP of $480. It is not intended to represent every financial relationship in the marketplace.

**The amount of payments does not add up to $400 due to markups and discounts as medicines are distributed.

## Use of Medicines in the U.S.: Spending and Usage Trends and Outlook to 2025

IQVIA, May 2021

**Key Findings**

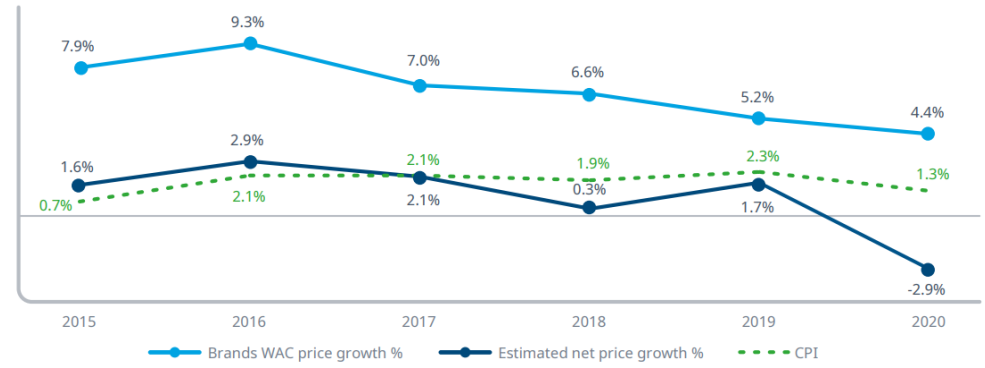
- **Brand medicine net prices *declined* by 2.9%, on average, in 2020.** Looking ahead, net price growth for brand medicines is projected to be 0 to -3% annually through 2025.
- **Net spending (manufacturer revenue) on medicines (retail and non-retail) increased 0.8% in 2020.** Looking ahead, net spending on medicines is projected to be 0 to 3% annually through 2025.
- Over the past 10 years, net per capita spending on medicines has remained effectively flat, increasing just 0.5%, on average, per year.
- In 2020, three quarters (74%) of brand prescriptions cost patients less than $20 out of pocket.
- Overall, 8% of patients spent more than $500 total on prescriptions in 2020 and just 1.8% spent more than $1,500.

**Full Summary**

**Prices:**

- Net prices for protected brand medicines *declined* by 2.9% in 2020, below or in line with inflation for the fourth year in a row. Looking ahead, net price growth for protected brands is forecast to be 0 to -3% annually through 2025.
- In 2020, net prices for brand medicines were, on average, 44% lower than WAC prices.
- Protected brand list prices increased just 4.4% in 2020.

Exhibit 29: Wholesaler Acquisition Cost (WAC) Growth and Net Price Growth for Protected Brands



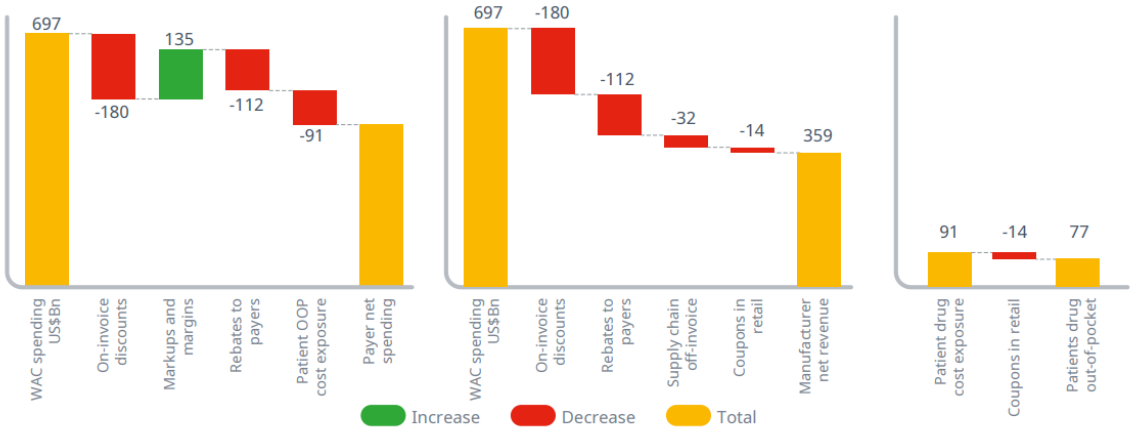

Source: IQVIA Institute: IQVIA National Sales Perspectives, Dec 2020; Bureau of Labor Statistics, CPI Data, Dec 2015–Dec 2020

**Spending:**

- Overall, net spending on all prescription medicines (retail and non-retail) increased by just 0.8% in 2020. Looking ahead, net spending on medicines is projected to increase between 0-3% annually over the next five years.
- Net medicine spending was 33% below total invoice spending in 2020. Looking ahead, the invoice to net spending difference is expected to increase to 38% by 2025
- Real net per capita spending in 2020 was $1,058, just $56 more than a decade ago, despite many new treatments coming to the market. Over 10 years, real net per capita spending grew an average 0.5% per year.

- In 2020, payers (including patients), in aggregate, paid $540 B in 2020 for medicines (including both retail and non-retail). Of this total, manufacturers retained $359 B.

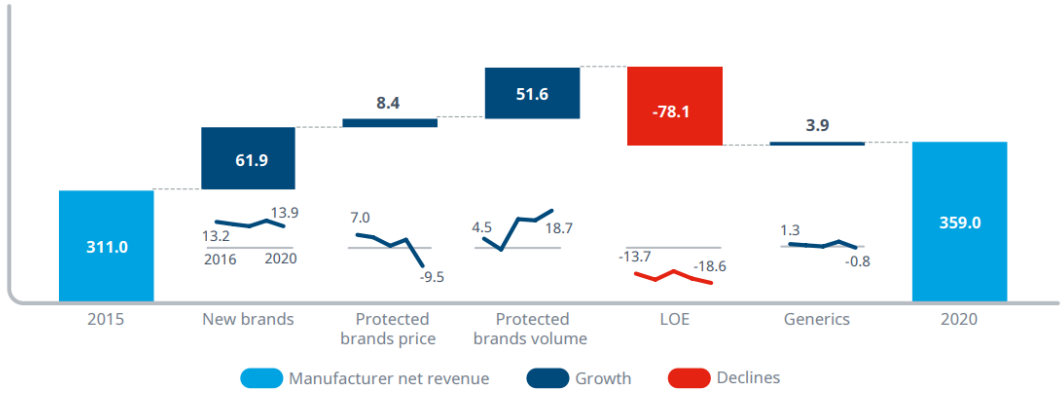
**Exhibit 24: Differences Between Various Spending Levels for U.S. Prescription Medicines in 2020, US$Bn**




Source: IQVIA Institute, May 2021; CMS National Health Expenditures (NHE), Dec 2020

- Spending on medicines has increased 64% since 2011 on an invoice basis and 37% on a net basis.
- Between 2015 and 2020, WAC spending increased at an annual rate (CAGR) of 5.1%, payer net spending on medicines (including patient OOP) increased 3.5% annually, net spending retained by manufacturers increased 2.9% annually, and patient out-of-pocket costs increased 1.1% annually.
- Between 2015 and 2020, total manufacturer net sales increased by $48 B. New product launches contributed $62 B, price increases for existing brands contributed $8.4 B, and increased brand medicine utilization contributed $52 B to the increase in spending. Losses of Exclusivity (LOE) resulted in a $78 B decline in manufacturer net revenues.

**Exhibit 27: Net Manufacturer Revenues and Growth 2015–2020, All Channels, US$Bn**




Source: IQVIA Institute, May 2021

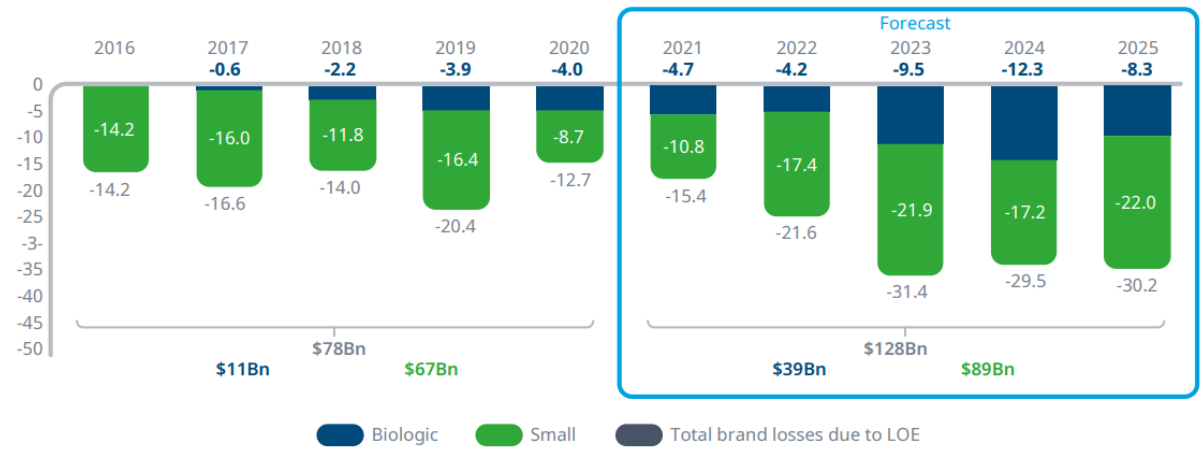
**New Medicine (NAS) Launches:**

- NAS launches in 2020 reached 55 (surpassing 50 for the third year in a row) “even as the aggregate amount of new brand spending dipped partly because more medicines are for smaller populations and generate less spending per drug”
- Over the next five years, 250–275 NAS launches are expected (50-55 NAS per year) but are anticipated to represent a decreasing share of total brand spending (7.3% compared to 11% in the past five years). NAS are expected to contribute an aggregate of $133 B of spending over five years.

**Loss of Exclusivity:**

- Between 2016 and 2020, loss of exclusivity (LOE) lowered brand spending by $78 B.
- Looking ahead, LOE is expected to decrease brand spending by $128 B through 2025, with $39 B coming from branded biologics.

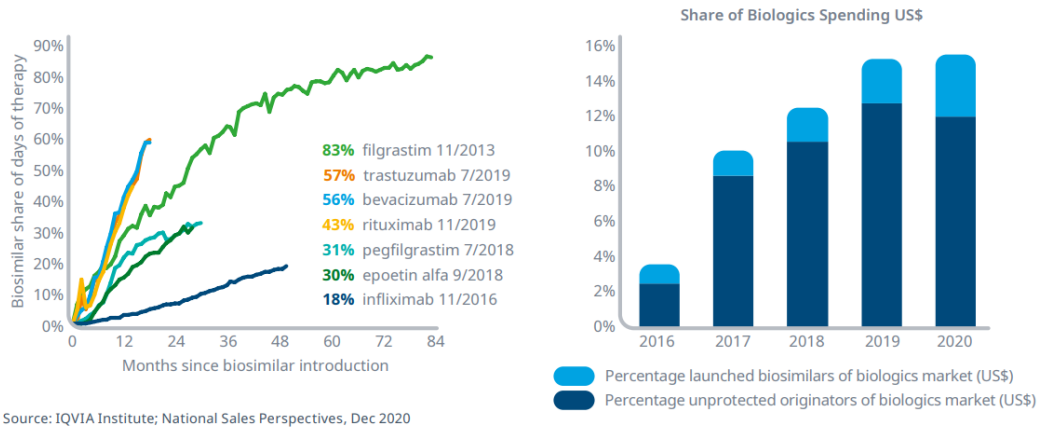
**Exhibit 52: Impact of Brand Losses of Exclusivity 2016–2025, US$Bn**




Source: IQVIA National Sales Perspectives; IQVIA Market Prognosis; IQVIA Institute, Feb 2021

- <u>Impact of Biosimilars:</u>
  - Nearly 14% of total medicine spending is currently facing biosimilar competition.
  - The last three biologics to lose exclusivity have had much faster and higher biosimilar uptake that previous biosimilars, trending to nearly 60% volume share by the end of their second year on the market.
  - Projected biosimilar spending is expected to reach $30 B in 2025 and a total of $102 B over the next five years.
  - Savings from biosimilars is expected to be $35-40 B in 2025, with a cumulative 5-year total savings of $133 B (with significant uncertainties around these projections).

**Exhibit 33: Biosimilar Share of Days of Therapy and Share of Biologic Spending**




Source: IQVIA Institute; National Sales Perspectives, Dec 2020

**Condition-Specific Findings:**

- <u>Diabetes:</u>
  - Net prices for brand diabetes medicine decreased, on average, 12.4% in 2020.
  - List prices for diabetes medicine increase, on average, 2.2% in 2020.

- On average, net prices for diabetes medicines are, on average, 56% lower than invoice prices. This difference is projected to increase to 70% by 2025.
- In 2020, net manufacturer revenue from diabetes medicines increased 2%. Looking ahead, manufacturer net revenue from diabetes medicines is projected to decline by 14% (-2% to -5% CAGR) by 2025.

- Oncology:
  - In 2020, oncology medicine spending increased $5 B, reaching $72 B.
  - For the first time in seven years, oncology medicine spending growth was below 10%, driven by increasing use of biosimilars.
  - Price growth among oncology medicines has remained historically low, contributing just 1% of growth in oncology medicine spending in 2020.
  - Oncology spending growth is expected to slow to 9-12% annually to $117 B in 2025 (a 62% or $45 B increase from 2020) as biosimilars offset a continued flow of newer treatments.
  - More than 100 new oncology drugs are anticipated based on current pipeline, although they are expected to be increasingly narrowly focused as precision medicine and biomarker-driven therapies become more common.
- Autoimmune:
  - Autoimmune medicine spending growth is expected to increase 12% annually (CAGR) to $134 B in 2025 (a 78% or $59 B increase from 2020).
  - More than half of current autoimmune medicine spending will lose exclusivity by 2025.

**Patient Coverage and Cost Sharing:**

- In 2020, patients with commercial insurance accounted for 52% of total adjusted retail prescriptions, Part D accounted for 33%, Medicaid accounted for 11%, and uninsured/cash pay accounted for 4%.
- In 2020, over 92% of prescriptions (brand and generic) had final patient out-of-pocket (OOP) costs below $20, and only 0.9% cost patients more than $125.
- In 2020, 74% of brand prescriptions had final patient OOP costs below $20 (up from 65% in 2015), 46% had $0 cost sharing (up from 36% in 2015), and only 3.2% cost patients more than $125 (down from 4.2% in 2015).
- The average amount paid OOP per retail prescription dropped from $10.33 in 2015 to $9.81 in 2020.
- Overall, 8% of patients spent more than $500 total on prescriptions in 2020 and just 1.8% spent more than $1,500.
- Abandonment:
  - In 2020, 55 M prescriptions were abandoned at the pharmacy.
  - Of prescriptions with a final OOP costs above $500, 56% are abandoned by patients at the pharmacy, compared to just 6% of prescriptions abandoned when the OOP cost is less than $10.
- Commercial Insurance:
  - The average amount commercially insured patients paid OOP per retail prescription dropped from $10.33 in 2015 to $9.81 in 2020.
  - The average amount commercially insured patients paid OOP per retail brand prescription dropped from $27.00 in 2015 to $20.37 in 2020, driven by copay coupon utilization.

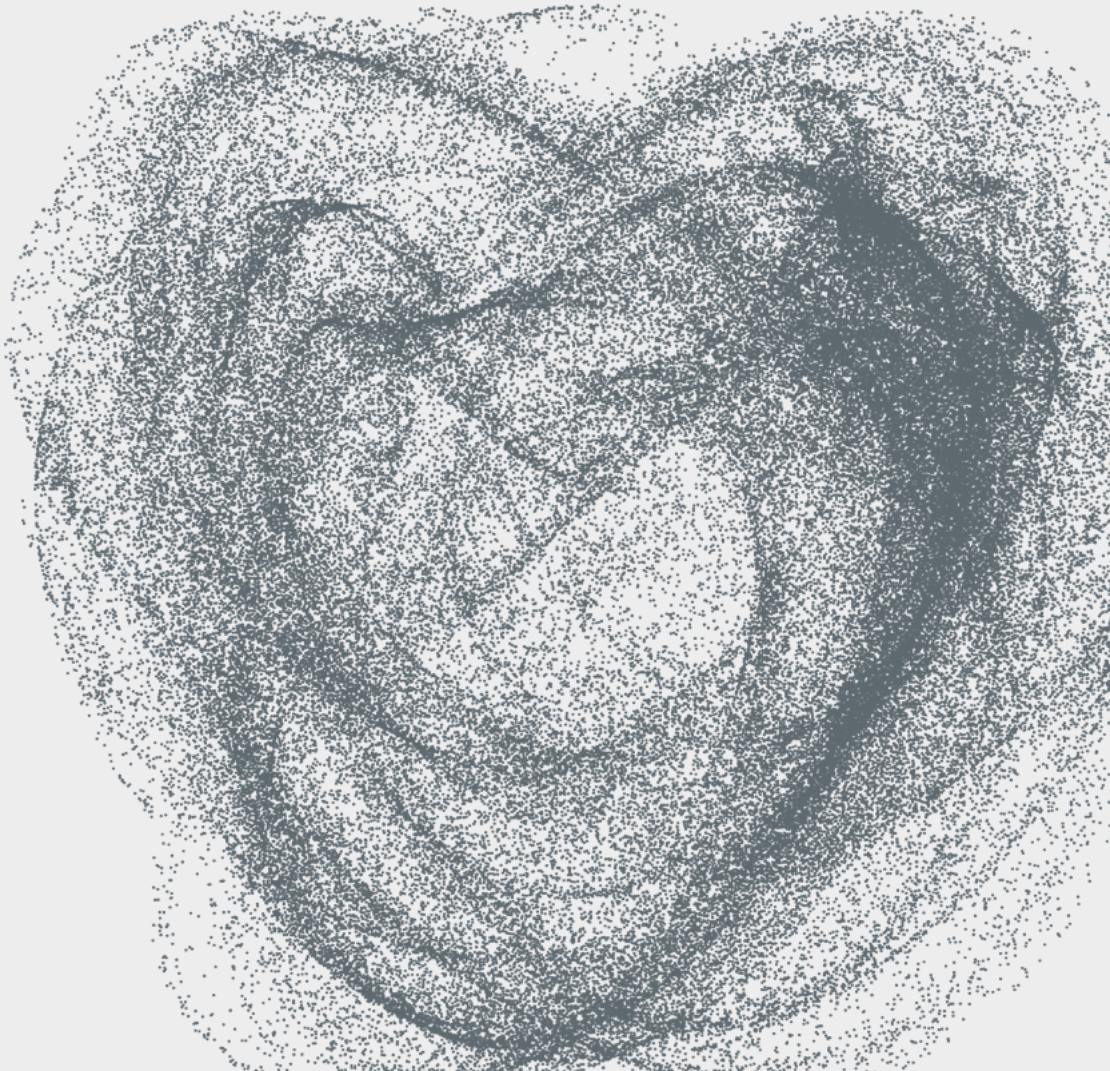
- Among commercially insured patients taking brand medicines, 14% used copay coupons in 2020. In aggregate, copay coupons reduced patient OOP spending by $14 B in 2020.
- Overall, 6.7% of employer insured patients and 6.3% of patients in exchanges plans spent more than $500 total on prescriptions in 2020 and just 1.1% spent more than $1,500 across both kinds of commercial insurance.

- Medicare:
  - In 2020, aggregate Medicare OOP spending increased by 8% to $11.9 B.
  - The average amount Part D patients paid OOP per prescription dropped from $7.03 in 2015 to $6.09 in 2020.
  - Overall, 17% of Medicare patients spent more than $500 total on prescriptions in 2020.
- Uninsured/ Cash Pay:
  - The share of cash-paid prescriptions declined from 8% of total adjusted prescriptions in 2015 to just 4% in 2020.
  - Patients paying cash account for 27% of overall patient OOP costs ($14 B) in 2020 but only 4% of total prescriptions. Of these prescriptions, 97% were for generic medicines.
  - The average amount cash-pay patients paid OOP per prescription increased from $35.23 in 2015 to $45.17in 2020, largely driven by generic prices which rose until 2018 and have since been declining.

IQVIA INSTITUTE FOR HUMAN DATA SCIENCE

# The Use of Medicines in the U.S.

## SPENDING AND USAGE TRENDS AND OUTLOOK TO 2025



MAY
2021

# Introduction

The impact of the COVID-19 pandemic on the people of the United States is hard to overstate. The direct and indirect impacts on people's health and their use of medicines is of critical importance now and as we manage the ongoing demands of this pandemic. As with many crises, other concerns are often pushed to the side, but the importance of healthcare for millions of Americans means these trends remain important. How quickly patients and providers return to 'normal' will impact health outcomes for decades to come.

This annual trends report is intended to provide a grounding in relevant information across a range of issues with both short- and long-term implications.

The impact of COVID-19 to-date on the regular running of the U.S. health system is one of the key elements that we can reference to judge the return to normalcy, and the Health Services Utilization Index we first introduced last summer is updated to show the recovery and what is still left to address.

Trends in the use of and spending on medicines illustrate the resilience of the system to the pandemic and in general are predominately driven by an aging population with chronic diseases or diseases of aging, including cancer. An overview of patient out-of-pocket costs provides insight into a key and significantly misunderstood area, and with these historic trends in mind, the outlook for the years ahead includes some key drivers and events to consider.

The study was produced independently by the IQVIA Institute for Human Data Science as a public service, without industry or government funding. The contributions to this report of Onil Ghotkar, Luke Greenwalt, Elyse Muñoz, Urvashi Porwal, Priya Srivastava, Marcella Vokey, Terri Wallace and dozens of others at IQVIA are gratefully acknowledged.

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**MURRAY AITKEN**
*Executive Director*
*IQVIA Institute for Human Data Science*

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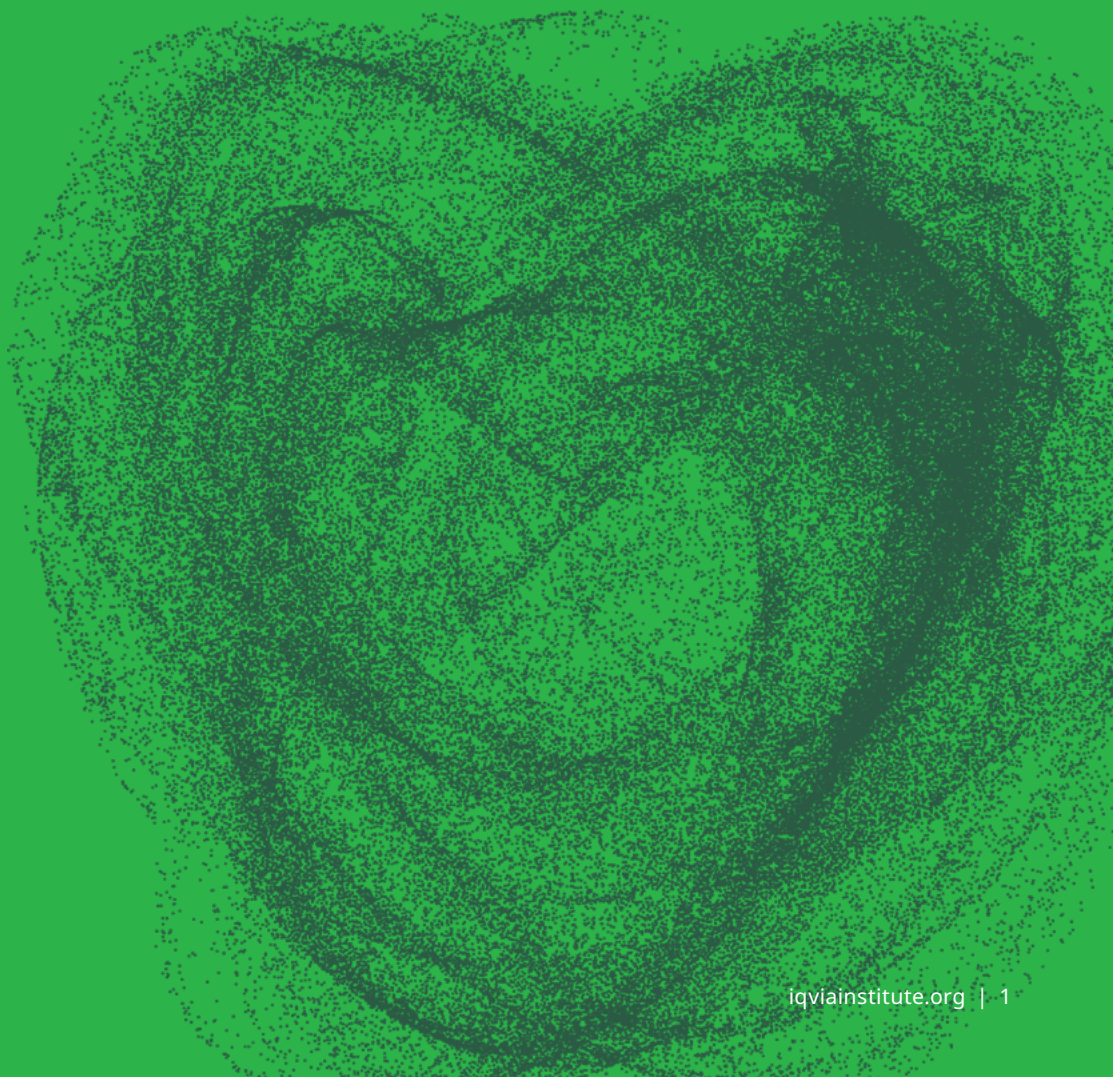


# Overview

**The U.S. health system demonstrated resilience and flexibility during 2020, recovering toward its pre-pandemic levels of activity and progressing into 2021, even as the backlog of missed or delayed activity remains substantial. Medicine supply was largely maintained and spending on medicines increased by less than 1% on a net price basis.**

### HEALTH SERVICES UTILIZATION INDEX DURING COVID-19

During the first quarter of 2021, the use of key health services — as measured by the IQVIA Health Services Utilization Index — was at 82% of pre-COVID-19 levels, up from a low of 42% at the peak of the first wave of the pandemic in April 2020. While the recovery has come closer to 100% levels in some of the component indices, it has yet to address the backlog of missed or delayed activity from earlier in the pandemic.

Elective procedures were only 15% of normal at the peak of the lockdowns in spring 2020 and have returned to 80%, but delayed procedures range from hip and knee replacements to procedures which are scheduled (rather than as emergencies) but are generally not seen as optional. Tests used to screen or monitor cancer dropped dramatically and then largely recovered, leaving a 11–23% deficit in key tests, including pap smears, and low-dose CT scans for lung cancer including colonoscopies, mammograms, pap smears, and low-dose CT scans for lung cancer.

Office visits, which are typically the entry point for patients, declined substantially, but a rapid shift to adopting telehealth across the system mitigated some of the decline. Telehealth now represents approximately 10% of visits, up from about 1% before the pandemic. These remote healthcare engagements are expected to remain an important part of healthcare delivery going forward.

*Median Health Services Utilization Index indicates the U.S. is operating at 82% of pre-COVID-19 levels.*

New prescriptions for acute and chronic therapies were disrupted in the pandemic while chronic continuing prescriptions were less affected. New prescriptions for chronic therapies are at 80% of normal, only recovering with the start of 2021.

### MEDICINE USE

A total of 6.3 billion prescriptions were dispensed in 2020 with growth slowing to 1.7% after adjusting for the increased use of 90-day prescriptions for chronic therapies. Prescription growth has been mainly driven by the aging population and their greater use of medicines for chronic diseases and offset by disruptions for acute therapies during the pandemic. Millions of patients were still treated during 2020 for a wide range of diseases, many of them chronic, while some acute therapy areas had significant declines in usage in 2020, mostly associated with disruptions from COVID-19. Social changes also contributed to shifts in the use of behavioral and mental health therapies, notably increases in anxiety and depression, and shifts in the use of ADHD medicines (most often used in children).

### MEDICINE SPENDING AND GROWTH DRIVERS

U.S. medicine spending increased 0.8% on a net price basis to $359 billion, which reflects an increasing gap between list or invoice prices and manufacturer net revenues. Real net per capita spending — adjusting for net prices, population and economic growth — declined in 2020 to $1,085 and has increased only $56 since 2010. Specialty medicines now account for 53% of spending, up from 27% in 2010 and driven by growth in autoimmune and oncology therapies.

*List prices increased 4.4% while net manufacturer prices for protected brands declined 2.9% in 2020.*

Manufacturer net revenues increased by $48 billion over the past five years, primarily driven by new products and brand volume. Protected brand list prices increased 4.4% in 2020, while net prices decreased by 2.9% - the fourth year at or below the level of consumer price inflation. Protected brand volume growth continues mostly in therapy areas with recent waves of innovation.. Generics

are now 90% of dispensed prescriptions, up from 72% ten years ago, and are dispensed 97% of the time when a generic is available. Biosimilar utilization is not as high as small molecules but newer biosimilars have seen volume share approach 60% within two years and have begun to contribute to savings at significant levels.

Immunology, diabetes, and oncology are the largest drivers of non-discounted spending growth. The introduction of biosimilars has contributed to oncology growth falling below 10% for the first time in seven years and new brand growth also slowed, despite a larger number of new drug launches. Diabetes growth slowed to 2% in 2020 on a net basis as off-invoice discounts and rebates drove protected brand prices down by 12%.

**PATIENT OUT-OF-POCKET COSTS AND AFFORDABILITY**

Out-of-pocket costs in aggregate for all patients — including retail prescriptions and non-retail medicines — increased $1 billion in 2020 to $77 billion. Patients without insurance coverage paid $14 billion for prescriptions, 97% of which were for generic medicines. Total out-of-pockets costs for these cash-pay patients has decreased by 16% over the past five years as many have become insured, offsetting exposure to higher list prices.

Across all types of insurance, the average amount paid out-of-pocket per retail prescription has dropped from $10.33 in 2015 to $9.81 in 2020, primarily reflecting lower generic costs.

While per-prescription costs are often a focus, insurance benefits are based on a plan year and overall, only 8% of patients reach annual out-of-pocket costs above $500. Medicare cost-exposure is higher, with 17% of patients reaching $500 of drug out-of-pocket costs in the year in part because cost-sharing is linked to list-prices which are higher than standardized copays, and because Medicare beneficiaries cannot use coupons to offset their costs. More than 92% of branded and generic prescriptions have a final out-of-pocket cost below $20, while 0.9% — about 57 million prescriptions — have a cost above $125 for a one-month supply. Patients were prescribed 55 million new therapy prescriptions by their doctors, which they abandoned at the pharmacy in 2020, about 9% of the total prescribed on average, with increasing frequency as costs rise. Those patients with commercial insurance are increasingly using savings programs offered by manufacturers to offset costs, especially in therapy areas such as immunology, mental health and diabetes.

*More than 92% of branded and generic prescriptions have a final out-of-pocket cost below $20, while 0.9% — about 57 million prescriptions — have a cost above $125*

**OUTLOOK TO 2025**

Total net spending on medicine is expected to reach $380–400 billion in 2025, up from $359 billion in 2020, reflecting a compound annual growth rate of 0–3%. This forecast is nearly unchanged from the pre-pandemic level, despite the disruptions from COVID-19 and short-term impact.

New brand launches are expected to continue at record levels, and the 50–55 new active substances forecast to be launched per year will contribute about $133 billion in spending growth through 2025, slightly higher than the past five years. Net prices for protected brands are expected to decline between 0 and 3% per year through 2025, reflecting more intense competition between manufacturers and aggressive negotiations by payers. Losses of exclusivity are forecast to result in $128 billion of lower brand spending through 2025, including $39 billion from branded biologics as the biosimilar market matures. Total saving to payers due to biosimilar introductions are forecast to be $133 billion ($85–183 billion range) in aggregate over the next five years.

Immunology, oncology and neurology will be the main sources of growth through 2025. Oncology spending will exceed $110 billion by 2025, up from $72 billion in 2020 and continuing at a slower growth rate due to the impact of biosimilars and new drug launches increasingly focused on rare cancers. Diabetes spending is expected to decline 2-5% on a net basis through 2025 due to heightened competition. Immunology will exceed $130 billion in the U.S. by 2025, with growth slowing after 2023 due to the launch of key biosimilars for adalimumab and ustekinumab in 2023 and 2024, respectively.

