2022 ACTS Annual Report

Statistical Quality Assurance applied to IQVIA's Information Offerings

Global Data Science and Advanced Analytics
(v20230228)

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Welcome

Thank you for downloading the most recent ACTS annual report, IQVIA's Statistical Quality Assurance program. We are proud to publish the 2022 edition on the IQVIA Customer Portal, serving as a quality measurement on MIDAS data offerings. Single country-pages available for download as validation results are ready for sharing.

The report is labeled '2022 ACTS Annual Report', which consolidates validation analyses on data spanning years 2017 thru 2021. Despite the uncertainty of COVID pandemic, regional conflicts and economic volatility, we are most grateful for constant support from our clients to allow us continuing with this important program. We are confident that the report will once again provide you valuable insight into IQVIA MIDAS offerings.

This new edition is a summary of ~90 single channel validation results. IQVIA analyzed data from 5000+ pharma companies and affiliates who shared data for validation on 88,000+ product forms. The analyses produced quality measurements which enable readers to compare country-level results with each other and enable IQVIA offering development teams and statistical methodologists to identify actions to improve quality of MIDAS.

ACTS country reports are available on the IQVIA Customer Portal, with country results being uploaded as soon as data has been thoroughly analyzed and validated. If you are a customer portal user, please visit ACTS Country Reports under the MIDAS country coverage section and subscribe to new content by enabling Manage IQVIA Alerts Subscriptions under 'My Settings'. In this annual report, you will find single country reports in the Appendix.

If you have questions about the methodology being used for deriving the quality metrics Bias and Precision, and for Timeliness, please refer to the Methodology section featured in the Appendix. For questions about this quality assurance program, please contact MIDAS Offering Management (MIDAS@iqvia.com), for technical assistance or inquiries about accessing services on the IQVIA Customer Portal, please email eService@iqvia.com.

Yours sincerely,

Yilian Yuan,

Ph.D., MBA
SVP, Global Data Science and Advanced Analytics

About this report

ACTS is a unique statistical quality assurance program, measuring data accuracy and timeliness of IQVIA's Information Offerings hosted on MIDAS

What ACTS is

- ACTS stands for Accuracy and Timeliness Statistics, a globally implemented, standardized and evidence-based quality assurance program that has been in operation for more than 30 years. It validates IQVIA's information offerings of sales data for each product pack registered in a market with the help of pharmaceutical companies.

- The manufacturers participating in the survey supply the ex-factory quantity sold in the validated calendar year for each registered product pack. These are compared with IQVIA's audits. Accuracy and timeliness indicators are derived from the analysis and reported in ACTS.

- It provides cross-national comparability of quality measurements. The validation results are published individually for each country and on the IQVIA Customer Portal and IQVIA Homepage.

- Timeliness of MIDAS data offerings is measured against target values (days after period) in a standardized way and published.

- As a special feature, ACTS reports the validity of IQVIA Market Prognosis and its forecasting accuracy.

- The ACTS report is the only quality assurance program in our industry to document the audits' quality and timeliness transparently across countries.

ACTS Data Basis

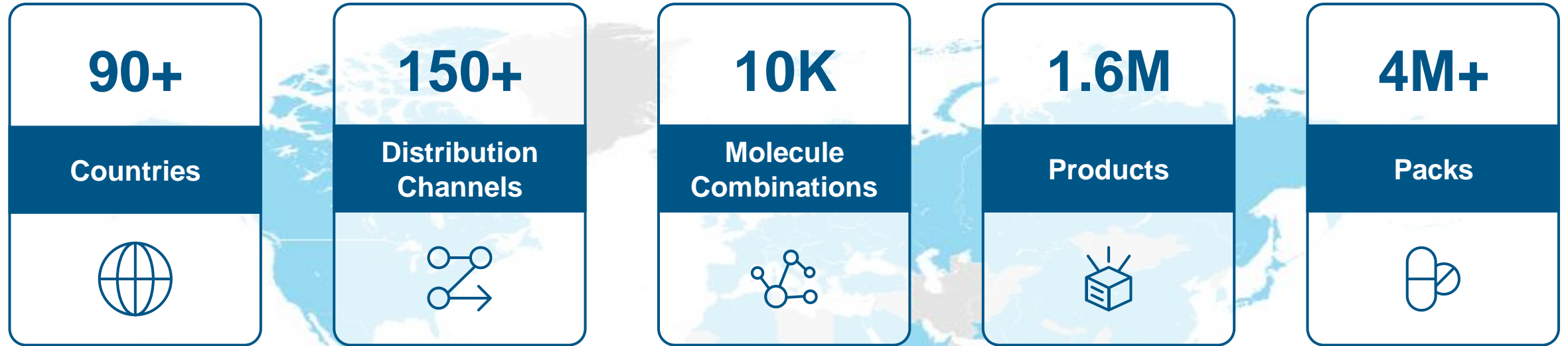|	Accuracy				Timeliness
	Countries*	Distribution Channels	Companies	Packs	Deliverables
Region					
North America	2	4	600+	11K	180+
Latin America	12	15	350+	16K	260+
Europe	22	44	3,100+	39K	1,100+
Africa, M. East, S. Asia	11	11	400+	8K	300+
Asia Pacific	10	12	500+	12K	280+
Total	**57**	**86**	**5,000+**	**88K**	**2,000+**
Channel					
Retail (Sell-in)	32	32	1,200+	35K	1,000+
Hospital (Sell-in)	3	3	150+	1K	300+
Combined (Sell-in)	19	19	1,100+	22K	250+
Retail (Sell-out)	15	15	1600+	20K	100+
Hospital(Sell-out)	3	3	400+	1K	300+
Retail OTC	14	14	450+	5K	-
Total	**57**	**86**	**5,000+**	**88K**	**2,000+**

*number of distinct countries

MIDAS

The trusted industry gold standard in global market measurement

90+	150+	10K	1.6M	4M+
Countries	**Distribution Channels**	**Molecule Combinations**	**Products**	**Packs**

40+ years of local and global experience

120+ production heads in 7 countries

Ongoing updates as new/changed products and packs appear:

	Products (per year)	Packs (per year)
NEW	82,000	267,000
CHANGED	46,000	236,000

Accuracy: Global & Regional Results

Content covered in this section

Global & Regional Global and regional accuracy results and 5-years trend
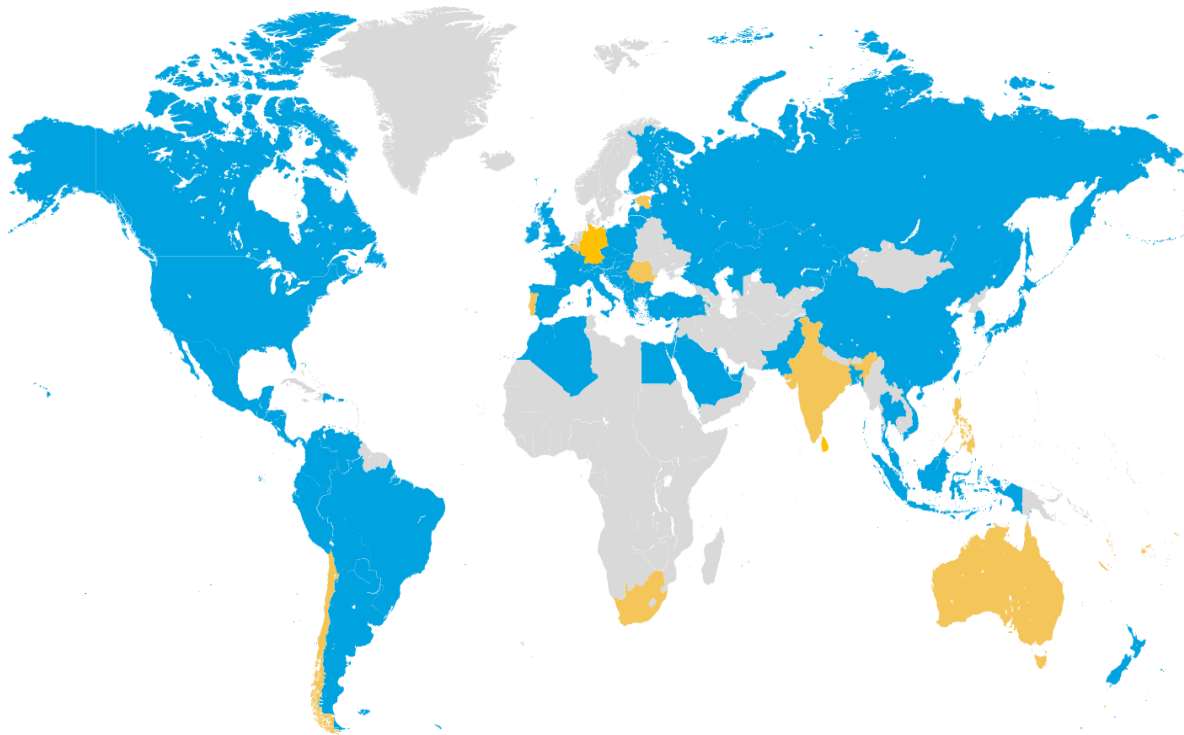
Data Type Results by data type (Retail, Hospital, PharmaTrend/Sell-out, OTC)

Countries Impacted List of countries with improved or deteriorated results

Regions and countries validated

Geographical Coverage

Regions covered

- North America
  - United States
  - Canada
- Latin America
- Europe
- Africa, Middle East, South Asia (AMESA)
- Asia Pacific (APAC)

Countries not covered

- Australia
- Belgium
- Chile
- Estonia
- Germany
- India
- Philippines
- Portugal
- Romania
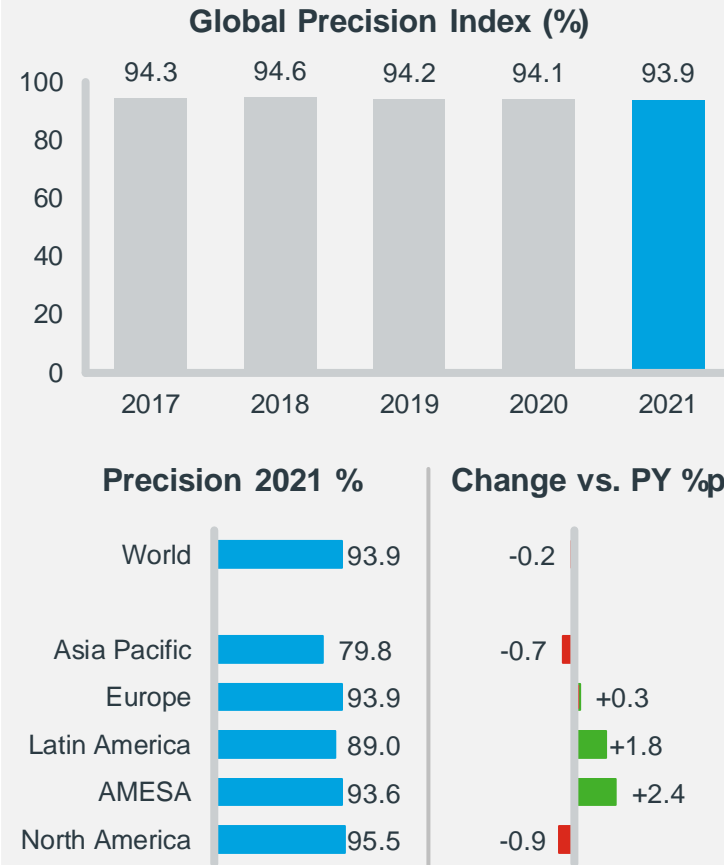- South Africa
- Sri Lanka

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Global and Regional Results

Coverage

- Several IQVIA audit data could not be validated due to lack of previously participating companies in the respective countries: e.g. **Australia, India, Romania, Portugal.**

- Countries paused validation of the most recent calendar year as information offerings were undergoing upgrade of data sources or statistical methodologies or both: e.g. **Belgium, Germany.**

- IQVIA could not secure enough participating companies, yet the validation was conducted but not published as the validated market share fell below a minimum threshold: e.g. **Chile, Estonia, South Africa, Spain Hospital.**

Results

Global Precision Index (%)

Year	Value
2017	94.3
2018	94.6
2019	94.2
2020	94.1
2021	93.9

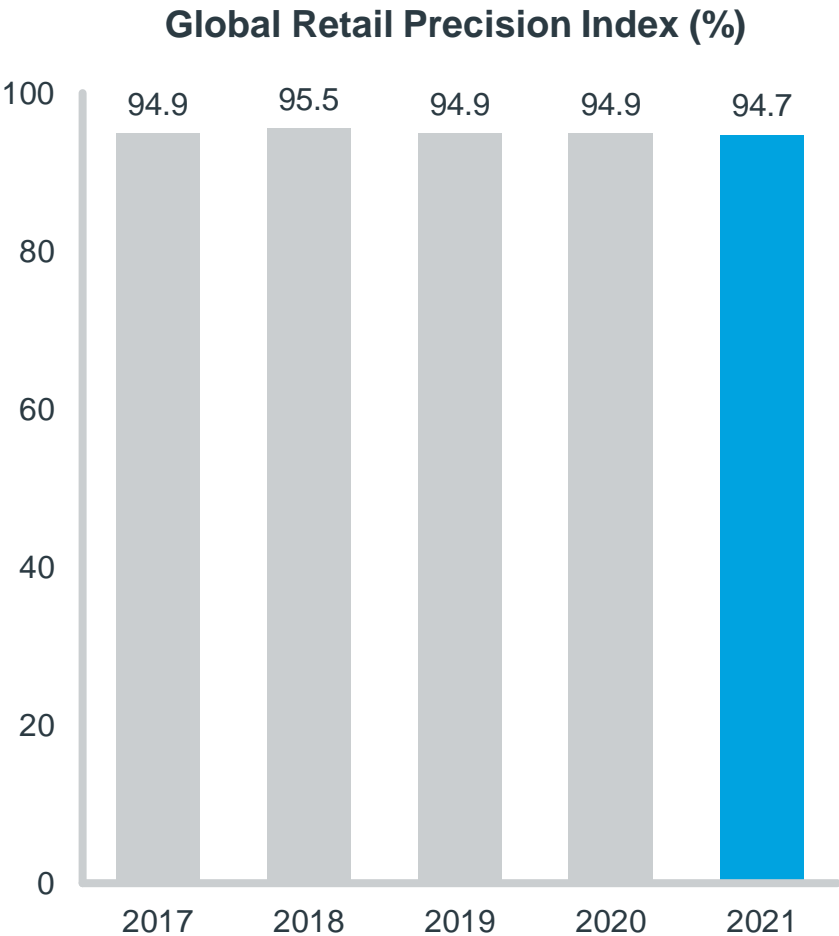|	Precision 2021 %	Change vs. PY %p
World	93.9	-0.2
Asia Pacific	79.8	-0.7
Europe	93.9	+0.3
Latin America	89.0	+1.8
AMESA	93.6	+2.4
North America	95.5	-0.9

Summary

- Global precision index in 2021 is 93.9%. It dropped slightly by 0.2% comparing with previous year.

- The global precision decrease is mainly driven by North America region. The 0.9% drop in North America region is due to additional blocked product sales identified across multiple companies in 2021. In spite of the decrease, North America region still has the highest precision of 95.5% among all regions.

- AMESA region improved by 2.4% with precision 93.6%.

- Asia Pacific region is with relatively low precision of 79.8%, slight drop comparing with previous year.

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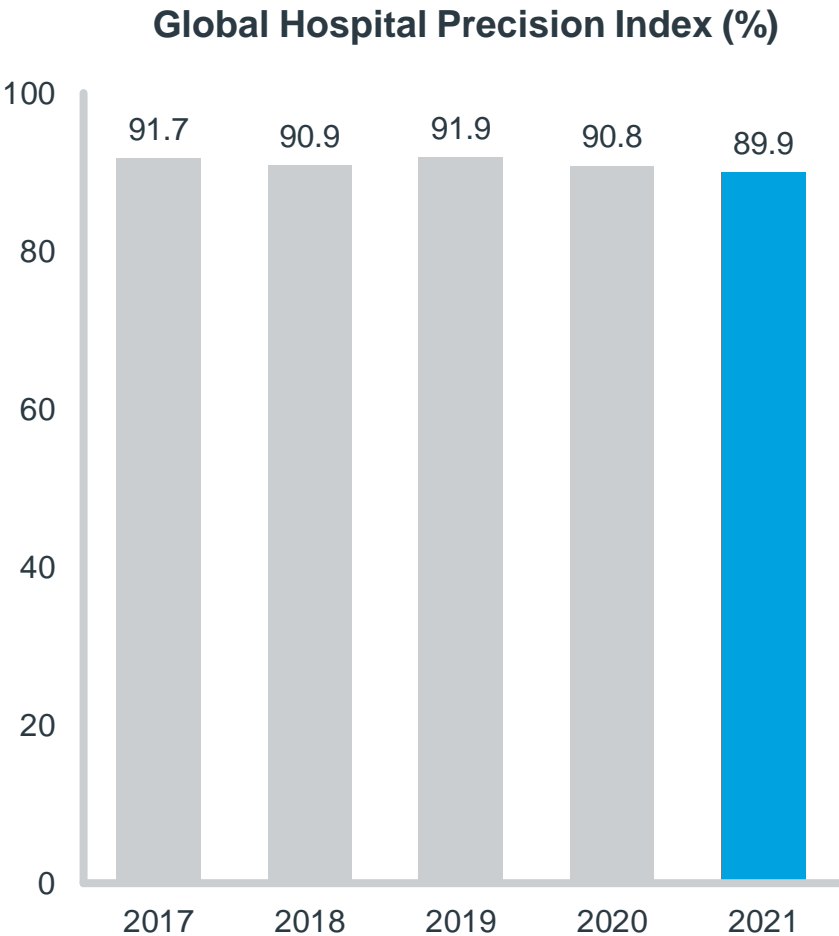# Countries with improved and deteriorated precision

Retail Validation Results

Global Retail Precision Index (%)

Year	Value
2017	94.9
2018	95.5
2019	94.9
2020	94.9
2021	94.7

Improvement			Deterioration		
Country	Precision 2021 %	Change vs. 2020 %p	Country	Precision 2021 %	Change vs. 2020 %p
Paraguay	65.8	+23.9	Morocco	88.8	-8.3
Bolivia	73.2	+13.0	Greece	88.5	-4.9
Uruguay	89.4	+12.6	South Korea	82.5	-3.8
Bangladesh	82.6	+10.0	Dom. Rep.	89.9	-3.0
Algeria	77.2	+7.8			

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Countries with improved and deteriorated precision

Hospital Validation Results

Global Hospital Precision Index (%)

Improvement			Deterioration		
Country	**Precision 2021 %**	**Change vs. 2020 %p**	**Country**	**Precision 2021 %**	**Change vs. 2020 %p**
Austria	93.2	+3.9	Italy	78.3	-3.9
Russia	86.4	+3.2	Croatia	98.7	-0.8
Bosnia	99.3	+2.8			
Kazakhstan	94.3	+2.8			

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Countries with improved and deteriorated precision

Pharmacy Sell-out (PharmaTrend PTR) Validation Results

Global PTR Precision Index (%)
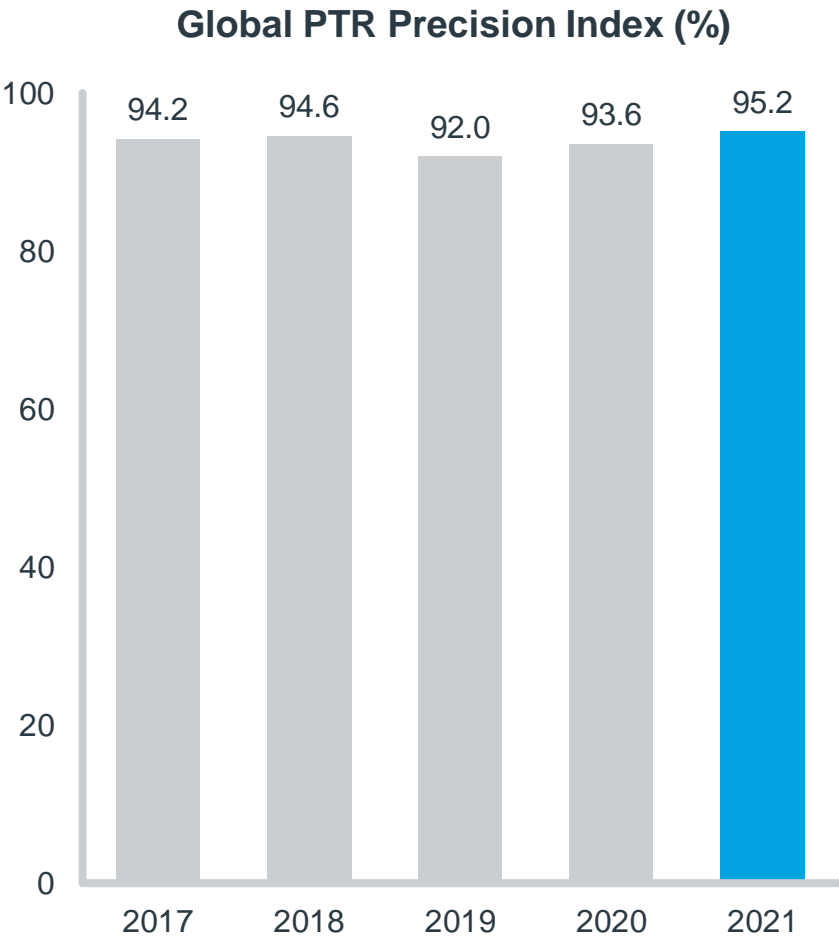
Improvement		
Country	**Precision 2021 %**	**Change vs. 2020 %p**
Italy	95.5	+3.6
Slovakia	96.4	+2.9
Czech Republic	96.6	+2.2

Deterioration		
Country	**Precision 2021 %**	**Change vs. 2020 %p**
Croatia	93.9	-5.3
Switzerland	94.6	-1.8

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Countries with improved and deteriorated precision

Retail OTC Validation Results

Global Retail OTC Precision Index (%)
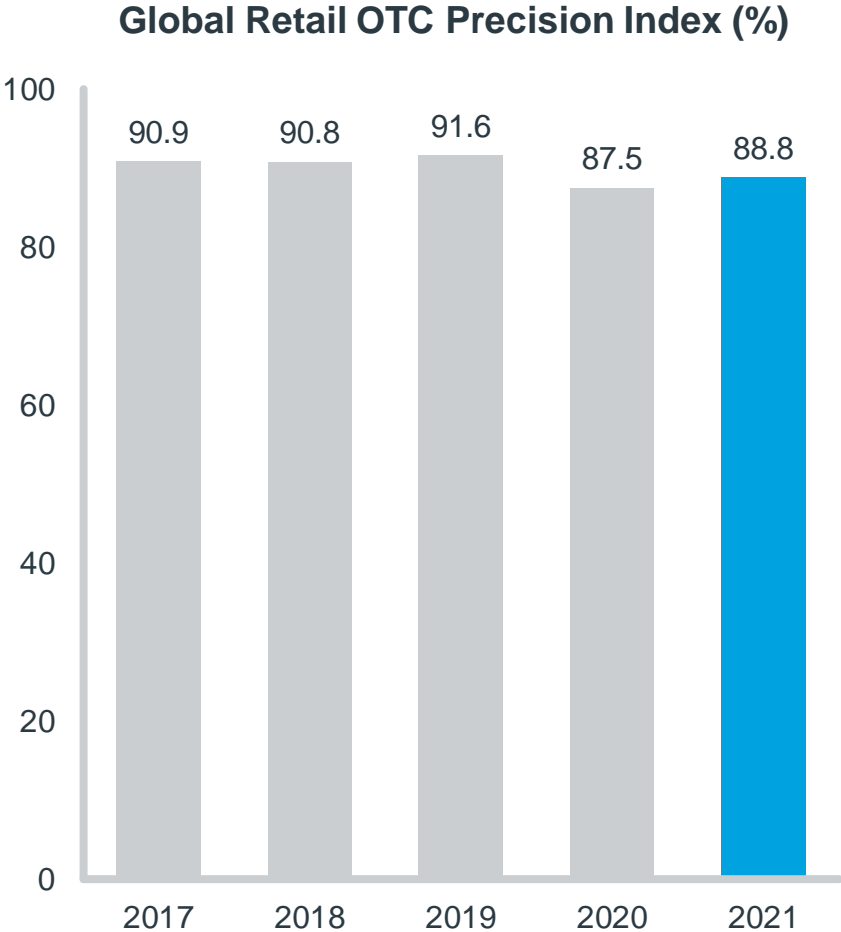
Improvement		
Country	**Precision 2021 %**	**Change vs. 2020 %p**
South Korea	80.6	+16.4
Argentina	89.8	+8.0
Bulgaria	93.5	+4.6

Deterioration		
Country	**Precision 2021 %**	**Change vs. 2020 %p**
Greece	71.7	-13.2
Mexico	76.8	-8.7
Austria	88.3	-2.1
Switzerland	93.5	-1.9

Timeliness

Content covered in this section

Timeliness

Statistics featured in this section pertain to number of days, after the end of the reporting period until time of delivery on MIDAS.

Metrics

"Elapsed days after period" and "Percent On-Target" are the two key performance indicators that express Timeliness/speed of delivery on MIDAS.

DAP Data

Number of deliverables used for measuring Timeliness: Also reported on IQVIA Customer Portal "MIDAS Delivery Performance".

Timeliness being measured against delivery targets of 30 days for Monthly MIDAS and 45 days for Quarterly MIDAS; DAP data being used is also published on MIDAS Delivery Performance:
https://customerportal.imshealth.com/sites/imsportal/product-support/midas-products-psa/iqvia-midas/psa/database-update-schedules

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DAP continued improving on both monthly and quarterly deliverables

Elapsed Days after Reporting Period (Average)

	2018	2019	2020	2021	2022
Quarterly	30.2	29.3	28.5	27.9	27.7
Monthly	27.1	26.2	25.0	24.2	23.9

Legend: Monthly, Quarterly

Percent On-Target

	2018	2019	2020	2021	2022
Monthly	63	70	72	73	76
Quarterly	85	86	87	89	89

Legend: Monthly, Quarterly
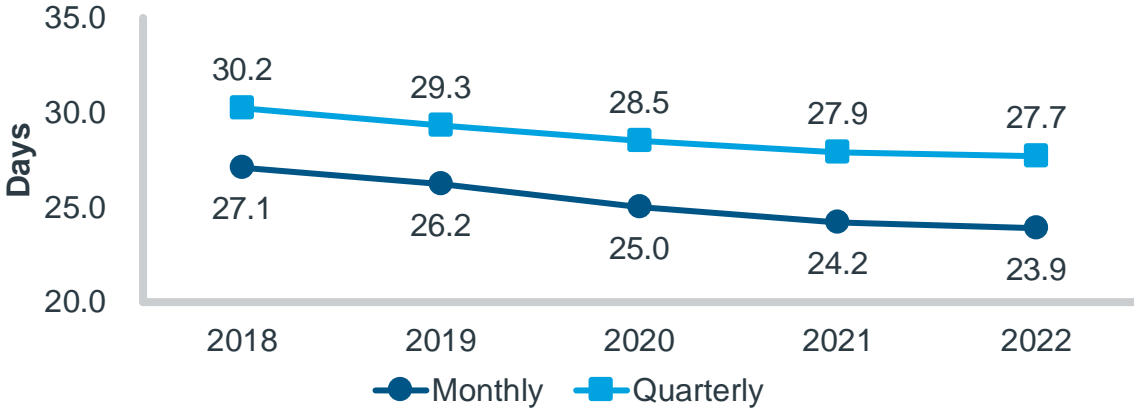
Region Percent On-Target 2022

Region	Monthly	Quarterly
World	76	89
North America	21	100
Latin America	69	100
Europe	87	95
Africa, Middle East, South Asia	92	90
Asia Pacific	53	63

Legend: Monthly, Quarterly
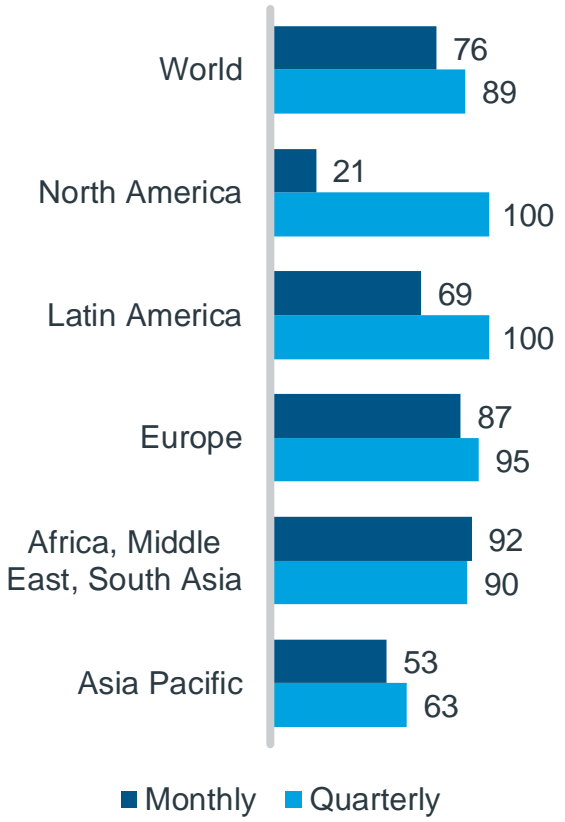
Channel Percent On-Target 2022

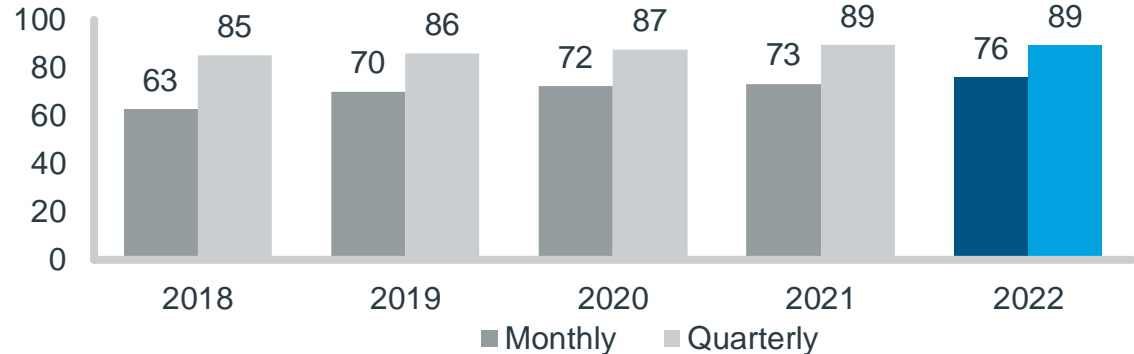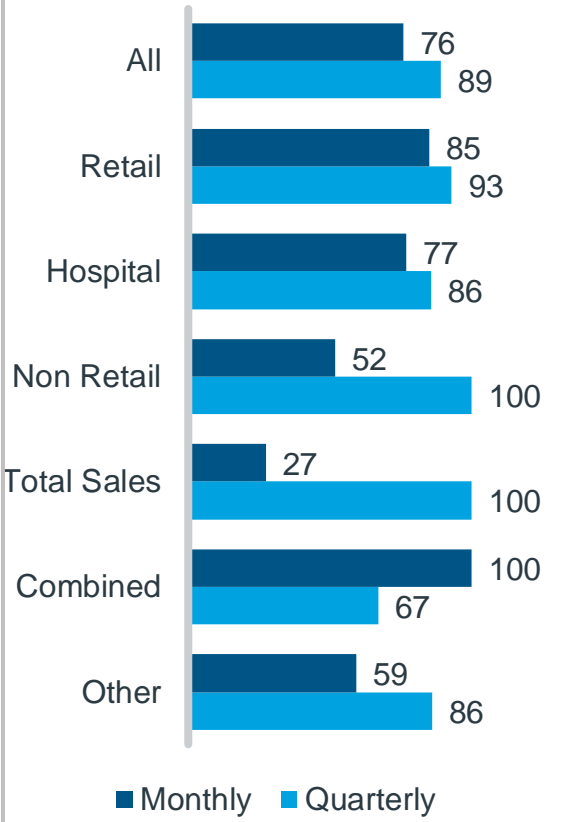| Channel	Monthly	Quarterly
All	76	89
Retail	85	93
Hospital	77	86
Non Retail	52	100
Total Sales	27	100
Combined	100	67
Other	59	86

Legend: Monthly, Quarterly

Timeliness being measured against delivery targets of 30 days for Monthly MIDAS and 45 days for Quarterly MIDAS DAP data being used is also published on MIDAS Delivery Performance:
https://customerportal.imshealth.com/sites/imsportal/product-support/midas-products-psa/iqvia-midas/psa/database-update-schedules

Number of deliverables used for measuring Timeliness

	2018		2019		2020		2021		2022	
	Month	**Quarter**	**Month**	**Quarter**	**Month**	**Quarter**	**Month**	**Quarter**	**Month**	**Quarter**
Channel										
Combined	60	32	60	32	60	32	60	32	60	32
Hospital	456	180	456	180	456	180	456	180	456	179
Non-Retail	36	12	36	12	36	12	36	12	36	12
Other	106	48	108	48	108	48	108	48	108	48
Retail	766	288	766	288	768	288	768	288	768	288
Total Sales	132	48	132	48	132	48	132	48	132	48
Total	**1,556**	**608**	**1,558**	**608**	**1,560**	**608**	**1,560**	**608**	**1,560**	**607**
Region										
North America	132	48	132	48	132	48	132	48	132	48
Latin America	192	68	190	68	192	68	192	68	192	68
Europe	850	288	852	288	852	288	852	288	852	287
Africa, M. East, S. Asia	216	92	216	92	216	92	216	92	216	92
Asia Pacific	166	112	168	112	168	112	168	112	168	112
Total	**1,556**	**608**	**1,558**	**608**	**1,560**	**608**	**1,560**	**608**	**1,560**	**607**

Timeliness being measured against delivery targets of 30 days for Monthly MIDAS and 45 days for Quarterly MIDAS DAP data being used is also published on MIDAS Delivery Performance:
https://customerportal.imshealth.com/sites/imsportal/product-support/midas-products-psa/iqvia-midas/psa/database-update-schedules

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Specialty Markets

Content covered in this section

Definitions

- MIDAS Specialty Definition
- ATC 4th level definition of Specialty products

Global Growth

- Specialty vs. Non-Specialty: Market size and market share

Accuracy Results

- Bias and Precision by Specialty markets (Anti-TNF, Hep-B & HIV, Oncology and Others)
- Data basis used: Countries and Specialty products surveyed

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MIDAS Specialty Definition

Starting point – US specialty definition

- The starting point for the MIDAS specialty definition is the IQVIA USA detailed definition of a specialty product, which includes concepts such as price, involvement of a specialist, form of administration, etc.

- First, the approved indication must be considered to be specialty (chronic and/or complex and/or rare and/or genetic) for a pack to be classified as specialty.

- The pack **must then also meet 4 out of 7 other criteria** to be classified as specialty.

- These US products have formed the starting point to identify similar products in other countries to assess if they are specialty using the MIDAS definition.

Researched Attributes (US)

Approved indication is (and/or) chronic, complex, rare, genetic **- REQUIRED -**	Special handling required (refrigeration, frozen, other biohazard)
High annual cost	Reimbursement assistance required
Drug treatment specialist initiated and maintained	Distribution is limited
Practitioner administered	In-depth monitoring or extensive patient counselling required

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ATC 4ᵗʰ level definition of Specialty

Anti-TNF & more*	Hepatitis B & HIV	Oncology					Crohn's Disease**	Others***		
L04B0	J05C1	L01A0	L01G1	L01H4	L01X5	L02B9	A07E0	A16A0	G03G0	J06H9
L04C0	J05C2	L01B0	L01G2	L01H5	L01X8	L03A1	A07E1	B02C1	H01C1	J06J0
L04X0	J05C3	L01C1	L01G3	L01H6	L01X9	L03A9	A07E2	B02C2	H01C2	L03B1
M01C0	J05C4	L01C2	L01G4	L01H9	L02A1	M05B4	A07E9	B02C3	H01C3	L03B2
	J05C5	L01C3	L01G5	L01J0	L02A2	V03C0		B02C9	H02A1	L03B3
	J05C9	L01C4	L01G9	L01L1	L02A3	V03D0		B02D1	H04C0	L03B9
	J05D1	L01C9	L01H0	L01X1	L02A9			B02D2	H04E0	M05B3
	J05D2	L01D0	L01H1	L01X2	L02B1			B02D3	J06C0	M05B9
	J05D3	L01F0	L01H2	L01X3	L02B2			B03C0	J06E0	
	J05D9	L01G0	L01H3	L01X4	L02B3			G02X9	J06H4	

*Anti-TNF, specific anti-rheumatic agents and immunosuppressants; ** not represented in this report; *** Acromegaly, Erythropoietins (Anemia), Gaucher's (Metabolic Disease), Growth hormones, Hemophilia, Immunoglobulins, Infertility, INJ CORTICOSTEROIDS PLN, Interferons (Hepatitis C, MS),; Osteoporosis, Other Anticoagulants, Other Gynaecologicals, Parathyroid hormones

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Specialty medicines will represent about 43% of global spending in 2027 and 56% of total spending in developed markets

Specialty medicines share of spending

Forecast

56%

49%

47%

40%

43%

39%

36%

28%

32%

27%

43%

24%

16%

16%

12%

10%

2012   2017   2022   2027

● **10 developed**   ● **Other developed**   ● **Pharmerging**   ● **Global**
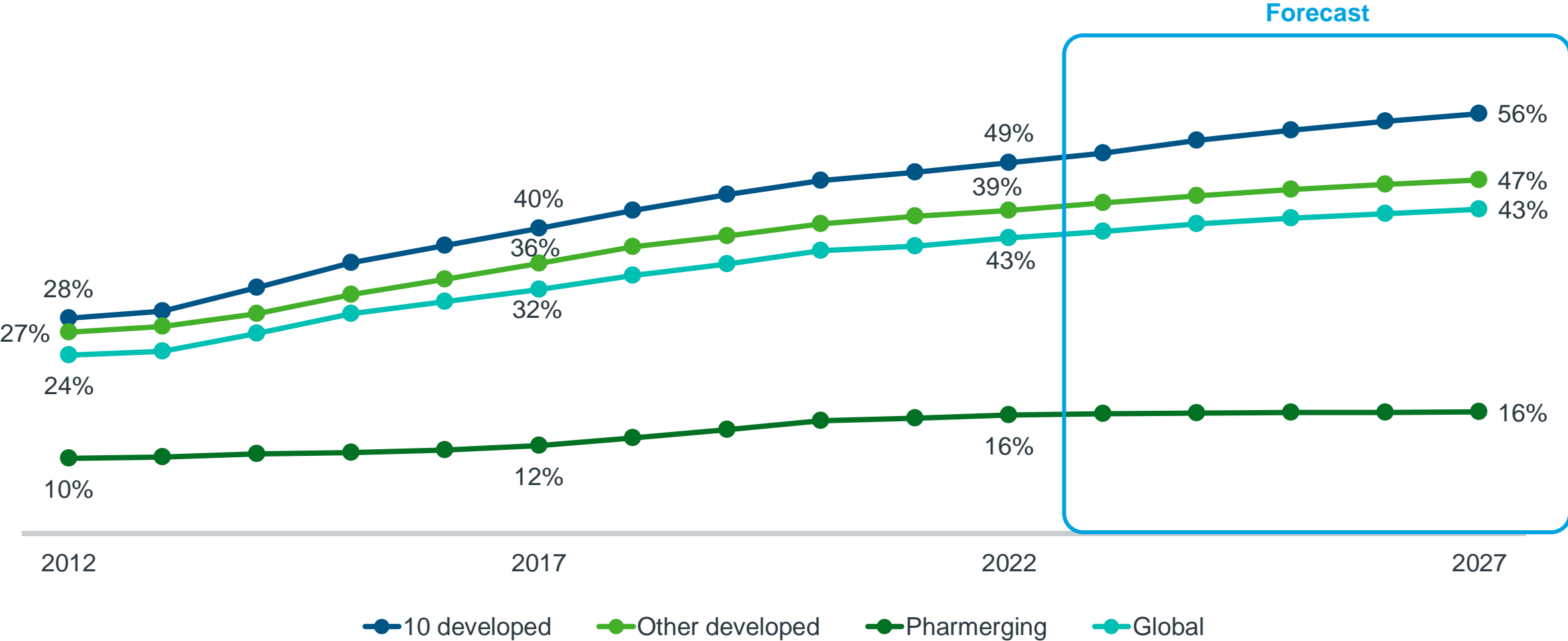
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Specialty market "Anti-TNF &more" show largest improvement*

Accuracy Results

Bias (%): -2.3, -1.8, -5.8, -5.0, -1.6, -2.6, -3.1, -2.1, -2.8, -3.2, -3.5, -4.6

Precision (%):
- Anti-TNF & more: 74.2 (2020), 99.6 (2021)
- Hepatitis B & HIV: 100.0 (2020), 99.6 (2021)
- Oncology: 93.9 (2020), 88.7 (2021)
- Others: 80.6 (2020), 78.0 (2021)
- Crohn's disease: 100.0 (2020), 100.0 (2021)
- All Specialty Groups: 87.8 (2020), 91.5 (2021)

■ 2020 ■ 2021
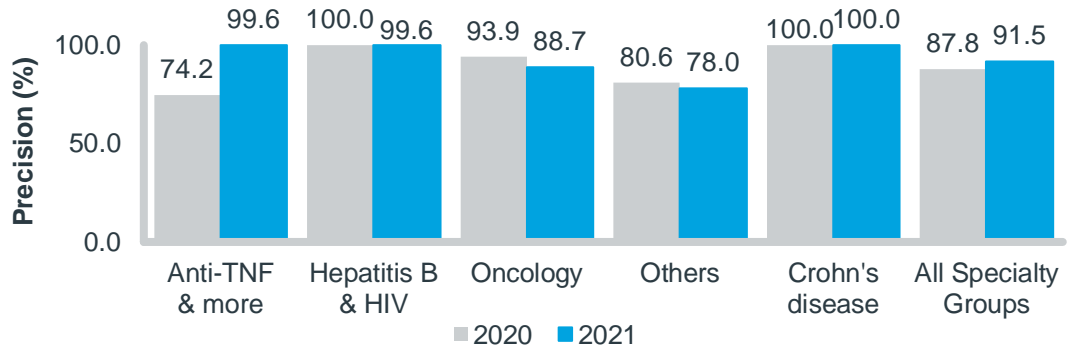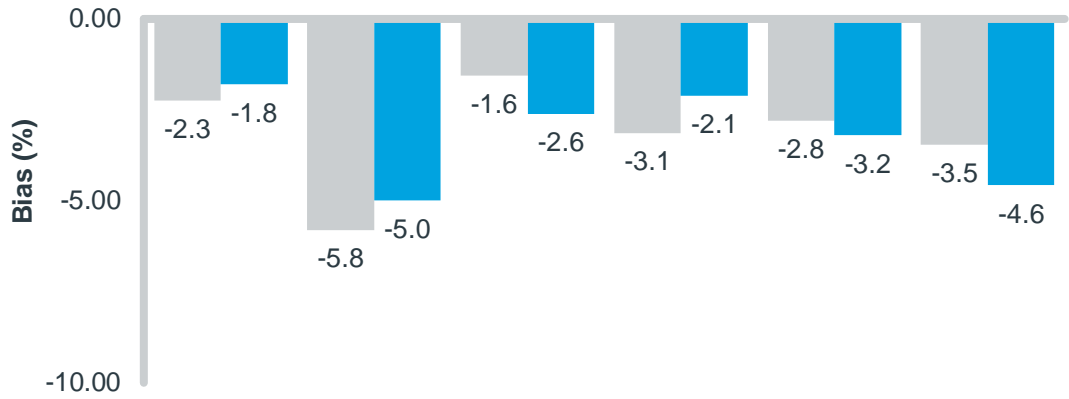
Survey Basis

	Anti-TNF	Hep B & HIV	Oncology	Others	Crohn's	All Specialty Groups	
Countries surveyed	Austria Canada Czech R. France Hungary Switzerland Turkey USA	France Switzerland USA	Austria Canada Croatia Czech R. France Hungary Italy Mexico Pakistan Poland Russia Serbia Slovakia Slovenia South Korea Switzerland Turkey UAE USA	Czech R. France Hungary Italy Pakistan Russia Serbia Switzerland Turkey USA	Canada	Argentina Austria Bangladesh Bulgaria Canada Central America Colombia Croatia Czech R. Dom. Rep. Ecuador France Greece Hungary Italy Kazakhstan Latvia	Lithuania Mexico Morocco Pakistan Peru Poland Russia Saudi Arabia Serbia Slovakia Slovenia South Korea Switzerland Turkey UAE Uruguay USA
Specialty products surveyed	470	116	1,486	717	20	4,148	

*Due to low number of countries and products surveyed, the Accuracy results presented on this page require careful interpretation. A larger Specialty data base is planned for in the future.

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IQVIA Market Prognosis

Content covered in this section

IQVIA Market Prognosis

What it is and what it is used for

Validity of Annual Forecast

Results by IQVIA's regional BU and leading 10 pharmaceutical markets

Commentary

Commentary on selected markets

IQVIA Market Prognosis

A strategic market forecasting publication that provides unparalleled country-level information on the pharmaceutical and healthcare industries

Capabilities

- Based on a rigorous evaluation of key events affecting the marketplace, IQVIA Market Prognosis provides a robust five-year forecast at country, regional, and global levels.
- Customers can gain insights into the economic and political issues affecting the local pharmaceutical and healthcare industries such as cost containment, prescribing and reimbursement, pricing trends, and the regulatory environment.
- Forecasts are supported with detailed evaluation of the key issues affecting the marketplace.
- In-depth reports are available for 49 countries across 7 regions.
- Market Prognosis Global extends coverage, providing top-line country forecasts across 220 countries in 11 regions.

Use Cases

Customers can use IQVIA Market Prognosis to:

- Validate their forecasts to establish annual targets
- Set and manage expectations from corporate headquarters to local subsidiaries
- Evaluate key economic and healthcare related issues in each country
- Identify macro events shaping the pharmaceutical country markets
- Understand key drivers in the hospital and retail markets over the next five years for each country market
- Apply unrivalled world perspective on established and emerging markets to determine future investments

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Market Prognosis Validations: Key Findings

Despite the unforeseen impact of the COVID-19 pandemic, both 1-Year and 5-Year validations showed very strong results

Global

Average 5-year error across 45 Market Prognosis countries was -4.9%, a slightly deterioration on previous average error of -3.0%. The average error for year 5 of forecast was -8.4%.

Regional

Three of the five Market Prognosis regions showed deteriorated 5-year errors compared to previous validation. Latin America showed an improved 5-year error, North America's 5-year error turned from over-estimation to under-estimation, see slide 5-8 for explanation.

Leading 10 Countries

For the leading 10 countries, four of them showed 5-year average errors greater than +/-5%, and five countries showed a 1-year error greater than +/-3%.

Market Prognosis

Validity of Annual Forecasts

Forecasting Bias (%) based on 45 Countries

	2017	2018	2019	2020	2021
Bias	-0.7	-3.6	-6.3	-5.6	-8.4
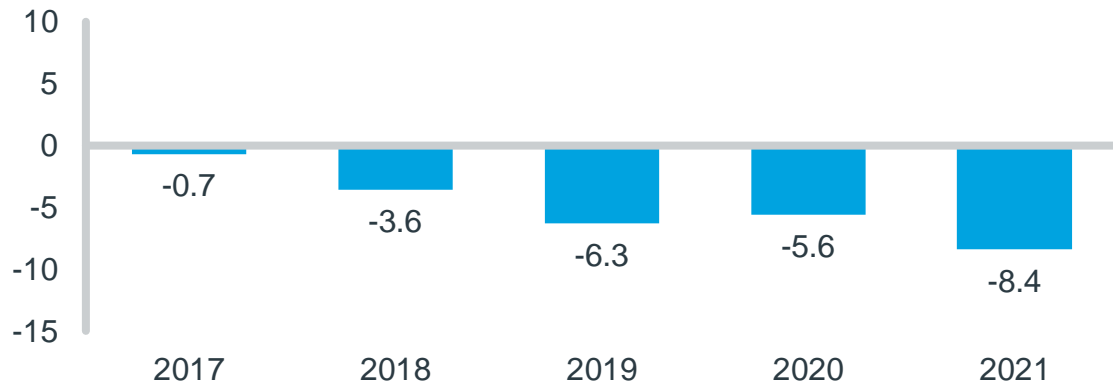
Region	Average Bias (%)	
	2016-2020	2017-2021
AMESA	-3.1	-4.8
Asia Pacific	-1.5	-3.1
Europe	-4.9	-7.0
Latin America	-2.4	-1.9
North America	4.6	-2.4
All Regions	**-3.0**	**-4.9**

Leading 10 Markets 5 years (2017-21)

Market	Value
USA	+1.5
China	+1.3
Japan	+0.1
Germany	-6.7
France	+0.3
Italy	+0.5
United Kingdom	-2.7
Spain	-7.6
Canada	-6.3
Brazil	-5.4
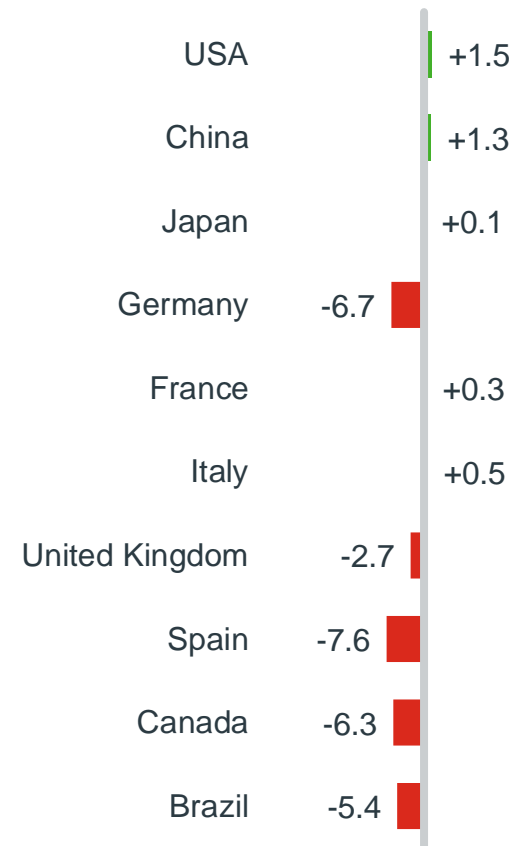
Leading 10 Markets 1 year (2021)

Market	Value
US	-2.3
CN	-0.1
JP	-2.7
GE	+0.0
FR	-3.7
IT	-3.8
UK	-6.8
SP	-5.2
CD	-1.7
BR	-5.7

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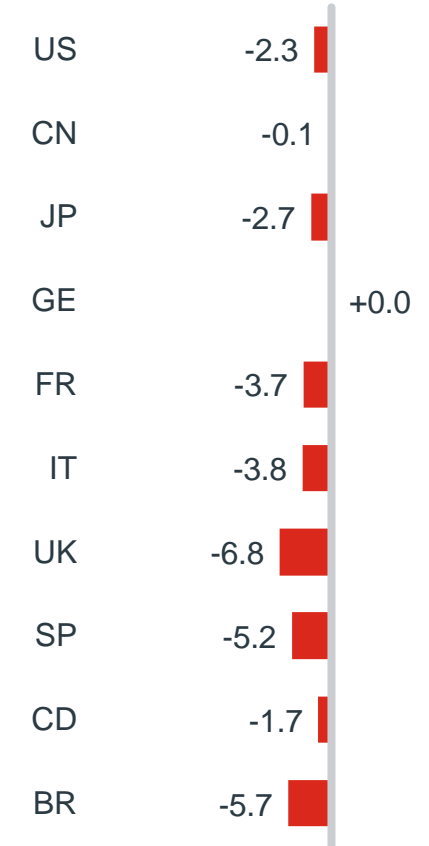
Market Prognosis on selected Markets

Commentary

United States

- The slight overestimation of 2017-2021 total market growth in the US is the result of weaker than anticipated annual list price increases in the early part of the forecast period, particularly for older brands and generics from late 2016. Market growth was also marginally below forecast due to a greater degree of price erosion from loss of exclusivity of some major brands than forecast.

- Moderating price-driven growth for branded products was accompanied by increasing deflationary pressure due to new generic entrants. Furthermore, heightened risk of broader legislative action during the mid-to-latter years of the 2017-2021 period curtailed drug price inflation and discouraged price increases for established generics and older brands. In addition, the contribution to growth from certain specialty products, including hepatitis C drugs, moderated by 2016, which limited their impact on growth over the 2017-2021 period.

- The underestimation of the 1-year forecast for 2021 was due to a stronger-than-expected rebound following the deceleration in growth witnessed in 2020 due to the COVID-19 pandemic. Primary care visits and volume trends gradually improved as patient visits increased despite further outbreaks.

China

- The minor overestimation of total market growth in China over the 2017-2021 period is the result of lower-than-expected growth in 2017-2018, due to cost-containment measures, as well as in 2020, as a result of the COVID 2019 crisis. Data enhancements introduced to the dominant hospital sector panel in January 2021, with backdata adjustments to 2019, have also raised overall hospital sector growth over the period.

- The 1-year forecast for China for 2021 was on track.

Japan

- The forecast for Japan over the 2017-2021 period was in line with expectation, while growth in 2021 was underestimated in the 1-year forecast as the market recovered surprisingly faster than anticipated from the slowdown caused by the COVID-19 pandemic.

- Both retail and hospital sector saw stronger than expected rebound in 2021 as COVID-19 related restrictions were lifted. While the retail sector saw a rebound in volume growth from the second half of 2021, hospital sector sales showed recovery primarily driven by high-priced oncology drugs.

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Market Prognosis on selected Markets

Commentary

Germany

- The 5-year outlook for the German pharmaceutical market over the 2017-2021 period was underestimated as a result of stronger-than expected cost-control measures curbing overall rates of growth.

- Mandatory and voluntary discounts, reference pricing, prescribing controls and the price moratorium effectively offset the anticipated growth of the market due to new product launches. Also, in the early part of the 2017-2021 period, product withdrawals due to dissatisfaction with early benefit assessments as well as price negotiations kept growth rates in check.

- Other restrictive measures such as eligibility of orphan drugs for early benefit assessment and introduction of measures to promote biosimilar use also curtailed market growth.

- Furthermore, the COVID-19 pandemic related disruptions in 2020 decelerated hospital sector growth.

France

- The 5-year forecast for France over the 2017-2021 period was on track, while the underestimation of growth for 2021 in the 1-year forecast was due to the market rebound from the COVID-19 pandemic.

- Both market sectors saw a stronger-than-expected rebound in 2021. In the retail sector, this was driven by growth in the average price per standard unit, lifted by the rapidly growing number of hospital prescriptions dispensed in the retail sector, while in the hospital sector both volume and price grew strongly as normal hospital operations resumed, amidst continuing waves of the pandemic.

Italy

- Italy's market growth over the 2017-2021 period was in line with forecast, while the 1-year forecast underestimated growth for 2021 due to the stronger than expected rebound during the second year of the COVID-19 pandemic.

- This occurred primarily due to a sharp increase in hospital sector price growth (on the back of a significant price contraction recorded in 2020); this was driven by demand for high-cost medicines following the resumption of backlog treatment which had been postponed during the initial phase of the pandemic.

Market Prognosis on selected Markets

Commentary

United Kingdom

- The underestimated forecast for the UK over the 2017-2021 period was largely driven by the launch and uptake of new innovative medicines. Sales in the dominant hospital sector experienced strong double-digit growth over the 2017-2021 period (excluding a COVID-induced slowdown in 2020) fuelled by use of high-priced drugs, notably antineoplastic agents and orphan drugs.

- In the retail sector, robust growth in 2019 was driven by significant price per standard unit increases registered for several unbranded drugs. In 2020, the use of high-priced medicines for blood/blood-forming organs, anti-diabetic agents, and significant price hikes of certain products, notably the antidepressant sertraline, contributed to strong average price growth.

- The 1-year forecast underestimation of total market growth in 2021 was largely due to a stronger than anticipated rebound in the hospital sector following the COVID-induced slowdown in 2020. The recovery was largely volume-driven, as hospital procedures picked up, notably in the second half of the year.

Spain

- The underestimation of total market growth in Spain from 2017-2021 is mainly the result of higher-than-expected growth in the hospital sector over the period. Strong hospital sales have been driven by a higher-than-expected price growth since 2017, a trend which intensified during the COVID-19 pandemic in 2020, while volumes contracted sharply due to the postponement of non-urgent treatments.

- The political instability in Spain over the past four years has delayed the approval of the draft Royal Decree on Regulating the Financing and Pricing of Drugs and Medical Devices, which was expected to curb overall rates of market growth. The ineffectiveness of measures aimed at limiting annual public pharmaceutical expenditure growth in line with GDP growth has therefore contributed to the underestimation of the forecast in 2017-2021.

- A quicker than expected recovery of hospital volumes in 2021 also led to an underestimation of the 1-year forecast. A major redesign of the hospital panel led to significant back data changes to the MIDAS data, which ultimately led to the market size being underestimated in 2020-2021.

Canada

- The underestimation of the 5-year total pharmaceutical market growth in Canada is primarily due to increased utilization of high-cost specialty drugs, which led to strong double-digit price growth, especially in 2019, in the hospital sector. In the retail sector too, strong price growth was observed, driven by anti-cancer drugs including anti-TNFs (Inflectra, Cimzia and Humira) and protein kinase inhibitors (Ibrance and Imbruvica), among others, in addition to five additional new oncology drug launches that year, that propelled growth at a pace above forecast.

- Market growth in 2021 was marginally above expectations, partly due to stronger-than-expected growth post the COVID-19 pandemic. Increased retail sector demand for acute therapies amidst the surge in seasonal infections and improved access to hospital services following the easing of COVID-19 restrictions drove consumption of medicines. A shift in the average product mix in favour of more expensive therapies also contributed to higher-than-expected growth in 2021.

IQVIA

Market Prognosis on selected Markets

Commentary

Brazil

- The 2017-2021 forecast underestimation is attributed to various factors. A centrist government at the end of 2016, followed by a right-wing conservative government in 2019, called for greater efficiencies, cost containment and a reduction in healthcare spending, leading to a conservative 5-year forecast. Additionally, after several years of economic contraction, Brazil's economy grew in 2017-2019, driving private healthcare and out-of-pocket spending during this period.

- The resilient Brazilian pharmaceutical market unexpectedly reached double-digit growth amidst the COVID-19 pandemic in 2020, driven primarily by the retail sector, as pharmacies became key providers of care. Brazil's lax approach to lockdowns also contributed to strong retail sales. Following an initial decline in hospital activity in 2020, the rescheduling of cancelled non-emergency treatments boosted pharmaceutical sales in 2021 resulting in extraordinary total market growth. The underestimation of growth for 2021 was also due in part to deteriorated patient profiles intensifying demand and spending on drugs post the pandemic. Additionally, the Pharmaceutical Market Regulatory Agency (CMED) permitted higher price adjustments in 2021 to compensate for price adjustment suspensions in 2020 and higher than expected inflation.

