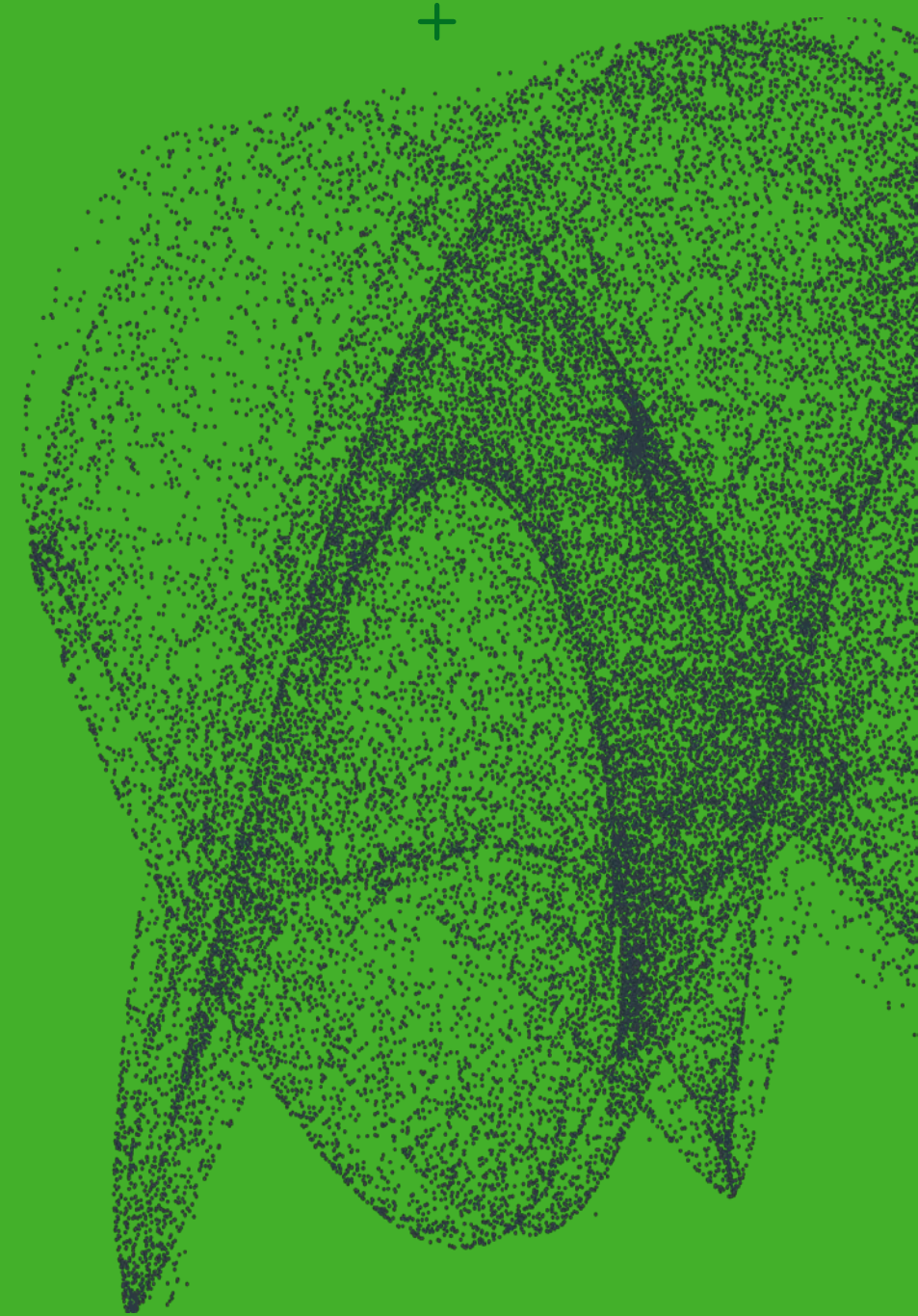# Drug Expenditure Dynamics 1995-2020

Understanding Medicine Spending in Context
**Country Detail Appendix:**

South Korea

Introduction

- This document is intended as an accompanying appendix to the report Understanding the Dynamics of Drug Expenditure 1995-2020.

- The report includes analyses of 11 major countries and provides cross-country and aggregate analyses of these markets.

- This document includes specific country analyses mirroring the main report and intended to illustrate the same dynamics in each country that are shown across countries.

- In some cases, there are important differences from cross-country trends and those are illustrated and highlighted.

- The key findings in relation to each country are summarized and each page represents a specific analysis of interest.

- This document is not an exhaustive analysis or summary of the country, and the primary purpose is to provide the long-history analyses which are unique to this report.

- The exhibits in this report are sometimes complex or include multiple graphics per page. This document ends with several annotated examples of the layout of important exhibits to enable the reader to better understand how to read and understand them.

South Korea
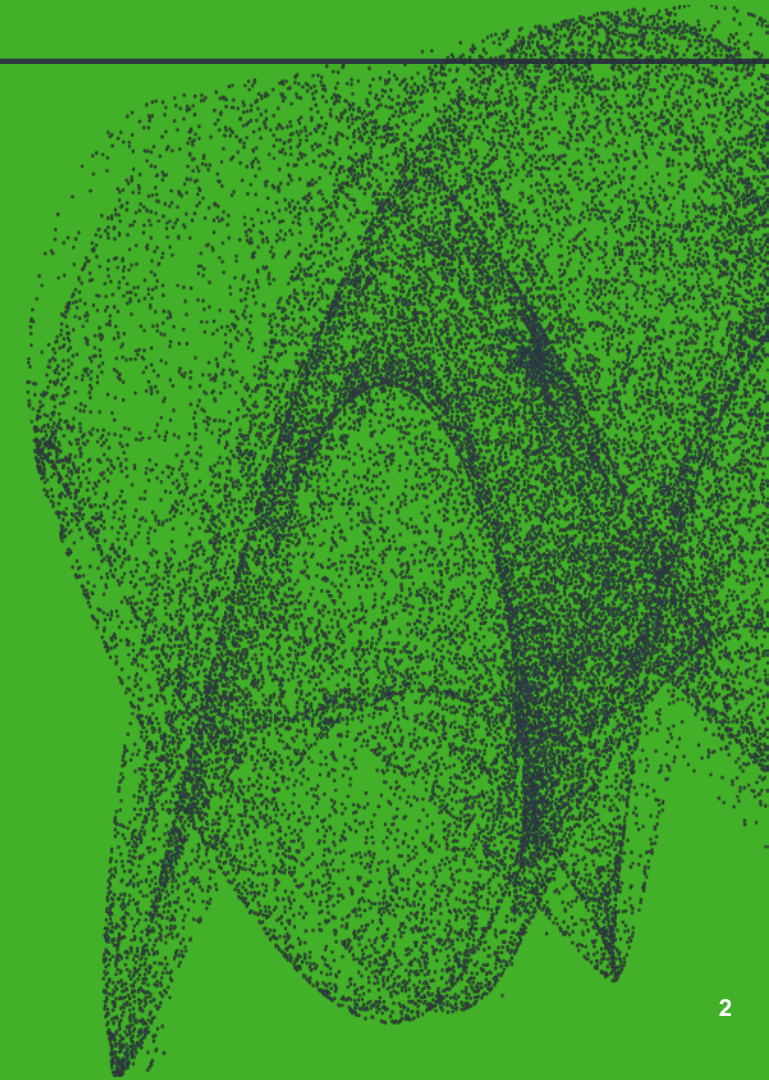
Key findings

- South Korea's share of healthcare spending devoted to drugs has been fluctuating, starting as low as 10% in 1995, peaking at 28% in 2008, and declining to 20% in 2018.

- Drug spending includes retail pharmacy drugs, which represent 13% of total healthcare spending, with an additional 7% of healthcare spending from non-retail.

- Spending remains dominated by generics and off-patent brands, with the protected segment accounting for only a quarter of overall spending.

- The therapy area focus of spending has shifted from traditional classes, which dominated in 1995, to more specialty classes in 2020. Overall, the top five classes of 1995 (respiratory, anti-diabetics, cardiovascular, pain, and HIV anti-virals) represented about 52% of drug spending in 1995, but only 26% of spending in 2020, predominantly driven by genericization. The current leading classes (oncologics, pain, immunology, antithrombotic, and cardiovascular) were 37% of spending in 2020, rising from 20% in 1995, illustrating a shift due to the influx of new treatment options, but to a lesser degree than other markets because of the limited size of the branded market.

- Immunology growth has been driven by increasing usage as cost per day has declined, supported by a robust domestic biosimilar industry.

- Diabetes spending has a much higher share of spending devoted to newer DPP-IV therapies, at 45% of overall diabetes spending.

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Both healthcare and drug spending have grown in recent times in South Korea, which parallels the economic growth in the country

Drug and Healthcare Spending 1995-2018

Per Capita Drug and Health Spending in Real PPP 2020$, 1995-2018
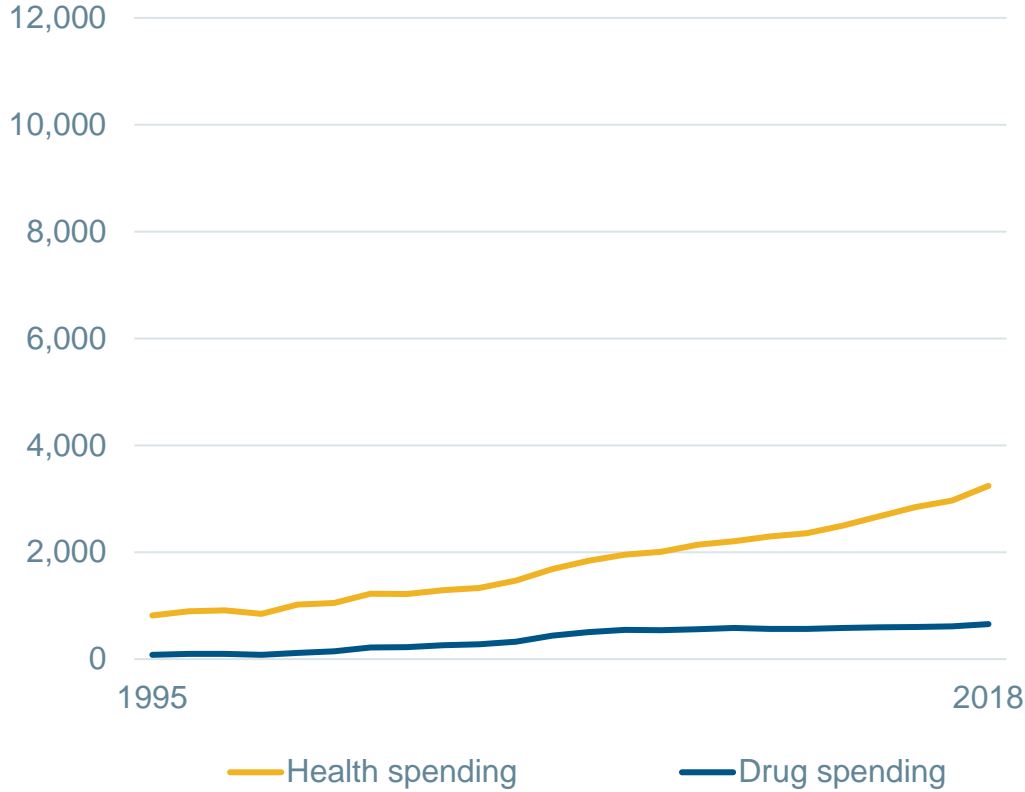
Drug Share of Healthcare Spending in Real PPP 2020$, 1995-2018
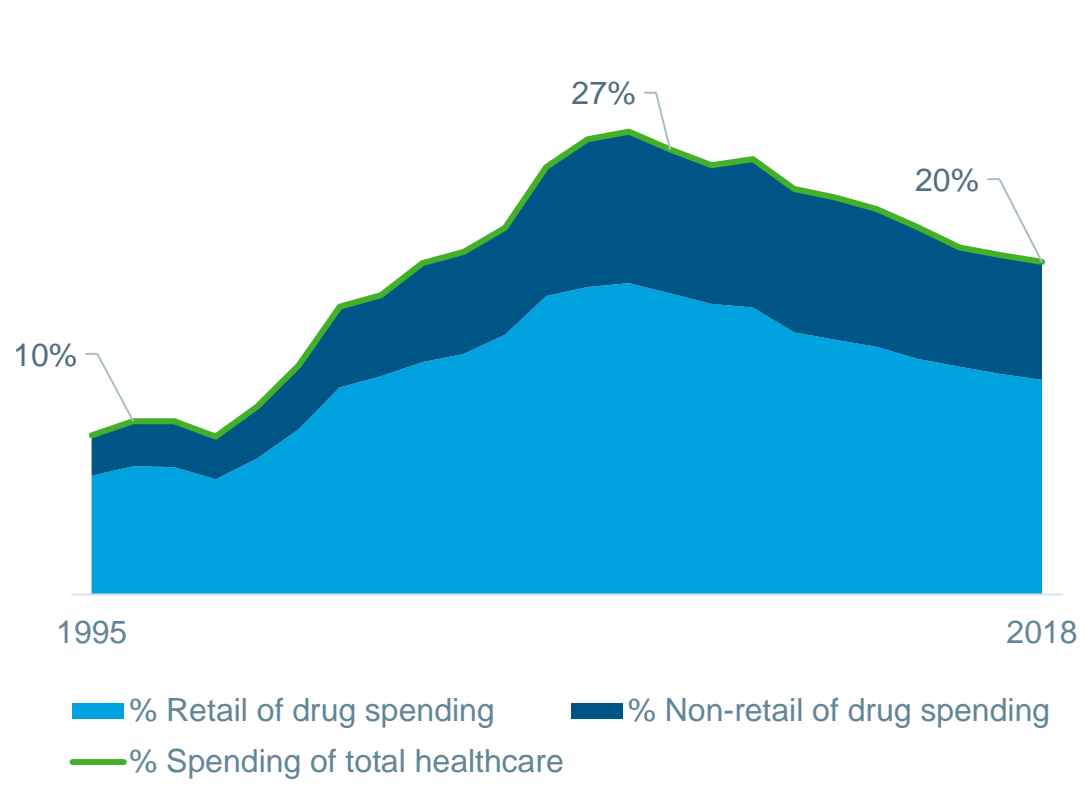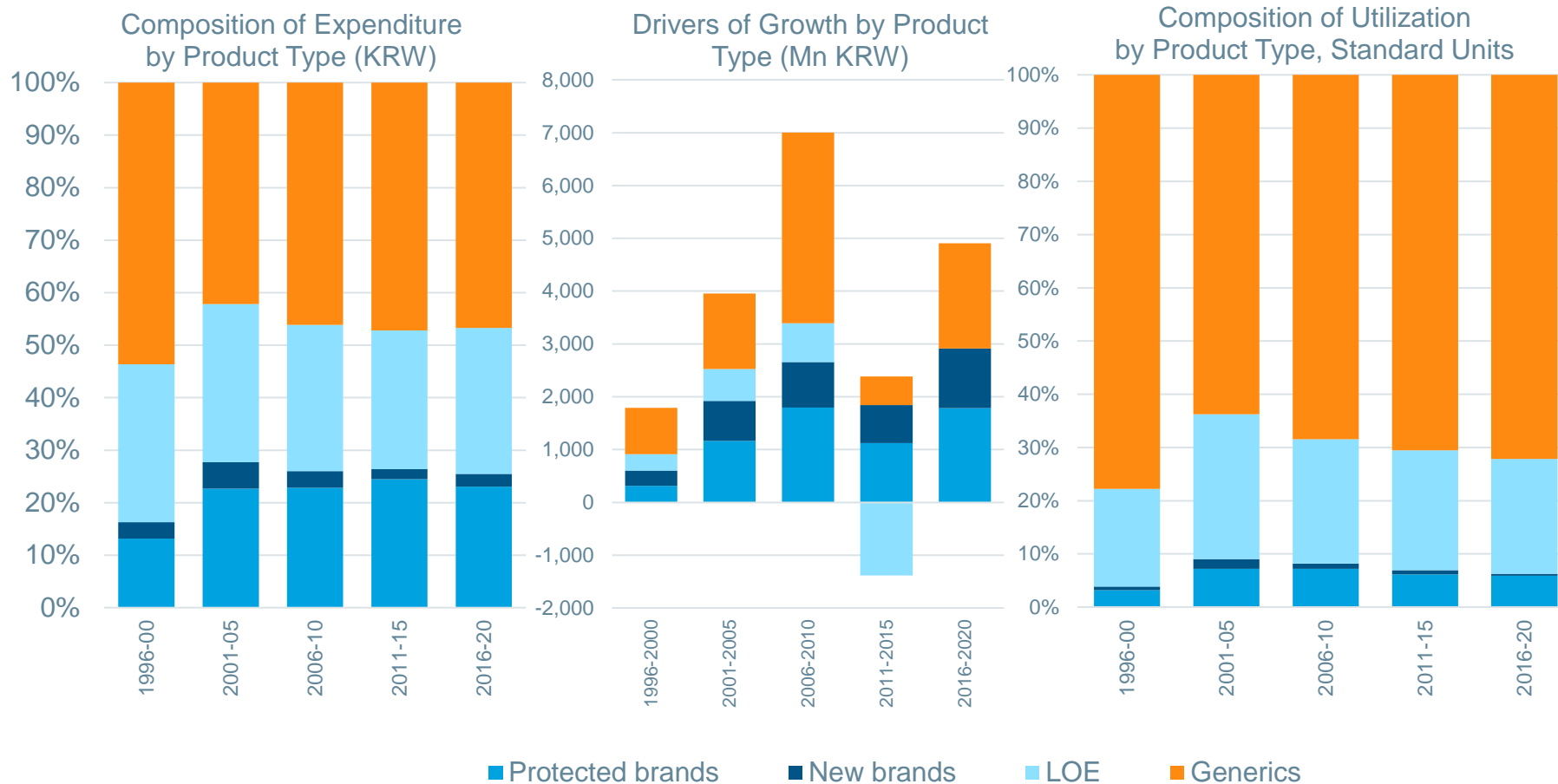
Chart Note: Methodology described in main report *Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context*
Source: IQVIA Institute for Human Data Science, Sep 2021