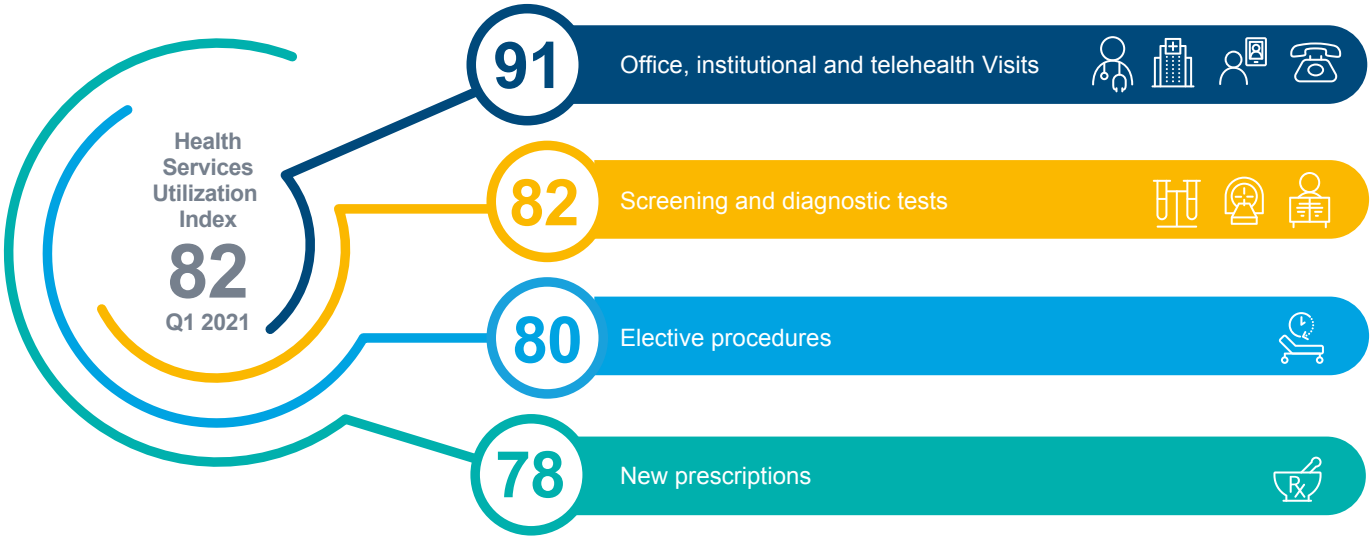
# Health Services Utilization Index during COVID-19

- Median Health Services Utilization Index indicates the U.S. is operating at 82% of pre-COVID-19 levels.
- Health Services Utilization Index has recovered to 82% of pre-COVID-19 levels but has yet to address backlog from earlier.
- Elective procedures declined by 85% during system-wide shutdowns, returning to 80% of pre-pandemic levels by Q1 2021.
- Diagnostics used to screen and monitor cancer dropped dramatically and recovered, though an 11% –23% deficit remains.
- Patients and providers have shifted to telehealth but remain below baseline levels of healthcare engagement.
- New prescriptions for acute and chronic therapies were disrupted in the pandemic while chronic continuing prescriptions were less affected.
- The composite Health Services Utilization Index ranges from a high of 117 in UT to 78 in WV and a median value of 89.
- Prescription utilization by method of payment has shown little movement over the past year despite rising unemployment.

*The U.S. is operating at 82% of pre-COVID-19 levels but has yet to address the backlog of missed or delayed activity from earlier in the pandemic.*

# Median Health Services Utilization Index indicates the U.S. is operating at 82% of pre-COVID-19 levels

**Exhibit 1: Overview of Health Services Utilization Index**



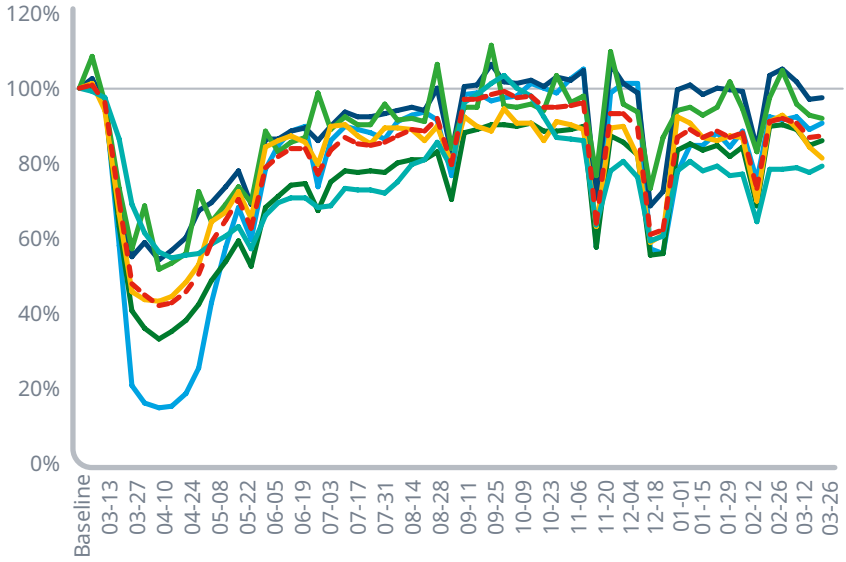

Source: IQVIA Institute; IQVIA Medical Claims Data; LAAD Prescription data, week ending 4/30/2021

- The return to a pre-pandemic level of utilization in the health system is critical to ensuring all Americans –including all those who have not been infected by the virus SARS-CoV-2 –receive the preventive and treatment services they need.
- A Health Services Utilization Index has been created and includes five essential components of a health system and measures their utilization against a base period of the eight-week average from January 4 to February 28, 2020.
- The four index components are equally weighted, and for each component a score of 100 or higher indicates a return to baseline levels, including elective procedures, doctor visits (office, institutional – hospital or clinic – or via telehealth), diagnostic lab results, and new brand or generic prescriptions filled.
- The first quarter of 2021, a period where millions of Americans have begun to be vaccinated for COVID-19, shows the overall utilization index recovered to 82, 18% below the pre-pandemic baseline but nearly double the index of 42 at the low-point in April 2020.

Exhibit Notes: Each component of the index compares the difference between actual values per week and baseline average for the eight weeks from January 4 to February 28.

# Health Services Utilization Index has recovered to 82% of pre-COVID-19 levels but has yet to address backlog from earlier

**Exhibit 2: Health Services Utilization Index and Component Metrics Percentage of 2020 Baseline**




| | % below baseline Peak (Apr 10, 2020) | FY2020 | Q1 2021 |
|---|---|---|---|
| Elective procedures | 15 | 77 | 80 |
| Office, institutional & telehealth visits | 54 | 87 | 91 |
| Institutional | 52 | 86 | 90 |
| Office | 33 | 72 | 76 |
| Screening and diagnostics | 43 | 79 | 82 |
| New prescriptions | 56 | 76 | 78 |
| Health Services Utilization Index | 42 | 80 | 82 |

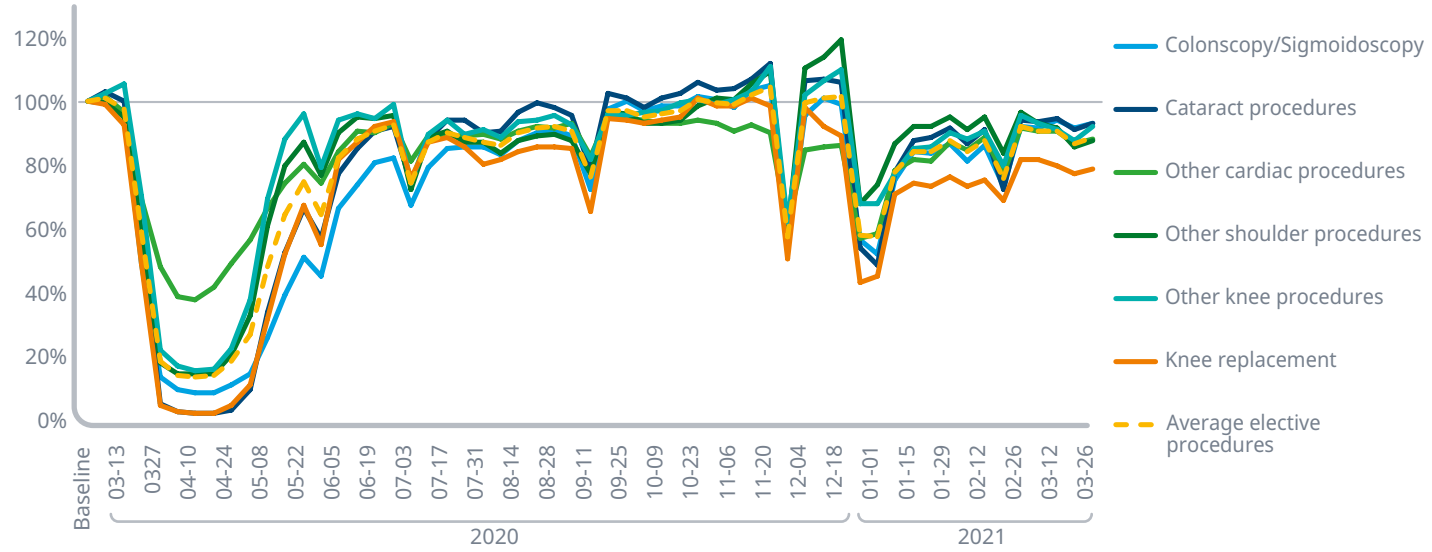
Source: IQVIA Medical Claims Data, LAAD Prescription data, week ending 4/30/2021

- Doctor visits - including office, institutional and telehealth – have rebounded strongly to an index of 91 relative to pre-pandemic baseline, the highest of the overall index components but still below prior levels and not yet making up the backlog in healthcare engagement that was created.
- Diagnostics and screening tests are often a part of a treatment sequence, starting with a visit and ultimately resulting in a procedure or drug therapy for many, and the gap in these tests from pre-pandemic levels allows risks for missing a cancer diagnosis or other such screening result.
- Elective procedures were largely stopped in the peak of the shutdowns from COVID-19, dropping to 15% of normal, but have since recovered to 80% nationally, though some states have begun to have above baseline levels.
- New prescription medicines have continued at well below the pre-pandemic baseline as a combination of factors are inhibiting prescribing, including lower visits and screening and diagnostics.
- It is notable that continuing prescriptions for chronic therapies have been trending above baseline as more patients have been filling longer three-month prescriptions or using mail-order in efforts to save money and/or avoid in-person pharmacy visits.
- The overall Health Services Utilization Index has recovered from 42 at the height of the shutdowns early in the pandemic to 80 for the full year 2020, and 82 in the first quarter of 2021.

Exhibit Notes: Each component of the index compares the difference between actual values per week and baseline average for the eight weeks from January 4 to February 28.

# Elective procedures declined by 85% during system-wide shutdowns, returning to 80% of pre-pandemic levels by Q1 2021

**Exhibit 3: Selected Elective Procedures Compared to Baseline**



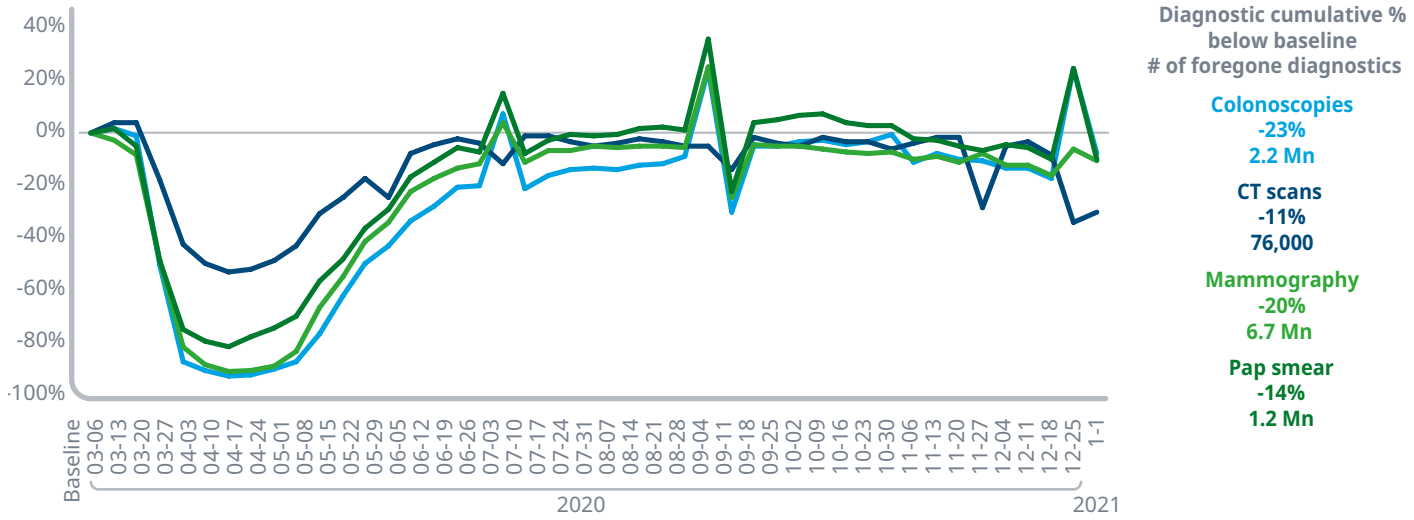

Source: IQVIA Medical Claims Data, week ending 4/30/2021

- Several elective procedures illustrate the decline in overall procedures during the height of the COVID-19 pandemic and the recovery since, with some above baseline for parts of the fourth quarter of 2020.
- For the most part, procedures for non-life-threatening conditions were rescheduled or canceled to a greater degree at the lowest point in April. Cardiac procedures dropped the least out of the procedures examined, to 38% of baseline, but have recovered to 89% as of the latest week.
- Aside from cardiac procedures, the other procedures dropped by 80-90% during the month of April but rebounded sharply in May and maintained a steady 80-90% of baseline through the summer, rebounding in the winter before dipping again in early 2021.
- Colonoscopies had one of the longer periods of disruption, recovering to 82% by the week before the Fourth of July holiday and steadily recovering since.
- As most restrictions in operating the health system safely have been well established for months, the absence of these procedures is most likely the result of the absence of initial diagnoses.
- The disruption to initial healthcare engagements such as doctor visits may be the cause of these lower elective procedure numbers, as patients who would otherwise have been seeking them may have delayed engaging with their doctor to start the sequence of events that would lead to a surgery.

Exhibit Notes: Each component of the index compares the difference between actual values per week and baseline average for the eight weeks from January 4 to February 28.

# Diagnostics used to screen and monitor cancer dropped dramatically and recovered, though an 11–23% deficit remains

**Exhibit 4: Selected Diagnostic Testing Procedures Compared to Baseline**



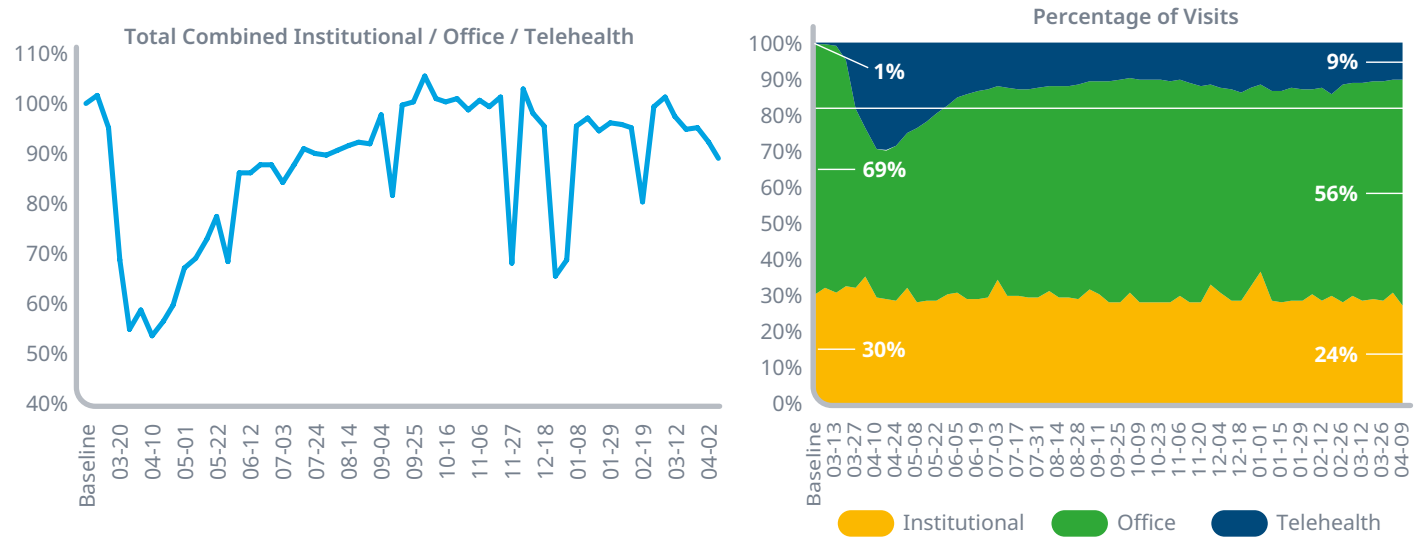

Source: IQVIA Real World Claims, Dec 2020; IQVIA Institute, Feb 2021

- Cancer screening diagnostics for several large prevalence tumors had significant disruptions during the height of the pandemic, which were sustained through midsummer.
- While the level has been largely near the pre-pandemic level since July, there has been little progress in addressing the backlog of missed screenings, affecting millions of tests.
- Low-dose CT scans for lung cancer screenings were the least disrupted, potentially as a result of an elevated focus of patients and providers on lung and breathing issues during the pandemic.
- Procedures for women such as pap smears for cervical cancer and mammograms for breast cancer finished 2020 down, 14% and 20% respectively, with 7.9 million expected diagnostic procedures not taking place.
- For a patient with an aggressive cancer, early diagnosis is often the key indicator of a better prognosis, even if only a small subset of those tested result in diagnosis of cancer.
- The benefits are clear for completing these regular screening tests and the size of this 'backlog', and the downward trend in 2021 are both concerning trends to oncologists.

Exhibit Notes: Each component of the index compares the difference between actual values per week and baseline average for the eight weeks from January 4 to February 28.

# Patients and providers have shifted to telehealth but remain below baseline levels of healthcare engagement

**Exhibit 5: Office, Institutional and Telehealth Visits Compared to Baseline**



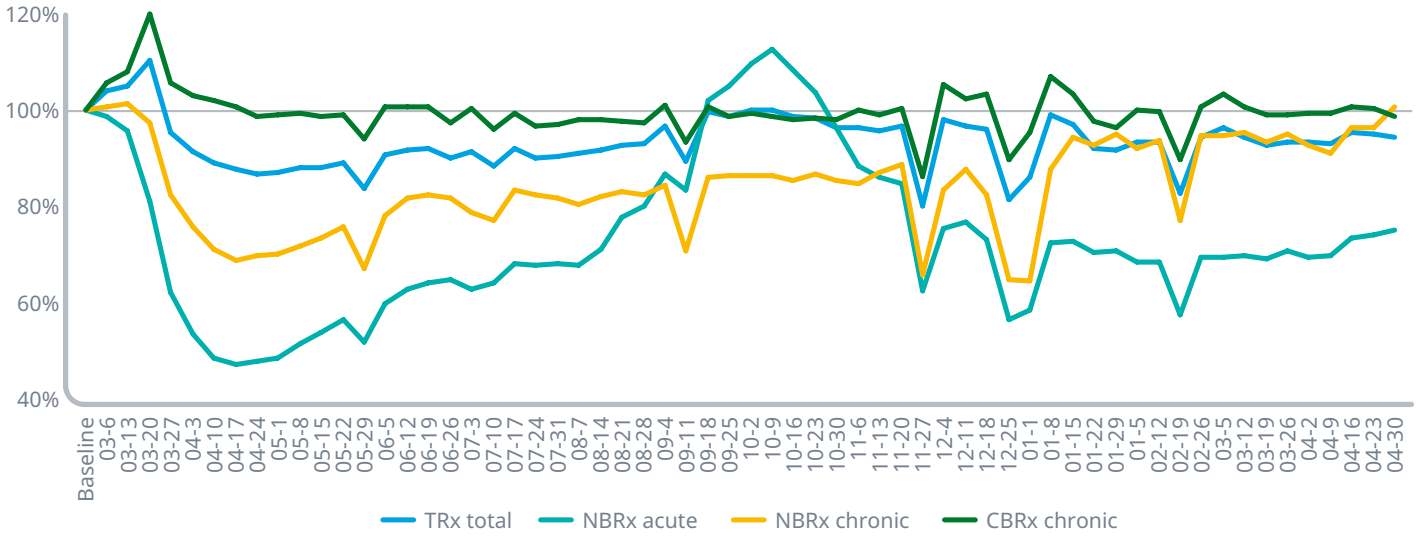

Source: IQVIA: Medical Claims Data Analysis, Apr 2020

- With doctor's offices closed and hospitals not accepting anything but emergency visits, patient office visits to doctors dropped to 33% of normal in April 2020 compared to 52% of normal for institutional visits.
- As a result of the rapid adoption of telehealth, the combined group of visits were 54% of the pre-pandemic baseline, and telehealth adoption increased afterward.
- Telehealth represented roughly 1% of visits prior to the pandemic, rising to nearly 30% in April 2020 and then continuing at a consistent 9–11% since summer 2020.
- The shift of some kinds of health services to remote interactions has enabled a continued management of patients despite social distancing restrictions and hygiene requirements in hospitals and medical practices.
- Even as restrictions have been lifted, patients and providers have continued to use remote options, suggesting that the pandemic has resulted in some fundamental shifts in the ways patients and providers interact.
- Prior to the pandemic, telehealth was generally not covered for most interactions under Medicare or commercial insurance, and the extent to which insurers continue to reimburse providers for these remote interactions is the most significant driver of whether they will continue at current levels.

Exhibit Notes: Each component of the index compares the difference between actual values per week and baseline average for the eight weeks from January 4 to February 28.

# New prescriptions for acute and chronic therapies were disrupted in the pandemic while chronic continuing were less affected

**Exhibit 6: Dispensed New and Continuing Prescriptions by Therapy Type as a Percent of 2020 Baseline**



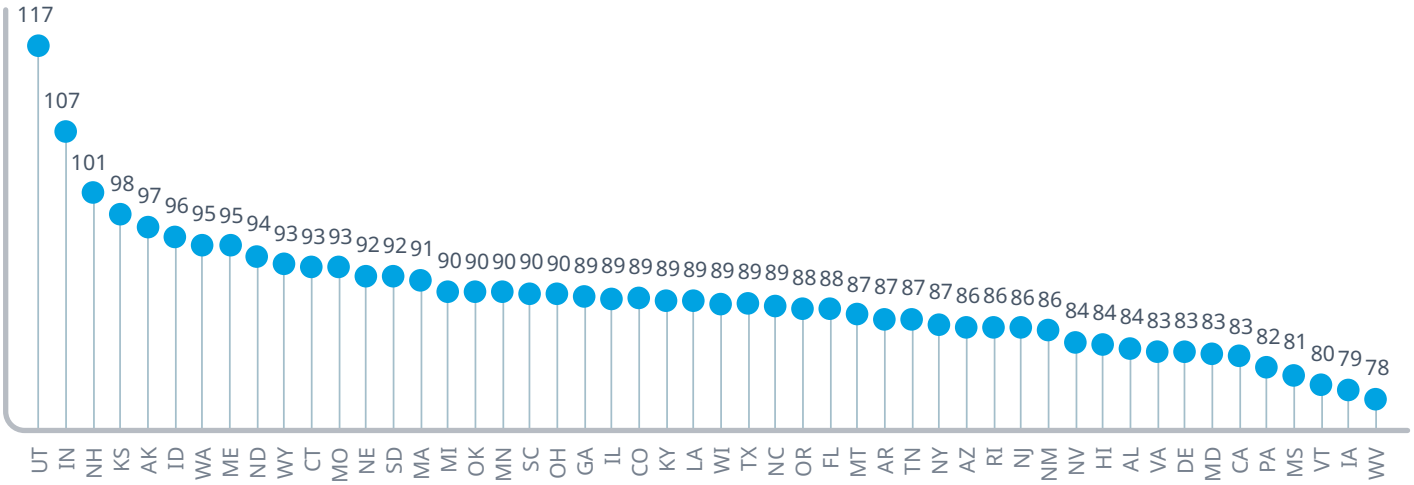

Source: IQVIA National Sales Perspective; IQVIA National Prescription Audit, Apr 2021

- Total prescriptions as of the end of March 2021 were at 94% of the baseline pre-pandemic level, as mostly acute therapies were far below normal while continuing chronic prescriptions have been trending at or just below baseline since the beginning of the pandemic.
- New to brand prescriptions (NBRx) are those where the patient is new to the medicine in the past year, and these were significantly below baseline for both chronic and acute prescriptions.
- Acute care prescriptions were significantly disrupted, not because it was difficult to get them, but rather that patients didn't require them.
- Many antibiotics and pain management prescriptions are given as a result of an elective or emergency procedure, and as these were also disrupted, the normally resulting prescriptions were not filled.
- Later in the year, as the normal seasonal flu season was set to begin, most infections did not present, but following recommendations, an above average number of people got vaccinated for seasonal flu. As the flu season progressed without the typical rate of diagnoses, the impact is visible in overall acute NBRx.
- As the summer progressed though, new starts for chronic therapies have continued at 80% of normal, only recovering with the start of 2021.

Exhibit Notes: Difference between actual values per week and baseline average for the eight weeks from January 4 to February 28 are plotted. Prescriptions where patient has not a prescription of the same medicine in the past year, includes both new therapy starts and switched or added-on prescriptions.

# The composite Health Services Utilization Index ranges from a high of 117 in UT to 78 in WV and a median value of 89

**Exhibit 7: Health Services Utilization Index Q4 2020**



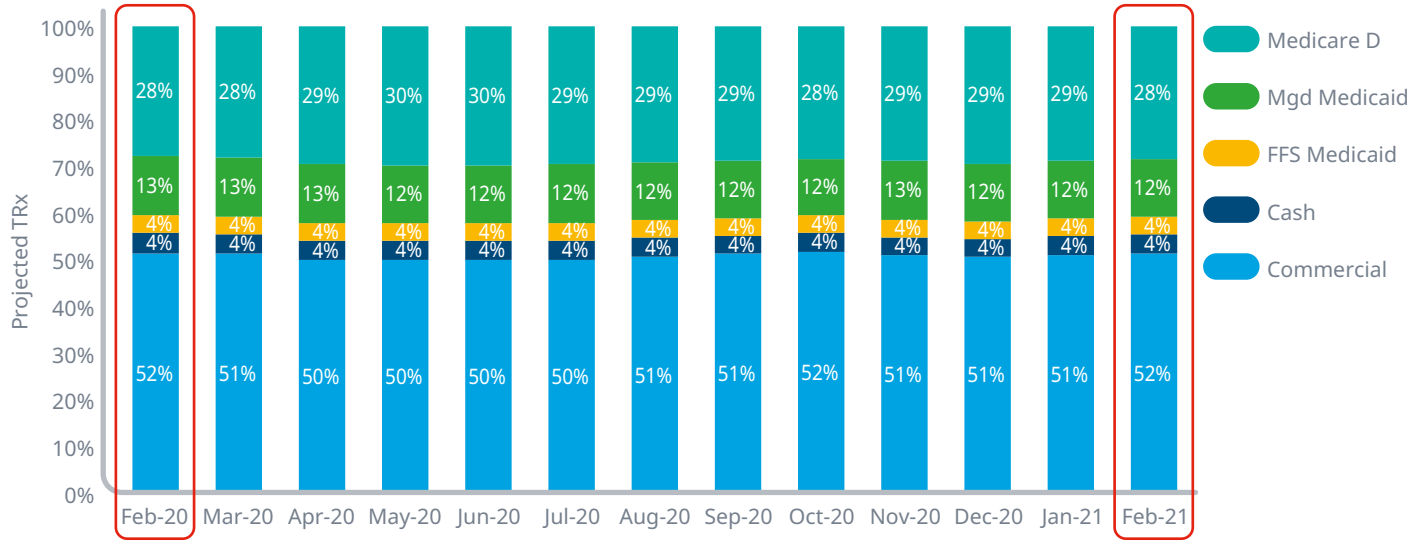

Source: IQVIA Real World Claims, 1/1/2021, Claims limited to processed within 14 days of service date for stability

- The Health Services Utilization Index ranged from 78 to 117 in the fourth quarter of 2020, with a median of 89.
- States have significantly different drivers of their overall indices, with elective procedures and lab tests above baseline for several states, while others lag far behind.
- Only three states have a Health Services Utilization Index (HSUI) above baseline: Utah, Indiana and New Hampshire, with 117, 107 and 101, respectively.
- Utah has lab tests at 145% of baseline and elective procedures at 128%, and combined doctor visits at 109%, all contributing the highest HSUI in the country – 117.
- By contrast, West Virginia, Iowa and Vermont all have HSUI below 80, with no component of the index above 100 for any of them.
- Diagnostic tests have a median index across states of 86, with 14 states below 80, the lowest in Vermont at 59.
- Combined doctor visits, including office, institutional and telehealth, have a median index in Q4 of 96, with a low in Vermont of 81 and a high of 116 in Indiana.
- Twelve states have visits above baseline levels, something key to addressing the burden of disease that may have built up during the pandemic.

Exhibit Notes: Index based on the average of the fourth quarter of 2020 at state level.

# Prescription utilization by method of payment has shown little movement over the past year despite rising unemployment

**Exhibit 8: Monthly Dispensed Prescriptions by Method of Payment**




Source: IQVIA PayerTrak; US Market Access Analytic Solutions analysis, Feb 2021

- Despite significant and rapid shifts in employment nationally, prescription utilization does not yet show a significant shift to Medicaid, representing 8% of dispensed prescriptions through the year through February 2021.
- Some states operating under ACA Medicaid expansion have less stringent waiting periods to become eligible for Medicaid, but even with these shifts in enrollment, the overall utilization remains unchanged as a share of overall volume.
- These trends suggest that while unemployment and economic disruption were significant in the pandemic, the combined effects of stimulus payments and employers retaining staff or extending insurance during layoffs/furloughs had the result of diminishing the numbers of people who would be newly Medicaid eligible.

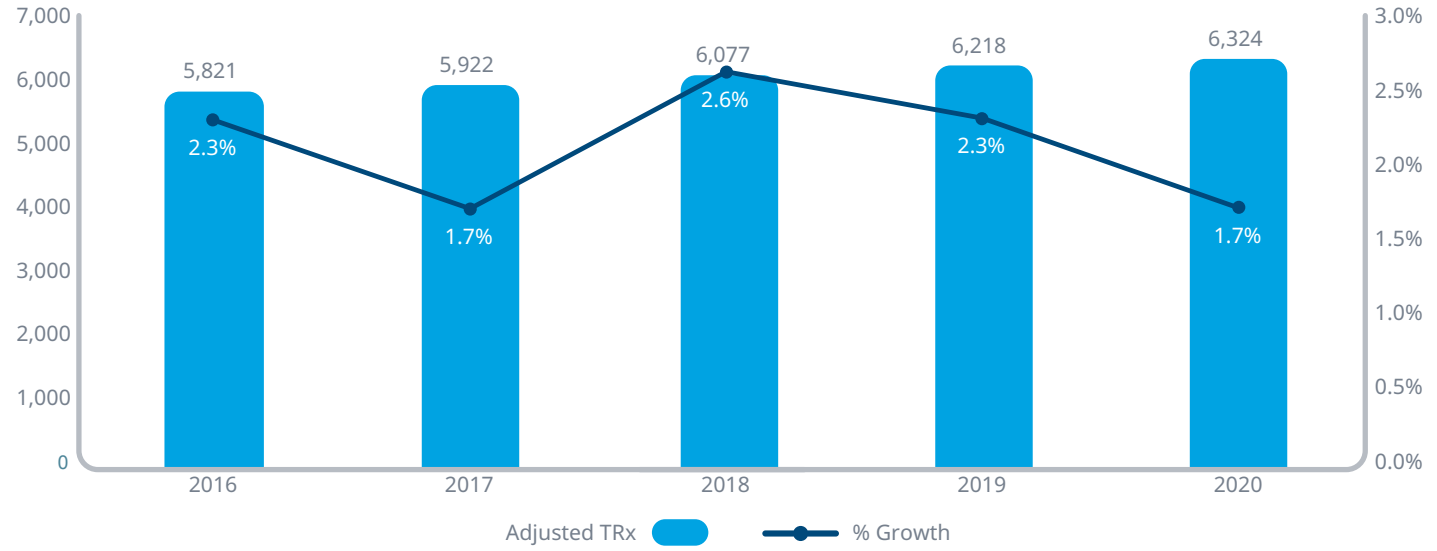
# Medicine use

- Dispensed prescriptions reached 6.3 billion in 2020 while growth slowed to 1.7%.
- Prescriptions grew on an adjusted basis as more were filled as a three-month supply in retail channels.
- Chronic prescriptions account for nearly 80% of dispensed prescriptions and are increasingly dispensed in three-month supplies.
- Prescription growth has been driven mainly by the aging population as seniors use more medicines per capita.
- Millions of patients are treated annually for a wide range of diseases, many of them chronic and driven by the elderly.
- Some therapy areas had significant declines in usage in 2020.
- New prescriptions for acute and chronic therapies were disrupted in the pandemic while chronic continuing were less affected.
- New prescriptions were impacted during the early phase of the pandemic primarily from acute therapies.
- COVID-19 related social changes drove modifications in the use of behavioral and mental health therapies.
- During the COVID-19 pandemic, patients changed their use of over-the-counter medicines.
- Cash paid prescriptions declined 10% in 2020 but the trend preceded COVID-19.
- Medicaid rose as third-party growth slowed.
- Medicaid enrollees use 7.5 prescriptions per enrollee per year, and use generics more than commercial or Medicare Part D.
- States exceed national average per enrollee use of medicines for 23 of 37 expansion states and only 3 of 14 non-expansion states.