Appendix

Accuracy: Country/Channel Results

Validated Countries/Regions by Channel

(please use hyperlinks for navigation)

Retail (Sell-in)
+ Algeria
+ Argentina
+ Austria
+ Bangladesh
+ Bolivia
+ Brazil
+ Bulgaria
+ Canada
+ Central America
+ Colombia
+ Dominican Republic
+ Ecuador
+ Egypt
+ Italy
+ Jordan
+ Kuwait
+ Latvia
+ Lebanon

Retail (Sell-in)
+ Lithuania
+ Mexico
+ Morocco
+ Pakistan
+ Paraguay
+ Peru
+ Saudi Arabia
+ South Korea
+ Spain
+ Thailand
+ Tunisia
+ Turkey
+ United A. Emirates
+ Venezuela

Hospital (Sell-in)
+ Canada
+ China
+ South Korea

Combined (Sell-in)
+ Bosnia and Herzegovina
+ Croatia
+ Czech Republic
+ Hong Kong
+ Hungary
+ Indonesia
+ Japan
+ Kazakhstan
+ Malaysia
+ Poland
+ Russia
+ Serbia
+ Singapore
+ Slovakia
+ Slovenia
+ Switzerland
+ Uruguay
+ USA
+ Vietnam

Retail OTC (Sell-in)
+ Argentina
+ Brazil
+ Bulgaria
+ Canada
+ Mexico
+ South Korea

Retail OTC (Sell-out)
+ Austria
+ Greece
+ Hungary
+ Italy
+ Poland
+ Slovakia
+ Spain
+ Switzerland

Other (Sell-out)

Retail
+ France
+ Greece
+ United Kingdom

PharmaTrend
+ Austria
+ Croatia
+ Czech Republic
+ Finland
+ Hungary
+ Ireland
+ Italy
+ Poland
+ Serbia
+ Slovakia
+ Spain
+ Switzerland

Hospital
+ Austria
+ Italy
+ United Kingdom

United States of America + Canada
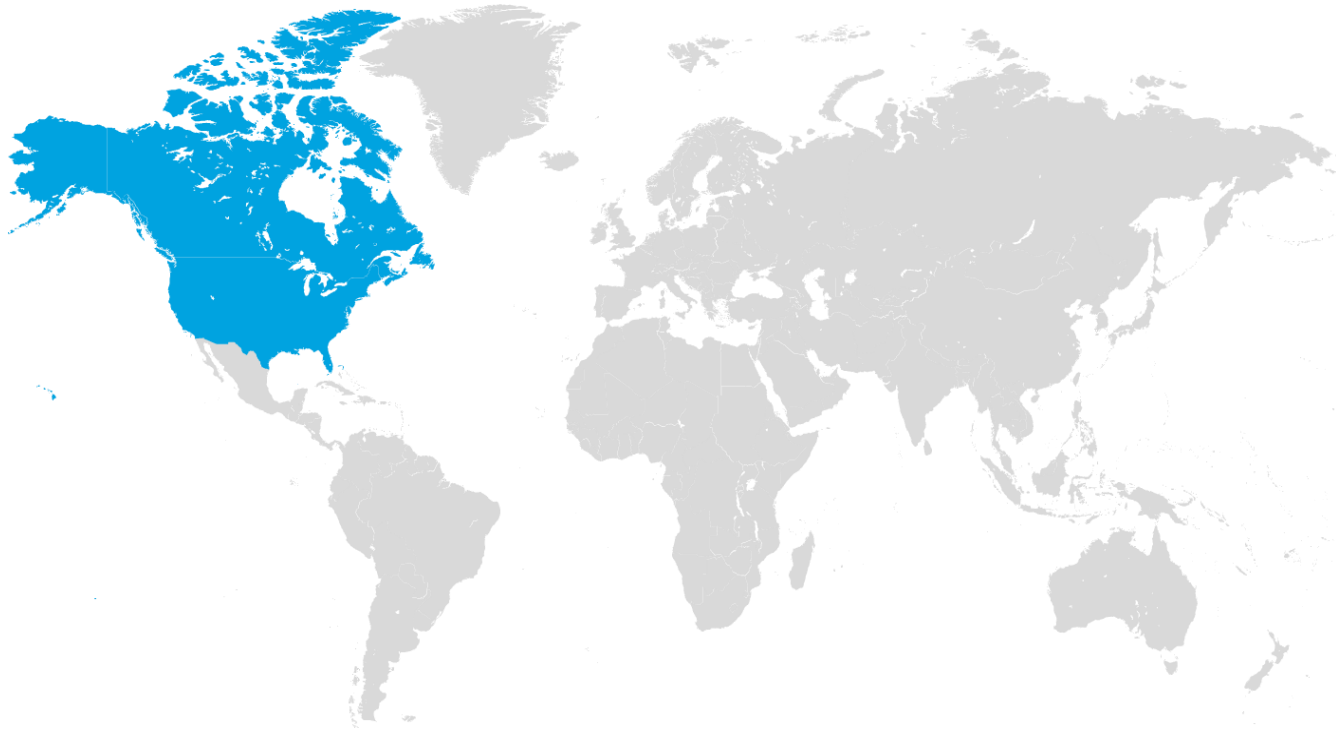
Countries
United States of America
Canada

IQVIA

USA Retail + Non-Retail Validation Study

2021 Validation Study

Validation Results

Precision — **95.0%**

| | 95.6 | 96.5 | 95.6 | 96.0 | 95.0 |
Precision values by year: 2017, 2018, 2019, 2020, 2021

Bias — **-7.3%**

Bias values by year: -11.6 (2017), -6.4 (2018), -7.6 (2019), -7.5 (2020), -7.3 (2021)
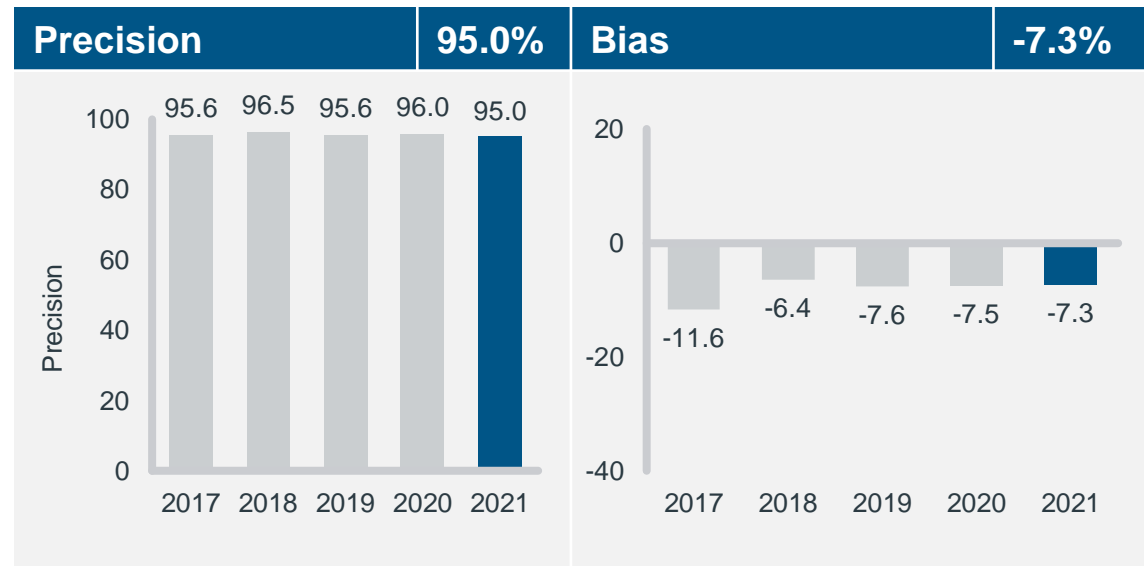
Outcomes
- Overall precision index declined by 1 percentage point in 2021
- Overall underestimation improved by 0.2 percentage points in 2021
- Lower precision is expected for companies with blocked product sales

Distribution Channels Validated

Manufacturers

Wholesalers — 77% — 16% — Chain Warehouses

1% — 1% — 7% — 5%

18% — 38% — 8% — 13%

14% — 2%

US Drugstores — US Foodstores — US Mail Service

Independent Pharmacies — Chain Pharmacies — Foodstores — Mail Order

19% — 53% — 10% — 18%

Patients
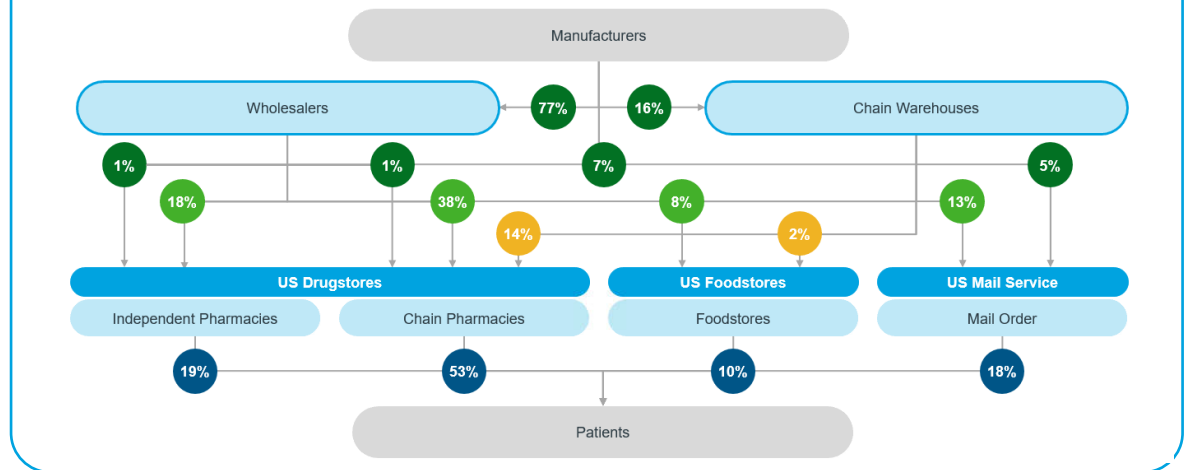
Participation

# Participating Companies	# Forms Validated	% Market Validated
74 (-3 vPY)	**1,263** (-58 vPY)	**80%** (-1% vPY)

Canada Retail Validation Study

2021 Validation Study

Validation Results

Precision	99.9%	Bias	-2.1%

Precision

100.0 99.9 100.0 100.0 99.9

2017	2018	2019	2020	2021

Bias

-1.0 -0.9 -1.3 -1.5 -2.1

2017	2018	2019	2020	2021
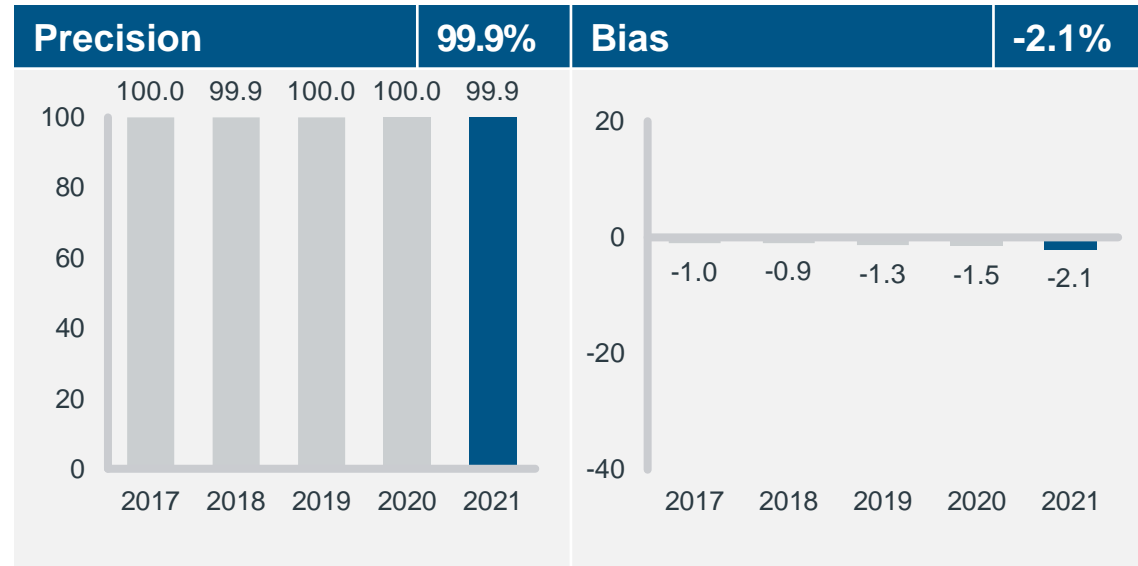
Outcomes

- Overall precision index declined slightly by 0.1 percentage points in 2021
- Overall underestimation increased by 0.6 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 86.7%

6% 7.3% 5.7%

81%

Canada Retail

Canada Hospital

Drugstores

Hospitals

87% 13%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
270 *(+11 vPY)*	5,993 *(-103 vPY)*	95% *(no change vPY)*

Canada OTC Validation Study

2021 Validation Study

Validation Results

Precision	99.7%	Bias	-0.2%

Precision chart:
- 2017: 100.0
- 2018: 100.0
- 2019: 100.0
- 2020: 100.0
- 2021: 99.7

Bias chart:
- 2017: 1.4
- 2018: 2.0
- 2019: 1.6
- 2020: 1.2
- 2021: -0.2

Outcomes

- Overall precision index declined slightly by 0.3 percentage points in 2021
- Overall bias turned from 1.2% overestimation to 0.2% underestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

- Manufacturers → Wholesalers: 86.7%
- Wholesalers → Canada Retail: 81%
- 6%
- 7.3%
- 5.7%
- Drugstores → Patients: 87%
- Hospitals → Patients: 13%
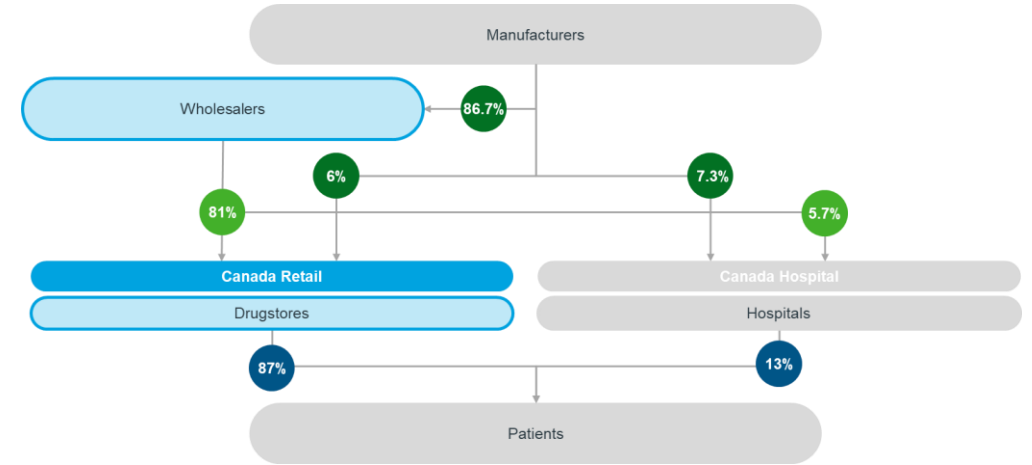
Participation

# Participating Companies	# Forms Validated	% Market Validated
168 *(+3 vPY)*	**2,695** *(-140 vPY)*	**100%** *(no change vPY)*

Canada Hospital Validation Study

2021 Validation Study

Validation Results

Precision	100%	Bias	0%

Precision: 2017: 100.0, 2018: 100.0, 2019: 100.0, 2020: 100.0, 2021: 100.0 (13% / 5.7% markers)

Bias: 2017: -0.1, 2018: -0.2, 2019: 0.0, 2020: 0.3, 2021: 0.0
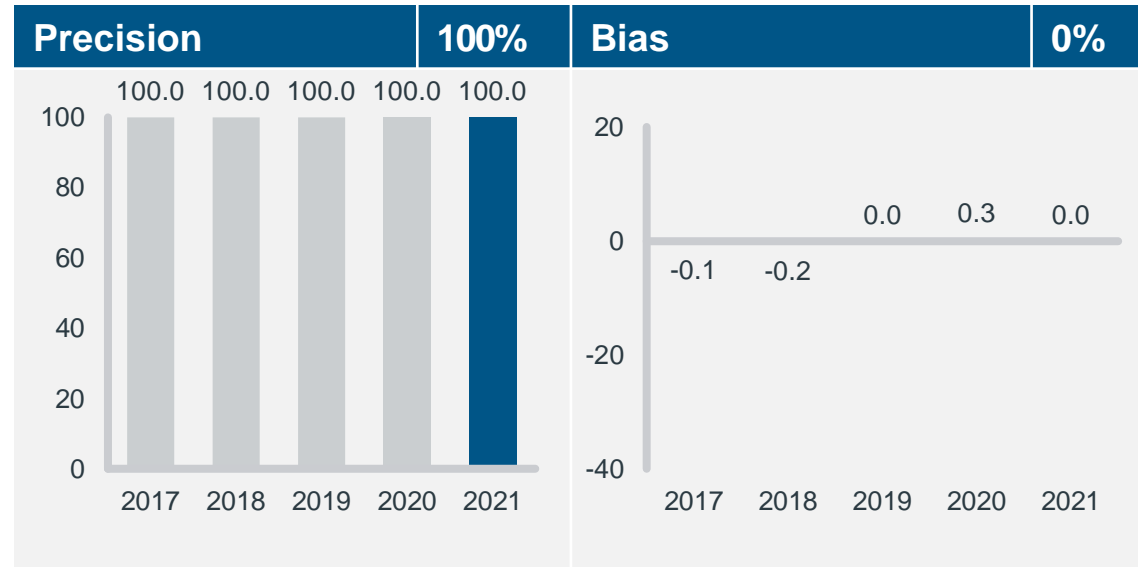
Outcomes

- Overall precision index remained 100% unchanged in 2021
- Overall bias index improved by 0.3 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 86.7%
Wholesalers 6%, 7.3%, 5.7%
Canada Retail 81%, Canada Hospital
Drugstores, Hospitals
Patients 87%, 13%
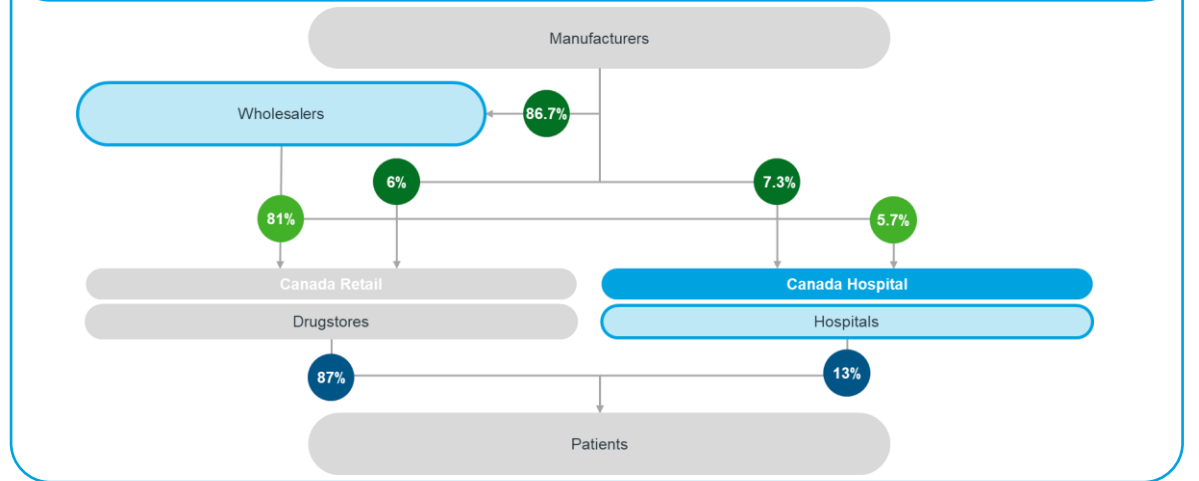
Participation

# Participating Companies	# Forms Validated	% Market Validated
123 (+3 vPY)	**1,165** (-12 vPY)	**95%** (no change vPY)

Latin America

Countries	
Argentina	Colombia
Bolivia	Dominican Republic
Brazil	Ecuador
Central America	Mexico
• Guatemala	Paraguay
• El Salvador	Peru
• Honduras	Uruguay
• Nicaragua	Venezuela
• Costa Rica	
• Panama	

IQVIA

Argentina Retail Validation Study
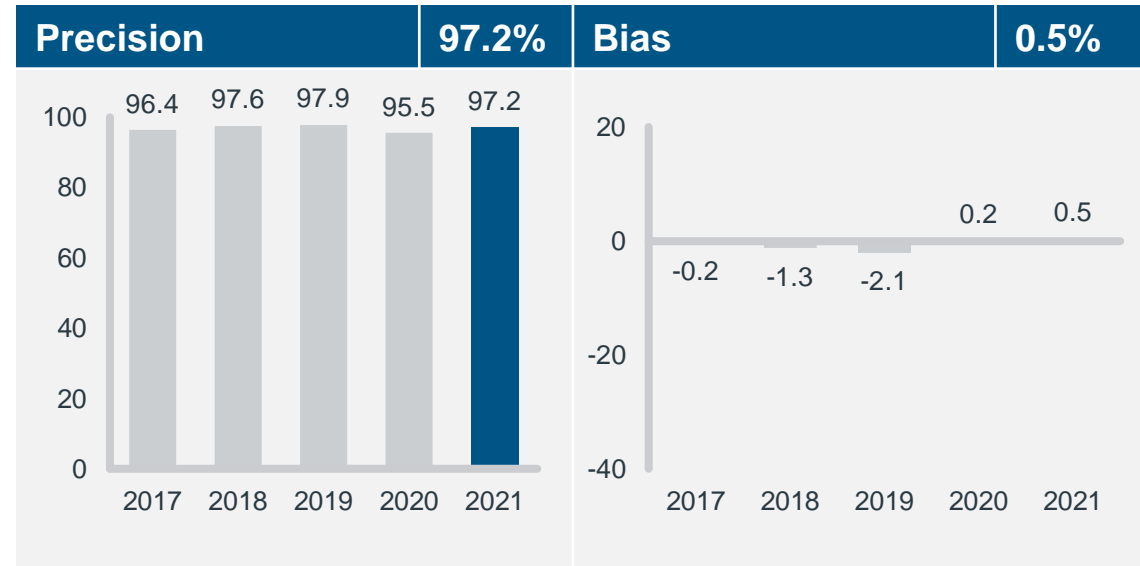
2021 Validation Study

Validation Results

Precision		97.2%	Bias		0.5%

Precision bars (%):
- 2017: 96.4
- 2018: 97.6
- 2019: 97.9
- 2020: 95.5
- 2021: 97.2

Bias values:
- 2017: -0.2
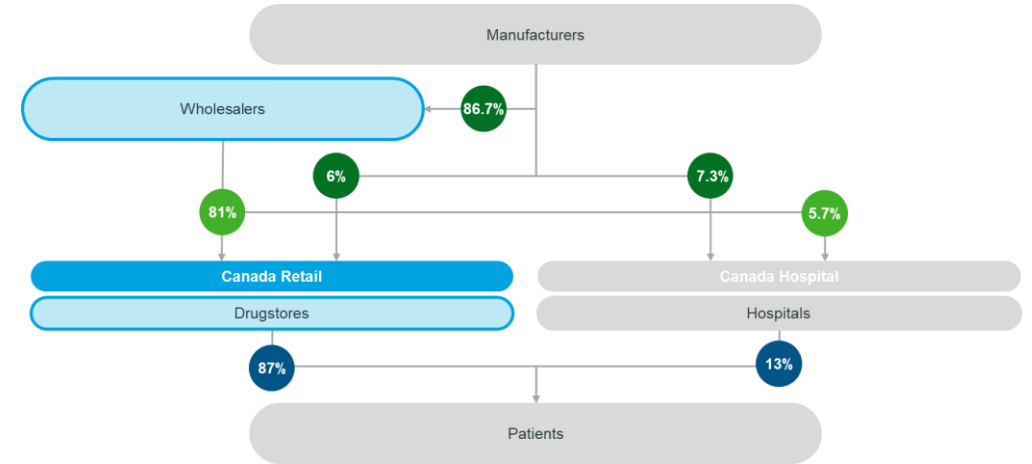- 2018: -1.3
- 2019: -2.1
- 2020: 0.2
- 2021: 0.5

Outcomes

- Overall precision index improved by 1.7 percentage points in 2021
- Overall overestimation increased slightly by 0.3 percentage points in 2021
- No action required from the statistical point of view
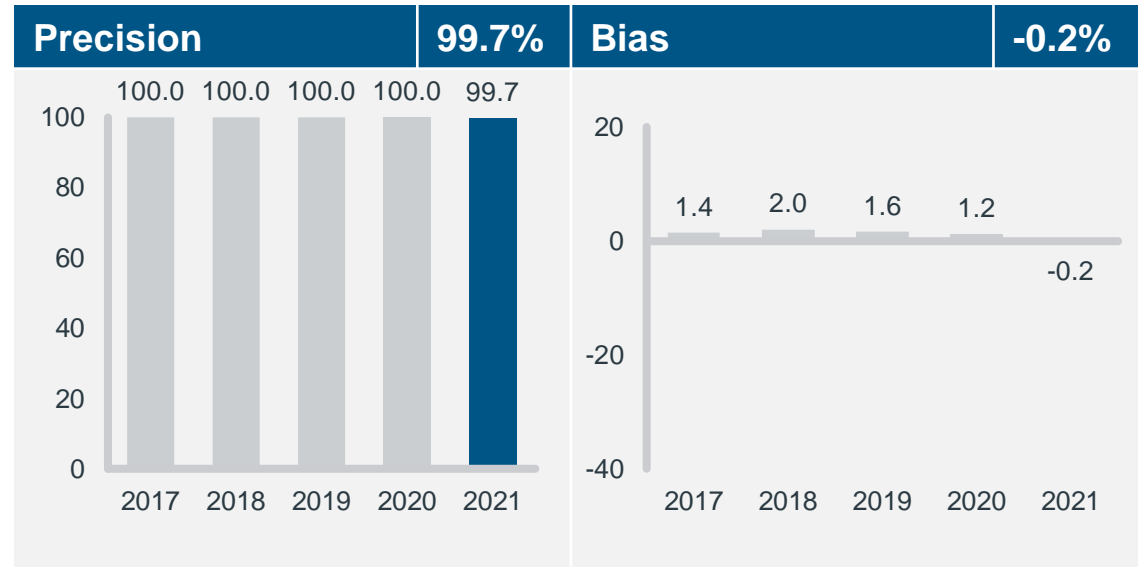
Distribution Channels Validated

Manufacturers

Wholesalers — 85%

- 60%
- 23%
- 1%
- 1%
- <1%

- 4%
- 2%
- 1%
- 5%
- 3%

Argentina Retail
- Independent Pharmacies
- Chains

Private Institutions
Public Institutions
Others*

- 63%
- 26%
- 2%
- 6%
- 3%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
37 *(no change vPY)*	2,070 *(+131 vPY)*	51% *(+4% vPY)*

Argentina OTC Validation Study

2021 Validation Study

Validation Results

Precision	89.8%	Bias	-5.9%

Precision (2017–2021): 89.7, 85.6, 91.3, 81.8, 89.8

Bias (2017–2021): -4.6, -3.1, -6.3, -8.9, -5.9
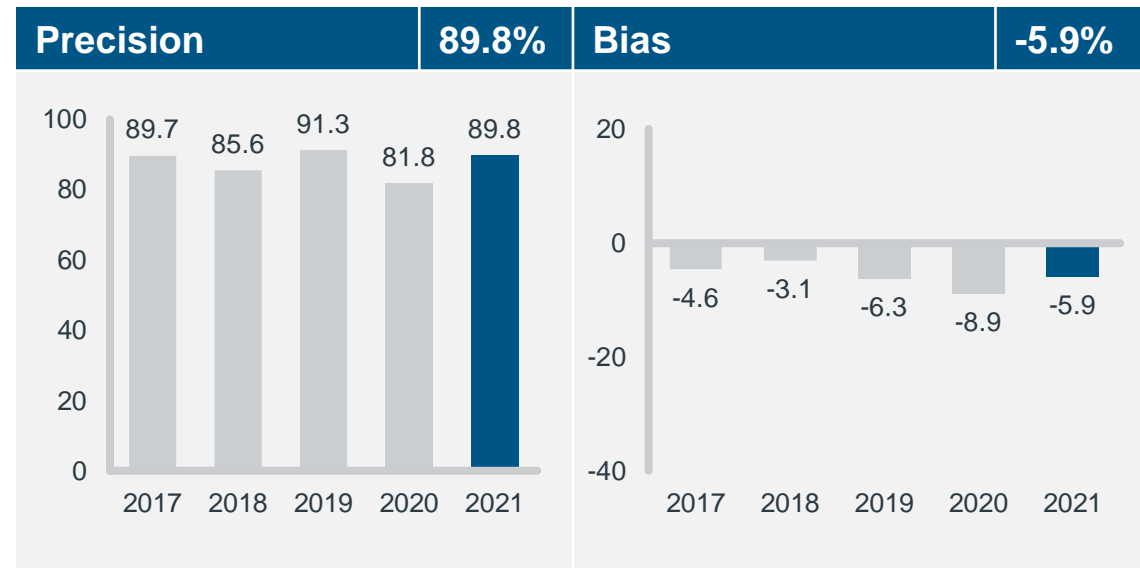
Outcomes

- Overall precision index improved by 8.0 percentage points in 2021
- Overall underestimation improved by 3.0 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 85%

60%   23%   1%   1%   <1%

4%   2%   1%   5%   3%

Argentina Retail

Independent Pharmacies   Chains   Private Institutions   Public Institutions   Others*

63%   26%   2%   6%   3%

Patients
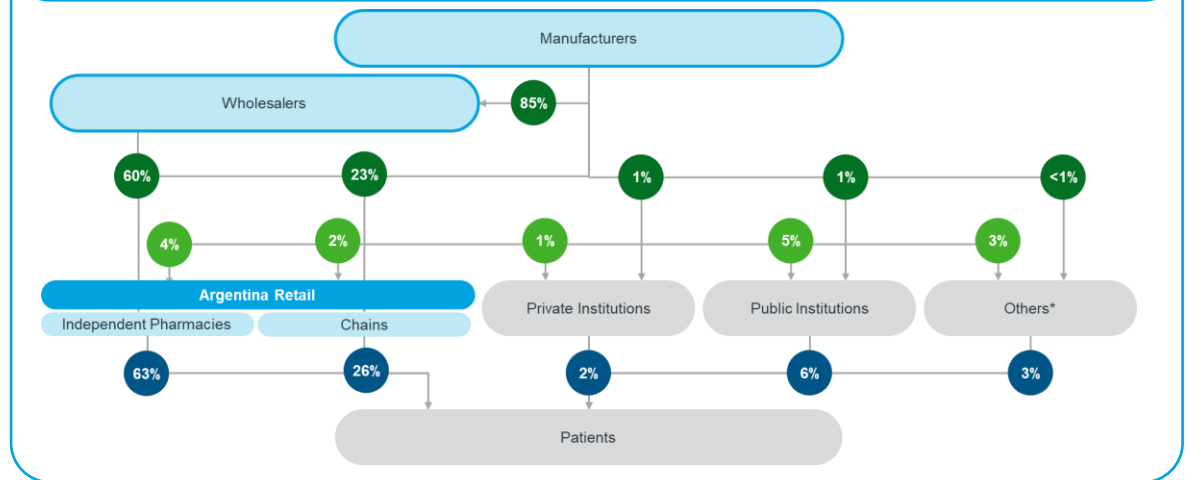
Participation

# Participating Companies	# Forms Validated	% Market Validated
23 (+1 vPY)	**243** (-6 vPY)	**36%** (-5% vPY)

Bolivia Retail Validation Study

2021 Validation Study

Validation Results

| Precision | **73.2%** | Bias | **-7.2%** |

Precision bar chart values: 2017: 53.6, 2018: 56.3, 2019: 53.8, 2020: 60.2, 2021: 73.2

Bias bar chart values: 2017: -20.4, 2018: -23.0, 2019: -25.5, 2020: -24.2, 2021: -7.2

Outcomes
- Overall precision index improved by 13.0 percentage points in 2021
- Overall underestimation improved by 17.0 percentage points in 2021
- Fulfill sample design according to the new PM territorial upgrade. Increase validation participation

Distribution Channels Validated

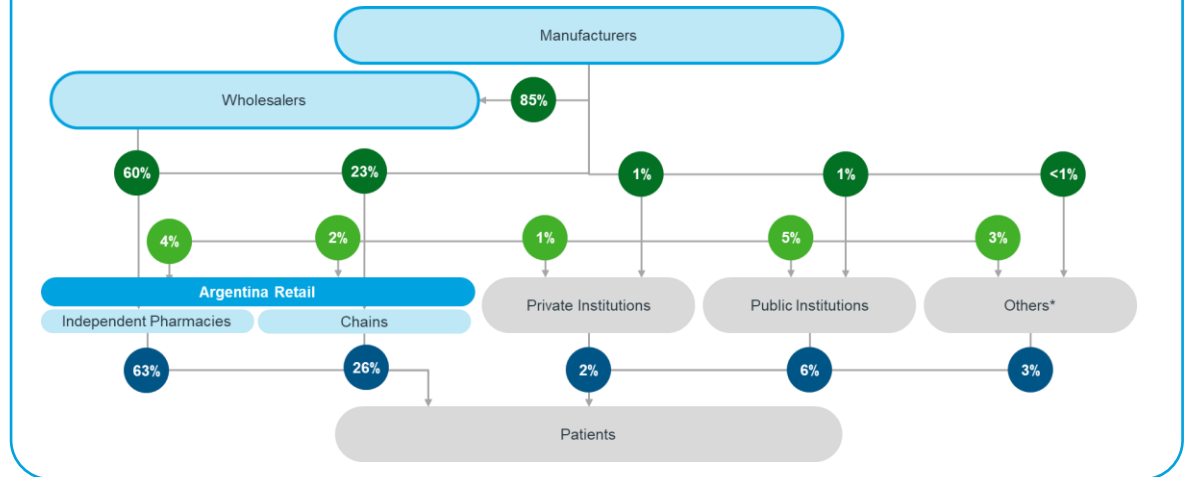Manufacturers → Independent Pharmacies* (41%), Chains (42%), Private Institutions (6%), Public Institutions (5%), Others (7%)

Independent Pharmacies* (41%), Chains (42%), Private Institutions (6%), Public Institutions (5%), Others (7%) → Patients

83% Market covered by IQVIA

Participation

# Participating Companies	# Forms Validated	% Market Validated
3 *(-43 vPY)*	**388** *(-1,035 vPY)*	**16%** *(-36% vPY)*

Brazil Retail Validation Study

2021 Validation Study

Validation Results

Precision	89.3%	Bias	0.7%

Precision chart (2017–2021): 94.3, 93.8, 87.8, 89.3

Bias chart (2017–2021): -3.5, -1.5, -3.8, 0.7
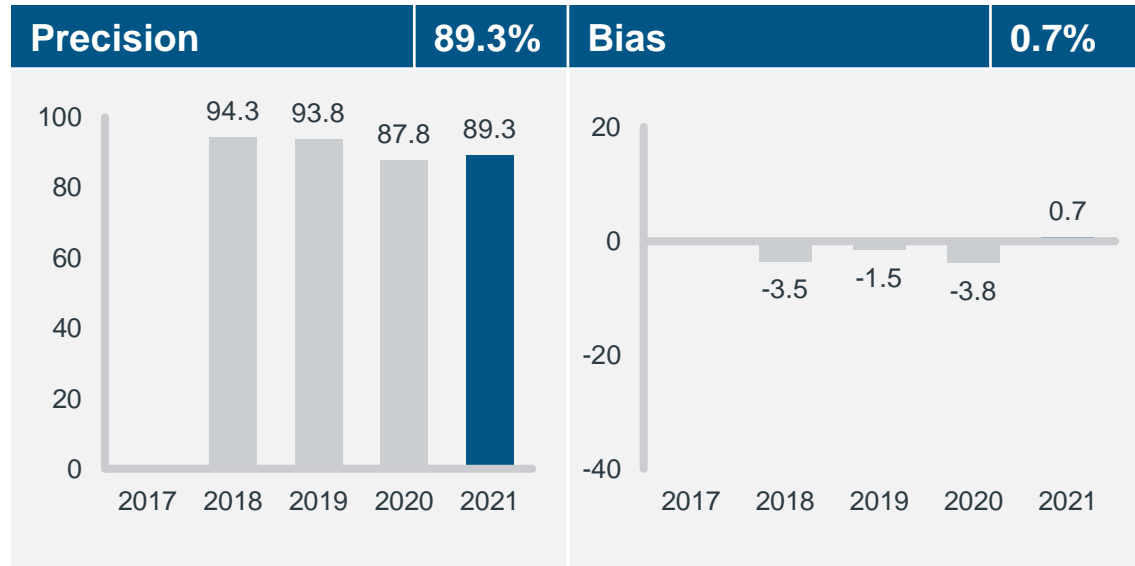
Outcomes

- Overall precision index improved by 1.5 percentage points in 2021
- Overall bias turned from 3.8% underestimation to 0.7% overestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers — 10% → Chain Warehouse; 59% → Wholesalers/Distributors; 17% → Chain Warehouse

Chain Warehouse — 27% → Brazil Retail; 1%; 16%

Wholesalers/Distributors — 29%, 24%, <1%, 2%

Brazil Retail, Brazil Retail PPP: Chain Pharmacies (27%), Independent Pharmacies (17%)

Brazil Non-Retail / Non-Retail (53%); Others (3%)

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
29 (+2 vPY)	**2,608** (+1,342 vPY)	**38%** (+23% vPY)

Brazil OTC Validation Study

2021 Validation Study

Validation Results

Precision	87.1%	Bias	3.6%

Precision bar chart values: 91.6 (2018), 96.1 (2019), 78.2 (2020), 87.1 (2021)

Bias bar chart values: -4.1 (2018), -1.1 (2019), -11.1 (2020), 3.6 (2021)
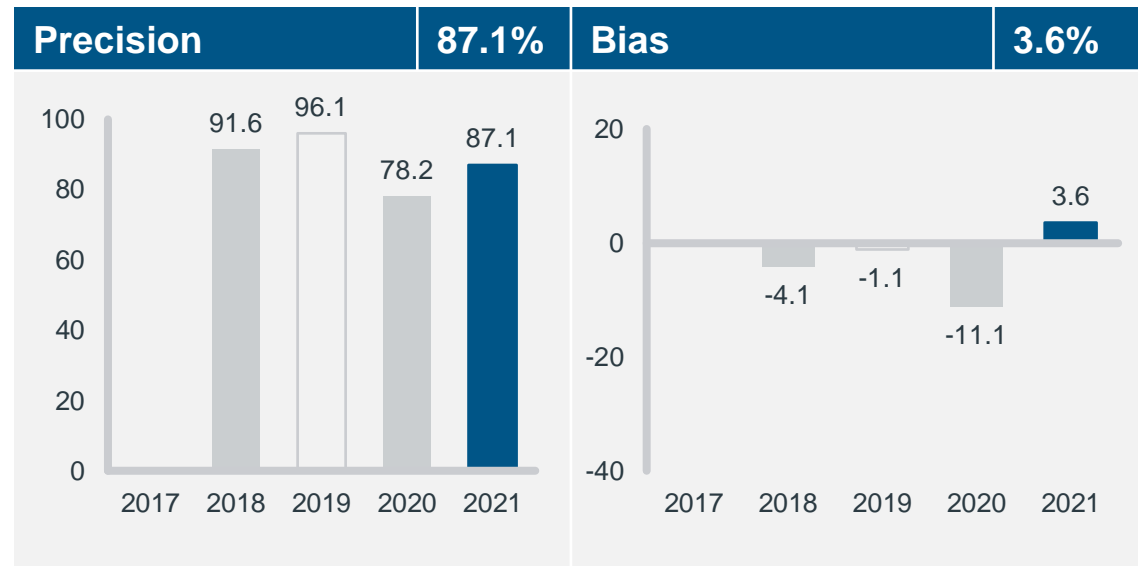
Outcomes

- Overall precision index improved by 8.9 percentage points in 2021
- Overall bias turned from 11.1% underestimation to 3.6% overestimation in 2021
- No action required from the statistical point of view
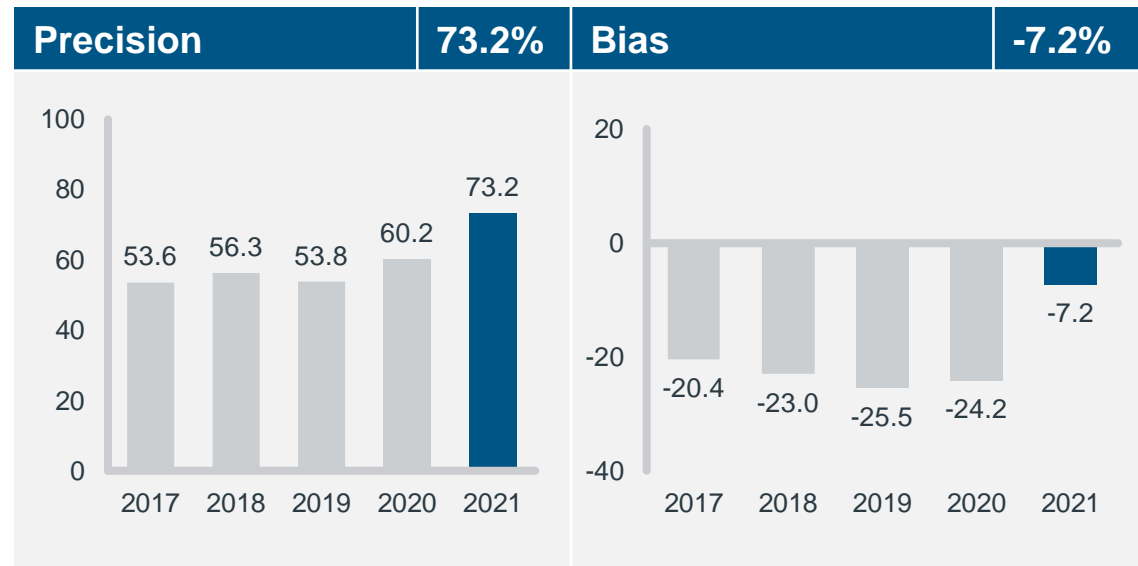
Distribution Channels Validated
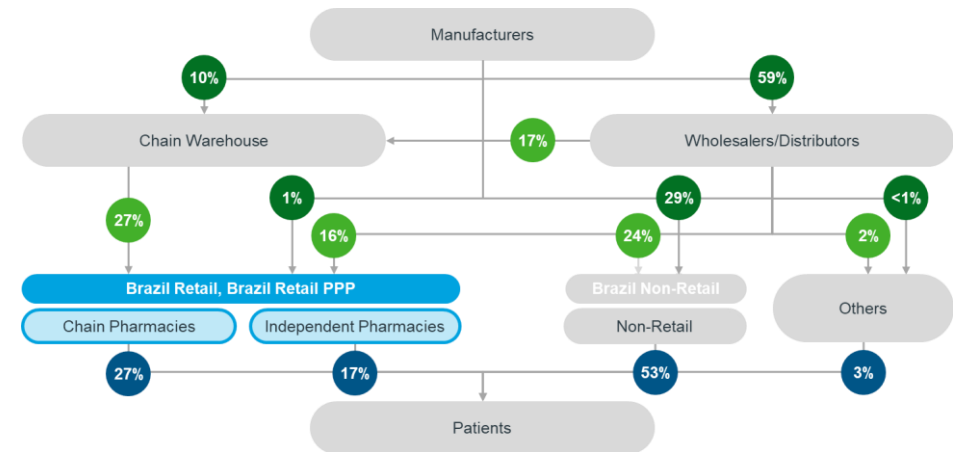
Participation

# Participating Companies	# Forms Validated	% Market Validated
23 (+5 vPY)	574 (+322 vPY)	26% (+16% vPY)

Central America Retail Validation Study

2021 Validation Study

Validation Results

Precision	90.9%	Bias	-8.7%

Precision bar chart:
- 2017: 84.5
- 2018: 88.3
- 2019: 94.6
- 2020: 91.2
- 2021: 90.9

Bias bar chart:
- 2017: -4.8
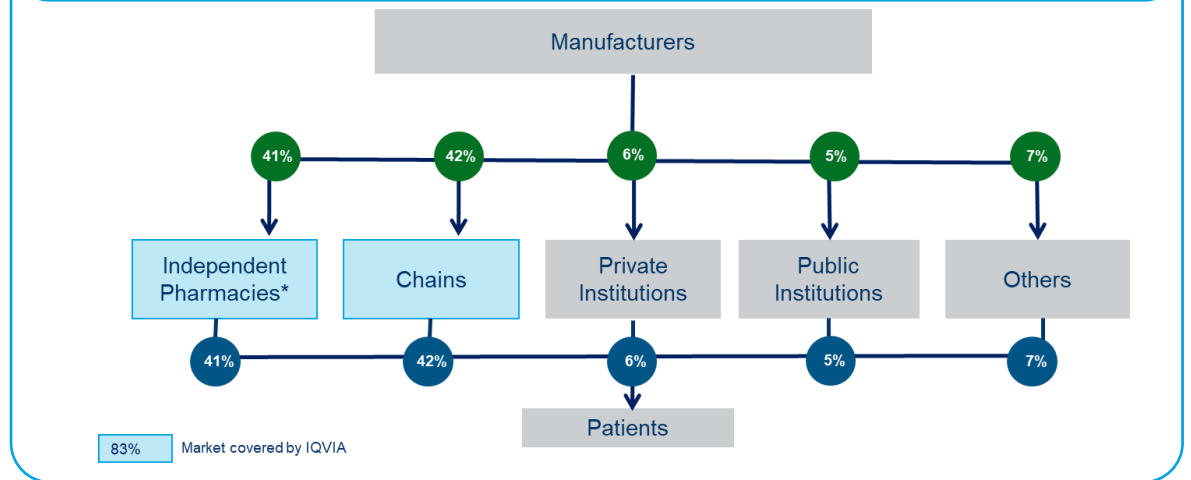- 2018: -8.9
- 2019: -2.3
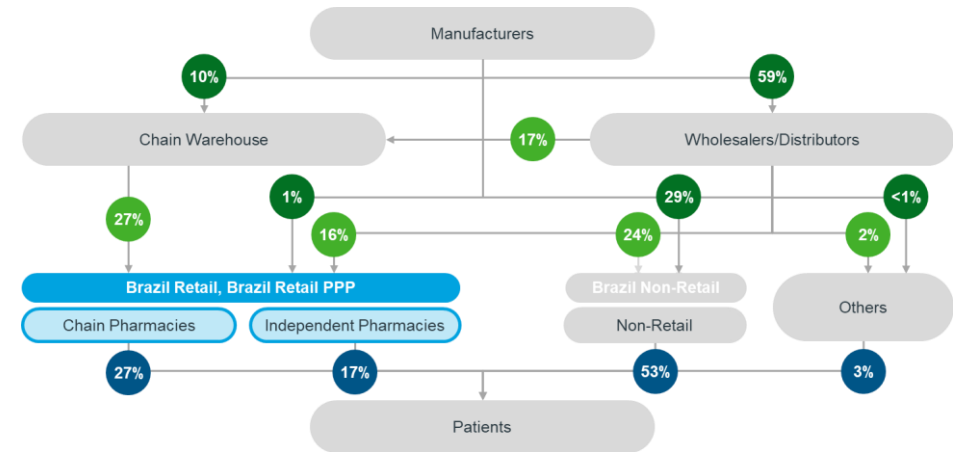- 2020: -4.2
- 2021: -8.7
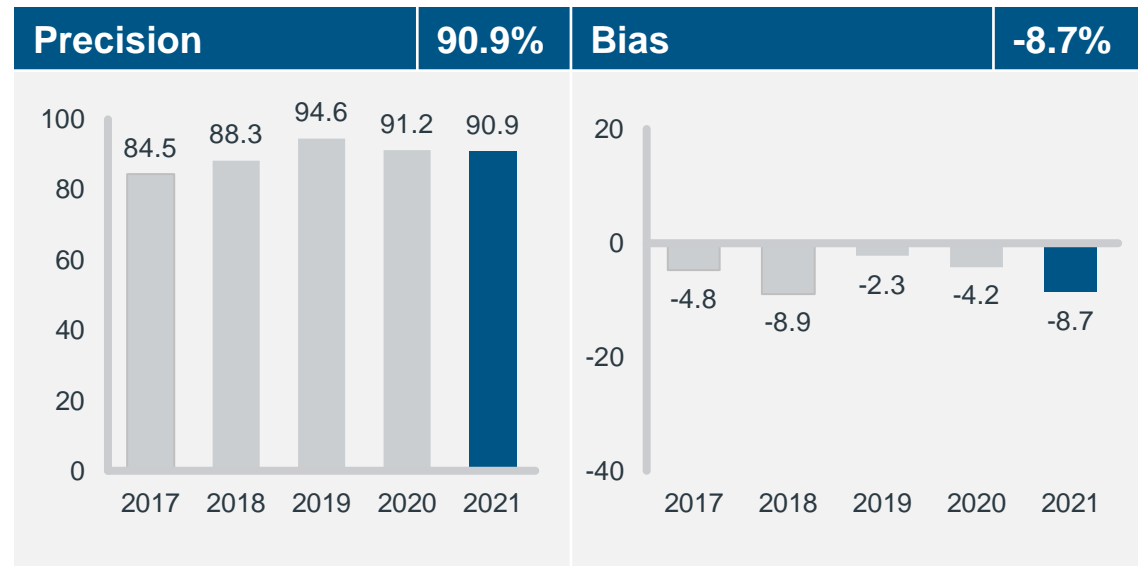
Outcomes

- Overall precision index declined by 0.3 percentage points in 2021
- Overall underestimation increased by 4.5 percentage points in 2021
- Adjust projection level and implement new projection structure

Distribution Channels Validated

Manufacturers
- Wholesalers: 75%
- C. America Retail / Private Pharmacies: 18%
- Government Institutions: 2%
- Clinics/Hospitals: 2%
- Others: 3%

- C. America Retail / Private Pharmacies: 59%
- Government Institutions: 9%
- Clinics/Hospitals: 3%
- Others: 4%

Patients:
- Private Pharmacies: 77%
- Government Institutions: 11%
- Clinics/Hospitals: 5%
- Others: 7%

Participation

# Participating Companies	# Forms Validated	% Market Validated
23 (+7 vPY)	1,080 (+103 vPY)	17% (+3% vPY)

Colombia Retail Validation Study
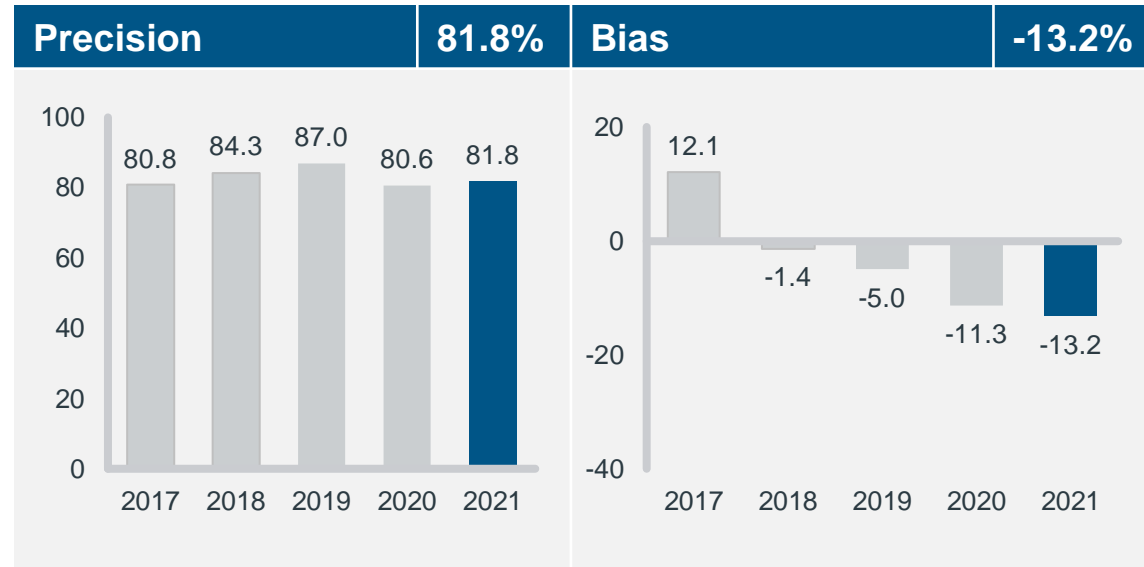
2021 Validation Study

Validation Results

Precision	81.8%	Bias	-13.2%

Precision: 2017: 80.8, 2018: 84.3, 2019: 87.0, 2020: 80.6, 2021: 81.8

Bias: 2017: 12.1, 2018: -1.4, 2019: -5.0, 2020: -11.3, 2021: -13.2

Outcomes

- Overall precision index improved by 1.2 percentage points in 2021
- Overall underestimation increased by 1.9 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
30 *(+1 vPY)*	**1,437** *(+310 vPY)*	**34%** *(+8% vPY)*

Dominican Republic Retail Validation Study

2021 Validation Study

Validation Results

Precision	89.9%	Bias	-0.2%

Precision chart:
- 2017: 80.7
- 2018: 80.9
- 2019: 85.5
- 2020: 92.9
- 2021: 89.9

Bias chart:
- 2017: -4.8
- 2018: -6.4
- 2019: -8.5
- 2020: -2.2
- 2021: -0.2

Outcomes

- Overall precision index declined by 3 percentage points in 2021
- Overall underestimation improved by 2 percentage points in 2021
- No action required from the statistical point of view
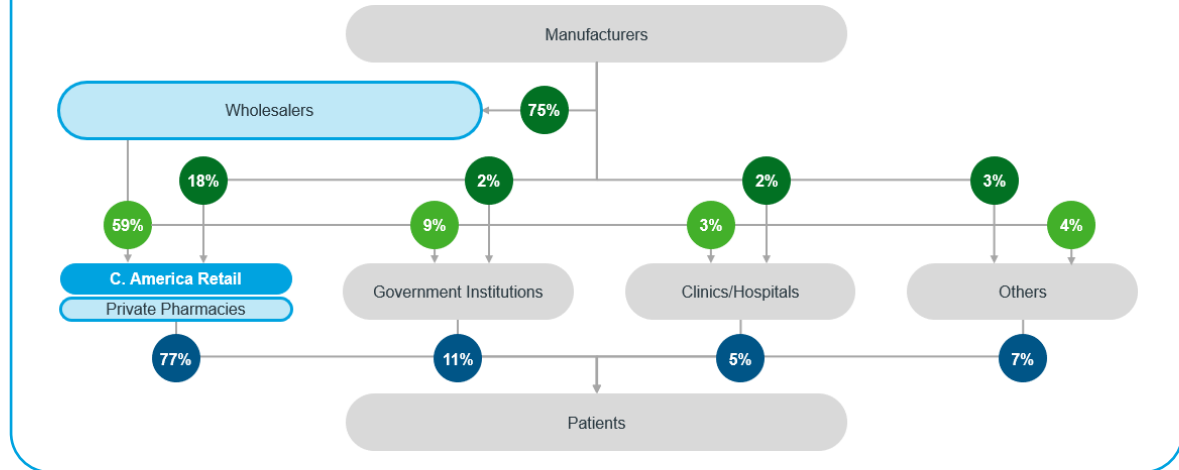
Distribution Channels Validated

Manufacturers → Wholesalers 76%
Wholesalers → Dom. Rep. Retail Pharmacies 63%, Public Hospitals 15%, Clinics and Private Hospitals 2%, Others* 5%
Manufacturers → Public Hospitals 2%, Clinics and Private Hospitals 4%, Others* 4%, 5%
Dom. Rep. Retail Pharmacies → Patients 78%
Public Hospitals → Patients 7%
Clinics and Private Hospitals → Patients 6%
Others* → Patients 9%

Participation

# Participating Companies	# Forms Validated	% Market Validated
16 (+3 vPY)	1,042 (+302 vPY)	20% (+9% vPY)

Ecuador Retail Validation Study

2021 Validation Study

Validation Results

Precision	89.1%	Bias	-3.5%
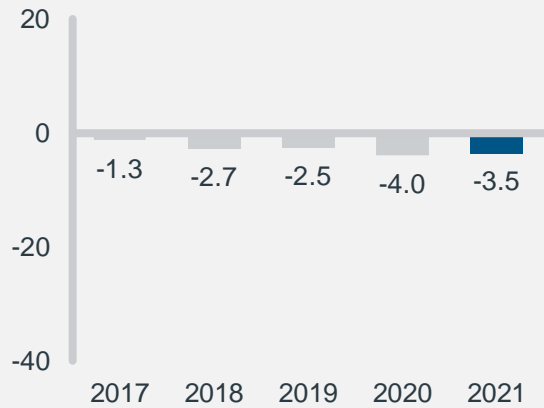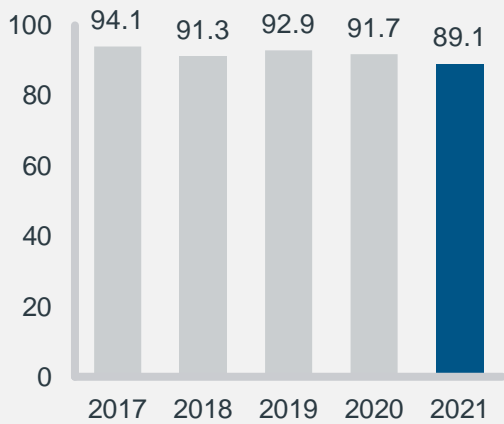
Precision bar chart (2017–2021): 94.1, 91.3, 92.9, 91.7, 89.1

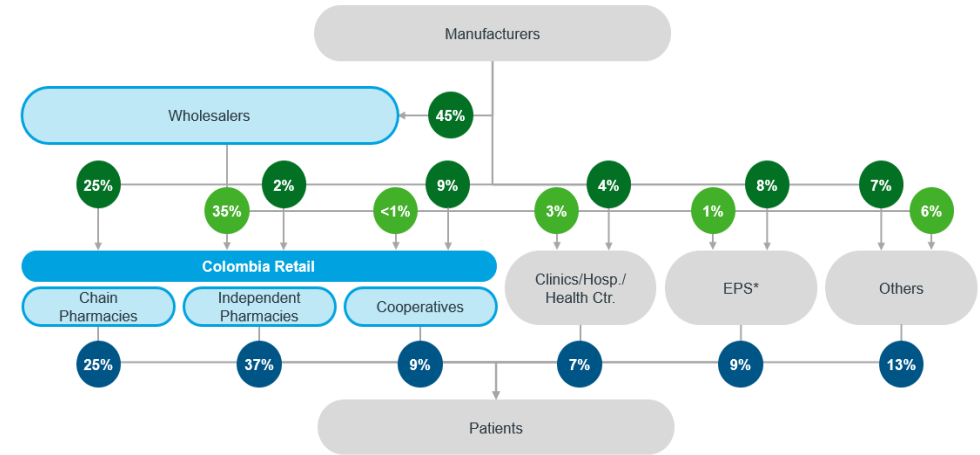Bias chart (2017–2021): -1.3, -2.7, -2.5, -4.0, -3.5