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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Growth from protected and new brands continues while generics drive higher utilization

South Korea Drug Spending and Utilization 1995-2020

Composition of Expenditure by Product Type (KRW)

Drivers of Growth by Product Type (Mn KRW)

Composition of Utilization by Product Type, Standard Units

- Protected brands, generics, and LOE have a steady share of spending in the past decade consistent with national pricing policy

- Most growth is driven by new and protected brands

- Largely stable generic share of combined generic and LOE segments are also consistent with shifts in policy

■ Protected brands ■ New brands ■ LOE ■ Generics

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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Anti-bacterial class, which contributed to ~20% of total share of spending during early years, declined to 4% in 2020

South Korea Composition of Drug Real Local Currency Spending by Drug Class,1995-2020
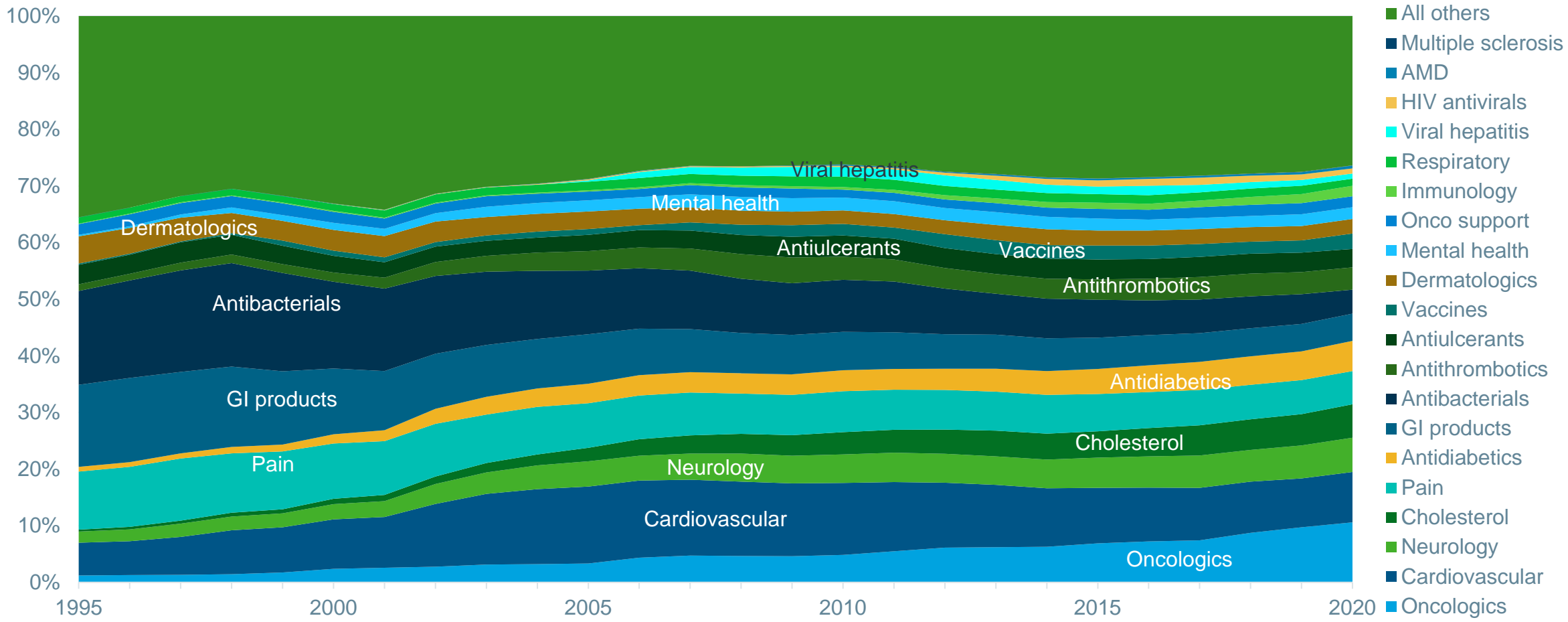
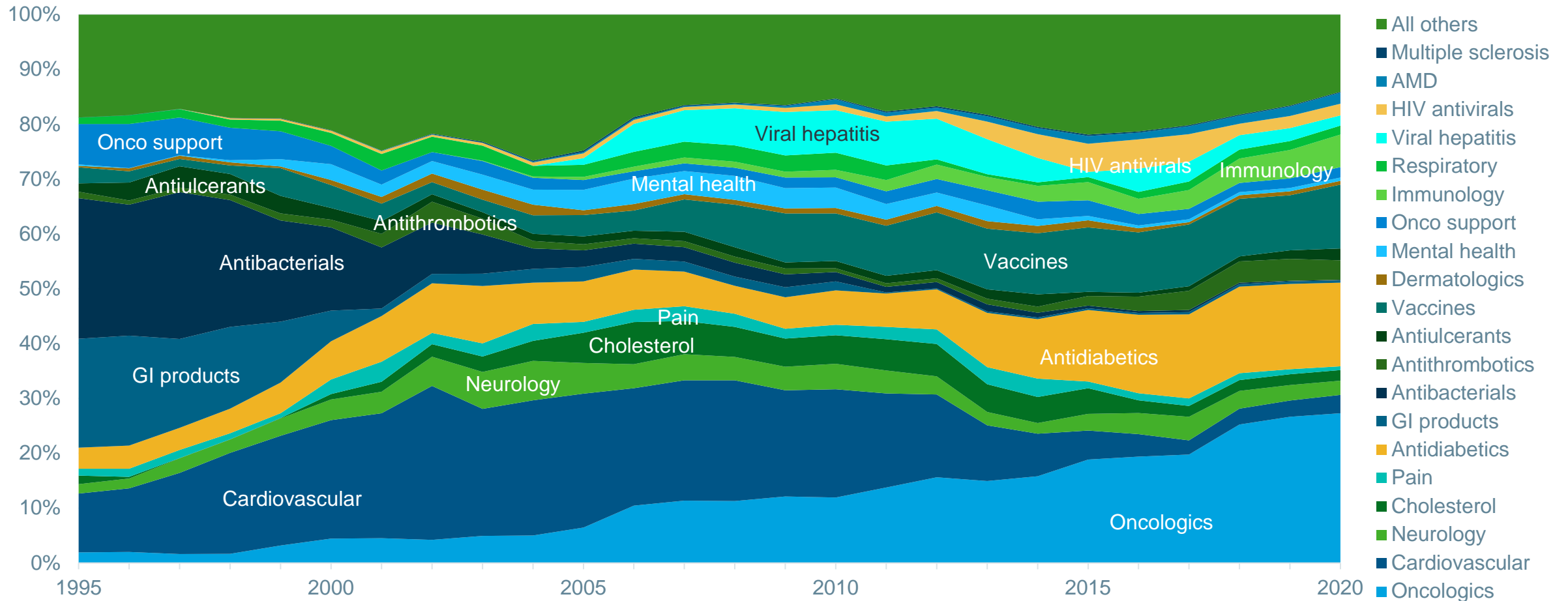# Vaccines, anti-diabetics and oncologics accounted for 54% of the protected brand spending in 2020

South Korea Composition of Protected Brands Real Local Currency Spending by Drug Class 1995-2020

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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Cholesterol market over last 5 years was driven by generics and drugs no longer protected in both spending and utilization

South Korea Cholesterol Volumes, Average Prices and Spending by Product Type, 1995-2020

Real Drug Spending (KRW Mn)

Standard Units (Mn)