*Chronic prescriptions account for nearly 80% of dispensed prescriptions and are increasingly dispensed in three-month supplies, contributing to improved medication adherence.*

# Dispensed prescriptions reached 6.3 billion in 2020 while growth slowed to 1.7%

**Exhibit 9: Adjusted Dispensed Prescriptions**



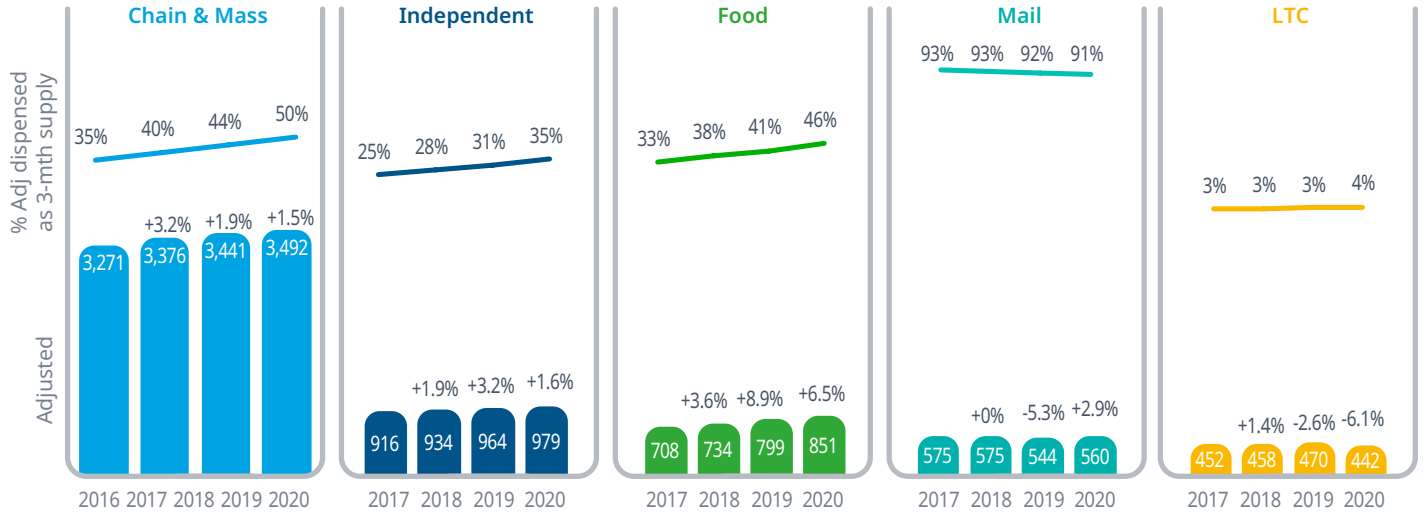

Source: IQVIA National Prescription Audit; IQVIA institute, Dec 2020

- Total prescriptions – adjusted for prescription length — reached nearly 6.3 billion in 2020, up from an estimated 5.8 billion in 2016.
- The increasing use of 90-day prescriptions is particularly notable as the rate of growth without adjustment for prescription length was -2.9% in 2020 but 1.7% after adjustment.
- Several incentives are in place for pharmacies, providers and Accountable Care Organizations (ACOs) based on achieving levels of medicine possession by patients, called percentage of days covered (PDC), and that are strongly linked to the rising use of 90-day prescriptions observed here.
- In 2020, the PDC for diabetes, cholesterol and hypertension all increased 3-4%, nearly the same percentage increase in 90-day prescriptions observed in those classes and in prescriptions overall.
- In total, dispensed prescriptions increased at an average 2.1% over the past four years.

Exhibit Notes: Prescription counts are adjusted for length of prescriptions and re-aggregated. Prescriptions referred to as '90-day' are calculated based on transactions with 84 days supply are more to include medicines with up to one-week of fewer treatment days. Prescriptions for 84 days supply or more or factored by three, and those under 84 days unchanged. Due to changes in data collection after 2016, adjusted prescription total has been back-projected based on published growth rates from prior Institute reports to estimate the number of adjusted prescriptions in 2016.

# Prescriptions grew on an adjusted basis as more were filled as a 3-month supply in retail channels

**Exhibit 10: Adjusted Dispensed Prescriptions by Channel and Percentage of Adjusted Prescriptions Dispensed as 3-Month Supply**



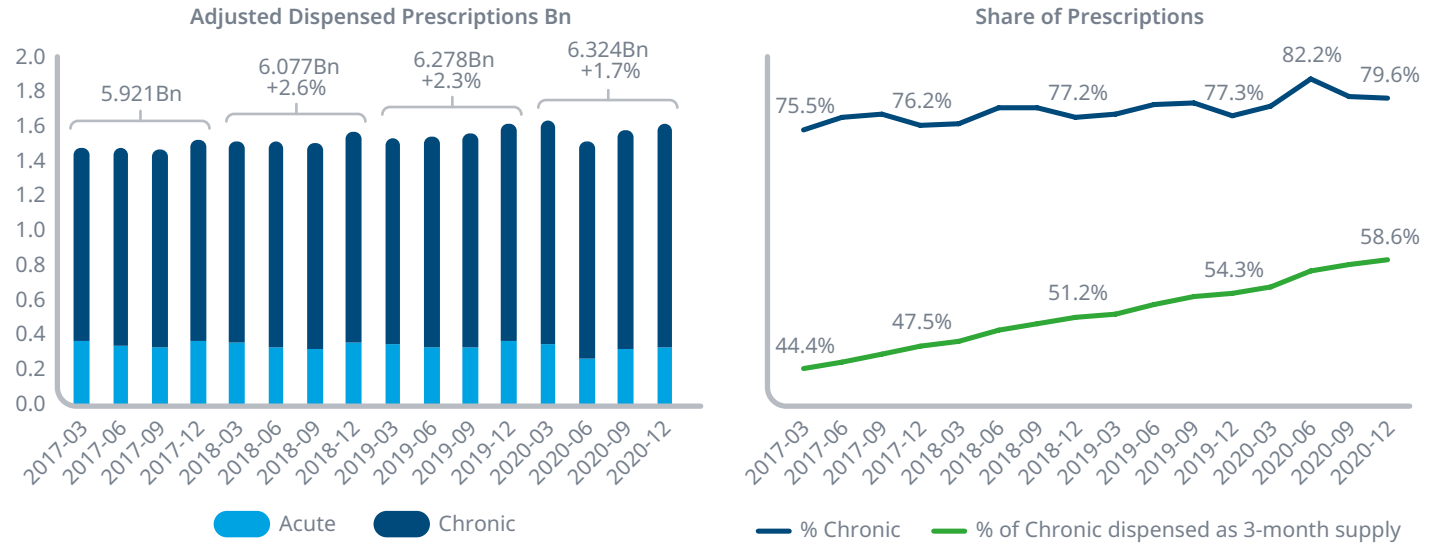

Source: IQVIA National Prescription Audit; IQVIA Institute, Dec 2020

- Over the past four years, prescriptions at retail pharmacies have risen faster than mail order.
- Retail pharmacies – including chain pharmacies, mass merchandisers, independent pharmacies and food stores - have increased at an average rate of 2.8% since 2017 compared to a decline of 0.9% in mail orders.
- Long-term care had been increasing, lifted by an aging population, but declined 6.1% in 2020, likely related to disruptions from COVID-19.
- The increases in prescriptions are also linked to the rising percentage dispensed as a three-month supply, limiting the number of opportunities for a patient to skip or miss a refill.
- Consistent and convenient access to chronic medicines is noted as one of the key drivers of medication adherence, which is linked to improved outcomes.
- It is also possible that some patients have unused or unneeded prescription medicines as a result of these dispensing patterns, which will require ongoing study and observation to manage the risks of these medicines being diverted to others and potentially causing harm.

Exhibit Notes: Prescription counts are adjusted for length of prescriptions and re-aggregated. Prescriptions referred to as 90-day are calculated based on transactions with 84 days supply or more to include medicines with up to one fewer week of treatment days in the planned three-month duration. Prescriptions for 84 days supply or more are factored by three, and those under 84 days unchanged. Long-term care pharmacies (LTC).

# Chronic prescriptions account for nearly 80% of dispensed prescriptions and are increasingly dispensed in 3-month supplies

**Exhibit 11: Adjusted Dispensed Prescriptions by Acute/Chronic and % 3-Month Chronic Dispensing**



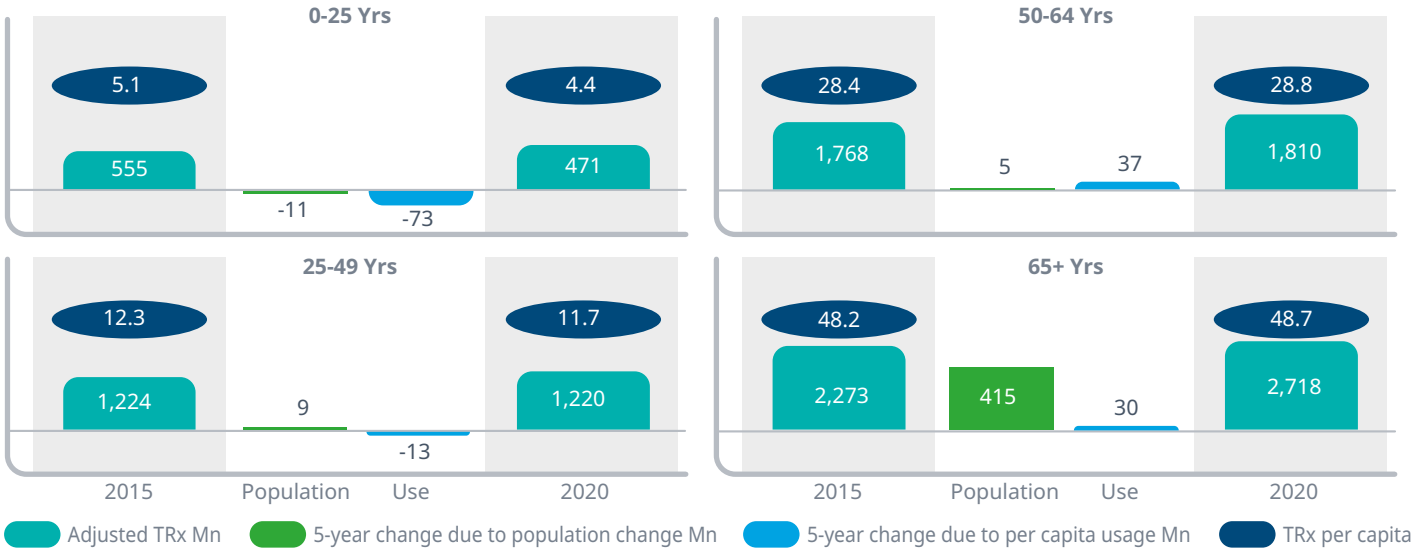

Source: IQVIA National Prescription Audit; IQVIA institute, Dec 2020

- Chronic prescriptions account for 79.6% of adjusted prescriptions as of Q4 2020, up from 75.5% at the beginning of 2017.
- Q2 2020 had a dip in acute prescriptions as some typical acute medicine uses were less likely to be required as people stayed home and were exposed less to common infections and had fewer elective procedures with associated discharge medications.
- The percentage of chronic prescriptions dispensed as a three-month supply has risen from 44.4% to 58.6% over that timeframe, adding 4.3 percentage points in just the last year.
- The dynamics of prescribing indicate that newer prescriptions — new and switch prescriptions are 5–20% of prescriptions in a therapy area — are less commonly dispensed this way, and that chronic continuing prescriptions are a slightly smaller share of overall prescriptions (65-72%) compared to total chronic of 79.6%.
- For those chronic prescriptions where it is potentially possible to dispense as three-month supplies, they are being dispensed that way over 80% of the time, consistent with the percentage of days covered (PDC) results which providers are achieving in Medicare STAR ratings.

Exhibit Notes: Prescription counts are adjusted for length of prescriptions and re-aggregated. Prescriptions referred to as 90-day are calculated based on transactions with 84 days supply or more to include medicines with up to one fewer week of treatment days in the planned three-month duration. Prescriptions for 84 days supply or more are factored by three, and those under 84 days unchanged. Chronic is determined as whether the medicine is generally intended to be prescribed for more than 180-days, and acute are all other medicines. Chronic and Acute are not specific patent or prescription attributes and do not reflect the potential for some medicines to be used on a long-term basis against recommendations.

# Prescription growth has been driven mainly by the aging population as seniors use more medicines per capita

**Exhibit 12: Adjusted Prescriptions by Age and Drivers**



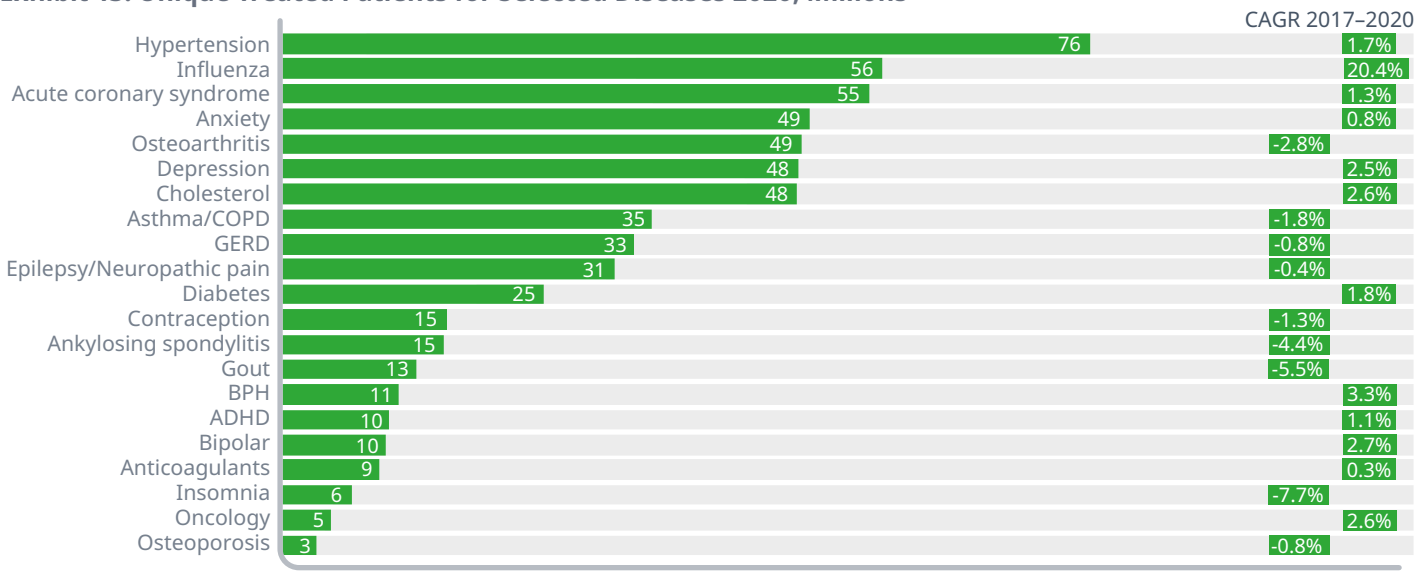

Source: IQVIA National Prescription Audit; US Census Bureau , Dec 2020

- Patients over 65 increased their per capita prescriptions per year only slightly — from 48.2 per year to 48.7 over the past five years.
- Seniors aged 50–64 also had a similar low change in per capita usage — from 28.4 to 28.8 per year.
- Younger adults from 26-49 decreased usage from 12.3 to 11.7, and younger people from birth to 25 years old also declined from 5.1 to 4.4 per person per year.
- Population changes associated with the aging population in the 'baby boom' generation drove almost all prescription growth over the past five years.
- The changes in coverage associated with the Affordable Care Act have had less effect on the younger age groups in this period than they did immediately after the initial implementation, as noted in an earlier report.

Exhibit Note: Chart values not displayed to scale. Population-driven growth calculated as base period (2015) if it had grown at the rate of population growth for the specific age band. Use-driven growth are the associated changes in per capita usage that resulted over five years and are calculated as the remainder of change in per capita usage over five years. For earlier version of this analysis, see *IQVIA Institute Medicine Use and Spending In the U.S.: A review of 2016 and Outlook to 2021* https://www.iqvia.com/insights/the-iqvia-institute/reports/medicines-use-and-spending-in-the-us-a-review-of-2016.

# Millions of patients are treated annually for a wide range of diseases, many of them chronic and driven by the elderly

**Exhibit 13: Unique Treated Patients for Selected Diseases 2020, Millions**



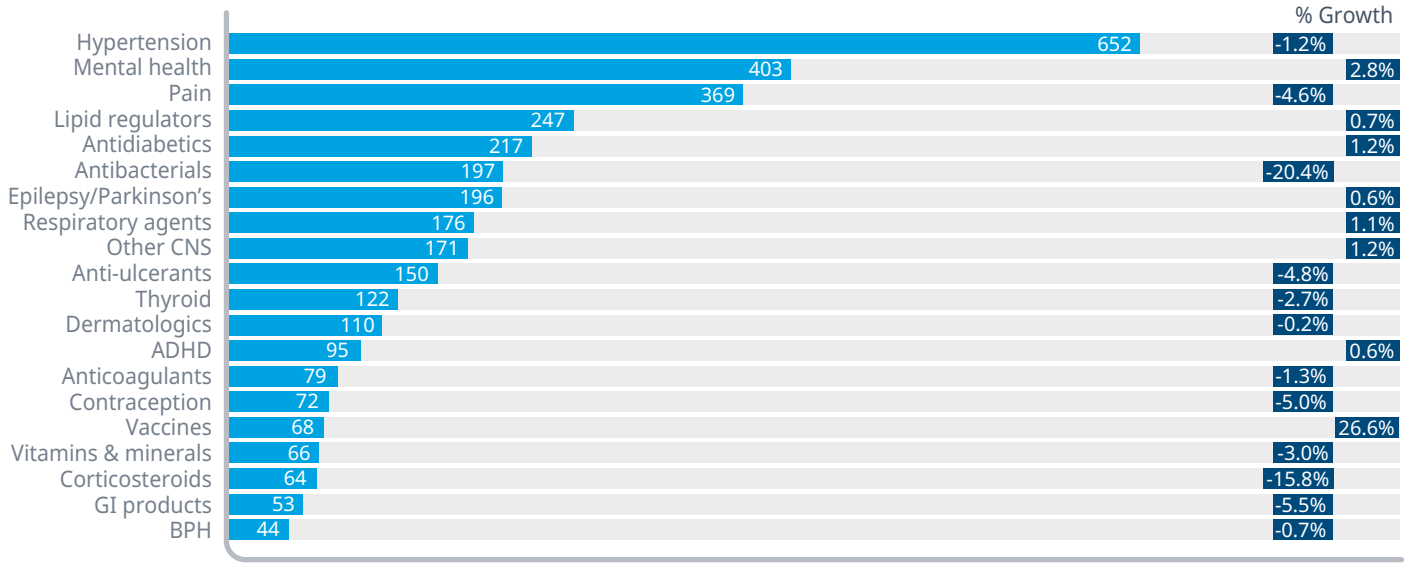

Source: IQVIA Medical Claims Data, Dec 2020

- Millions of Americans have a diagnosis and treatment for disease during the year, led by hypertension, with 76 million patients having filled at least one prescription in 2020, up 1.7% from 2017.
- Influenza — season flu — had more diagnoses resulting in a treatment in 2020, but this was predominately due to higher rates of vaccination as the seasonal flu was dramatically lower in the 2020/2021 flu season than in prior years.
- Insomnia had a decline of 7.7% in patients over the past four years, moving from 8.2 million to 6.4 million in 2020, with one-quarter of the decline happening in 2020 despite reports that many people are having trouble sleeping during the pandemic — suggesting the decline in 2020 would have been greater without the pandemic.
- There has been an average of 2.6% more oncology patients per year over the past 3 years, but that includes growth of 3.6% in 2018, 3.5% in 2019 and only 0.8% in 2020 as cancer screenings and treatment delays disrupted or slowed diagnoses, potentially putting thousands at risk for worse prognosis than if their cancers were detected earlier.

Exhibit Notes: Disease definitions are not mutually-exclusive and do not correspond perfectly to therapy areas reported elsewhere in this report. Annual unique patients does not reflect the number of patients on-therapy at any one time as some patients start and stop therapy during the year. Medical claims are unprojected and reflect the data captured in IQVIA's audits.

# Some therapy areas had significant declines in usage in 2020

**Exhibit 14: Unadjusted Dispensed Prescriptions 2020 and % Growth from 2019**



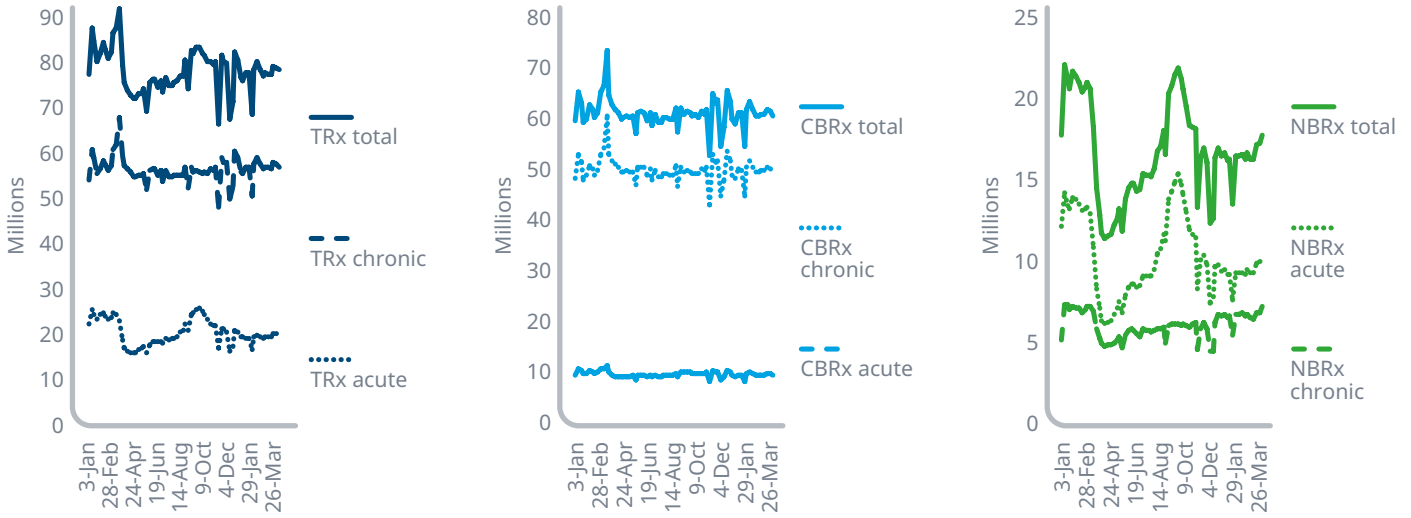

Source: IQVIA National Prescription Audit, Dec 2020

- Patients filled 652 million prescriptions (of any length) for hypertension medicines in 2020, down 1.2% without adjusting for prescription size, but increasing when adjusted for the increase in three-month supplies.
- Mental health prescriptions increased 2.8% in 2020 on an unadjusted basis, suggesting increases from both chronic users with improved adherence and new patients prompted by issues during the pandemic.
- The broad pain management therapy area declined 4.6%, largely because there were fewer elective procedures requiring pain medicines at discharge, even as pain medicine usage has been slowly declining, particularly with prescription opioids.
- Antibacterials were down 20.4% from the combined effects of fewer elective procedures and fewer bacterial infection as people socially-distanced.
- Vaccines were up 26% primarily from higher seasonal flu vaccines in 2020.
- Corticosteroids down 15.8% as a common treatment for injuries, infections and other acute events which didn't happen as often in 2020.

Exhibit Notes: Therapy definitions are mutually exclusive. Prescriptions are unadjusted for length or volume of medicine prescribed.

# New prescriptions for acute and chronic therapies were disrupted in the pandemic while chronic continuing were less affected

**Exhibit 15: Dispensed Total, Continuing and New Prescriptions by Therapy Type**



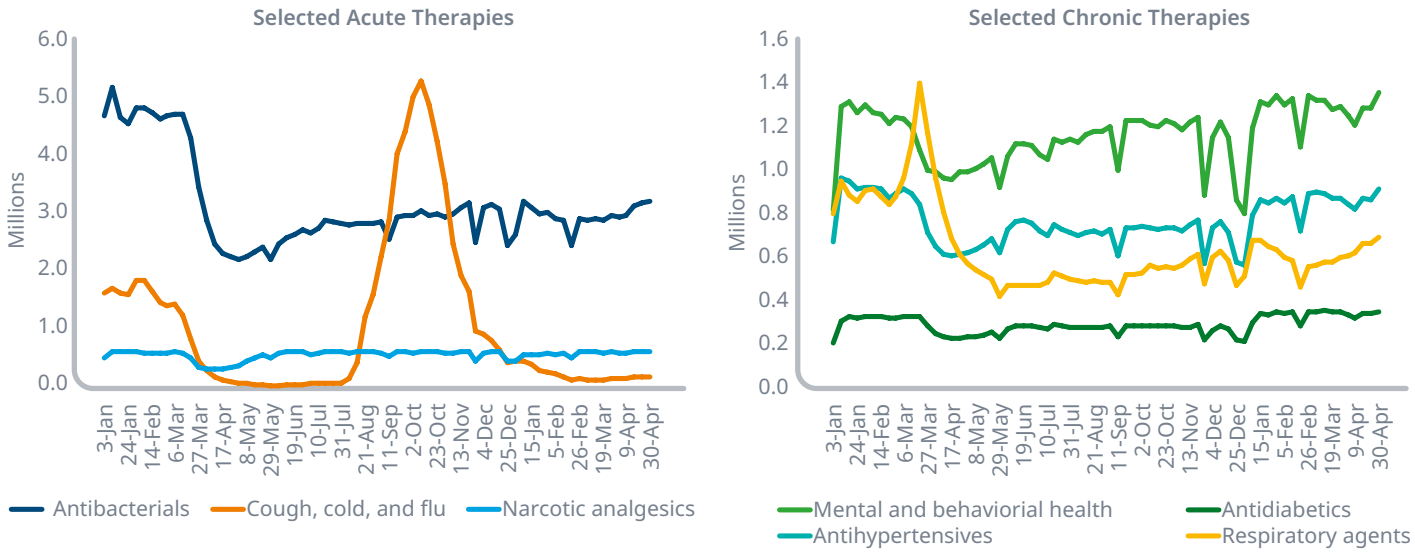

Source: IQVIA National Prescription Audit, Apr 2021

- The impact on prescriptions from the COVID-19 pandemic is particularly notable for acute prescriptions, which had a sharp decline in spring 2020 as the initial lockdown phase of the pandemic took hold.
- Acute prescriptions recovered during the remainder of the year as reopening spread and aided by an above average seasonal flu vaccination cycle, which had been recommended by experts to mitigate risks of being co-infected with COVID-19 and influenza; many people heeded the advice.
- Later in the year, acute prescriptions dropped again, largely as a result of the absence of the seasonal flu in the population from the combined effects of higher vaccination rates and social-distancing and mask-wearing.
- Chronic continuing prescriptions were relatively stable through 2020, with week-to-week variations following normal patterns and marked by disruptions surrounding weeks containing public holidays.
- There has been a steady increase in new to brand (NBRx) chronic prescriptions, but the level has remained below the first eight weeks of 2020 before the pandemic, suggesting that these 'missing' new patients may still be present with their illnesses but are undiagnosed, and is an area of ongoing concern for long-term chronic health outcomes.

Exhibit Notes: Prescriptions are unadjusted. New to Brand (NBRx) prescriptions are those where the patient had no prescription of the medicine in the prior year and includes naïve patients as well as those who switch from another drug or add a new drug to their existing regimens. Continuing prescriptions (CBRx) are those where the patient has filled a prescription of the same medicine in the past year and can include gaps in dispensing. Chronic is determined as whether the medicine is generally intended to be prescribed for more than 180-days, and acute are all other medicines. Chronic and acute are not specific patent or prescription attributes and do not reflect the potential for some medicines to be used on a long-term basis against recommendations.

# New prescriptions were impacted during the early phase of the pandemic primarily from acute therapies, chronic showing rise later

**Exhibit 16: New to Brand Prescriptions (NBRx) Selected Acute and Chronic Therapies**



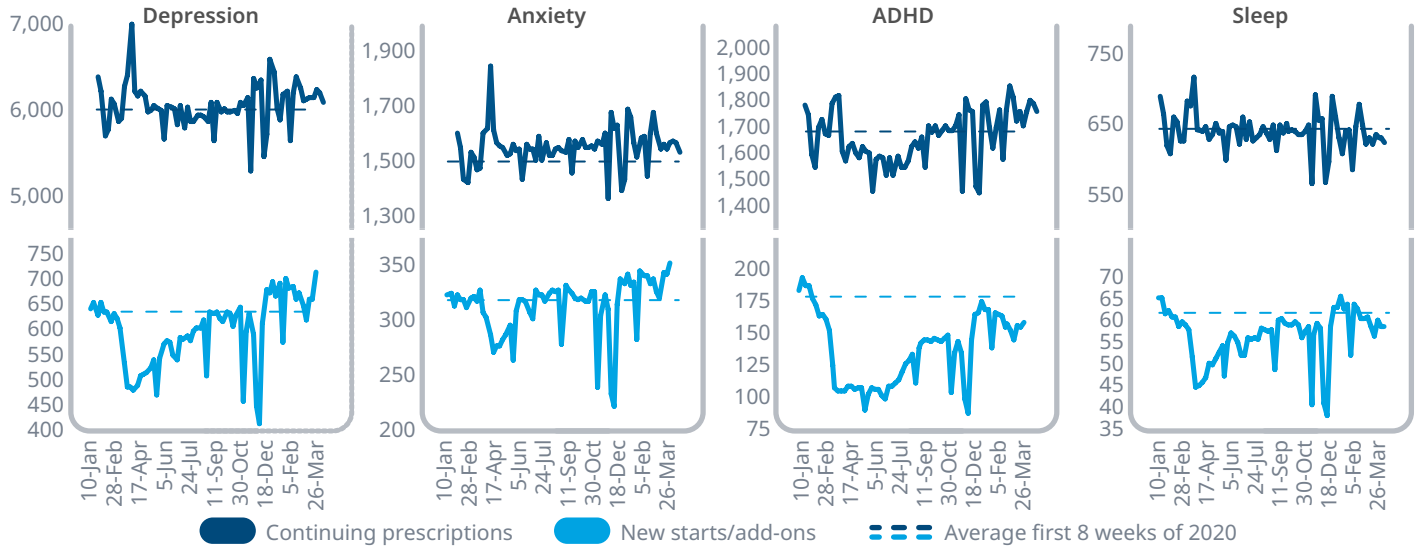

Source: IQVIA National Prescription Audit, Apr 2021

- Disruptions to patterns of life during the pandemic resulted in clear changes in prescribing for acute therapies.
- Antibacterial therapies are used for community-acquired infections and as prophylaxis after a medical procedure where there is a risk of infection, and both types of usage were affected as fewer procedures took place and fewer person-to-person interactions limited community spread of infections.
- Narcotic analgesics declined less in terms of new prescriptions as some patients required pain management for delayed procedures.
- New starts for respiratory therapies, often for chronic asthma, had a sharp increase early in the pandemic as some hospitals increased use of rescue inhalers for COVID-19 patients and existing asthma patients stocked up fearing supply shortages.
- Hypertension and diabetes new starts have rebounded more slowly after the initial shutdown period, suggesting there may have been a time-displacement of some patients who would have been diagnosed earlier, but the increases in 2021 suggest that there could be a larger burden of disease emerging due to the lifestyle changes millions went through adapting to the pandemic.
- Early diagnosis is critical to better outcomes for most chronic diseases, and the degree to which annual health checks are restarted at previous levels will determine whether these patients are identified early enough to have a meaningful impact on their disease progression.

Exhibit Notes: Prescriptions are unadjusted. New to Brand (NBRx) prescriptions are those where the patient had no prescription of the medicine in the prior year and includes naïve patients as well as those who switch from another drug or add a new drug to their existing regimens.

# COVID-19 related social changes drove changes in use of behavioral and mental health therapies

**Exhibit 17: Selected Mental and Behavioral Health Therapies New and Continuing Prescriptions, Thousands**



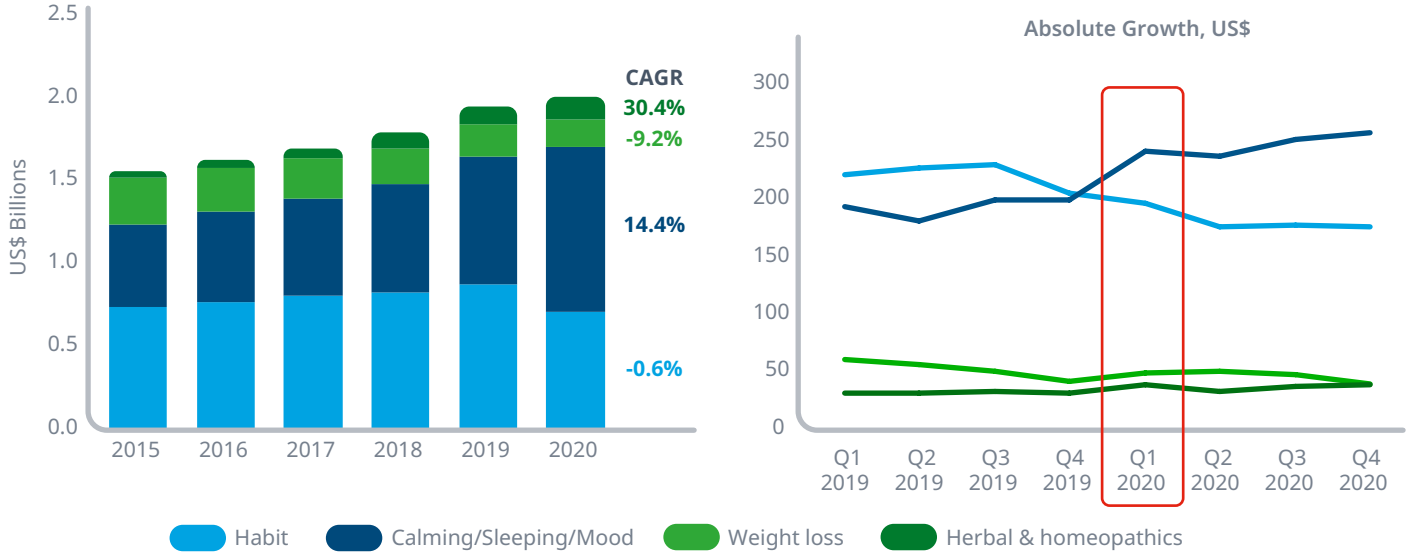

Source: IQVIA National Sales Perspective; IQVIA National Prescription Audit, Apr 2021

- Reports of increasing mental health burden during the COVID-19 pandemic appear warranted and may represent a complex challenge for providers to identify patients in the future.
- Anxiety and depression both exhibited a sharp disruption in new therapy starts early in the pandemic but have recovered to above the baseline average (first eight weeks of 2020) in the late summer, and now continue above those average levels.
- These increases could be the result of simply shifting new patients later in time or because of personal or social reasons that patients have not presented themselves for treatment as soon after reopening as they have with other conditions.
- This could also reflect a limited capacity of providers to cope with an influx of new patients and protocols that would delay drug therapy until it has been deemed appropriate.
- Attention Deficit Hyperactivity Disorder (ADHD) typically experiences a trough in usage during the summer as some parents choose to take a prescription holiday, but the pattern in 2020 was a greater degree of decline and for longer than is typical, likely related to school closures, and levels of new starts have not returned to previous levels.
- Sleep (insomnia) prescriptions have been declining for several years and the decline in new starts may represent a continuation of that trend partly offset by new patients with sleep issues during the pandemic.

