2021 ACTS Annual Report

Statistical Quality Assurance applied to IQVIA's Information Offerings

GLOBAL DATA SCIENCE AND ADVANCED ANALYTICS
(v20220214)

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(please use hyperlinks for navigation)

Welcome

Thank you for downloading the most recent ACTS annual report, IQVIA's Statistical Quality Assurance program. We are proud to be publishing the third edition on the IQVIA Customer Portal, serving as a measurement on MIDAS data offerings performance. Single country-pages available for download as validation results are ready for sharing with MIDAS data users and people interested in IQVIA's continuous quality measurement.

The report is labeled '2021 ACTS Annual Report', which consolidates validation analyses on data spanning years 2016 thru 2020. Despite the continued impact of COVID-19 this year, we are very grateful for the ongoing support from our customers to keep this quality measurement program running. We are confident that the report will once again provide you valuable insight into IQVIA quality commitment.

The report in its 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 95,000+ 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,

PhD, 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 a total of 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

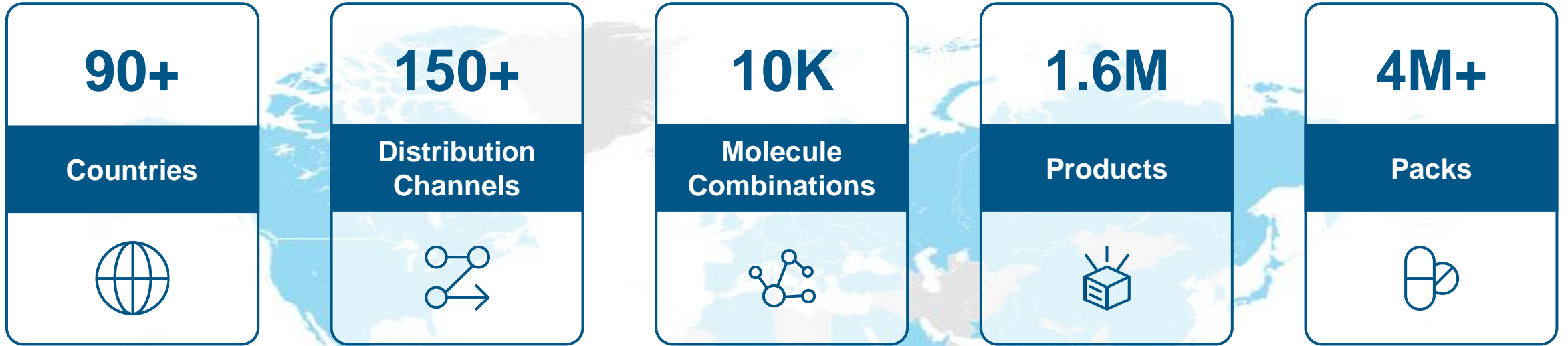|	Accuracy				Timeliness
	Countries*	Distribution Channels	Companies	Packs	Deliverables
Region					
North America	2	4	600+	11K	180+
Latin America	13	16	400+	14K	260+
Europe	24	48	3,000+	46K	1,100+
Africa, M. East, S. Asia	12	13	450+	9K	300+
Asia Pacific	12	15	650+	14K	260+
Total	**63**	**96**	**5,200+**	**96K**	**2,000+**
Channel					
Retail (Sell-in)	40	40	1,600+	44K	1,000+
Hospital (Sell-in)	5	5	150+	2K	600+
Combined (Sell-in)	15	15	650+	16K	90+
Retail (Sell-out)	14	15	1700+	22K	-
Total Market (Sell-in)	3	3	200+	4K	180+
Retail OTC	16	16	500+	6K	-
Other	2	2	200+	-	160+
Total	**63**	**96**	**5,200+**	**96K**	**2,000+**

*number of distinct countries

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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