Standard Units (Mn) and Average Price Real KRW

■ Protected brands   ■ New brands   ■ LOE   ■ Generics   ■ OTC and other

— Standard units Mn
— Average real expenditure per SU
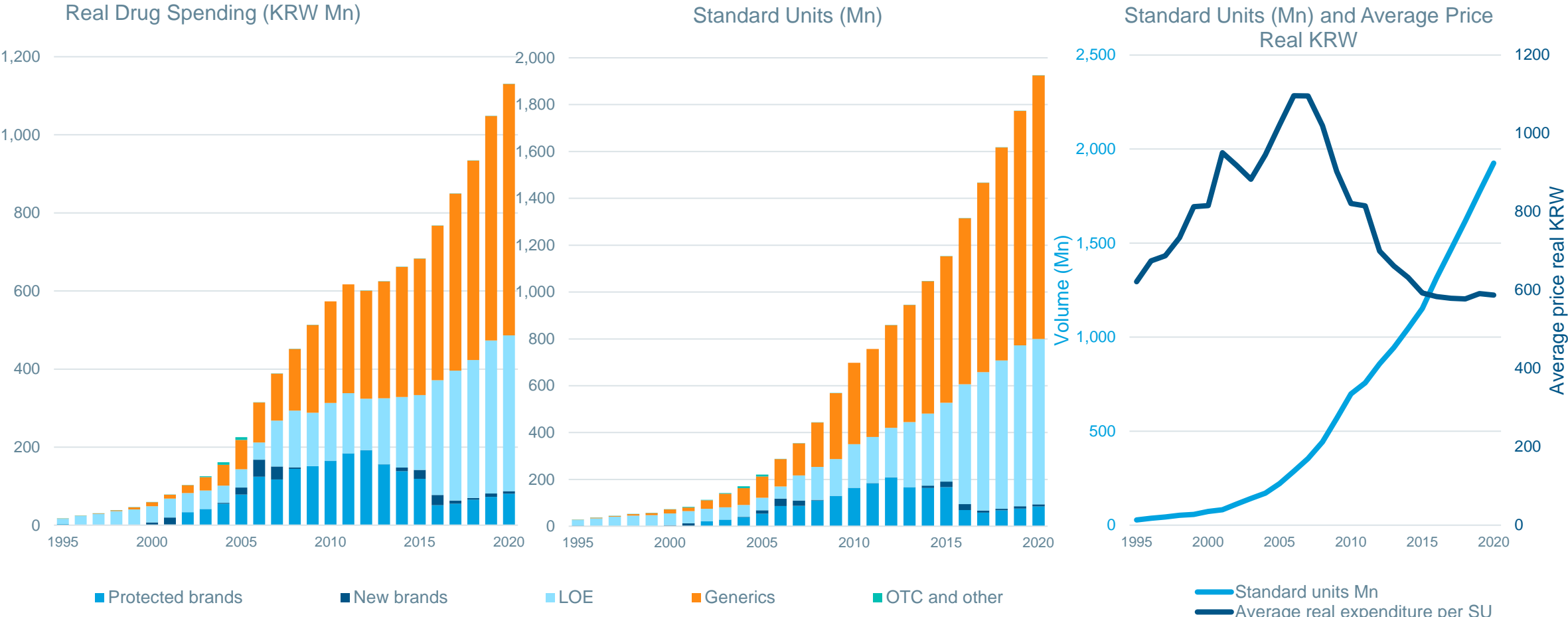
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Anti-bacterial spending has declined, while utilization has stabilized over the past decade; 2020 impacted by COVID-19

South Korea Antibacterial Volumes, Average Prices and Spending by Product Type, 1995-2020

Real Drug Spending (KRW Bn)

Standard Units (Mn)

Standard Units (Mn) and Average Price Real KRW

Volume (Mn)

Average price real KRW

■ Protected brands   ■ New brands   ■ LOE   ■ Generics

— Standard units Mn   — Average real expenditure per SU

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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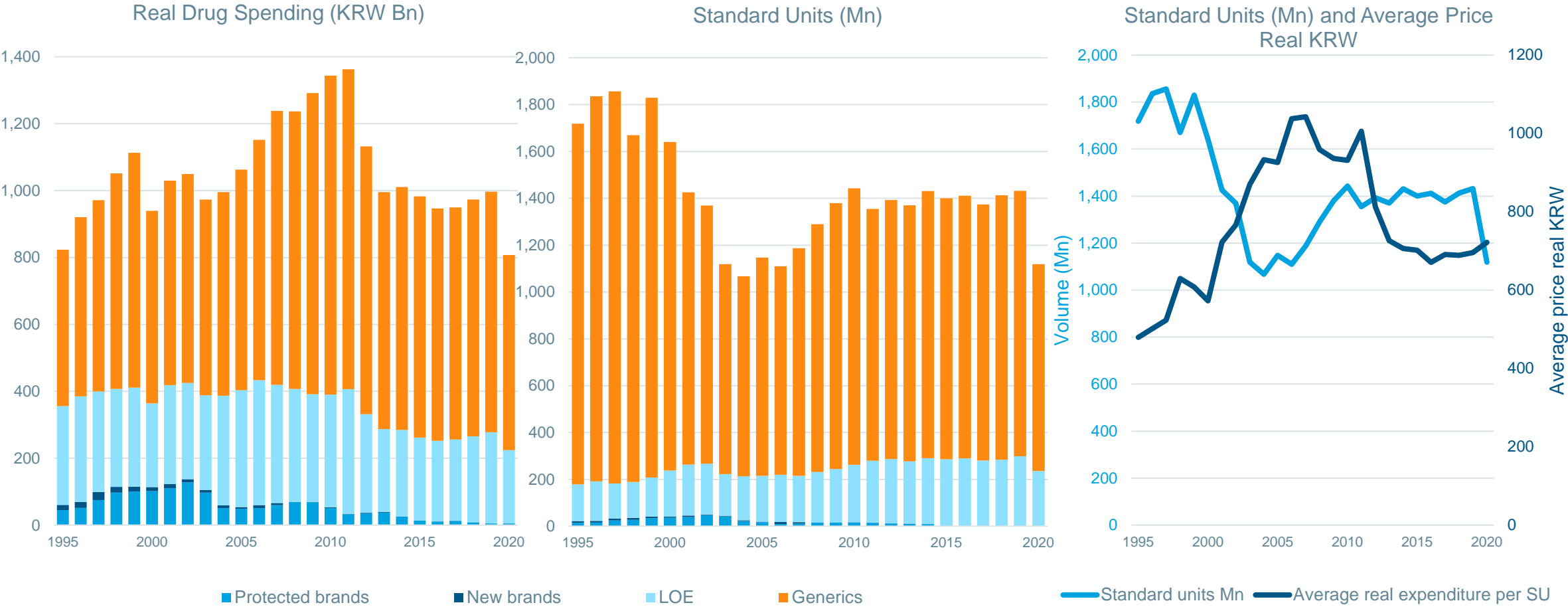
Anti-ulcerant spending and volume both grew in the past decade, largely due to generics and no longer protected brands

South Korea Anti-Ulcerants Volumes, Average Prices and Spending by Product Type, 1995-2020

Real Drug Spending (KRW Bn)

Standard Units (Mn)

Standard Units (Mn) and Average Price Real KRW

Legend: Protected brands | New brands | LOE | Generics | OTC and other | Standard units Mn | Average real expenditure per SU
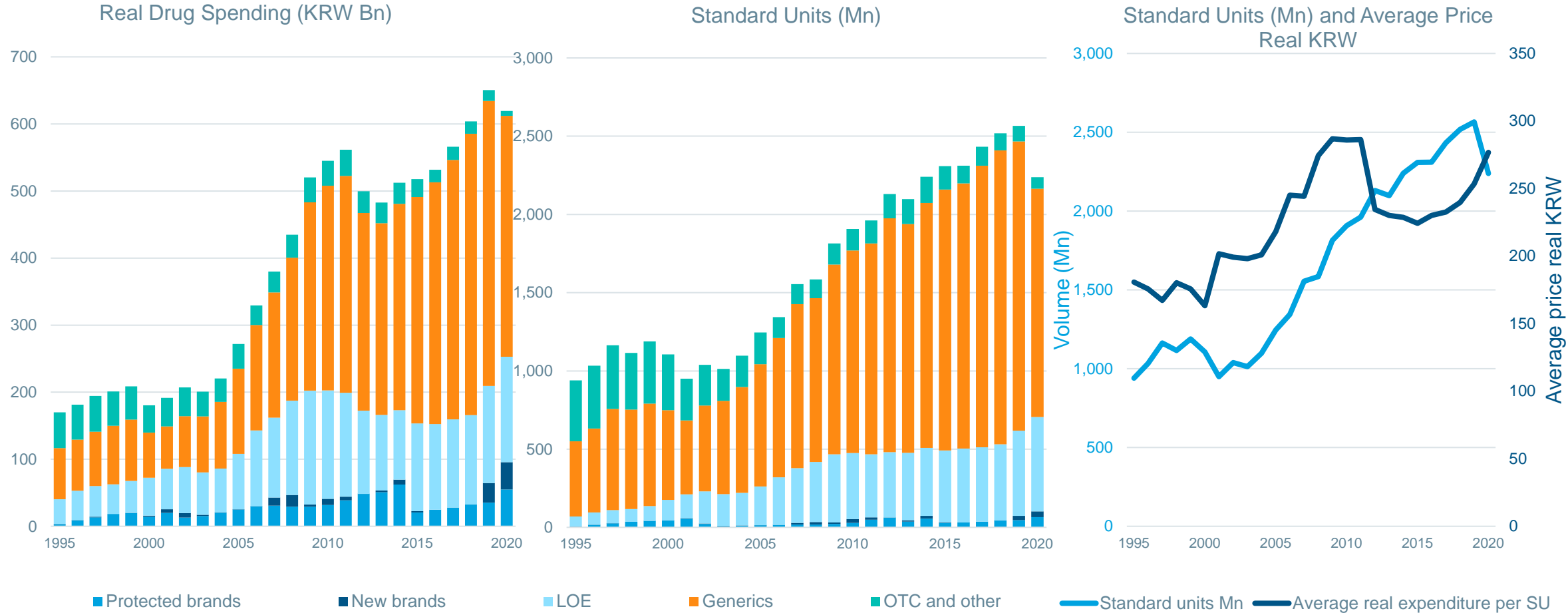
Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Antithrombotic spending peaked in 2006, with ADP receptors and other platelet aggregation accounting for 71% of 2020 spending
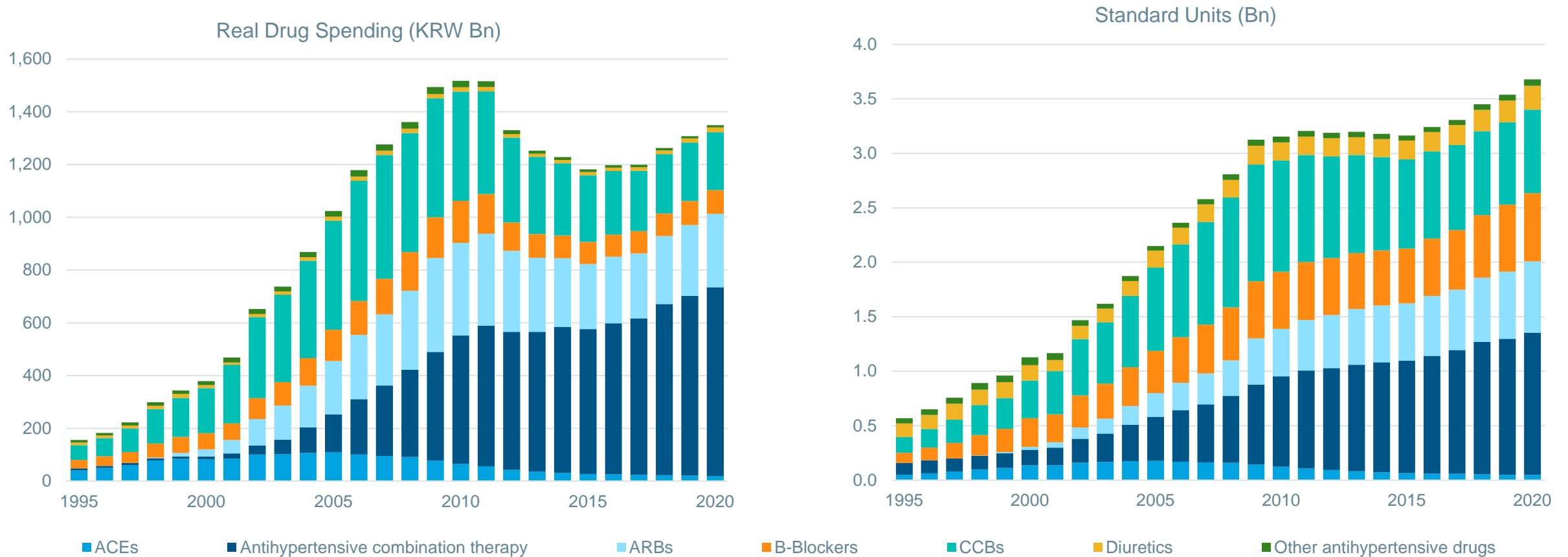
South Korea Antithrombotics Spending and Volumes by Drug Type, 1995-2020

Real Spending (KRW Mn)

Volume Standard Units (Mn)

Legend:
- All other antithrombotics
- Other platelet aggregation inhibitors
- ADP receptor antagonists
- Factor Xa
- Heparins
- Vitamin K antagonists
- Thrombin inhibitors