Exhibit Notes: Prescriptions are unadjusted. New to Brand or new starts/add ons (NBRx) prescriptions are those where the patient had no prescription of the medicine in the prior year and includes naïve patients as well as those who switch from another drug or add a new drug to their existing regimens. Continuing prescriptions (CBRx) are those where the patient has filled a prescription of the same medicine in the past year and can include gaps in dispensing.

# During the COVID-19 pandemic patients changed their use of over-the-counter medicines

**Exhibit 18: Selected Over-the-Counter Medicines Spending 2015–2020**



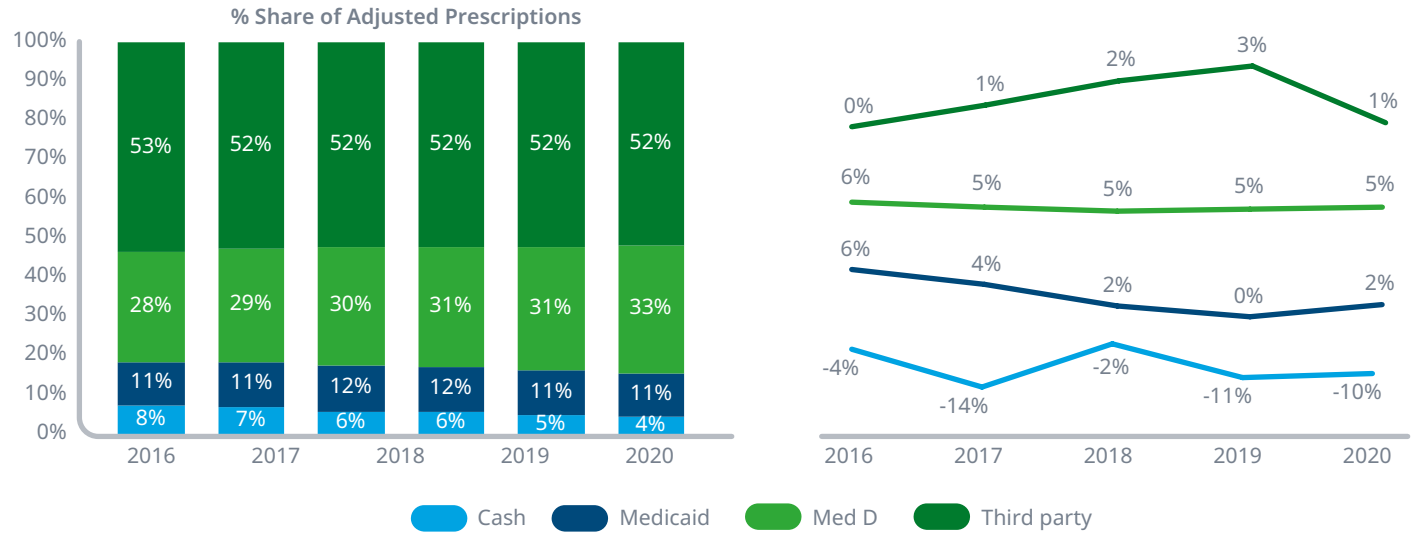

Source: IQVIA Consumer Health data licensed from Nielsen, Dec 2020

- COVID-19 has created a surge in internal well-being, exercise regimens and healthy-eating sectors.
- Calming/sleeping/mood medicines were up significantly in Q1 2020 and since, as many have reported increased stress levels, and over-the-counter medications offer potential relief without the burden of a doctor visit.
- Smoking cessation — the largest component of the habit categor -— was declining prior to the pandemic as more patients were switching from branded anti-smoking products to store-brands or 'private-label' with a lower cost, and this accelerated during the pandemic.
- OTC diet and weight loss therapies have also been declining before the pandemic but may be a signal of a growing burden if they increase following further re-opening as COVID-19 vaccinations progress.

Exhibit Notes: Data are reported spending in dollars, and most over-the-counter (OTC) medicines are relatively low cost, with few changes in cost over time.

# Cash paid prescriptions declined 10% in 2020 but the trend preceded COVID-19; Medicaid rose as third-party growth slowed

**Exhibit 19: Adjusted Dispensed Prescriptions and % Growth by Method of Payment**



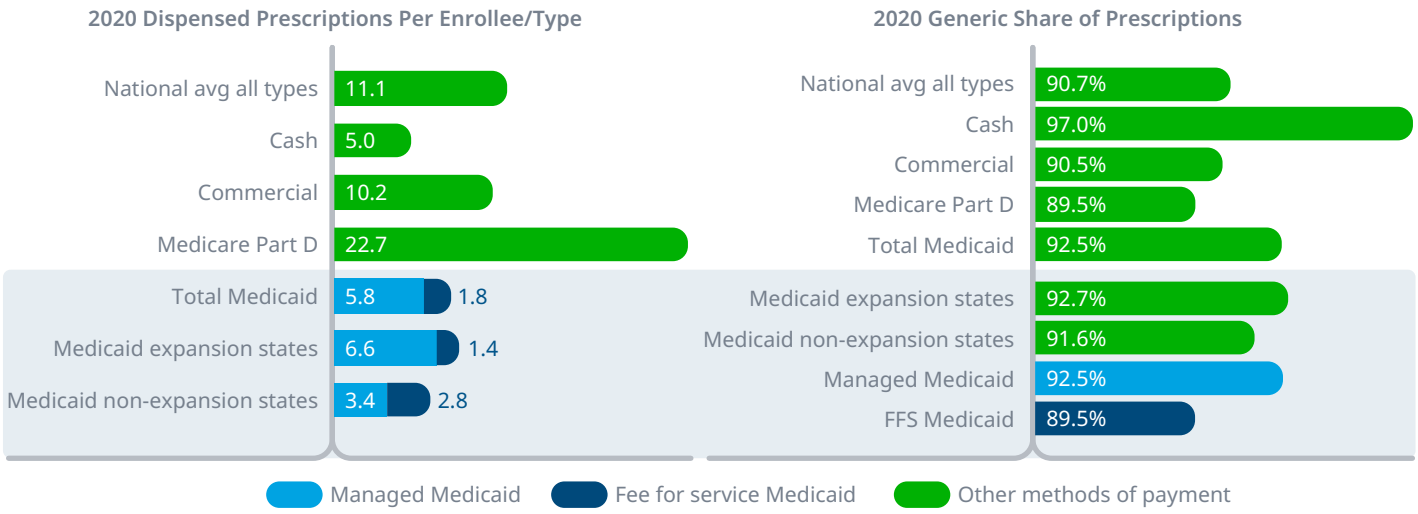

Source: IQVIA National Prescription Audit; IQVIA institute, Dec 2020

- Over the past five years as levels of insurance coverage have increased, cash-paid prescriptions have been in decline, accounting for just 5% of adjusted prescriptions in 2019 compared to 8% in 2015.
- Cash prescriptions declined 10% in 2020, not because more people got insurance but rather because of disruptions from COVID-19.
- Third-party insurance — including employer-sponsored, private group market and health insurance exchanges — grew only 1% in 2020 after increasing faster over the prior three years, as people with insurance used fewer prescriptions and people lost their insurance with layoffs or furloughs.
- Medicaid prescriptions had been slowing prior to the pandemic, with prior growth driven primarily by some states adopting Affordable Care Act Medicaid expansion in the last three years, and the 2020 rebound in growth driven to a degree by increased enrollment.
- Medicare Part D has been relatively unchanged in the prescription growth rate at 5%, only slightly above the population growth rate for those 65+ years old.

Exhibit Notes: Prescription counts are adjusted for length of prescriptions and re-aggregated. Prescriptions referred to as '90-day' are calculated based on transactions with 84 days supply or more to include medicines with up to one-week fewer treatment days. Prescriptions for 84 days supply or more or factored by three, and those under 84 days unchanged. Due to changes in data collection data after 2016, adjusted prescription total has been back-projected based on published growth rates from prior Institute reports to estimate the number of adjusted prescriptions in 2016. Medicare Part D includes dual eligible for Medicare and Medicaid.

# Medicaid enrollees use fewer prescriptions per enrollee per year, but use generics more than commercial or Medicare Part D

**Exhibit 20: Dispensed Prescriptions per Enrollee and Generic Share of Prescriptions by Insurance Type, 2020**



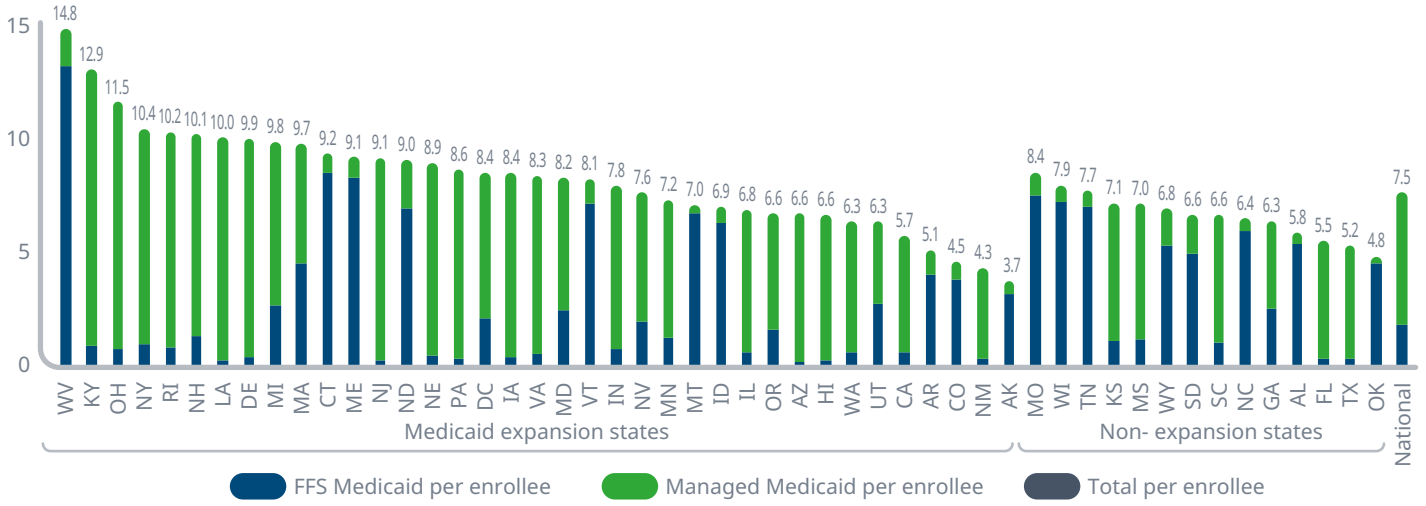

Source: IQVIA National Prescription Audit, Dec 2020;
https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/ accessed 5/18/2021.

- As expanded Medicaid enrollment has been following the economic disruption from the pandemic, the patterns in usage of medicine by insurance types are helpful to understand the burden Medicaid programs will face.
- Commercially-insured patients use almost twice as many prescriptions per person than the average Medicaid enrollee, potentially increasing the burden of increased enrollment.
- Notably, states that have not expanded Medicaid eligibility under the ACA have the lowest per capita medicine usage.
- Generic utilization is one of the more effective mechanisms to control drug costs and yet generic utilization varies considerably across insurance types, with commercial 1% higher than Medicare and states that have expanded Medicaid 1.1% higher than those that have not, and usage under Managed Medicaid 3% higher than under fee for service.
- Differences in generic usage may be related to the types of enrollees, diseases and treatments that are being covered, but also reflect plan designs and incentives.

Exhibit Notes: Prescriptions are unadjusted. Medicare Part D utilization significantly understates per capita usage due to the high degree of three-month supply prescriptions known to be present in the over-65 years old population (see exhibit 12)

# States exceed national average per enrollee use of medicines for 23 of 37 expansion states and only 3 of 14 non-expansion states

**Exhibit 21: Dispensed Prescriptions per Enrollee, 2020**




Source: IQVIA National Prescription Audit, Dec 2020;
https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/ accessed 5/18/2021

- States operate the Medicaid program independently, receiving subsidies from the federal program but having the option to run it with state management, or outsource to a managed care organization.
- All states have some part of their program run by the state on a fee for service basis, usually for complex diseases or specific diseases, while most have a very large share run by managed care organizations on their behalf.
- For the most part, higher Managed Medicaid volume correlates with higher overall prescription volume per enrollee, as better disease management often leads to lower overall healthcare costs.
- While only 3 of the 14 non-expansion states exceed the national average per capita prescription volume, all three have majority fee for service usage.

Exhibit Notes: Prescriptions are unadjusted for prescription length.

# Medicine spending and growth drivers

- U.S. medicine spending reflects an increasing gap between invoice level spending and manufacturer net revenues.
- Diverse measures of medicine spending illustrate differing trends depending on the party doing the spending.
- There are large differences between list prices and the amounts spent by payers and patients or received by manufacturers.
- Real net per capita manufacturer revenues declined as specialty discounts, rebates and coupons increased significantly in 2020.
- Specialty medicines now account for 53% of spending, up from 27% in 2010 and driven by growth in autoimmune and oncology.
- Manufacturer net revenues increased by $48 billion over the past five years, primarily driven by new products and brand volume.
- New brand spending in the U.S. has averaged higher than in the last five years but represents a smaller share of spending

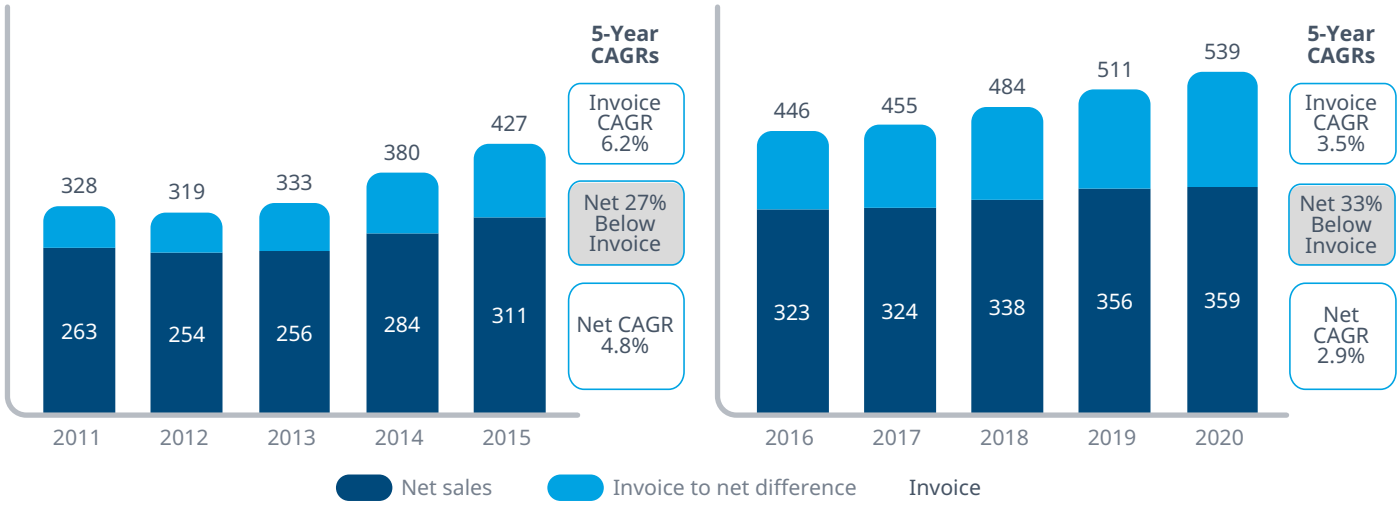
- Protected brand list prices increased 4.4% in 2020, while net prices decreased -2.9% - the fourth year at or below the CPI.
- The impact of losses of exclusivity of biologics has increased dramatically in the past three years.
- Generics are 90% of dispensed prescriptions, up from 72% 10 years ago, and dispensed 97% of the time when possible.
- Biosimilars mature as volume tracks toward 60% for newer molecules and originators begin to decline in accessible markets.
- Specialty classes – Immunology and oncologics drive non-discounted spending growth.
- Biosimilars bring oncology growth below 10% for the first time in seven years as new brand growth also slowed.
- Diabetes growth slowed to 2% in 2020 on a net basis as off-invoice discounts and rebates drive protected brand costs down by 12%.
- Autoimmune grew $10.8 billion to $77.1 billion in 2020, driven by products launched in the past five years and those with upcoming biosimilars.

**A NOTE ON NOMENCLATURE**

In this report, "spending on medicines" and "invoice-price spending" refer to the amounts paid to distributors by their pharmacy or hospital customers. It does not relate directly to either the out-of-pocket costs paid by a patient, except where noted, nor does it refer to the amount health plans or Medicare pay for medicines, and does not include mark-ups and additional costs associated with dispensing or other services associated with medicines reaching patients. "Net-Price Spending" or "Net Manufacturer Revenue" are proprietary derived estimates of the amount received by pharmaceutical manufacturers after rebates, off-invoice discounts and other price concessions have been made by manufacturers to government for statutory discounts and rebates, distributors, health plans and intermediaries. See the Methodology section for more details.

# The U.S. spending reflects an increasing gap between invoice level spending and manufacturer net revenues

**Exhibit 22: U.S. Medicine Spending and Growth at Invoice-level and Estimated Net 2011–2020**



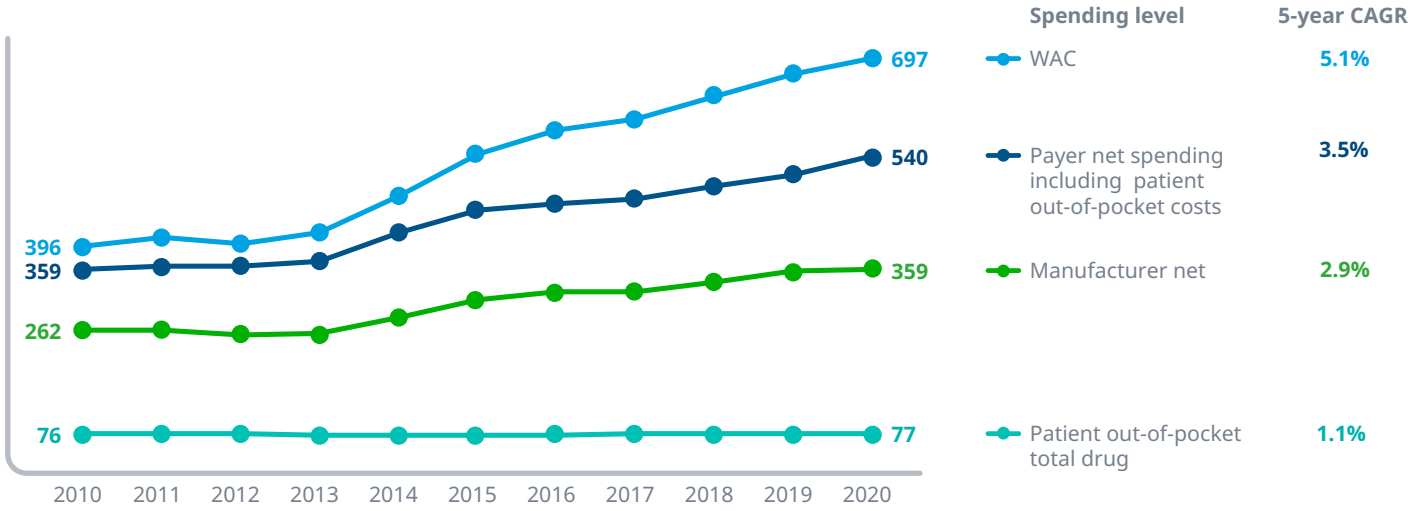

Source: IQVIA Institute, May 2021

- In 2020, spending grew 0.8% net of off-invoice discounts and rebates, while growth at the invoice-level was 5.5%.
- Discounts, rebates and other price concessions on brands reduced absolute invoice spending by an estimated 33% to $359 billion.
- Off-invoice discounts and rebates paid by manufacturers to other stakeholders include statutory discounts and rebates to government programs like the pharmaceutical fee paid by branded companies, Medicaid and 340B, negotiated rebates with pharmacy benefit managers, supply chain discounts and fees, and coupons provided to patients, among others.
- Spending grew in 2020 due in part to the launch of new branded products as well as an increase in the volume of current branded products, and offset disruptions that mostly affected generic volume from the COVID-19 pandemic.
- On an invoice basis, spending has risen 64% since 2011, from $328 to $539 billion in 2020, but only 37% on a net basis, from $263 to $359 billion in 2020.
- The past decade has included both the most impactful concentration of patent expiries in 2011 and 2012 as well as the largest impact from new brand launches from late 2013 through 2015, while periods since have shown more modest growth dynamics, punctuated by the COVID-19 pandemic in 2020.

Exhibit Notes: Measures total value of spending on medicines, including generics, branded products, biologics, small-molecules, retail and non-retail channels. Invoice spending is based on IQVIA reported values from wholesaler transactions measured at trade/invoice prices and exclude off-invoice discounts and rebates that reduce net revenue received by manufacturers. Net spending reflects company recognized revenue after off-invoice discounts, rebates and price concessions are applied. Includes all medicines in both pharmacy and institutional settings. Pricing is at the manufacturer level.

# Diverse measures of medicine spending illustrate differing trendsdepending on the party doing the spending

**Exhibit 23: Medicine Spending at Selected Reporting Levels, US$Bn**



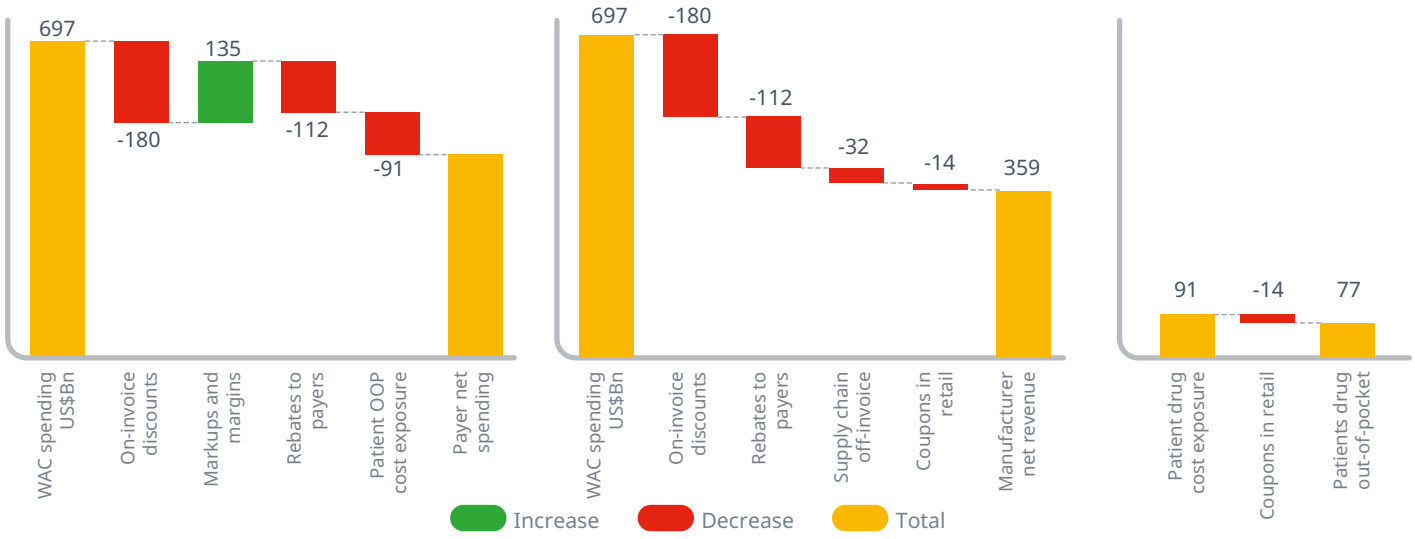

Source: IQVIA Institute, May 2021; CMS National Health Expenditures (NHE), Dec 2020

- Over the past five years, spending at list prices [Wholesaler Acquisition Cost (WAC)] has increased from $543 billion to $697 billion — an average of 5.1% per year.
- Manufacturer net revenues from these sales, including all products, are estimated to have grown an average of 2.9% over five years and 0.8% from 2019 to 2020.
- Patient out-of-pocket costs for drugs dispensed in a retail setting and those costs for drugs dispensed in hospitals or at doctor's offices have remained relatively unchanged, rising from $76 billion 2010 to $77 billion in 2020.
- Manufacturer net revenue is lower than other measures of spending based on a combination of statutory discounts to Medicaid, discounts for 340b eligible institutions, the branded pharmaceutical fee in the ACA, donut-hole subsidies in Medicare Part D, supply chain discounts (often for generic drugs), as well as the value of coupons given to patients.
- Payers (including government and private insurance and patient out-of-pocket costs) have seen their spending rise an average 3.5% over the past five years to $540 billion, mostly driven by higher insurer cost exposure.

Exhibit Notes: IQVIA Audits include measures of sales at Wholesaler Acquisition Cost (WAC) or list prices. Additionally, the IQVIA Institute has analyzed company reported net revenues for a sample of companies and products and projected a total market estimate (see Methodology section). Payer net spending reflects the total amount spent by payers for medicines in both retail and non-retail settings, including all insurance types and cash paying patients, offset by the estimates of rebates or payments that reduce payer responsibility. Payer net spending is derived from an analysis of CMS National Health Expenditure (NHE) data, IQVIA audited sales, and IQVIA estimates of manufacturer invoice-level and net revenue. Patient out-of-pocket costs are derived from CMS NHE. Due to lag-times in reporting, CMS-derived measures are projections for 2019 while IQVIA-derived metrics are actual.

# There are large differences between list prices and the amounts spent by payers and patients or received by manufacturers

**Exhibit 24: Differences Between Various Spending Levels for U.S. Prescription Medicines in 2020, US$Bn**



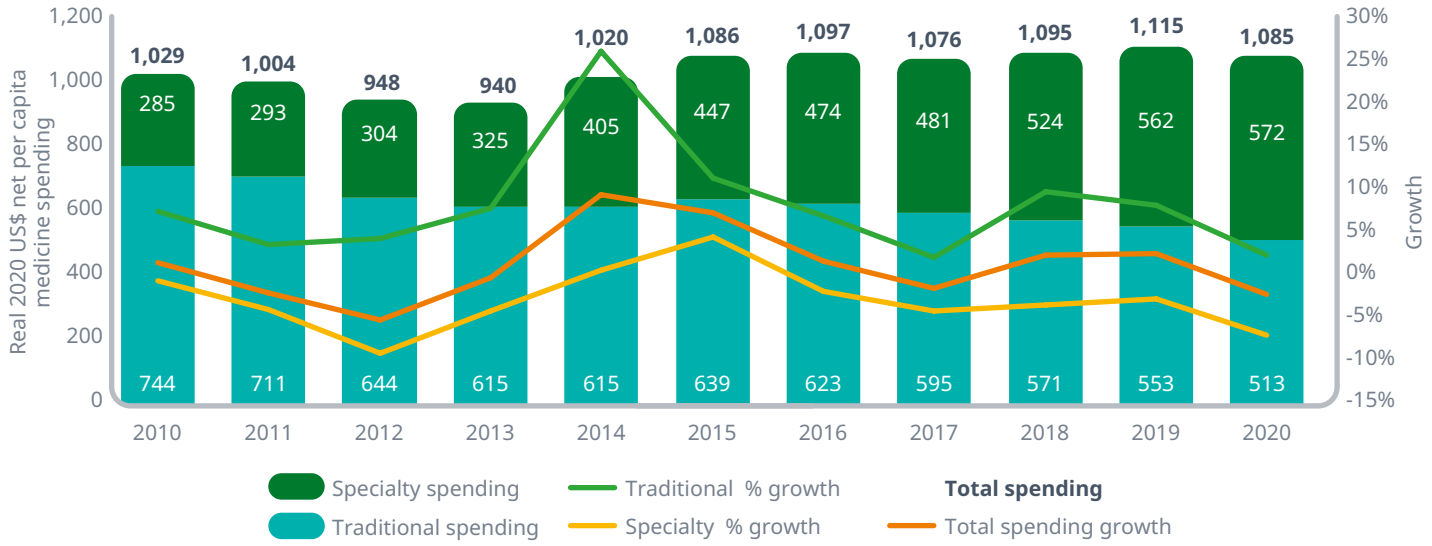

Source: IQVIA Institute, May 2021; CMS National Health Expenditures (NHE), Dec 2020

- Wholesaler acquisition costs (WAC) represent list prices that influence the costs paid by others in the supply chain and some patients. WAC does not reflect elements like discounts and rebates, which cause significant differences in the prices experienced by various stakeholders and individuals.
- Payers (including patients), in aggregate, paid $540 billion in 2020 for medicines, including those paid through a patient's medical benefit for doctor-administered drugs or drugs used during a hospitalization, which are often excluded from official statistics.
- Manufacturers offer supply chain discounts, rebates to insurers, and coupons to patients, resulting in net revenues of $359 billion - $338 billion lower than at WAC prices.
- Patient costs are much lower overall due to insurance coverage but still represent a substantial amount: $77 billion in 2019. This value accounts for $14 billion in savings for patients as a result of manufacturer coupons (including the use of manufacturer-provided pre-paid debit cards).

Exhibit Notes: IQVIA Audits include measures of sales at Wholesaler Acquisition Cost (WAC) or list prices. Additionally, the IQVIA Institute has analyzed company reported net revenues for a sample of companies and products and projected a total market estimate (see Methodology section). Payer net spending reflects the total amounts spent by payers for medicines in both retail and non-retail settings, including all insurance types, and cash paying patients, offset by the estimates of rebates or payments which reduce payer responsibility. Payer net spending is derived from an analysis of CMS NHE data, IQVIA audited sales, and IQVIA estimates of manufacturer invoice-level and net revenue. Patient out-of-pocket costs are derived from CMS NHE. Due to lag-times in reporting, CMS-derived measures are projections for 2020 while IQVIA-derived metrics are actual.

# Real net per capita manufacturer revenues declined as specialty discounts, rebates and coupons increased significantly in 2020

**Exhibit 25: Real Net per Capita Medicine Spending and Growth by Product Type US$**



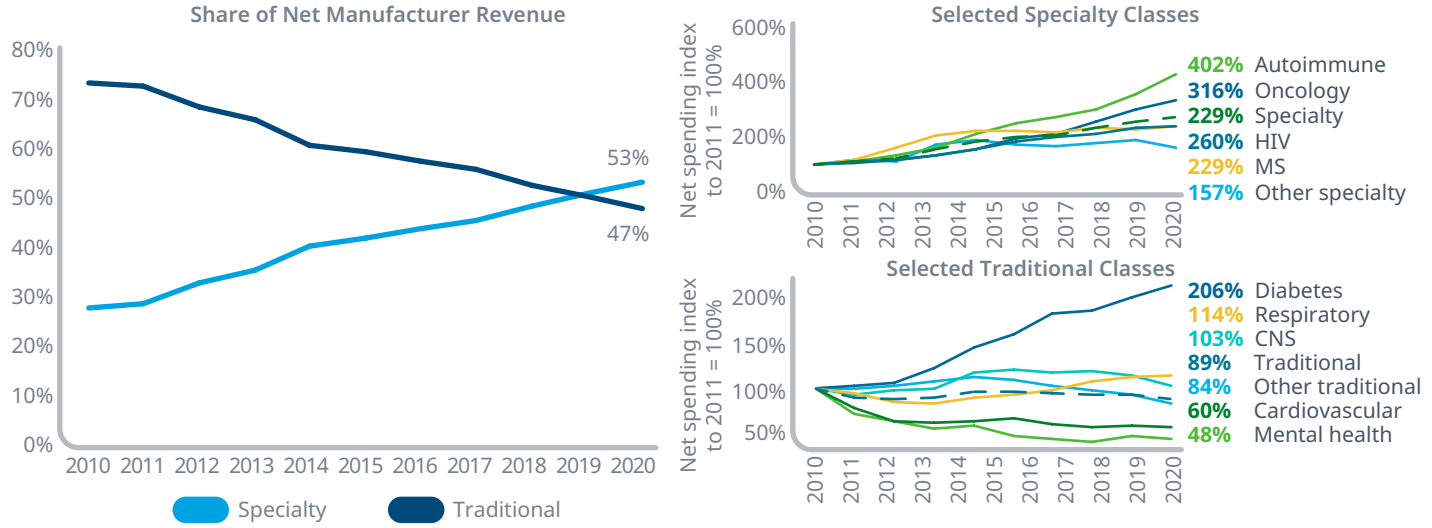

Source: IQVIA National Sales Perspectives, IQVIA Institute, May 2021; U.S. Census Bureau; U.S. Bureau of Economic Analysis (BEA), Dec 2020

- Medicine spending per capita, adjusted for population growth and shown in current (2020) dollars, grew only $56 since 2010.
- Real net per capita spending declined by 2.7% in 2020 as a result of the economic impact of COVID-19, while net growth of 0.8% was only slightly above reported population growth.
- Over 10 years, real net per capita spending grew an average 0.5% per year but was trending at 0.9% through 2019.
- Specialty share of net spending across institutional and retail settings rose from 27% in 2010 to 53% in 2020, driven by innovation, and the declining share for traditional medicines as growth has slowed due to patent expiries.
- Growth in real net per capita spending for specialty medicines peaked in 2014, when it grew by 21.0% with the introduction of several breakthrough therapies for the hepatitis C virus, cancer and autoimmune diseases.
- The largest proportion of new medicines launched in the past five years has been specialty drugs, and specialty spending per person has doubled from $285 in 2010 to $572 in 2020, while traditional net medicine spending has declined by $231 per person over the same period.
- Across all settings, specialty medicines treat relatively few patients and have costs far higher per patient than traditional medicines.