Outcomes

- Overall precision index declined by 2.6 percentage points in 2021
- Overall underestimation improved by 0.5 percentage points in 2021
- No action required from the statistical point of view
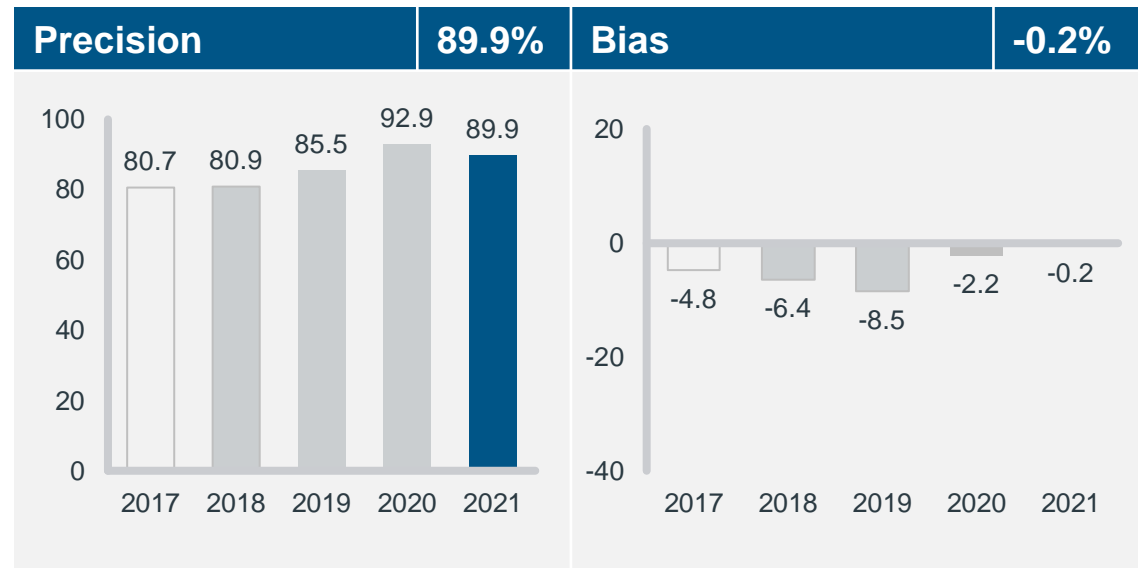
Distribution Channels Validated

Manufacturers → Wholesalers 73%

Wholesalers → Ecuador Retail / Pharmacies 61%, 14%, 8%, 2%, 3%

7%, 3%, 2%

Ecuador Retail / Pharmacies → Patients 75%, 15%, 5%, 5%

Public Institutions, Private Institutions, Others, Patients
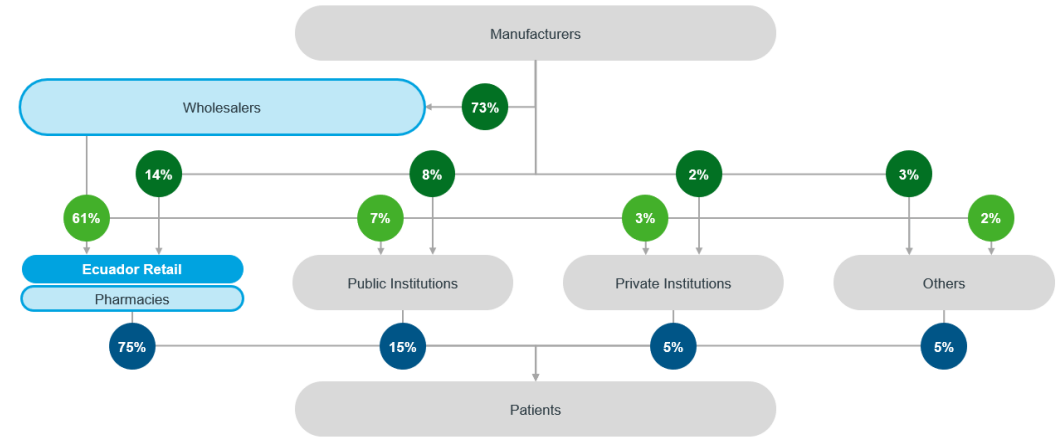
Participation

# Participating Companies	# Forms Validated	% Market Validated
66 (+22 vPY)	1,852 (+83 vPY)	53% (-2% vPY)

Mexico Retail Validation Study
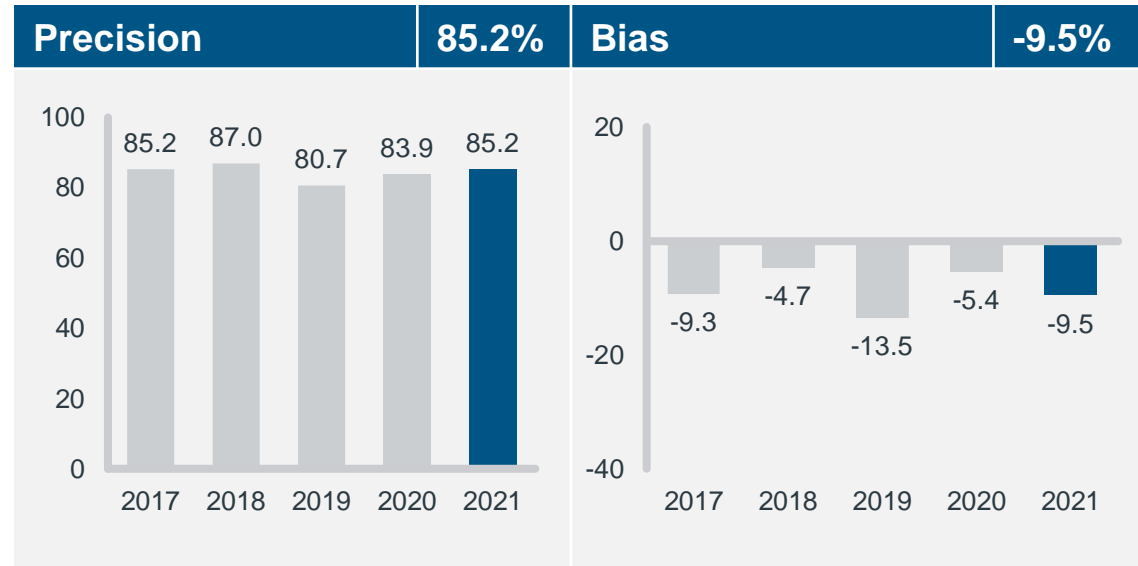
2021 Validation Study

Validation Results

Precision	**85.2%**	Bias	**-9.5%**

Precision chart:
- 2017: 85.2
- 2018: 87.0
- 2019: 80.7
- 2020: 83.9
- 2021: 85.2

Bias chart:
- 2017: -9.3
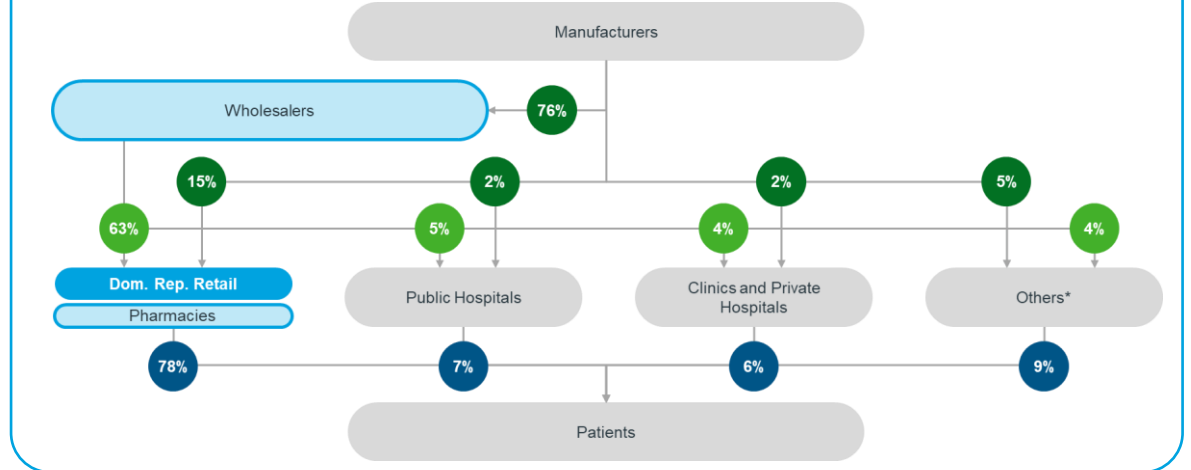- 2018: -4.7
- 2019: -13.5
- 2020: -5.4
- 2021: -9.5

Outcomes

- Overall precision index improved by 1.3 percentage points in 2021
- Overall underestimation increased by 4.1 percentage points in 2021
- Review projection structure

Distribution Channels Validated
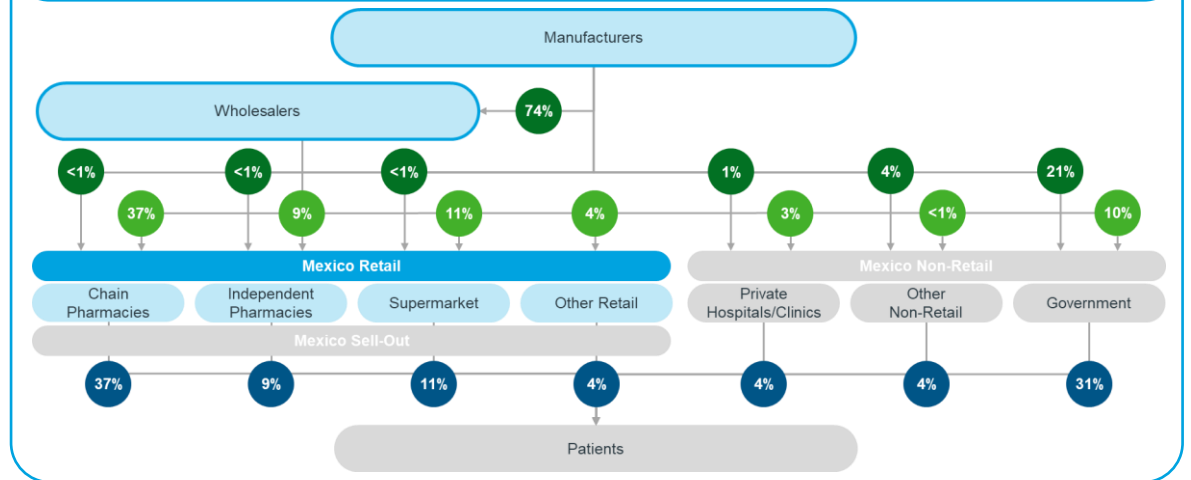
Participation

# Participating Companies	# Forms Validated	% Market Validated
32 *(-2 vPY)*	**964** *(-23 vPY)*	**16%** *(+2% vPY)*

Mexico OTC Validation Study

2021 Validation Study

Validation Results

Precision	76.8%	Bias	-9.8%

Precision (bar chart):
- 2017: 92.5
- 2018: 95.9
- 2019: 79.1
- 2020: 85.5
- 2021: 76.8

Bias (bar chart):
- 2017: -2.5
- 2018: -1.0
- 2019: -17.1
- 2020: 1.4
- 2021: -9.8
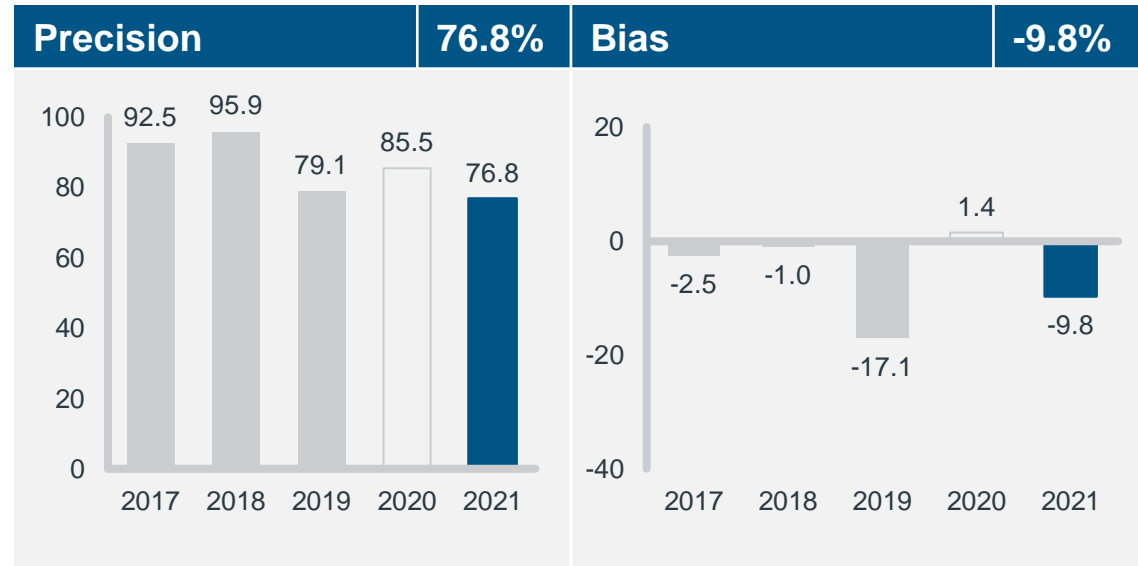
Outcomes
- Overall precision index declined by 8.7 percentage points in 2021
- Overall bias turned from 1.4% overestimation to 9.8% underestimation in 2021
- Review projection structure

Distribution Channels Validated

Manufacturers → Wholesalers (74%)

Wholesalers to Mexico Retail: <1%, <1%, <1%
To Mexico Retail: 37%, 9%, 11%, 4%
Mexico Non-Retail: 1%, 4%, 21%
Non-Retail sub: 3%, <1%, 10%

Mexico Retail: Chain Pharmacies, Independent Pharmacies, Supermarket, Other Retail
Mexico Non-Retail: Private Hospitals/Clinics, Other Non-Retail, Government

Mexico Sell-Out: 37%, 9%, 11%, 4%, 4%, 4%, 31%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
12 *(no change vPY)*	**143** *(+27 vPY)*	**10%** *(+3% vPY)*

Paraguay Retail Validation Study

2021 Validation Study

Validation Results

Precision	65.8%	Bias	2.7%

Precision chart values: 2017: 60.7, 2018: 58.1, 2019: 46.2, 2020: 41.9, 2021: 65.8

Bias chart values: 2017: -31.1, 2018: -35.9, 2019: -29.9, 2020: -26.1, 2021: 2.7
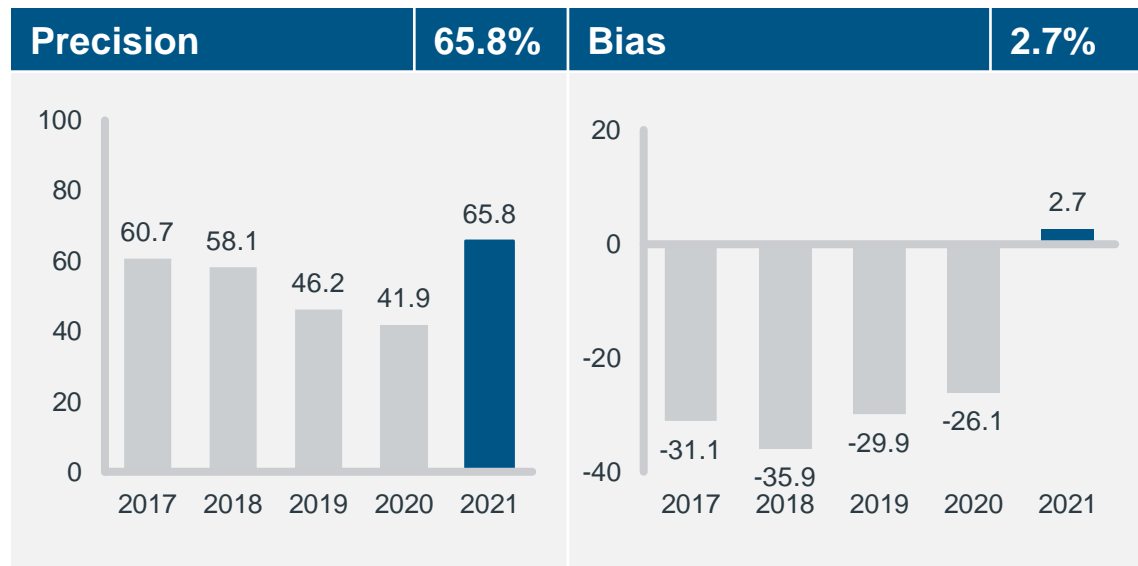
Outcomes

- Overall precision index improved by 23.9 percentage points in 2021
- Overall bias turned from 26.1% underestimation to 2.7% overestimation in 2021
- Fulfill sample design; Increase chain and independent pharmacy panels and/or incorporate more census data; Increase participation

Distribution Channels Validated

88% Market covered by IQVIA

Participation

# Participating Companies	# Forms Validated	% Market Validated
31 (-22 vPY)	**824** (-195 vPY)	**25%** (-7% vPY)

Peru Retail Validation Study

2021 Validation Study

Validation Results

Precision	89.3%	Bias	-9.6%

Precision (2017–2021): 91.8, 91.1, 90.6, 85.1, 89.3

Bias (2017–2021): -2.5, 0.1, -6.2, -7.5, -9.6
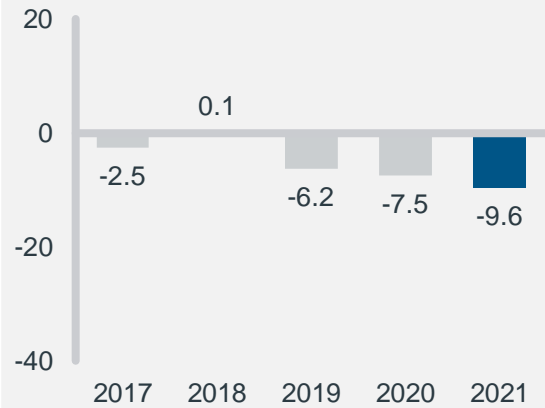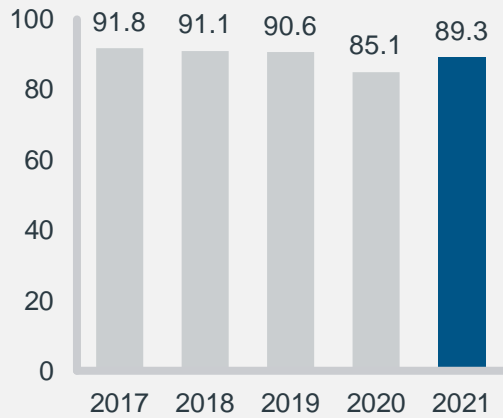
Outcomes
- Overall precision index improved by 4.2 percentage points in 2021
- Overall underestimation increased by 2.1 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers/Distributors
Wholesalers — 55%
25% 16% 3% 1%
18% 24% 6% 5% 2%
Peru Retail — Private Pharmacies — Chain Pharmacies
Government Institutions Private Institutions Others
67% 14% 25% 32%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
31 (+11 vPY)	1,421 (+475 vPY)	52% (+18% vPY)

Uruguay Retail+Mutuales Validation Study

2021 Validation Study

Validation Results

Precision	89.4%	Bias	-0.8%

Precision chart (2017–2021): 86.7, 84.2, 85.3, 76.8, 89.4

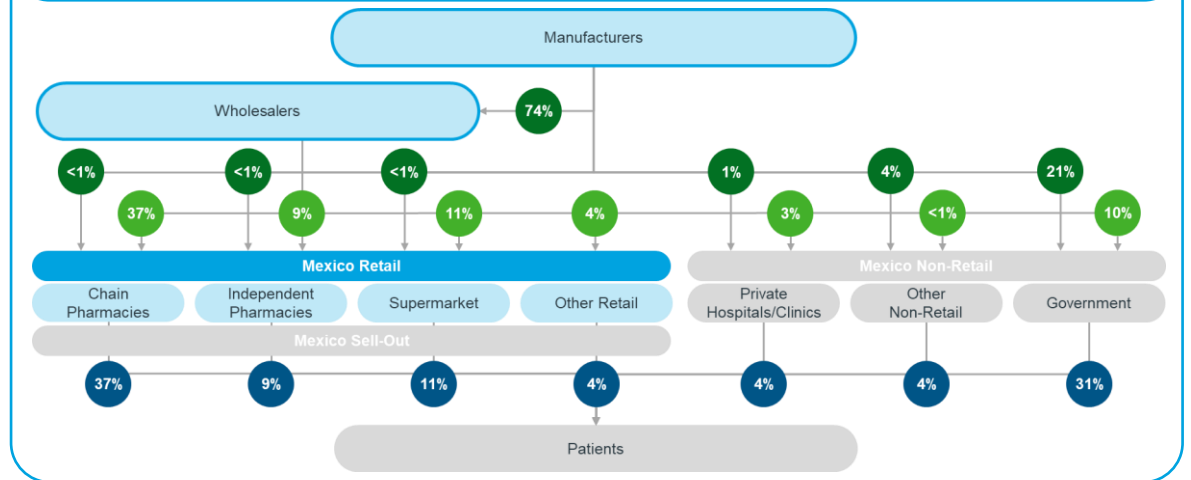Bias chart (2017–2021): -1.1, -4.0, 1.5, 1.3, -0.8

Outcomes

- Overall precision index improved by 12.6 percentage points in 2021
- Overall bias turned from 1.3% overestimation to 0.8% underestimation in 2021
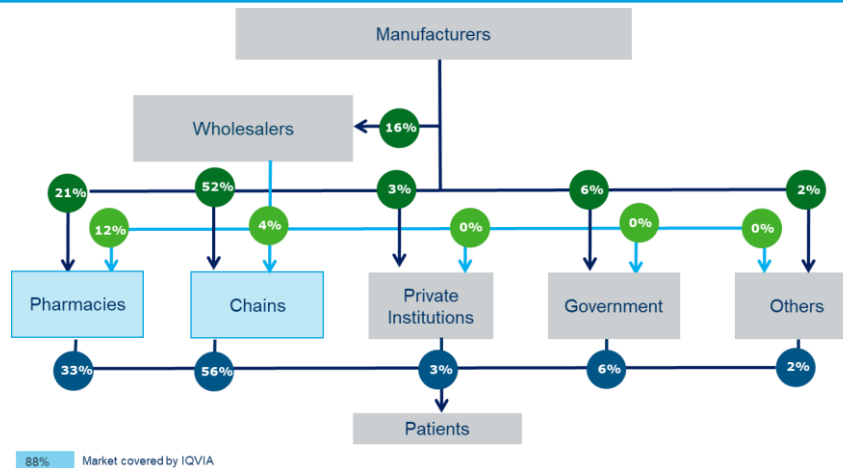- No action required from the statistical point of view

Distribution Channels Validated
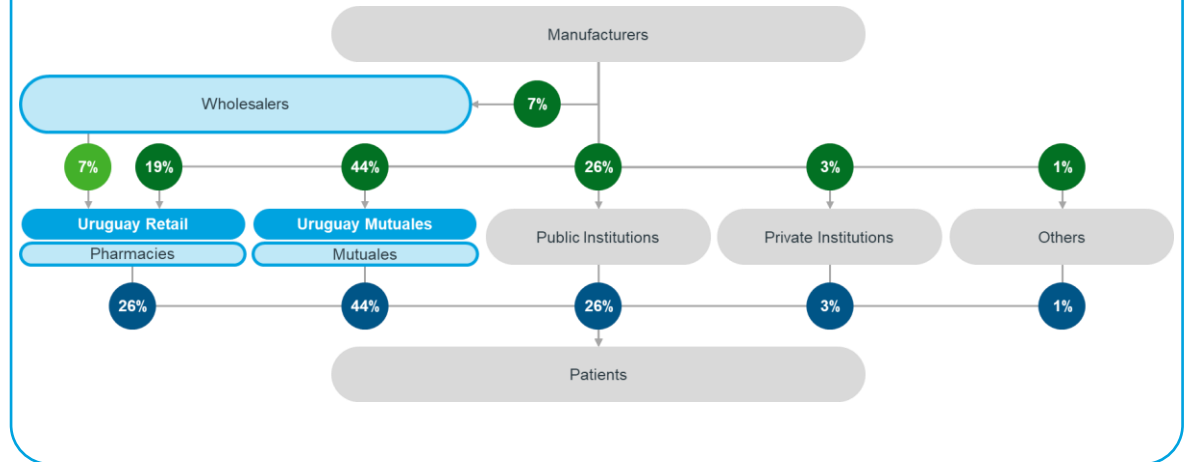
Participation

# Participating Companies	# Forms Validated	% Market Validated
15 *(no change vPY)*	**905** *(-2 vPY)*	**51%** *(-2% vPY)*

Venezuela Retail Validation Study

2021 Validation Study

Validation Results

Precision	91.3%	Bias	-4.9%

Precision chart:
- 2017: 89.6
- 2019: 74.3
- 2020: 88.0
- 2021: 91.3

Bias chart:
- 2017: -1.1
- 2019: 6.8
- 2020: -0.7
- 2021: -4.9
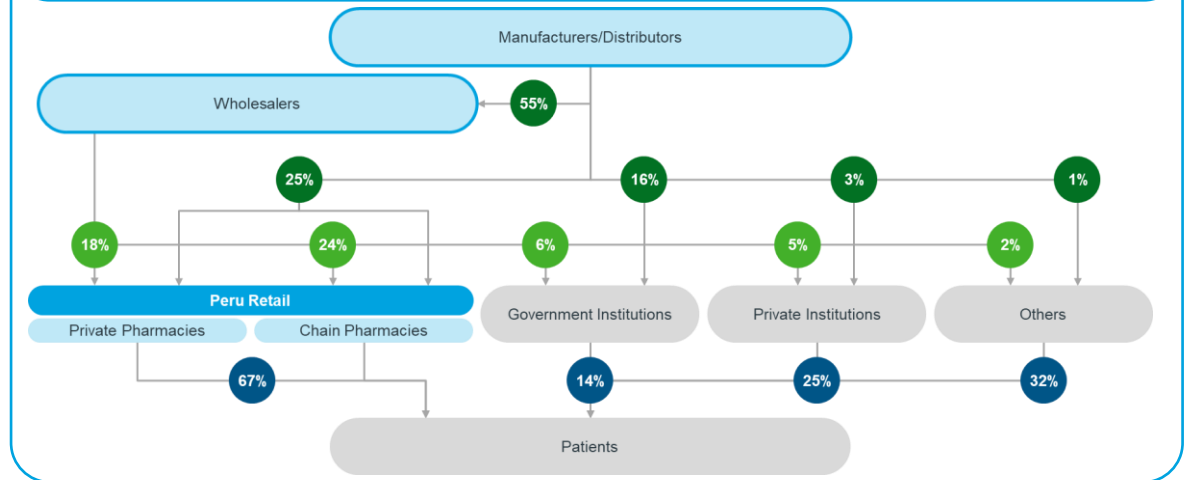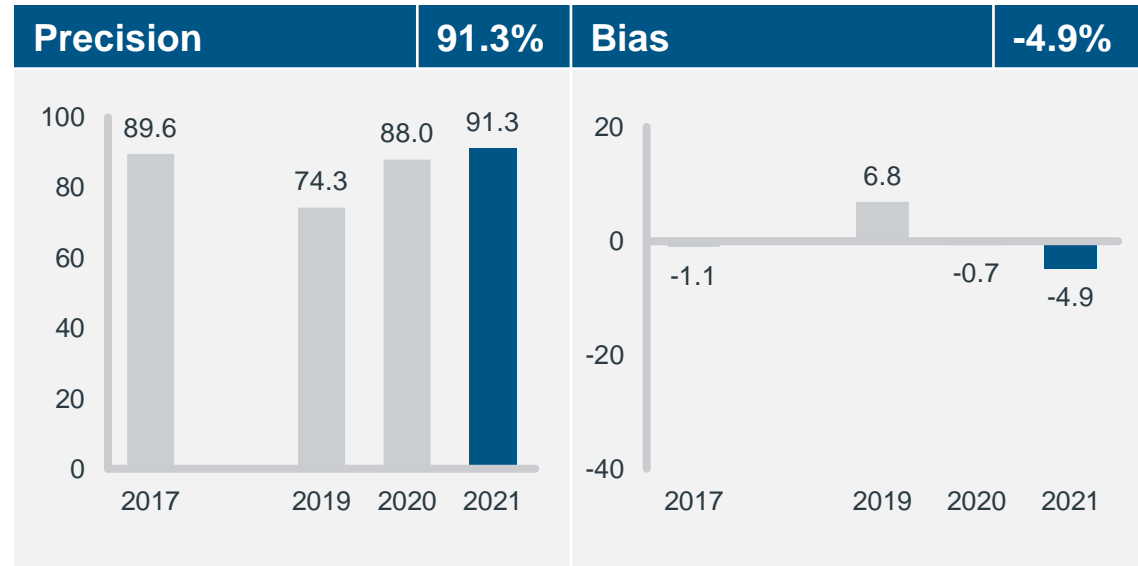
Outcomes
- Overall precision index improved by 3.3 percentage points in 2021
- Overall underestimation increased by 4.2 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

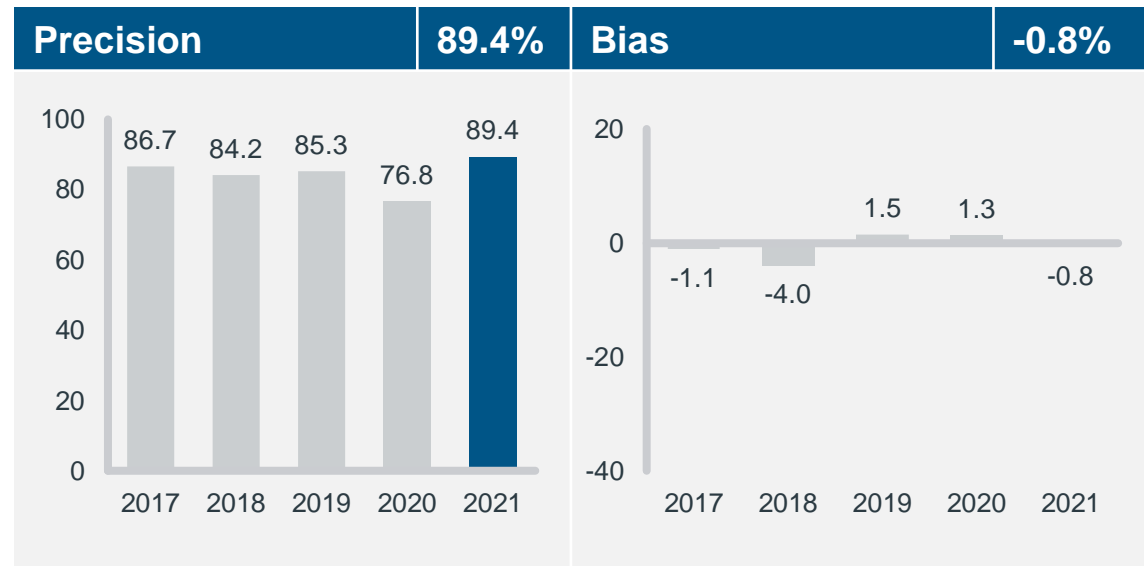Manufacturers
- Wholesalers 63%
- 5%, 12%, 2%, 18%, 1%
- 44%, 18%, <1%, <1%, <1%

Venezuela Retail
- Pharmacies
- Farmatodo Fundafarmacia Locatel
- Hospitals/Clinics
- I.V.S.S.
- Others

- Pharmacies 48%
- Farmatodo 30%
- Hospitals/Clinics 2%
- I.V.S.S. 18%
- Others 2%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
26 (+8 vPY)	**921** (+430 vPY)	**54%** (+25% vPY)

Europe

Countries	
Austria	Kazakhstan
Bosnia	Latvia
Bulgaria	Lithuania
Croatia	Poland
Czech Republic	Russia
Finland	Serbia
France	Slovakia
Greece	Slovenia
Hungary	Spain
Ireland	Switzerland
Italy	United Kingdom

IQVIA

Austria Retail Validation Study
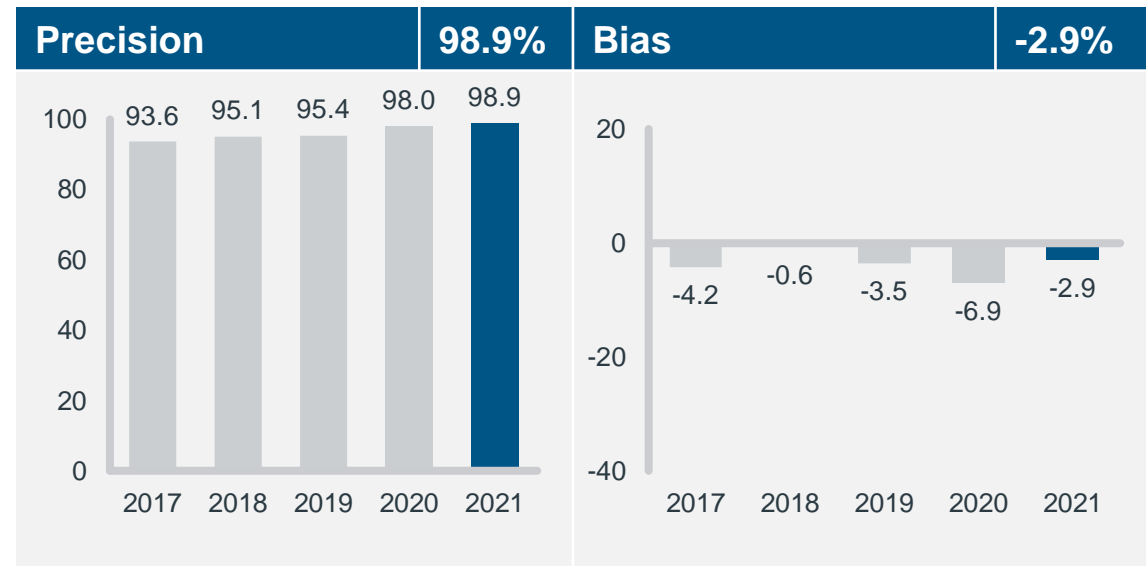
2021 Validation Study

Validation Results

Precision	98.9%	Bias	-2.9%

Precision chart (2017-2021): 93.6, 95.1, 95.4, 98.0, 98.9

Bias chart (2017-2021): -4.2, -0.6, -3.5, -6.9, -2.9

Outcomes

- Overall precision index improved by 0.9 percentage points in 2021
- Overall underestimation improved by 4.0 percentage points in 2021
- Review projection levels

Distribution Channels Validated

Manufacturers → Wholesalers 62%
Wholesalers 10%
51% 3% 8% 28%
Austria Retail
Retail Pharmacies | Dispensing Doctors | Hospitals / Austria Hospital
61% 8% 31%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
17 *(-1 vPY)*	**486** *(-51 vPY)*	**15%** *(-1% vPY)*

Austria PharmaTrend Validation Study
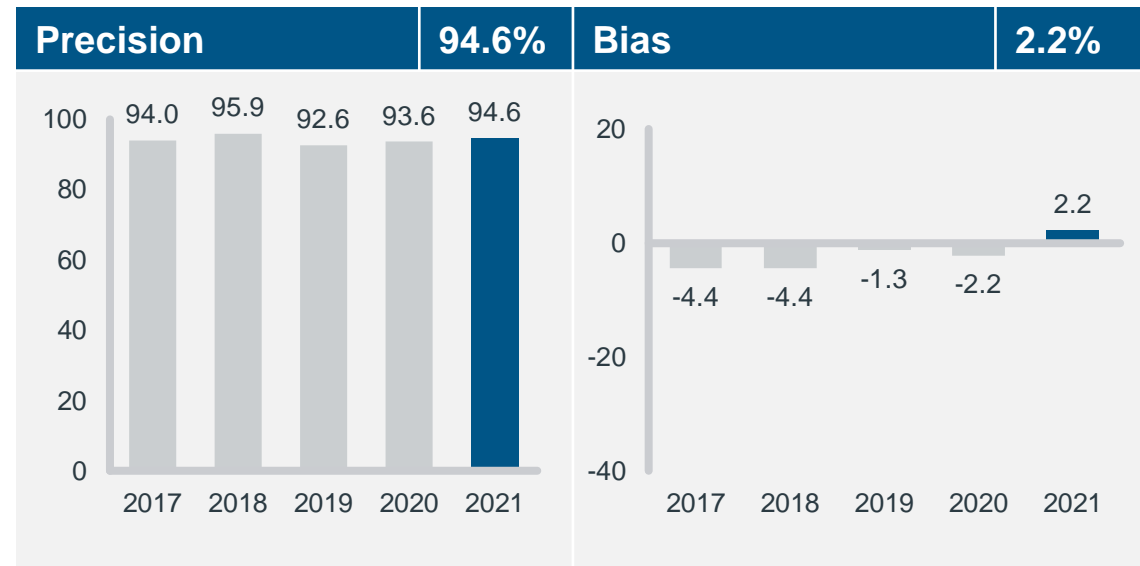
2021 Validation Study

Validation Results

Precision	94.6%	Bias	2.2%

Precision chart: 2017: 94.0, 2018: 95.9, 2019: 92.6, 2020: 93.6, 2021: 94.6

Bias chart: 2017: -4.4, 2018: -4.4, 2019: -1.3, 2020: -2.2, 2021: 2.2

Outcomes

- Overall precision index improved by 1.0 percentage point in 2021
- Overall bias turned from 2.2% underestimation in 2020 to 2.2% overestimation in 2021
- Analyze root-cause for slight overestimation; Implement enhanced universe update and adjust projection levels

Distribution Channels Validated

Manufacturers

Wholesalers — 62%

10% — 28%

51% — 3% — 8%

Retail Pharmacies — Dispensing Doctors — Hospitals / Austria Hospital

Austria Retail Sell-Out

61% — 8% — 31%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
17 *(-1 vPY)*	**472** *(-54 vPY)*	**15%** *(-1% vPY)*

Austria OTC Validation Study

2021 Validation Study

Validation Results

Precision	88.3%	Bias	-2.8%

Precision chart (2017–2021): 92.5, 94.7, 96.0, 90.4, 88.3

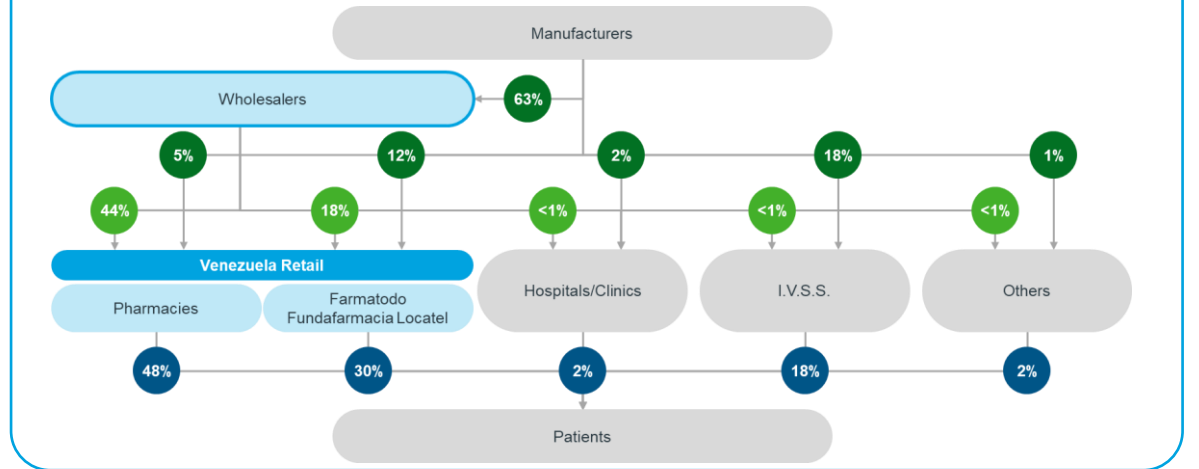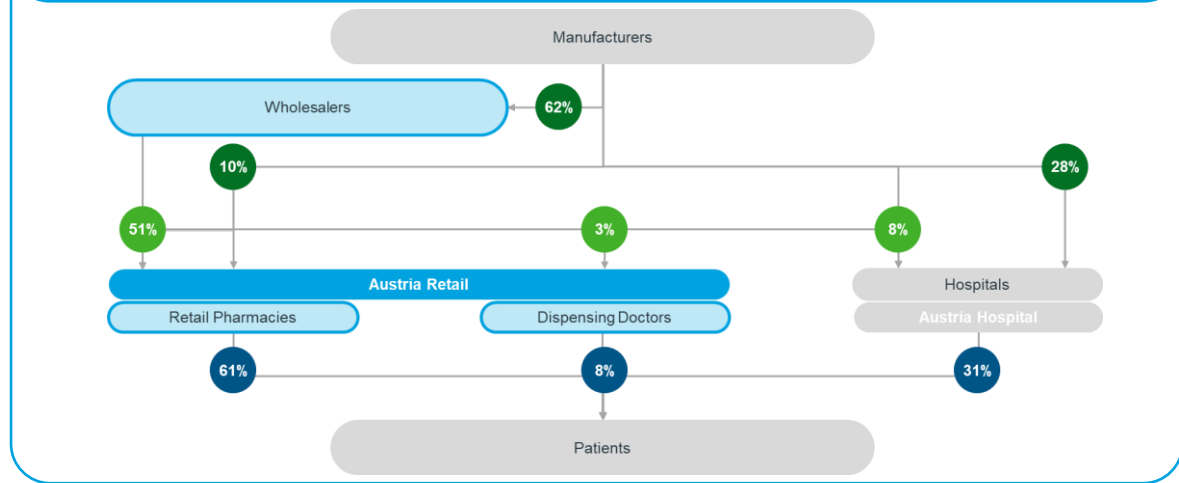Bias chart (2017–2021): -8.8, -5.8, -8.2, -8.2, -2.8
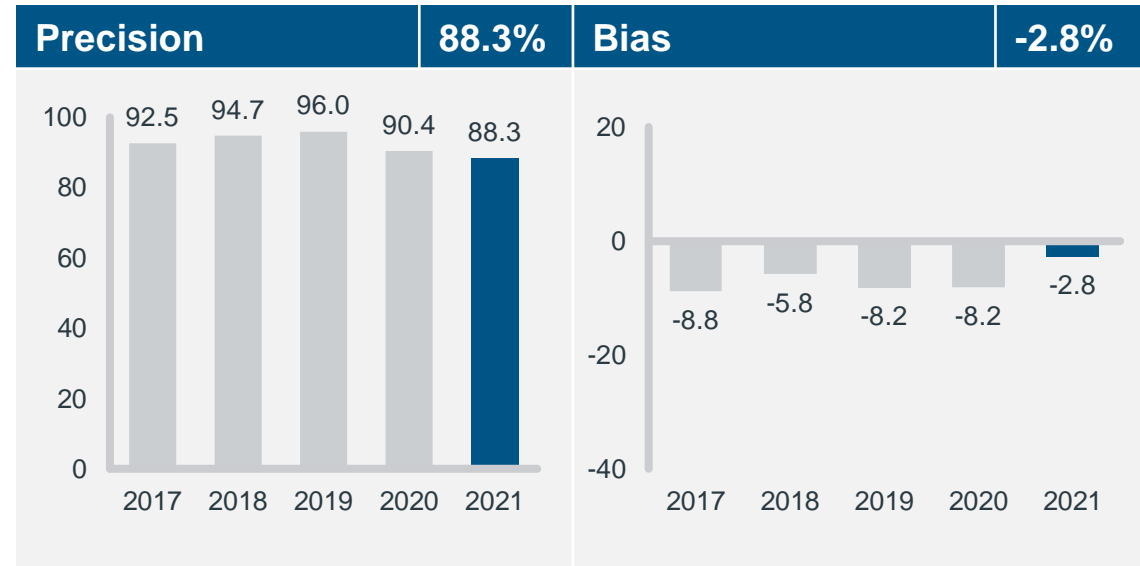
Outcomes
- Overall precision index declined by 2.1 percentage points in 2021
- Overall underestimation improved by 5.4 percentage points in 2021
- Improve quality of incoming data; Implement enhanced universe update and adjust projection levels

Distribution Channels Validated

Manufacturers
- 62% → Wholesalers
- 10%
- 51% → Retail Pharmacies
- 3% → Dispensing Doctors
- 8% → Hospitals
- 28%
- Austria Retail Sell-Out
- Austria Hospital
- 61%
- 8%
- 31%
- Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
6 (-1 vPY)	77 (-3 vPY)	15% (-3% vPY)

Austria Hospital Validation Study

2021 Validation Study

Validation Results

Precision	93.2%	Bias	0.1%

Precision chart (values by year):
- 2017: 84.2
- 2018: 82.7
- 2019: 89.3
- 2020: 89.3
- 2021: 93.2

Bias chart (values by year):
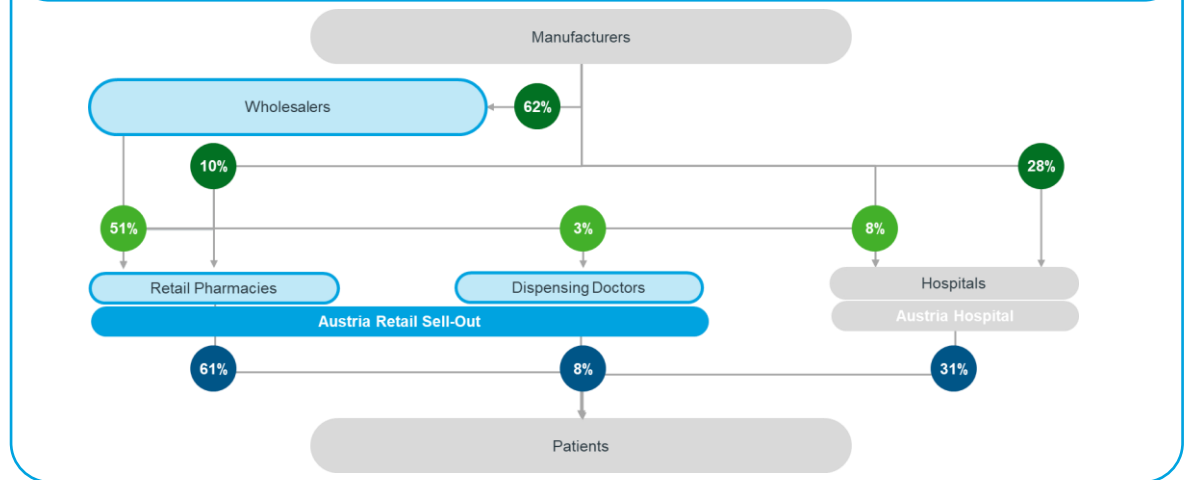- 2017: 2.4
- 2018: 2.4
- 2019: -1.8
- 2020: -1.9
- 2021: 0.1
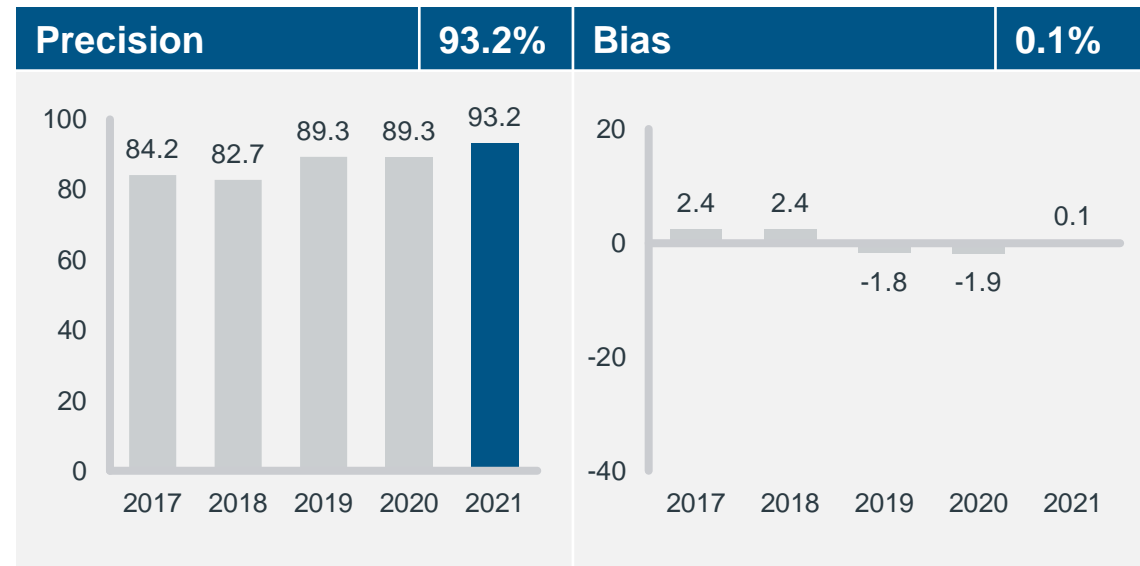
Outcomes

- Overall precision index improved by 3.9 percentage points in 2021
- Overall bias turned from 1.9% underestimation to 0.1% overestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers
Wholesalers — 62%
10%
51%
28%
8%
3%
Austria Retail
Retail Pharmacies
Dispensing Doctors
Hospitals
Austria Hospital
61%
8%
31%
Patients
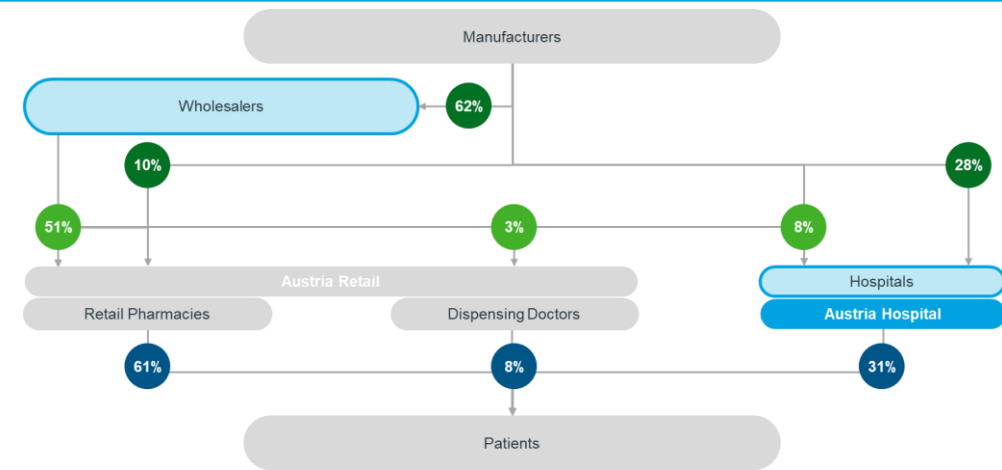
Participation

# Participating Companies	# Forms Validated	% Market Validated
12 *(-2 vPY)*	**267** *(+1 vPY)*	**15%** *(+1% vPY)*

Bosnia and Herzegovina Retail+Hospital Validation Study
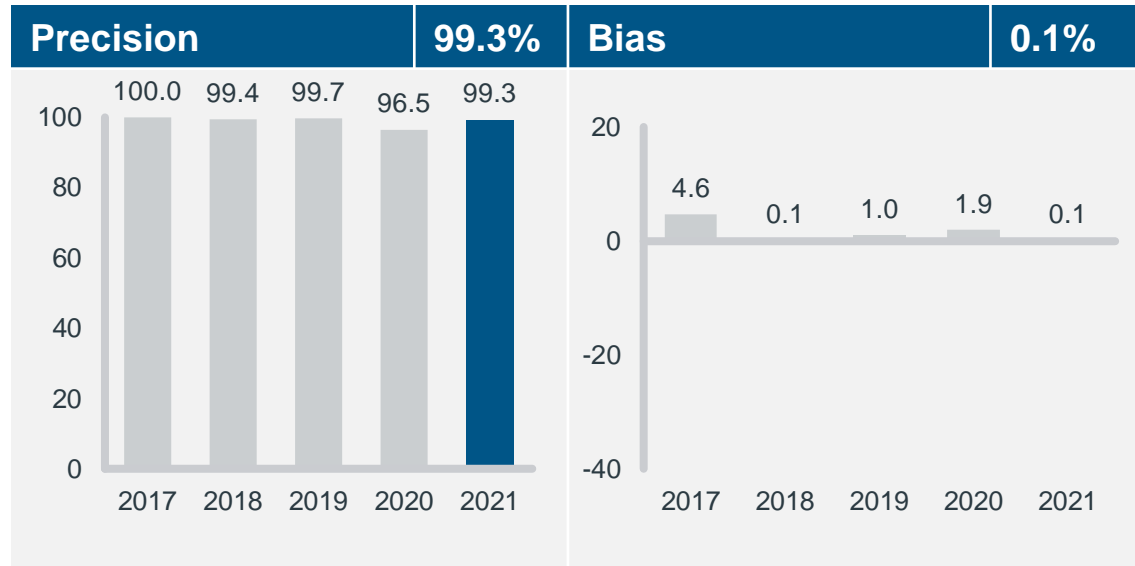
2021 Validation Study

Validation Results

Precision	99.3%	Bias	0.1%

Precision:
- 2017: 100.0
- 2018: 99.4
- 2019: 99.7
- 2020: 96.5
- 2021: 99.3

Bias:
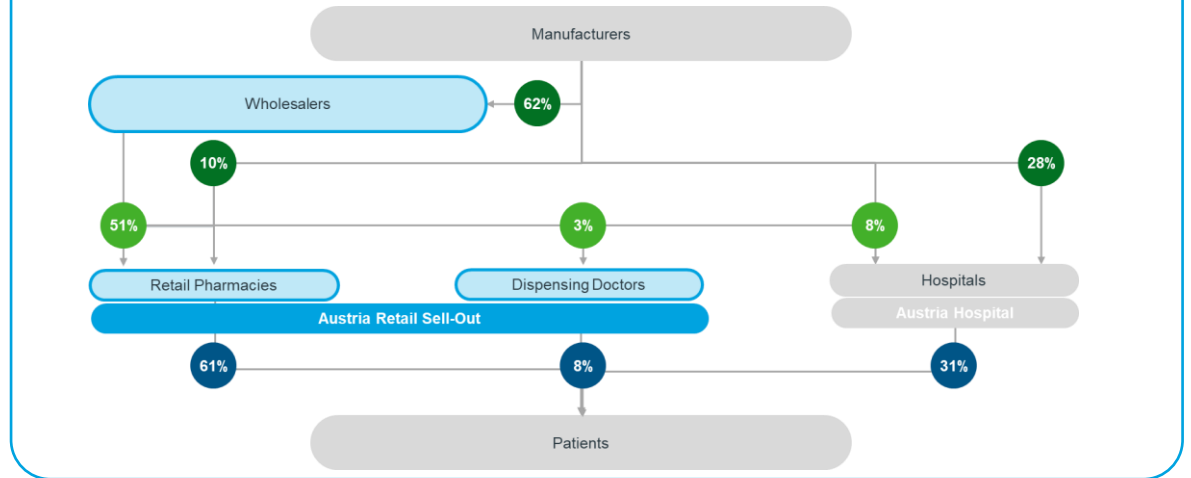- 2017: 4.6
- 2018: 0.1
- 2019: 1.0
- 2020: 1.9
- 2021: 0.1

Outcomes

- Overall precision index improved by 2.8 percentage points in 2021
- Overall overestimation improved by 1.8 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Domestic Manufacturers *(Own Products & Under Licence)* — 18%
Foreign Manufacturers *(Imports)* — 82%

Other Small Wholesalers
Wholesalers

75% — 10% — 10%
5%

Bosnia Combined

Pharmacies — Hospitals *(clinical pharmacies)* — Others

78% — 11% — 11%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
14 *(-4 vPY)*	402 *(-236 vPY)*	34% *(-18% vPY)*

Bulgaria Retail Validation Study
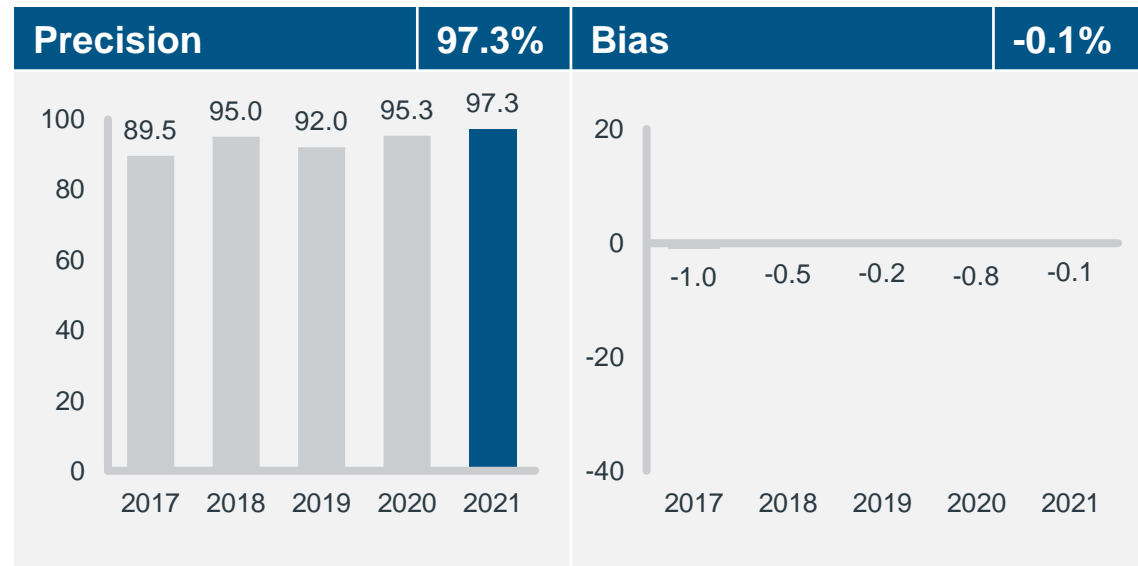
2021 Validation Study

Validation Results

Precision	97.3%	Bias	-0.1%

Precision (2017–2021): 89.5, 95.0, 92.0, 95.3, 97.3

Bias (2017–2021): -1.0, -0.5, -0.2, -0.8, -0.1

Outcomes

- Overall precision index improved by 2.0 percentage points in 2021
- Overall underestimation improved by 0.7 percentage points in 2021
- No action required from the statistical point of view
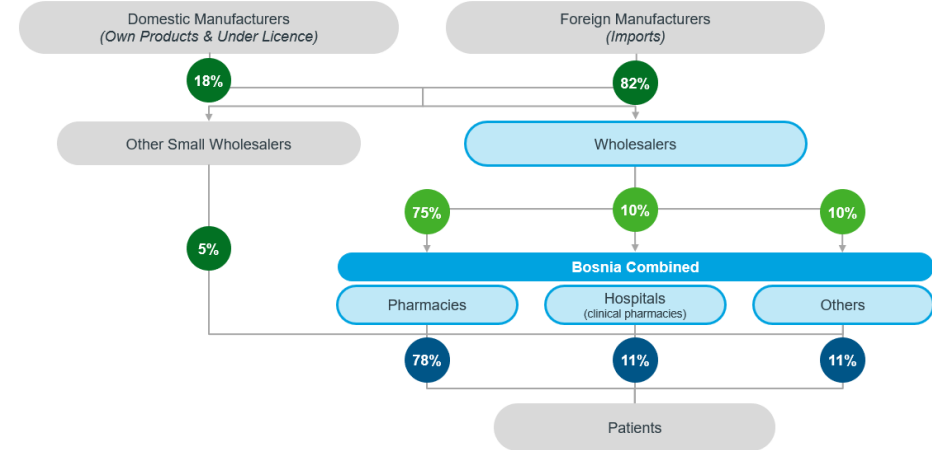
Distribution Channels Validated