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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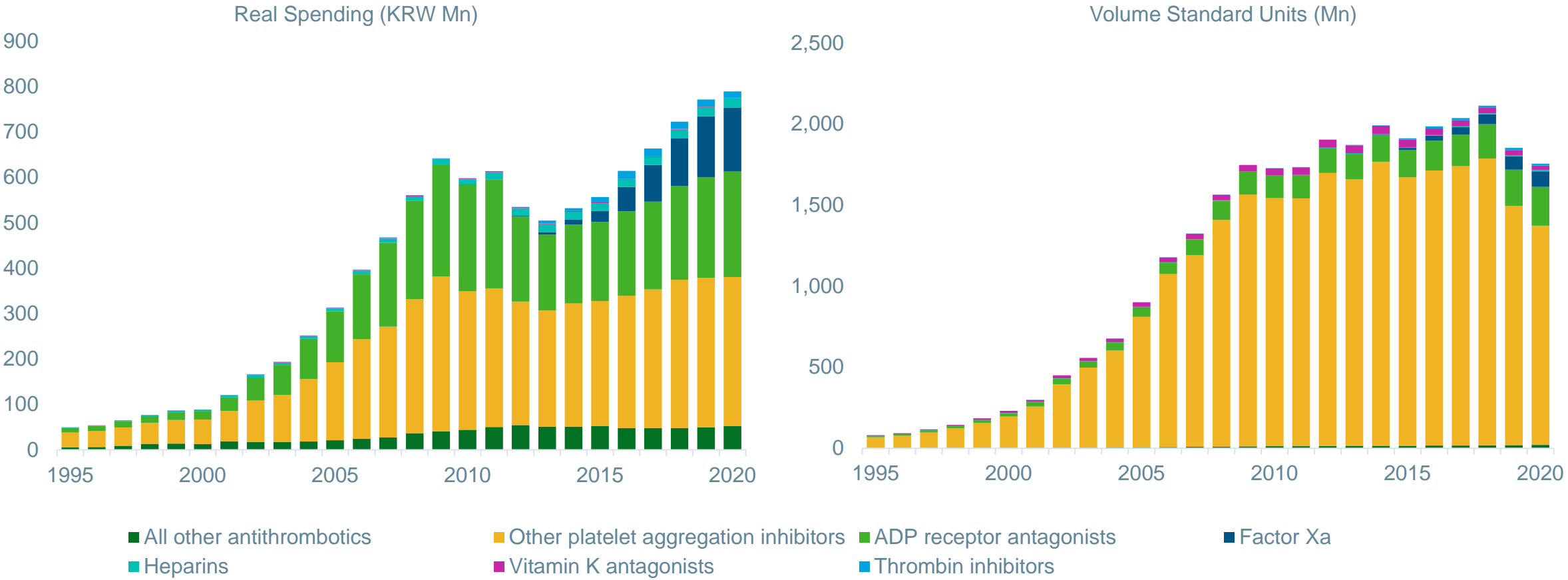
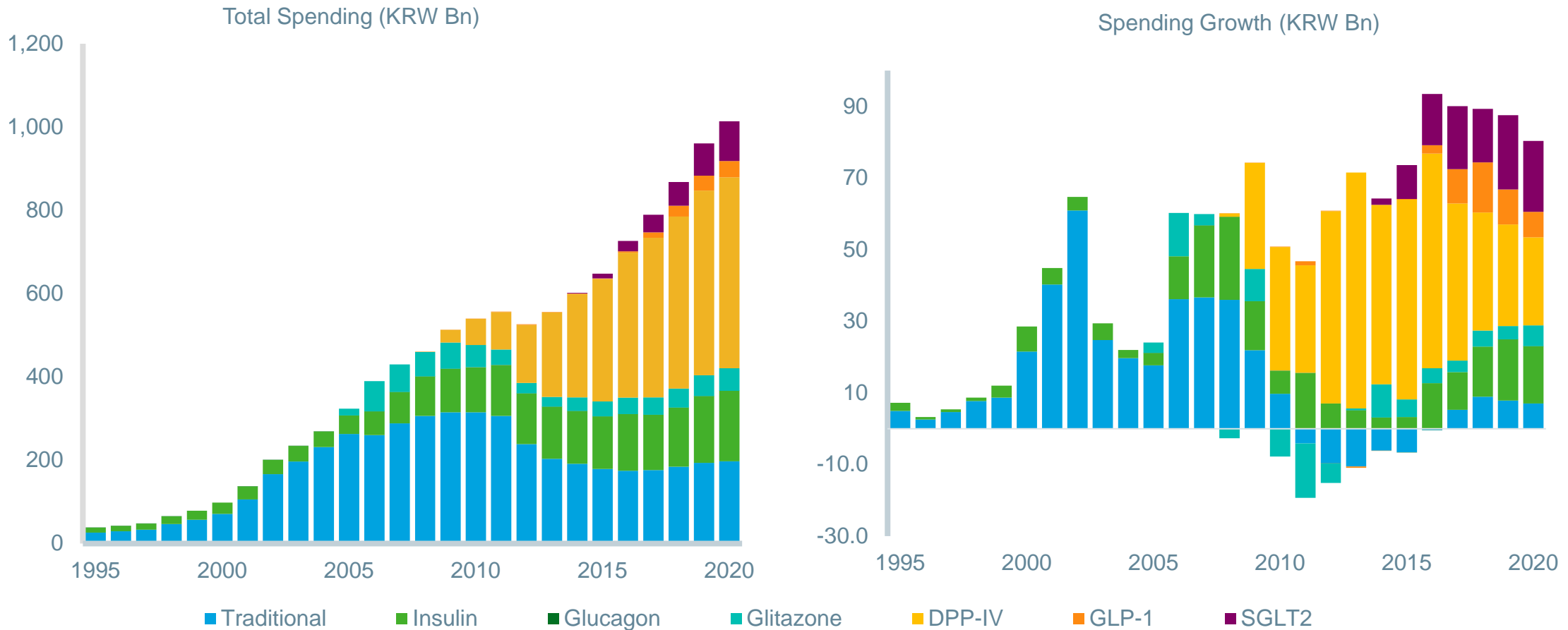# Hypertension spending peaked in 2010 and declined 10% over last 10 years, while usage has continued to increase

South Korea Hypertension Spending and Volume by Mechanism, 1995-2020

Real Drug Spending (KRW Bn)

Standard Units (Bn)

Legend: ACEs · Antihypertensive combination therapy · ARBs · B-Blockers · CCBs · Diuretics · Other antihypertensive drugs

Diabetes DPP-IV therapies were 45% of spending and driving growth, while traditional therapies and insulins were 36% in 2020

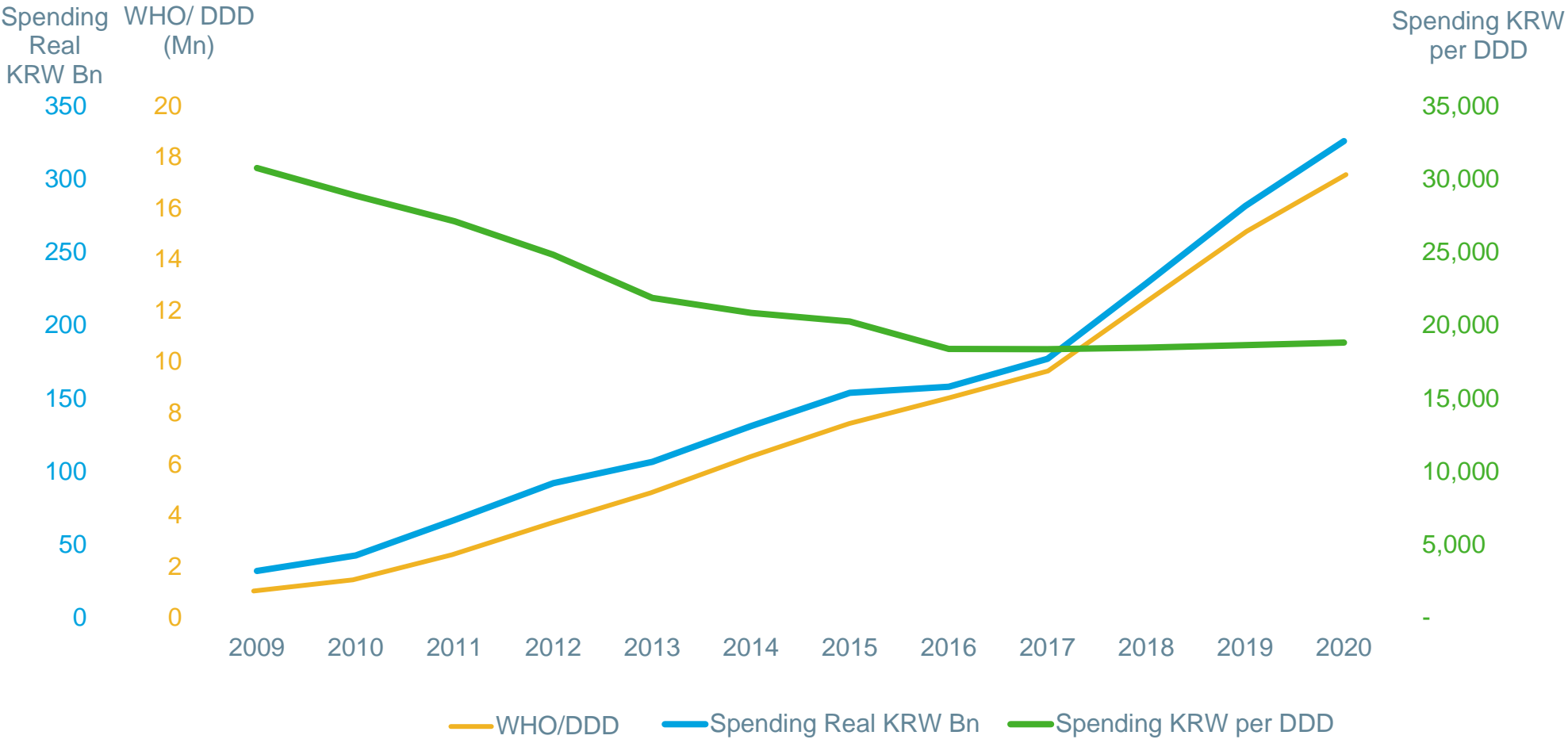*South Korea Diabetes Real Spending and Growth KRW (Mn) by Drug Type, 1995-2020*

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

Auto-immune cost per day declined 39% since 2009, whereas usage increased from 1 Mn to 17 Mn days of therapy over the same period

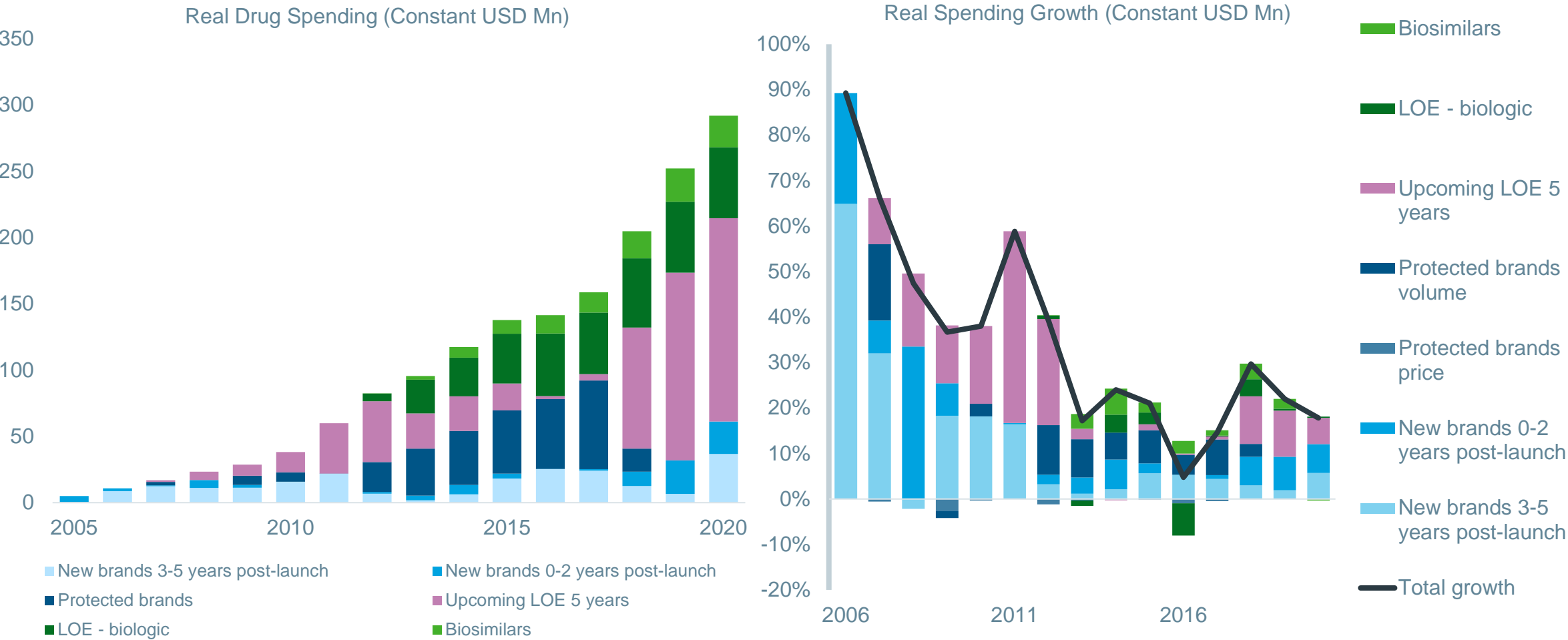*South Korea Auto-immune Biologic Spending, DDD and Cost, 2009-2020*

WHO/DDD — Spending Real KRW Bn — Spending KRW per DDD

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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Auto-immune biosimilar competitors, often local companies, captured share of spending in the early 2010s

South Korea Auto-immune Biologic Invoice Spending and Growth Drivers, 2005-2020

Real Drug Spending (Constant USD Mn)

Real Spending Growth (Constant USD Mn)

Legend (left chart):
- New brands 3-5 years post-launch
- New brands 0-2 years post-launch
- Protected brands
- Upcoming LOE 5 years
- LOE - biologic
- Biosimilars

Legend (right chart):
- Biosimilars
- LOE - biologic
- Upcoming LOE 5 years
- Protected brands volume
- Protected brands price
- New brands 0-2 years post-launch
- New brands 3-5 years post-launch
- Total growth

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Vaccine spending increased steadily over the past decade, with a sharp uptake in flu, shingles, and HPV vaccines in the past year

South Korea Vaccine Spending and Volumes by Drug Type, 1995-2020

Real Spending (KRW Mn)

Standard Units (Mn)