Exhibit Notes: Real medicine spending reflected in 2020 US$. Specialty and traditional medicines are defined by IQVIA. Specialty medicines  those that treat chronic, complex or rare diseases, and possess additional distribution, care delivery and/or cost characteristics which require special management by stakeholders. Includes all medicines in both pharmacy and institutional settings, and all brands and generics. Totals may not sum due to rounding.

# Specialty medicines now account for 53% of spending, up from 27% in 2010, driven by growth in autoimmune and oncology

**Exhibit 26: Share of Net Manufacturer Revenue**



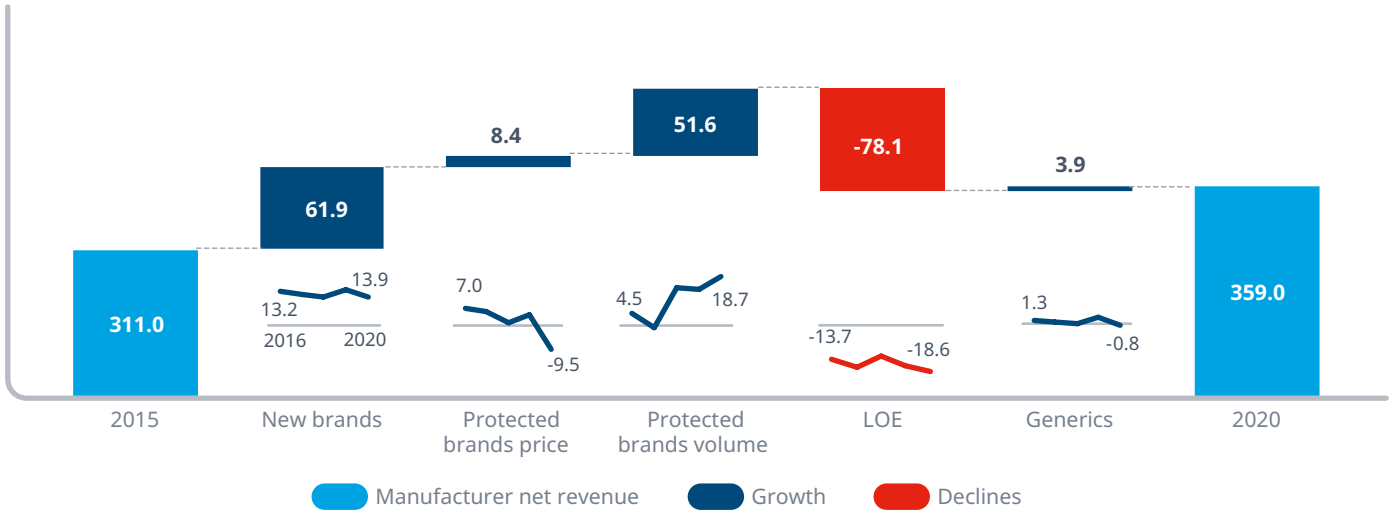

Source: IQVIA Institute, May 2021

- Specialty medicines — those that treat chronic, complex or rare diseases and possess additional distribution, care delivery and/or cost characteristics which require special management by stakeholders — now represent 53% of net manufacturer revenue.
- The rise in specialty spending has been predominately driven by oncology and autoimmune diseases, where spending has increased 316% and 402% respectively since 2011 on a net basis.
- Traditional therapies have generally faced declining spending as many had faced patent expiries and had not had newer generation therapies introduced into the classes over time.
- This pattern has driven mental health and cardiovascular classes to 48% and 60% respectively of their 2011 level of net spending as of 2020.
- Diabetes has increased to 206% of the 2011 level as a result of significant innovation, with three new classes of treatments (DPP-IV, GLP-1, and SGLT-2) treatments introduced and gaining wide usage during the period, as well as novel insulin products, and offset by some of the highest off-invoice discounts and rebates in the market.

Exhibit Notes: Specialty and Traditional medicines are defined by IQVIA. Specialty medicines  those that treat chronic, complex or rare diseases, and possess additional distribution, care delivery and/or cost characteristics which require special management by stakeholders. Includes all medicines in both pharmacy and institutional settings, and all brands and generics. Totals may not sum due to rounding.

# Manufacturer net revenues increased by $48 billion over the past five years, primarily driven by new products and brand volume

**Exhibit 27: Net Manufacturer Revenues and Growth 2015–2020, All Channels, US$Bn**



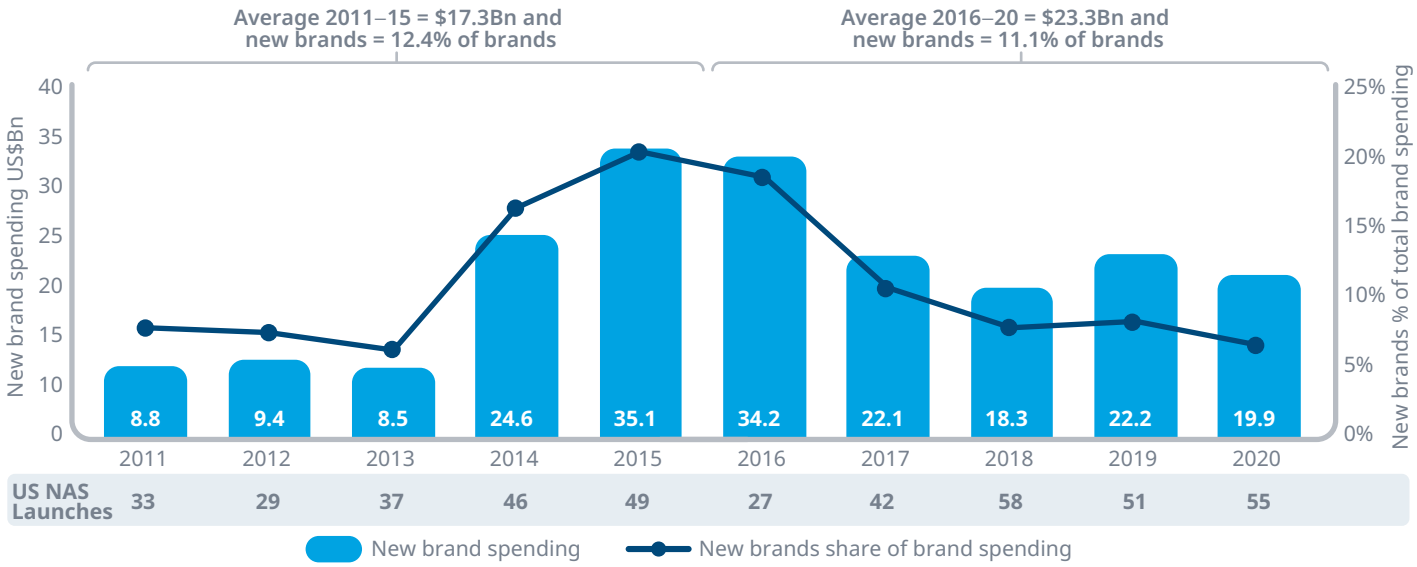

Source: IQVIA Institute, May 2021

- New products, including 233 new active substances that launched from 2016 through 2020, contributed $62 billion to net manufacturer revenue growth over the past five years.
- Price increases for protected brands, which have slowed substantially in recent years, contributed $8.4 billion to growth over five years, averaging a 0.8% increase per year, including the net decline in 2020.
- Volume growth experienced by protected brands — most often driven by brands in the three to five-year period since their launch when adoption by HCPs grows — contributed $52 billion to growth over the five-year period.
- Losses of Exclusivity (LOE), or patent expiries, typically result in a dramatic shift of volume to generics and also lower brand sales for the originator. These contributed a decline of $78 billion to manufacturer net revenues.
- The impact of LOE had a significant inflection from biosimilars in 2020, with brand losses of $7.4 billion on an invoice basis (see exhibit 31).
- During the past five years, generic prices have been deflating, driven by an increase in the number of generic approvals, shrinking a previous backlog in applications at FDA and bringing new competition to existing generic molecule markets as well as the impact from new patent expiries during the period.

Exhibit Notes: IQVIA estimates of net manufacturer revenue and growth are based on comparisons of IQVIA audited data and company reported net revenues (see Methodology section). Products are assigned to segments in each month based on time relative to launch or patent expiry and product type. Growth is calculated annually on a like-for-like product segment basis and then aggregated to five-year totals.

# New brand spending in the U.S. has averaged higher than in the last five years but represents a smaller share of spending

**Exhibit 28: U.S. New Brand Invoice Spending**



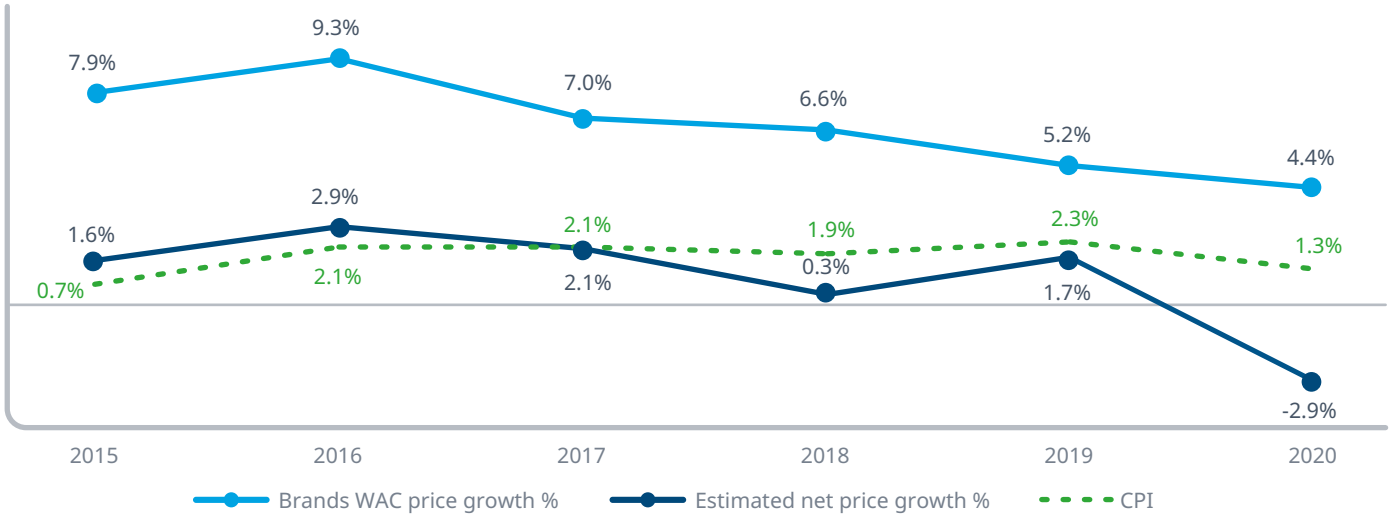

Source: IQVIA Institute, Feb 2021

- New medicines launched in the past two years drove spending of $19.9 billion on an invoice basis in 2020, down from $22.2 billion in 2019 as new launches had lower average sales in 2020.
- There were 55 novel active substances (NAS) launched in 2020, including three emergency use authorizations (EUA) for COVID-19 whose sales are not reflected in the totals.
- The number of NAS launches per year was 50 or more for the third year in a row even as spending for new products has trended down overall as a share of brand spending.
- Increasingly, new medicines are specialty, niche and orphan disease drugs, driving most of the increase in new medicines and in the spending which has been elevated since 2014 with the launch of drugs for hepatitis C and a range of other specialty conditions.
- New launches were impacted in 2020 by disruptions from COVID-19, with newer products performing worse than comparators, both from a skew to more orphan products in the launch group, as well as lack of promotion due to shutdowns.
- Large contributors to new brand spending in 2020 were remdesivir (Veklury) for COVID-19, quadrivalent flu vaccines (Fluzone HD Quadrivalent and Fluad Quadrivalent), and a reformulation of daratumumab (Darzalex Faspro), which brings a shorter treatment duration with a subcutaneous injection compared to prior infusion for multiple myeloma.

Exhibit Notes: New brands are defined as brands launched in the last 24 months and defined separately for each year. NAS = new active substance.

# Protected brand list prices increased 4.4% in 2020, while netprices decreased -2.9% - the fourth year at or below the CPI

**Exhibit 29: Wholesaler Acquisition Cost (WAC) Growth and Net Price Growth for Protected Brands**



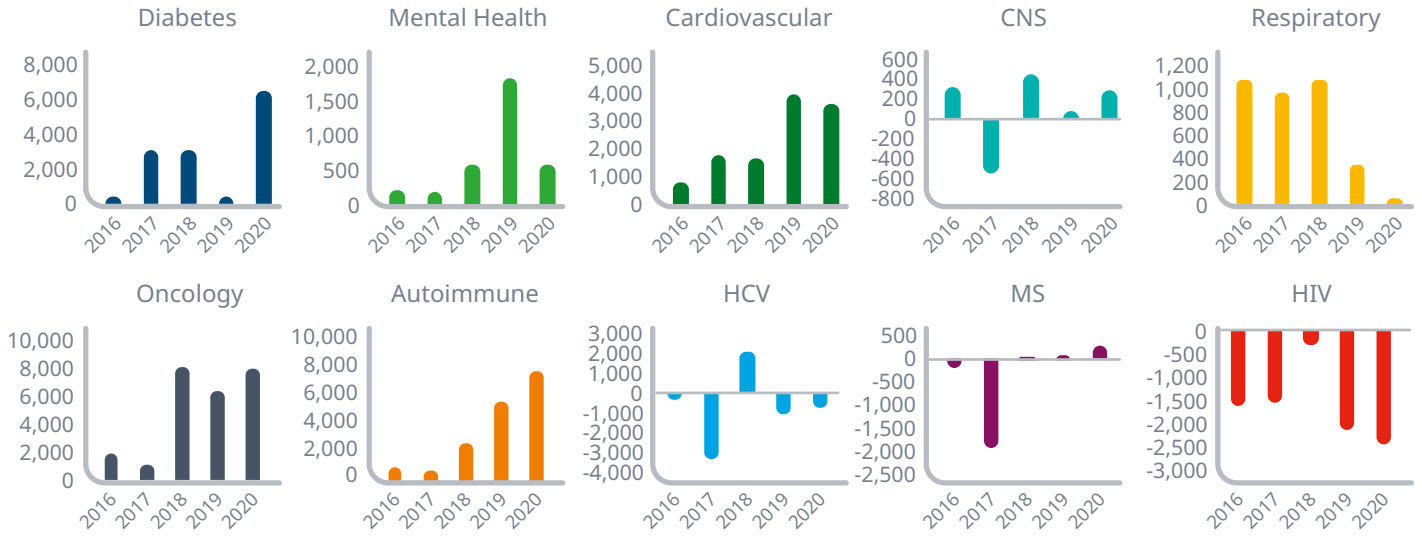

Source: IQVIA Institute: IQVIA National Sales Perspectives, Dec 2020; Bureau of Labor Statistics, CPI Data, Dec 2015–Dec 2020

- The list prices of protected branded products — those products more than two years after launch having not yet lost patent protection — increased 4.4% in 2020.
- Net manufacturer prices — the cost of medicines after all discounts and rebates have been paid — declined 2.9% in 2020, continuing a downward trend for the past five years that was interrupted in 2019.
- Prices paid by different stakeholders in the U.S. health system are based to varying degrees on list prices and the discounts and rebates they negotiate or receive and do not apply uniformly to all parties.
- Most discounts are offered to wholesalers and pharmacies and do not necessarily result in lower out-of-pocket costs for patients.
- Some of the rebates and other price concessions manufacturers pay (resulting in lower net prices) are statutory payments to government programs such as Medicaid. Price concessions also include coupons offered to patients using private insurance, whereas those with government insurance cannot use coupons.
- These complexities mean that the price for each medicine can be unique, reflecting the drug, the insurance type, the other medicines a patient takes during the year, the time of year, the pharmacy, the coupons offered by manufacturers, and whether a patient chooses to use them.

Exhibit Notes: Wholesaler Acquisition Cost (WAC) price. Protected brands are brands more than 24 months after first launch and not yet off-patent. Net price growth estimates based on public information compared to IQVIA data (see Methodology). CPI = consumer price index.

# Protected brand volume growth continues mostly in therapy areas with recent waves of innovation

**Exhibit 30: Protected Brand Volume Growth at Net Prices US$Bn**



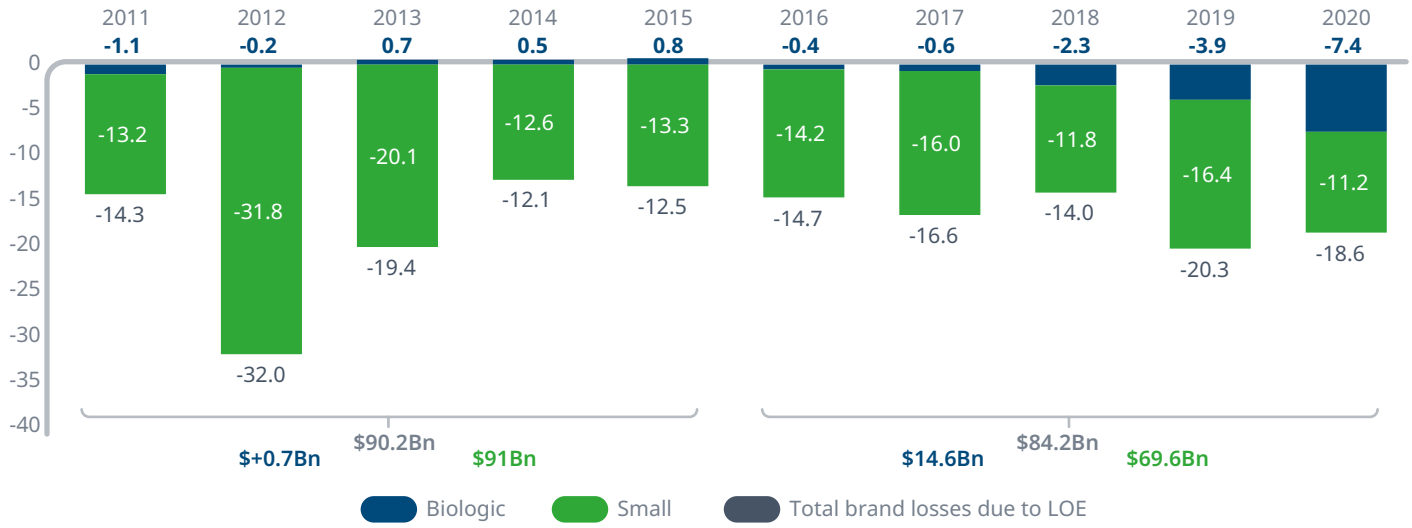

Source: IQVIA Institute; IQVIA National Sales Perspectives, Dec 2020

- Volume growth — sales measured at prior year estimated net prices for products older than two years after launch but not yet off-patent — has grown to widely differing degrees across therapy areas.
- Diabetes, despite net price declines due to rising discounts and rebates, had volume growth of nearly $6.5 billion 2020 as the wider use of newer protected brands has continued.
- Oncology volume growth has been more than $6 billion per year for the last three years, largely as products launched from 2013–2015 began to be included.
- Autoimmune similarly includes a group of products first launched from 2013 to 2016 and which are growing through volume even as competition is driving up off-invoice discounts, rebates and the use of patient savings programs (coupons).
- Hepatitis C volume has been declining as fewer patients are being treated after the initial waves when the drugs were first introduced.

Exhibit Notes: Volume growth measured as sales at constant prices, adjusted to net prices. Volume growth measured at invoice level may have different trends as some products experience net price changes without changing list prices.

# The impact of losses of exclusivity of biologics has increased dramatically in the past three years

**Exhibit 31: Impact of Brand Losses of Exclusivity 2011–2020, US$Bn**



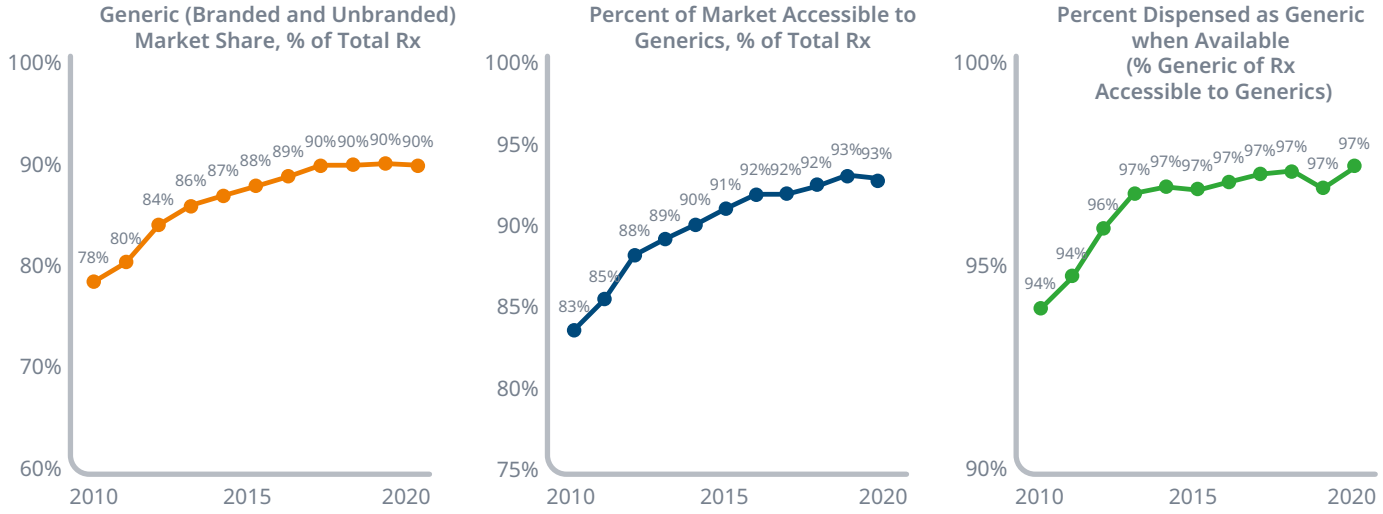

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

- The introduction of multiple biosimilars for three molecules in the oncology market — bevacizumab, rituximab, and trastuzumab — have contributed to a significant increase in brand losses due to losses of exclusivity (LOE) in 2020.
- Biologic brand losses were $7.4 billion 2020, an increase from the 3.9 billion in 2019 and totaling $14.6 billion in the past five years.
- Small molecule brand losses continued at historic rates and contributed $69.6 billion over the past five years, down from $91 billion in the prior five years.
- In total, the $84.2 billion of brand losses from LOE in the past five years was down from the $90.2 billion in the prior five years which included the ‘patent cliff’.
- Notably, biosimilars earlier in the period actually didn’t reduce brand sales in the early periods and resulted in an increase of $700 million in invoice level spending for brands facing competition, though these increases were likely offset by off-invoice discounts and rebates.

Exhibit Notes: Chart reflects the lower spending for branded products which have lost exclusivity but does not reflect the increased spending for generics or biosimilars. Analysis at invoice level.

# Generics are 90% of dispensed prescriptions, up from 72% 10 years ago, and dispensed 97% of the time when possible

**Exhibit 32: Generic Shares of Dispensed Prescriptions, Accessible Market and Generic Share when Available**



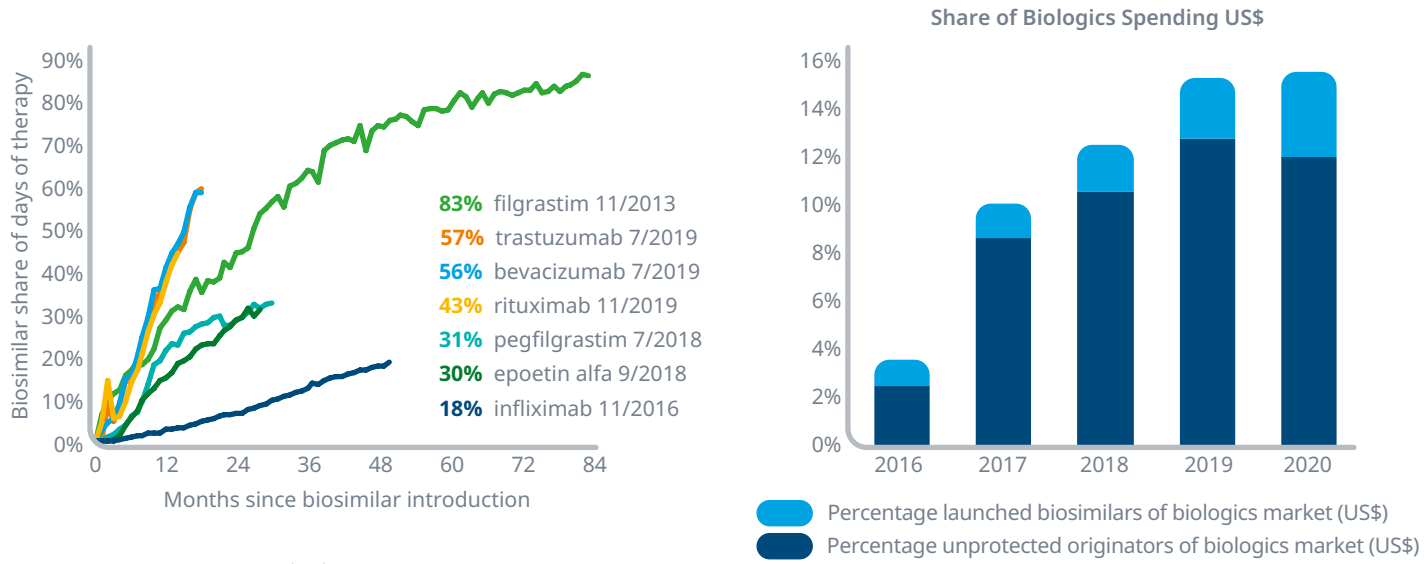

Source: IQVIA National Prescription Audit, Dec 2020

- The overall level of generic dispensing of prescription medicines has risen from 78% in 2010 to 90% in 2020.
- The market accessible to generics, measured as that part of the market where generics have launched, has risen from 83% of prescriptions to 93% over 10 years.
- The overall rate of generic dispensing, when it is possible to do so, rose from 94% to 97% by 2013, and has remained steady for the past seven years.
- The high level of generic dispensing is consistent with significant financial incentives for patients and providers to make use of the lowest cost alternatives where possible.
- In many therapy areas, however, the rate of generic dispensing is at or near 100%.

Exhibit Notes: If a generic or branded generic is available in the market for a medicine (e.g., a molecule, molecule combination, of a specific formulation) it is considered to be available, whether or not the FDA Orange Book indicates that they are substitutable.

# Biosimilars mature as volume tracks toward 60% for newer molecules and originators begin to decline in accessible market

**Exhibit 33: Biosimilar Share of Days of Therapy and Share of Biologic Spending**



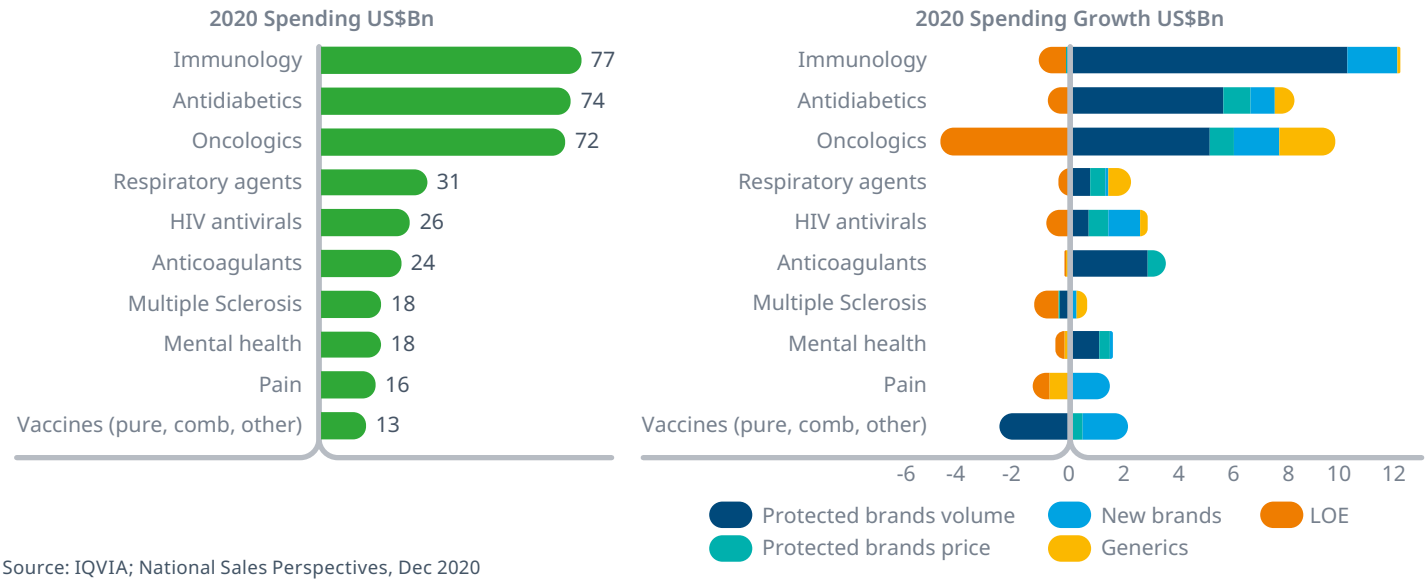

Source: IQVIA Institute; National Sales Perspectives, Dec 2020

- The last three biologics to lose exclusivity have had much faster and higher biosimilar uptake, trending to nearly 60% volume share by the end of their second year on the market.
- Older biosimilars had lower trajectories or took longer to achieve such levels.
- As new molecules have become available as biosimilars, the share of the market that is accessible to biosimilars has risen to almost 14% of spending, and as biosimilars have taken share, and had lower prices, they have taken a larger share of the competitive market.
- The rapid uptake of these newer biosimilars may be helped by the way the medicines are used, largely in treatment episodes with an independently measurable clinical outcome such as tumor shrinkage, indicating if another cycle of therapy should be used.
- This usage pattern is a marked contrast to chronic therapies, where switching from the reference brand to the biosimilar would need to be considered, and to date there have been no approvals deemed interchangeable by the FDA.

Exhibit Notes: Days of therapy are based on the World Health Organization Defined Daily Dose concept (WHO-DDD) where each molecule has a set volume of medicine that is assumed to represent a day of therapy. Spending is at invoice level.