- Manufacturers — 98% → Wholesalers, 2% → Non Panel WHS/DTP/DTH
- Wholesalers — 80% → Bulgaria Retail (Pharmacies & Drugstores), 18% → Bulgaria Hospital (Hospitals), 2% → Others
- Bulgaria Retail 80% → Patients, Bulgaria Hospital 18% → Patients, Others 2%
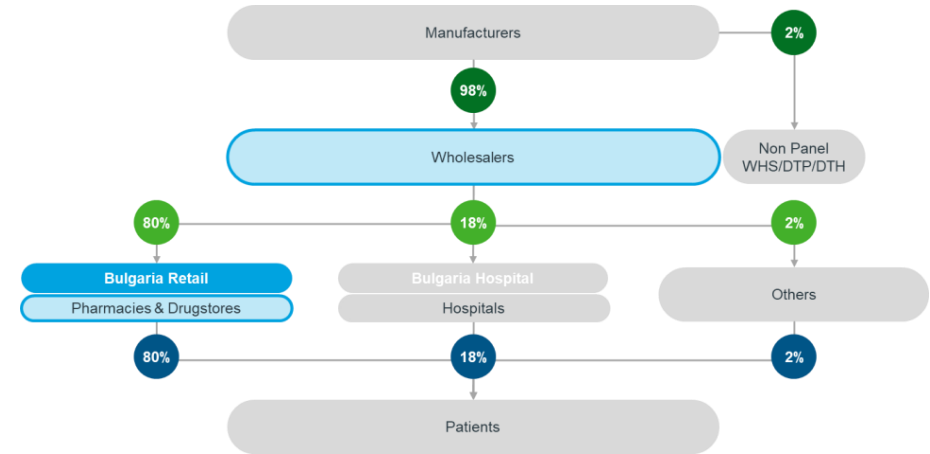
Participation

# Participating Companies	# Forms Validated	% Market Validated
53 *(+10 vPY)*	**626** *(+42 vPY)*	**33%** *(+1% vPY)*

Bulgaria OTC Validation Study
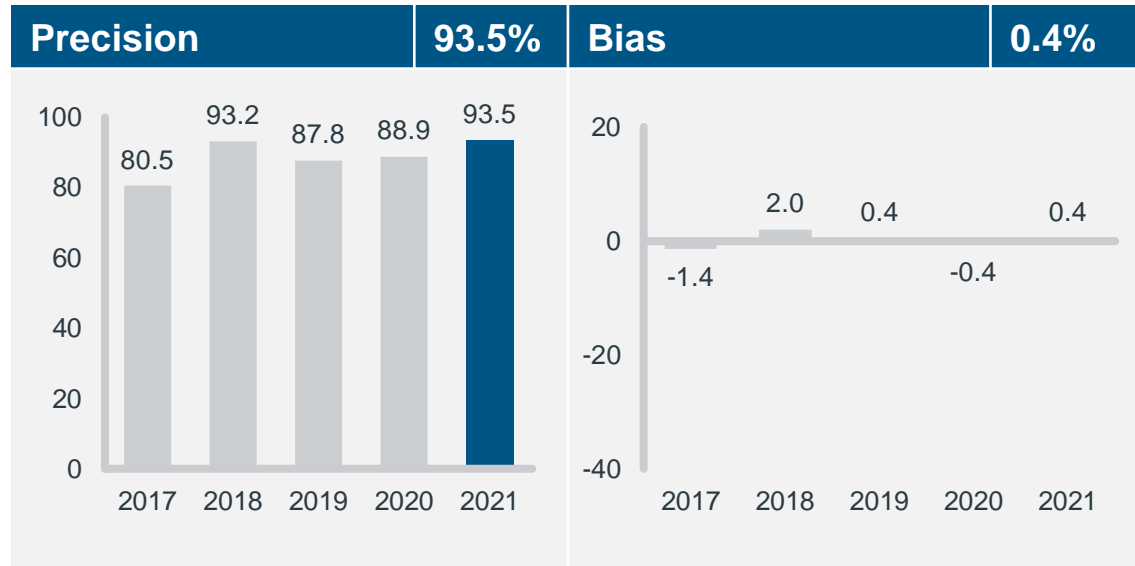
2021 Validation Study

Validation Results

Precision	93.5%	Bias	0.4%

Precision bar chart:
- 2017: 80.5
- 2018: 93.2
- 2019: 87.8
- 2020: 88.9
- 2021: 93.5

Bias chart:
- 2017: -1.4
- 2018: 2.0
- 2019: 0.4
- 2020: -0.4
- 2021: 0.4

Outcomes

- Overall precision index improved by 4.6 percentage points in 2021
- Overall bias turned from 0.4% underestimation in 2020 to 0.4% overestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → 98% → Wholesalers; 2% → Non Panel WHS/DTP/DTH
Wholesalers: 80% → Bulgaria Retail (Pharmacies & Drugstores); 18% → Bulgaria Hospital (Hospitals); 2% → Others
Bulgaria Retail 80% → Patients; Bulgaria Hospital 18% → Patients; Others 2%
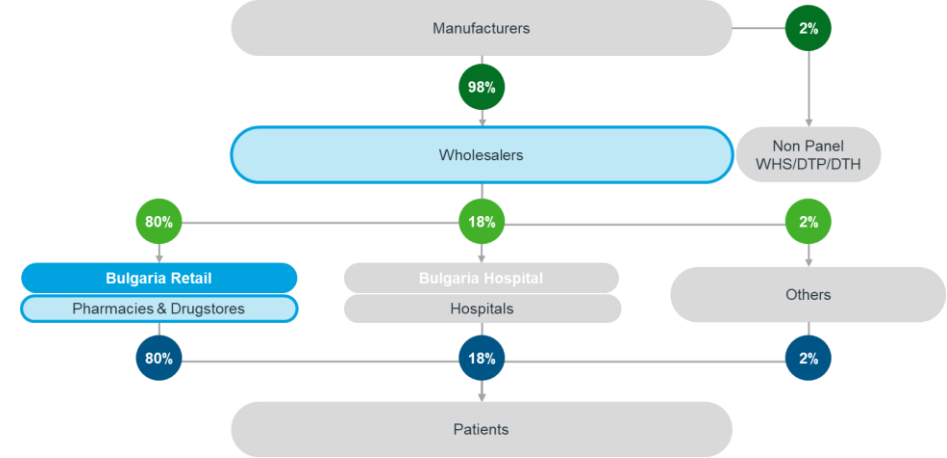
Participation

# Participating Companies	# Forms Validated	% Market Validated
27 (+7 vPY)	108 (-9 vPY)	24% (-4% vPY)

Croatia Retail+Hospital Validation Study
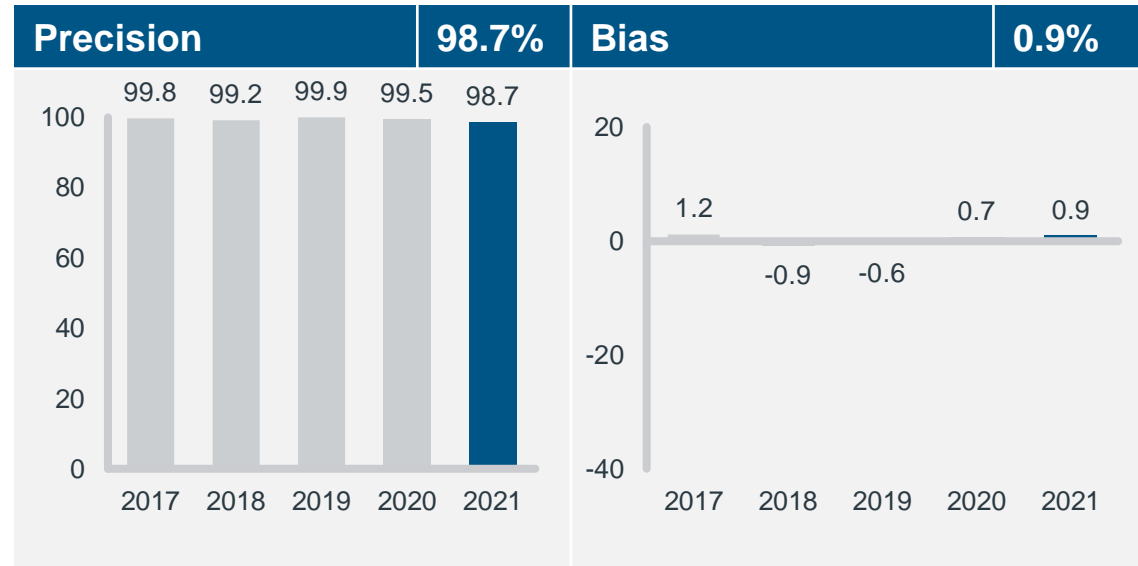
2021 Validation Study

Validation Results

Precision	98.7%	Bias	0.9%

Precision chart (2017-2021): 99.8, 99.2, 99.9, 99.5, 98.7

Bias chart (2017-2021): 1.2, -0.9, -0.6, 0.7, 0.9

Outcomes
- Overall precision index declined by 0.8 percentage points in 2021
- Overall overestimation increased slightly by 0.2 percentage points in 2021
- Increase the collaboration in the validation

Distribution Channels Validated

Domestic Manufacturers (Own Products & Under Licence) — 25%
Foreign Manufacturers (Imports) — 75%
Distributors
64% → Croatia Retail / Pharmacies — 36% → Croatia Hospital / Hospitals+Others
64% / 36% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
11 (+1 vPY)	**268** (+42 vPY)	**10%** (-1% vPY)

Croatia PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	93.9%	Bias	-1.8%

Precision values:
- 2017: 93.4
- 2018: 92.3
- 2019: 95.0
- 2020: 99.2
- 2021: 93.9

Bias values:
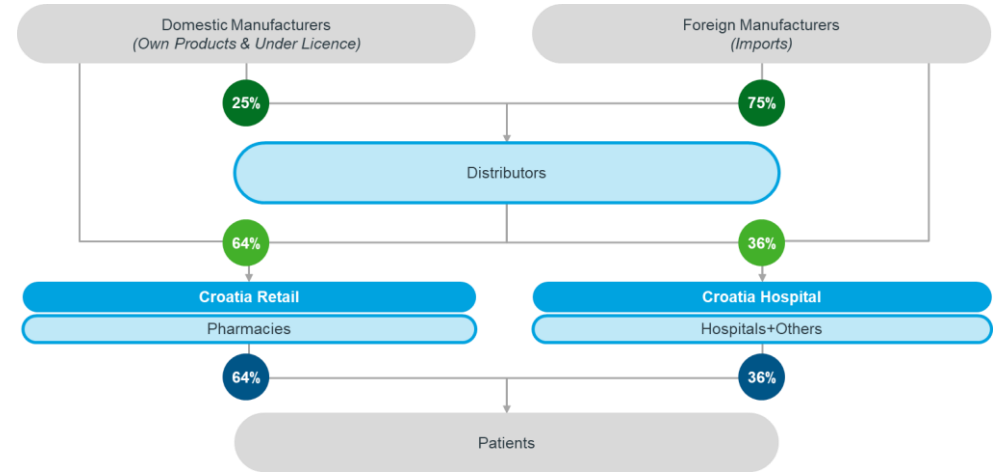- 2017: 0.6
- 2018: -0.8
- 2019: 0.2
- 2020: -1.0
- 2021: -1.8

Outcomes

- Overall precision index declined by 5.3 percentage points in 2021
- Overall underestimation increased by 0.8 percentage points in 2021
- Increase collaboration in the validation
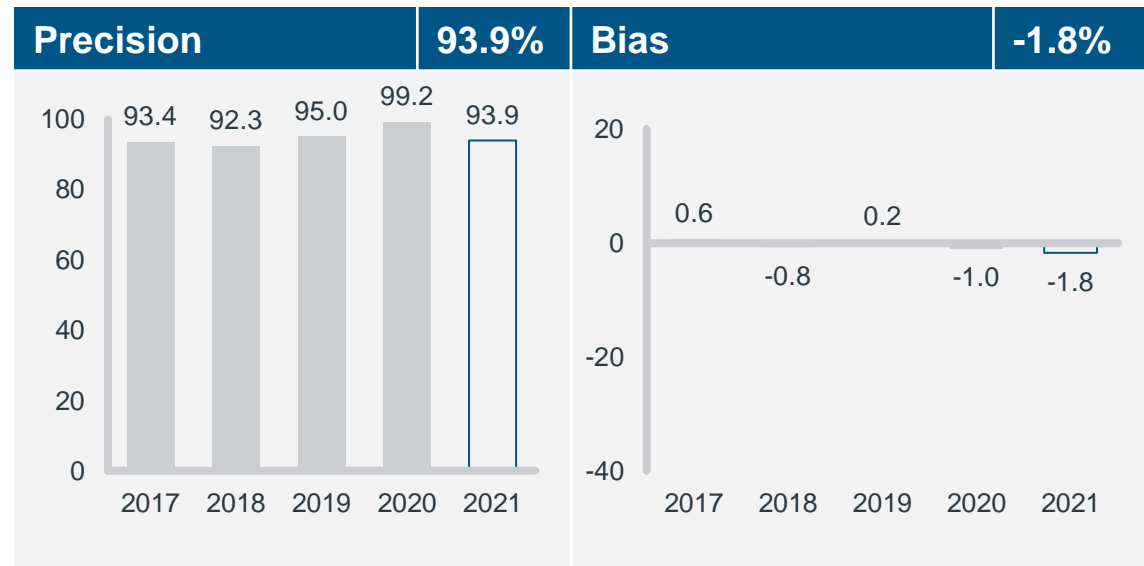
Distribution Channels Validated

Domestic Manufacturers (Own Products & Under Licence) — 25%
Foreign Manufacturers (Imports) — 75%
Distributors
Croatia Retail — 64%
Croatia Hospital — 36%
Pharmacies
Hospitals+Others
Croatia Retail Sell-Out — 64%
36%
Patients
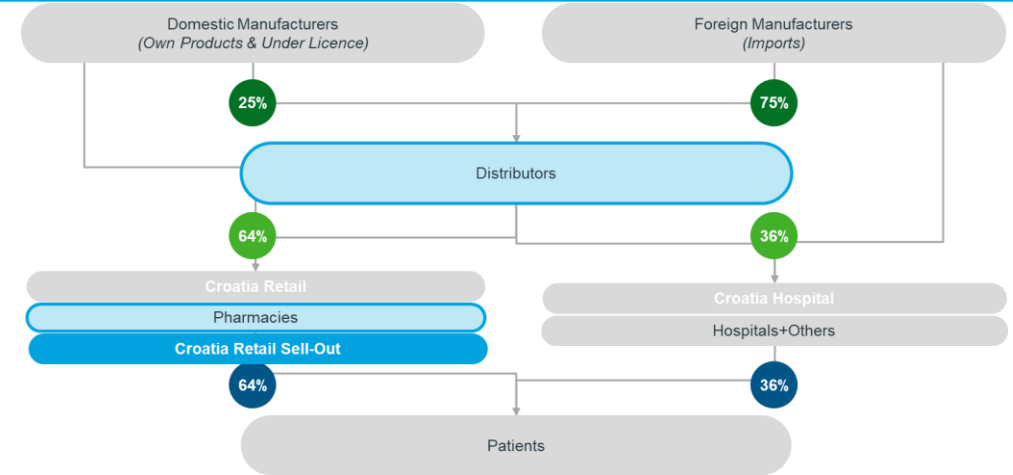
Participation

# Participating Companies	# Forms Validated	% Market Validated
11 (+1 vPY)	**150** (-4 vPY)	**9%** (-2% vPY)

Czech Republic Retail+Hospital Validation Study

2021 Validation Study

Validation Results

Precision	98.5%

Precision bar chart (scale 0–100):
- 2017: 98.8
- 2018: 99.3
- 2019: 98.6
- 2020: 98.0
- 2021: 98.5

Bias	0.0%

Bias bar chart (scale -40 to 20):
- 2017: -2.3
- 2018: -2.3
- 2019: -3.3
- 2020: -2.9
- 2021: 0.0
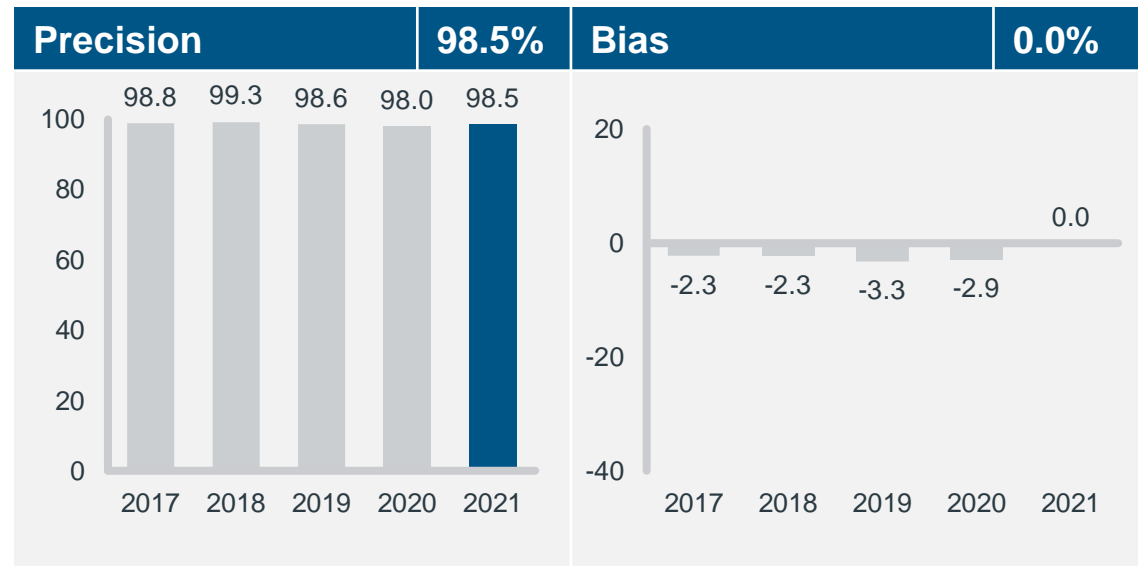
Outcomes
- Overall precision index improved by 0.5 percentage points in 2021
- Overall bias turned from 2.9% underestimation to no bias in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers/Import Agents → Big Wholesalers 90%, Other Wholesalers 5%
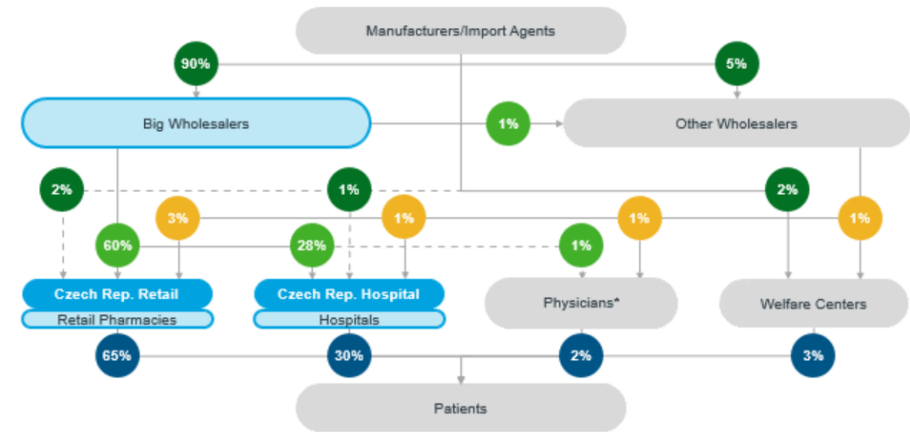Big Wholesalers → Other Wholesalers 1%
2%, 3%, 1%, 1%, 2%, 1%
60%, 28%, 1%
Czech Rep. Retail / Retail Pharmacies 65%
Czech Rep. Hospital / Hospitals 30%
Physicians* 2%
Welfare Centers 3%
Patients

Participation

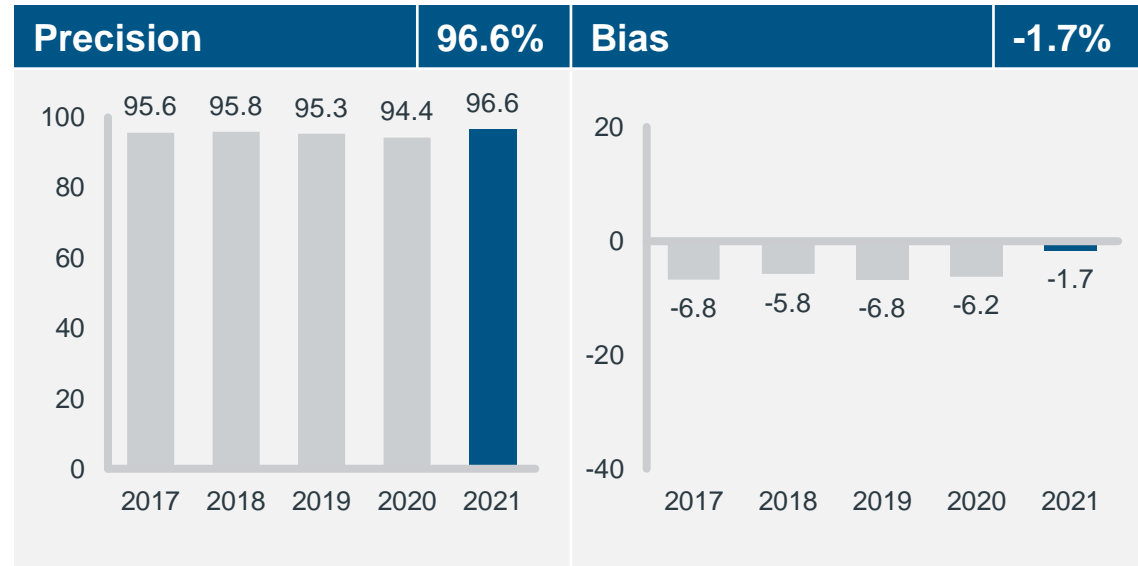| # Participating Companies	# Forms Validated	% Market Validated
254 *(+237 vPY)*	3,057 *(+2,191 vPY)*	85% *(+51% vPY)*

*Government data used in validation since 2021

Czech Republic PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	96.6%	Bias	-1.7%

Precision

2017	2018	2019	2020	2021
95.6	95.8	95.3	94.4	96.6

Bias

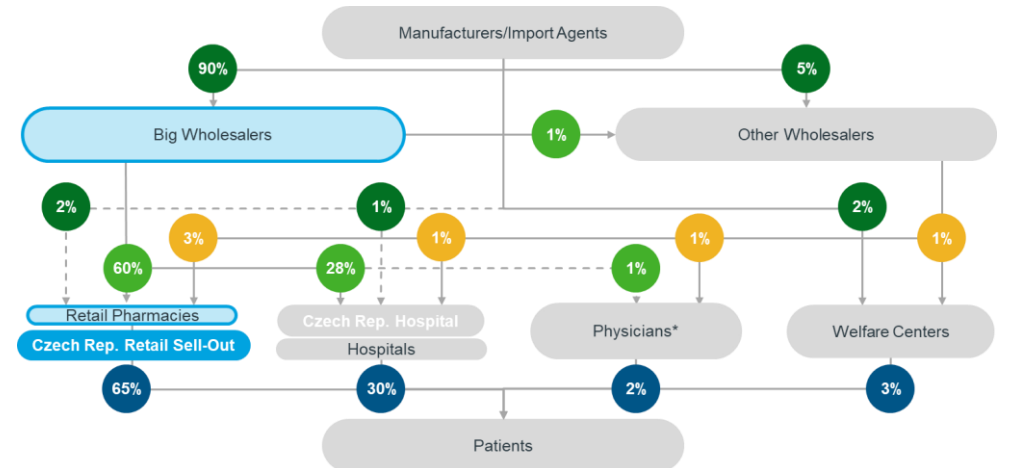| 2017	2018	2019	2020	2021
-6.8	-5.8	-6.8	-6.2	-1.7

Outcomes

- Overall precision index improved by 2.2 percentage points in 2021
- Overall underestimation improved by 4.5 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers/Import Agents

- 90% — Big Wholesalers
- 5% — Other Wholesalers
- 1% — Other Wholesalers
- 2% — Retail Pharmacies
- 3%
- 60% — Retail Pharmacies / Czech Rep. Retail Sell-Out
- 1% — Czech Rep. Hospital Hospitals
- 1%
- 28% — Czech Rep. Hospital Hospitals
- 1% — Physicians*
- 1%
- 2% — Welfare Centers
- 1%

- 65% — Patients
- 30% — Patients
- 2% — Patients
- 3% — Patients

Participation

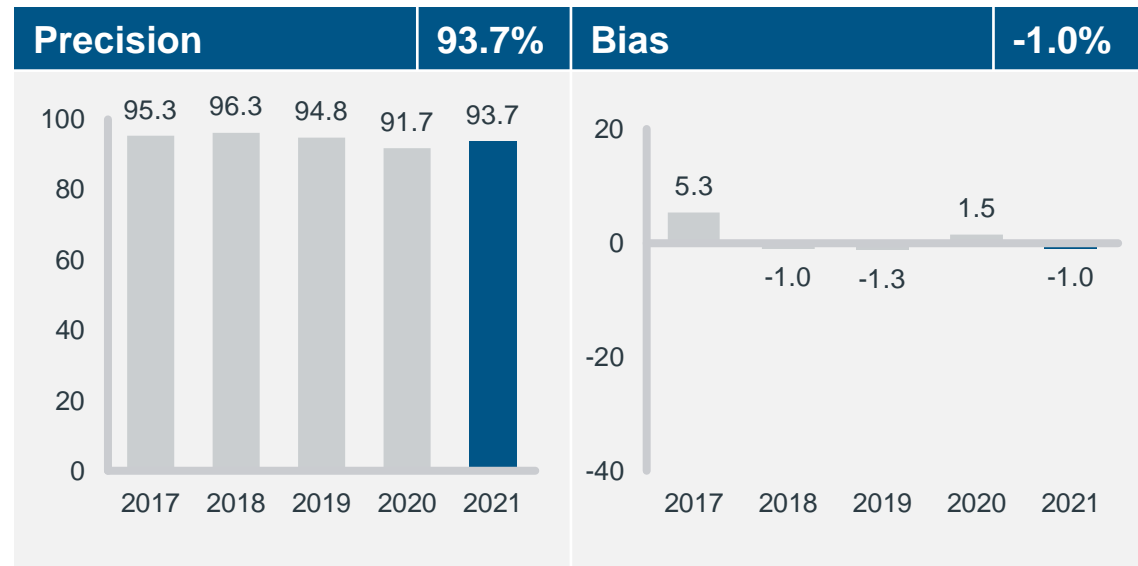| # Participating Companies	# Forms Validated	% Market Validated
149 *(+135 vPY)*	**1,615** *(+1,210 vPY)*	**55%** *(+24% vPY)*

*Government e-prescription sales data used in validation since 2021

IQVIA

Finland PharmaTrend Validation Study

2021 Validation Study

Validation Results

| Precision | 93.7% | Bias | -1.0% |

Precision chart (2017–2021): 95.3, 96.3, 94.8, 91.7, 93.7

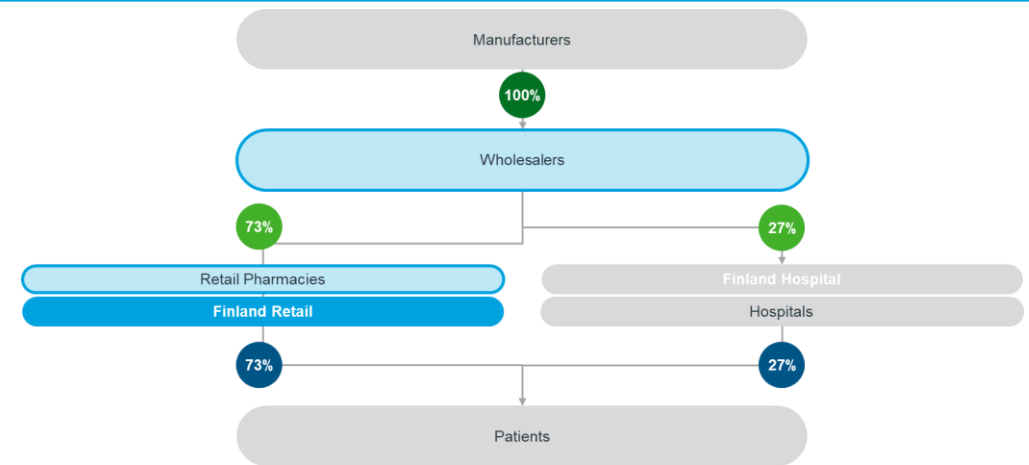Bias chart (2017–2021): 5.3, -1.0, -1.3, 1.5, -1.0

Outcomes

- Overall precision index improved by 2.0 percentage points in 2021
- Overall bias turned from 1.5% overestimation in 2020 to 1.0% underestimation in 2021
- No action required from statistical point of view

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 73% Retail Pharmacies (Finland Retail) / 27% Finland Hospital (Hospitals) → 73% / 27% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
148 *(+8 vPY)*	1,922 *(+82 vPY)*	89% *(-2% vPY)*

France Retail Validation Study
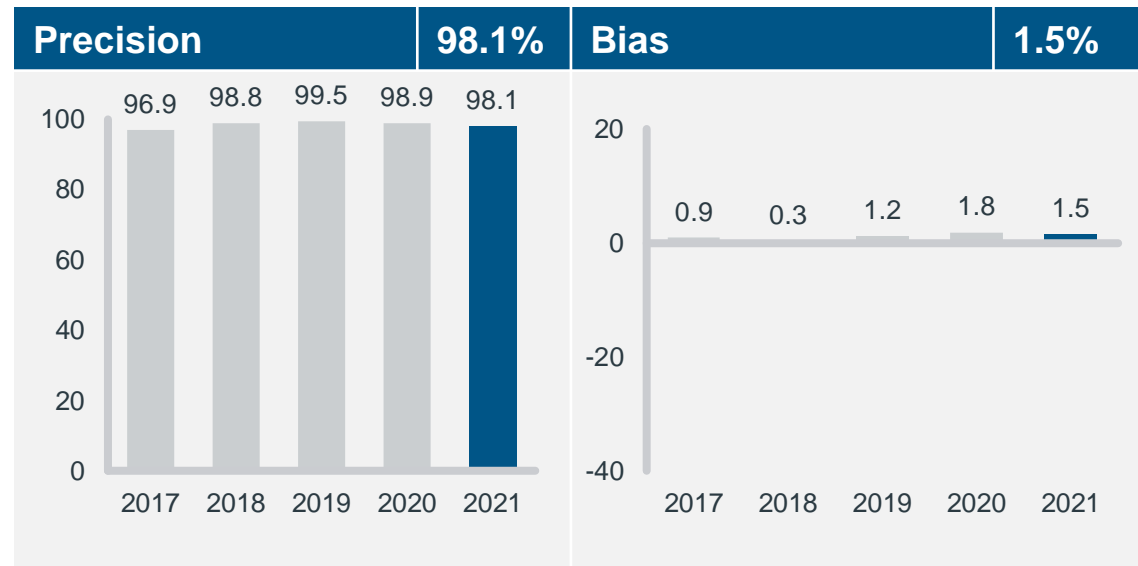
2021 Validation Study

Validation Results

Precision	98.1%	Bias	1.5%

Precision (2017–2021): 96.9, 98.8, 99.5, 98.9, 98.1

Bias (2017–2021): 0.9, 0.3, 1.2, 1.8, 1.5

Outcomes
- Overall precision index declined by 0.8 percentage points in 2021
- Overall overestimation improved by 0.3 percentage points in 2021
- No action required from the statistical point of view
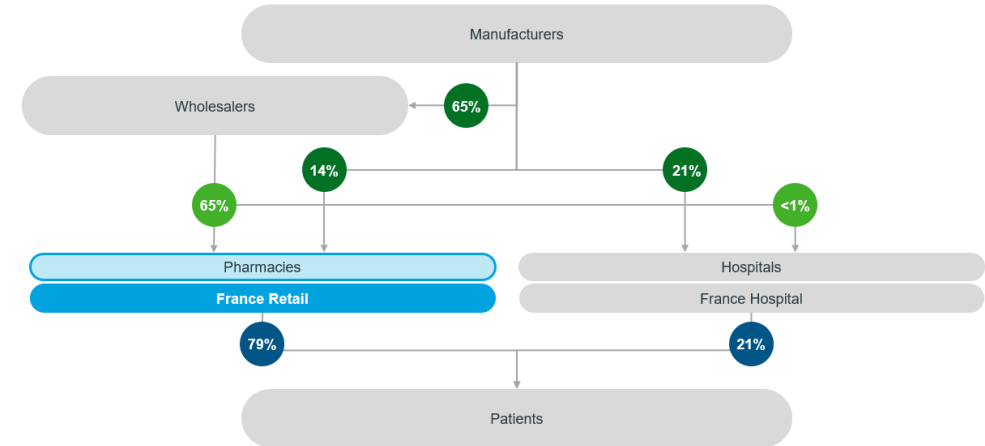
Distribution Channels Validated

Manufacturers

Wholesalers — 65%

65%

14%

21%

<1%

Pharmacies
France Retail

Hospitals
France Hospital

79%

21%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
162 *(+3 vPY)*	**3,573** *(+55 vPY)*	**90%** *(+2% vPY)*

Greece Retail Validation Study

2021 Validation Study

Validation Results

Precision	88.5%	Bias	0.0%

Precision bars: 2017: 89.3, 2018: 91.6, 2019: 89.6, 2020: 93.4, 2021: 88.5

Bias values: 2017: -1.5, 2018: -0.7, 2019: -1.1, 2020: -1.5, 2021: 0.0
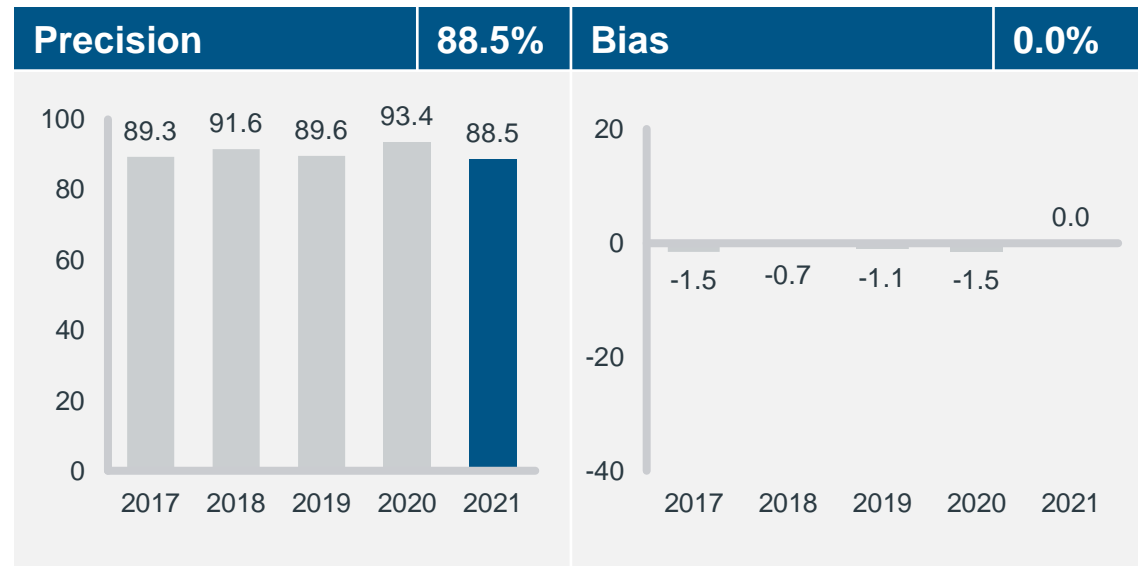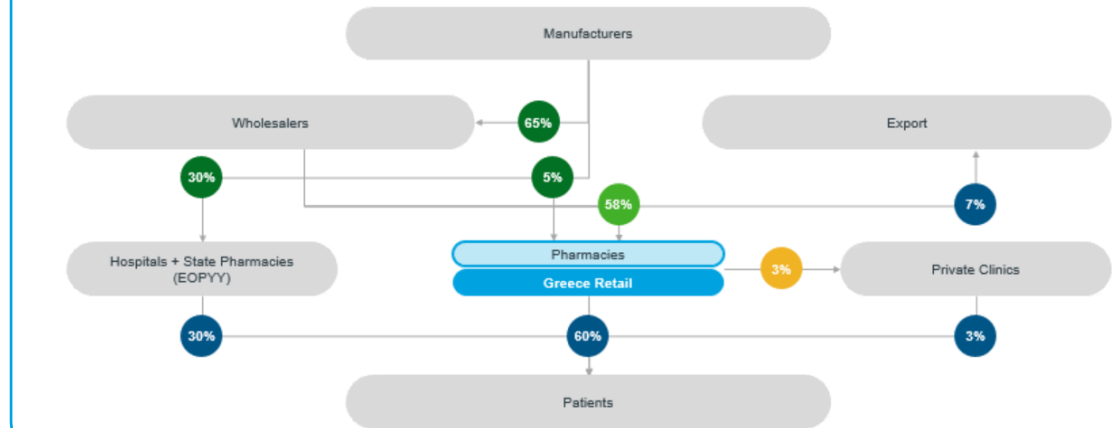
Outcomes
- Overall precision index declined by 4.9 percentage points in 2021
- Overall bias turned from 1.5% underestimation to no bias in 2021
- Explore channel distributions

Distribution Channels Validated

Manufacturers → Wholesalers 65%
Wholesalers 30%, 5%
58%
Export 7%
Pharmacies / Greece Retail
3% → Private Clinics
Hospitals + State Pharmacies (EOPYY) 30%
Patients 60%, 3%

Participation

# Participating Companies	# Forms Validated	% Market Validated
44 (-4 vPY)	**933** (+65 vPY)	**49%** (+1% vPY)

Hungary Retail+Hospital Validation Study
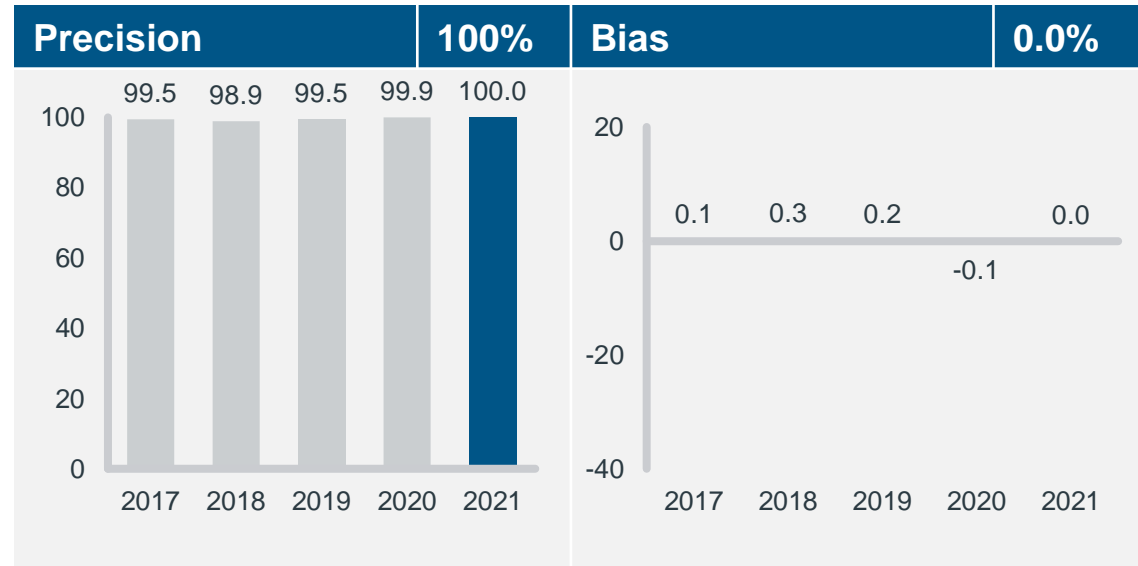
2021 Validation Study

Validation Results

Precision	100%	Bias	0.0%

Precision bar chart: 99.5 (2017), 98.9 (2018), 99.5 (2019), 99.9 (2020), 100.0 (2021)

Bias chart: 0.1 (2017), 0.3 (2018), 0.2 (2019), -0.1 (2020), 0.0 (2021)

Outcomes

- Overall precision index improved slightly by 0.1 percentage points in 2021
- Overall bias turned from 0.1% underestimation to no bias in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 95%; <1%; 5%; Wholesalers → Hungary Retail 77%; 18%; Hungary Retail / Pharmacies → Patients 77%; Hungary Hospital / Hospitals → Patients 23%
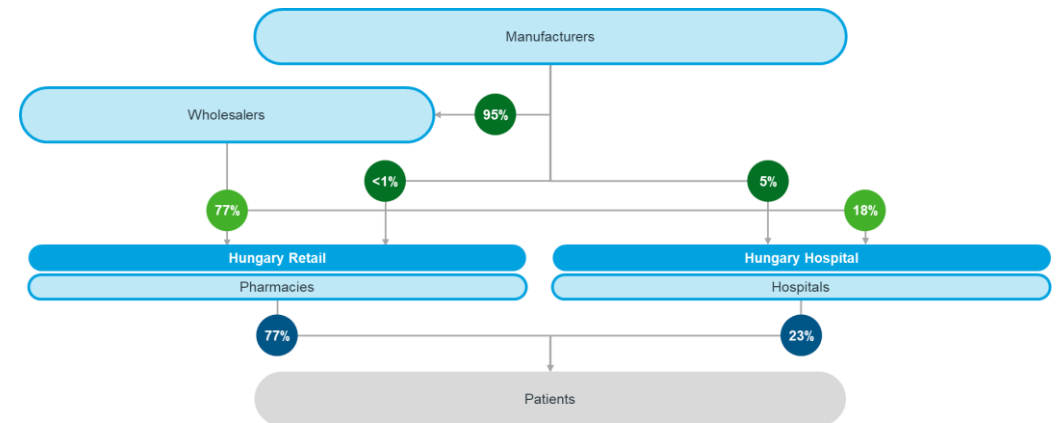
Participation

# Participating Companies	# Forms Validated	% Market Validated
71 (+5 vPY)	**1,446** (-88 vPY)	**66%** (-6% vPY)

Hungary PharmaTrend Validation Study
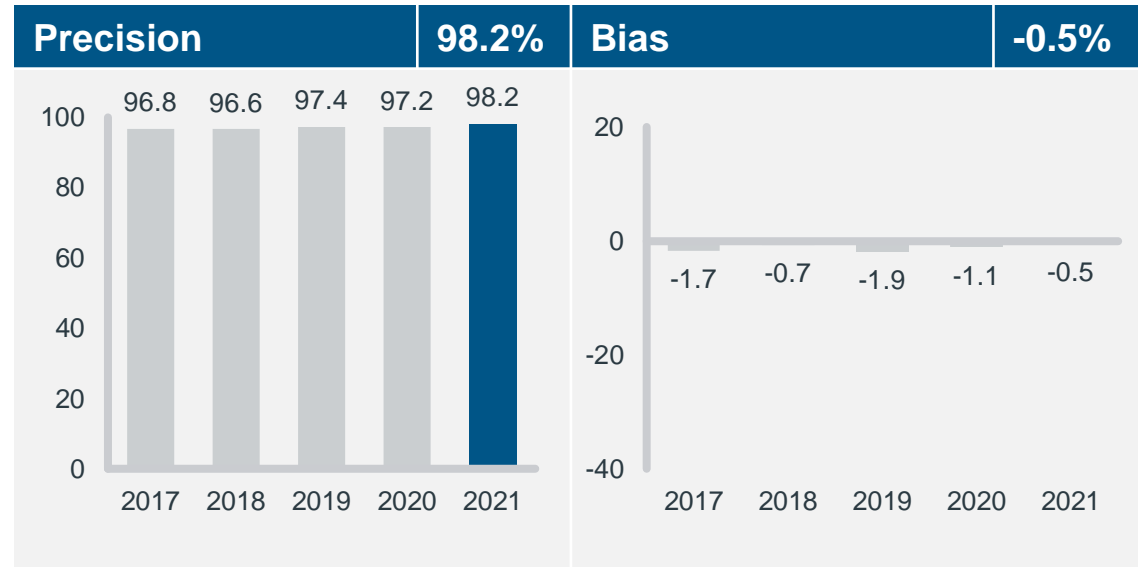
2021 Validation Study

Validation Results

Precision	98.2%	Bias	-0.5%

Precision chart (2017–2021): 96.8, 96.6, 97.4, 97.2, 98.2

Bias chart (2017–2021): -1.7, -0.7, -1.9, -1.1, -0.5
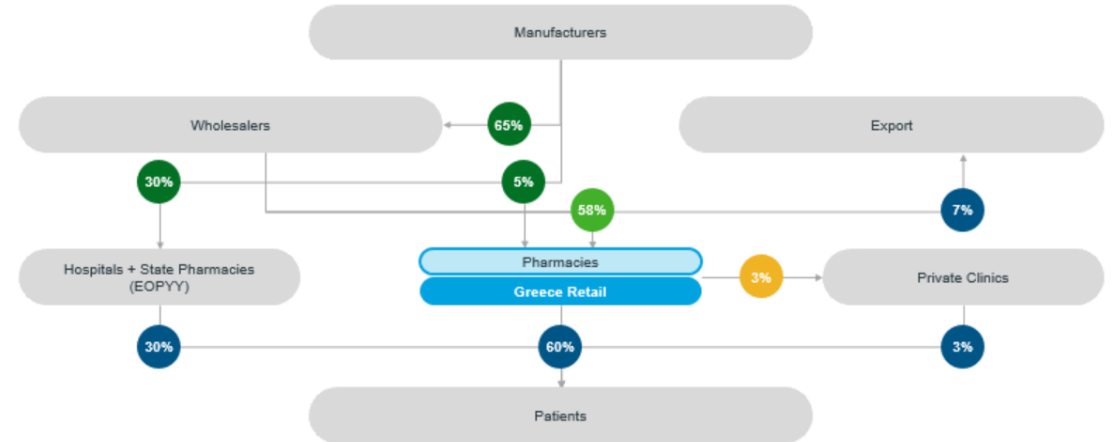
Outcomes
- Overall precision index improved by 1.0 percentage point in 2021
- Overall underestimation improved by 0.6 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

- Manufacturers
- Wholesalers — 95%
- <1%
- 5%
- 77%
- 18%
- Pharmacies
- Hungary Retail Sell-Out
- Hungary Hospital
- Hospitals
- 77%
- 23%
- Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
65 *(+1 vPY)*	**1,233** *(-79 vPY)*	**66%** *(-5% vPY)*

Back

IQVIA

Ireland PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	87.6%	Bias	-1.0%

Precision chart values: 89.1 (2020), 87.6 (2021)
Bias chart values: -3.6 (2020), -1.0 (2021)

Outcomes

- Overall precision index declined by 1.5 percentage points in 2021
- Overall underestimation improved by 2.6 percentage Points in 2021
- No action required from statistical point of view
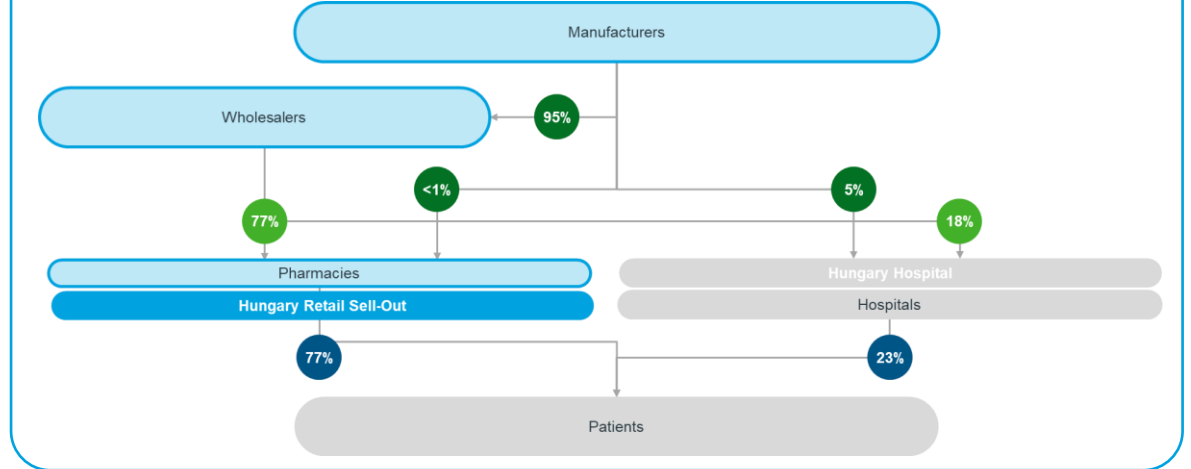
Distribution Channels Validated

Manufacturers → Wholesalers (83%)
Wholesalers → Retail Pharmacies (66%)
14%, 3%, 17%
Retail Pharmacies / Ireland Retail
Ireland Hospital / Hospitals
Ireland Retail → Patients (80%)
Hospitals → Patients (20%)

Participation

# Participating Companies	# Forms Validated	% Market Validated
113 (-4 vPY)	**1,532** (-11 vPY)	**89%** (+3% vPY)

Italy Retail Validation Study

2021 Validation Study

Validation Results

Precision	97.1%	Bias	-1.2%

Precision chart (2017–2021):
- 2017: 97.8
- 2018: 96.2
- 2019: 91.7
- 2020: 93.4
- 2021: 97.1

Bias chart (2017–2021):
- 2017: -2.0
- 2018: -3.4
- 2019: -0.8
- 2020: 0.6
- 2021: -1.2

Outcomes
- Overall precision index improved by 3.7 percentage points in 2021
- Overall bias turned from 0.6% overestimation to 1.2% underestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 32%
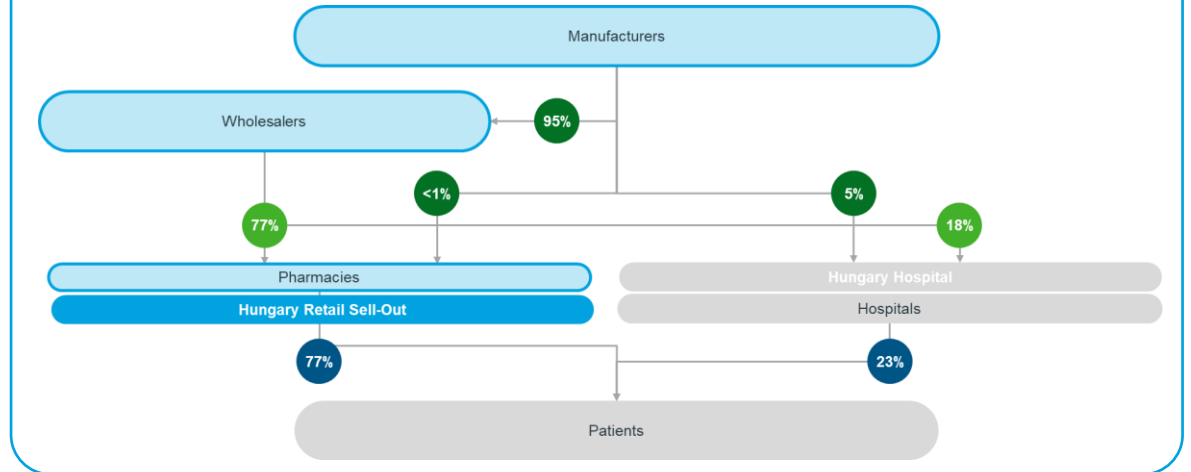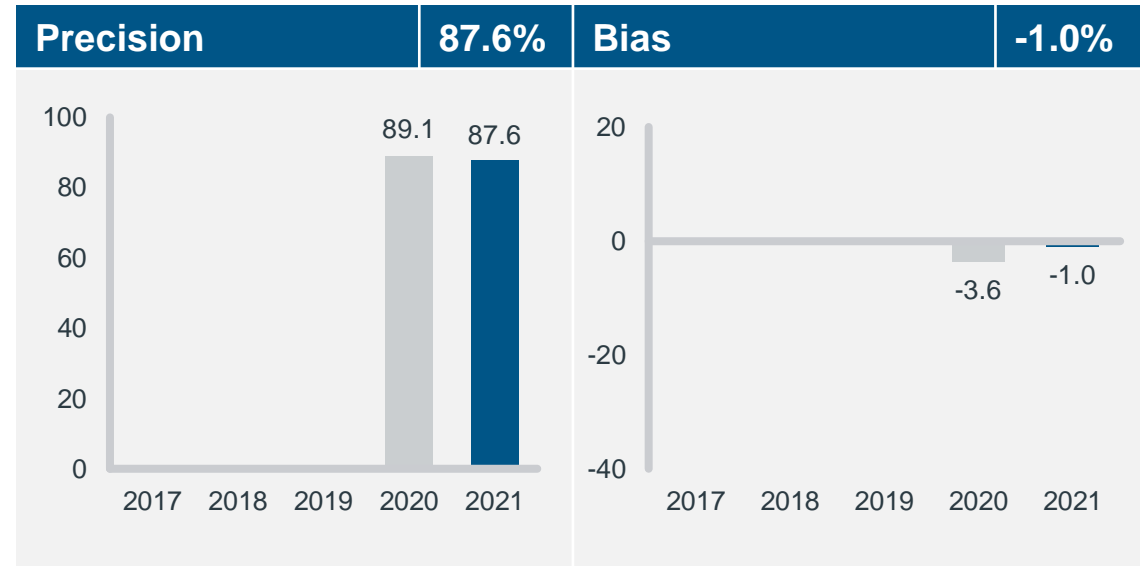Wholesalers → Italy Retail 6%
Manufacturers → Hospitals 53%
Manufacturers → DPC 8%
Manufacturers → Government, Charity Organizations 1%
Italy Retail / Pharmacies → Patients 38%
Italy Hospital → Patients 53%
Italy DPC → Patients 53%
Government, Charity Organizations → Patients 1%
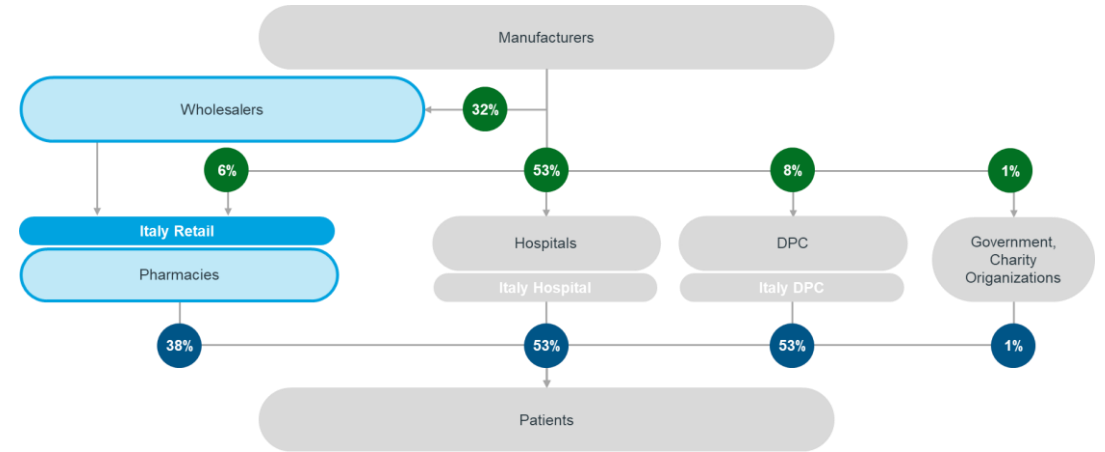
Participation

# Participating Companies	# Forms Validated	% Market Validated
25 (no change vPY)	**1,193** (+58 vPY)	**27%** (+2% vPY)

Italy PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	95.5%	Bias	-1.3%

Precision (2017–2021): 96.3, 95.6, 87.9, 91.9, 95.5

Bias (2017–2021): -3.6, -4.4, -1.7, -1.2, -1.3
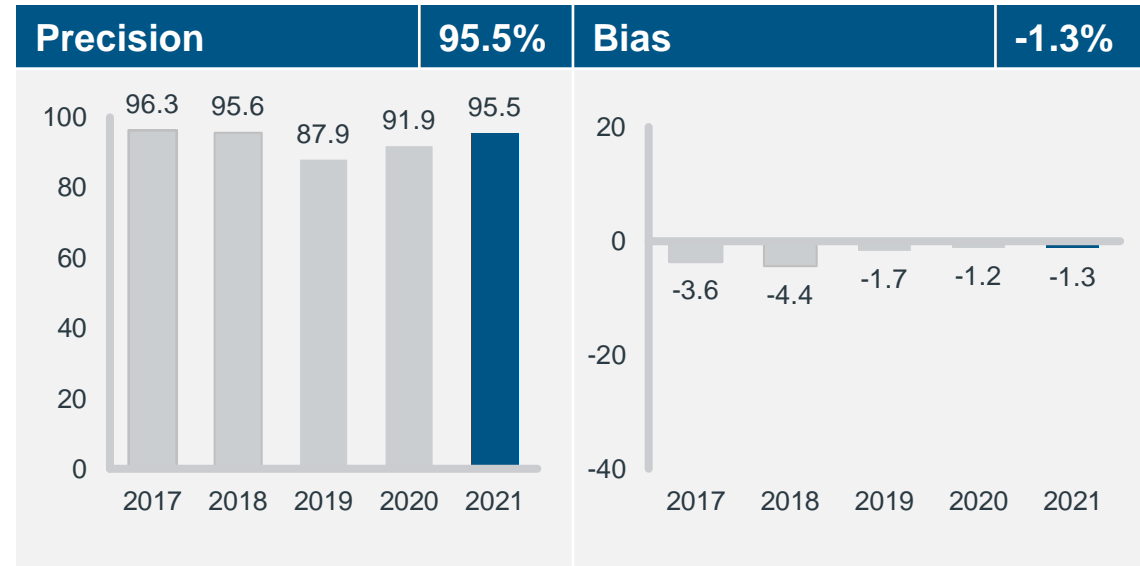
Outcomes
- Overall precision index improved by 3.6 percentage points in 2021
- Overall underestimation increased by 0.1 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 32%

6% — 53% — 8% — 1%

Pharmacies — Hospitals — DPC — Government, Charity Organizations

Italy Retail Sell-Out — Italy Hospital — Italy DPC

38% — 53% — 53% — 1%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
24 *(no change vPY)*	**1,141** *(+41 vPY)*	**27%** *(+1% vPY)*