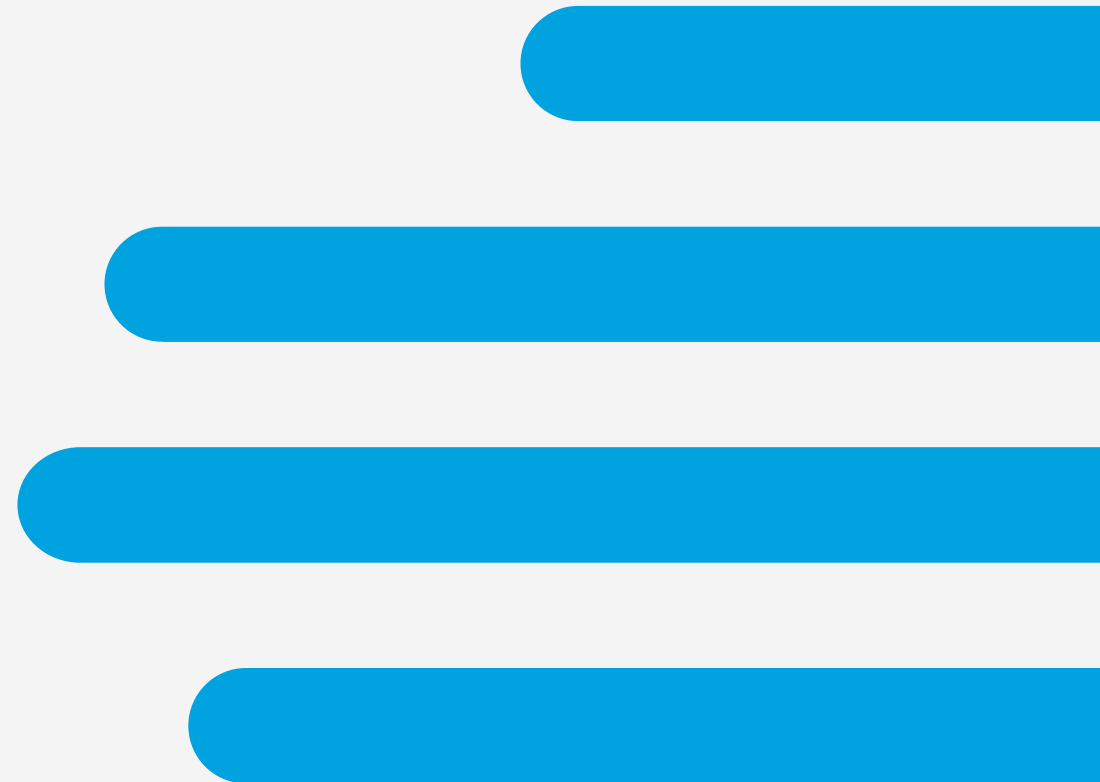120+ production heads in 7 countries

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

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IQVIA

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Accuracy: Global & Regional Results