# Specialty classes — immunology and oncologics — drive non-discounted spending growth

**Exhibit 34: Leading Therapy Classes Non-Discounted Spending Growth by Segment ($BN), 2020**

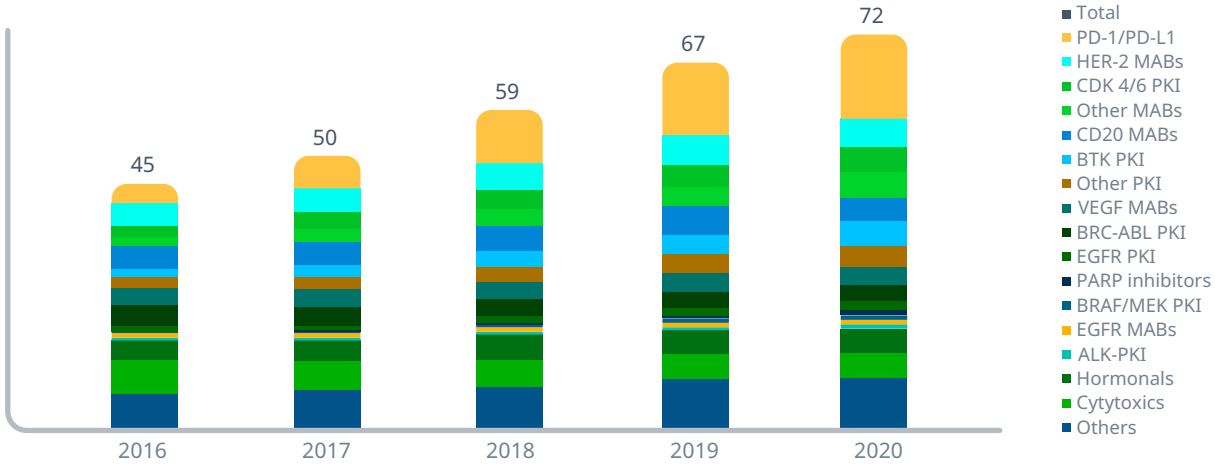



Source: IQVIA; National Sales Perspectives, Dec 2020

- Spending in leading therapy areas has been led by immunology, diabetes and oncology, with these three classes accounting for 60% of spending growth on an invoice basis.
- Oncology drivers of growth include declines from losses of exclusivity, including biosimilars, as well as the continued uptake from new drugs launched in the past five years, though that slowed in 2020.
- The fourth largest therapy area by growth is anticoagulants, as novel anticoagulants continue to grow steadily.
- Vaccines had a significant decline in 2020 as existing vaccinations were disrupted as medical practices were closed for COVID-19, while the new quadrivalent flu formulations drove uptake during the extra high level of seasonal flu vaccination in late 2020.

# U.S. Oncology spending has been growing from the uptake of PD-1/PD-L1s and a myriad of other new mechanisms

**Exhibit 35: U.S. Oncology Invoice Spending by Mechanism**



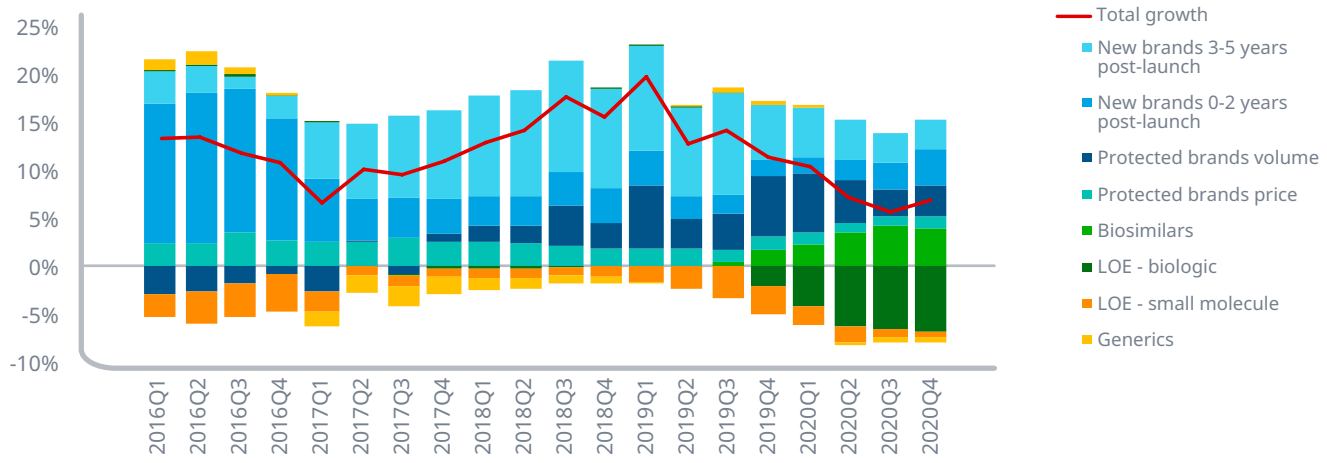

Source: IQVIA National Sales Perspectives, Dec 2020

- Oncology spending increased $5 billion in the past year and $27 billion over the past four years to $72 billion in 2020.
- Oncology growth has been driven by new products, particularly PD-1/PD-L1 as well as a proliferation of mechanisms for small molecule and antibody targeted agents.
- Each of these various mechanisms is typically identified as the result of a biomarker test where the particular tumor exhibits mutations where the drugs have been shown to be effective.
- This fragmentation of therapy options has brought new options with better outcomes to many cancer patients.
- Mechanisms related to new biosimilars were HER-2 MABs, VEGF MABs and CD20 MABs, where spending declined as a result.
- HER-2 MABs declined from $5.3 billion in 2019 to $5 billion in 2020, while CD20 MABs declined from $5 billion to $4.4 billion, and VEGF MABs from $3.6 billion to $3.3 billion, with most of the negative contribution to growth from the impact of biosimilars.

Exhibit Notes: Mechanisms represent a summary of all drugs of the same types.

# Biosimilars bring oncology growth below 10% for the first time in seven years as new brand growth also slowed

**Exhibit 36: U.S. Oncology Invoice Spending Growth Drivers**



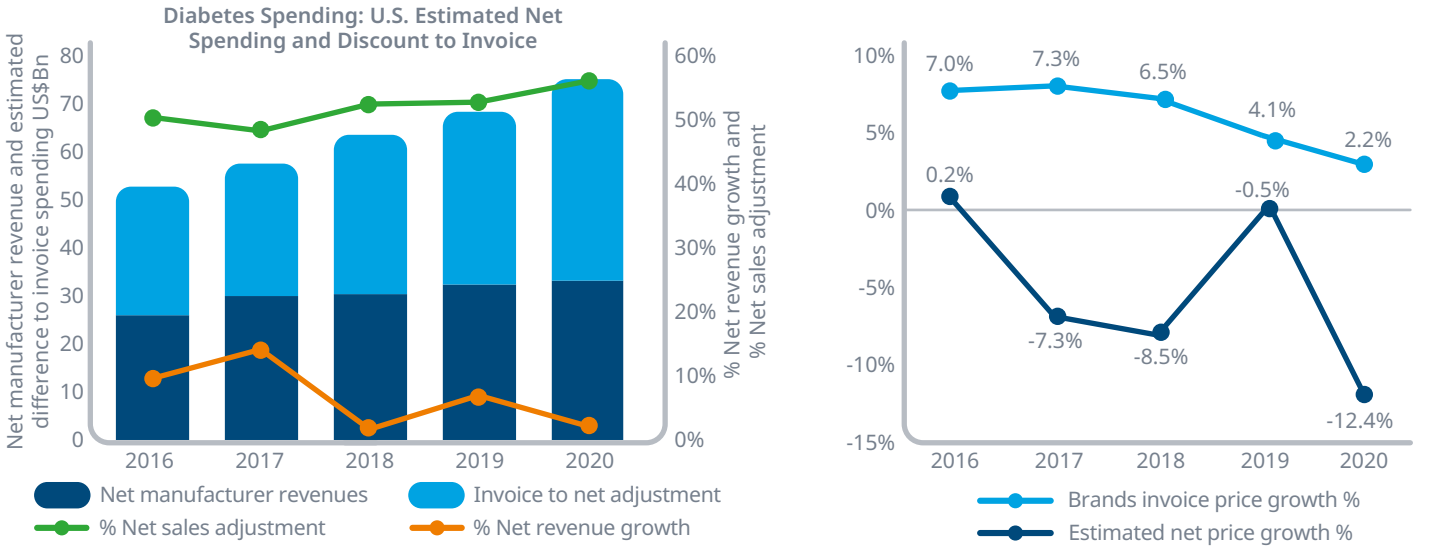

Source: IQVIA National Sales Perspectives, Dec 2020

- Despite the continued flow of new products – including another 17 new active substance (NAS) launches in oncology in 2020 — there has been a relative slowing of growth from new products. This reflects the niche and often rare cancer focus of newer drugs, with 16 of the 17 NAS orphan designated in 2020.
- Older launches have been continuing to drive growth, as illustrated in the new brands three to five years after launch segment, which has been driving more than half of positive growth for most of the last five years, slowing in 2020.
- Protected brand volume growth includes those drugs more than five years after launch, and their increased growth starting in 2018 represents launches from 2012 and 2013, which are continuing to grow strongly.
- Price growth has remained historically low, contributing only 1% to growth in 2020.
- Biosimilars dramatically reduced spending for bevacizumab, trastuzumab and rituximab and while that was offset by biosimilar spending, the impact on growth was considerable.

Exhibit Notes: New brands are assigned to the <2 years or 3-5-year segments based on their launch date relative to each quarter in the analysis. Products are included in different segments over time, and upon being more than 5 years after launch are in the protected brand segment until patent expiry. Protected brands are segmented by growth due to price changes on an invoice basis and growth due to volume. Generics and biosimilars are shown separately.

# Diabetes growth slowed to 2% in 2020 on a net basis as off-invoice discounts and rebates drive protected brand costs down 12%

**Exhibit 37: Diabetes Invoice and Net Spending and Growth**



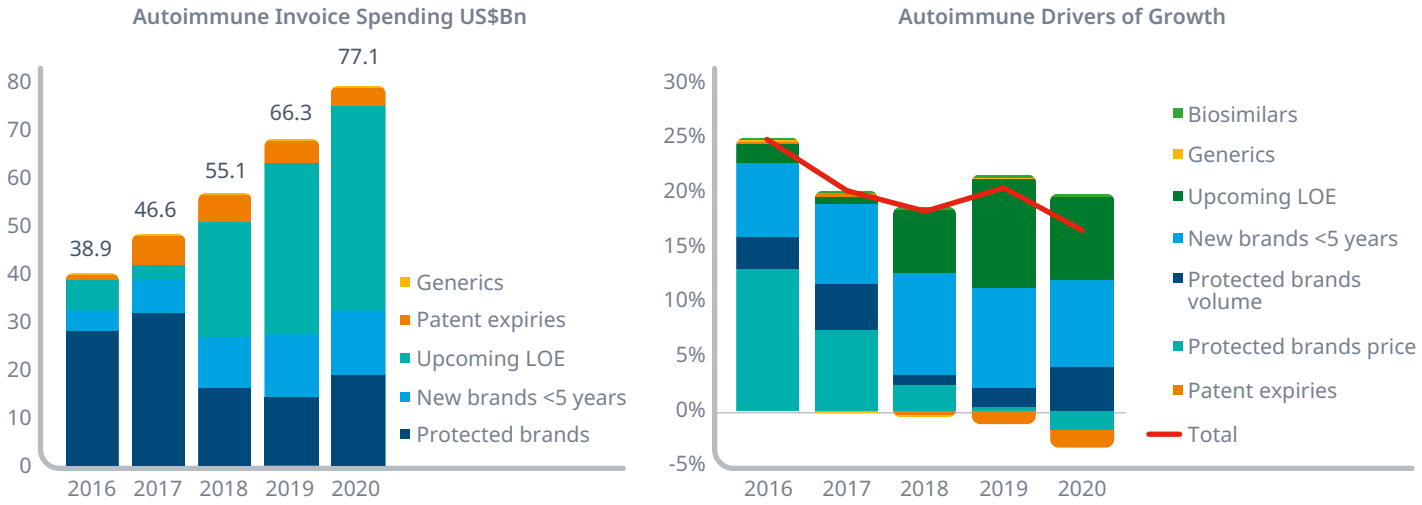

Source: IQVIA Institute, May 2021; IQVIA National Sales Perspectives, Dec 2020

- Diabetes was the second largest therapy area in the U.S. in 2020 at invoice prices, but nearly 60% off-invoice discounts and rebates resulted in net manufacturer revenue that is $40 billion lower.
- Protected brands in diabetes had invoice price increases of only 2.2% in 2020, but net prices declined 12.4%.
- Several factors are contributing to net price declines in diabetes, including the expansion of the 340B program and market competition.
- The 340B program allowing outpatient drug purchases to be made at the lowest net prices in the market for covered entities which serve the poor, and which has grown significantly in recent years.
- Market competition is a significant factor with multiple brands in newer mechanisms (DPP-IV, GLP-1, SGLT-2) offering negotiated discounts as well as patient savings programs (coupons), all of which lower net revenues even as the experience of diabetes costs for some are linked to list prices.
- Net revenue increased at 2% in 2020 and rose $7 billion since 2016 to $33 billion.

Exhibit Notes: Measures total value of spending on medicines, including generics, branded products, biologics, small-molecules, retail and non-retail channels. Invoice spending is based on IQVIA reported values from wholesaler transactions measured at trade/invoice prices and exclude off-invoice discounts and rebates that reduce net revenue received by manufacturers. Net spending reflects company recognized revenue after off-invoice discounts, rebates and price concessions are applied. Includes all medicines in both pharmacy and institutional settings.

# Autoimmune grew $10.8Bn to $77.1 Bn in 2020 driven by products launched in past five years and those with upcoming biosimilars

**Exhibit 38: Autoimmune Invoice Spending and Growth Drivers**




Source: IQVIA National Sales Perspectives, Dec 2020

- Autoimmune was the leading therapy area by invoice spending in 2020, but with more than half of current spending due to face loss of exclusivity by 2025, including adalimumab (Humira) in 2023 and ustekinuamb (Stelara) in 2024.
- Products facing upcoming losses of exclusivity through 2025 were contributing 7.6% to the total 16.4% growth in 2020, suggesting that spending will decline sharply when biosimilars appear in 2023.
- New brands in the past five years now represent $13 billion in spending of the total market $77 billion, though it is estimated that off-invoice discounts and rebates for brands mean net revenues are on average 35-40% lower.as many newer products have significant negotiated discounts and patient savings (coupon) programs.
- Invoice prices for protected brands declined in 2020 after having slowed to near zero in 2019.
- Biosimilars, in this market relating to infliximab (Remicade), have relatively little contribution to spending ($523 million in 2020) but contribute to the declining growth from off-patent brands (LOE), which lowered 2020 growth by 1.5%.

Exhibit Notes: Spending at invoice levels. Autoimmune includes drugs which are indicated for a variety of autoimmune disorders including rheumatoid arthritis, psoriasis, ulcerative colitis, Crohn's disease, atopic dermatitis and others), and includes small molecules and biologics. Estimates of net revenues are based on comparisons of IQVIA audited spending at invoice levels to company-reported net revenues in public filings (see Methodology).

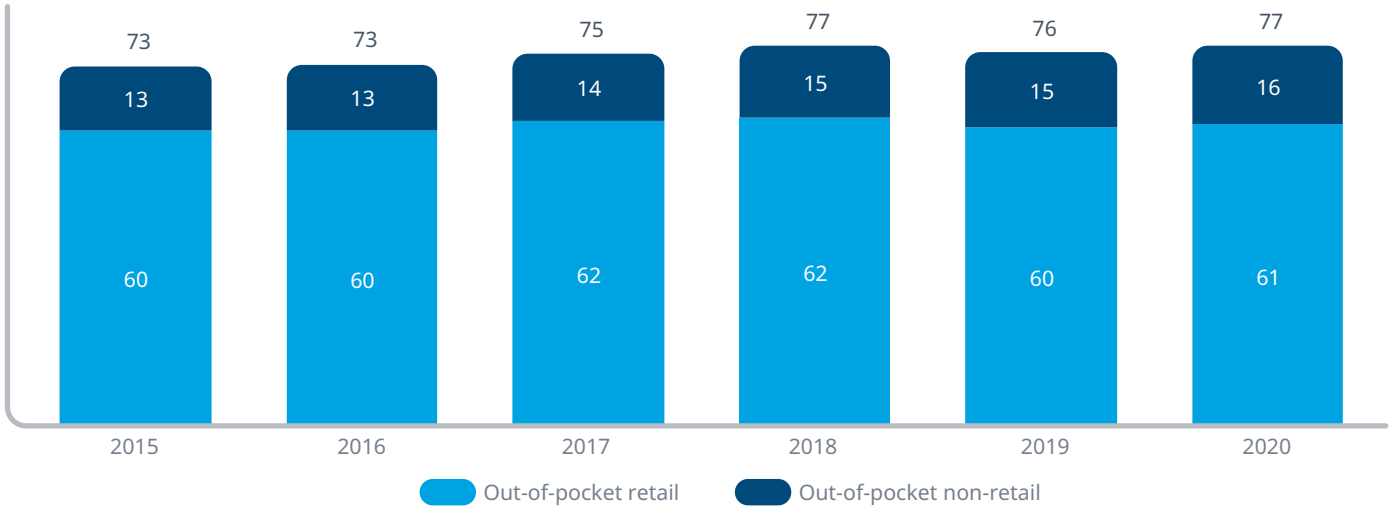
# Patient out-of-pocket costs and affordability

- Out-of-pocket costs in aggregate increased $1 billion in 2020.
- Medicare aggregate out-of-pocket costs have risen over the past five years, with population increases offset by declining cost sharing.
- The average amount paid out-of-pocket per retail prescription has dropped from $10.33 in 2015 to $9.81 in 2020.
- Generics and branded generics account for 19% of invoice-level spending but represent 65% of patient out-of-pocket costs.
- Overall, 8% of patients reach annual out-of-pocket costs above $500 compared to 17% in Medicare, in large part due to benefit design.
- Over 92% of branded and generic prescriptions have a final out-of-pocket cost below $20, and only 0.9% have a cost above $125.
- Patients starting new therapy abandoned 55 million prescriptions at pharmacies in 2020 with increasing frequency as costs rise.
- Increasingly patients are using savings programs offered by manufacturers to offset costs.

*While average prescription costs are declining, large numbers of patients — in private plans, Medicare and the uninsured — are faced with higher costs.*

# Out-of-pocket costs in aggregate increased $1 billion in 2020

**Exhibit 39: Aggregate Patient Out-of-Pocket Cost for Medicines Dispensed in Retail and Non-Retail Settings, US$Bn**



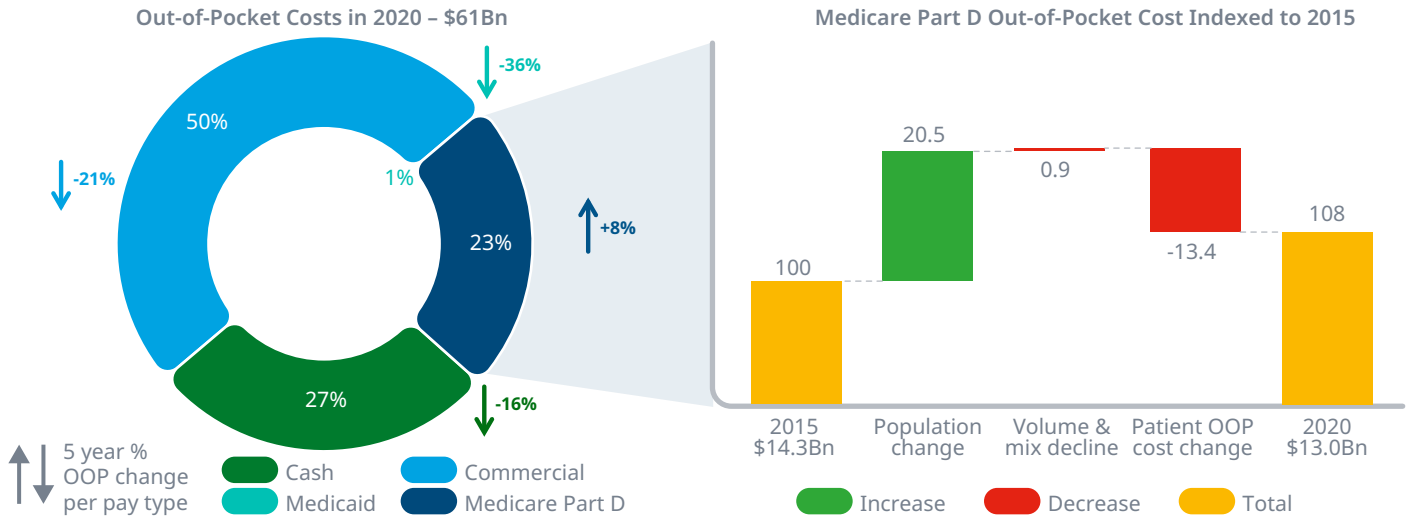

Source: IQVIA Xponent; IQVIA LAAD Sample Claims Data, Jan 2015–Dec 2020; IQVIA Institute, May 2021; CMS National Health Expenditures (NHE), Dec 2020

- Retail pharmacy out-of-pocket costs have risen from $60 billion in 2015 to $61 billion in 2020, though some patients have seen their costs decline during this period.
- Patients with Medicare Part D or high-deductible private health plans have seen individual prescription costs rise in line with the rising list prices of drugs but be offset by the Medicare "donut hole" subsidy program or the use of coupons, respectively.
- As out-of-pocket costs have risen, coupons for commercially-insured patients have reached $14 billion in 2020, including the use of pre-paid debit cards issued to eligible patients by manufacturers.
- This use of coupons and debit cards is occurring alongside benefit-design changes, including the preponderance of deductibles in most private insurance plans and a rising number of them termed high-deductible plans, which expose patients to the list price of a drug until a deductible is met.
- Among commercially-insured patients on branded medications, 14% of them used coupons to reduce their out-of-pocket costs in 2020.
- Patient out-of-pocket costs for non-retail medicines reached $16 billion in 2020, up from $13 billion in 2015, which represent a smaller share of total costs for patients with deductibles or out-of-pocket maximums, but can be significant for those few in private insurance without a maximum or for Medicare patients who do not have supplemental insurance and who pay 20% of medical costs without a cap.

Exhibit Notes: OOP costs are estimated based on prescription volumes and observed OOP costs. OOP costs are projected from a sample in the IQVIA LAAD sample claims data to a national estimate using national adjusted prescriptions, which were back-projected to estimate the trend prior to a trend break after 2016 due to restatement of NPA volumes (see Methodology). Values have been restated from past reports.

# Medicare patient out-of-pocket costs have decreased over the past five years, as population increases offset by declining cost sharing

**Exhibit 40: Aggregate Patient Out-of-Pocket Cost for Prescriptions and Value Offset by Coupons**



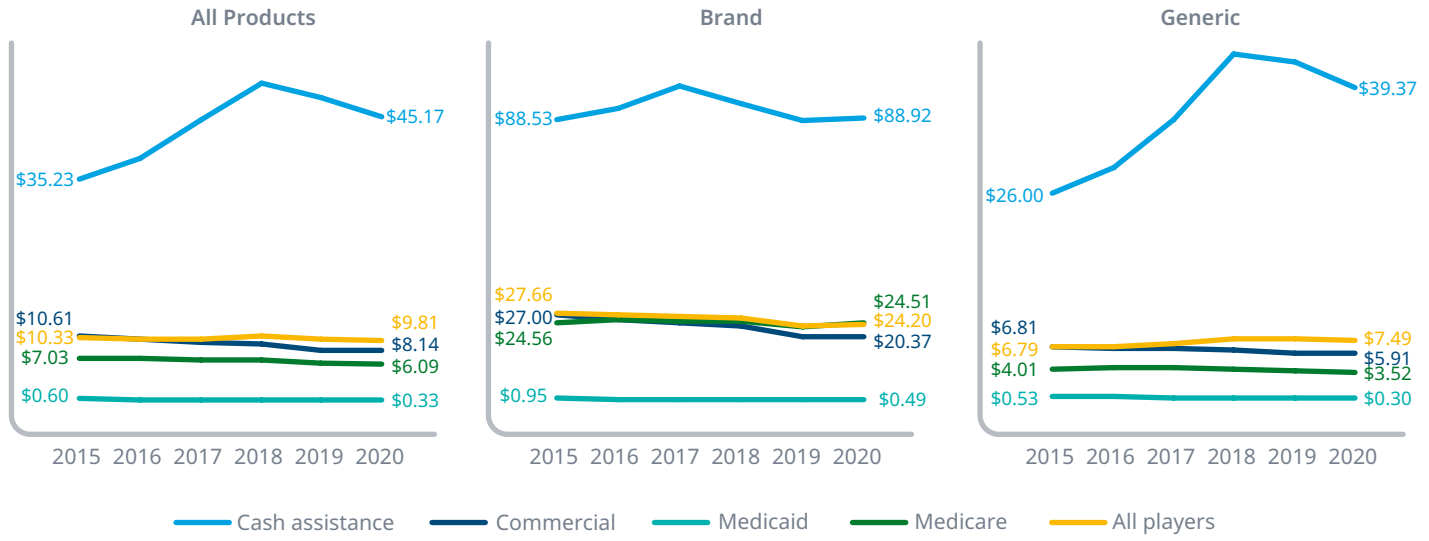

Source: IQVIA Xponent; IQVIA LAAD Sample Claims Data, Jan 2015–Dec 2020; US Census Bureau; IQVIA Institute, May 2021; CMS National Health Expenditures (NHE), Dec 2020

- Medicare out-of-pocket costs rose, in aggregate, by 8% from $11.1 billion to 11.9 billion in 2020, as total spending by beneficiaries would have risen 21% due to population growth, but declined a combined 14% due to the mix of products used and the closure of the donut hole.
- Commercially insured patients or "third party" insured overall out-of-pocket costs declined 21% over five years as patients shifted coverage to Medicare and Medicaid, while cash patients saw their aggregate out-of-pocket costs decline by 16% as the number of uninsured dropped even as rising costs linked to list prices raised their cost exposure per prescription.
- Patients paying cash account for 27% of overall patient out-of-pocket costs and paid $14 billion in 2020, for only 4% of prescriptions, for which they received 97% generic medicines (see exhibit 20).
- Medicaid patients account for 11% of prescriptions and 1% of patient out-of-pocket costs as most of their costs are waved as the basis for the program.

Exhibit Notes: OOP = out-of-pocket. OOP costs estimated based on prescription volumes and observed OOP costs. OOP costs were projected from a sample in the IQVIA LAAD sample claims data to a national estimate using national adjusted prescriptions. Note, method of payment is determined based on the most common or mode pay type in recorded claims. Cash method of payment includes those where patients used no insurance, including those who received some assistance from charities, foundations or other programs, or where a mode pay type was impossible to determine. Volume and mix growth is the remainder of all growth minus population and price growth.

# The average amount paid out-of-pocket per retail prescription has dropped from $10.33 in 2015 to $9.81 in 2020

**Exhibit 41: Average Final Out-of-Pocket Cost per Retail Prescription by Type and Method of Payment, 2015–2020**



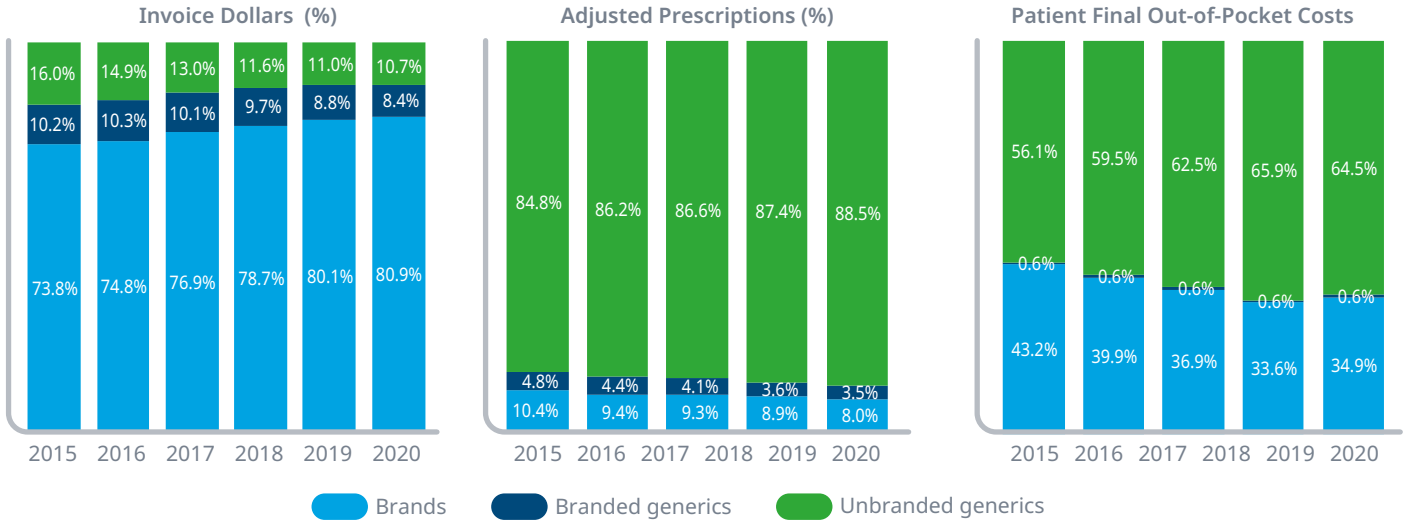

Source: IQVIA LAAD Sample Claims Data, Jan 2015–Dec 2020

- Overall, average out-of-pocket costs are not rising rapidly, with an average cost declining from $10.33 in 2015 to $9.81 in 2020 across all products and all payers.
- Uninsured patients paying with cash have seen costs rise for all types of products from $35.23 to $45.17, largely driven by generic prices which rose until 2018 and then have been declining.
- Medicare average prescription costs dropped from $7.03 to $6.09 as brand costs declined $0.05 and generic costs declined $0.49 but generics were used more often; all of these cost changes embed the benefit design changes associated with closing the 'donut hole'.
- Commercially-insured patient prescription costs have declined from $10.61 to $8.14 as brand costs dropped from $27.00 to $20.37 over five years, predominately from the use of coupons to offset higher list prices.
- For generics, commercial and Medicare patients have seen their costs decline while cash-paying patients saw costs rise from $26.00 in 2015 to $43.60 in 2018 and then drop to $39.37 in 2020.

Exhibit Notes: Includes paid claims only for patients filling at least one prescription. Prescriptions and costs normalized to 30 days.

# Generics and branded generics account for 19% of invoice-level spending but represent 65% of patient out-of-pocket costs

**Exhibit 42: Share of Spending, Prescriptions and Patient Out-of-Pocket Costs by Product Type, 2016–2020**



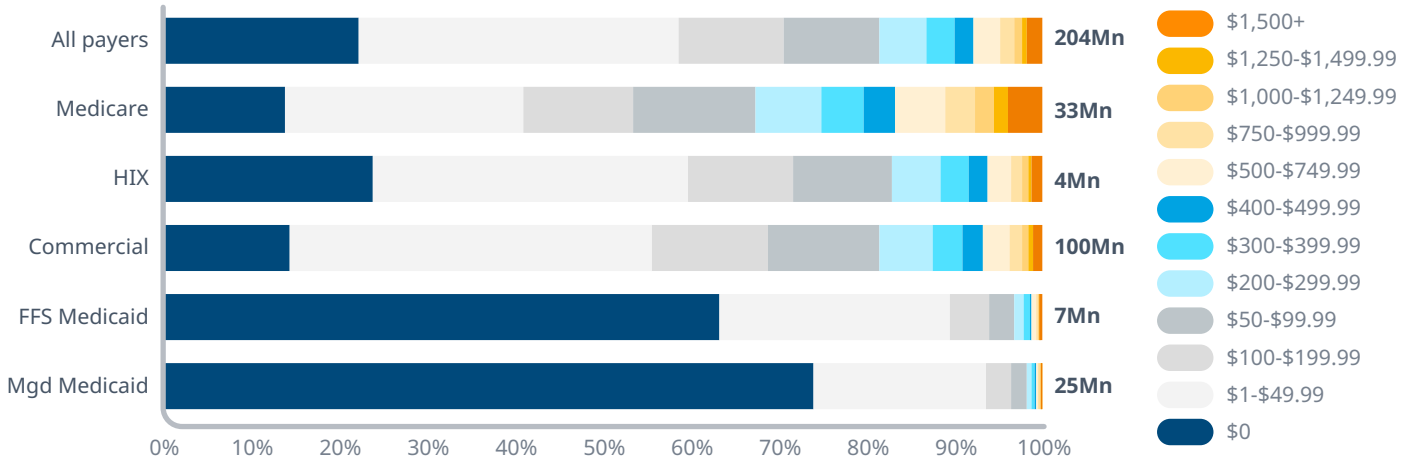

Source: IQVIA National Sales Perspectives; IQVIA National Prescription Audit, Dec 2020; IQVIA LAAD Sample Claims Data, Dec 2020

- Patent expiries over decades for products used by millions of patients have contributed to overall generic share of adjusted prescriptions, reaching 92% — including branded generics.
- While these products are relatively inexpensive, accounting for 19.1% invoice-level spending, they account for 65.1% of patients' out-of-pocket costs.
- Over the past five years generic share of invoice-level spending has dropped from 26.2% to 19.1% while the share of prescriptions has risen from 89.6% to 92.0%, and yet patient out-of-pocket costs have risen.
- Generics have seen a rising share of out-of-pocket costs as some are paid by cash-paying patients at list prices.

Exhibit Notes: Prescription counts are adjusted for length of prescriptions and re-aggregated. Prescriptions referred to as '90-day' are calculated based on transactions with 84 days supply or more to include medicines with up to one week fewer treatment days. Prescriptions for 84 days supply or more or factored by three, and those under 84 days unchanged. Due to changes in data collection data after 2016, adjusted prescription total has been back-projected based on published growth rates from prior Institute reports to estimate the number of adjusted prescriptions in 2016.