Italy OTC Validation Study

2021 Validation Study

Validation Results

Precision	82.4%	Bias	-2.4%

Precision chart (2017–2021): 89.6, 91.2, 94.2, 82.9, 82.4

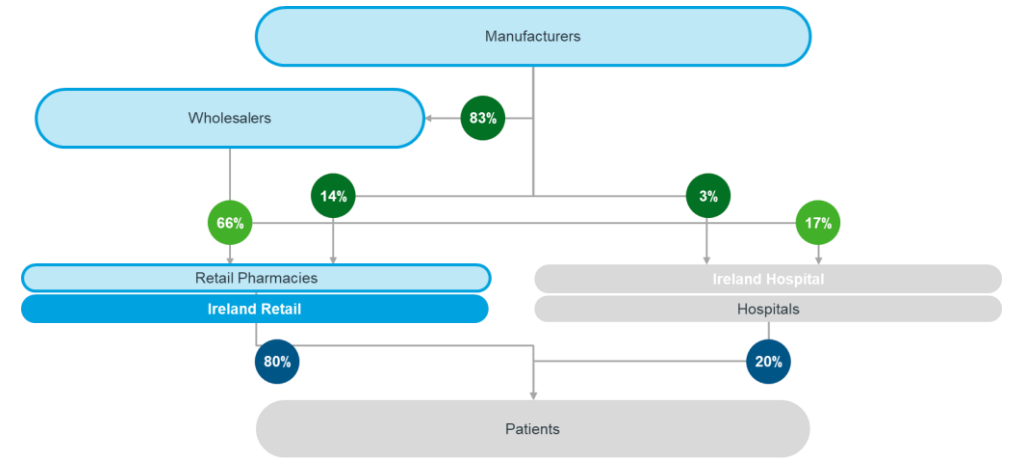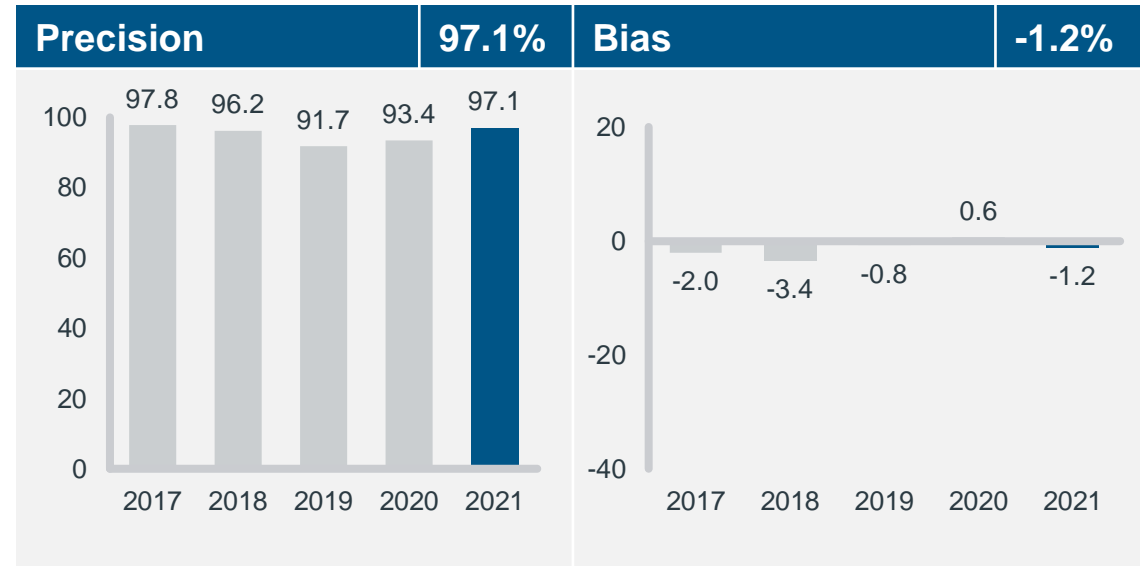Bias chart (2017–2021): -9.3, -13.2, -8.8, -8.5, -2.4
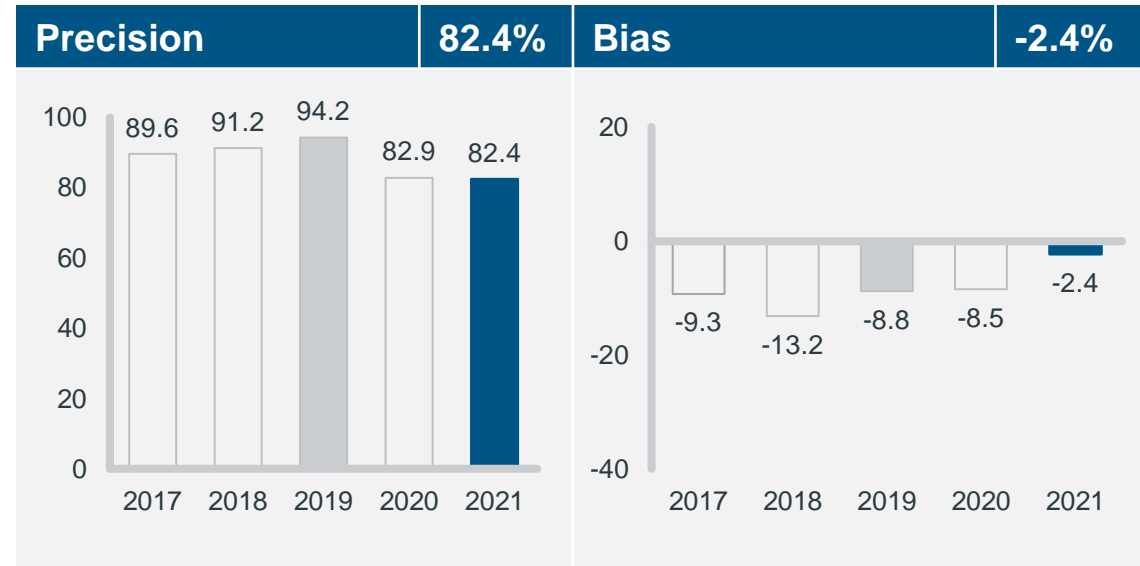
Outcomes

- Overall precision index declined by 0.5 percentage points in 2021
- Overall underestimation improved by 6.1 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 32% ; 6% ; 53% ; 8% ; 1%

Wholesalers → Pharmacies (Italy Retail Sell-Out) 38%

Hospitals (Italy Hospital) 53%

DPC (Italy DPC) 53%

Government, Charity Organizations 1%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
14 *(+3 vPY)*	**86** *(+16 vPY)*	**12%** *(+3% vPY)*

Italy Hospital Validation Study

2021 Validation Study

Validation Results

| Precision | 78.3% | Bias | -7.3% |

Precision bar chart values by year:
2017: 90.8, 2018: 85.2, 2019: 88.1, 2020: 82.2, 2021: 78.3

Bias bar chart values by year:
2017: -6.7, 2018: -8.8, 2019: -8.4, 2020: -7.1, 2021: -7.3

Outcomes

- Overall precision index declined by 3.9 percentage points in 2021
- Overall underestimation increased slightly by 0.2 percentage points in 2021
- Non-Retail distribution is undergoing several changes and this might explain increased variability. Continue implementation of quality-improving actions (incl. improvements of panel coverage)

Distribution Channels Validated
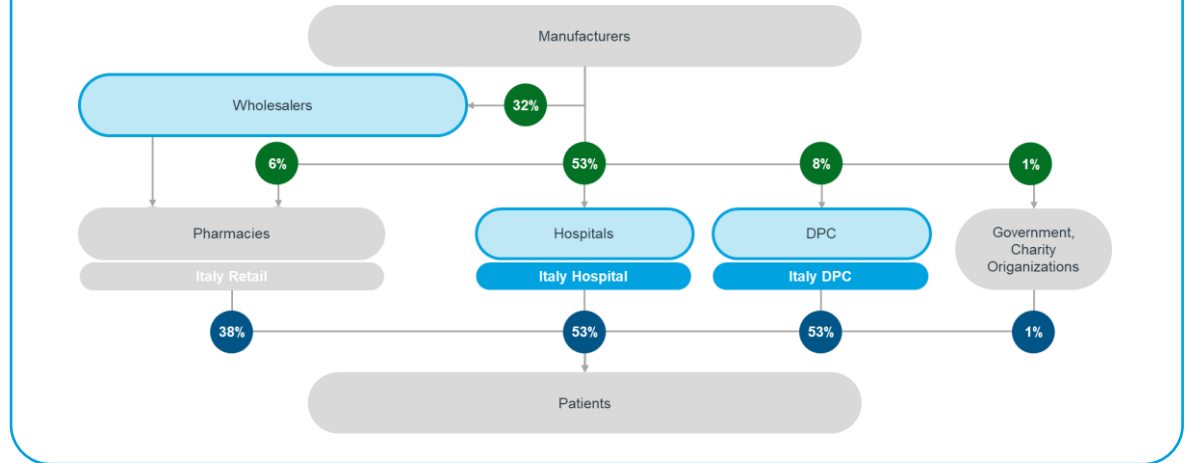
Participation

# Participating Companies	# Forms Validated	% Market Validated
12 *(-4 vPY)*	**272** *(-34 vPY)*	**28%** *(-1% vPY)*

Kazakhstan Retail+Hospital Validation Study
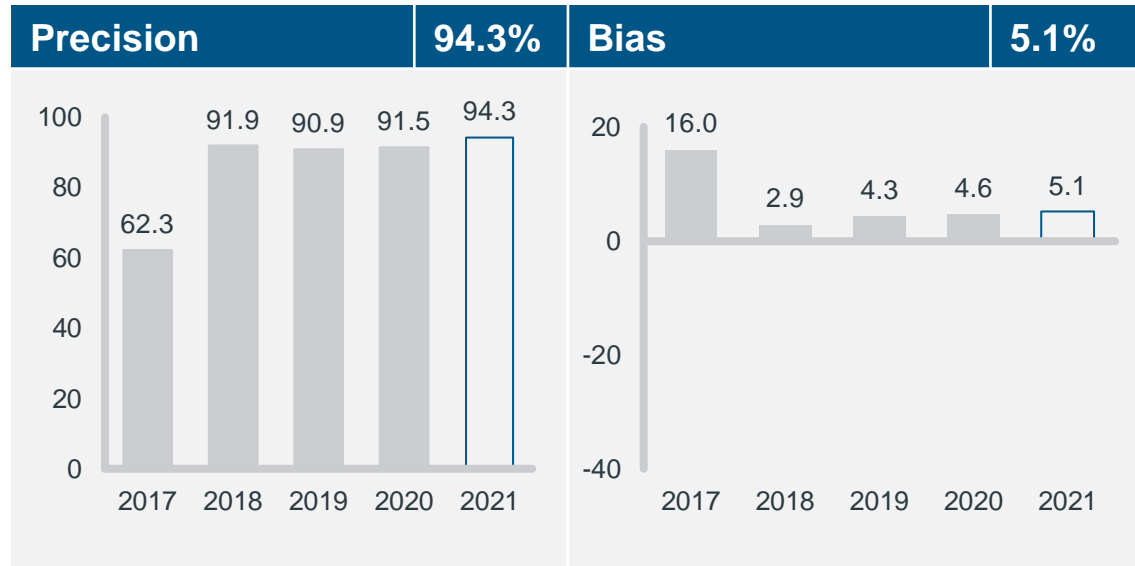
2021 Validation Study

Validation Results

Precision	94.3%	Bias	5.1%

Precision chart (2017–2021): 62.3, 91.9, 90.9, 91.5, 94.3

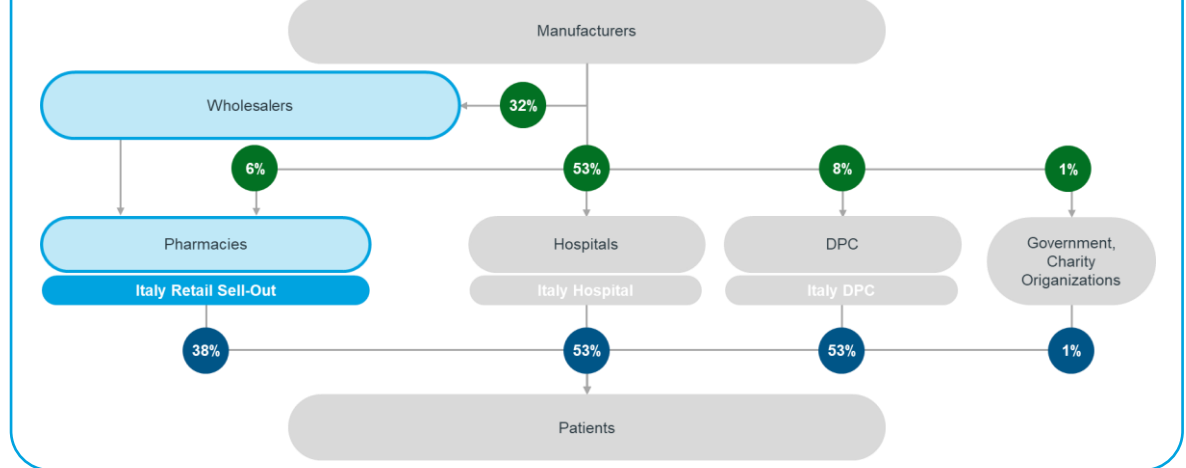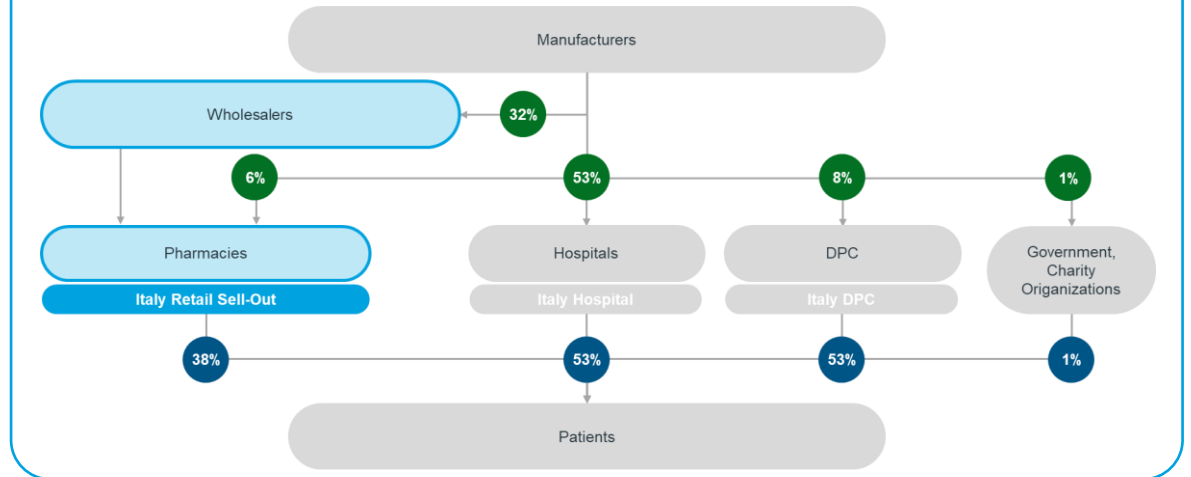Bias chart (2017–2021): 16.0, 2.9, 4.3, 4.6, 5.1

Outcomes

- Overall precision index improved by 2.8 percentage points in 2021
- Overall overestimation increased by 0.5 percentage points in 2021
- Increase participants of study; Work with participants more closely and focus their attention on more accurately filling in survey; Add two additional wholesalers to panel

Distribution Channels Validated

Manufacturers/Importers — 78% / 22%

Wholesalers/Depots — State distribution*

60% / 25% / 15%

Kazakhstan Retail — Kazakhstan Non-Retail

Pharmacies — Hospitals — Reimbursement

60% / 25% / 15%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
42 *(-27 vPY)*	**399** *(-257 vPY)*	**9%** *(-5% vPY)*

Latvia Retail Validation Study
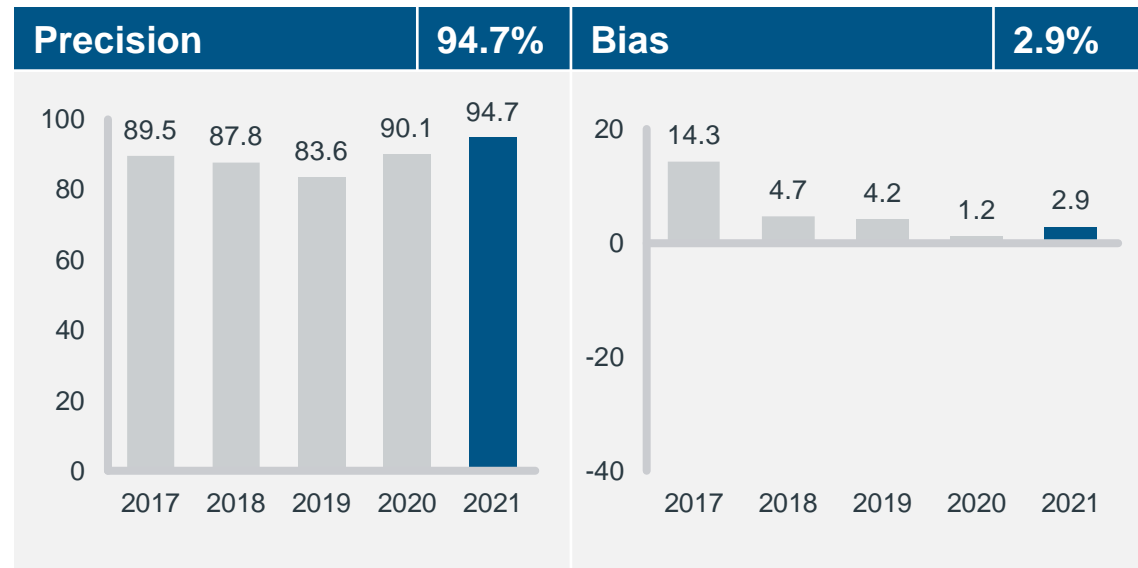
2021 Validation Study

Validation Results

Precision	94.7%	Bias	2.9%

Precision chart (2017–2021): 89.5, 87.8, 83.6, 90.1, 94.7

Bias chart (2017–2021): 14.3, 4.7, 4.2, 1.2, 2.9

Outcomes

- Overall precision index improved by 4.6 percentage points in 2021
- Overall overestimation increased by 1.7 percentage points in 2021
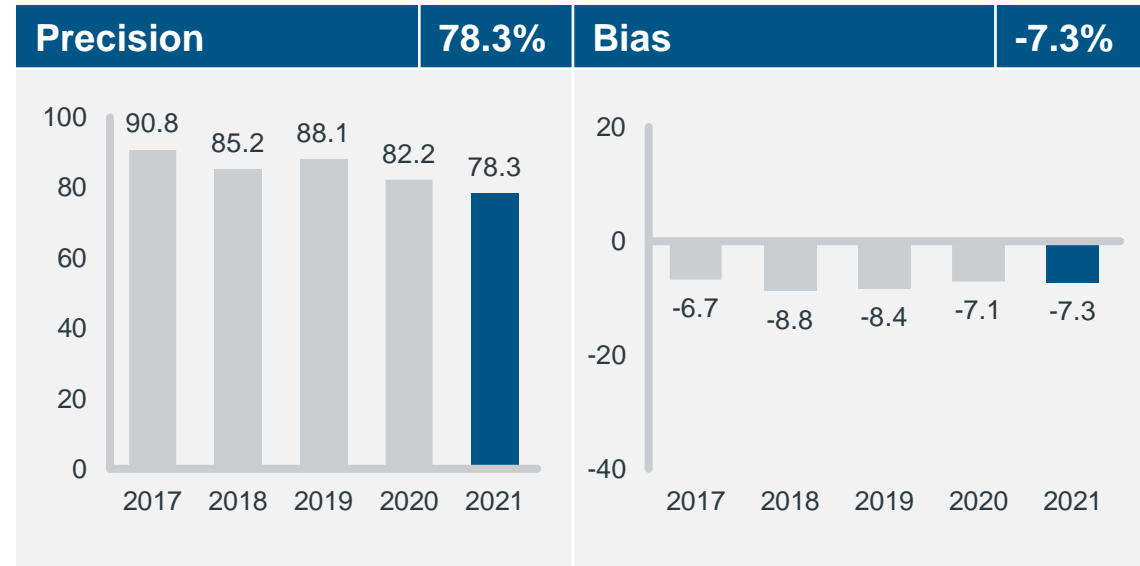- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 92% → Latvia Retail / Retail Pharmacies; 8% → Latvia Hospital / Hospitals. 97% and 8% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
14 *(-1 vPY)*	**253** *(-233 vPY)*	**10%** *(-11% vPY)*

Lithuania Retail Validation Study
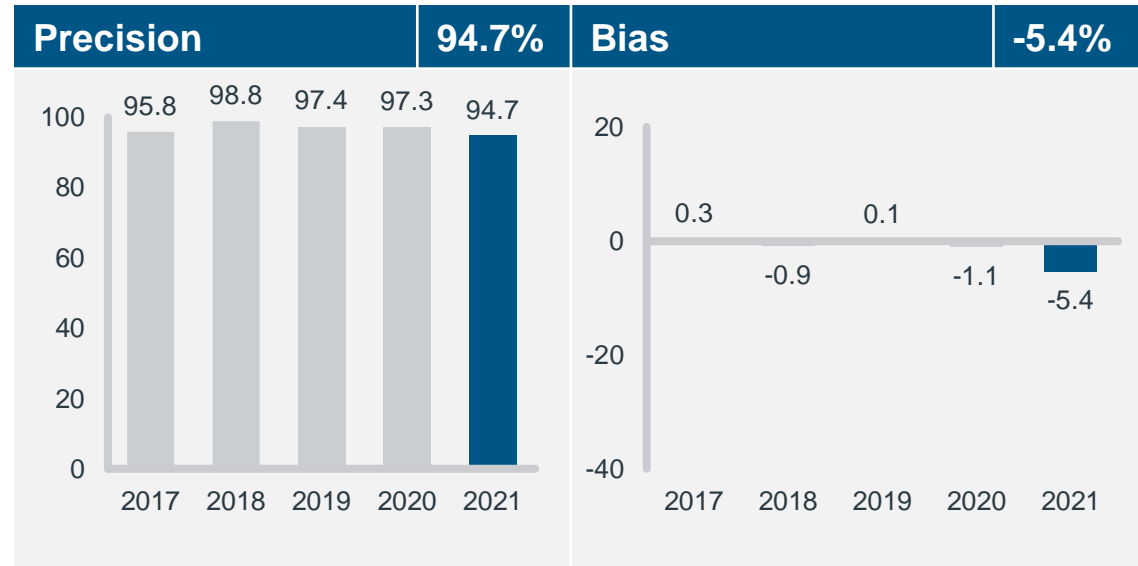
2021 Validation Study

Validation Results

Precision	94.7%	Bias	-5.4%

Precision

95.8 (2017), 98.8 (2018), 97.4 (2019), 97.3 (2020), 94.7 (2021)

Bias

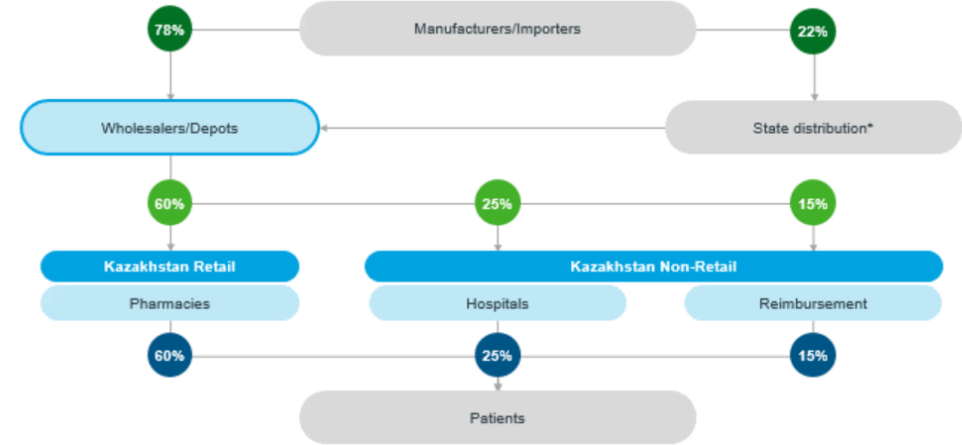0.3 (2017), 0.1 (2018), -0.9 (2019), -1.1 (2020), -5.4 (2021)

Outcomes
- Overall precision index declined by 2.6 percentage points in 2021
- Overall underestimation increased by 4.3 percentage points in 2021
- Review projection levels

Distribution Channels Validated

Manufacturers
100%
Wholesalers
92%   8%
Lithuania Retail   Lithuania Hospital
Retail Pharmacies   Hospitals
92%   8%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
19 (-6 vPY)	**428** (-278 vPY)	**22%** (-14% vPY)

Poland Retail+Hospital Validation Study

2021 Validation Study

Validation Results

| Precision | 98.1% | Bias | -0.6% |

Precision

95.3 94.6 97.7 97.1 98.1

2017 2018 2019 2020 2021

Bias

2.6 3.1 1.4 0.4 -0.6

2017 2018 2019 2020 2021
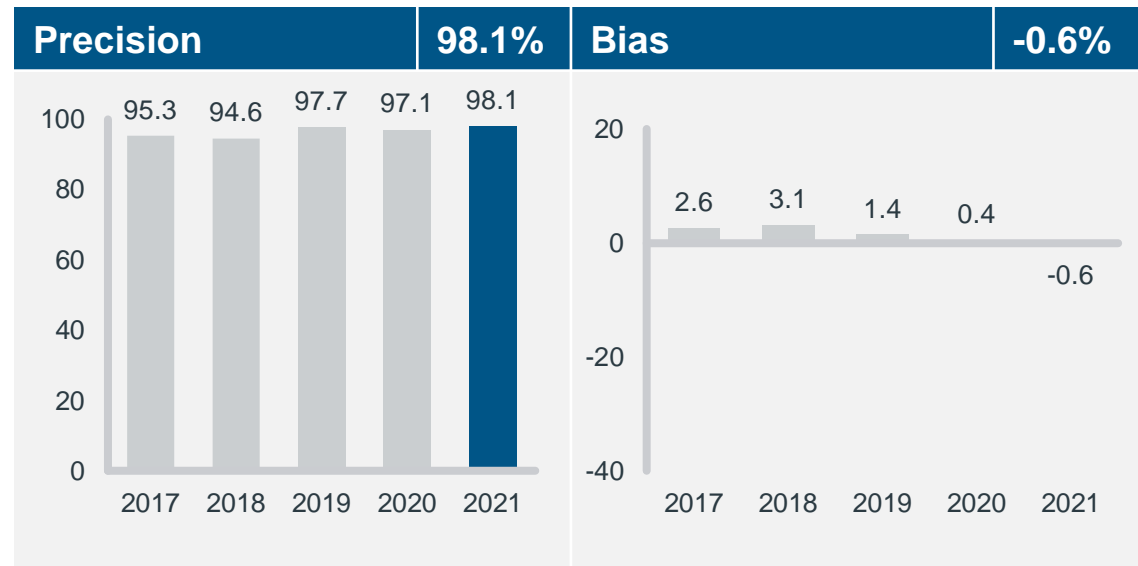
Outcomes

- Overall precision index improved slightly by 1.0 percentage point in 2021
- Overall bias turned from 0.4% overestimation to 0.6% underestimation in 2021
- Increase the collaboration in the validation

Distribution Channels Validated

Manufacturers/Import Agents

Wholesalers — 93%

4% 3%

81% 12%

Poland Retail — Pharmacies

Poland Hospital — Hospitals

85% 15%

Patients
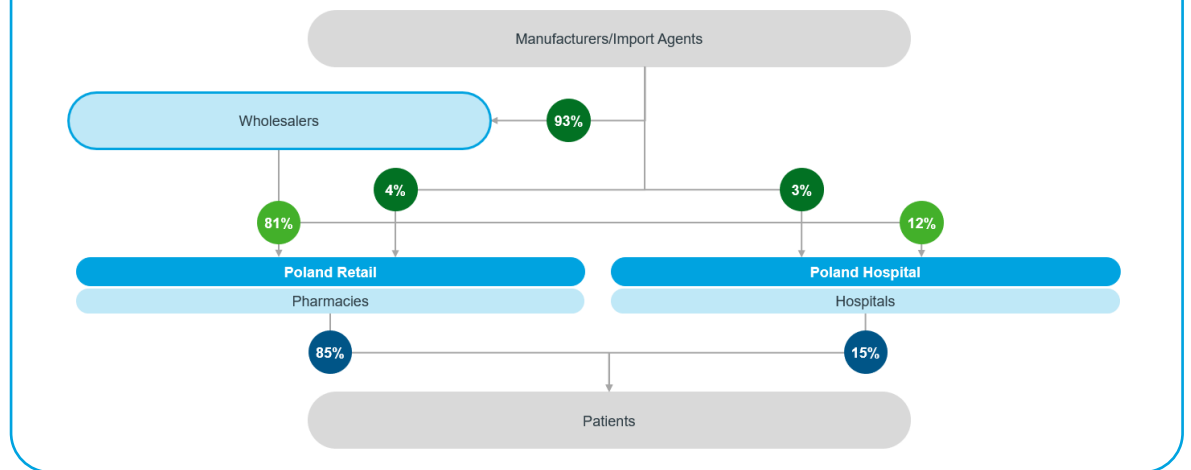
Participation

# Participating Companies	# Forms Validated	% Market Validated
40 *(-15 vPY)*	**786** *(-450 vPY)*	**16%** *(-14% vPY)*

Poland PharmaTrend Validation Study
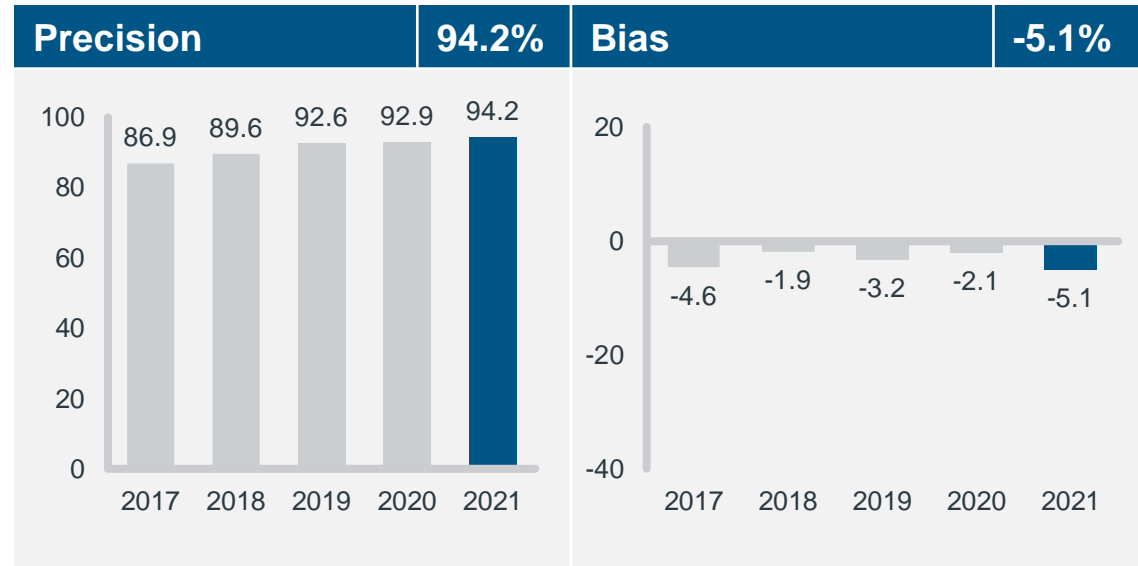
2021 Validation Study

Validation Results

Precision	94.2%	Bias	-5.1%

Precision bar chart:
- 2017: 86.9
- 2018: 89.6
- 2019: 92.6
- 2020: 92.9
- 2021: 94.2

Bias bar chart:
- 2017: -4.6
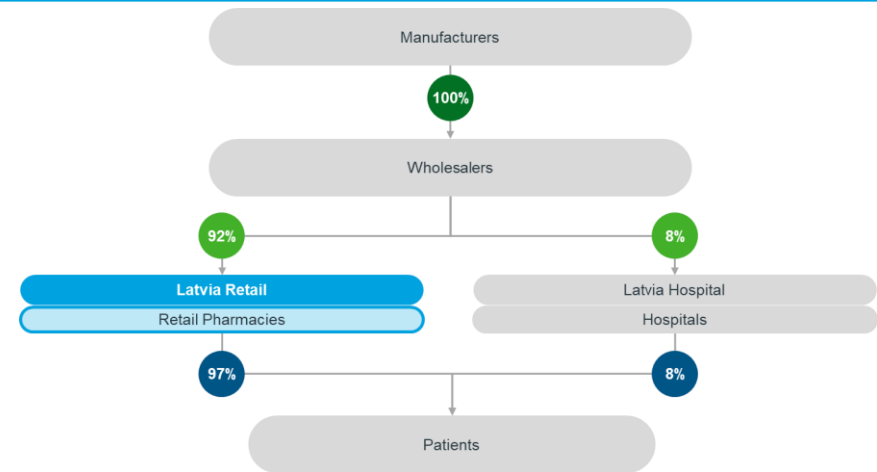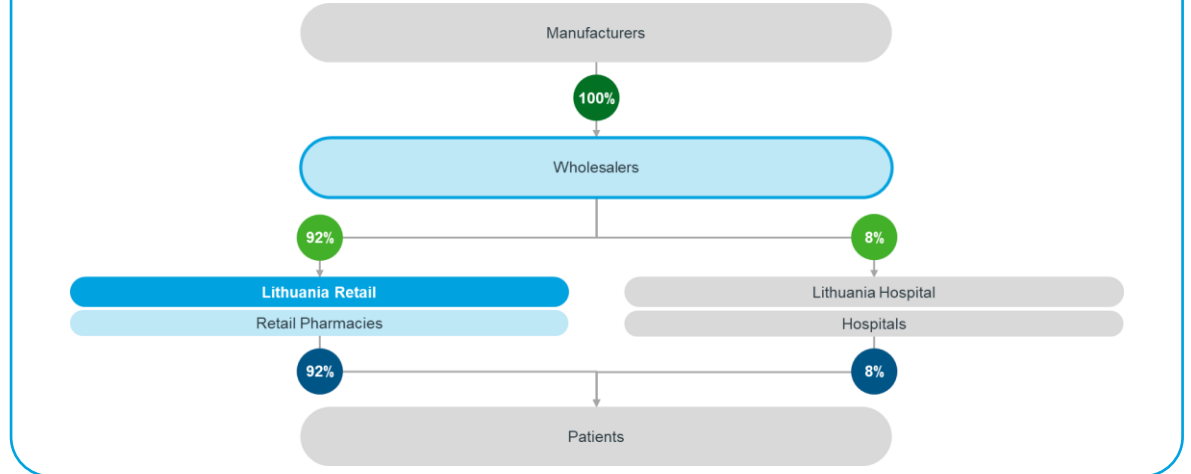- 2018: -1.9
- 2019: -3.2
- 2020: -2.1
- 2021: -5.1

Outcomes

- Overall precision index improved by 1.3 percentage points in 2021
- Overall underestimation increased by 3.0 percentage points in 2021
- Annual revision of projection factors; Increase the collaboration in the validation

Distribution Channels Validated

Manufacturers/Import Agents → Wholesalers (93%)
Wholesalers → Poland Retail (81%), Poland Hospital
4% 3% 12%
Poland Retail / Pharmacies / Poland Retail Sell-Out
Poland Hospital / Hospitals
85% → Patients ← 15%

Participation

# Participating Companies	# Forms Validated	% Market Validated
34 *(-19 vPY)*	**693** *(-410 vPY)*	**16%** *(-14% vPY)*

Poland OTC Validation Study

2021 Validation Study

Validation Results

Precision	88.2%	Bias	-5.4%

Precision chart (2017-2021): 75.4, 82.7, 88.3, 87.5, 88.2

Bias chart (2017-2021): -6.0, -1.7, -5.7, -2.6, -5.4
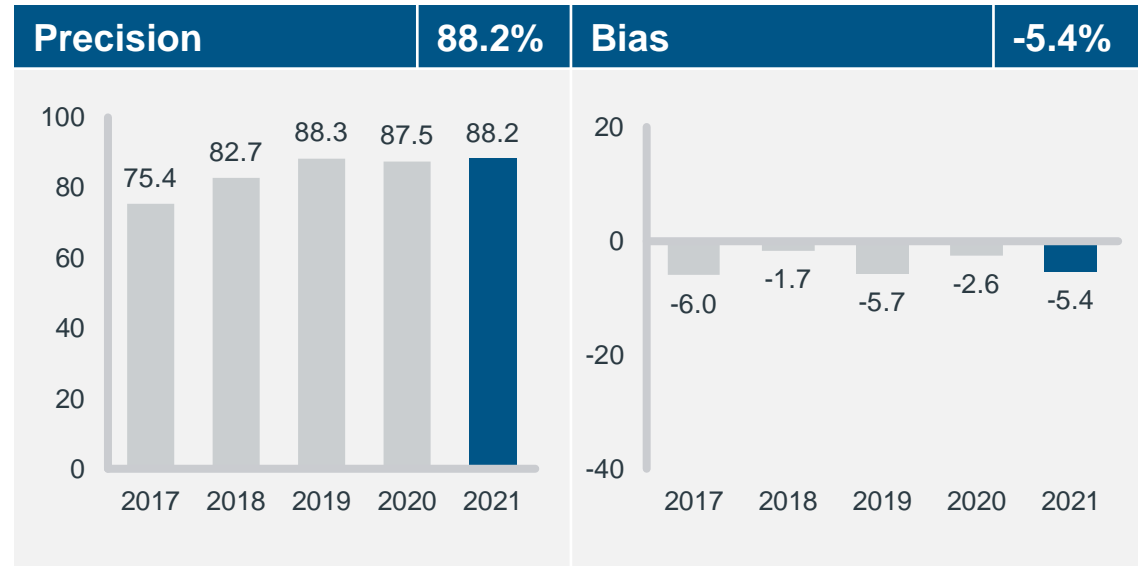
Outcomes

- Overall precision index improved by 0.7 percentage points in 2021
- Overall underestimation increased by 2.8 percentage points in 2021
- Annual revision of projection factors; Increase the collaboration in the validation

Distribution Channels Validated

Manufacturers/Import Agents

Wholesalers — 93%

81% — 4% — 3% — 12%

Poland Retail / Pharmacies / Poland Retail Sell-Out

Poland Hospital / Hospitals

85% — 15%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
21 *(-16 vPY)*	**224** *(-127 vPY)*	**15%** *(-16% vPY)*

Russia Retail+Hospital Validation Study

2021 Validation Study

Validation Results

Precision	86.4%	Bias	-10.1%

Precision chart:
- 2017: 88.0
- 2018: 88.8
- 2019: 89.0
- 2020: 83.2
- 2021: 86.4

Bias chart:
- 2017: -11.7
- 2018: -15.3
- 2019: -9.8
- 2020: -11.4
- 2021: -10.1
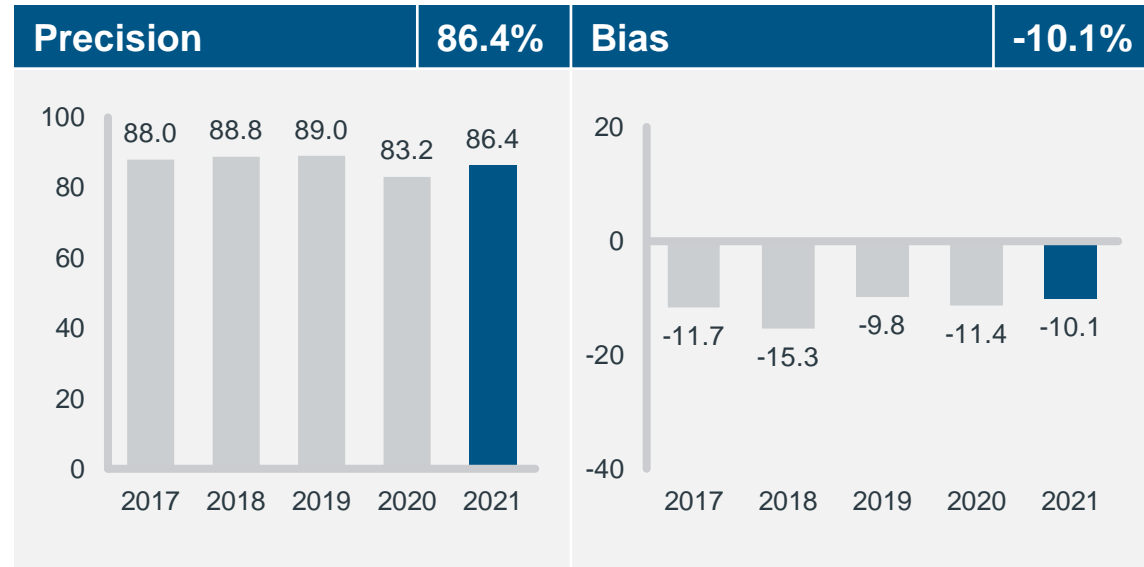
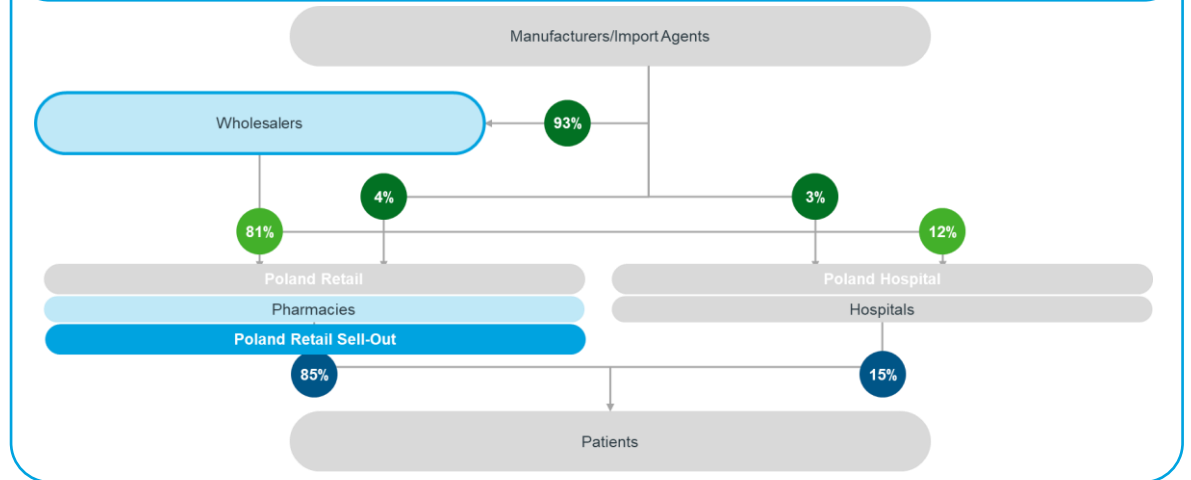### Outcomes

- Overall precision index improved by 3.2 percentage points in 2021
- Overall underestimation improved by 1.3 percentage points in 2021
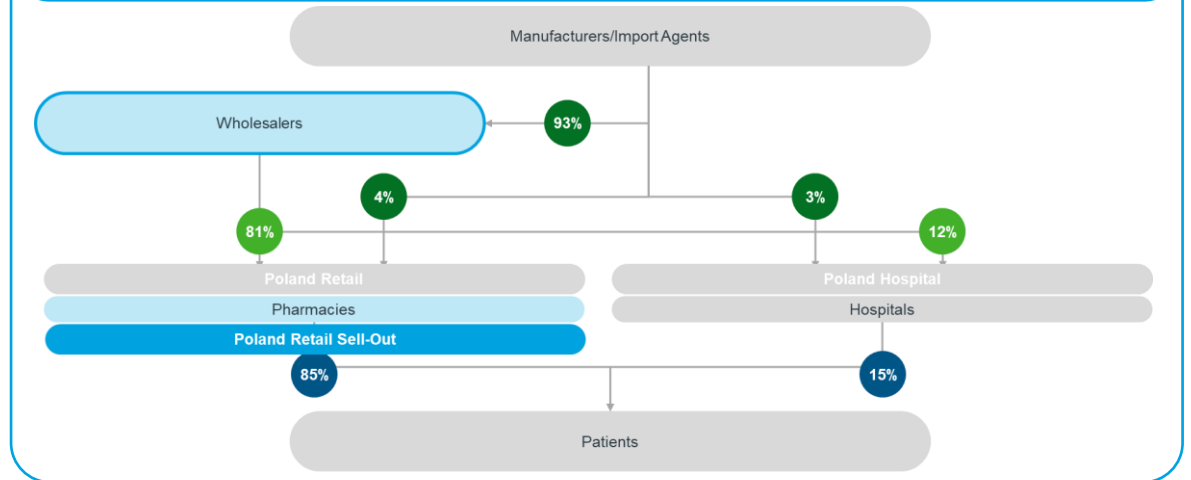- Improved the quality by adding new important chains in the panel

Distribution Channels Validated

Manufacturers → Retail Sector, Wholesalers, Hospital Sector

- Russian Fed. Retail — Pharmacies – Out of Pocket — 65%
- Russia DLO — Reimbursed (Federal) — 9%
- Russia RLO — Reimbursed (Regional) — 7%
- Russian Fed. Hospital — Hospitals — 17%
- Non-Audit — 2%

→ Patients
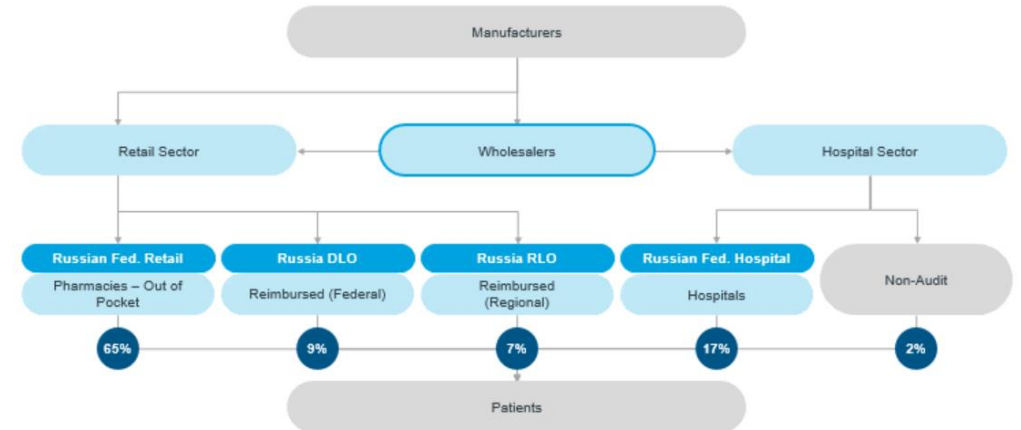
Participation

# Participating Companies	# Forms Validated	% Market Validated
142 *(+17 vPY)*	2,283 *(+183 vPY)*	45% *(+8% vPY)*

Serbia Retail+Hospital Validation Study

2021 Validation Study

Validation Results

Precision	98.5%	Bias	-0.2%

Precision bars: 94.4 (2017), 96.1 (2018), 97.8 (2019), 98.2 (2020), 98.5 (2021)

Bias values: -2.4 (2017), 3.4 (2018), 1.1 (2019), 0.0 (2020), -0.2 (2021)
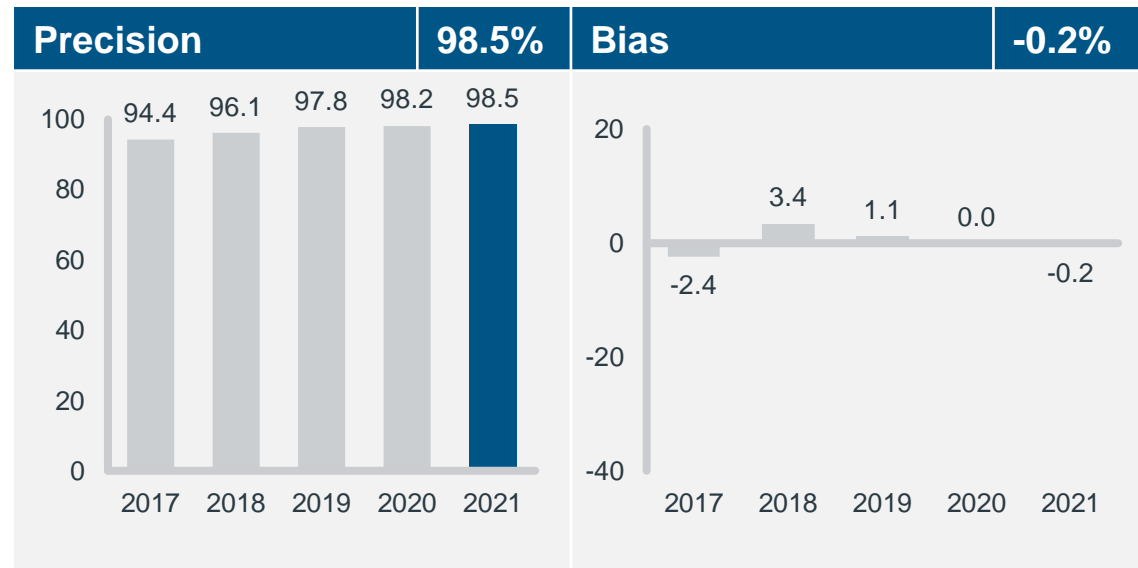
Outcomes

- Overall precision index improved slightly by 0.3 percentage points in 2021
- Overall bias turned from no bias to 0.2% underestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Domestic Manufacturers
Own products & under licence

Foreign Manufacturers
Imports

25%   67%

2%   Wholesalers   6%

55%   21%   22%   2%

Serbia Combined

Private Pharmacies   State Owned Pharmacies   Hospital   Others*

76%   22%   2%

Patients
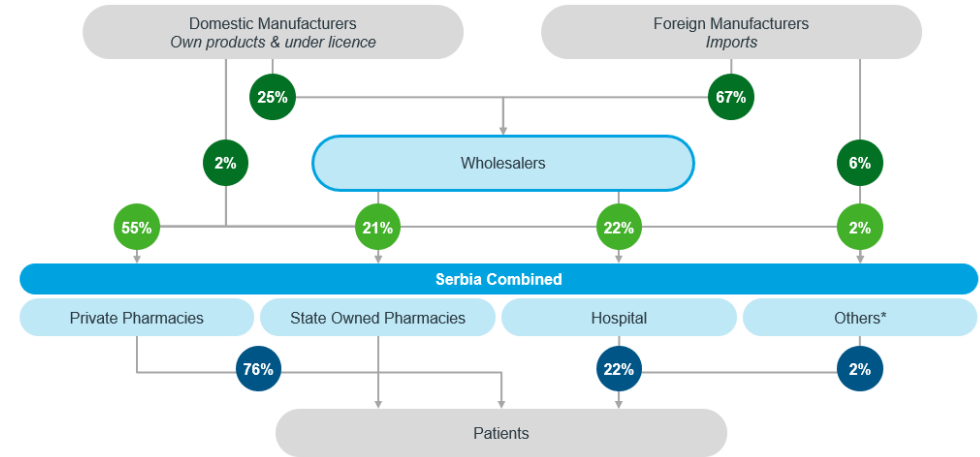
Participation

# Participating Companies	# Forms Validated	% Market Validated
22 *(-14 vPY)*	**441** *(-359 vPY)*	**39%** *(-32% vPY)*

Serbia PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	93.3%	Bias	-5.4%
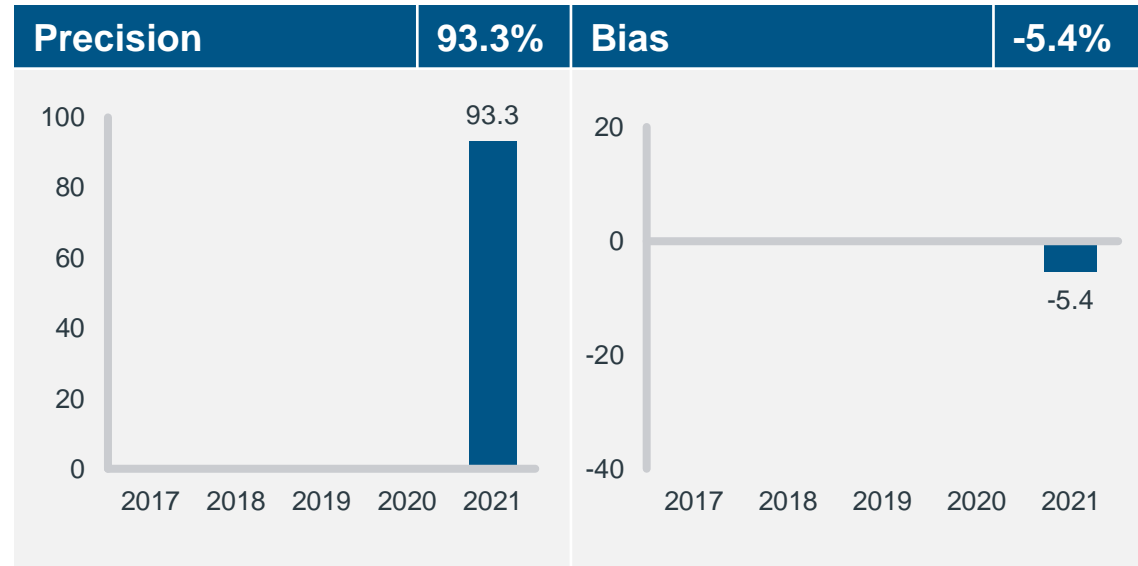
Outcomes

- Overall precision index at 93.3% in 2021
- Overall underestimation at 5.4% in 2021
- Improve the panel coverage; Fine tune the outlier detection process

Distribution Channels Validated
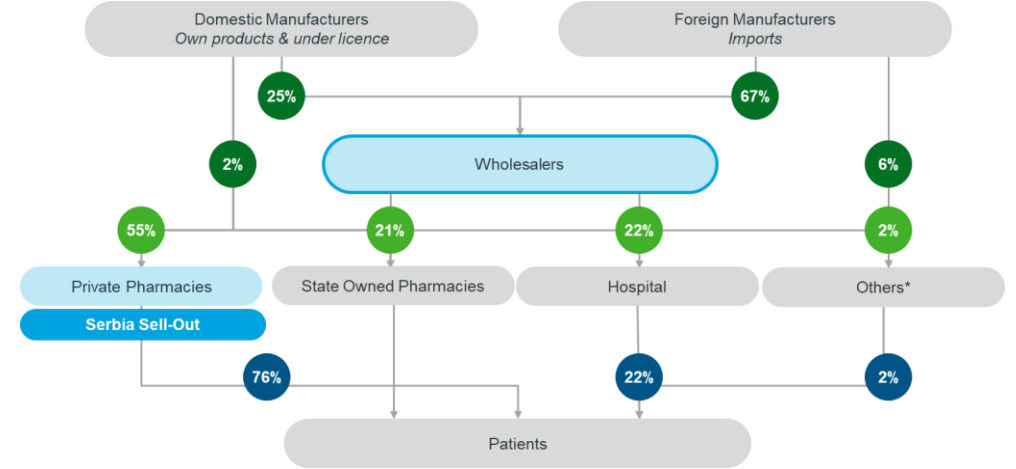
Participation

# Participating Companies	# Forms Validated	% Market Validated
21 (vPY)	287 (vPY)	35% (vPY)

Slovakia Retail+Hospital Validation Study

2021 Validation Study

Validation Results

Precision	99.7%	Bias	-0.6%

Precision bars (2017–2021): 99.4, 99.6, 98.3, 99.7, 99.7

Bias chart (2017–2021): 0.2, -0.1, -0.2, -0.4, -0.6
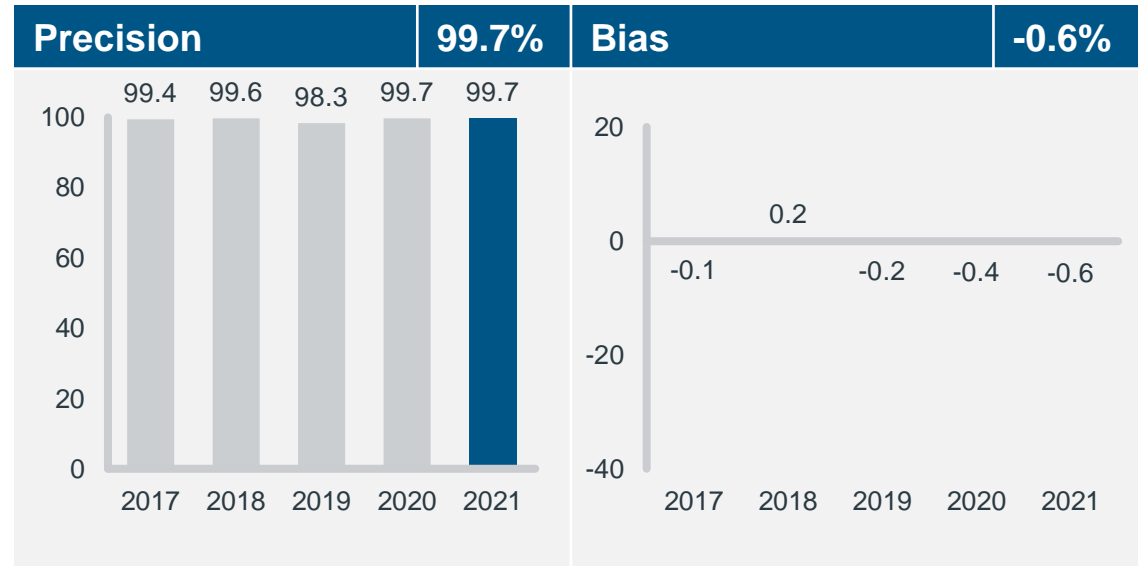
Outcomes

- Overall precision index remained unchanged in 2021
- Overall underestimation increased by 0.2 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → 79% Big Wholesalers, 21% Other Wholesalers

Big Wholesalers → 69% Slovakia Retail, 7.5% Slovakia Hospital, 2.5% Others*

Other Wholesalers → 16%, 4.5%, 0.5%

Slovakia Retail / Retail Pharmacies → 85% Patients

Slovakia Hospital / Hospital Pharmacies → 12% Patients

Others* → 3%

*Others: Special distribution channels, deliveries to the army
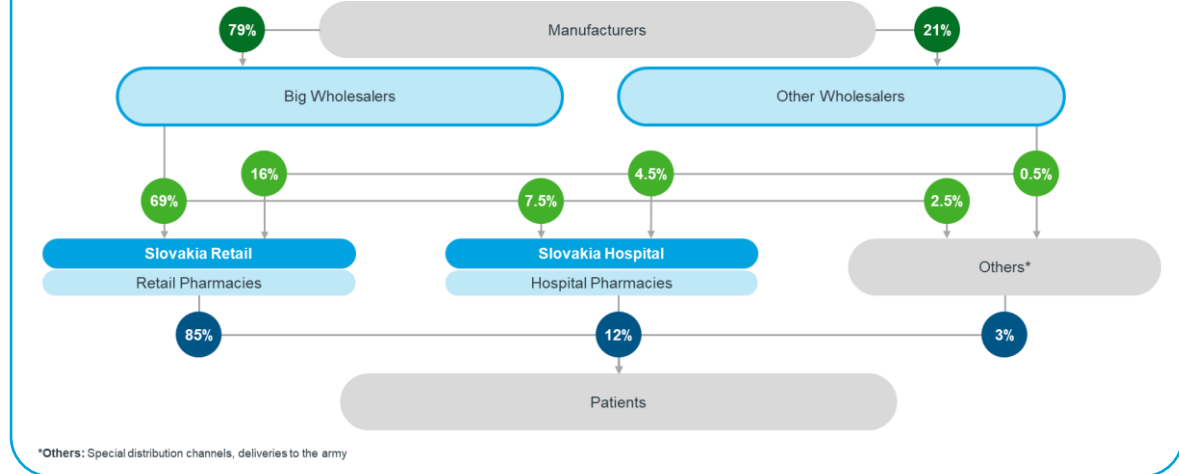
Participation

# Participating Companies	# Forms Validated	% Market Validated
12 *(-10 vPY)*	**508** *(-210 vPY)*	**18%** *(-14% vPY)*

Slovakia PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	96.4%	Bias	-0.4%

Precision chart (2017–2021): 93.1, 95.4, 93.6, 93.5, 96.4

Bias chart (2017–2021): -3.5, -0.7, -2.3, -3.5, -0.4

Outcomes

- Overall precision index improved by 2.9 percentage points in 2021
- Overall underestimation improved by 3.1 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Big Wholesalers (79%), Other Wholesalers (21%)

Big Wholesalers → Retail Pharmacies (69%), Slovakia Hospital / Hospital Pharmacies (7.5%), (16%), (4.5%)

Other Wholesalers → Others* (0.5%), (2.5%)

Retail Pharmacies / Slovakia Retail Sell-Out → Patients (85%)

Slovakia Hospital / Hospital Pharmacies → Patients (12%)

Others* → (3%)

Participation

# Participating Companies	# Forms Validated	% Market Validated
12 (-10 vPY)	**435** (-181 vPY)	**18%** (-14% vPY)

Slovakia OTC Validation Study

2021 Validation Study

Validation Results

Precision	95.7%	Bias	-0.9%

Precision bars: 98.2 (2017), 95.7 (2018), 90.2 (2019), 94.0 (2020), 95.7 (2021)