Legend:
- Combination vaccines
- Hepatitis vaccine
- HPV vaccine
- Meningococcal vaccine
- Pneumococcal vaccine
- Rotavirus vaccine
- Influenza vaccine
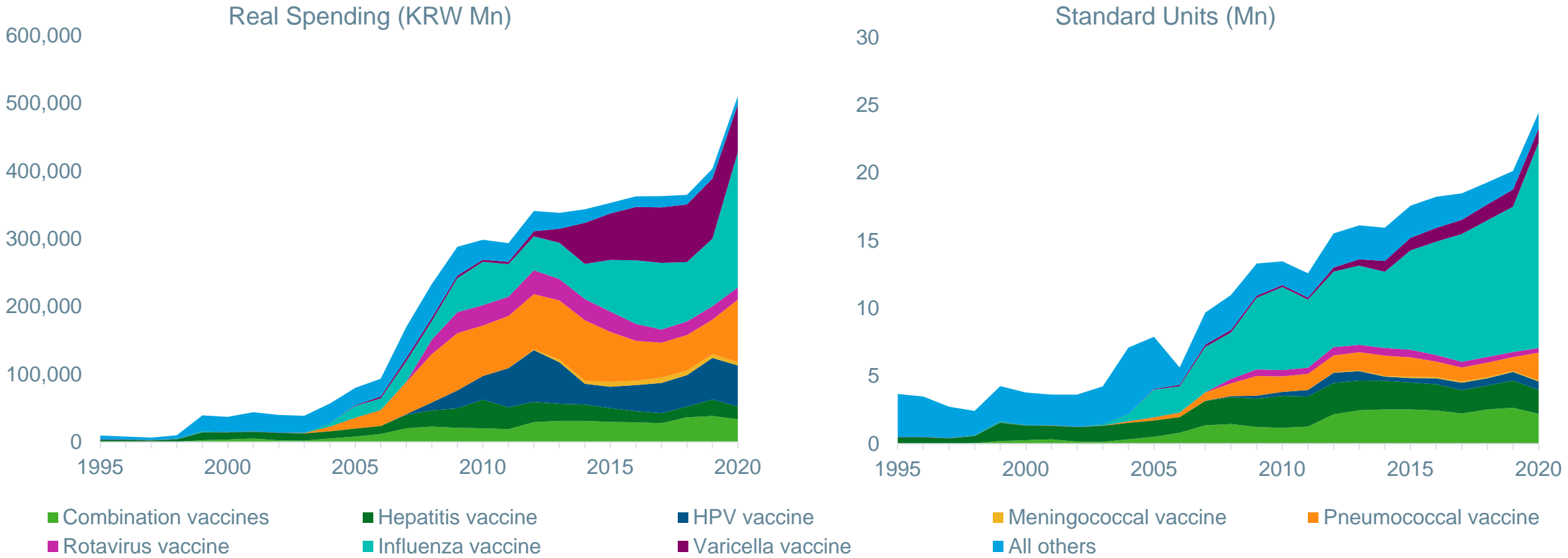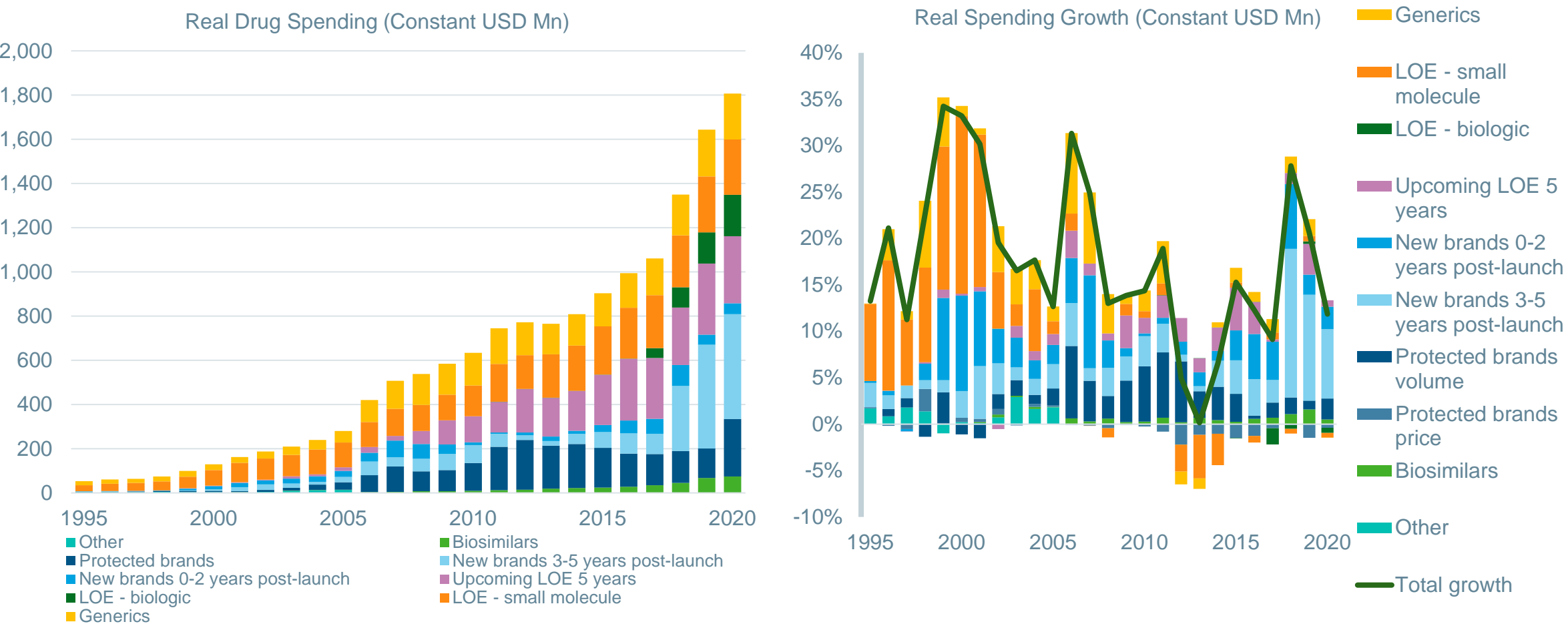- Varicella vaccine
- All others

Chart notes: Combination vaccines represent combined vaccines (with measles, mumps, tetanus or other); HPV vaccine for human papillomavirus; Meningococcal vaccine for meningitis; Pneumococcal vaccine for pneumonia; Rotavirus vaccine for rotavirus; Influenza vaccine for the flu; Varicella vaccine for shingles; and All others for cholera, tetanus, typhoid and other viral/bacterial vaccines.
Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

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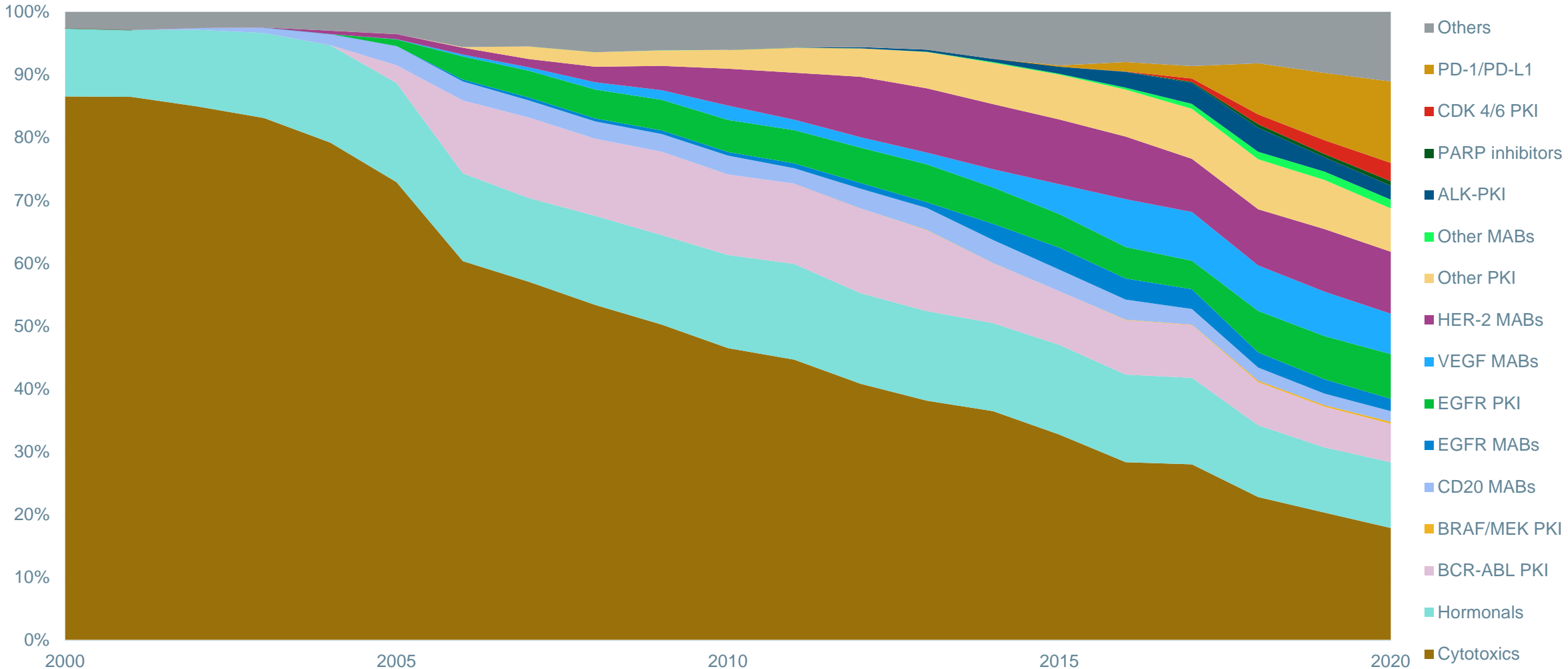# Oncology growth has been driven by new brands in their first 5 years on the market, especially in the last 3 years

South Korea Oncology Invoice Spending and Spending Growth Drivers, 1995-2020

Real Drug Spending (Constant USD Mn)

Real Spending Growth (Constant USD Mn)

Legend:
- Generics
- LOE - small molecule
- LOE - biologic
- Upcoming LOE 5 years
- New brands 0-2 years post-launch
- New brands 3-5 years post-launch
- Protected brands volume
- Protected brands price
- Biosimilars
- Other
- Total growth

Left chart legend:
- Other
- Protected brands
- New brands 0-2 years post-launch
- LOE - biologic
- Generics
- Biosimilars
- New brands 3-5 years post-launch
- Upcoming LOE 5 years
- LOE - small molecule

Successive waves of novel targeted cancer drugs have contributed to spending, especially in the past 5 years

South Korea Oncology Real Local Currency Spending by Mechanism, 2000-2020

Legend:
- Others
- PD-1/PD-L1
- CDK 4/6 PKI
- PARP inhibitors
- ALK-PKI
- Other MABs
- Other PKI
- HER-2 MABs
- VEGF MABs
- EGFR PKI
- EGFR MABs
- CD20 MABs
- BRAF/MEK PKI
- BCR-ABL PKI
- Hormonals
- Cytotoxics

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context South Korea Detail Appendix

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In last 5 years, HIV integrase inhibitors and their combinations contributed 38% of total spending

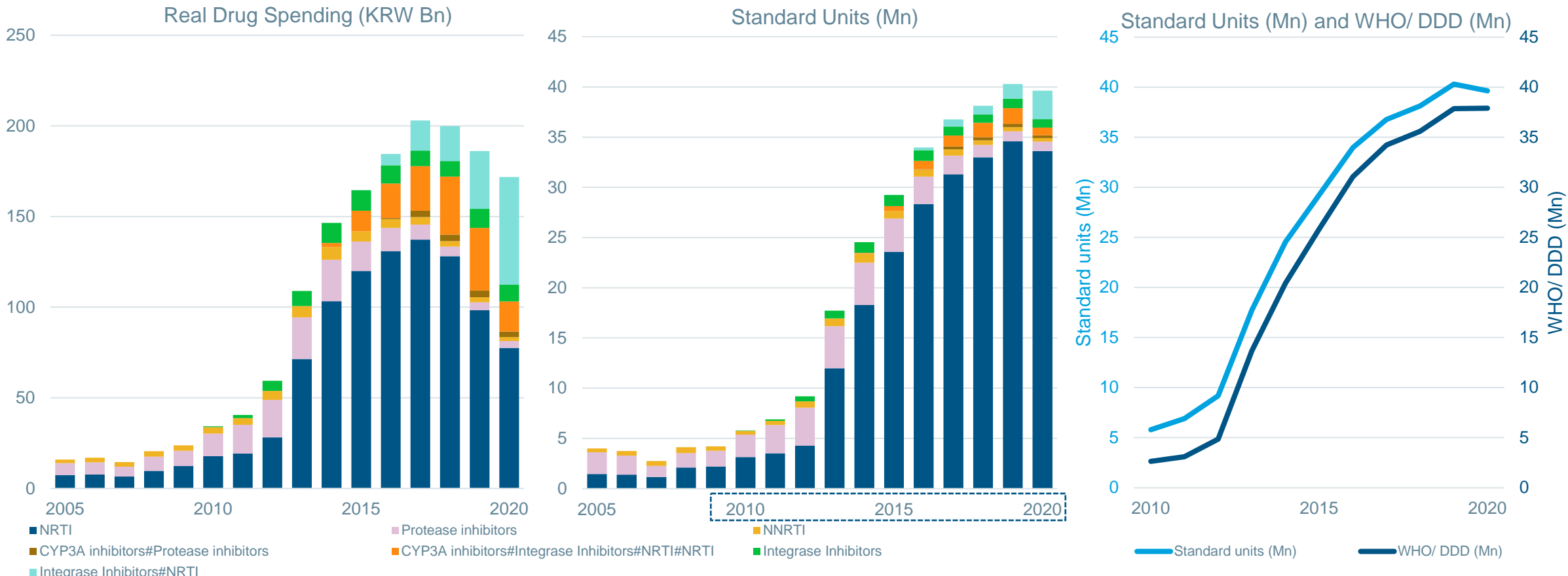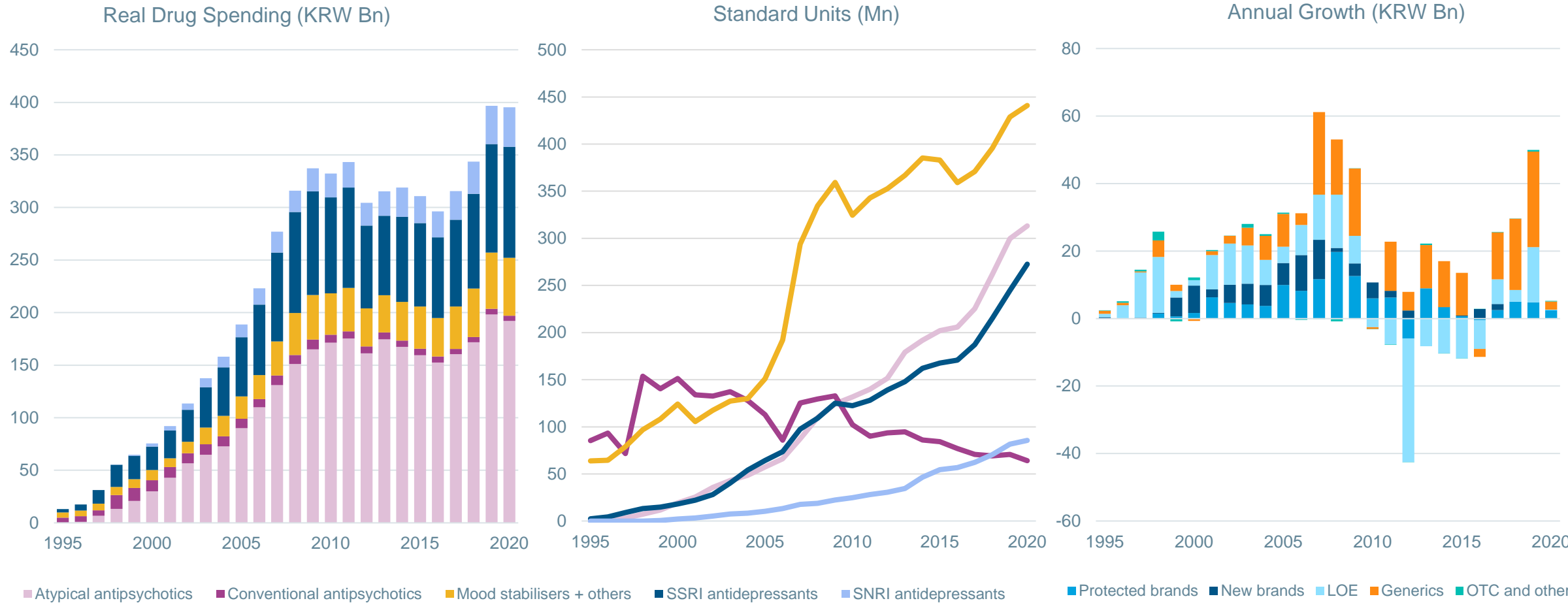*South Korea HIV Spending and Volume by Mechanism, 2005-2020*