# Overall, 8% of patients reach annual out-of-pocket costs above $500 compared to 17% in Medicare largely due to benefit design

**Exhibit 43: Patients by Annual Prescription Out-of-Pocket Cost in 2020**



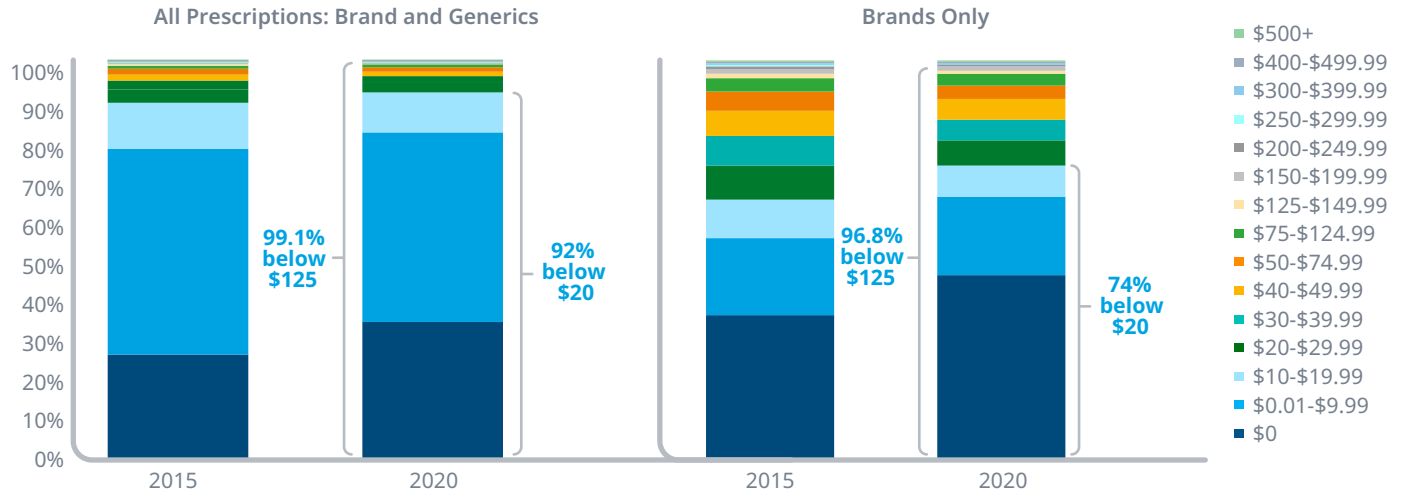

Source: IQVIA LAAD Sample Claims Data, Dec 2020

- Across all pay types, 8% of patients pay more than $500 and 1.8% pay more than $1,500 out-of-pocket for prescriptions.
- In Medicaid, only 1.9% of patients pay more than $500 out-of-pocket for prescriptions, and only 0.3% pay more than $1500, and these most likely relate to patients on a different kind of insurance for part of the year.
- In Medicare, 17% of patients pay more than $500 out-of-pocket — the amount where cost-sharing starts for patients with standard coverage under Medicare Part D, and patients become responsible for 25% of costs. Four percent also pay more than $1,500.
- As a result, seniors have higher cost exposures than the commercially-insured population.
- In commercial coverage, 6.7% of patients pay more than $500 compared to 6.3% in ACA health insurance exchanges (HIX) and 1.1% pay more than $1,500 in both kinds of commercial plans.
- For the millions of seniors who become Medicare eligible each year, the cost exposure difference as their insurance changes can be a significant shock, which could lead to changes in adherence to planned medication.

Exhibit Notes: Patients who filled at least one prescription in our sample were included. Patients were grouped into cohorts by mode pay type and costs aggregated in the year.

# Over 92% of branded and generic prescriptions have a final out-of-pocket cost below $20, and only 0.9% have a cost above $125

**Exhibit 44: Distribution of Prescriptions by Out-of-Pocket Cost in 2020, All Channels**



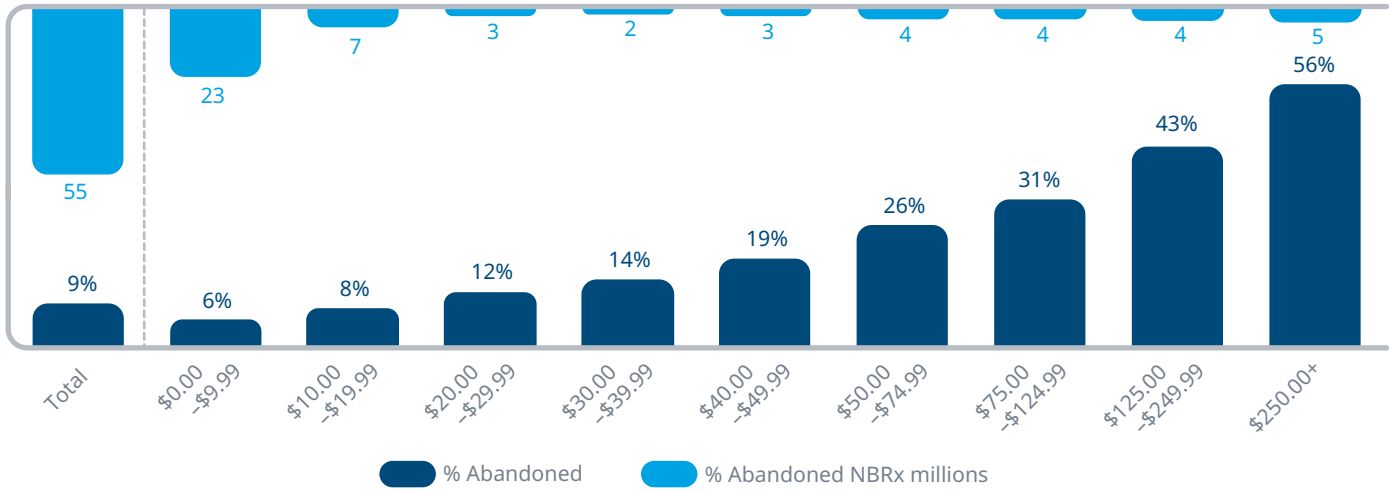

Source: IQVIA LAAD Sample Claims Data, Jan 2015–Dec 2019

- Over 92% of all prescriptions have final out-of-pocket costs below $20, which is up 2.4 percentage points from 2015.
- Branded prescriptions with final out-of-pocket costs below $20 account for 74% of brands filled in 2020, up from 65% in 2015.
- Out-of-pocket costs above $125 for a normalized monthly prescription account for 0.9%, down from 1.1% in 2015.
- Only 3.2% of branded prescriptions have out-of-pocket costs above $125, down from 4.2% in 2015.
- Many patients have paid lower costs year-over-year due to a variety of shifts in benefit designs, coupon programs, patient assistance programs, rising Medicaid enrollment, and mandated supports, such as the Medicare Part D donut-hole subsidy.
- While relatively few patients fill prescriptions at higher cost levels, abandonment is higher, and those prescriptions may be underrepresented as those prescriptions might have been abandoned due to cost (see exhibit 45).
- A rising number of prescriptions are now dispensed with a $0 payment by the patient and now amount to 46% of all branded prescriptions in 2020, up from 36% in 2015.
- These zero cost prescriptions are driven by a combination of factors, including patients reaching out-of-pocket maximums, receiving coupons (some of which lower costs to zero), or being driven by benefit designs which provide free products in certain classes, or from Medicaid.

Exhibit Notes: Includes paid claims only for patients filling at least one prescription. Prescriptions and costs normalized to 30-days.

# Patients starting new therapy abandoned 55 million prescriptions at pharmacies in 2020 with increasing frequency as costs rise

**Exhibit 45: 14-day Abandonment Share of New-to-Product Prescriptions by Final Out-of-Pocket Cost in 2020, All Payers, All Products**



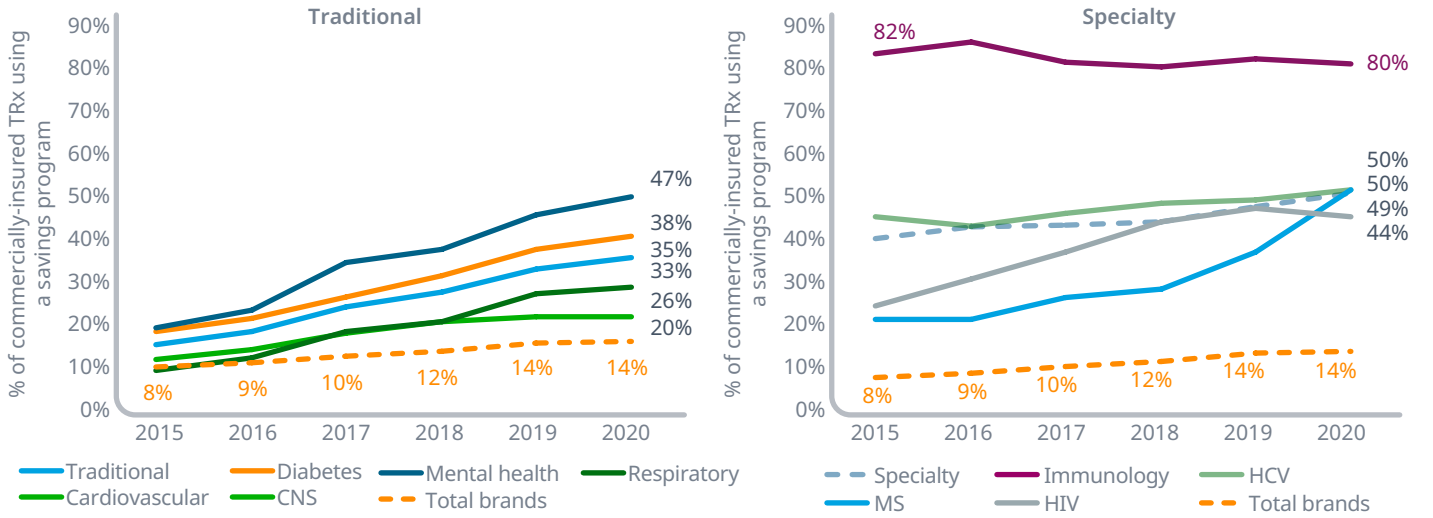

Source: IQVIA LAAD Sample Claims Data, Dec 2020

- The number of prescriptions written and transmitted to pharmacies by doctors, either by traditional paper, by phone or electronically, exceeds the number that patients actually had filled, for a variety of reasons.
- Some patients choose not to fill a prescription if they don't agree with the doctor's advice or find it inconvenient to do so, but the more common reason is the cost of the prescription.
- Of prescriptions with a final cost above $500, 56% are not picked up by patients, as compared with 6% of patients who do not fill when the cost is less than $10.
- The overall abandonment rate for all prescriptions across all pay types is 9% but rises consistently as cost exposure increases.
- Of the 55 million new-to-product prescriptions abandoned in 2020, 23 million were abandoned when costs were under $10, while the remaining 32 million were abandoned at greater rates as costs rise.
- Many traditional insurance plans with a fixed copay design include brand copays of less than $30 for preferred products, with abandonment of 12% or less. This can be compared to a non-preferred brand copay of $75 with an abandonment of 26% or higher.
- Benefit designs that inherently expose patients to costs use this patient behavior relating to costs to encourage the use of lower-cost medicines but can equally result in patients not taking necessary medicines.

Exhibit Notes: New to product prescriptions are those where patients have not had a prescription for the specific brand or generic drug within the prior year. Pharmacies in the sample provide information on prescriptions which were prepared for dispensing and whether they were dispensed, with abandonment defined as the prescription in question not being dispensed to the patient within 14 days of the initial fill.

# Increasingly patients are using savings programs offered by manufacturers to offset costs

**Exhibit 46: Percent Utilization of Savings Programs for Commercial Branded Prescriptions, Selected Traditional and Specialty Therapy Areas**




Source: IQVIA LAAD Sample Claims Data, Dec 2020

- As out-of-pocket costs have risen, coupons for commercially-insured patients have been increasingly used, reaching $14 billion in 2020, including an estimate of pre-paid debit cards – and helping lower commercially-insured patients out-of-pocket costs over the period.
- Of commercially-insured patients on branded medications, 14% of them used coupons to reduce their out-of-pocket costs in 2020.
- Coupon usage in some therapy areas is far higher, however, and reached 47% in mental health and 80% in immunology.
- Savings programs include coupons, e-coupons, pre-paid debit cards, and average 50% of brand prescriptions in some of the highest overall spending specialty therapy areas, compared to 33% of leading traditional medicine therapy areas.
- The use of coupons is also a relatively good indicator of the competitive intensity in the therapy area where multiple competitors are negotiating with payers for market access and using coupons to help patients with costs in the event they lose those contracts.

Exhibit Notes: Prescriptions for patients with commercial insurance are assessed for whether there was a supplementary payer identified by IQVIA as a coupon or savings program.

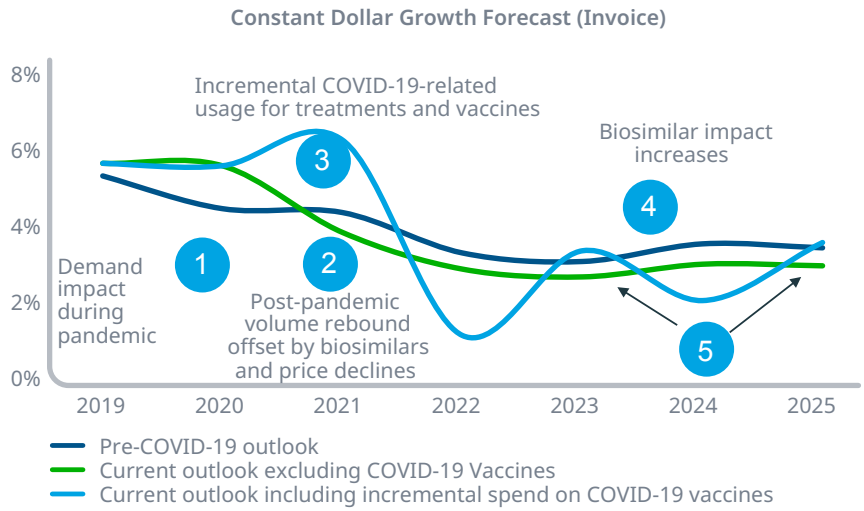
# Outlook to 2025

- U.S. market growth will return to pre-pandemic projections by 2025 despite year-to-year fluctuations.
- Policy changes impacting the use of medicines are likely to be phased in over the next five years.
- The U.S. spending forecast reflects an increasing gap between invoice level spending and manufacturer net revenues.
- New brand spending in the U.S. is projected to be higher than the last five years but a smaller share of spending.
- Net price growth for protected brands is forecast to be 0 to -3% through 2025.
- Losses of exclusivity expected to result in $128 billion of lower brand spending through 2025 with $39 billion from branded biologics.
- Biosimilars mature, and the impact of medicines facing new biosimilar competition in 2023 and 2024 will have a large impact.
- Immunology, oncology, and neurology drive growth.
- U.S. oncology spending to exceed $110 billion by 2025, with growth slowing to 10% from biosimilar savings.
- Diabetes spending to decline 2-5% through 2025 as off-invoice discounts and rebates continue to offset list prices.
- Treatments for autoimmune disorders to exceed $130 billion in the U.S. by 2025, slowing after 2023 due to key biosimilars.

*Total net spending on medicine is expected to reach $380–400 billion in 2025, reflecting a compound annual growth rate of 0–3%.*

# U.S. market growth will return to pre-pandemic projections by 2025 despite year-to-year fluctuations

**Exhibit 47: Comparison of Current Outlook to Pre-COVID-19 Outlook**




**Key Changes in the Outlook**

1. 2020: +1.0 (~$5 billion)
2. 2021: -0.4% below pre-COVID-19 growth; -1.5% below 2020 growth as volume returns but biosimilars offsets growth
3. Current outlook for 2021 including vaccines +2% over outlook that excludes vaccines due to ~$9–12 billion of vaccine spending, later reduced as volume shifts to biennial boosters and prices drops over time
4. Biosimilar market impact expected to be substantial in 2023–25, offset by flow of innovative products
5. Vaccine spending declines as biennial boosters and costs decline in the endemic phase, followed by overall growth returning to expected levels

Source: IQVIA Market Prognosis, Sep 2020; IQVIA Institute, Mar 2021

- While the short-term impact from COVID-19 in 2020 and 2021 has been significant, the long-term impact on growth trends is more muted.
- Including estimates of higher spending growth from COVID-19 vaccines and lower spending from existing treatments due to disruptions from the pandemic, the five-year CAGR to 2025 is unchanged compared to the pre-COVID-19 outlook and the forecasts differ by only 0.2% within the range of uncertainty of 2-5%.
- These dynamics reflect the relative resilience of spending levels in the U.S. market compared to other countries and the already rapid progress in the unprecedented mass vaccination program.
- The spending associated with COVID-19 vaccines is expected to add approximately 2% of spending growth in 2021, dipping in 2022 as fewer need new shots, and rebounding in 2023 and 2025 with expected need for booster shots.
- Because the effectiveness of current vaccines against new variants, as well as the duration of immunity, remains uncertain, it is expected that many people will need to receive new booster vaccinations in future years.
- If vaccinations fail to reach herd immunity levels, it is likely that continued waves of infections and economic and health impacts will be felt for years to come, though based on current trends, this may be rarer and isolated to certain geographic areas within the U.S.

Exhibit Notes: Pre-COVID-19 outlook based on IQVIA Market Prognosis, Sept. 2019 edition. Current outlook based on IQVIA Market Prognosis Sept. 2020 edition. Incremental COVID-19 vaccine scenario based on current outlook combined with incremental spending for vaccines.

# Policy changes impacting the use of medicines are likely to be phased in over the next five years

**Exhibit 48: Selected Policy Areas with Likely Legislation or Executive Order Implementation through 2025**

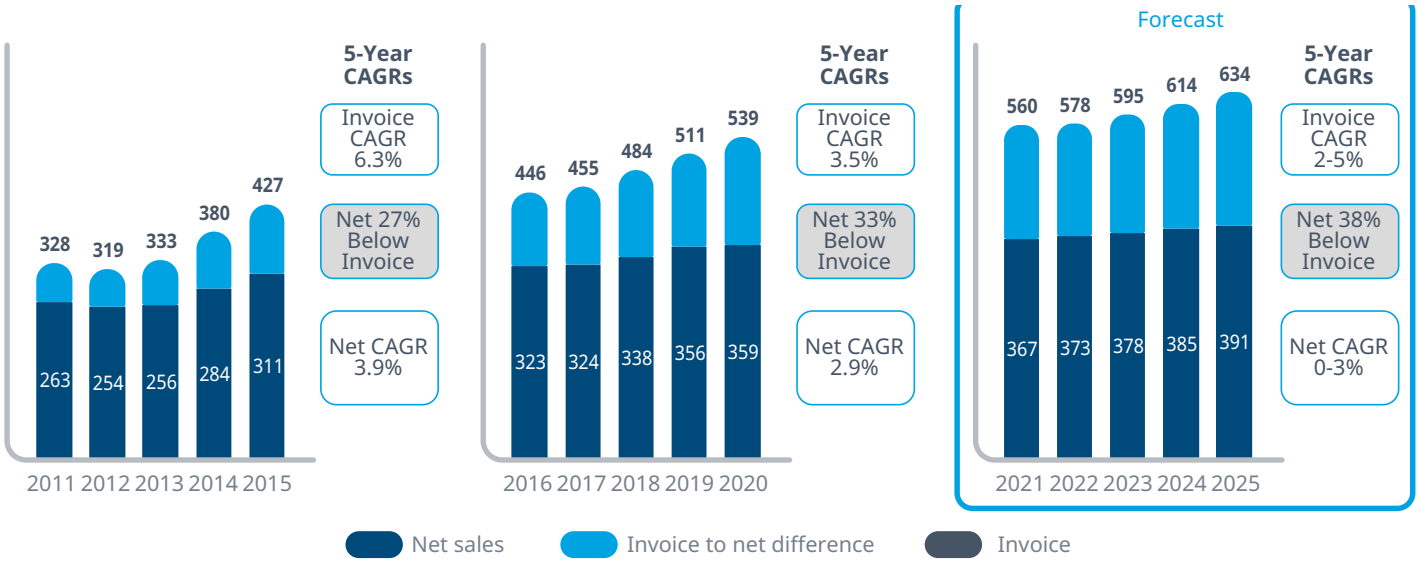
| Medicaid | Medicare | Commercial |
|---|---|---|
| • Medicaid 5% increase in matching funds from stimulus<br>• Medicaid drug rebate cap removal in 2024 resulting in some rebates >100% | • Medicare buy-in options at lower ages<br>• Price negotiation in Medicare<br>• Cost sharing changes for patients in Medicare including caps in out-of-pocket<br>• Changes in rebate structure for manufacturers, payers and CMS | • Exchange subsidies temporary boost through 2022<br>• Expanded ACA Open Enrollment periods<br>• Reform to accumulator adjuster / maximizer plan designs<br>• Net-price cost sharing for deductible / co-insurance |

Source: IQVIA Institute, May 2021

- Policies affecting medicine costs could include the legislation H.R.3, which as passed the House but not the Senate (where this looks uncertain), as well as policies included in the stimulus in March 2021.
- One provision was to remove the cap on Medicaid rebates at 100%, which if removed could affect some established branded products if price increases were faster than inflation for a sustained period, and which would result in additional rebates flowing to Medicaid, which states benefit from.
- The stimulus bill also included a 5% increase in matching funds to states for Medicaid, which will help during the pandemic as states have significant tax revenue shortfalls but will also potentially encourage the 14 remaining states to consider Medicaid expansion.
- Medicare policies include expanding eligibility to younger enrollees in the so-called Medicare at 60 or allowing younger people to buy into the program by choice, are part of a mosaic of issues including caps on out-of-pocket costs as well as reforms to pricing and rebate structures that would help pay for these changes.
- As with the last administration, it is notable that policies affecting Medicare are potentially addressable with executive orders, and this could occur particularly if legislation stalls in Congress.
- States have also entered these debates, with nearly a dozen enacting restrictions on accumulator adjuster/ maximizer plans to ensure patients receive their share of negotiated rebates.

# The U.S. spending forecast reflects an increasing gap between invoice level spending and manufacturer net revenues

**Exhibit 49: U.S. Medicine Spending and Growth at Invoice-Level and Estimated Net 2011–2025**



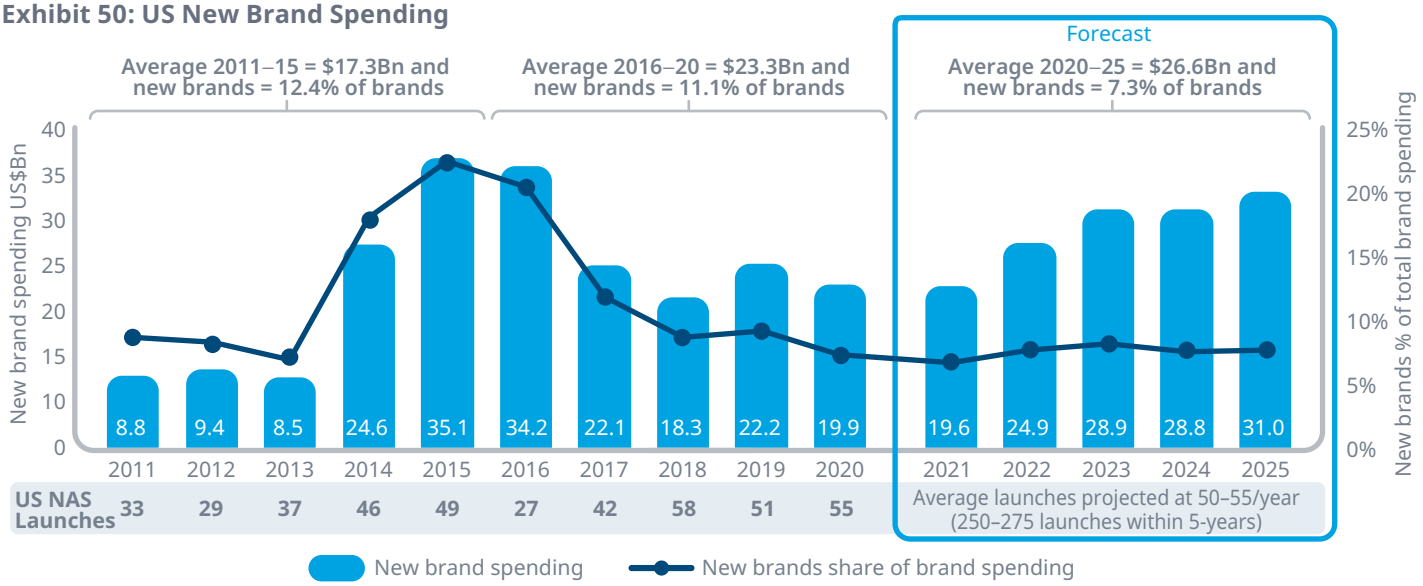

Source: IQVIA Institute, Feb 2021

- Total net spending on medicines is expected to reach $380-400 billion in 2025, up from $359 billion in 2020, and includes spending across all channels and product types.
- Over the next five years, medicine spending will grow between 2–5% on an invoice basis and 0–3% after off-invoice discounts and rebates.
- Growth will be driven by adoption of newly launched innovative products, which are expected to occur at higher levels than in past years with an average of 50–55 new medicines launching per year over the next five years, including those in oncology or with specialty or orphan status.
- Spending growth will be offset by losses of exclusivity and continued emergence and uptake of biosimilars.
- The effect of price growth on overall spending over the next five years is expected be 0 to -3% as list price increases continue at historically low levels and net prices will decline in markets with significant competitive intensity.

Exhibit Notes: Invoice spending is based on IQVIA reported values from wholesaler transactions measured at trade/invoice prices and exclude off-invoice discounts and rebates that reduce net revenue received by manufacturers. Net spending reflects company recognized revenue after off-invoice discounts, rebates and price concessions are applied. Includes all medicines in both pharmacy and institutional settings.

# New brand spending in the U.S. is projected to be higher than the last five years but a smaller share of spending

**Exhibit 50: US New Brand Spending**



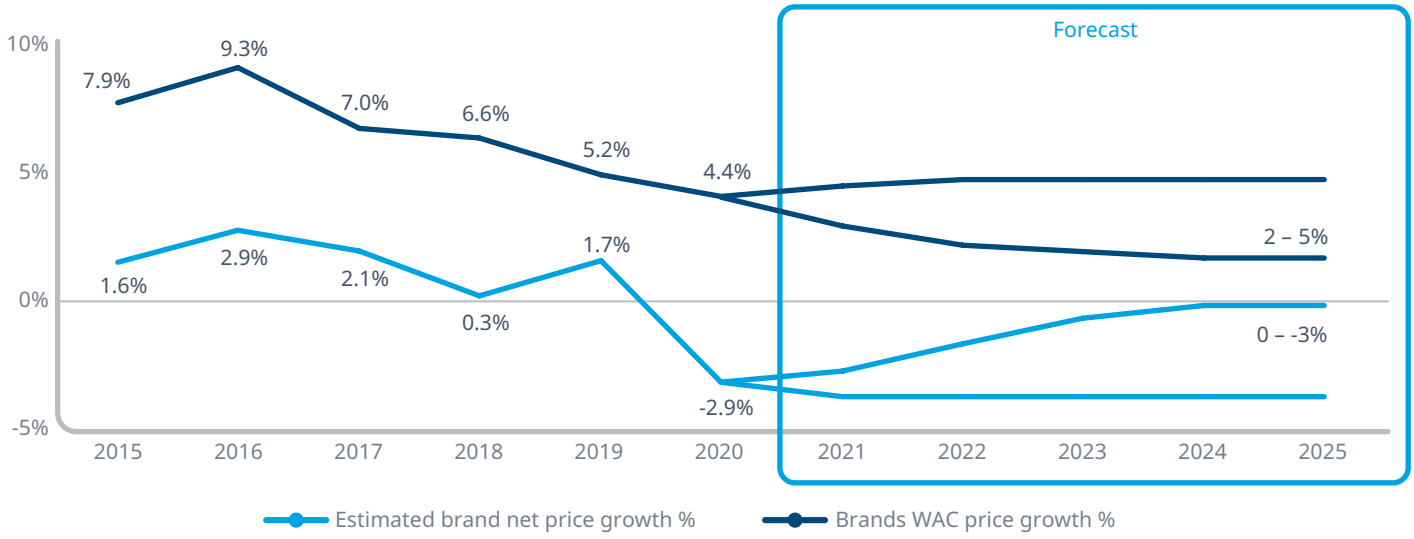

Source: IQVIA Institute, Feb 2021

- The growing output of R&D is expected to continue to result in an average 50–55 NASs per year and an aggregate of $133 billion of new drug spending over five years.
- NAS launches in 2020 reached 55, even as the aggregate amount of new brand spending dipped partly because more medicines are for smaller populations and generate less spending per drug.
- Over the next five years, 250–275 NAS launches are expected but are anticipated to represent 7.3% of brand spending compared to 11% in the past five years.
- New brands in the next five years are expected to include large numbers of oncology, immunology and neurology drugs as well as a significant proportion of rare disease treatments.

Exhibit Notes: NAS = new active substance. New brands are protected branded products on the market less than 24 months during the year reported.

# Net price growth for protected brands is forecast to be 0 to -3% through 2025

**Exhibit 51: Protected Brand Invoice and Net Price Growth**



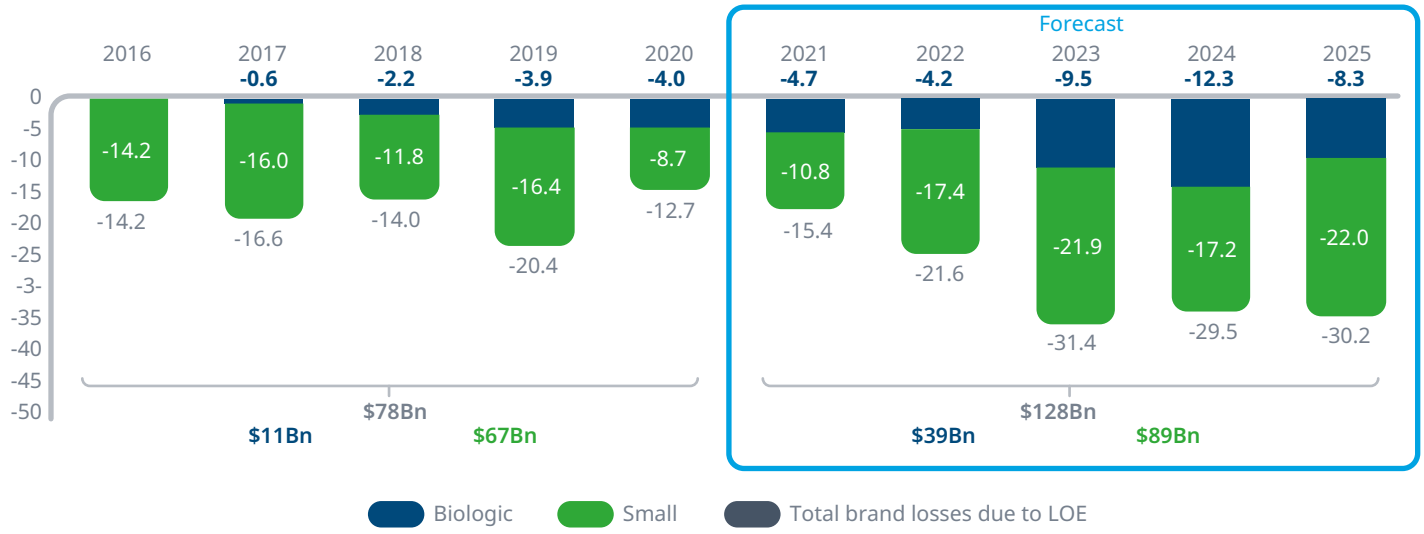

Source: IQVIA Institute, May 2021

- As public pressure on drug pricing has escalated, list price increases have slowed to 4.4% in 2020 and are expected to average 2–5% per year through 2025.
- Net price growth is likely to continue to see declines in the 0 to -3% range as the structural drivers of low net price growth are expected to remain in effect and be amplified by increased competitive intensity in many therapy areas, especially those with new launches and/or upcoming biosimilar events such as diabetes and immunology.
- Some products and therapy areas may be able to increase net prices to a greater or lesser extent, linked to the level of differentiation and/or competition in their markets.
- The lower level of net price growth and the continued gap between invoice and net price growth reflect the higher levels of off-invoice discounts, rebates and price concessions, which began to increase in 2012 and have continued.
- While there is a clear expectation that drug pricing policies will be reformed, there are likely impacts of those policies on either invoice prices, consumer out-of-pocket costs or net prices, and the exact nature of those changes remain significantly uncertain.

Exhibit Notes: Wholesaler Acquisition Cost (WAC) price. Protected brands are brands more than 24 months after first launch and not yet off-patent. Net price growth estimates based on public information compared to IQVIA data (see Methodology).