Bias: 0.0, -2.8, -2.9, -3.7, -0.9 (2017–2021)

Outcomes
- Overall precision index improved by 1.7 percentage points in 2021
- Overall underestimation improved by 2.8 percentage points in 2021
- No action required from the statistical point of view
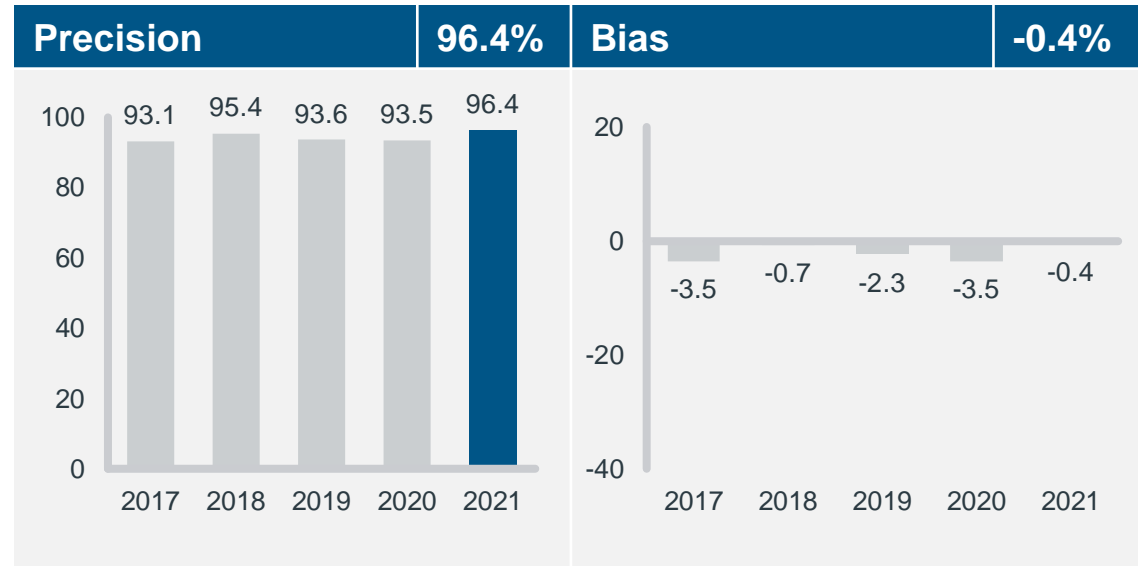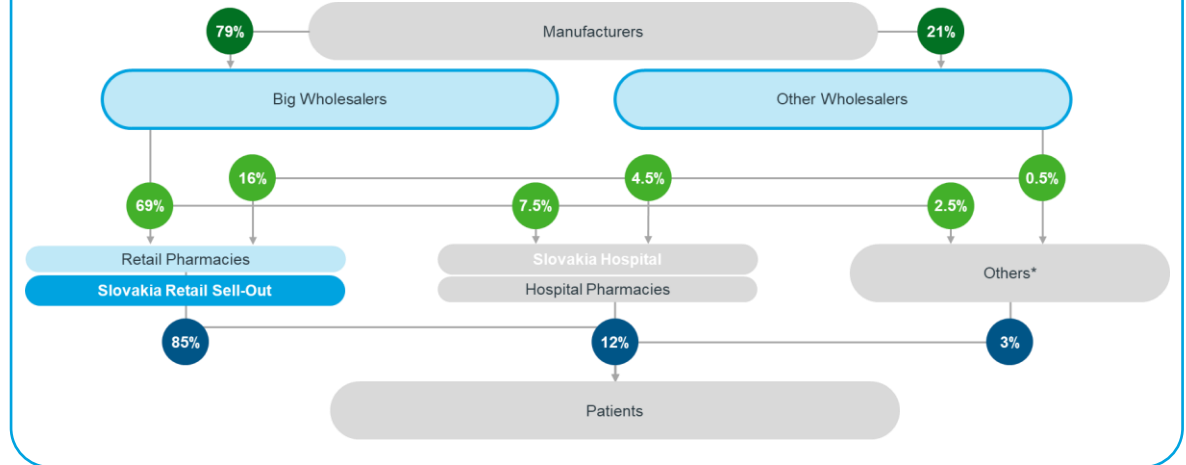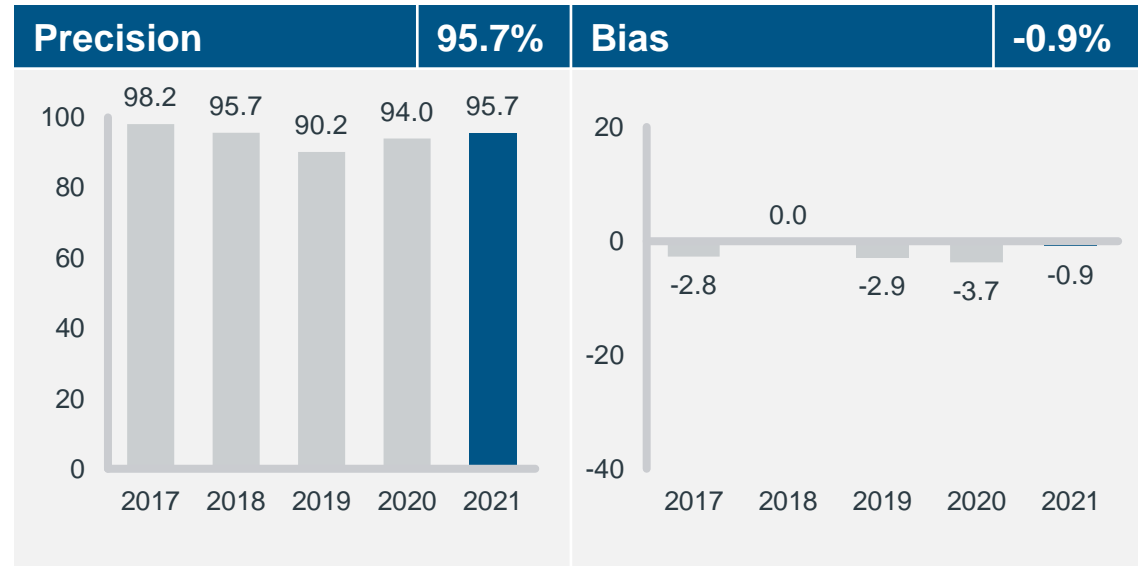
Distribution Channels Validated

Manufacturers — 79% / 21%
Big Wholesalers, Other Wholesalers
69% / 16% / 7.5% / 4.5% / 2.5% / 0.5%
Retail Pharmacies, Slovakia Hospital, Others*
Slovakia Retail Sell-Out, Hospital Pharmacies
85% / 12% / 3%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
9 (-3 vPY)	**75** (-64 vPY)	**13%** (-23% vPY)

Slovenia Retail+Hospital Validation Study

2021 Validation Study

Validation Results

Precision	98.7%	Bias	1.1%

Precision values by year:
- 2017: 98.1
- 2018: 99.7
- 2019: 95.3
- 2020: 99.3
- 2021: 98.7

Bias values by year:
- 2017: -2.5
- 2018: -1.0
- 2019: -0.1
- 2020: 0.4
- 2021: 1.1

Outcomes

- Overall precision index declined slightly by 0.6 percentage points in 2021
- Overall overestimation increased slightly by 0.7 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Domestic Manufacturers (Own products and under licence) → 16% → Wholesalers
Foreign Manufacturers, Imports → 82% → Wholesalers

Wholesalers → 73% / 1% / 24% / 2%

Slovenia Combined:
- Private Pharmacies — 73%
- State-owned Pharmacies
- Others — 1%
- Hospitals (Pharmacies) — 24% / 2%

→ Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
13 *(no change vPY)*	**268** *(-24 vPY)*	**11%** *(-1% vPY)*

Spain Retail Validation Study

2021 Validation Study

Validation Results

Precision	94.8%	Bias	1.1%

Precision chart (2017–2021): 95.8, (2018 blank), 95.2, 93.6, 94.8

Bias chart (2017–2021): 0.1, -0.5, 1.5, 1.1
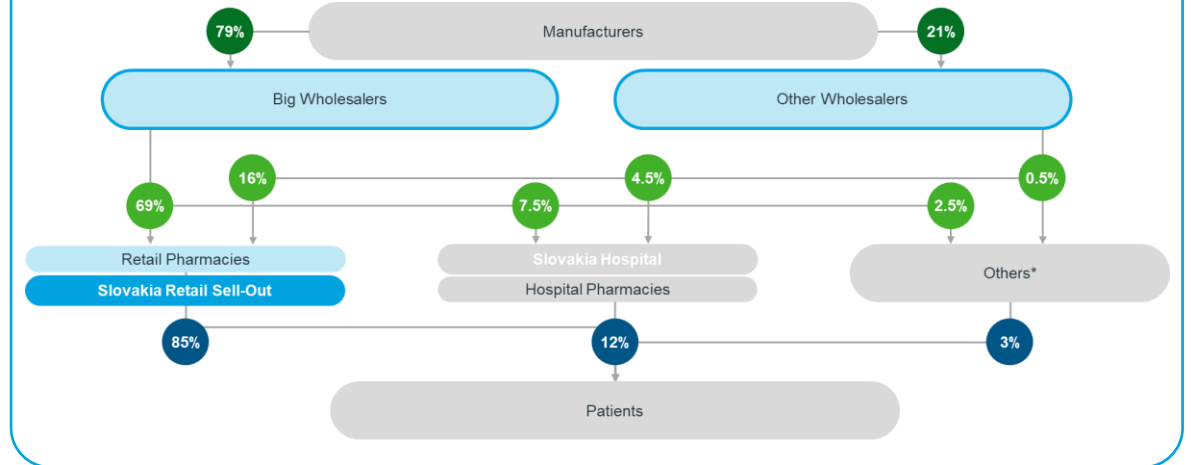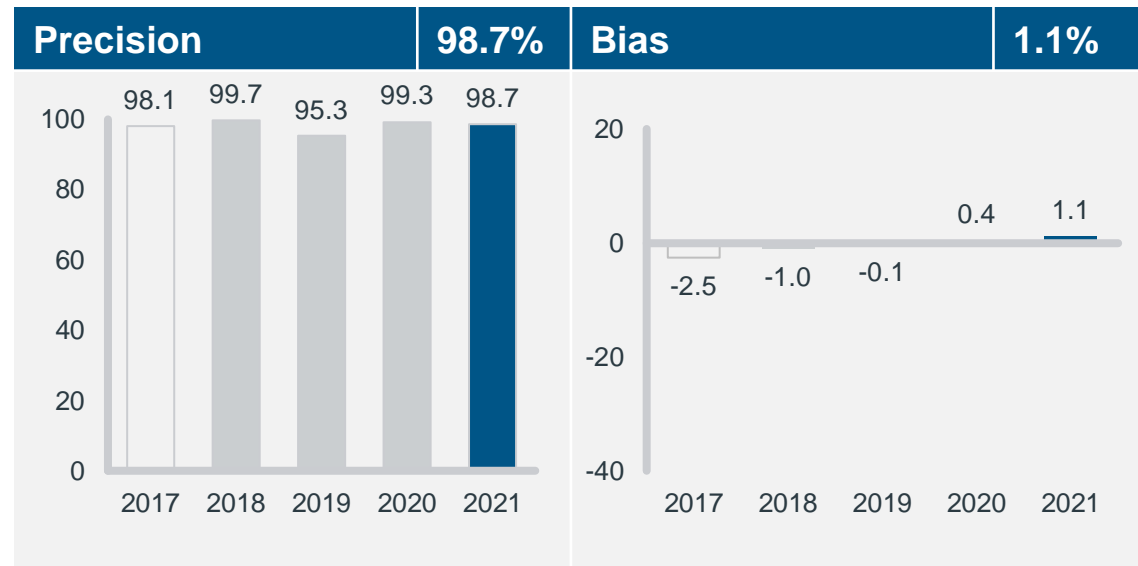
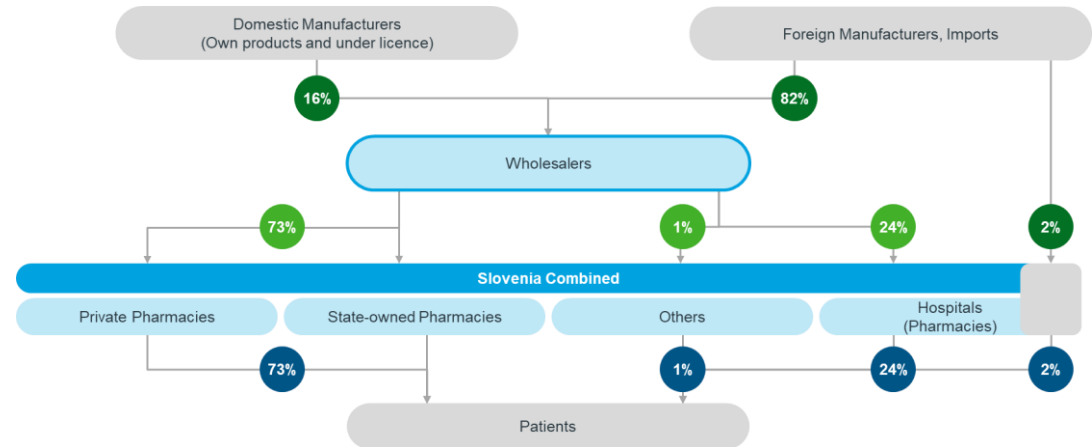**Outcomes**
- Overall precision index improved by 1.2 percentage points in 2021
- Overall overestimation improved slightly by 0.4 percentage points in 2021
- No action required from the statistical point of view
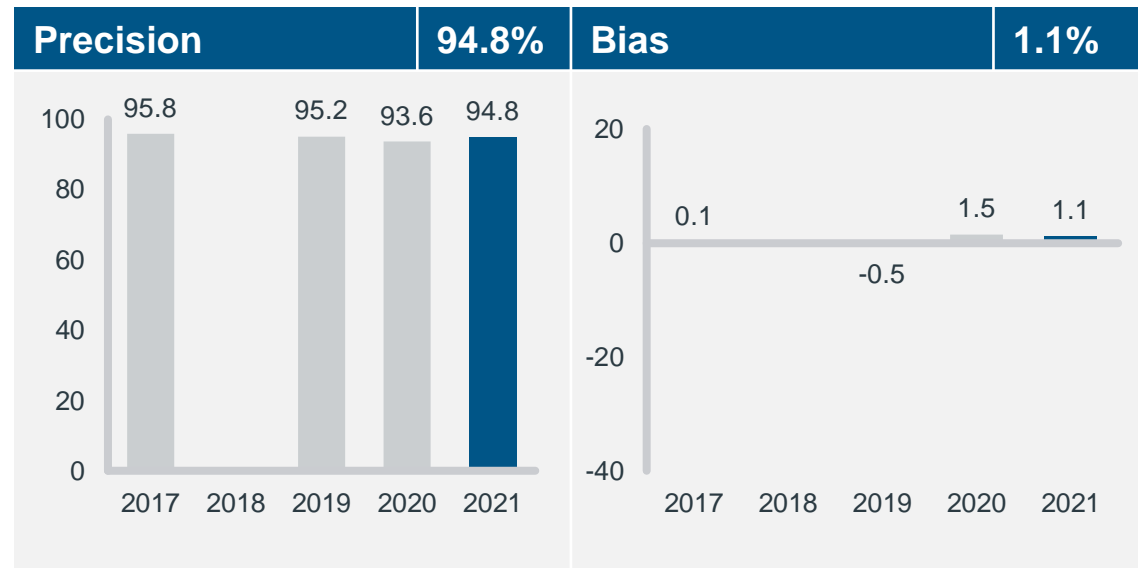
Distribution Channels Validated

Manufacturers → Wholesalers 60% → 34% → 1%
Wholesalers → Spain Retail / Pharmacies 59%, 5%, 1%
Spain Retail / Spain Sell-Out 64%
Hospitals / Spain Hospital 35%
Other* 1%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
26 (+5 vPY)	**997** (+211 vPY)	**20%** (+5% vPY)

Spain PharmaTrend Validation Study
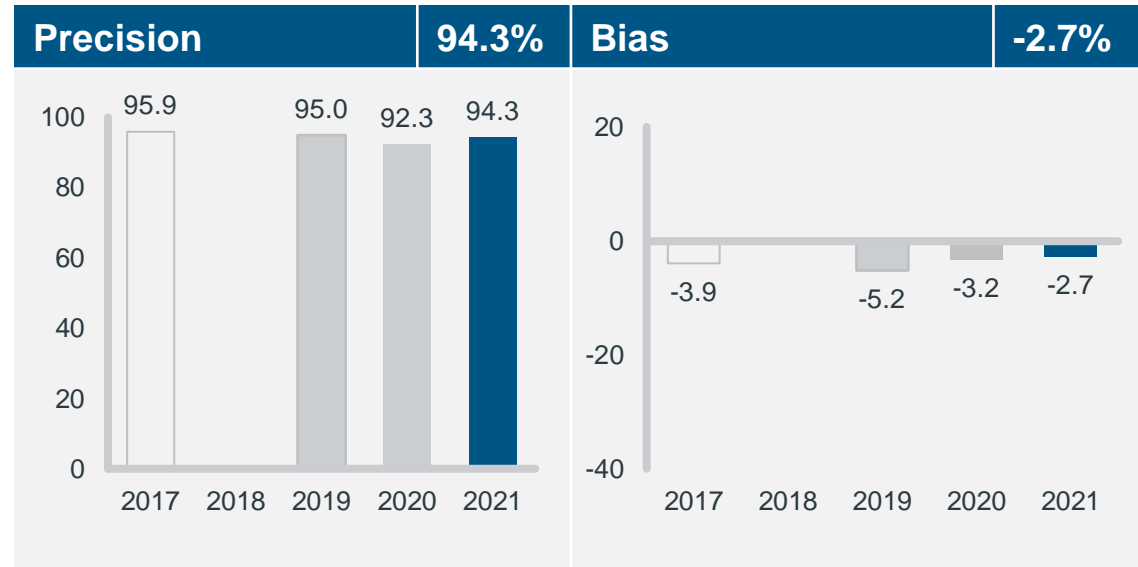
2021 Validation Study

Validation Results

Precision	94.3%	Bias	-2.7%

Precision chart (2017–2021): 95.9, (2018), 95.0, 92.3, 94.3

Bias chart (2017–2021): (2017), -3.9, -5.2, -3.2, -2.7

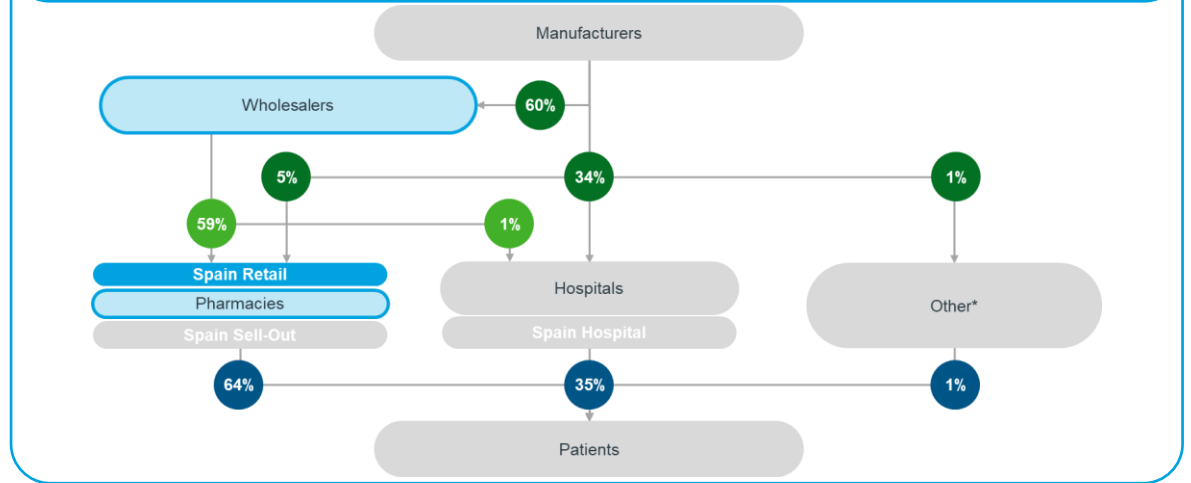**Outcomes**

- Overall precision index improved by 2.0 percentage points in 2021
- Overall underestimation improved by 0.5 percentage points in 2021
- Increase manufacturer participation in the validation; Review projection levels

Distribution Channels Validated

Manufacturers — Wholesalers (60%), 34%, 1%

Wholesalers — 5%, 1%

Spain Retail — 59%

Pharmacies

Spain Sell-Out — 64%

Hospitals — Spain Hospital — 35%

Other* — 1%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
26 (+5 vPY)	**964** (+220 vPY)	**16%** (+4% vPY)

Spain OTC Validation Study

2021 Validation Study

Validation Results

Precision	90.7%	Bias	-2.8%

Precision bar chart (2017-2021): 92.9, (2018 blank), 89.5, 92.9, 90.7

Bias chart (2017-2021): -3.0, (2018 blank), 0.7, 0.8, -2.8

Outcomes

- Overall precision index declined by 2.2 percentage points in 2021
- Overall bias turned from 0.8% overestimation to 2.8% underestimation in 2021
- Increase Manufacturer participation in the validation; Review projection levels

Distribution Channels Validated

Manufacturers → Wholesalers 60%, 34%, 1%
Wholesalers → Spain Retail 5%, Hospitals 1%
Spain Retail 59%, Pharmacies 1%
Spain Sell-Out 64%, Spain Hospital 35%, Other* 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
10 (+1 vPY)	**54** (+12 vPY)	**13%** (+4% vPY)

IQVIA

Switzerland Retail+Hospital Validation Study
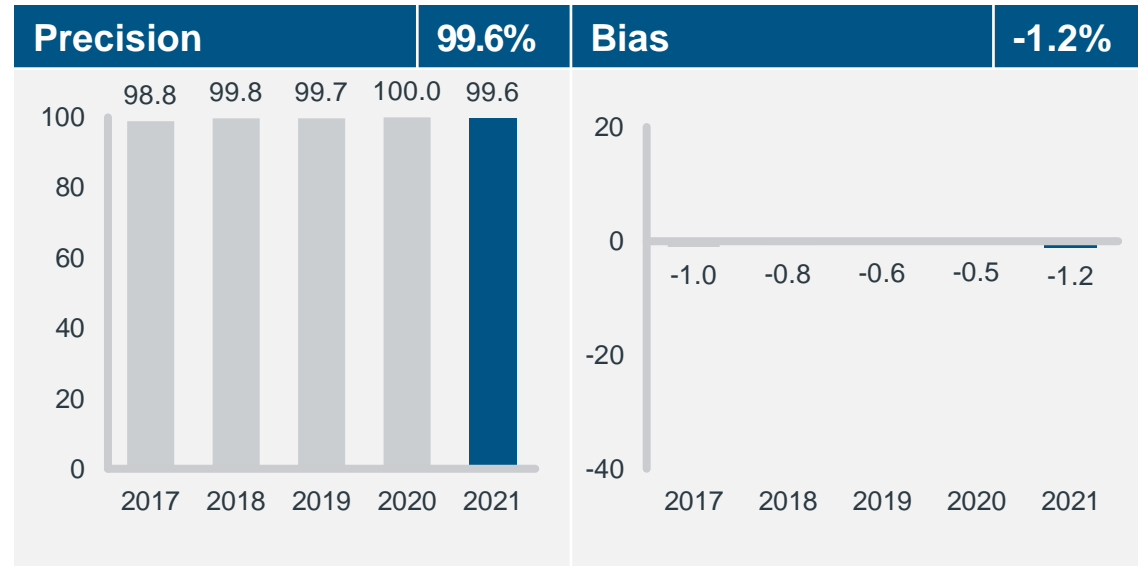
2021 Validation Study

Validation Results

Precision	99.6%	Bias	-1.2%

Precision chart (2017-2021): 98.8, 99.8, 99.7, 100.0, 99.6
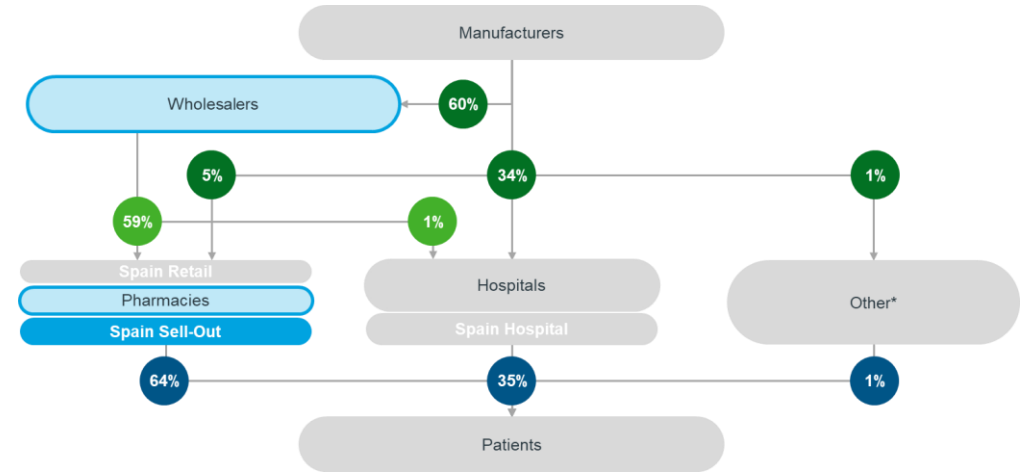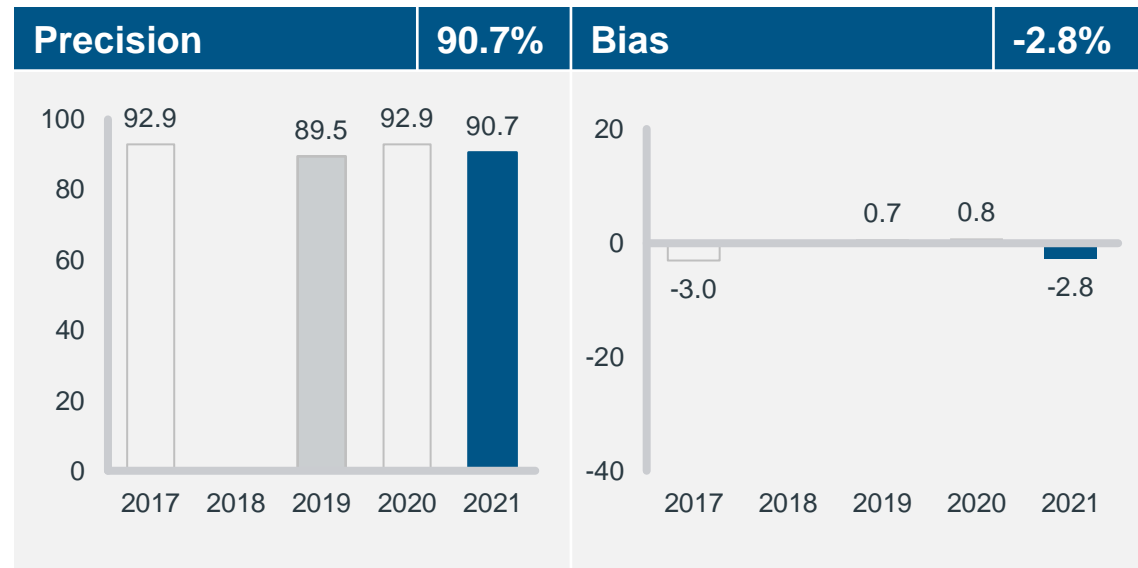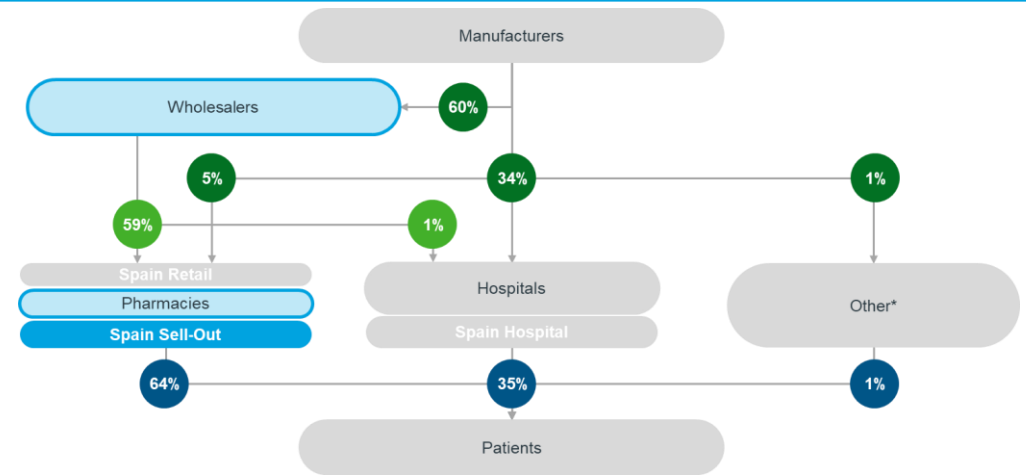
Bias chart (2017-2021): -1.0, -0.8, -0.6, -0.5, -1.2

Outcomes
- Overall precision index declined by 0.4 percentage points in 2021
- Overall underestimation increased by 0.7 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers
- 65%
- Wholesalers/Mail Order
- 3%, 46%, <1%, 1%, 17%, 8%, 24%, 1%

Switzerland Retail: Pharmacies, Drugstores, Dispensing Doctors
Switzerland Hospital: Hospitals

- Pharmacies 49%
- Drugstores 1%
- Dispensing Doctors 25%
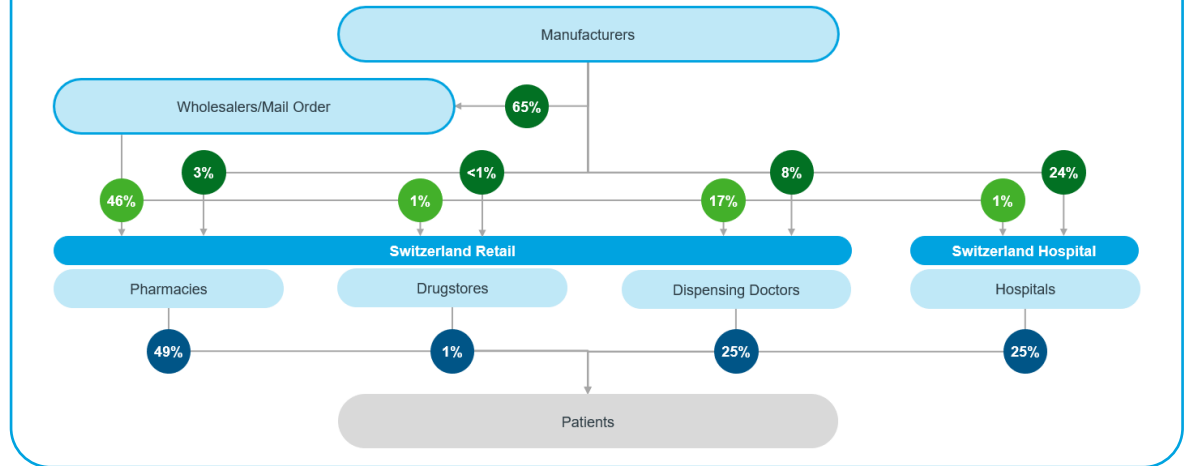- Hospitals 25%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
50 (+4 vPY)	1,861 (-159 vPY)	41% (-10% vPY)

Switzerland PharmaTrend Validation Study

2021 Validation Study

Validation Results

Precision	94.6%	Bias	2.8%

Precision (bar chart):
- 2017: 95.8
- 2018: 95.8
- 2019: 95.5
- 2020: 96.4
- 2021: 94.6

Bias (bar chart):
- 2017: -2.6
- 2018: 1.0
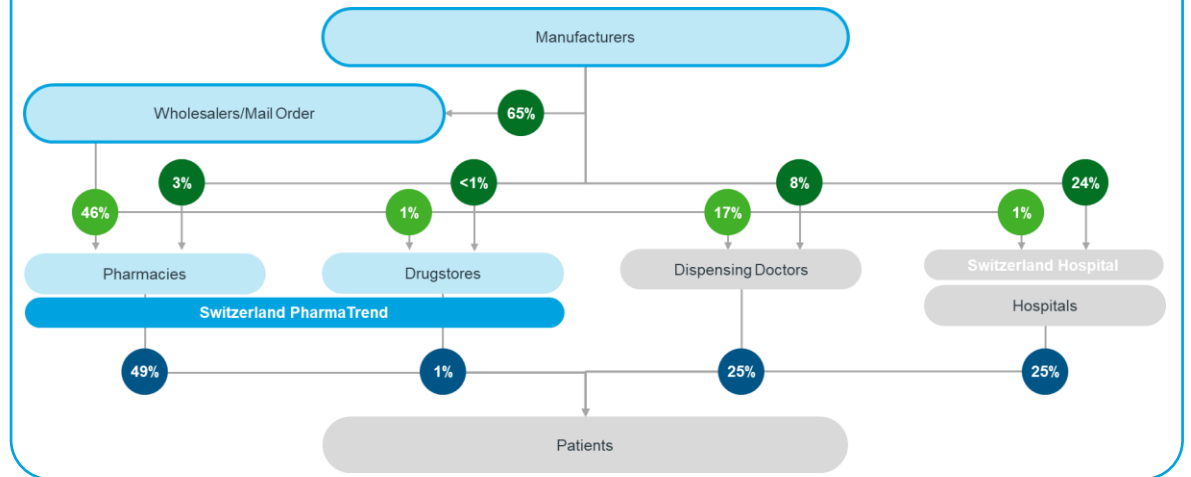- 2019: 2.3
- 2020: 3.3
- 2021: 2.8
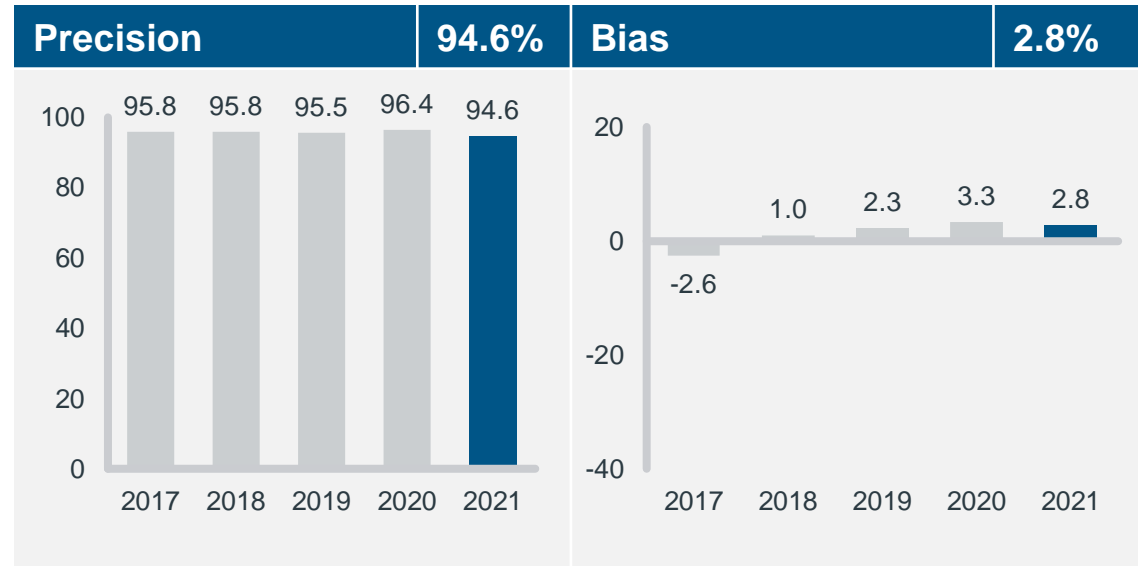
Outcomes

- Overall precision index declined by 1.8 percentage points in 2021
- Overall overestimation improved by 0.5 percentage points in 2021
- Enhance quality control metrics; Review projection levels

Distribution Channels Validated

Manufacturers → Wholesalers/Mail Order 65%

- Pharmacies 46%, 3%
- Drugstores 1%, <1%
- Dispensing Doctors 17%, 8%
- Switzerland Hospital / Hospitals 1%, 24%

Switzerland PharmaTrend:
- Pharmacies → Patients 49%
- Drugstores → Patients 1%
- Dispensing Doctors → Patients 25%
- Hospitals → Patients 25%

Participation

# Participating Companies	# Forms Validated	% Market Validated
179 *(+5 vPY)*	3,707 *(-5 vPY)*	91% *(-1% vPY)*

IQVIA

Switzerland OTC Validation Study

2021 Validation Study

Validation Results

Precision	93.5%	Bias	6.2%

Outcomes
- Overall precision index declined by 1.9 percentage points in 2021
- Overall overestimation increased by 2.4 percentage points in 2021
- Enhance quality control metrics; Review projection levels

Distribution Channels Validated

Participation
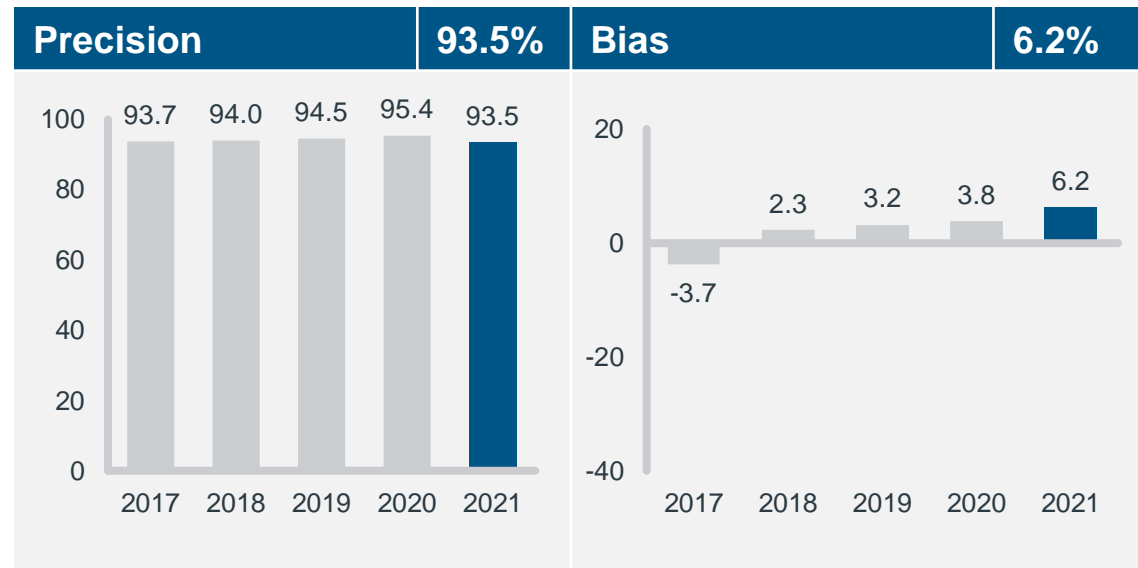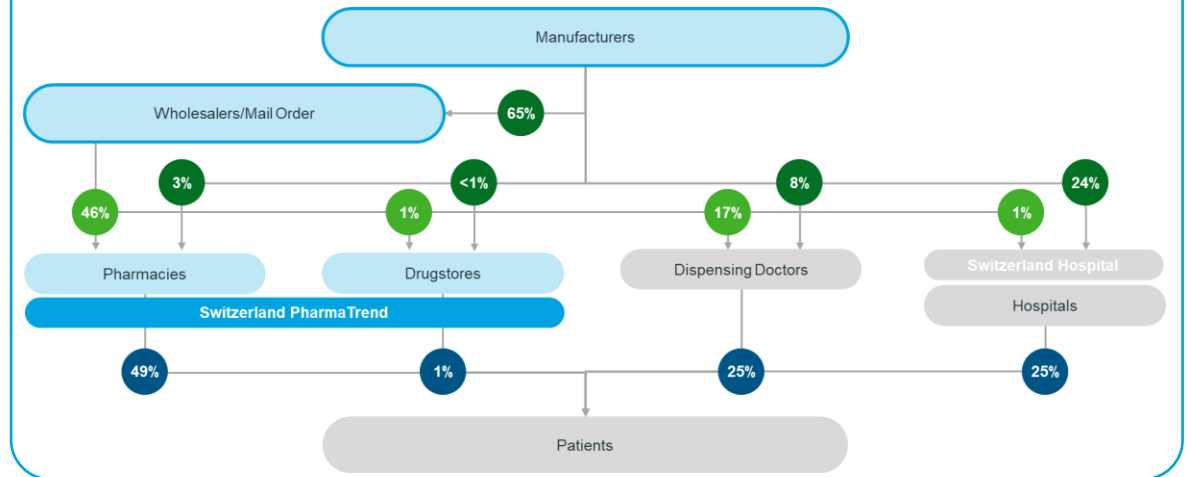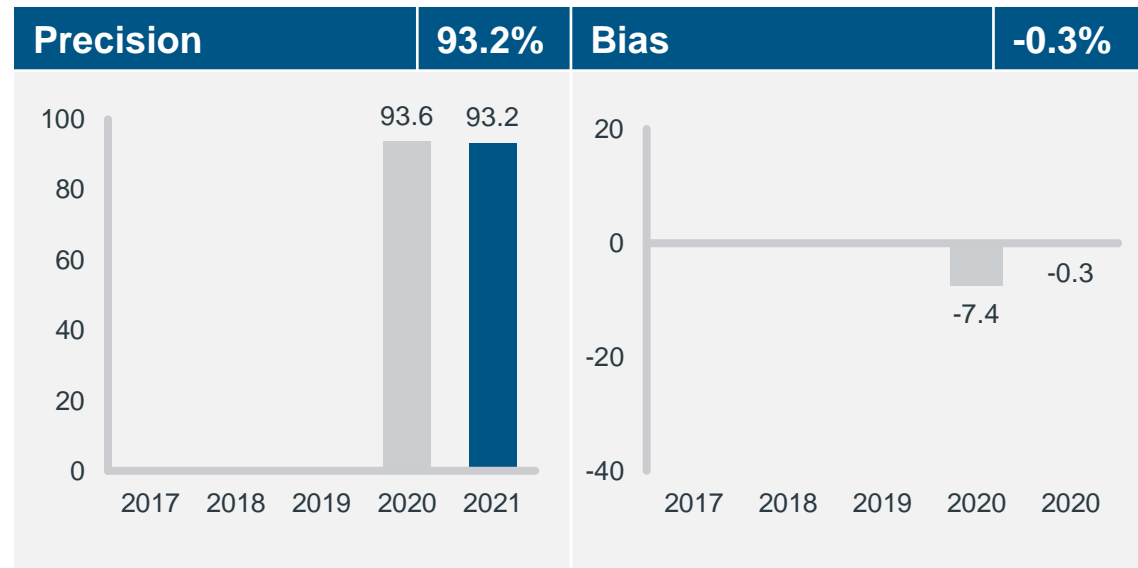
# Participating Companies	# Forms Validated	% Market Validated
103 *(-3 vPY)*	**1,087** *(-41 vPY)*	**93%** *(-3% vPY)*

United Kingdom Retail Validation Study

2021 Validation Study

Validation Results

Precision	93.2%	Bias	-0.3%

Precision chart: 2020 = 93.6, 2021 = 93.2
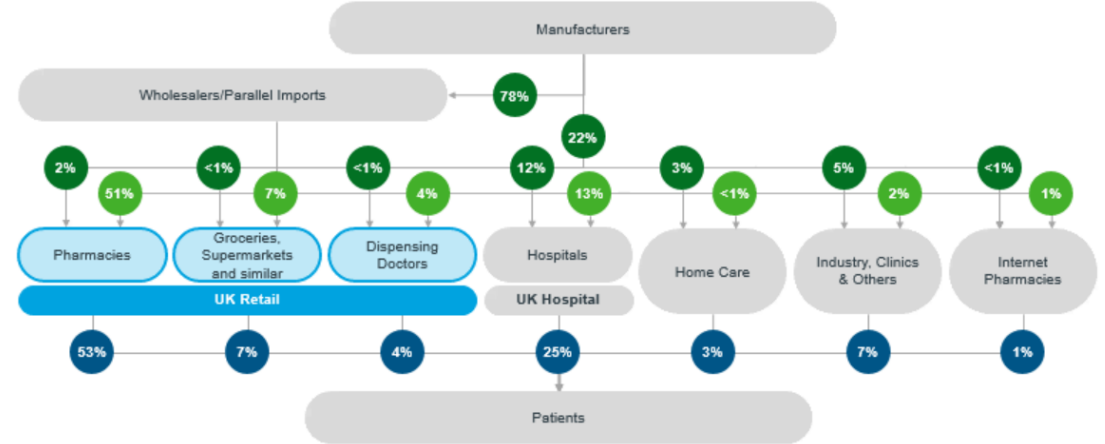
Bias chart: 2020 = -7.4, 2020 = -0.3

Outcomes
- Result are based on Rx count at Molecule/Form/Strength level
- Overall precision index declined by 0.4 percentage points in 2021
- Overall underestimation improved by 7.1 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Participation

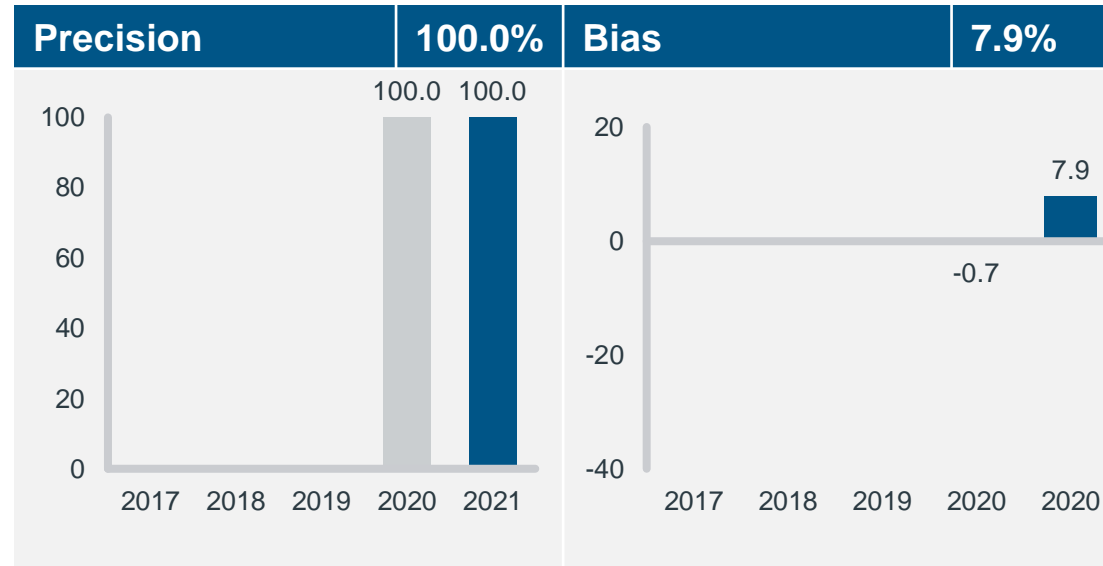| # Participating Molecules	# Molecule/Form/ Strength Validated	% Market Validated
617 *(-16 vPY)*	2,144 *(No change vPY)*	94% *(+2% vPY)*

*2020 validation has been refreshed to be comparable with 2021 validation

United Kingdom Hospital Validation Study

2021 Validation Study

Validation Results

Precision	**100.0%**	Bias	**7.9%**

Precision chart: 100.0 (2020), 100.0 (2021), years 2017 2018 2019 2020 2021

Bias chart: -0.7, 7.9, years 2017 2018 2019 2020 2020

Outcomes

- Result are based on Molecule/Form/Strength level
- Overall precision index remained unchanged in 2021
- Overall bias turned from 0.7% underestimation to 7.9% overestimation in 2021
- Review product bridging

Distribution Channels Validated
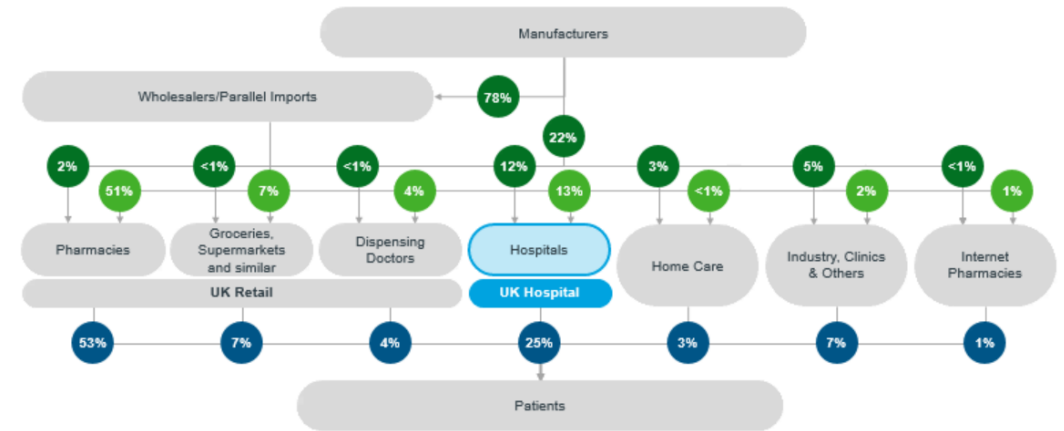
Participation

# Participating Molecules	# Molecule/Form/Strength Validated	% Market Validated
444 *(+197 vPY)*	**797** *(+296 vPY)*	**61%** *(+38% vPY)*

Africa, Middle East, South Asia
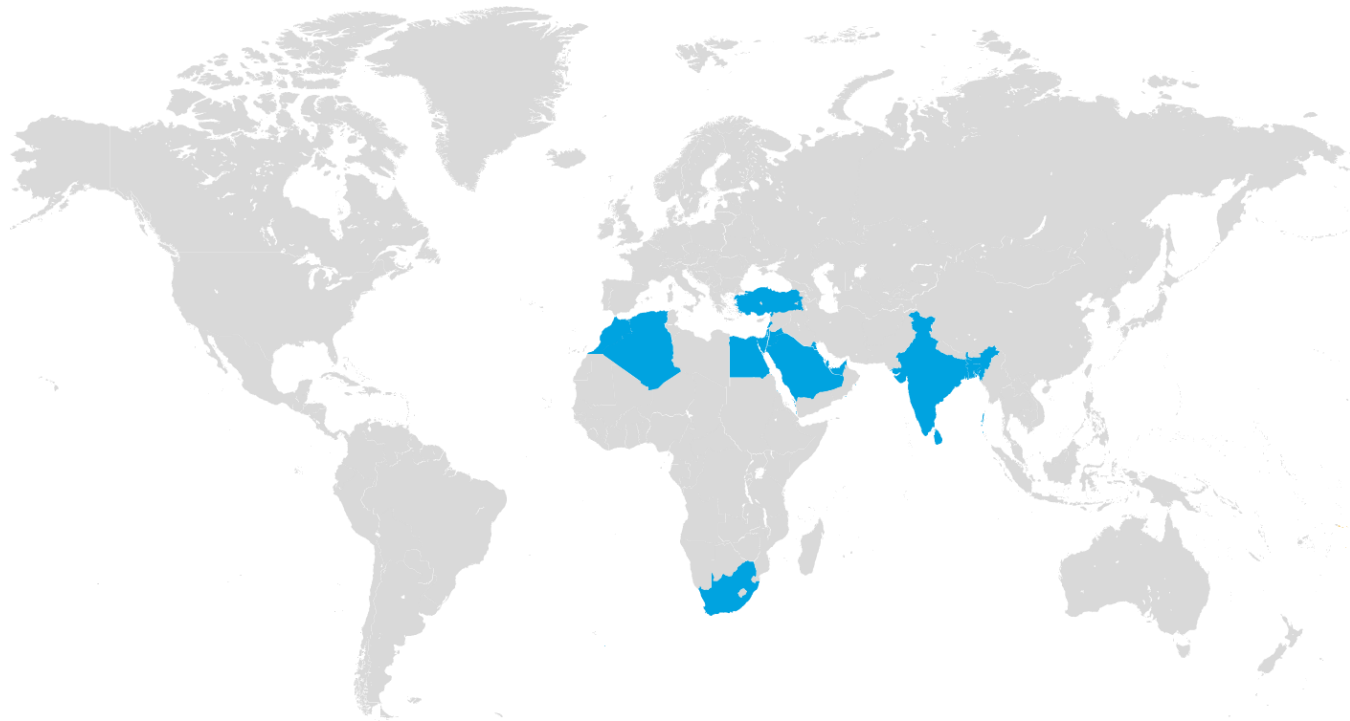
Countries

Africa

- Algeria
- Morocco
- Tunisia

South Asia

- Bangladesh

Middle East

- Egypt
- Jordan
- Kuwait
- Lebanon
- Saudi Arabia
- Turkey
- United Arab Emirates

Algeria Retail Validation Study

2021 Validation Study

Validation Results

Precision	77.2%	Bias	0.2%

Precision (bar chart): 2017: 74.0, 2018: 68.0, 2019: 68.6, 2020: 69.4, 2021: 77.2

Bias (bar chart): 2017: -4.8, 2018: -9.8, 2019: 3.5, 2020: -0.7, 2021: 0.2
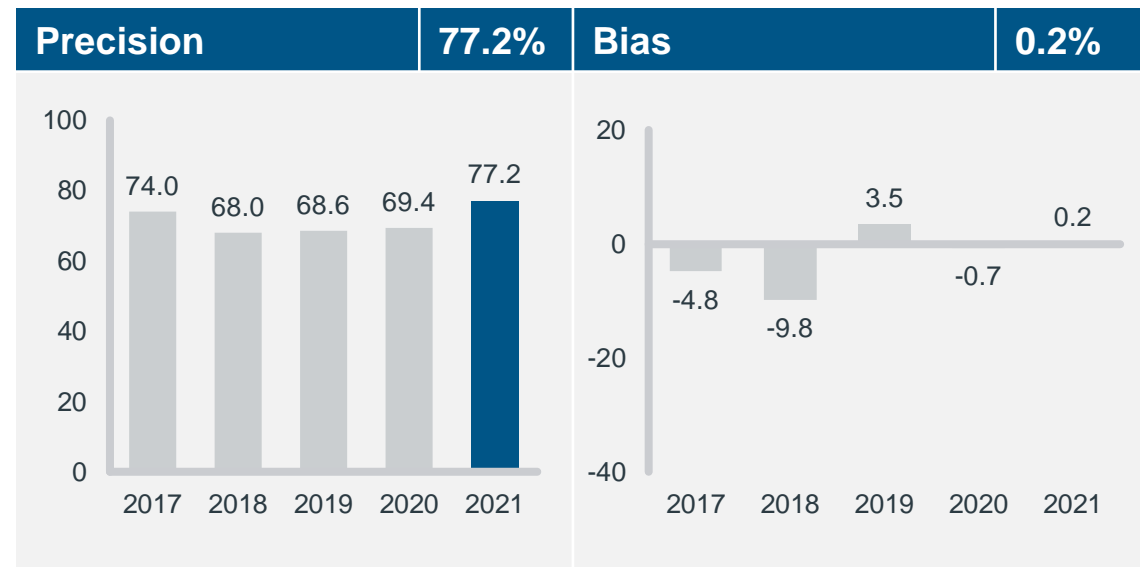
Outcomes

- Overall precision index improved by 7.8 percentage points in 2021
- Overall bias turned from 0.7% underestimation to 0.2% overestimation in 2021
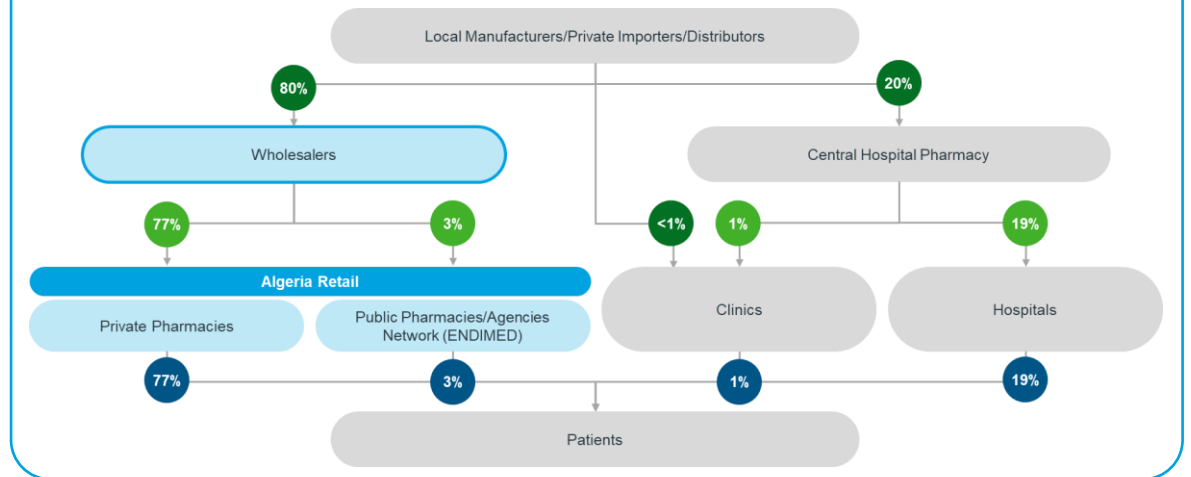- No action required from the statistical point of view

Distribution Channels Validated

Local Manufacturers/Private Importers/Distributors

- 80% → Wholesalers
- 20% → Central Hospital Pharmacy

Wholesalers:
- 77% → Algeria Retail
- 3% →

Central Hospital Pharmacy:
- <1% → Clinics
- 1% → Clinics
- 19% → Hospitals

Algeria Retail:
- Private Pharmacies
- Public Pharmacies/Agencies Network (ENDIMED)

To Patients:
- Private Pharmacies: 77%
- Public Pharmacies: 3%
- Clinics: 1%
- Hospitals: 19%

Participation

# Participating Companies	# Forms Validated	% Market Validated
18 *(-3 vPY)*	**438** *(+9 vPY)*	**41%** *(+2% vPY)*

Morocco Retail Validation Study

2021 Validation Study

Validation Results

Precision	88.8%	Bias	-2.1%

Precision chart (2017–2021): 93.5, 96.1, 97.9, 97.1, 88.8

Bias chart (2017–2021): -5.3, -10.1, -11.5, -7.0, -2.1
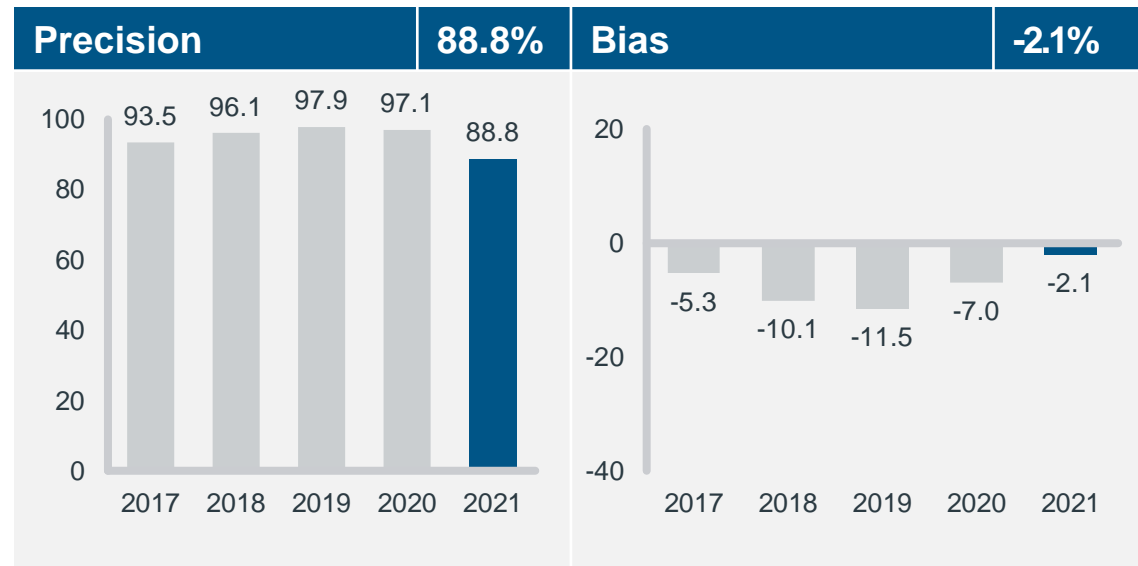
Outcomes
- Overall precision index declined by 8.3 percentage points in 2021
- Overall underestimation improved by 4.9 percentage points in 2021
- Continue implementation of quality-improving actions