Real Drug Spending (KRW Bn)

Standard Units (Mn)

Standard Units (Mn) and WHO/ DDD (Mn)

Legend:
- NRTI
- Protease inhibitors
- NNRTI
- CYP3A inhibitors#Protease inhibitors
- CYP3A inhibitors#Integrase Inhibitors#NRTI#NRTI
- Integrase Inhibitors
- Integrase Inhibitors#NRTI
- Standard units (Mn)
- WHO/ DDD (Mn)

Chart notes: NRTI - Nucleos(t)ide reverse transcriptase inhibitor; NNRTI - Non- nucleoside reverse transcriptase inhibitor; CYP3A inhibitors - cytochrome P450 3A CYP3A inhibitors; # is used to define the combinations of mechanisms used in respective categories.
Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

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The impact of mental health patent expiries shifted spending to generics; growth stifled in 2020, likely due to COVID-19

South Korea Mental Health Spending by Mechanism and Annual Growth by Product Type,1995-2020

Real Drug Spending (KRW Bn)

Standard Units (Mn)

Annual Growth (KRW Bn)

■ Atypical antipsychotics ■ Conventional antipsychotics ■ Mood stabilisers + others ■ SSRI antidepressants ■ SNRI antidepressants

■ Protected brands ■ New brands ■ LOE ■ Generics ■ OTC and other

Source: IQVIA MIDAS; IQVIA Institute, Dec 2020

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Illustration and explanation of data and chart layouts
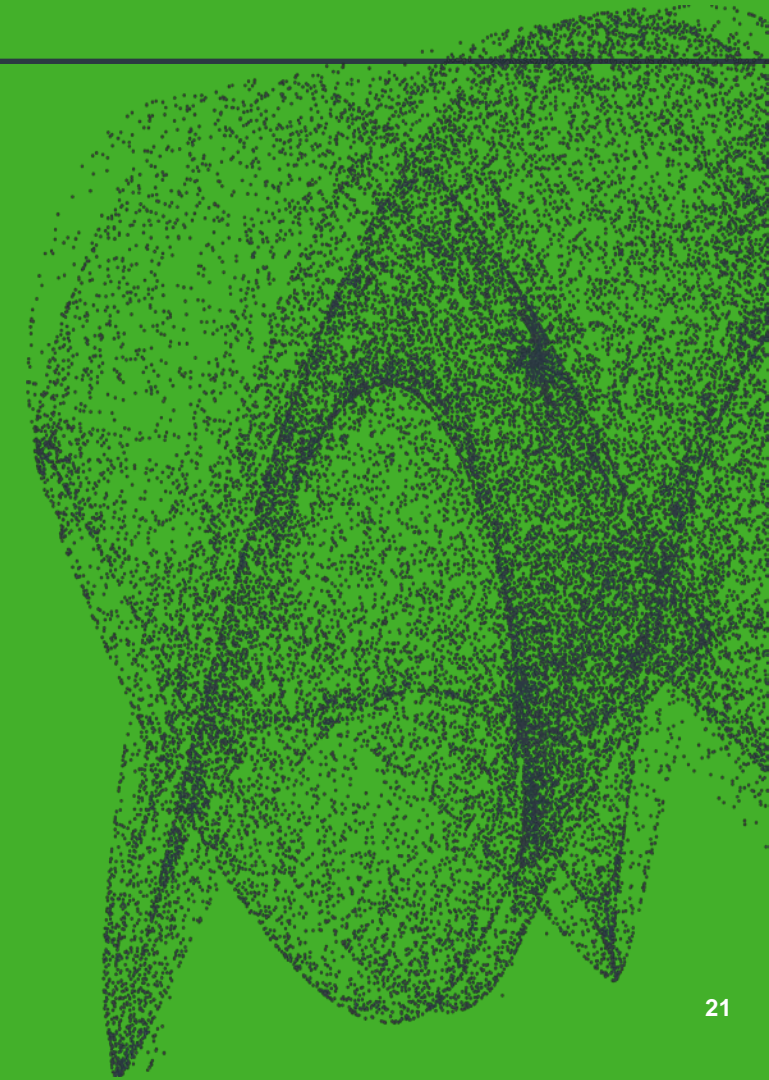
Drug and Healthcare Spending Analyses

Key elements to note for interpreting charts
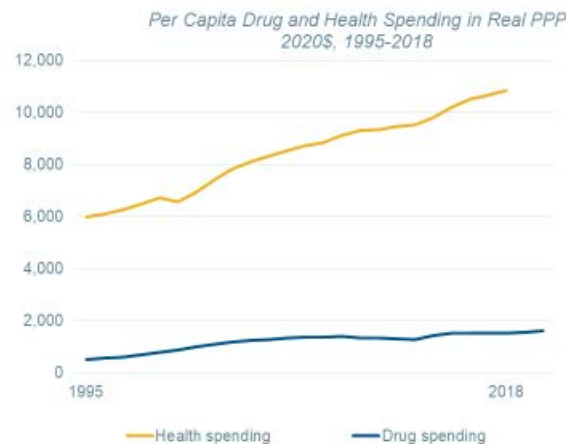

Drug and Healthcare Spending 1995-2018
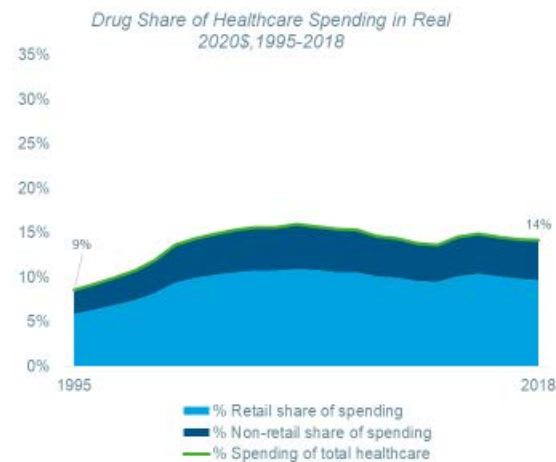
Per Capita Drug and Health Spending in Real PPP 2020$, 1995-2018

Drug Share of Healthcare Spending in Real 2020$, 1995-2018

- Health spending
- Drug spending

- % Retail share of spending
- % Non-retail share of spending
- % Spending of total healthcare

Chart Note: Methodology described in main report *Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context*
Source: IQVIA Institute for Human Data Science, Sep 2021

Drug Expenditure Dynamics 1995-2020: Understanding Medicine Spending in Context U.S Detail Appendix

- **Drug and healthcare spend have been adjusted for economic growth ('real' GDP growth has been removed), population growth, and for cost of living differences (Purchasing Power Parity – PPP).**
- **Drug spending as a percentage of healthcare spending uses estimates of total drug spending in all channels (retail and hospital) and after discounts and rebates.**
- **The hospital drug spend adds 1-11 percentage points, depending on the country, to the retail drug share of healthcare that is most often reported by governments (OECD).**
- **The right-most chart illustrates how much of overall drug spending is attributable to non-retail spending, which is significant and varies over time.**

Drug spending is segmented by type of product, changing over time for some products to enable more complex analyses

Illustrating the Drug Type Segmentation Used in the Report
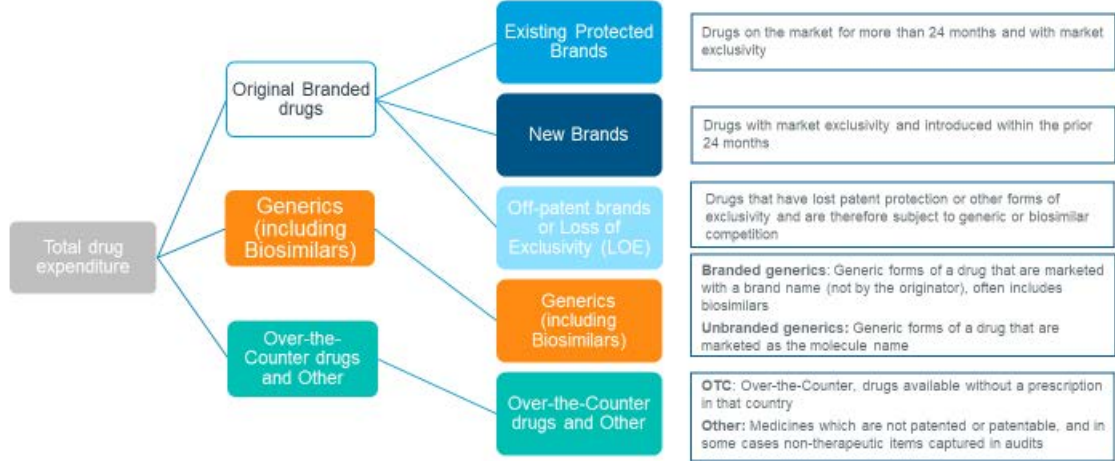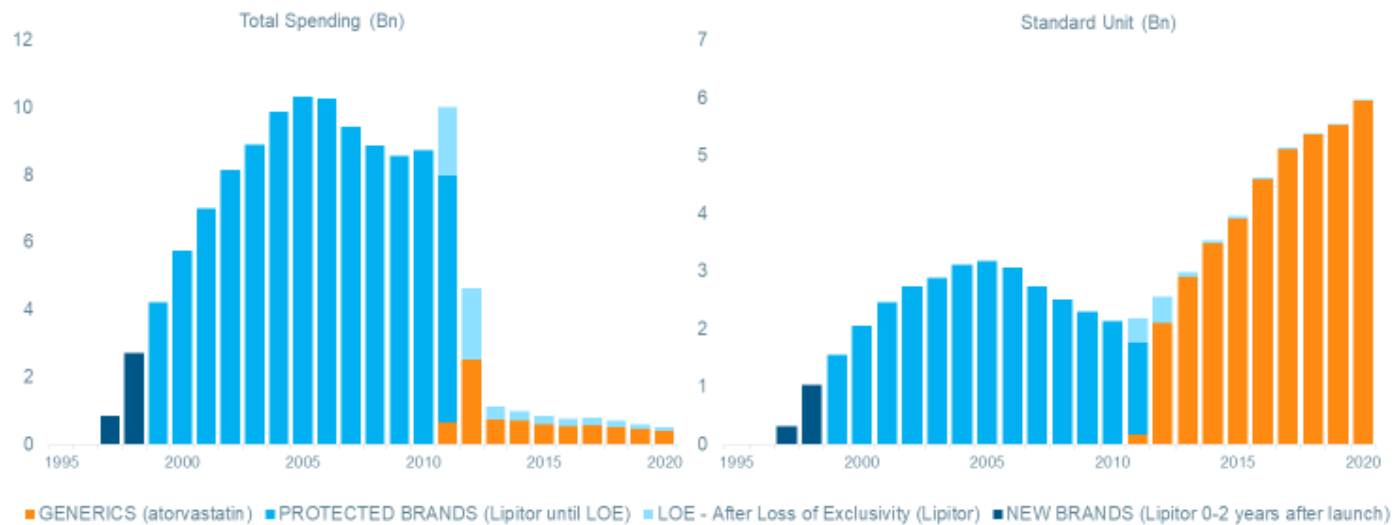

Drug Expenditure Segmented by Type of Drug

- Analyses in this report that use product segmentations as shown here are based on IQVIA audited data. They do not reflect payer net spending due to the confidential nature of some of the discounts and rebates. Unless a page indicates a non-IQVIA source, the analysis would not be adjusted for off-invoice discounts and rebates.
- Products have been segmented both by the way they are marketed (brands, generics, biosimilars, Over-the-counter) as well as by the status of their patent or other types of protection.
- Existing Protected brands are those which are no longer 'new' and are not yet off-patent.
- Nnew brands are defined as those products within their first 2 years in the market; however, some analytics in this report specifically identify older new brands from 3-5 years after launch.
- Loss of exclusivity is the status for branded products that are off-patent or no longer protected (but still had sales in the market) and these terms are used interchangeably in the report.
- Generics and biosimilars are treated in the same segment unless noted specifically on the chart.
- Over-the-counter status is a country-specific regulatory status and some drugs have both prescription-bound and OTC packs in the market.
- Other is a status where products either do not have typical brand or generic or protection statuses or where the product is no longer marketed and it was not possible to apply segmentation.