# Losses of exclusivity to result in $128 billion of lower brand spending through 2025 with $39 billion from branded biologics

**Exhibit 52: Impact of Brand Losses of Exclusivity 2016–2025, US$Bn**



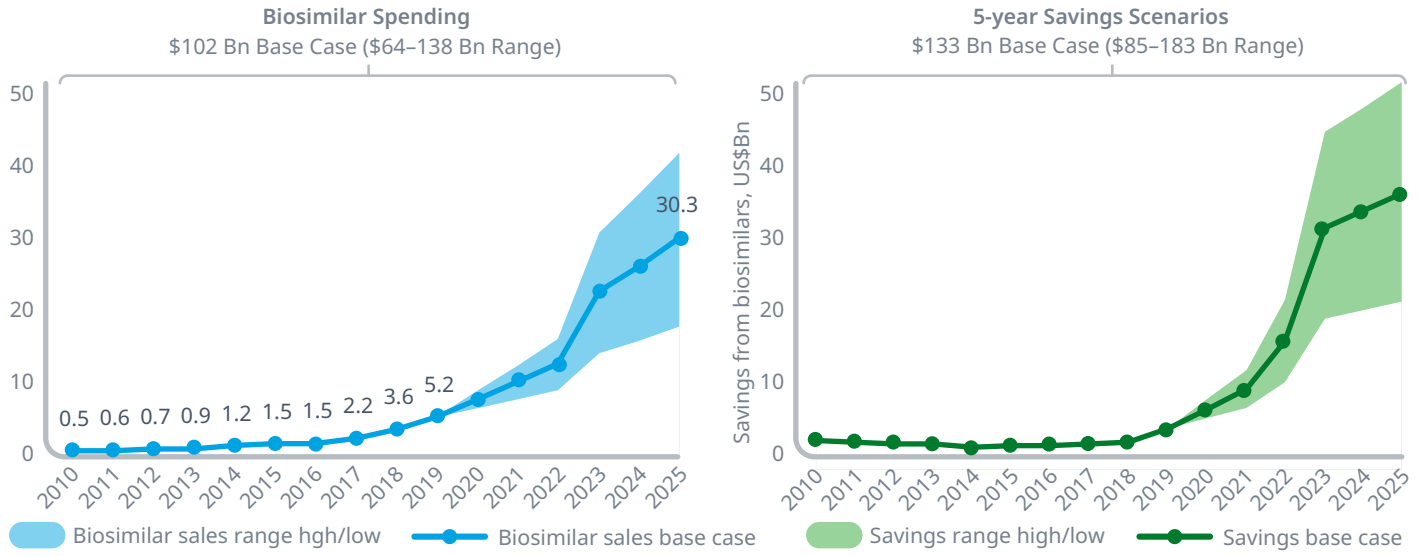

Source: IQVIA National Sales Perspectives; IQVIA Market Prognosis; IQVIA Institute, Feb 2021

- The impact of patent expiries is expected to increase over the next five years as both small molecules and biologics will increase by almost $30 billion in brand losses compared to the last five years.
- The largest biologic impact is expected in 2023 when adalimumab (Humira) is expected to face competition. While biosimilars for this drug are already approved, litigation and settlements between originators and biosimilar companies have agreed 0n market entry in early 2023.
- While 2020 has seen some of the largest overall impact on branded spending from biosimilars, mainly from those that entered in 2019 — bevacizumab, rituximab and trastuzumab — and to a lesser extent, new biosimilars in 2018 — pegfilgrastim, insulin lispro and epoetin alfa.
- Small molecule expiry impact in 2023 is the largest in the outlook with medicines expiring in 2022, such as Januvia and Spiriva, fully impacting the market in 2023.

Exhibit Notes: Lower brand spending based on invoice prices. Forecast impacts are modeled by projecting individual products sales growth to the point of patent expiry and then modeling expected impact based on historical analogues and actual data for in-progress events. Chart totals may not sum due to rounding.

# Biosimilars mature and the impact of medicines facing new biosimilar competition in 2023 and 2024 will have a large impact

**Exhibit 53: Biosimilar Spending and Savings Scenarios**



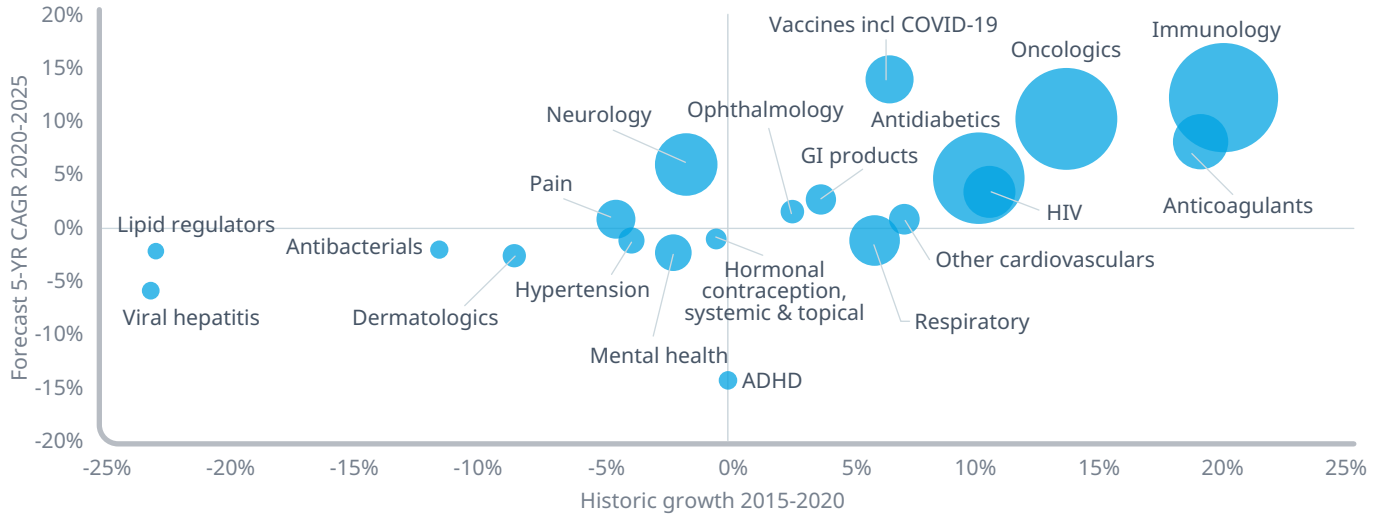

Source: IQVIA Institute, Dec 2020

- The first biosimilars approved in the U.S. captured an average 15–30% share of their respective molecules and averaged 15% from Q2 2013 to Q3 2016.
- Since then, newer biosimilars have generated much higher volume shares and projected biosimilar spending is expected to reach $30 billion in 2025 and a total of $102 billion over the next five years.
- Savings from biosimilars — the difference between projected spending with and without biosimilars — is expected to be $35-40 billion in 2025 and a cumulative five years total of $133 billion, but with significant uncertainties around these projections.
- Future biosimilars may continue to achieve very high-volume shares as recent entrants have, but that will depend on the number of competitors in each molecule, their decisions as well as the competitive actions of originators and the cost negotiating tactics of insurers and drug purchasers.
- In some cases, negotiations may even spill over into other still-patent-protected brands in the same therapy areas, resulting in higher discounts, rebates, and use of coupons.
- With the scale of savings potentially in the balance, there will be significant attention focused on the evolution of these markets, and if savings are below expectations, policymakers will likely review policies which incentivize biosimilar development and uptake as well as those around originator periods of exclusivity.

Exhibit Notes: Biosimilar spending projections based on pricing and volume assumptions, extended to 2025 (See *IQVIA Institute Report Biosimilars in the United States 2020-2024*, Oct 2020).

# Immunology, oncology, neurology drive growth through 2025 along with COVID-19 vaccines

**Exhibit 54: US Historic and Forecast Growth for Top 20 Therapy Areas**



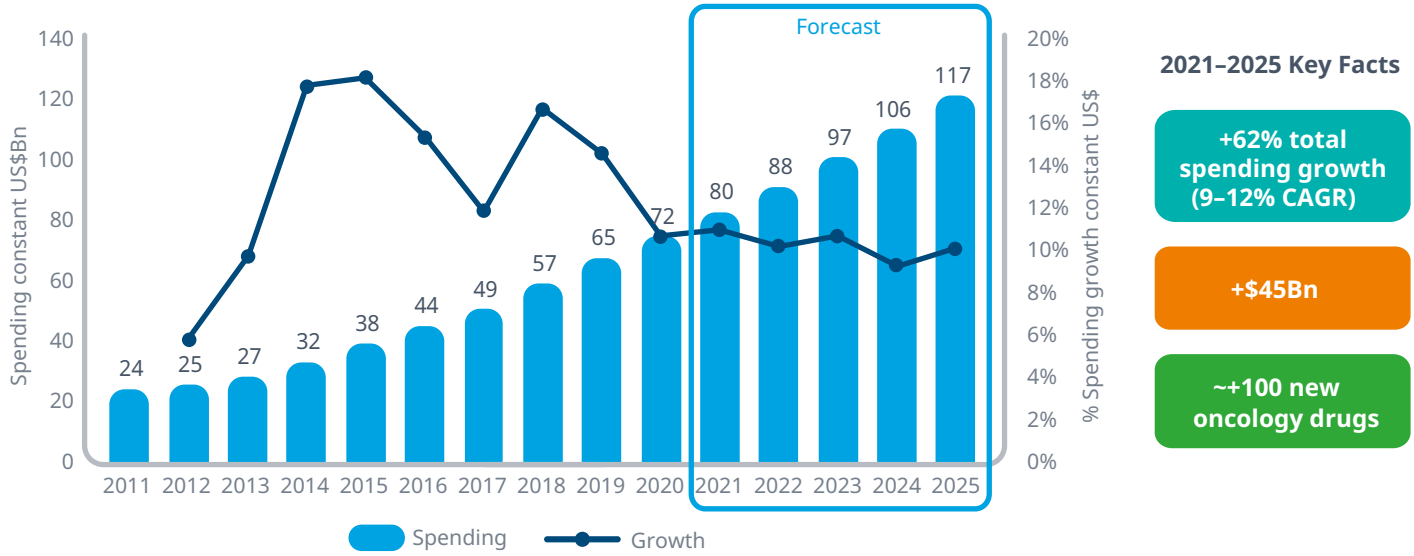

Source: IQVIA Institute, Feb 2021

- Immunology, oncology and neurology represent the largest aggregate contributors to growth in the next five years, predominately from a continued flow of new medicines and offset by losses of exclusivity.
- Overall growth in neurology is not significantly lower than diabetes but has much lower discounts and rebates and embeds significant upside uncertainty related to Alzheimer's and Parkinson's therapies as well as rare neuromuscular disorders.
- Therapy areas with lower growth in the next five years than in the last five, including ADHD, dermatology, mental health and respiratory, are consistently those focused in more traditional therapy areas where fewer new launches have happened and where savings from losses of exclusivity are contributing to lower growth.

Exhibit Notes: Bubble size represents forecast in 2025; COVID vaccine estimates based on estimates of periodic booster shots; neurology includes nervous system disorders such as epilepsy, Parkinson's, Alzheimer's, other neurological disorders but excluding mental health or pain. Neurology estimate based on risk-adjusted potential for Alzheimer's approval and uptake.

# U.S. oncology spending to exceed $110 billion by 2025,with growth slowing to 10% from biosimilar savings

**Exhibit 55: Oncology Non-Discounted Spending and Growth**




**2021–2025 Key Facts**

**+62% total spending growth (9–12% CAGR)**

**+$45Bn**

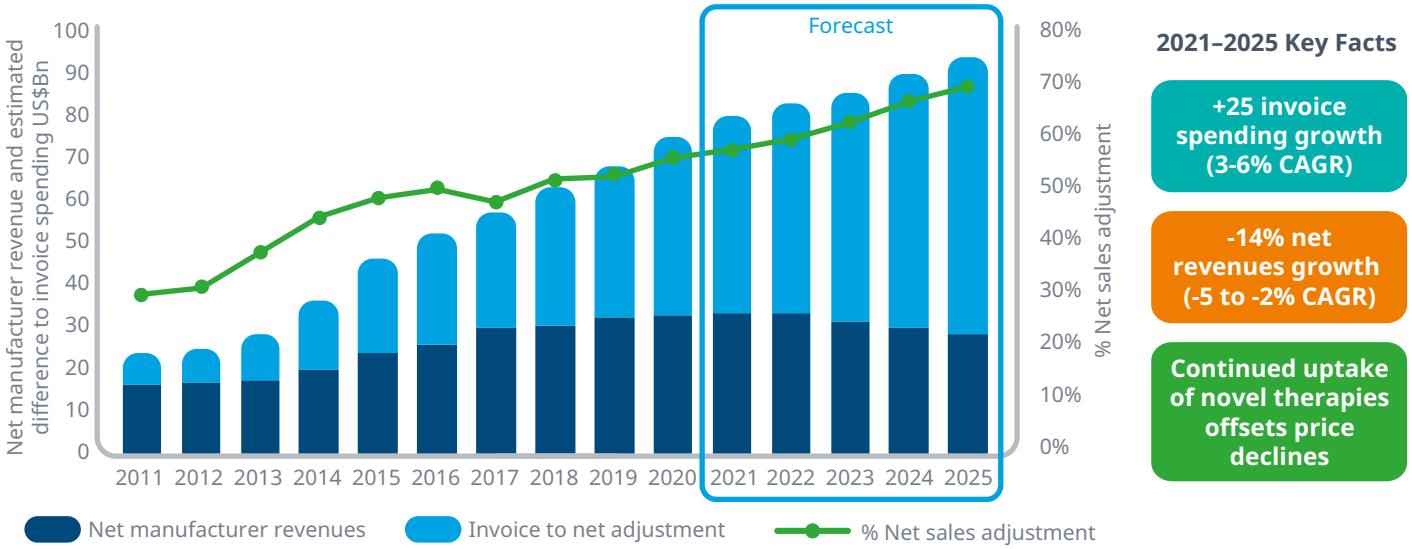
**~+100 new oncology drugs**

Source: IQVIA Institute, Feb 2021

- U.S. oncology spending is expected to slow to 9-12% through 2025 as biosimilars offset a continued flow of newer treatments.
- Over the next five years spending is expected to increase 62%, an average of 9-12% per year, and add $45 billion in spending.
- More than 100 new oncology drugs are anticipated based on current pipeline, although they are expected to be increasingly narrowly focused as precision medicine and biomarker-driven therapies become more common.
- While some therapies are being developed with wide tumor applicability and are being approved based on biomarkers or mutations and termed 'tissue-agnostic' approvals, there are also a continued flow of treatments for very specific tumor or biomarker situations which do not translate to wider use.
- In addition to the flow of more biomarker-driven therapeutic choices, developed markets will benefit from wider use of next-generation sequencing technologies (NGS), which can test for multiple potential mutations at once and guide therapy selection more precisely.
- While still in earlier stages of adoption, the use of liquid biopsies where NGS is used on blood samples has the potential to identify tumors much earlier and drive much more effective outcomes for patients.
- Savings from biosimilars are expected to contribute to slower spending growth despite the wide range of expected innovations.

# Diabetes spending to decline 2-5% through 2025 as off-invoice discounts and rebates continue to offset list prices

**Exhibit 56: Diabetes Spending and Growth at Net and Non-Discounted Levels**




**2021–2025 Key Facts**

**+25 invoice spending growth (3-6% CAGR)**

**-14% net revenues growth (-5 to -2% CAGR)**

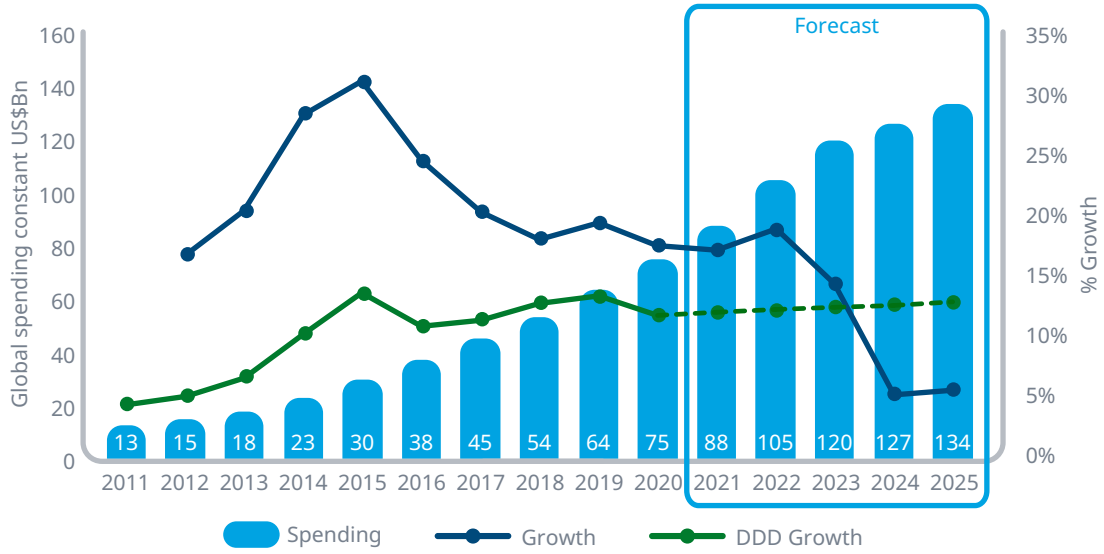
**Continued uptake of novel therapies offsets price declines**

Source: IQVIA Institute, Feb 2021

- Diabetes spending in the U.S. reflects both the consistent use of older therapies as patients' type 2 disease progresses, and the adoption of novel therapies later in the treatment pathway.
- The key element in assessing trends in diabetes is the current 56% lower-than-net revenue in the U.S. compared to invoice and projected to increase to 70% lower by 2025, far higher than other therapy areas.
- Over the next five years net revenues for manufacturers will decline by 14%;at -2% to -5% CAGR as net price declines continue.
- Demographic shifts which will likely increase the number of diabetes patients will contribute to greater volume but be offset by net price reductions.

# Treatments for autoimmune disorders to exceed $130 billion in the U.S. by 2025, slowing after 2023 due to key biosimilars

**Exhibit 57: U.S. Autoimmune Non-discounted Spending Growth**




**2021–2025 Key Facts**

**+12% per year volume growth**

**+59 billion +78% (12% CAGR)**

**Average cost per day -$2 to $85**

Source: IQVIA Institute, Feb 2021

- Over the past 10 years, immunology treatments have consistently been driven by increasing volume, averaging 12% volume growth in days of therapy and averaging a higher rate of growth in spending as newer products with higher prices have contributed to growth.
- In the next five years, spending is expected to increase 78% or $59 billion.
- The average cost per day has been rising throughout the past 10 years as prices were rising but are expected to drop once new biosimilars enter the market in 2023.
- The introduction of biosimilar adalimumab (Humira) in 2023 and ustekinumab (Stelara) in 2024 will contribute significantly to lower costs for immunology treatments, with the full impact visible in 2024 when spending growth slows to 5%.
- Spending is expected to grow at a 12% CAGR through 2025, to exceed $134 billion.

# Notes on sources

**THIS REPORT IS BASED ON THE IQVIA SERVICES DETAILED BELOW**

**NATIONAL SALES PERSPECTIVES (NSP)™** measures revenue within the U.S. pharmaceutical market by pharmacies, clinics, hospitals and other healthcare providers. NSP reports 100% coverage of the retail and non-retail channels for national pharmaceutical sales at actual transaction prices. The prices do not reflect off-invoice price concessions that reduce the net amount received by manufacturers.

**REAL WORLD EVIDENCE** is a suite of services that provides clinical evidence regarding the usage and potential benefits or risks of medical products or procedures derived from analysis of IQVIA Real World Data (RWD). IQVIA's RWD are a variety of information assets that represent the healthcare experiences of the patient. IQVIA's RWD provides near census-level coverage of dispensed prescription information at a prescriber and insurance plan level and tracks deidentified anonymous patient records over time to analyze distinct use patterns. Additionally, IQVIA's RWD captures information about the patient's medical, hospital, EMR, consumer, and laboratory experiences, among other details.

**MIDAS™** is a unique platform for assessing worldwide healthcare markets. It integrates IQVIA's national audits into a globally consistent view of the pharmaceutical market, tracking virtually every product in hundreds of therapeutic classes and provides estimated product volumes, trends and market share through retail and non-retail channels. MIDAS data is updated monthly and retains 12 years of history.

**IQVIA™ MARKET PROGNOSIS** is a comprehensive, strategic market forecasting publication that provides decision makers with insights on the drivers and constraints of healthcare and pharmaceutical market growth. This includes political and economic developments, alongside dynamics in healthcare provision, cost containment, pricing and reimbursement, regulatory affairs and the operating environment for pharmaceutical companies. Market Prognosis contains economic forecasts from the Economist Intelligence Unit and delivers in-depth analysis at a global, regional and country level, and analyzes dynamics at distribution channel, market segment and therapy class level.

**IQVIA™ THERAPY PROGNOSIS GLOBAL** covers ATC3 level sales forecasts for major therapy areas in 14 key markets, 8 developed (U.S., Japan, Germany, France, Italy, Spain, U.K., and Canada) and 6 pharmerging (China, Brazil, Russia, India, Turkey and Mexico) and includes interactive modeling and event-based forecasts and comprehensive market summary

**IQVIA'S LONGITUDINAL PRESCRIPTION DATA:** IQVIA receives nearly 4 billion prescription claims per year with history from January 2006 with coverage over 90% for the retail channel, 60–85% for mail service, and 75– 80% for long-term care. Longitudinal data derives from electronic data received from pharmacies, payers, software providers and transactional clearinghouses. This information represents activities that take place during the prescription transaction and contains information regarding the product, provider, payer, and geography. Rx data is longitudinally linked back to an anonymous patient token and is linkable to events within the data set itself and across other patient data assets.

**IQVIA'S MEDICAL CLAIMS DATA:** Dx data are pre-adjudicated claims collected from office-based physicians and specialists. These data are sourced from CMS-1500 form-based claim transactions, the standard reimbursement form for all non-cash claims. Medical claims data includes patient-level diagnosis and procedures for visits to U.S. office-based individual professionals, ambulatory and general healthcare sites. The medical claims data includes more than 205 million patients, over 1.7 billion claims and 3 billion service records obtained annually.

Diagnosis, telehealth and procedural claims have been derived based on IQVIA's medical claims database through the week ending 5/29/2020. Normal claims processing lags are adjusted for by IQVIA using a methodology called "date control" in order to estimate claim levels where the full number of claims has not yet been received. The methodology considers historic patterns of lag periods between service dates and receipt of claims to project missing claims.

Disruptions from COVID-19 may result in claim lags that differ from historic patterns. IQVIA's medical claims database is dynamic and IQVIA will always employ the latest available information to consider in its estimates — therefore estimates of growth may change from publication to publication.

**IQVIA'S NATIONAL PRESCRIPTION AUDIT (NPA):** NPA is the industry standard source of national prescription activity for all pharmaceutical products. It measures demand for prescription drugs, including dispensed pharmaceuticals to consumers across three unique channels: retail, mail service, and long-term care pharmacies. From sample pharmacies, IQVIA collects new and refilled prescription data daily. NPA represents and captures over 92% of all outpatient prescription activity in the United States and covers all products, classes, and manufacturers.

**IQVIA'S NATIONAL PRESCRIPTION AUDIT: NEW TO BRAND (NPA NTB):** NPA New to Brand provides enhanced visibility into the volume of a patient's true, first-time use of a brand versus continued therapies. IQVIA's longitudinal data allows users to analyze new therapy starts, switched to/add-on products, as well as continued therapies. In addition to reporting the new or refill information from a prescription, the therapy history for the patient is taken into account in order to categorize that prescription. New to Brand RX (NBR) = New Therapy Start Rx + Switch/Add-On Rx

# Methodologies

**DISPENSED PRESCRIPTIONS ADJUSTED FOR 90-DAY PRESCRIPTIONS** (method used in appendix tables)

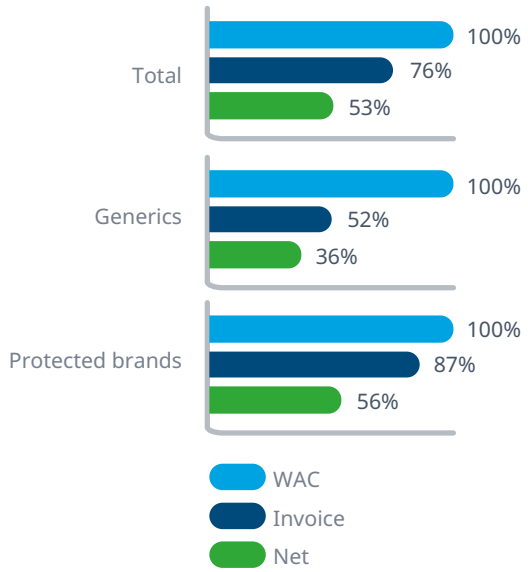
Prescriptions with >84 days supply to the patient are assumed to represent a three-month prescription, and all other prescriptions are assumed to represent a one-month prescription. Three-month prescriptions are factored by three to normalize prescriptions to one-month durations.

**ESTIMATES OF NET MANUFACTURER REVENUE AND PRICES**

IQVIA audits reflect invoice-based pricing derived from proprietary information gathered from wholesalers and company direct sales. While IQVIA invoice prices reflect supply-chain price concessions, they do not reflect the off-invoice discounts and rebates separately paid to insurers, or other price concessions paid to patients or other health system participants. Estimated net prices and revenue are projected from a sample of large and mid-sized companies analyzed from 2011–2020. Branded products are included in the sample if their net sales amount is disclosed in financial filings with the Securities and Exchange Commission (SEC) and if the volume of sales captured in IQVIA audits is consistent with information provided directly by manufacturers in support of IQVIA proprietary datasets. Net prices are calculated by dividing publicly reported net sales values by volumes for the same products reported to IQVIA. Estimated brand net price growth for the total market is projected from the analysis sample to the total market. Net prices represent an estimate of the average manufacturer realized price, reflecting any reductions in net revenues due to off-invoice discounts, rebates, copay assistance or other price concessions, and do not necessarily reflect the net costs paid by insurers, the federal government, or patients, which all vary significantly and independently. For generic companies, a sample of five large generic companies' generic portfolios were analyzed in aggregate consistent with their SEC filings, as specific generic product analyses are not possible. See Medicine Use and Spending in the United States, April 2019 for more details.

The IQVIA "net sales adjustment" analysis is based on ex-manufacturer invoice sale prices, which are lower than wholesaler acquisition cost (WAC). In the market overall, invoice prices are 24% below WAC, with net prices are 47% below that list price.

**Exhibit 58: WAC, Invoice and Net Prices, 2020**




Source: IQVIA Institute, Mar 2020

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Murray Aitken is Executive Director, IQVIA Institute for Human Data Science, which provides policy setters and decisionmakers in the global health sector with objective insights into healthcare dynamics. He led the IMS Institute for Healthcare Informatics, now the IQVIA Institute, since its inception in January 2011. Murray previously was Senior Vice President, Healthcare Insight, leading IMS Health's thought leadership initiatives worldwide. Before that, he served as Senior Vice President, Corporate Strategy, from 2004 to 2007. Murray joined IMS Health in 2001 with responsibility for developing the company's consulting and services businesses. Prior to IMS Health, Murray had a 14-year career with McKinsey & Company, where he was a leader in the Pharmaceutical and Medical Products practice from 1997 to 2001. Murray writes and speaks regularly on the challenges facing the healthcare industry. He is editor of Health IQ, a publication focused on the value of information in advancing evidence-based healthcare, and also serves on the editorial advisory board of Pharmaceutical Executive. Murray holds a Master of Commerce degree from the University of Auckland in New Zealand, and received an M.B.A. degree with distinction from Harvard University.

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Michael Kleinrock serves as research director for the IQVIA Institute for Human Data Science, setting the research agenda for the Institute, leading the development of reports and projects focused on the current and future role of human data science in healthcare in the United States and globally. Kleinrock leads the research development included in Institute reports published throughout the year. The research is focused on advancing the understanding of healthcare and the complex systems and markets around the world that deliver it. Throughout his tenure at IMS Health, which began in 1999, he has held roles in customer service, marketing, product management, and in 2006 joined the Market Insights team, which is now the IQVIA Institute for Human Data Science. He holds a B.A. degree in History and Political Science from the University of Essex, Colchester, UK, and an M.A. in Journalism and Radio Production from Goldsmiths College, University of London, UK.

# About the Institute

The IQVIA Institute for Human Data Science contributes to the advancement of human health globally through timely research, insightful analysis and scientific expertise applied to granular non-identified patient-level data.

Fulfilling an essential need within healthcare, the Institute delivers objective, relevant insights and research that accelerate understanding and innovation critical to sound decision making and improved human outcomes. With access to IQVIA's institutional knowledge, advanced analytics, technology and unparalleled data the Institute works in tandem with a broad set of healthcare stakeholders to drive a research agenda focused on Human Data Science including government agencies, academic institutions, the life sciences industry and payers.

**Research Agenda**

The research agenda for the Institute centers on 5 areas considered vital to contributing to the advancement of human health globally:

- Improving decision-making across health systems through the effective use of advanced analytics and methodologies applied to timely, relevant data.
- Addressing opportunities to improve clinical development productivity focused on innovative treatments that advance healthcare globally.
- Optimizing the performance of health systems by focusing on patient centricity, precision medicine and better understanding disease causes, treatment consequences and measures to improve quality and cost of healthcare delivered to patients.
- Understanding the future role for biopharmaceuticals in human health, market dynamics, and implications for manufacturers, public and private payers, providers, patients, pharmacists and distributors.
- Researching the role of technology in health system products, processes and delivery systems and the business and policy systems that drive innovation.

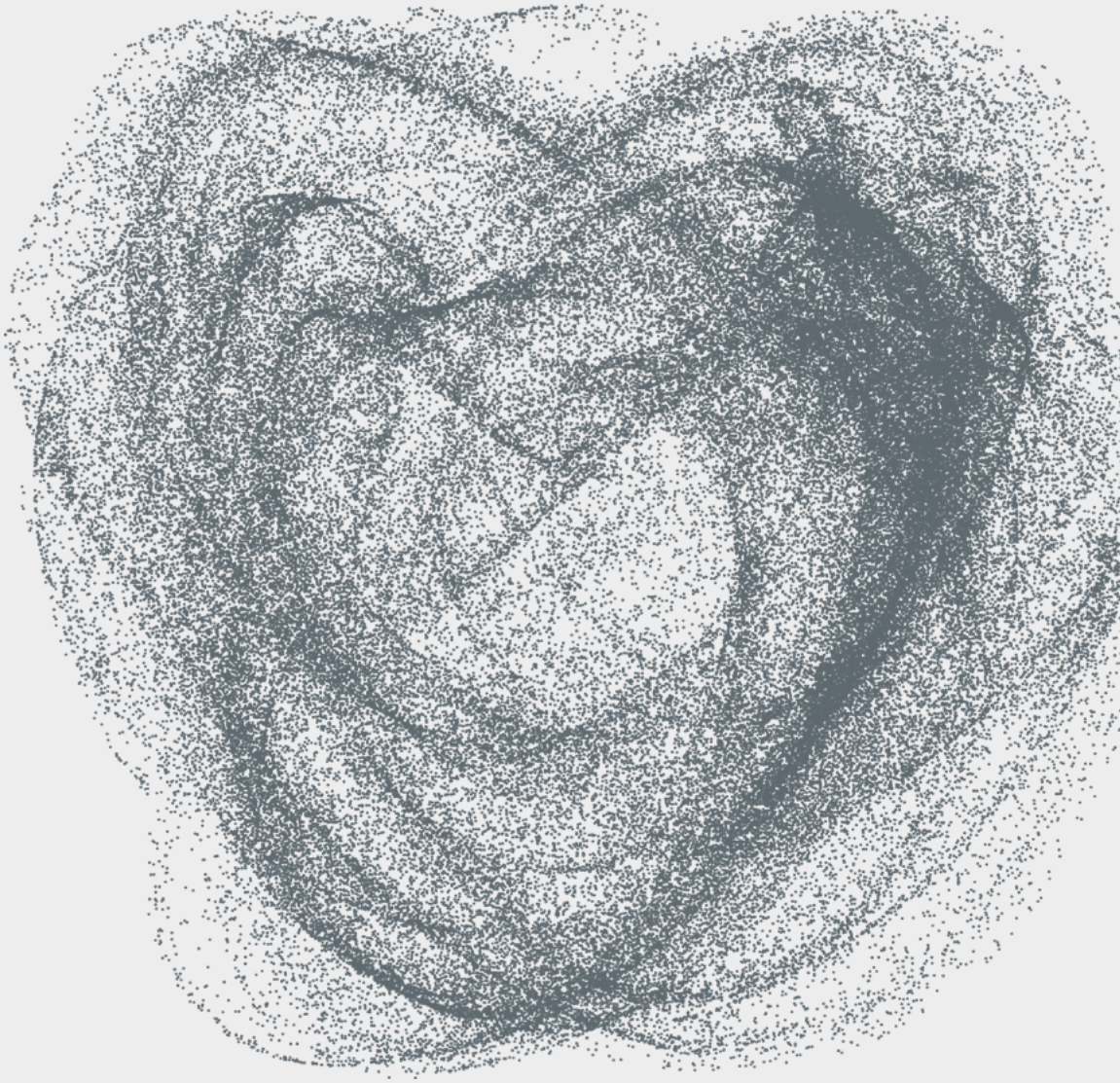
**Guiding Principles**

The Institute operates from a set of guiding principles:

- Healthcare solutions of the future require fact based scientific evidence, expert analysis of information, technology, ingenuity and a focus on individuals.
- Rigorous analysis must be applied to vast amounts of timely, high quality and relevant data to provide value and move healthcare forward.
- Collaboration across all stakeholders in the public and private sectors is critical to advancing healthcare solutions.
- Insights gained from information and analysis should be made widely available to healthcare stakeholders.
- Protecting individual privacy is essential, so research will be based on the use of non-identified patient information and provider information will be aggregated.
- Information will be used responsibly to advance research, inform discourse, achieve better healthcare and improve the health of all people.

*The IQVIA Institute for Human Data Science is committed to using human data science to provide timely, fact-based perspectives on the dynamics of health systems and human health around the world. The cover artwork is a visual representation of this mission. Using algorithms and data from the report itself, the final image presents a new perspective on the complexity, beauty and mathematics of human data science and the insights within the pages.*

*The data is based on medical claims and dispensed new prescriptions related to the utilization of health services in the U.S. after the start of the COVID-19 pandemic as explored in the first chapter of this report.*



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