Distribution Channels Validated

Manufacturers → Wholesalers 84%; 5%; 11%; 1%
Wholesalers → Morocco Retail / Pharmacies 83%
Clinics/Hospitals
Pharmacies → Patients 88%; Clinics/Hospitals → Patients 12%

Participation

# Participating Companies	# Forms Validated	% Market Validated
73 (-5 vPY)	**549** (-30 vPY)	**30%** (+7% vPY)

Tunisia Retail Validation Study
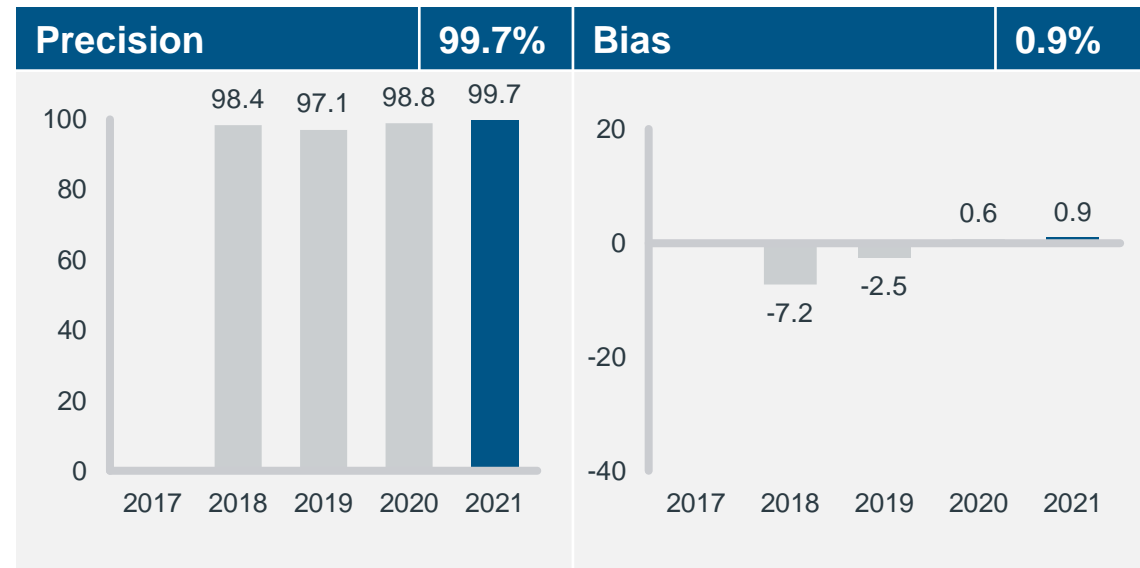
2021 Validation Study

Validation Results

Precision	99.7%	Bias	0.9%

Precision chart (2017–2021): 98.4, 97.1, 98.8, 99.7

Bias chart (2017–2021): -7.2, -2.5, 0.6, 0.9

Outcomes

- Overall precision index improved by 0.9 percentage points in 2021
- Overall overestimation increased by 0.3 percentage points in 2021
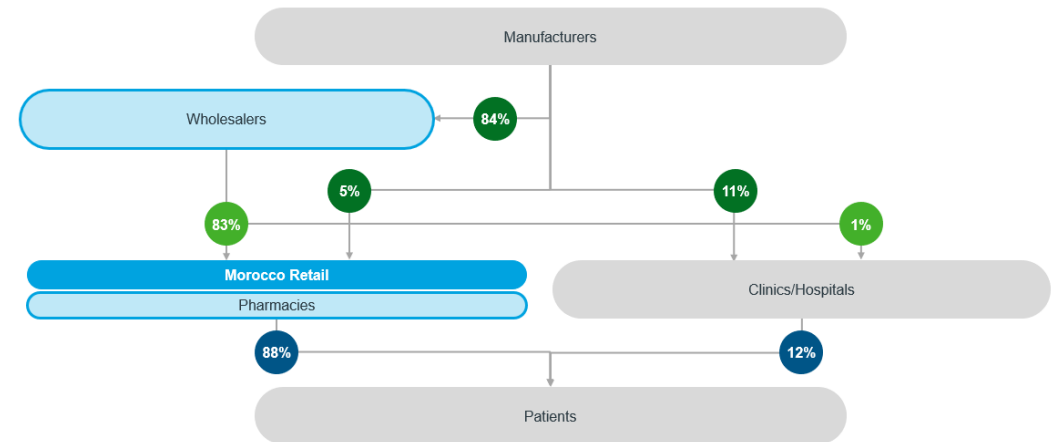- No action required from the statistical point of view

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
27 (+1 vPY)	**732** (+41 vPY)	**44%** (+4% vPY)

Egypt Retail Validation Study

2021 Validation Study

Validation Results

Precision	92.6%	Bias	3.1%

Precision chart:
- 2017: 99.6
- 2018: 99.7
- 2019: 95.3
- 2020: 88.5
- 2021: 92.6

Bias chart:
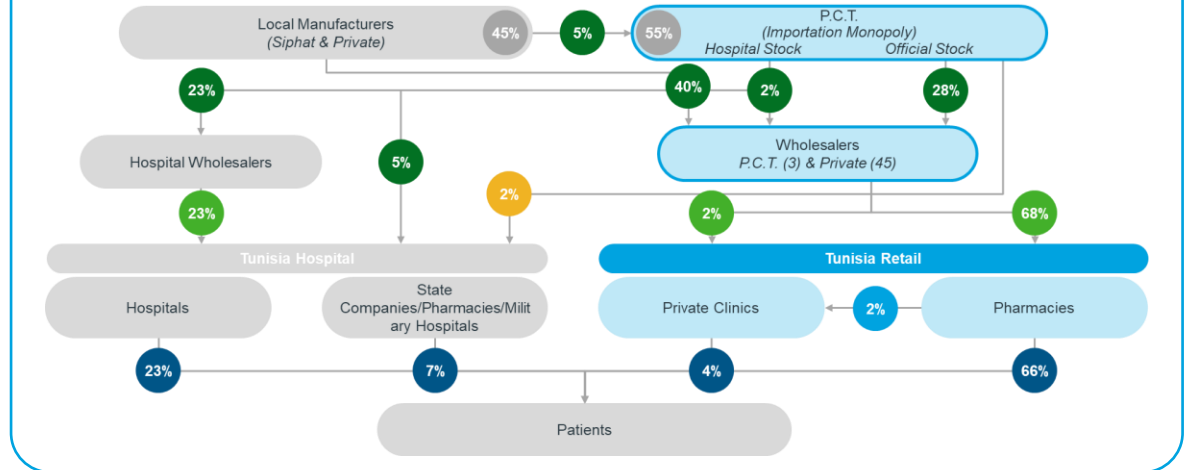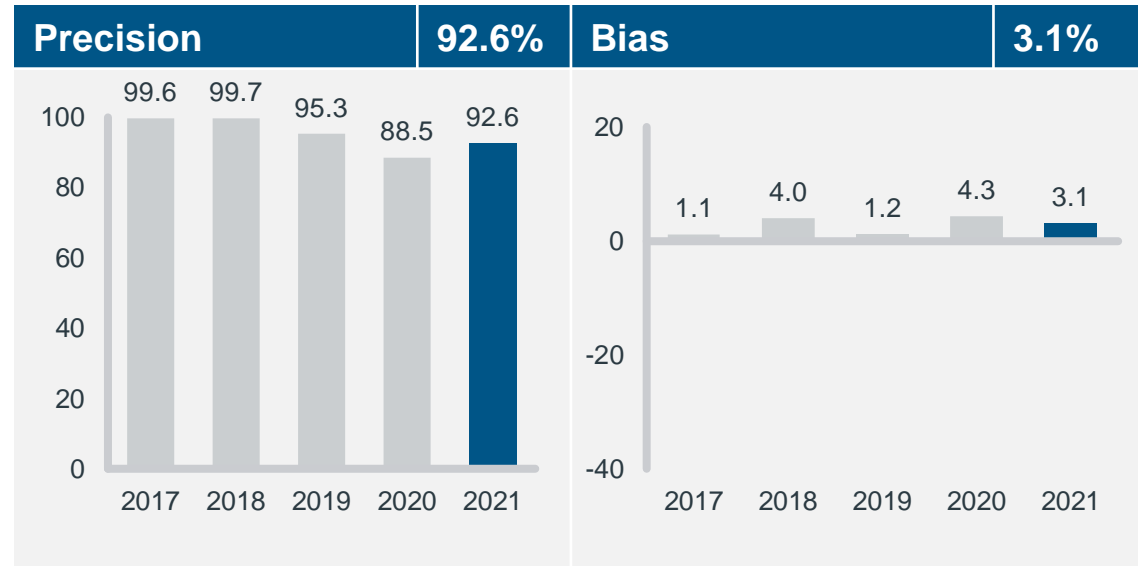- 2017: 1.1
- 2018: 4.0
- 2019: 1.2
- 2020: 4.3
- 2021: 3.1

Outcomes
- Overall precision index improved by 4.1 percentage points in 2021
- Overall overestimation improved by 1.2 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

- Domestic Manufacturers — 88%
- Foreign Supply, Imports — 12%
- Private Distributors — 57%
- Egydrug — 20%
- 18%
- 5%
- 47%
- 10%
- 10%
- 10%
- Egypt Retail
- Pharmacies
- Hospitals, Tenders, Army
- Patients — 75%
- 25%

Participation

# Participating Companies	# Forms Validated	% Market Validated
50 (+7 vPY)	520 (+10 vPY)	24% (-4% vPY)

Jordan Retail Validation Study

2021 Validation Study

Validation Results

Precision	93.4%	Bias	-1.1%

Precision chart:
- 2017: (no value shown)
- 2018: 91.9
- 2019: 85.9
- 2020: 89.9
- 2021: 93.4

Bias chart:
- 2018: -8.5
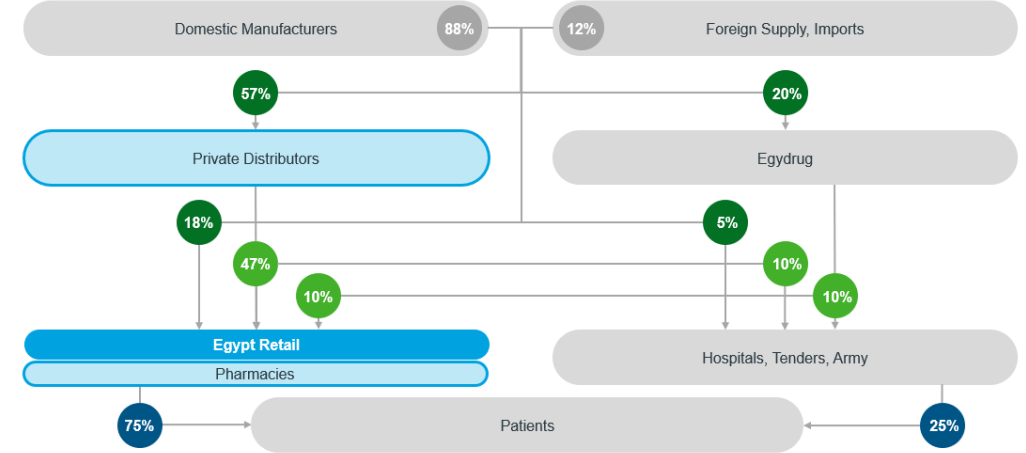- 2019: -6.4
- 2020: -11.7
- 2021: -1.1

Outcomes

- Overall precision index improved by 3.5 percentage points in 2021
- Overall underestimation improved by 10.6 percentage points in 2021
- No action required from the statistical point of view
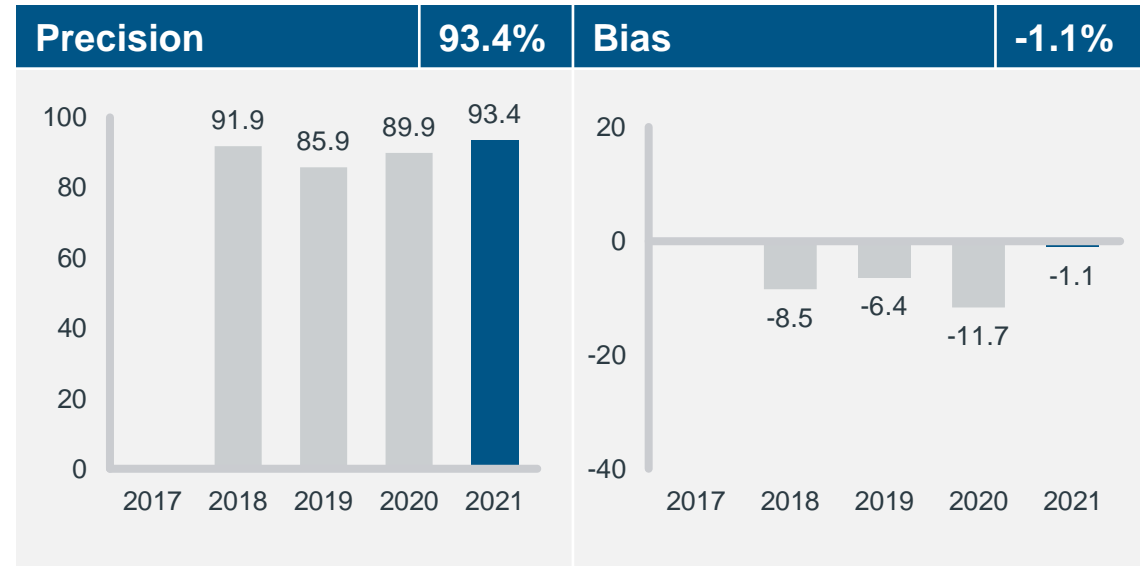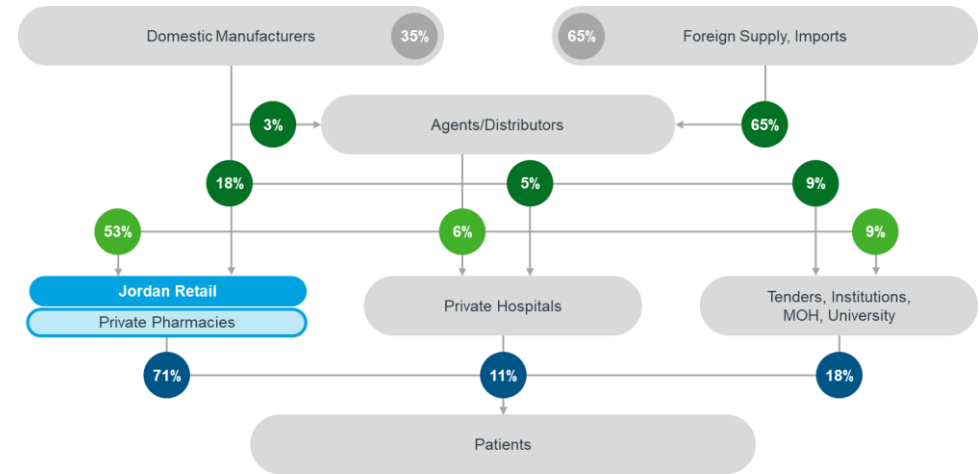
Distribution Channels Validated

Domestic Manufacturers 35% — Foreign Supply, Imports 65%
- 3%, 18%, 53%, 65%, 9%, 5%, 6%, 9%
- Agents/Distributors
- Jordan Retail / Private Pharmacies — Private Hospitals — Tenders, Institutions, MOH, University
- 71%, 11%, 18%
- Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
27 (+9 vPY)	**758** (+170 vPY)	**47%** (+11% vPY)

Kuwait Retail Validation Study

2021 Validation Study

Validation Results

Precision	98.6%	Bias	-1.0%

Precision chart (bars by year):
- 2017: 100.0
- 2018: 100.0
- 2019: 98.7
- 2020: 100.0
- 2021: 98.6

Bias chart (by year):
- 2017: -1.1
- 2018: -0.1
- 2019: 0.2
- 2020: 0.2
- 2021: -1.0
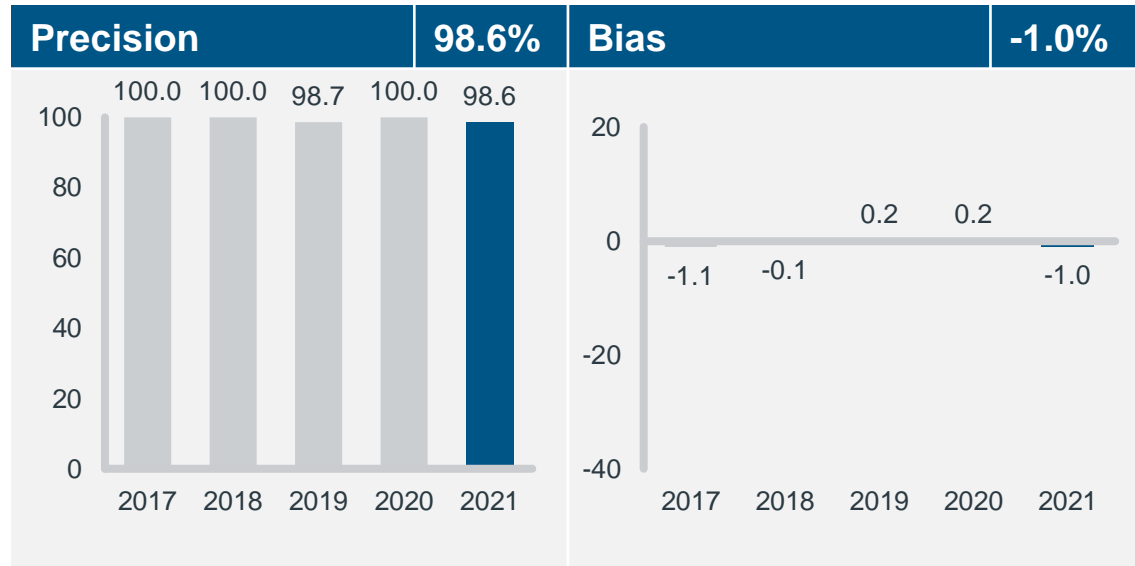
Outcomes

- Overall precision index declined by 1.4 percentage points in 2021
- Overall bias turned from 0.2% overestimation to 1% underestimation in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

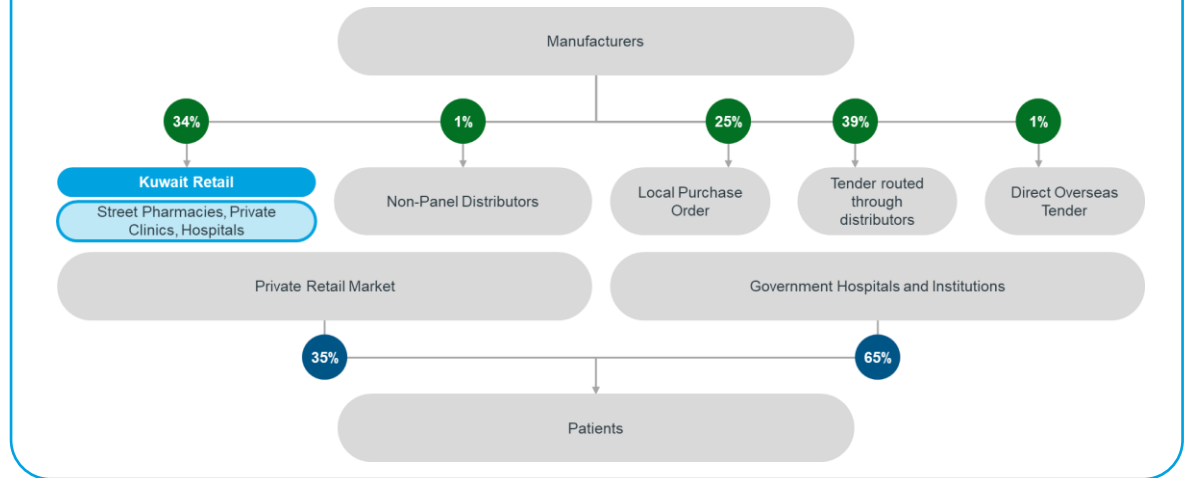- 34% → Kuwait Retail (Street Pharmacies, Private Clinics, Hospitals)
- 1% → Non-Panel Distributors
- 25% → Local Purchase Order
- 39% → Tender routed through distributors
- 1% → Direct Overseas Tender

Private Retail Market — 35% → Patients

Government Hospitals and Institutions — 65% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
18 (+2 vPY)	352 (+47 vPY)	30% (+6% vPY)

Lebanon Retail Validation Study

2021 Validation Study

Validation Results

Precision	**96.7%**	Bias	**1.9%**

Precision (2017–2021): 91.8, 90.3, 86.9, 90.6, 96.7

Bias (2017–2021): 6.0, 8.4, 1.3, -4.9, 1.9

Outcomes

- Overall precision index improved by 6.1 percentage points in 2021
- Overall bias turned from 4.9% underestimation to 1.9% overestimation in 2021
- No action required from the statistical point of view
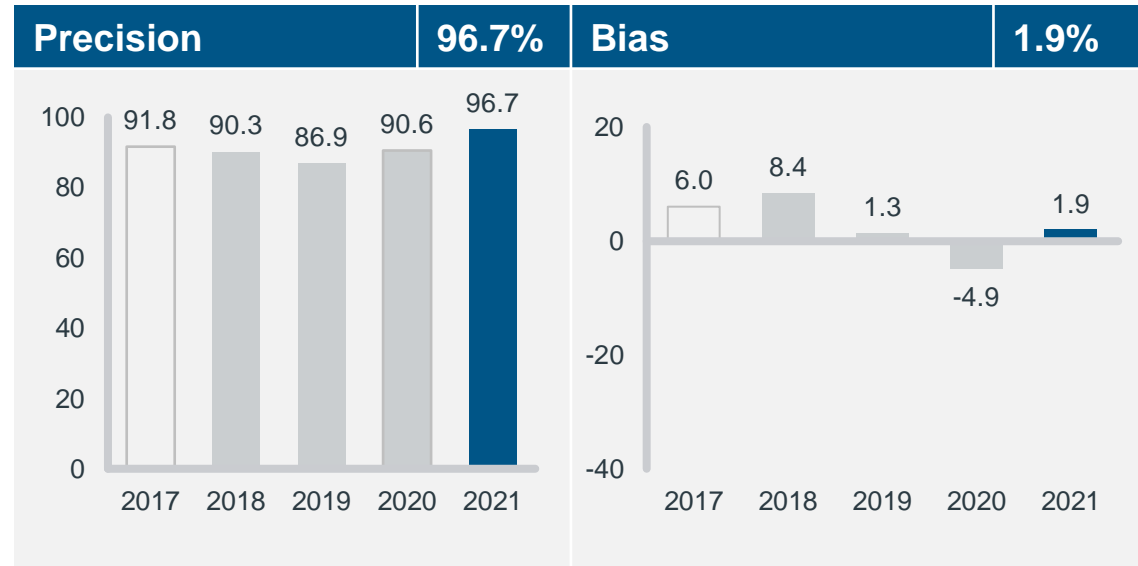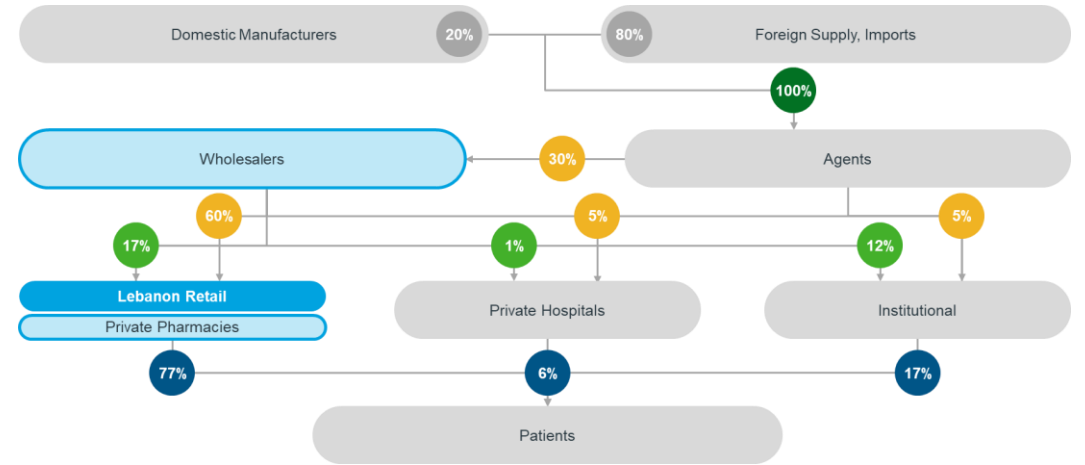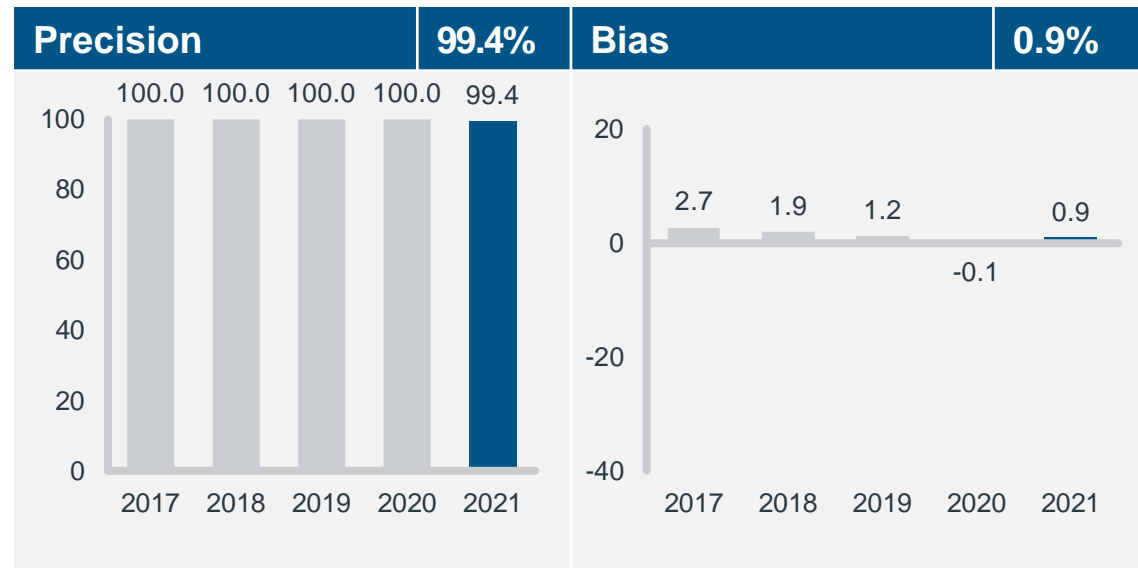
Distribution Channels Validated

Domestic Manufacturers 20% — 80% Foreign Supply, Imports

100% Agents

Wholesalers 30%

60% 5% 5%

17% 1% 12%

Lebanon Retail / Private Pharmacies — Private Hospitals — Institutional

77% 6% 17%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
24 (-19 vPY)	**299** (-231 vPY)	**17%** (-11% vPY)

Saudi Arabia Retail Validation Study

2021 Validation Study

Validation Results

Precision	99.4%	Bias	0.9%

Precision chart:
- 2017: 100.0
- 2018: 100.0
- 2019: 100.0
- 2020: 100.0
- 2021: 99.4

Bias chart:
- 2017: 2.7
- 2018: 1.9
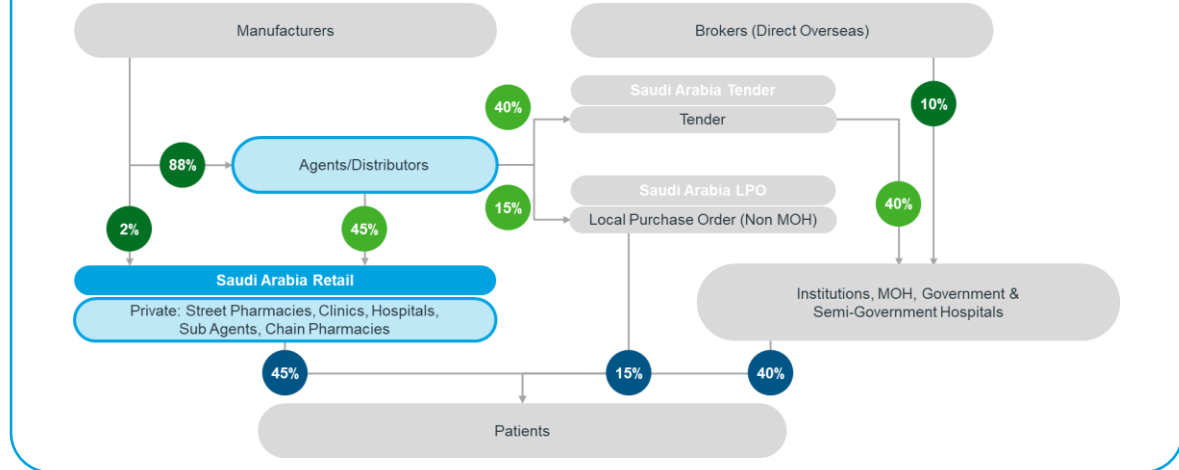- 2019: 1.2
- 2020: -0.1
- 2021: 0.9

Outcomes
- Overall precision index declined by 0.6 percentage points in 2021
- Overall bias turned from 0.1% underestimation to 0.9% overestimation in 2021
- No action required from the statistical point of view
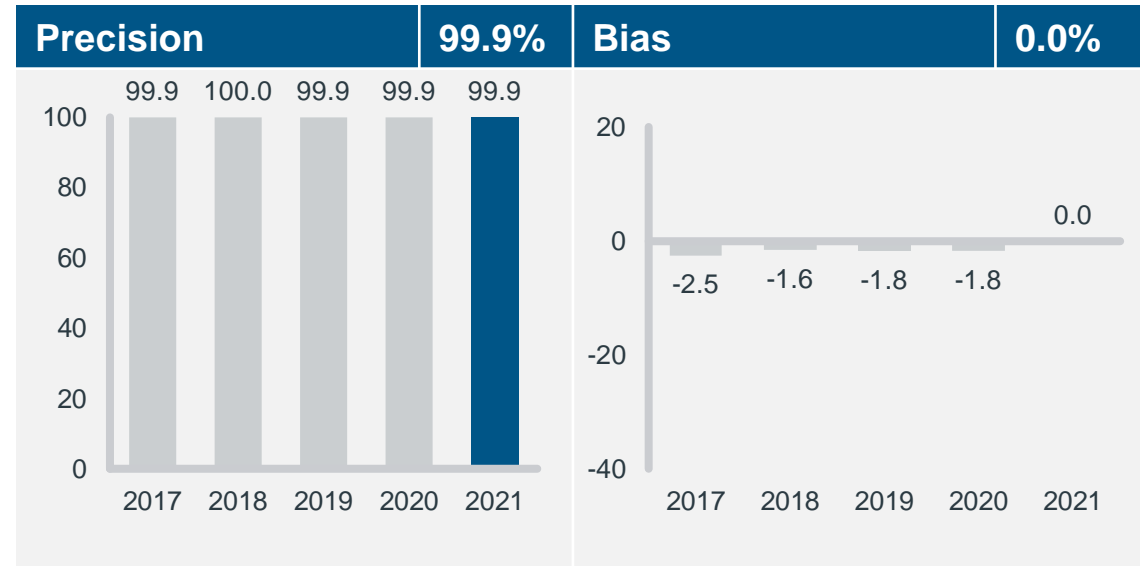
Distribution Channels Validated

- Manufacturers
- Brokers (Direct Overseas)
- 88% → Agents/Distributors
- 2%
- 40% → Saudi Arabia Tender / Tender
- 15% → Saudi Arabia LPO / Local Purchase Order (Non MOH)
- 10%
- 40%
- 45%
- Saudi Arabia Retail
- Private: Street Pharmacies, Clinics, Hospitals, Sub Agents, Chain Pharmacies
- Institutions, MOH, Government & Semi-Government Hospitals
- 45%
- 15%
- 40%
- Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
40 (-4 vPY)	518 (+89 vPY)	28% (+5% vPY)

Turkey Retail Validation Study

2021 Validation Study

Validation Results

Precision	99.9%	Bias	0.0%

Precision values by year:
- 2017: 99.9
- 2018: 100.0
- 2019: 99.9
- 2020: 99.9
- 2021: 99.9

Bias values by year:
- 2017: -2.5
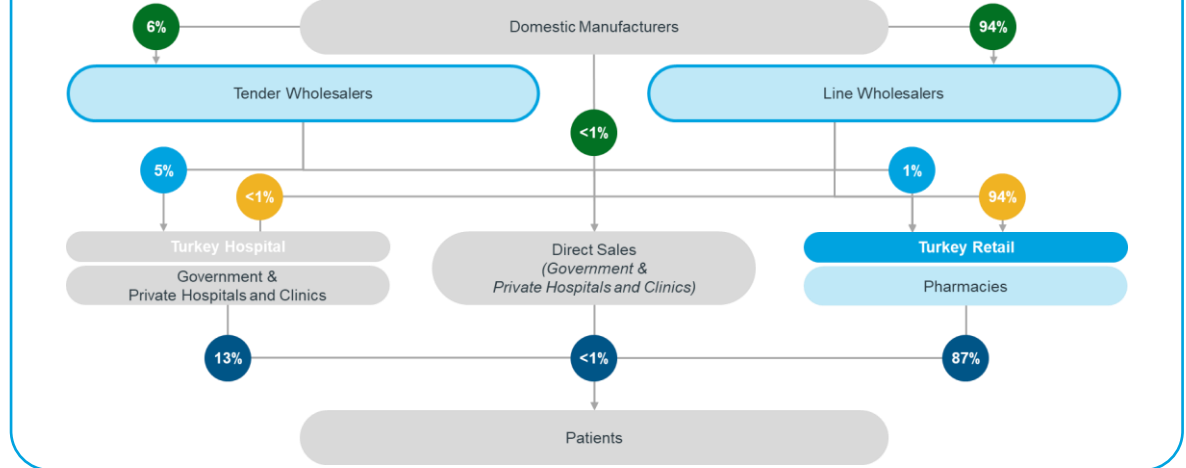- 2018: -1.6
- 2019: -1.8
- 2020: -1.8
- 2021: 0.0

Outcomes

- Overall precision index remained unchanged in 2021
- Overall bias turned from 1.8% underestimation to no bias in 2021
- No action required from the statistical point of view
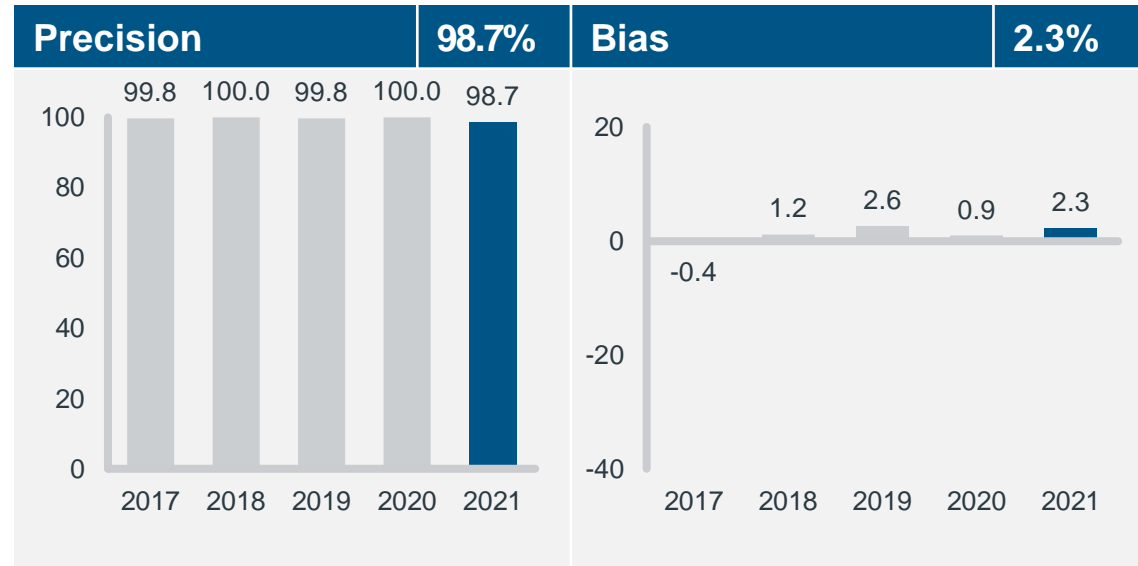
Distribution Channels Validated

- Domestic Manufacturers
  - 6% → Tender Wholesalers
  - 94% → Line Wholesalers
  - <1% (Direct Sales)
- Tender Wholesalers
  - 5% → Turkey Hospital
  - <1% →
- Line Wholesalers
  - 1% →
  - 94% → Turkey Retail / Pharmacies
- Turkey Hospital (Government & Private Hospitals and Clinics)
  - 13% → Patients
- Direct Sales (Government & Private Hospitals and Clinics)
  - <1% → Patients
- Turkey Retail / Pharmacies
  - 87% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
75 (+9 vPY)	1,250 (+61 vPY)	52% (+1% vPY)

United Arab Emirates Retail Validation Study

2021 Validation Study

Validation Results

| Precision | 98.7% | Bias | 2.3% |

Precision bar chart:
- 2017: 99.8
- 2018: 100.0
- 2019: 99.8
- 2020: 100.0
- 2021: 98.7

Bias chart:
- 2017: -0.4
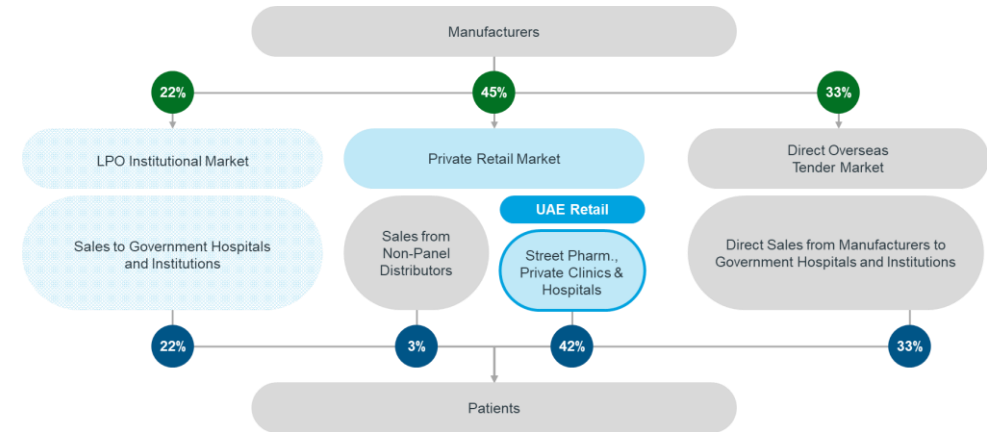- 2018: 1.2
- 2019: 2.6
- 2020: 0.9
- 2021: 2.3

Outcomes

- Overall precision index declined by 1.3 percentage points in 2021
- Overall overestimation increased by 1.4 percentage points in 2021
- No action required from the statistical point of view
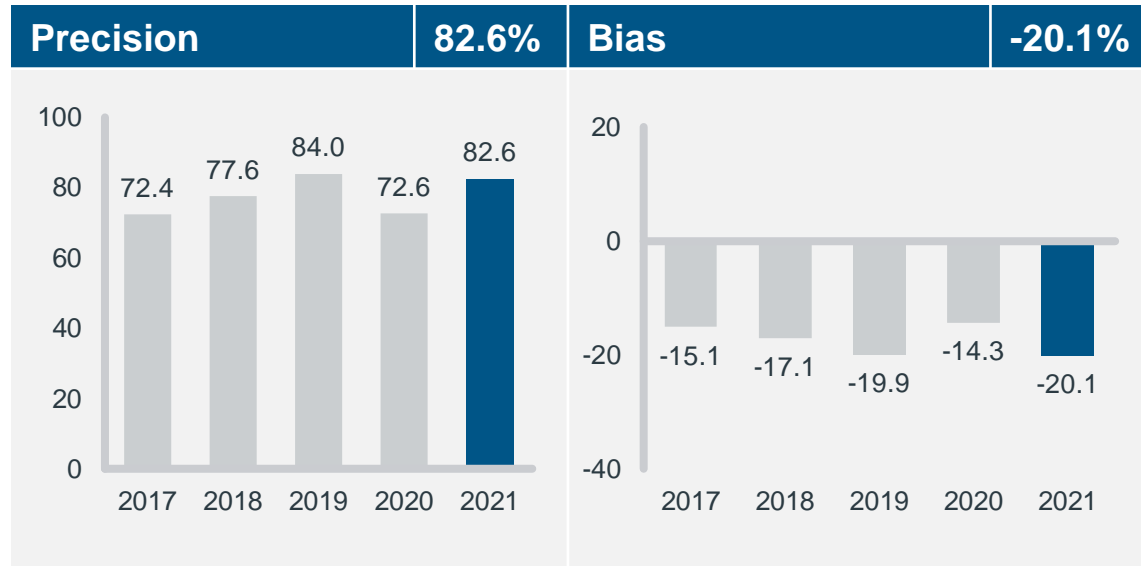
Distribution Channels Validated

Manufacturers
- 22% → LPO Institutional Market
- 45% → Private Retail Market
- 33% → Direct Overseas Tender Market

LPO Institutional Market → Sales to Government Hospitals and Institutions

Private Retail Market → Sales from Non-Panel Distributors / **UAE Retail** Street Pharm., Private Clinics & Hospitals

Direct Overseas Tender Market → Direct Sales from Manufacturers to Government Hospitals and Institutions

- 22% / 3% / 42% / 33% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
30 *(-3 vPY)*	**830** *(+69 vPY)*	**47%** *(+4% vPY)*

Bangladesh Retail Validation Study

2021 Validation Study

Validation Results

| Precision | 82.6% | Bias | -20.1% |

Precision bar chart: 2017: 72.4, 2018: 77.6, 2019: 84.0, 2020: 72.6, 2021: 82.6

Bias bar chart: 2017: -15.1, 2018: -17.1, 2019: -19.9, 2020: -14.3, 2021: -20.1

Outcomes
- Overall precision index improved by 10.0 percentage points in 2021
- Overall underestimation increased by 5.8 percentage points in 2021
- Conduct census activity and implement its results for adjustment of projection factors

Distribution Channels Validated

Manufacturers — 100% — Distributors — 85% / 15% — Bangladesh Retail Pharmacies (85%) / Clinics/Hospitals (15%) — Patients
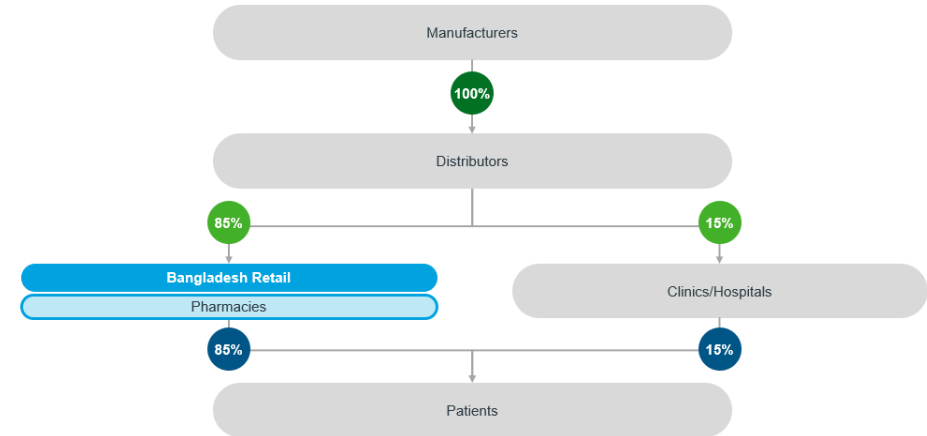
Participation

# Participating Companies	# Forms Validated	% Market Validated
23 (+6 vPY)	**2,127** (+2 vPY)	**46%** (-8% vPY)

Asia Pacific
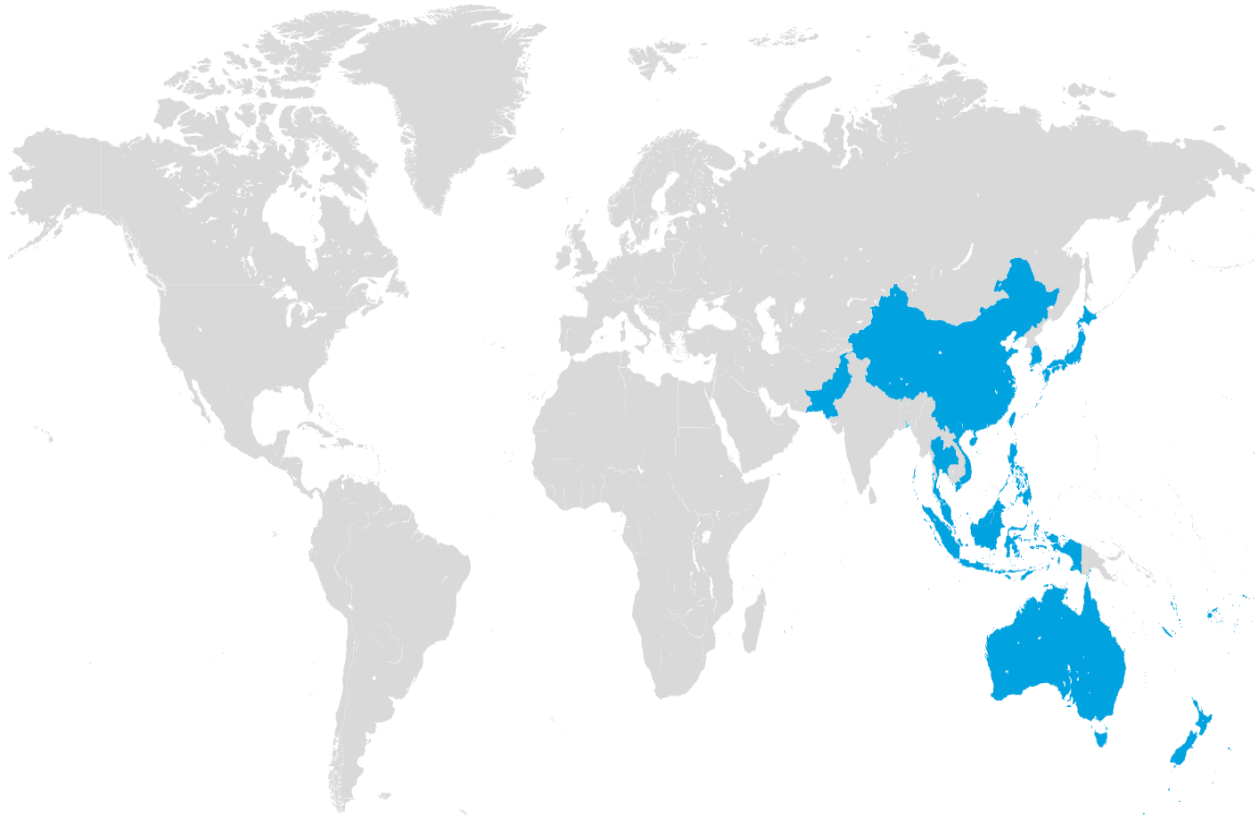
Regions/Countries

Greater China

- China

- Hong Kong

Pacific Asia

- South Korea

- Japan

Southeast Asia

- Indonesia

- Malaysia

- Pakistan

- Singapore

- Thailand

- Vietnam

China Hospital Validation Study
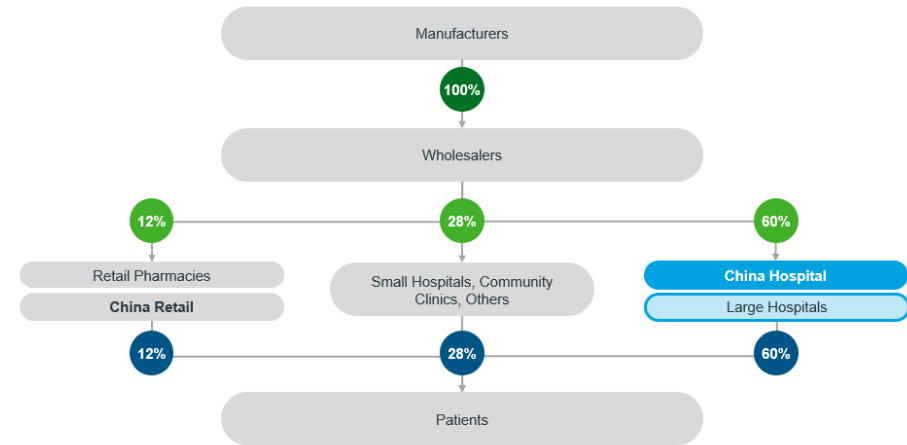
2021 Validation Study

Validation Results

Precision	88.5%	Bias	-6.2%

Precision bar chart:
- 2017: 96.5
- 2018: 97.5
- 2020: 97.8
- 2021: 88.5

Bias bar chart:
- 2017: -6.1
- 2018: -14.1
- 2020: -7.0
- 2021: -6.2
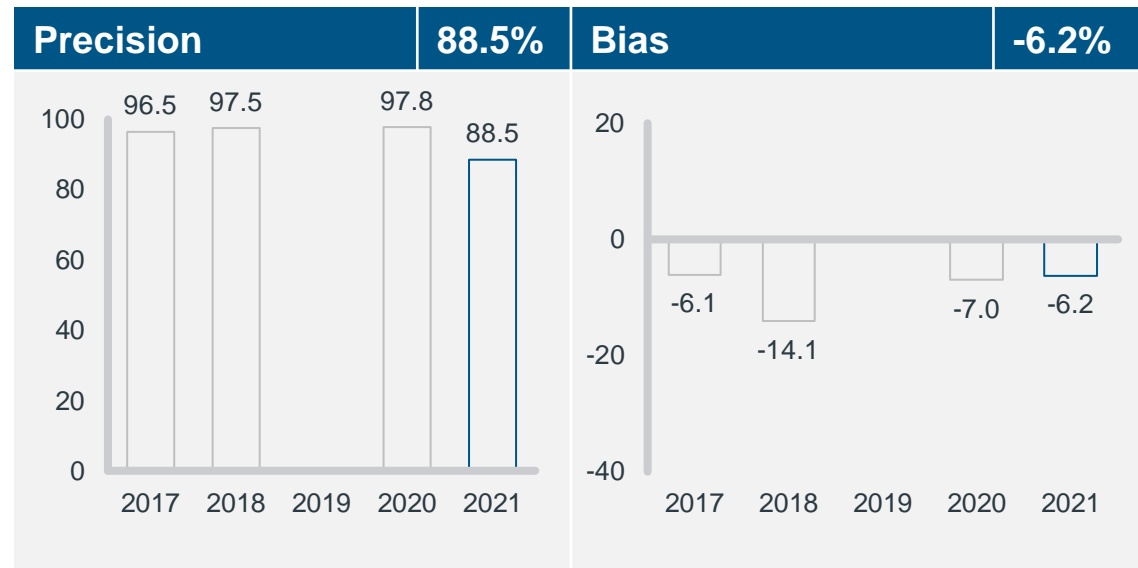
Outcomes
- Overall precision index declined by 9.3 percentage points in 2021
- Overall underestimation improved by 0.8 percentage points in 2021
- Continue to strengthen panel and evaluate alternative data sources in long-term

Distribution Channels Validated

Manufacturers → 100% → Wholesalers

- Retail Pharmacies / China Retail — 12%
- Small Hospitals, Community Clinics, Others — 28%
- China Hospital / Large Hospitals — 60%

Patients: 12%, 28%, 60%

Participation

# Participating Companies	# Forms Validated	% Market Validated
24 (+2 vPY)	**158** (+14 vPY)	**2%** (-2% vPY)

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Hong Kong Retail Validation Study

2021 Validation Study

Validation Results

Precision		83.0%	Bias		-7.6%
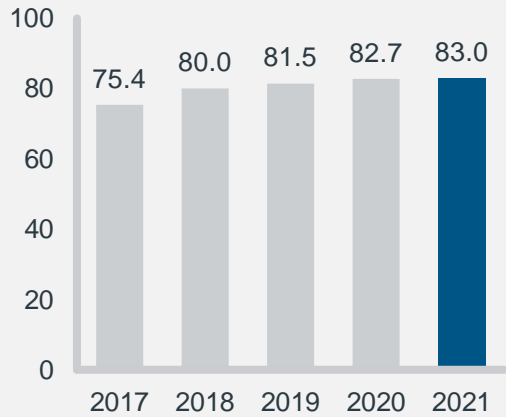
Precision (2017–2021): 75.4, 80.0, 81.5, 82.7, 83.0
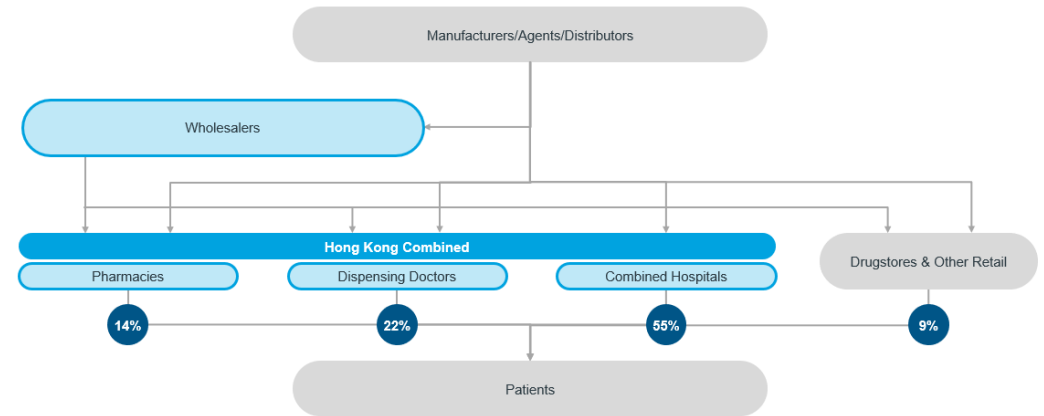
Bias (2017–2021): -9.0, -9.2, -9.0, -7.3, -7.6

Outcomes

- Overall precision index improved by 0.3 percentage points in 2021
- Overall underestimation increased by 0.3 percentage points in 2021
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers/Agents/Distributors → Wholesalers → Hong Kong Combined

- Pharmacies 14%
- Dispensing Doctors 22%
- Combined Hospitals 55%
- Drugstores & Other Retail 9%

→ Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
47 (+5 vPY)	**803** (+8 vPY)	**26%** (-2% vPY)

IQVIA

South Korea Retail Validation Study

2021 Validation Study

Validation Results

| Precision | 82.5% | Bias | -17.6% |

Precision (2017–2021): 90.1, 86.9, 87.6, 86.3, 82.5

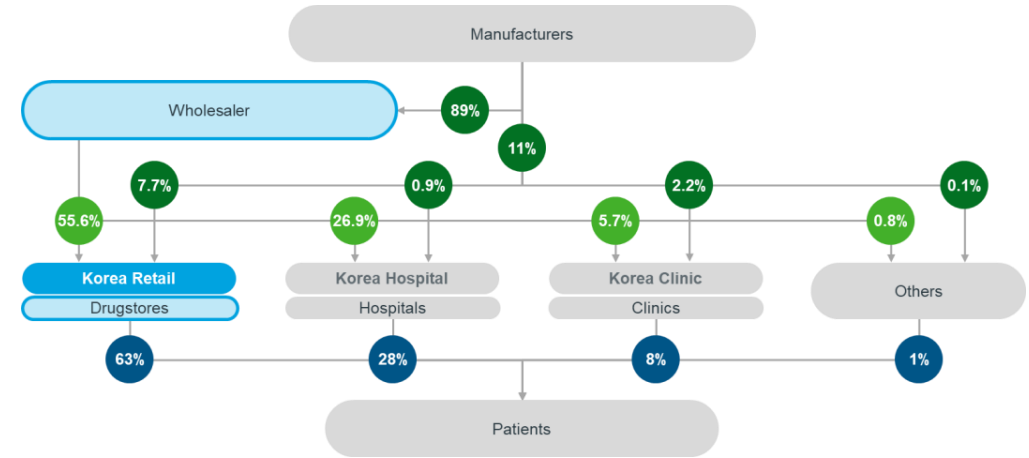Bias (2017–2021): -7.4, -10.1, -13.5, -17.5, -17.6
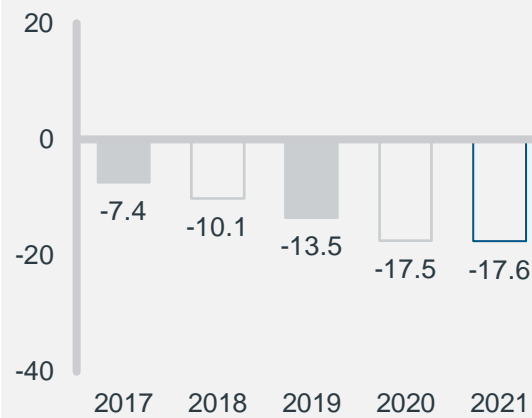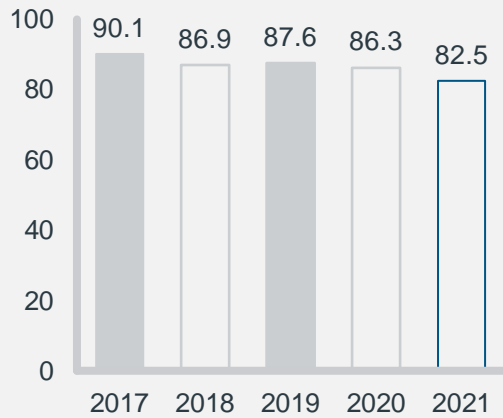
Outcomes
- Overall precision index declined by 3.8 percentage points in 2021
- Overall underestimation increased slightly by 0.1 percentage points in 2021
- Review projection level and panel composition. Check completeness and replace inadequate panel

Distribution Channels Validated

Manufacturers → Wholesaler 89%, 11%

Wholesaler → Korea Retail Drugstores 55.6%, 7.7%; Korea Hospital Hospitals 26.9%, 0.9%; Korea Clinic Clinics 5.7%, 2.2%; Others 0.8%, 0.1%

Korea Retail Drugstores → Patients 63%; Korea Hospital Hospitals → 28%; Korea Clinic Clinics → 8%; Others → 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
11 *(-3 vPY)*	**473** *(-226 vPY)*	**7%** *(-1% vPY)*