Illustration: product segmentation drug lifecycle dynamics

Example of Drug Type Segmentation using a single medicine

Exhibit x: Illustration of U.S. branded and generic segmentation, Lipitor and Atorvastatin generics

Legend:
- GENERICS (atorvastatin)
- PROTECTED BRANDS (Lipitor until LOE)
- LOE - After Loss of Exclusivity (Lipitor)
- NEW BRANDS (Lipitor 0-2 years after launch)

- **In this example, the drug 'atorvastatin' begins life as a New Brand when Lipitor launched.**
- **The segmentation changes after 24 months to 'Protected Brand'. Analyses are based on quarterly time periods and a product may be considered new in 3 calendar years depending on the timing of launch in a country.**
- **At the point of patent expiry, the brand Lipitor becomes LOE, and new competing Generics enter the market.**
- **The left chart shows 'spending,' which is reflected in the currency noted on each chart. In the report the currencies. are most often normalized to real 2020$ with constant US$ exchange rates, but in the country appendix local currencies are used.**
- **The right chart shows values in standard units. Standard units vary by form and are generally not recommended to report in this aggregated way. However most drugs in the therapy areas were similar enough to enable this analysis.**

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Illustration of data and charts in this report

Country level overview of product types

Drug Spending and Utilization 1995-2020
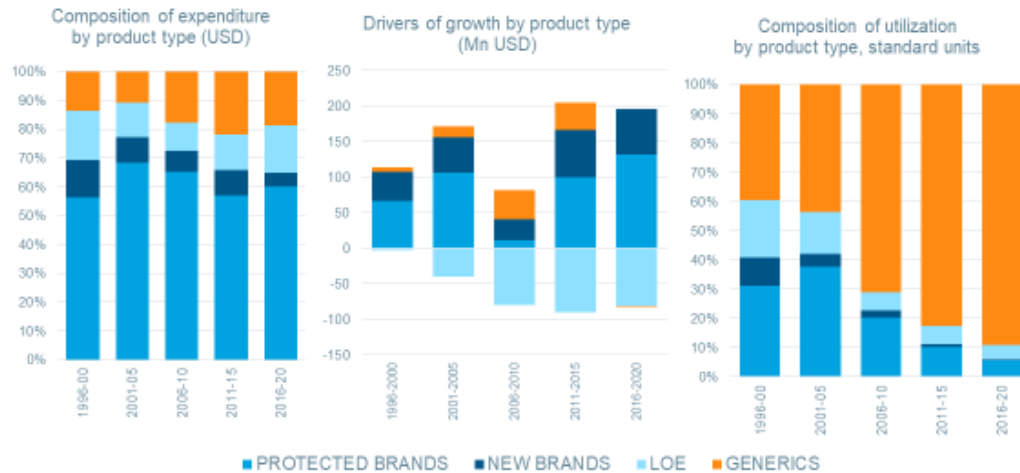
- Protected brands including new products average less than 70% of spending consistently
- Generic share of combined generic and LOE segments increasing steadily over time
- Generic share of volume increasing as generations of products shift to off-patent
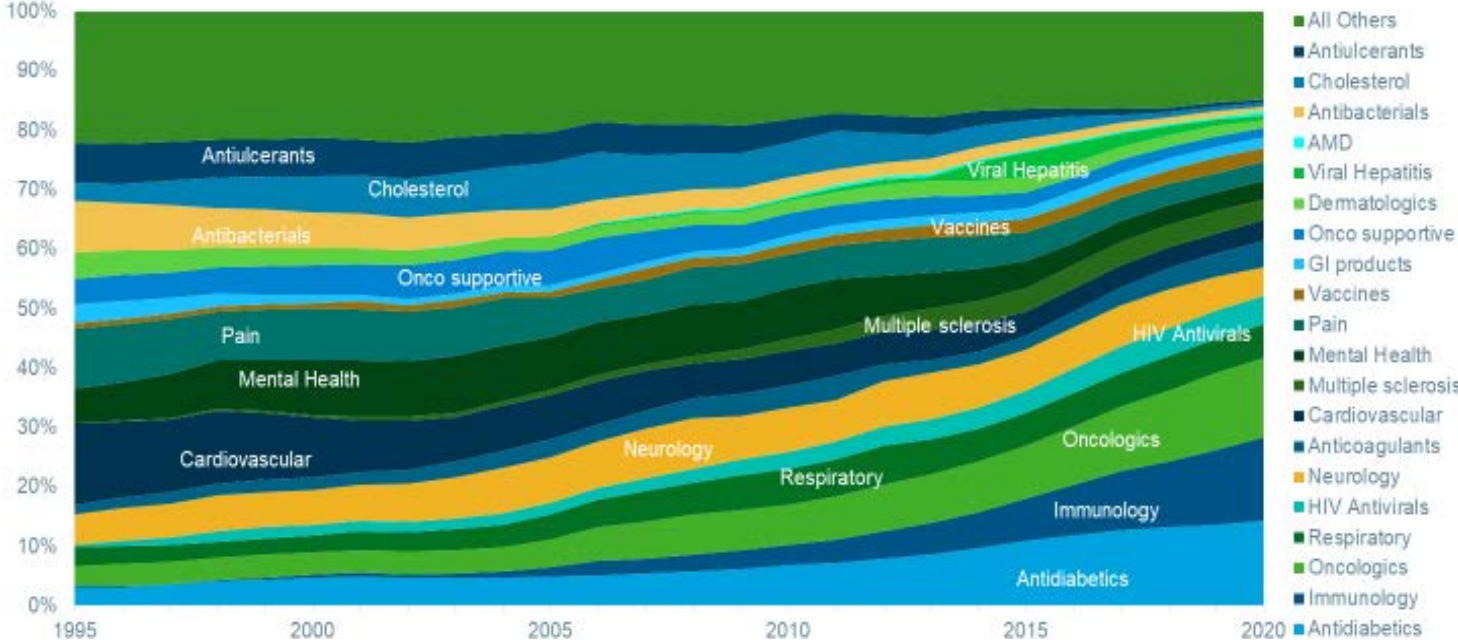- Most growth is driven by protected brands including new products, and offset by losses of exclusivity

- **This analysis includes three views of drug spending, growth and volume in standard units, each present in the cross-country comparison section of the report and repeated in the beginning of each country section of the appendix.**
- **Spending is IQVIA audited sales and does not reflect off-invoice discounts and rebates.**
- **The drivers of growth chart is represented in absolute values of the currency noted.**
- **Products each have a segment status in each time period, and growth is a representation of the current group of products and their growth compared to prior periods. The product status in the prior period is not considered.**
- **Growth on an annual basis has been added together into 5-year groupings.**
- **Standard units are highly dissimilar by formulation and not recommended.**

Illustration of data and charts in this report

Total drug spending over time on 100% scale by top 20 Therapy areas

US Composition of Drug Real Local Currency Spending by Drug Class, 1995-2020

Legend: All Others, Antiulcerants, Cholesterol, Antibacterials, AMD, Viral Hepatitis, Dermatologics, Onco supportive, GI products, Vaccines, Pain, Mental Health, Multiple sclerosis, Cardiovascular, Anticoagulants, Neurology, HIV Antivirals, Respiratory, Oncologics, Immunology, Antidiabetics

- **Total IQVIA audited spending over 25 years has been collated and grouped by therapy areas.**
- **The therapy areas are defined by IQVIA with details of the definitions in the main report methodology section.**
- **The therapy areas called out by name are the classes that were ranked in the top 20 the most often across the eleven countries studied across the 25 years. This can mean that some classes which have declined in sales outside the top 20 in the most recent period are still shown.**

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Therapy area charts with sales, volume and cost by type of drug

Example of single therapy area with multiple metrics analyzed

US Cholesterol Volumes, Average Prices and Spending by Product Type, 1995-2020
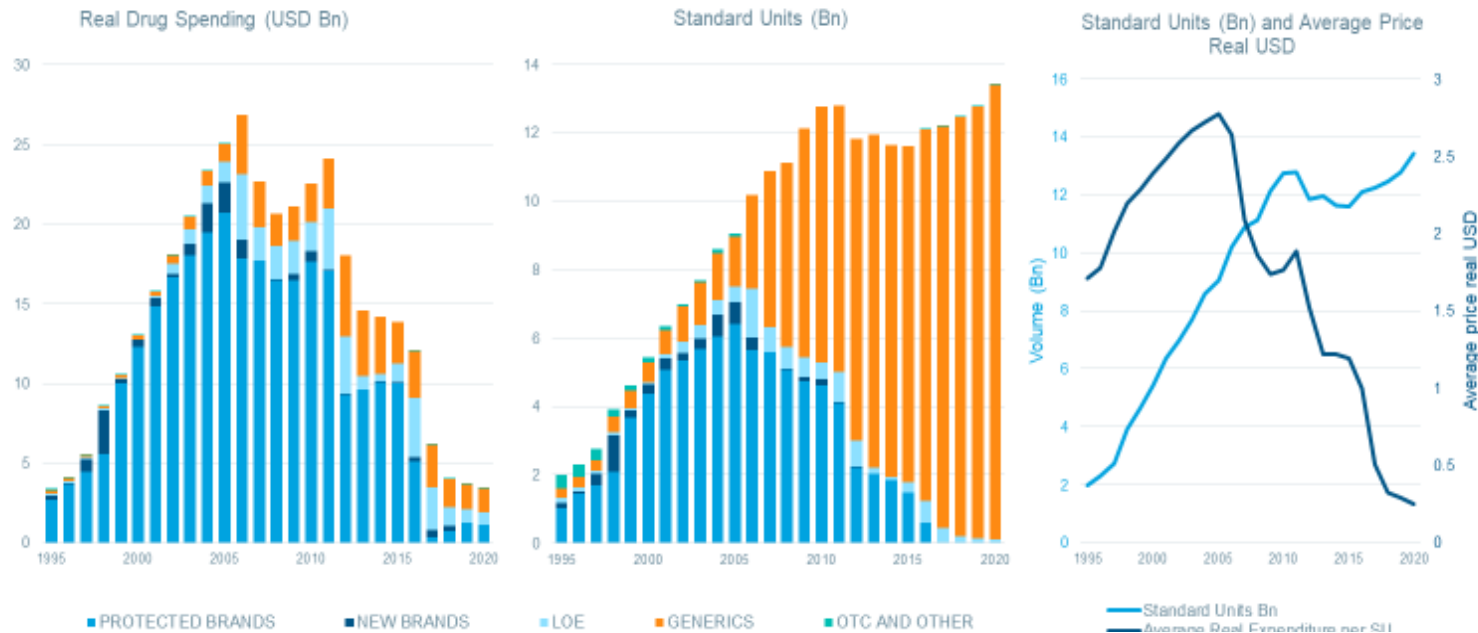
- **Some analyses show three charts in this orientation, with spending, standard unit volume and finally a chart of volume and average cost per standard unit.**
- **Spending and cost are based on IQVIA audited data and do not reflect discounts and rebates.**
- **The segmentations shown in the charts are the same as described earlier.**
- **The average cost calculation is at the therapy area level.**

Therapy areas showing subclasses by mechanism of action

Illustration of a therapy area using multiple analysis metrics

U.S. Diabetes Real Spending, Volume and Growth USD (Mn) by Drug Type, 1995-2020

Legend: Traditional, Insulin, Glucagon, Glitazone, DPP-IV, GLP-1, SGLT2
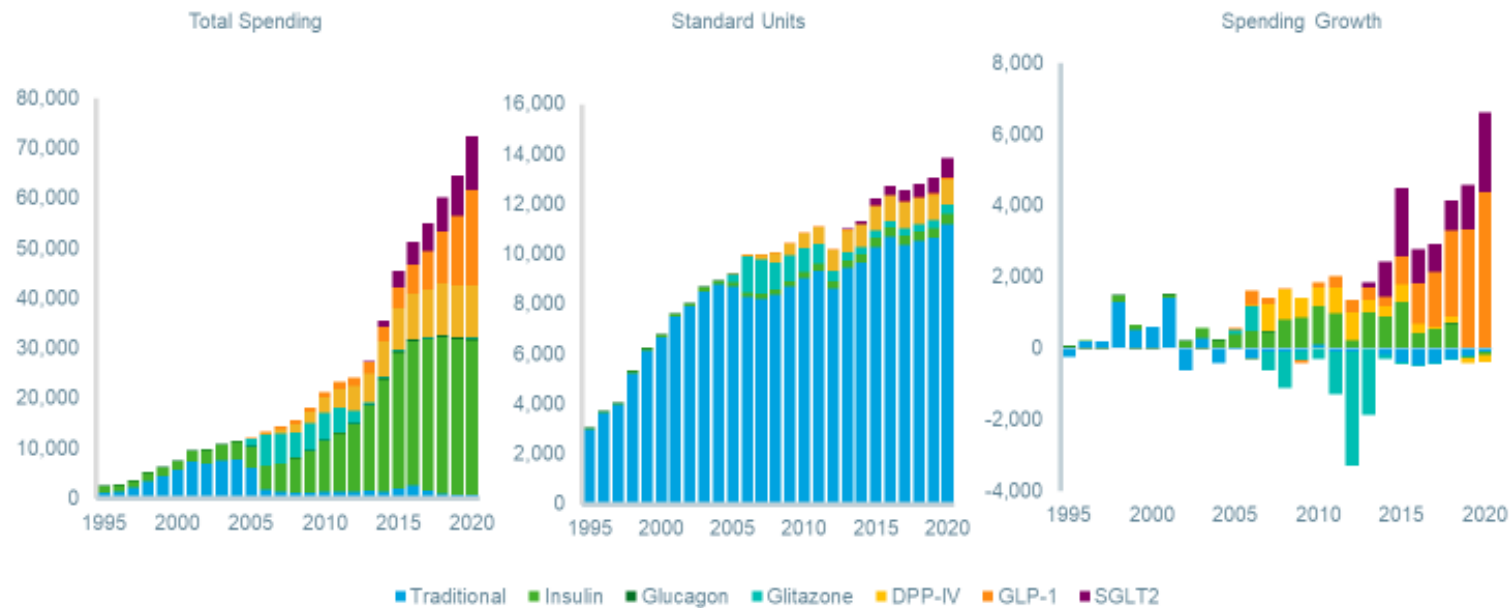
- Some therapy area charts include spending, standard units and spending growth.
- All are shown in the currency value noted.
- The colors of the chart indicate therapy sub segments, typically indicating shifts in the types of medicines used over time.