South Korea OTC Validation Study

2021 Validation Study

Validation Results

Precision	80.6%	Bias	-19.9%

Precision chart (2017–2021): 83.3, 73.3, 83.1, 64.2, 80.6

Bias chart (2017–2021): -3.6, -14.3, -13.8, -16.6, -19.9
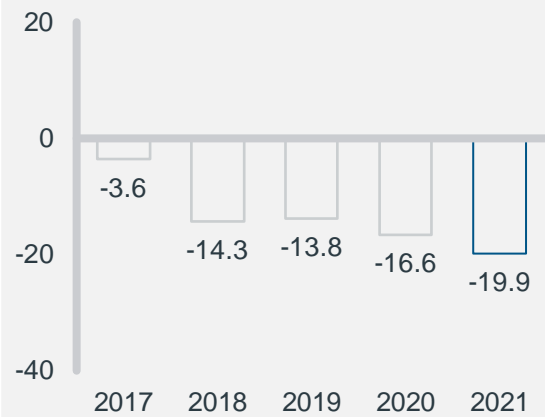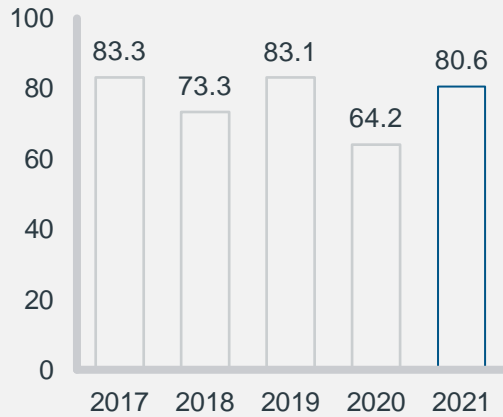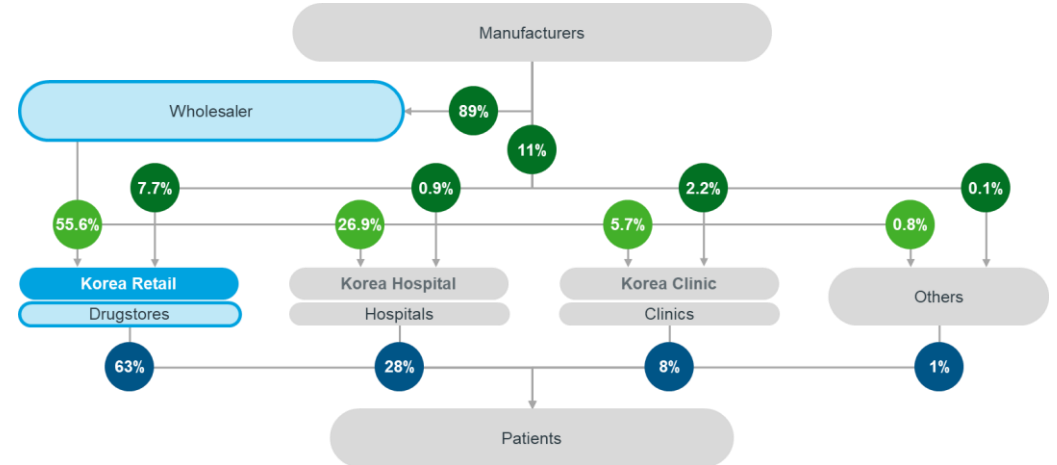
Outcomes

- Overall precision index improved by 16.4 percentage points in 2021
- Overall underestimation increased by 3.3 percentage points in 2021
- Review projection level and panel composition. Check completeness and replace inadequate panel

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
6 (-1 vPY)	99 (-27 vPY)	5% (-1% vPY)

South Korea Hospital Validation Study

2021 Validation Study

Validation Results

Precision	62.8%	Bias	-9.1%

Precision bar chart (2017–2021): 50.4, 46.9, 57.0, 60.7, 62.8

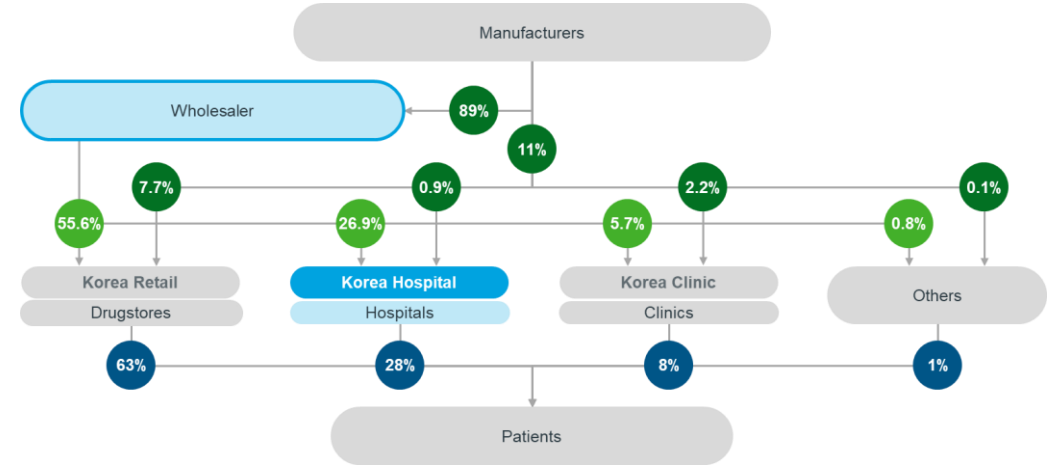Bias chart (2017–2021): -19.1, -15.8, -9.4, -2.3, -9.1
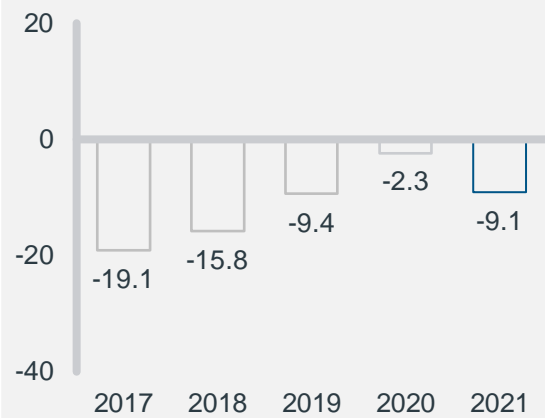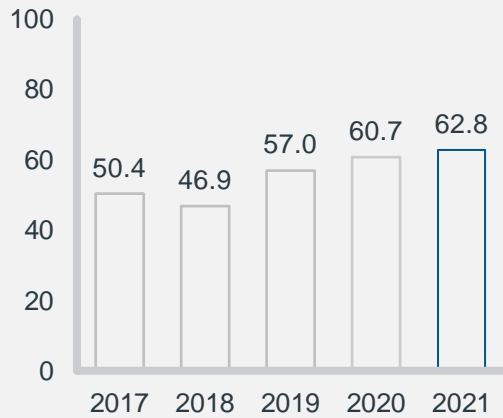
Outcomes

- Overall precision index improved by 2.1 percentage points in 2021
- Overall underestimation increased by 6.8 percentage points in 2021
- Review projection level panel composition. Improve QC process
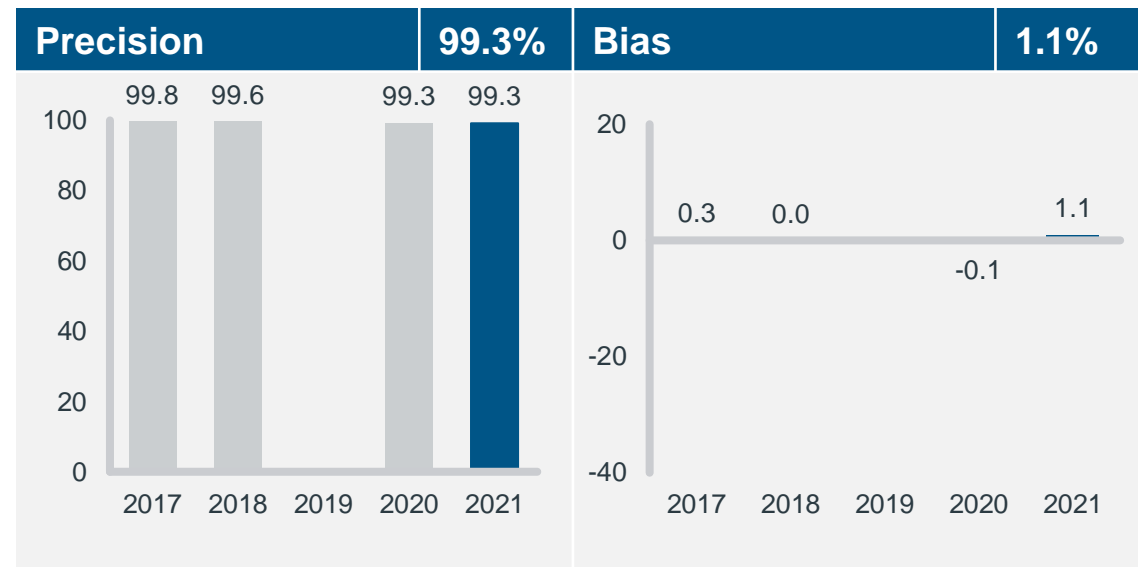
Distribution Channels Validated

Manufacturers → Wholesaler 89%, 11%

7.7%, 0.9%, 2.2%, 0.1%

55.6%, 26.9%, 5.7%, 0.8%

Korea Retail Drugstores, Korea Hospital Hospitals, Korea Clinic Clinics, Others

Patients: 63%, 28%, 8%, 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
11 (-2 vPY)	**128** (-42 vPY)	**4%** (-1% vPY)

Japan Retail+Hospital Validation Study

2021 Validation Study

Validation Results

Precision	99.3%	Bias	1.1%

Precision chart (2017–2021): 99.8, 99.6, —, 99.3, 99.3
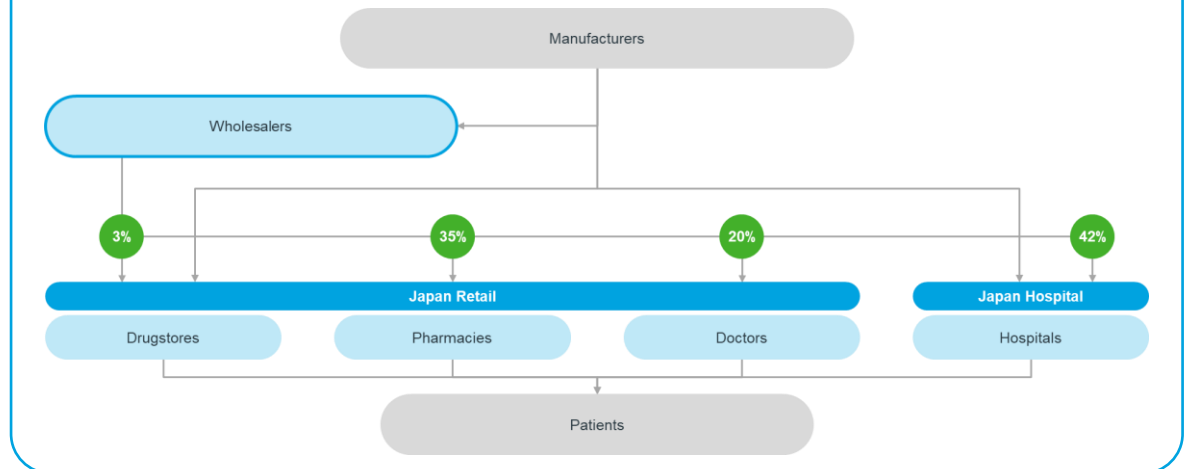
Bias chart (2017–2021): 0.3, 0.0, —, -0.1, 1.1

Outcomes

- Overall precision index remained unchanged in 2021
- Overall bias turned from 0.1% underestimation to 1.1% overestimation in 2021
- No action required from the statistical point of view
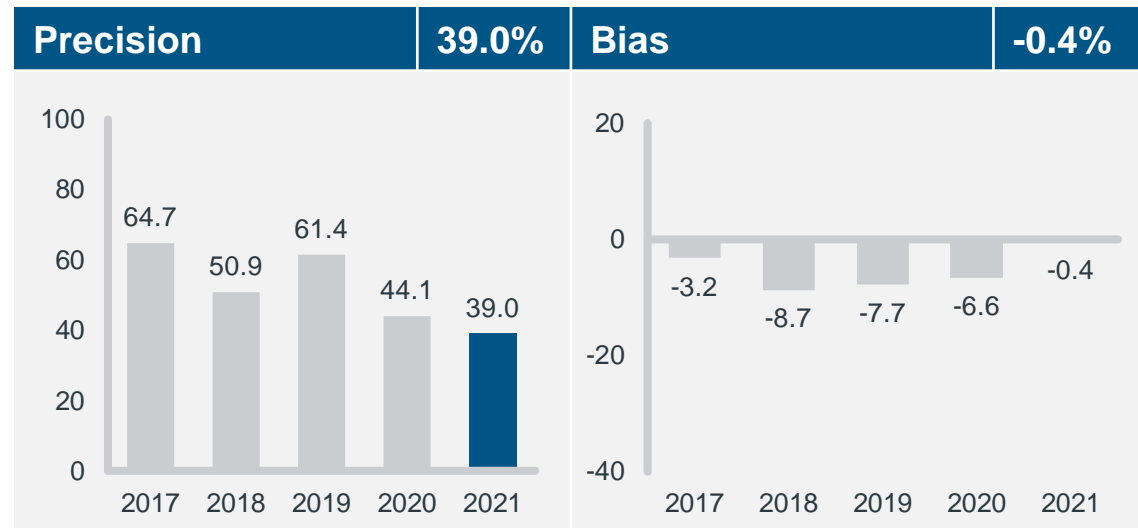
Distribution Channels Validated

Manufacturers → Wholesalers → Japan Retail (Drugstores 3%, Pharmacies 35%, Doctors 20%) → Patients; Japan Hospital (Hospitals 42%)

Participation

# Participating Companies	# Forms Validated	% Market Validated
30 *(-7 vPY)*	**1,728** *(-444 vPY)*	**27%** *(-9% vPY)*

Indonesia Total Market Validation Study

2021 Validation Study

Validation Results

Precision	39.0%	Bias	-0.4%

Precision chart (2017–2021): 64.7, 50.9, 61.4, 44.1, 39.0

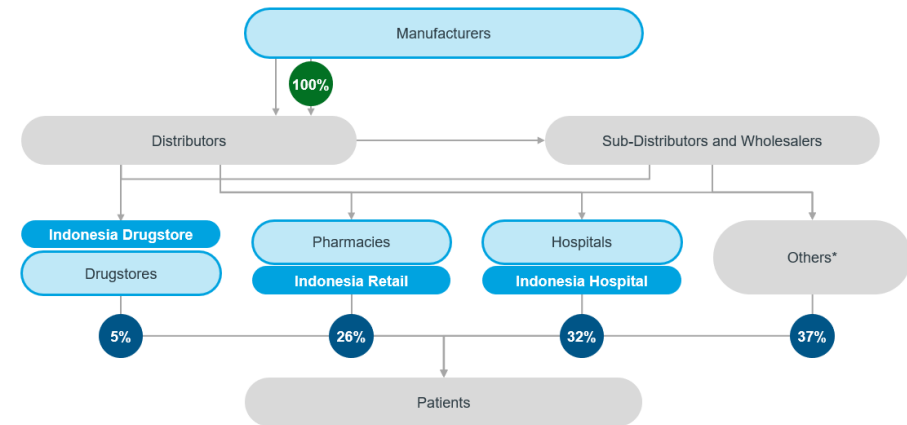Bias chart (2017–2021): -3.2, -8.7, -7.7, -6.6, -0.4

Outcomes

- Overall precision index declined by 5.1 percentage points in 2021
- Overall underestimation improved by 6.2 percentage points in 2021
- New data sources from chain pharmacies and Nielsen general &modern trade are integrated, meanwhile, IQVIA continues to expand the number of contributors and improve data coverage with more partners

Distribution Channels Validated

Validation Participation

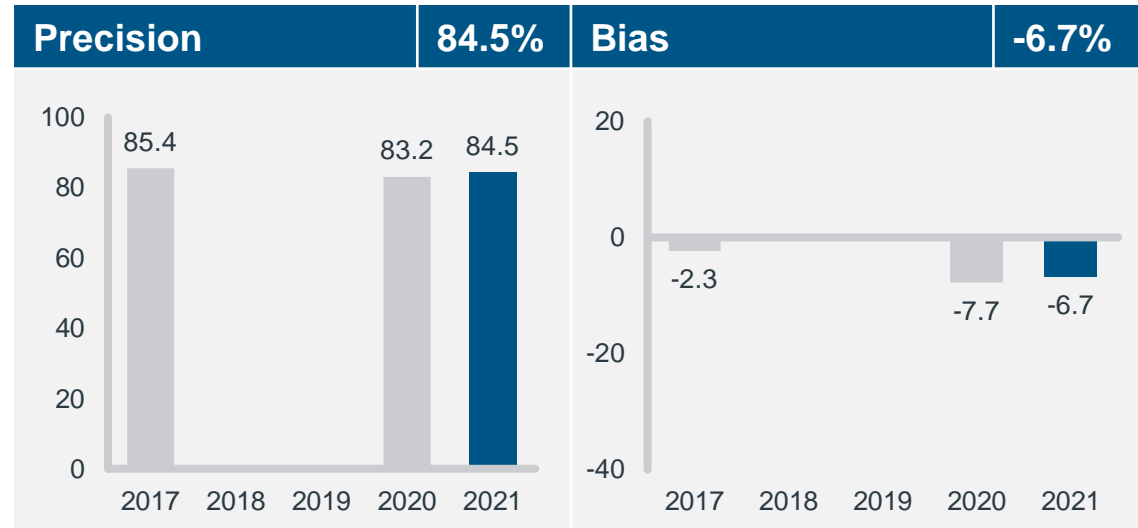| # Participating Companies	# Forms Validated	% Market Validated*
46 (-4 vPY)	**1,322** (-101 vPY)	**15%** (-4% vPY)

*% Market Validated is calculated based on units, in terms of values, % Market can be validated has reached at 50%

Malaysia Combined Validation Study

2021 Validation Study

Validation Results

Precision	84.5%	Bias	-6.7%

Precision chart: 2017: 85.4, 2020: 83.2, 2021: 84.5
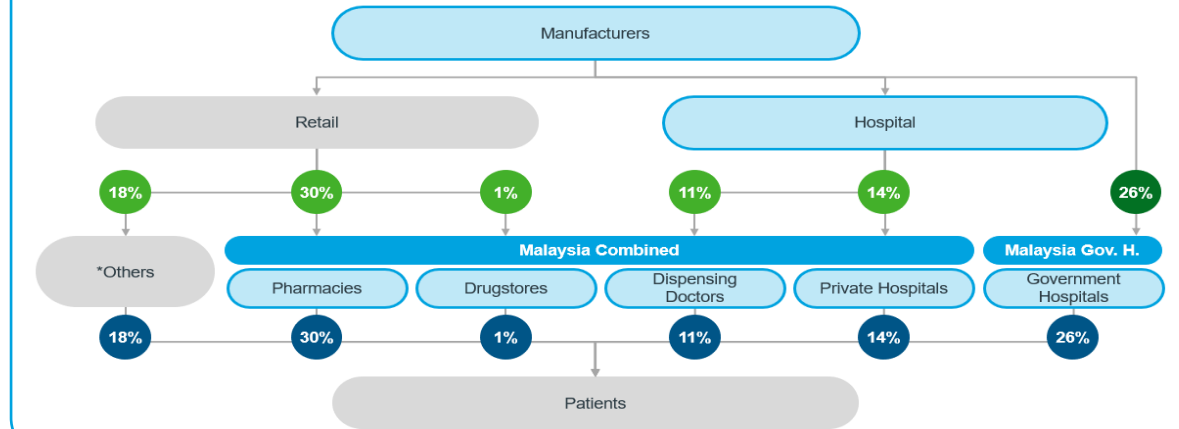
Bias chart: 2020: -2.3, 2021: -7.7, -6.7

Outcomes

- Overall precision index increased by 1.3 percentage points in 2021
- Overall underestimation declined by 1.0 percentage points in 2021
- Continue to secure additional direct data and panels; Leverage AIML powered methodology to improve further
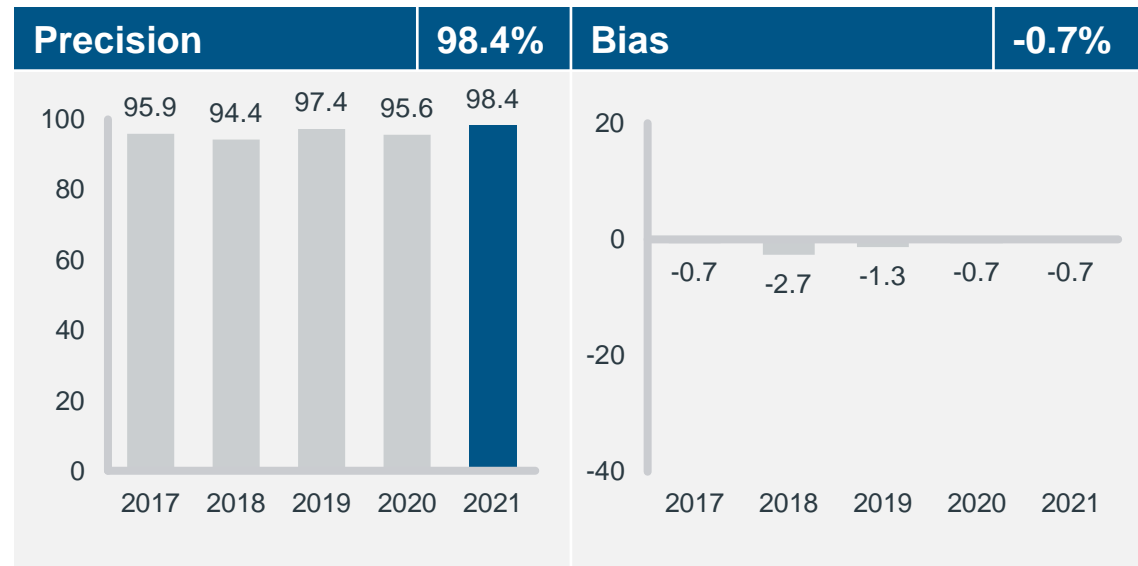
Distribution Channels Validated

Manufacturers

Retail — 18%, 30%, 1%
Hospital — 11%, 14%
26%

*Others

Malaysia Combined: Pharmacies, Drugstores, Dispensing Doctors, Private Hospitals

Malaysia Gov. H.: Government Hospitals

18%, 30%, 1%, 11%, 14%, 26%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
104 *(+29 vPY)*	**1,510** *(+98 vPY)*	**50%** *(+6% vPY)*

Pakistan Retail Validation Study

2021 Validation Study

Validation Results

Precision	98.4%	Bias	-0.7%

Precision bars: 2017: 95.9, 2018: 94.4, 2019: 97.4, 2020: 95.6, 2021: 98.4

Bias values: 2017: -0.7, 2018: -2.7, 2019: -1.3, 2020: -0.7, 2021: -0.7
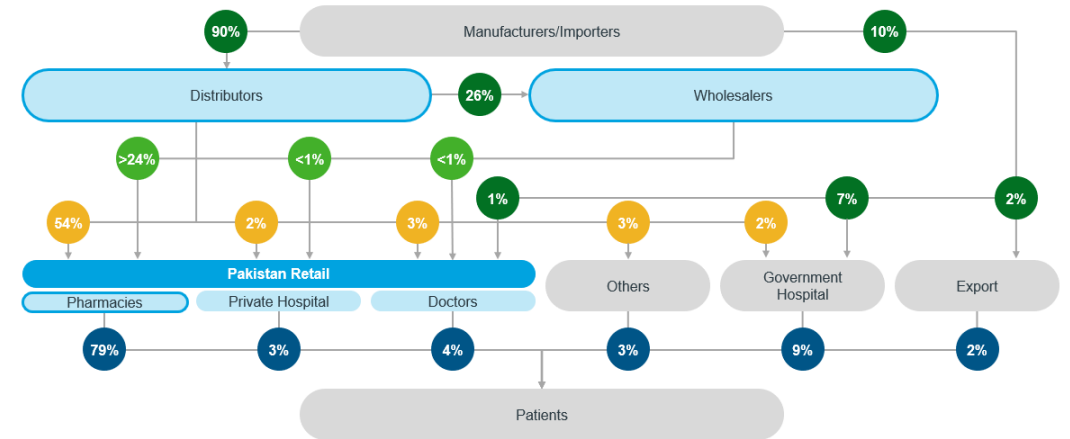
Outcomes
- Overall precision index improved by 2.8 percentage points in 2021
- Overall underestimation remained unchanged at 0.7% in 2021
- Maintain the participation level of the validation study
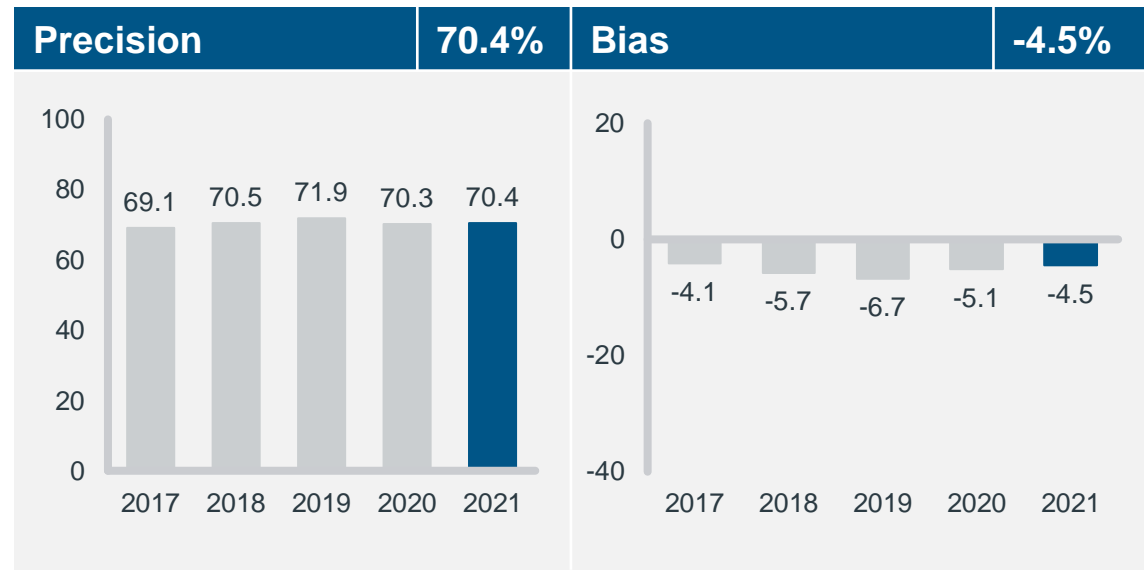
Distribution Channels Validated

Manufacturers/Importers: 90%, 10%
Distributors, Wholesalers: 26%
>24%, <1%, <1%, 1%
54%, 2%, 3%, 3%, 2%, 7%, 2%
Pakistan Retail — Pharmacies, Private Hospital, Doctors | Others | Government Hospital | Export
79%, 3%, 4%, 3%, 9%, 2%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
50 *(-7 vPY)*	**1,834** *(-202 vPY)*	**52%** *(-12% vPY)*

Singapore Combined Market Validation Study

2021 Validation Study

Validation Results

Precision	70.4%	Bias	-4.5%

Precision bar chart:
- 2017: 69.1
- 2018: 70.5
- 2019: 71.9
- 2020: 70.3
- 2021: 70.4

Bias bar chart:
- 2017: -4.1
- 2018: -5.7
- 2019: -6.7
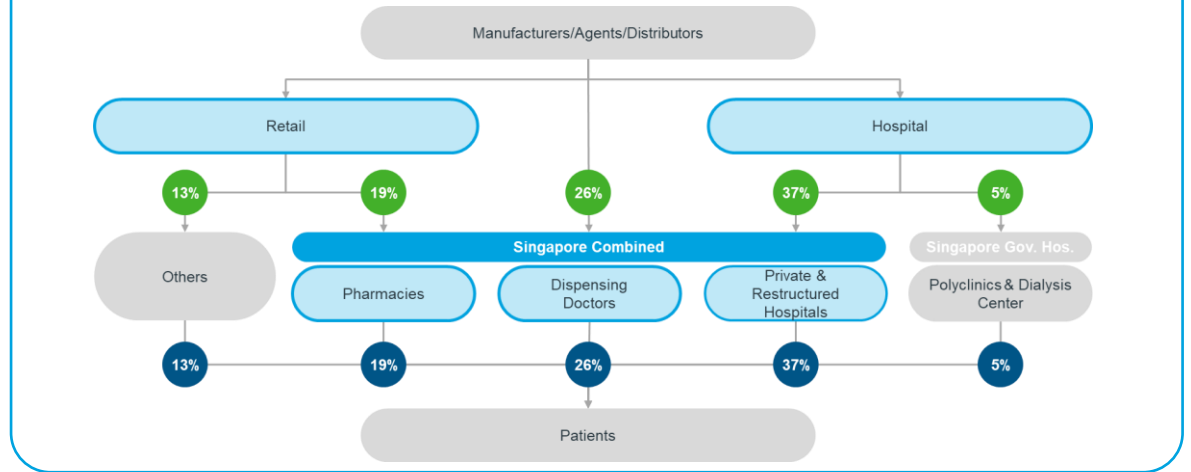- 2020: -5.1
- 2021: -4.5

Outcomes

- Overall precision index improved by 0.1 percentage points in 2021
- Overall underestimation improved slightly by 0.6 percentage points in 2021
- Continue to secure additional direct data and panels; Leverage AIML powered methodology to improve further
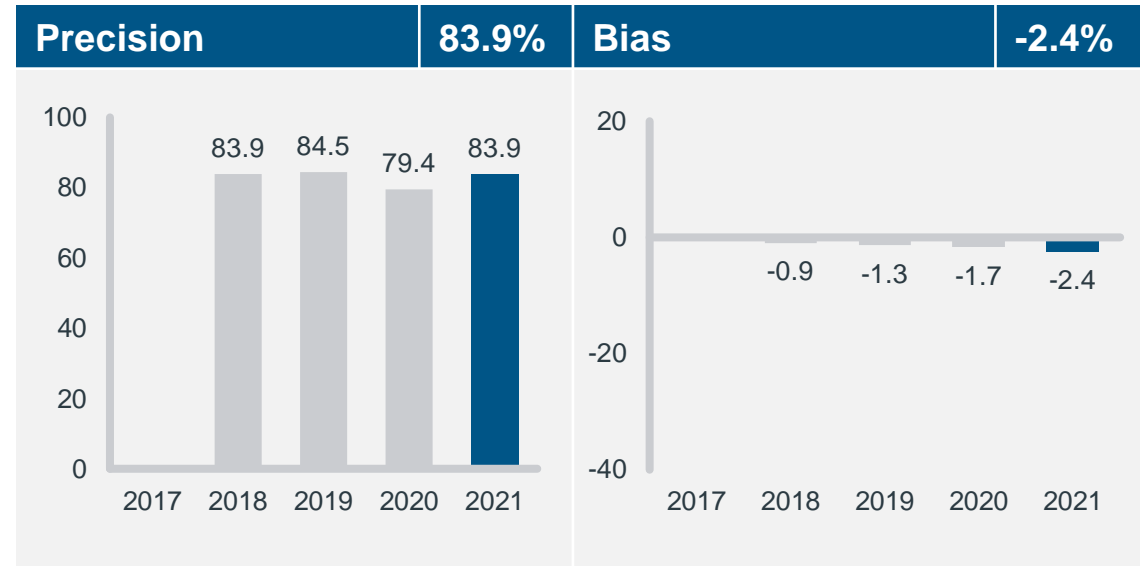
Distribution Channels Validated

Manufacturers/Agents/Distributors → Retail / Hospital

- Retail → Others 13%
- Retail → Pharmacies 19%
- Dispensing Doctors 26%
- Hospital → Private & Restructured Hospitals 37%
- Hospital → Singapore Gov. Hos. / Polyclinics & Dialysis Center 5%

Singapore Combined

- 13%
- 19%
- 26%
- 37%
- 5%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
83 (+10 vPY)	**1,198** (+140 vPY)	**39%** (+4% vPY)

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Thailand Retail Validation Study

2021 Validation Study

Validation Results

Precision	83.9%	Bias	-2.4%

Precision chart: 2017, 2018 (83.9), 2019 (84.5), 2020 (79.4), 2021 (83.9)

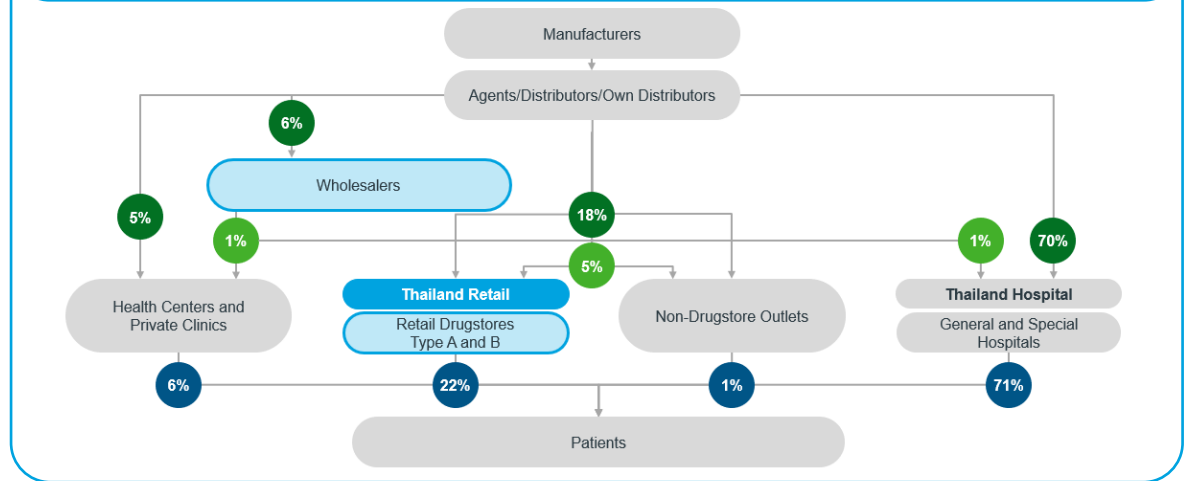Bias chart: 2017, 2018 (-0.9), 2019 (-1.3), 2020 (-1.7), 2021 (-2.4)

Outcomes

- Overall precision index improved by 4.5 percentage points in 2021
- Overall underestimation increased by 0.7 percentage points in 2021
- Continue to maintain data consistency in long term

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
81 *(-5 vPY)*	**913** *(-238 vPY)*	**18%** *(-1% vPY)*

Vietnam Total Market Validation Study

2021 Validation Study

Validation Results

Precision	80.1%	Bias	-3.3%

Precision chart:
- 2017: 79.7
- 2018: 81.5
- 2019: 81.5
- 2020: 79.5
- 2021: 80.1

Bias chart:
- 2017: -3.7
- 2018: -1.7
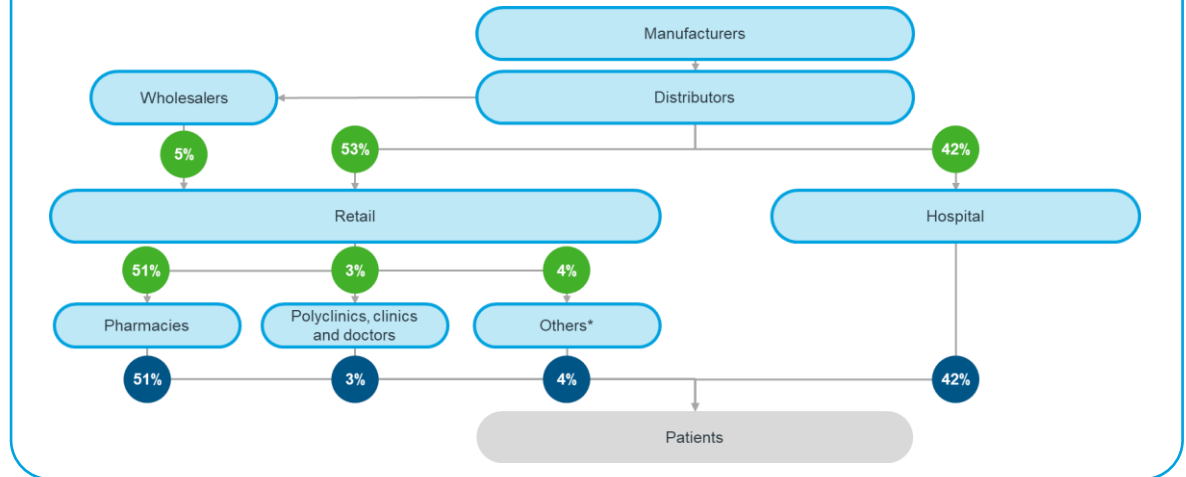- 2019: -1.5
- 2020: -2.9
- 2021: -3.3
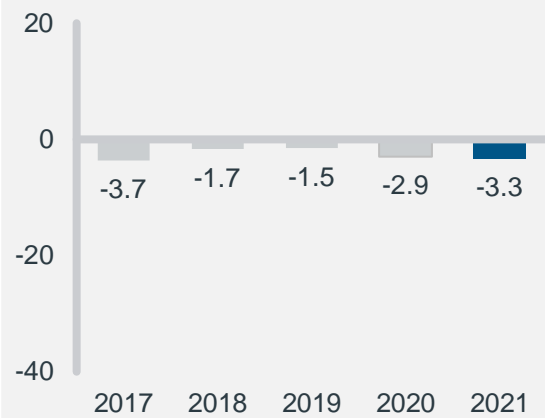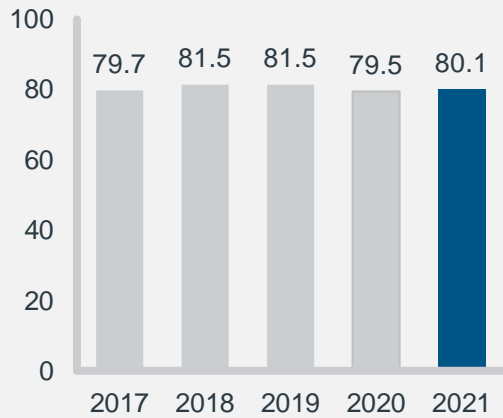
Outcomes
- Overall precision index improved by 0.6 percentage points in 2021
- Overall underestimation increased slightly by 0.4 percentage points in 2021
- Continue to secure additional benchmark data and panels to improve further

Distribution Channels Validated

Manufacturers → Distributors → Wholesalers (5%), Retail (53%), Hospital (42%)
Retail → Pharmacies (51%), Polyclinics, clinics and doctors (3%), Others* (4%)
Pharmacies (51%), Polyclinics clinics and doctors (3%), Others* (4%), Hospital (42%) → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
98 *(+7 vPY)*	1,499 *(+49 vPY)*	23% *(no change vPY)*

Methodology

Content covered in this section

Validation Studies **1**

- Distribution Channels validated
- Decile Inclusion/Exclusion Schema
- How IQVIA measures Accuracy

Accuracy **2**

- Bias (interpretation – calculus – limitations)
- Overestimation (illustration)
- Underestimation (illustration)
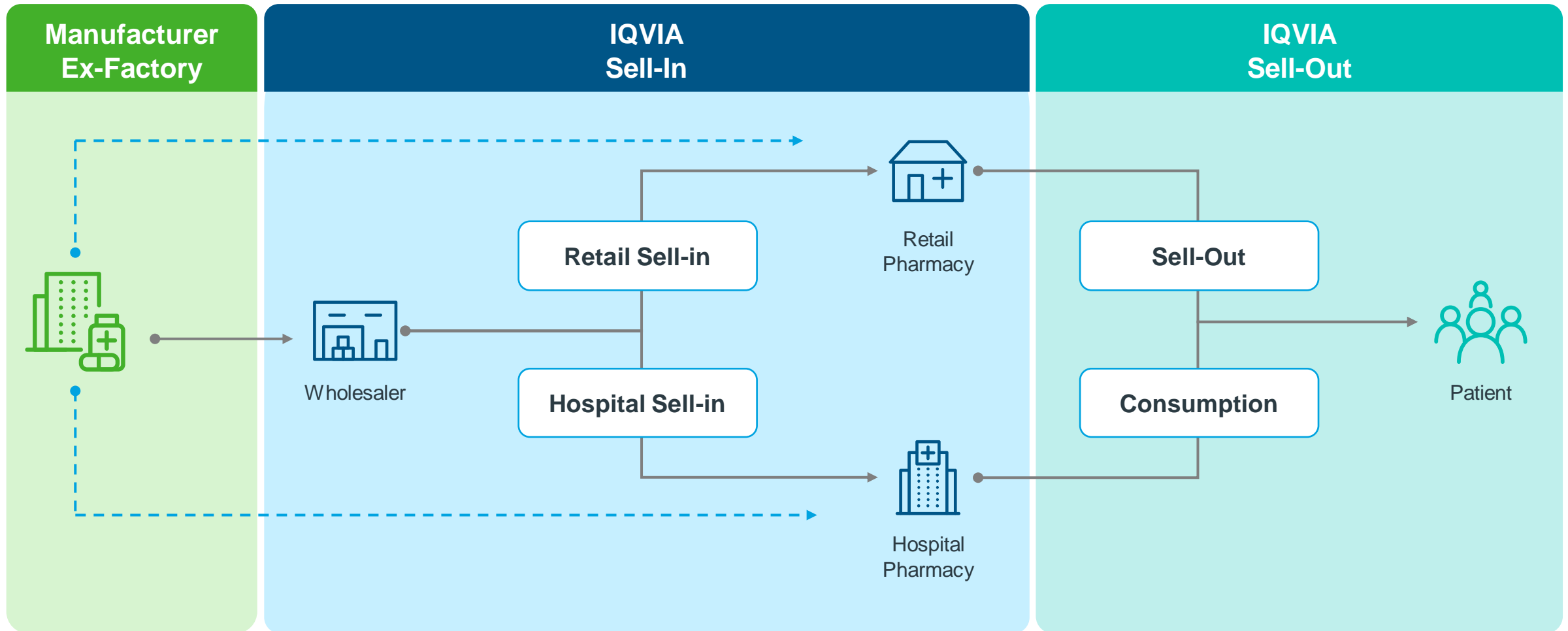- Precision (interpretation – calculus – illustration)

Timeliness **3**

- Elapsed days after reporting period (definition)
- On-target % (definition)
- On-target % vs. On-time % (how both compare)

IQVIA

Distribution Channels validated

ACTS compares the Manufacturer's ex-factory sales with IQVIA's audited channels

ACTS surveys 95% of the units market in the audited channel Small 5% of product forms get excluded

Decile Inclusion/Exclusion Schema

Total Market					Decile 1 breakdown					ACTS breakdown				
Decile	#Forms	Upper Limit (FY Units)	Total (FY Units)	Segment	Decile	#Forms	Upper Limit (FY Units)	Total (FY Units)	Segment	Decile	#Forms	Upper Limit (FY Units)	Total (FY Units)	Segment
1	16,746	288,316	421,249,733	Small 10%	1.01	12,546	20,349	42,128,674		1.01-1.05	15,623	210,803,990	210,803,990	Small 5% excluded
2	874	795,338	421,315,079	Next 10% included	1.02	1,386	44,263	42,143,302		1.06-2	1,997	631,760,822	631,760,822	Small 15% included
3	385	1,541,503	421,089,812	Medium 30% Included	1.03	771	67,192	42,167,630	Low 5% excluded	3-5	709	1,263,890,256	1,263,890,256	Medium 30% included
4	206	2,782,743	421,471,438		1.04	530	93,364	42,200,606		6-10	132	2,103,828,718	2,103,828,718	Large 50% included
5	118	4,572,060	421,329,006		1.05	390	122,163	42,163,778						
6	66	9,143,464	427,161,847		1.06	313	148,246	42,209,105						
7	36	15,617,602	424,827,107	Large 50% included	1.07	258	181,048	42,244,392						
8	20	34,458,310	444,648,076		1.08	215	214,823	42,284,130	Next 5% included					
9	8	89,798,547	507,434,006		1.09	183	248,645	42,301,336						
10	2	206,855,970	299,757,682		1.10	154	288,316	41,406,780						
Total	18,461		4,210,283,786			16,746		421,249,733			18,461	4,210,283,786	4,210,283,786	
ACTS	1,715		3,789,034,053			1,123		210,445,743			2,838	3,999,479,796	3,999,479,796	

FY = Full Year; This page only serves as a simplified illustration!

IQVIA

Validation Studies

How IQVIA measures Accuracy

1 Once a year, IQVIA supplies clients with a software that includes estimated yearly sales volumes for each product pack

2 Clients enter their actual ex-factory sales volume based on what they supplied to the validated market channel, e.g., retail pharmacies

3 Validation Studies then produce two key quality statements:
- **BIAS**: Average over/underestimation of the market or a single product
- **PRECISION**: Percentage of product forms weighted by its IQVIA units within a predefined deviation range

Validation Metrics

Bias: % of Over- or Underestimation

Interpretation

- The objective of Bias is to provide a robust estimation of average deviation between IQVIA data and Real data.
- Bias measures the level of deviation caused by systematic errors, e.g.
  - Projecting to a too small universe may result in a negative bias (=underestimation) or
  - Systematically collecting incomplete data from panels may lead to underestimated projected results or
  - Not capturing 100% of the market, say because of unaudited channels (like private clinics) is another reason for Bias (here underestimation).
- Extreme R-Values distort robustness. Therefore, R-Values outside ±52.5% interval are excluded.

Calculus

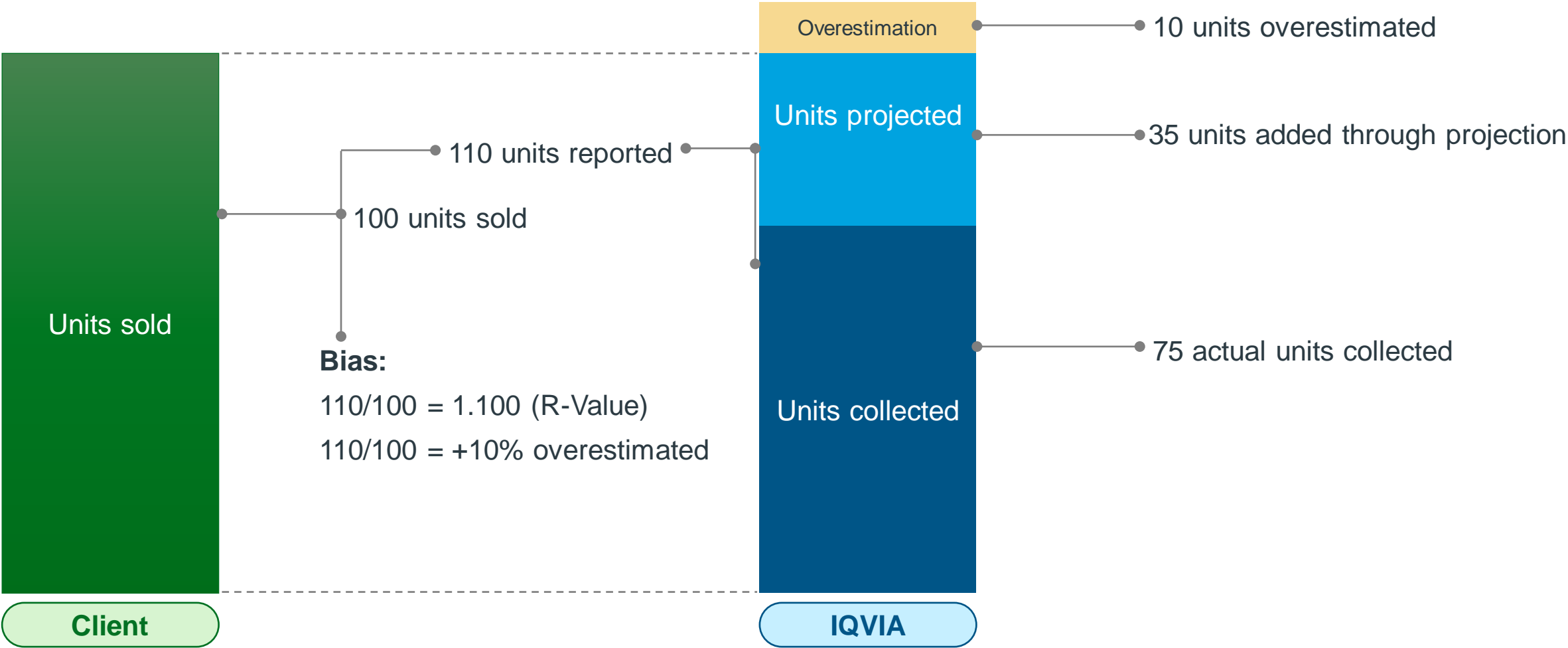| Pack	Audit Units	Real Units	R-Values
A	1,000	900	1.111
B	1,200	1,500	0.800
C	4,000	3,800	1.053
D	6,500	7,000	0.929
E	7,200	7,400	0.973
Sum	**19,900**	**20,600**	**0.966**

Bias = -3.4%

Average over/underestimation (Bias) in %

$$= (\frac{Total\ Audit\ units\ of\ all\ validated\ product\ forms}{Total\ REAL\ units\ of\ all\ validated\ product\ forms} -1) * 100$$

Limitations

- Inclusion of unaudited market channels (e.g., private clinics/ dispensing doctors or tender) into real sales data affects bias measurement. Participants are not always able to segregate their sales to the validated segment.
- Low validation coverage may lead to an inaccurate bias measure. The higher the number of participants the better.
- Purposive selection of therapeutic classes or products into the validation data set provides an unrepresentative bias measure.
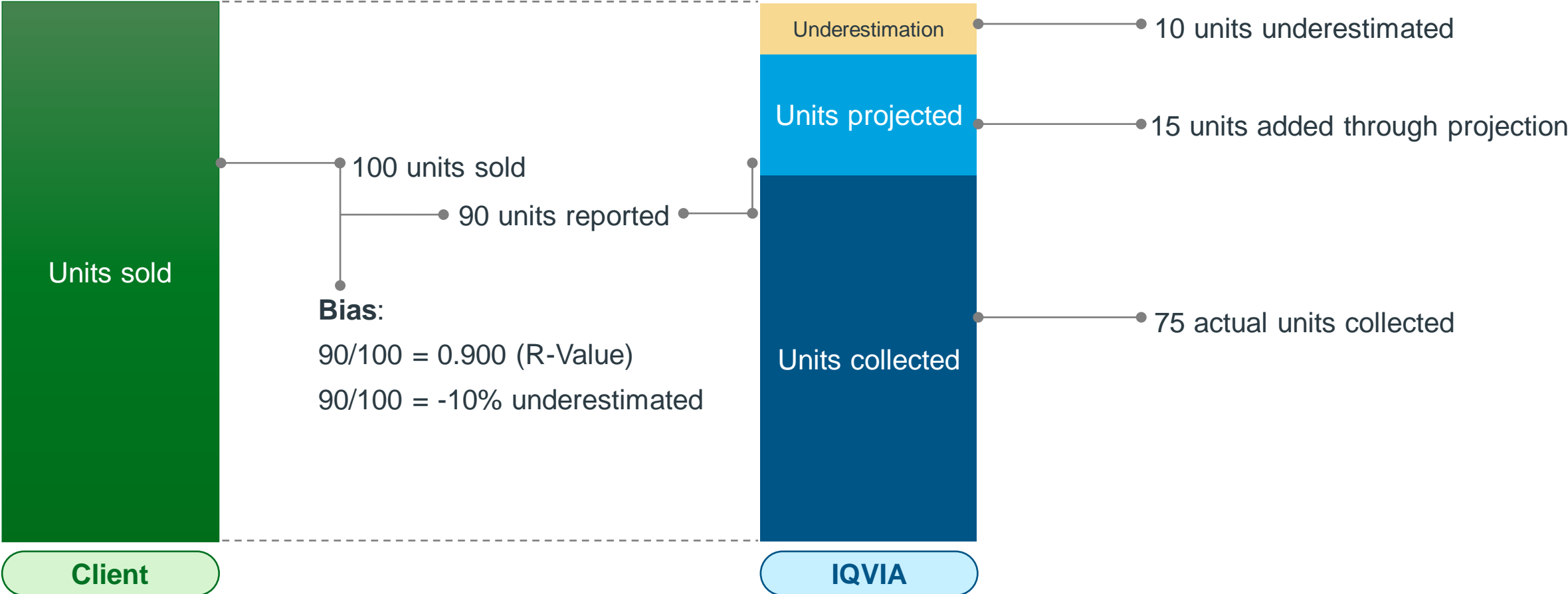
IQVIA

Clients Ex-Factory data vs. IQVIA's audited channel data

Example 1: Overestimation

Overestimation —————• 10 units overestimated

Units projected —————• 35 units added through projection

110 units reported

100 units sold

Units sold

Bias:

110/100 = 1.100 (R-Value)

110/100 = +10% overestimated

Units collected —————• 75 actual units collected

Client

IQVIA

IQVIA

Clients Ex-Factory data vs. IQVIA's audited channel data

Example 2: Underestimation

Units sold

100 units sold

90 units reported

Bias:

90/100 = 0.900 (R-Value)

90/100 = -10% underestimated

Underestimation — 10 units underestimated

Units projected — 15 units added through projection

Units collected — 75 actual units collected

Client

IQVIA

Validation Metrics

Precision: % of products in a fixed range of deviation

Interpretation

- Precision index measures the R-Value dispersion, i.e., it measures how many R-Values (weighted by its IQVIA units) lay inside a ±22.5% interval around the overall Bias.

- Different to Bias which measures systematic effects, the Precision Index measures the random effect of a sample.

- A low precision index usually indicates that the underlying sample size is too small/not representative and also causes wrong market shares and rankings.

- A high precision index indicates a representative sample size and is a result of consistent projected numbers. This is being measured around the average Bias which either can be negative or positives.

Calculus

R-Value Distribution		
From	To	# Forms
0.475	0.575	15
0.575	0.675	35
0.675	0.775	55
0.775	*0.875*	*230*
0.875	*0.975*	*590*
0.975	*1.075*	*770*
1.075	*1.175*	*410*
1.175	*1.275*	*100*
1.275	1.375	45
1.375	1.475	25
1.475	1.575	5
Total		**2,280**

$\sum$ = 2,100 R-Values inside the ±22.5% interval

R-Value Distribution

$$Precision = \frac{2,100}{2,280} \times 100 = 92.1\%$$

IQVIA

Timeliness

Speed of Delivery

Definition

- "Elapsed days after reporting period" measures the number of days, after the end of the reporting period until time of delivery on MIDAS.

- "On-Target %" measures how many data deliverables were shipped on MIDAS within a certain number of days.

- Thresholds:
  - Monthly: Actual ≤ 30 days
  - Quarterly: Actual ≤ 45 days

- Databases in scope:
  - Monthly MIDAS
  - Quarterly MIDAS

On-Target % vs. On-Time %

	On-Target %	On-Time %
Transaction	Country/Region*Audit*Period *(period = data month!)*	Country*Audit*Period*Client *(period = calendar month!)*
Measure	Days after Period (DAP)	Actual vs. Schedule
Threshold	Monthly: Actual < 30 days Quarterly: Actual < 45 days	Actual < Schedule (agreed)
Handling	Threshold is applied consistently to any country and audit.	Threshold is individual by country and considers local agreements with clients.
Interpretation	Metric measures if deliverable is within threshold (DAP), hence the time it took after period to build databases.	Metric measures if deliverable is as per the plan. It considers agreed delivery dates with clients.
Real world	"I received August data with delay"	"I got a late delivery in August"
Publication	ACTS Annual Report	n/a

DAP data being used is also published on MIDAS Delivery Performance: https://customerportal.imshealth.com/sites/imsportal/product-support/midas-products-psa/iqvia-midas/psa/database-update-schedules

ACTS content now available on IQVIA Customer Portal

How to access?

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IQVIA MIDAS

- Country Coverage
- ACTS Country Reports
- CAD Sheets
- Data Elements
- Database Update Schedules
- MIDAS Alerts Library
- IQVIA Access Indicator

Countries/Regions available 🌐

Algeria	Estonia	Mexico	Switzerland
Argentina	Finland	Morocco	Thailand
Austria	France	Pakistan	Tunisia
Bangladesh	Germany	Peru	Turkey
Bosnia	Greece	Philippines	UAE
Brazil	Hong Kong	Poland	UK
Bulgaria	Hungary	Portugal	Uruguay
Canada	Indonesia	Russia	USA
Cen. America	Italy	Saudi Arabia	Venezuela
Chile	Japan	Serbia	Vietnam
Colombia	Jordan	Singapore	
Croatia	Kazakhstan	Slovakia	
Czech R.	Kuwait	Slovenia	
Dominican R.	Latvia	South Africa	
Ecuador	Lebanon	South Korea	
Egypt	Lithuania	Spain	

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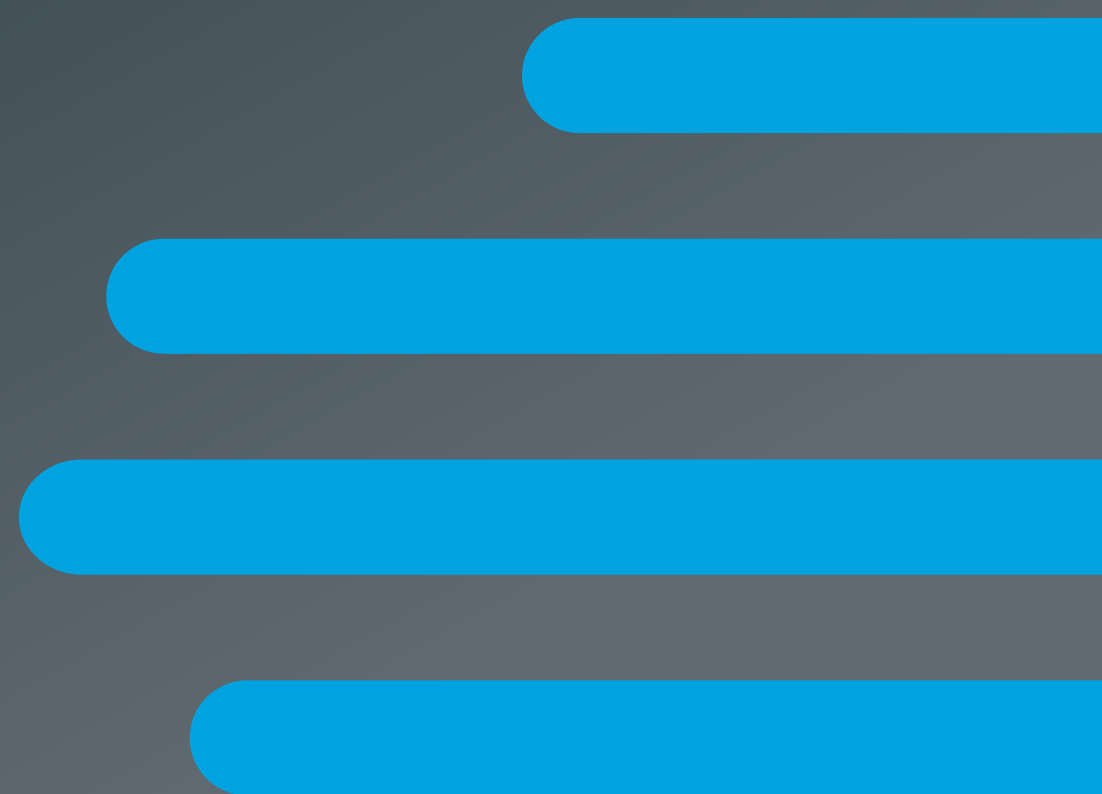
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