Autoimmune biologic charts

Illustration of three metrics on three axes on the same chart

Cost per day in immunology had been rising rapidly but has slowed since the first introduction of biosimilars in 2016

US Auto-immune Biologic Spending, DDD and Cost 2009-2020
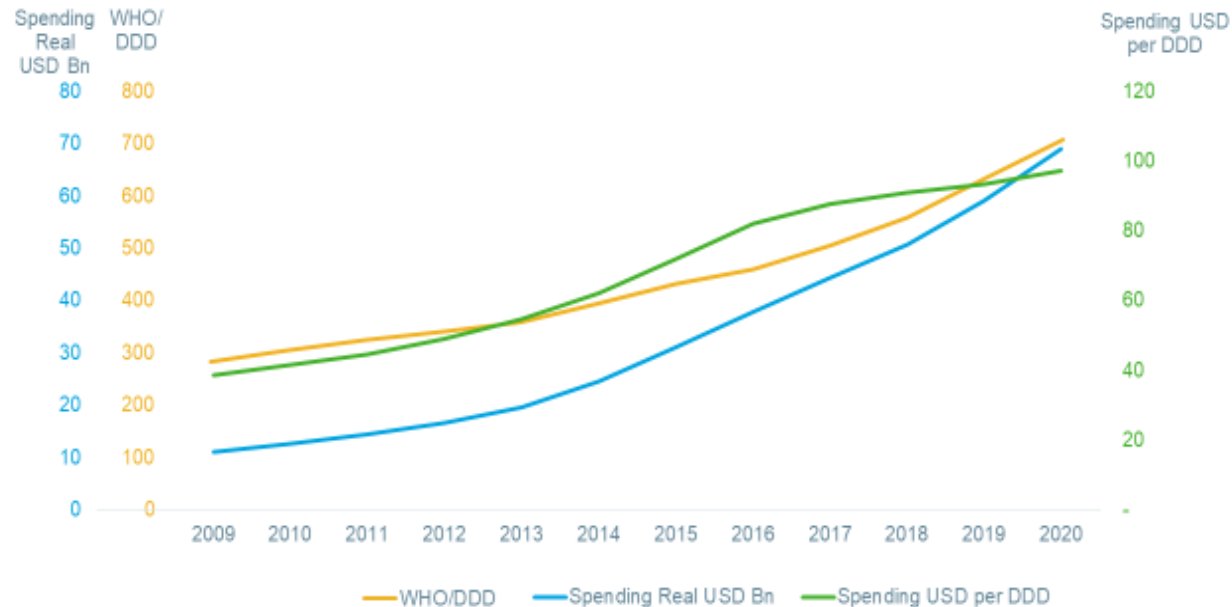
Sources: IQVIA MIDAS, IQVIA Institute, December 2020

- This chart layout is used for the autoimmune biologic market.
- It has 3 axes which are color-matched to the lines
- Two axes are on the left (sales and volume in WHO Defined Daily Doses – WHODDD). The color of the lines matches the color used on the axis to show increments.
- WHODDD represent a standardized dose used for all patients and normalized for packaging and formulation differences which are common with some products in this therapy area.
- WHODDD is particularly helpful for comparisons when original and biosimilar products are packaged differently from each other.

Charts using a more granular product type view

Illustration of product type segmentation with forward-looking segment

More than half of autoimmune biologic spending is due to lose exclusivity in next 5 years

U.S. Auto-immune Biologic Invoice Spending and Growth Drivers, 2005-2020

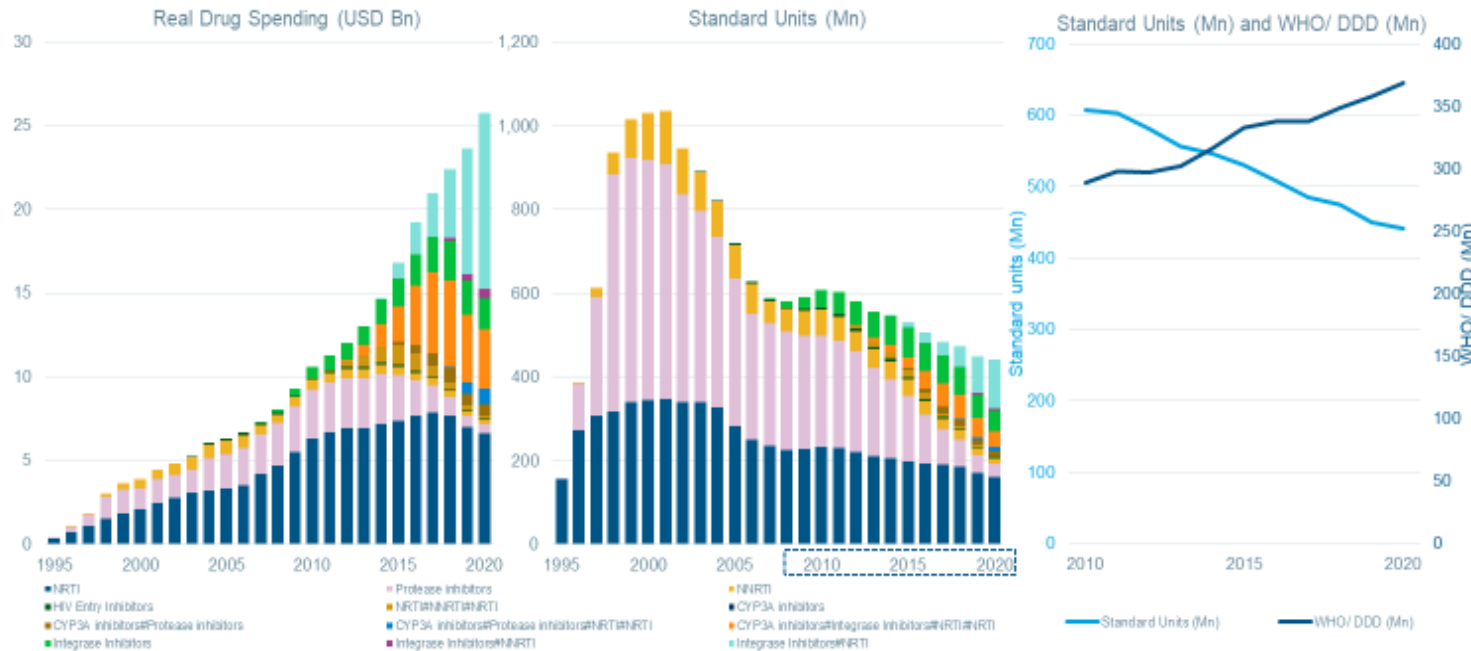Source: IQVIA National Sales Perspectives, Dec 2020
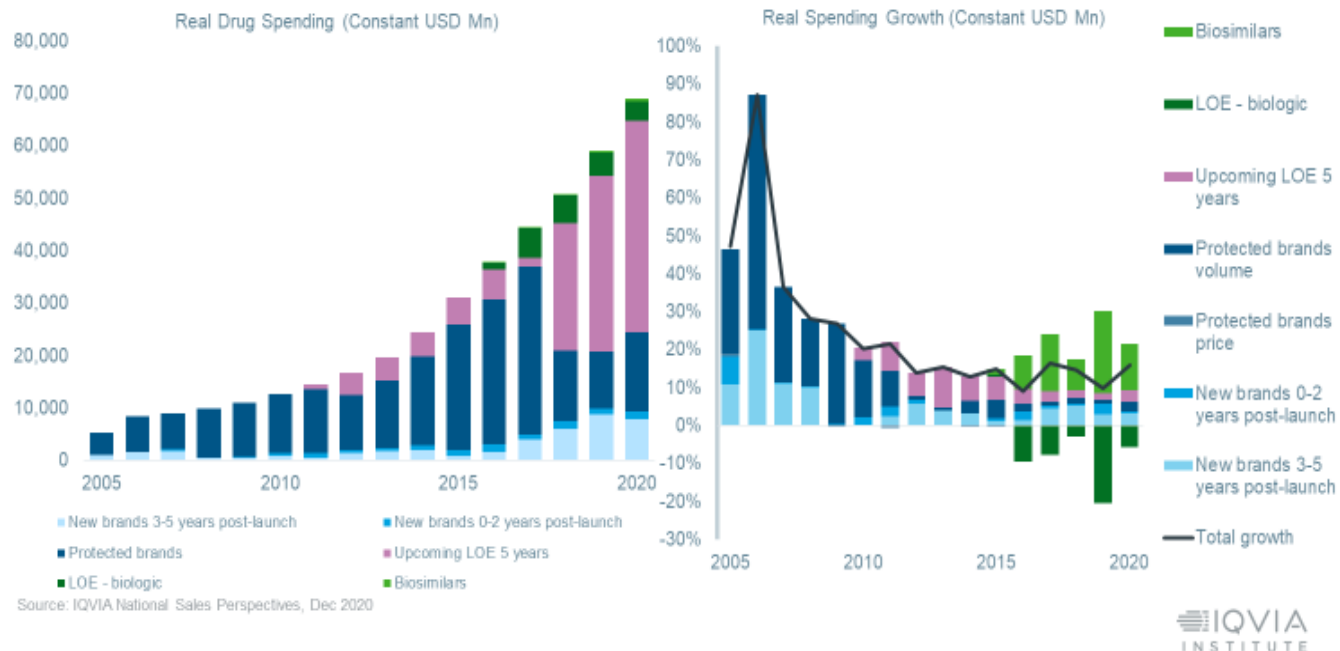
- Oncology and Autoimmune charts employ a more granular time-dependent segmentation of product type than other analyses in the report.
- Original biologics and small molecules when off-patent are identified separately as well as generics (small molecule) and biosimilars.
- The autoimmune charts are limited to biologic products and therefore exclude some small molecule products that could be relevant in some analyses such as JAK inhibitors.
- The upcoming LOE 5 years segment is composed of different products each year as their status changes, and refers to the expected entry of biosimilars in key products in future years.
- New products are shown with both 0-2 years and 3-5 year segments.
- Brands that are not 'new' and not LOE are shown as 'protected' and growth charts are split by price and volume.

HIV market charts

Illustration of products with varying mechanisms of action

New combination treatments with low dosing regimens led to reduction in volume, offset by an increase of days of therapy

US HIV Spending and Volume by Mechanism 1995-2020 and DDD, 2010-2020

Real Drug Spending (USD Bn)

Standard Units (Mn)

Standard Units (Mn) and WHO/ DDD (Mn)

NRTI
HIV Entry Inhibitors
CYP3A inhibitors#Protease inhibitors
Integrase Inhibitors

Protease inhibitors
NRTI#NNRTI#NRTI
CYP3A inhibitors#Protease inhibitors#NRTI#NRTI
Integrase Inhibitors#NNRTI

NNRTI
CYP3A inhibitors
CYP3A inhibitors#Integrase inhibitors#NRTI#NRTI
Integrase Inhibitors#NRTI

Standard Units (Mn)   WHO/ DDD (Mn)

Sources: IQVIA MIDAS, IQVIA Institute, December 2020
Chart notes: NRTI - Nucleos(t)ide reverse transcriptase inhibitor; NNRTI - Non- nucleoside reverse transcriptase inhibitor; CYP3A inhibitors - cytochrome P450 3A CYP3A inhibitors; # is used to define the combinations of mechanisms used in respective categories

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- **Products in this market have been grouped by mechanism of action.**
- **Fixed-dose combination products are grouped by the type of mechanism of each ingredient, with each mechanism separated by a '#' symbol.**
- **Volume is measured in standard units in the middle chart.**
- **In the right chart, volume is in both standard units and WHO DDD, and the shift in the trajectory of these two measures suggests a changing number of doses per day as combination products become more common.**

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