Content covered in this section

Global & Regional 🌐

- Global and regional accuracy results and 5-years trend
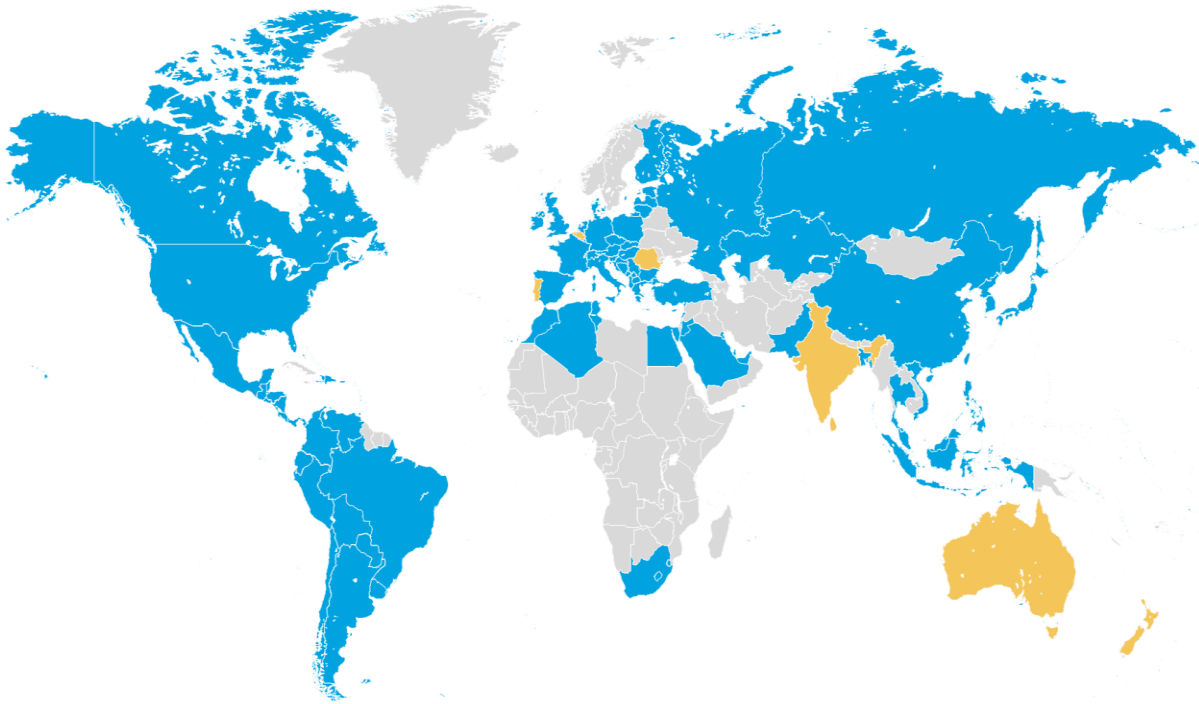
Data Type 🗄

- 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

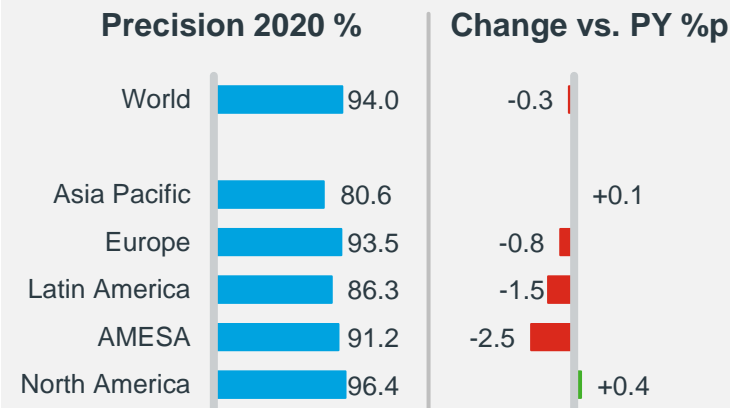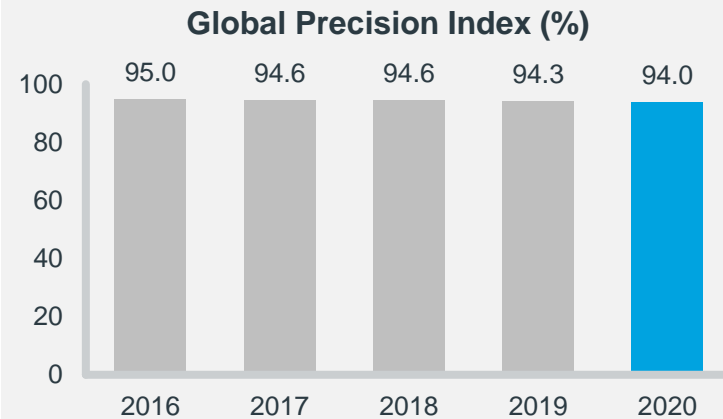| Regions covered	Countries not covered

• North America
  - United States
  - Canada
• Latin America
• Europe
• Africa, Middle East, South Asia (AMESA)
• Asia Pacific (APAC)
	• Australia
	• Belgium
	• India
	• New Zealand
	• Portugal
	• Romania

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Global and Regional Results

Coverage

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

- 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**

- 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. **Germany Hospital, Spain Hospital**

Results

Global Precision Index (%)

Year	Value
2016	95.0
2017	94.6
2018	94.6
2019	94.3
2020	94.0

Precision 2020 % | Change vs. PY %p

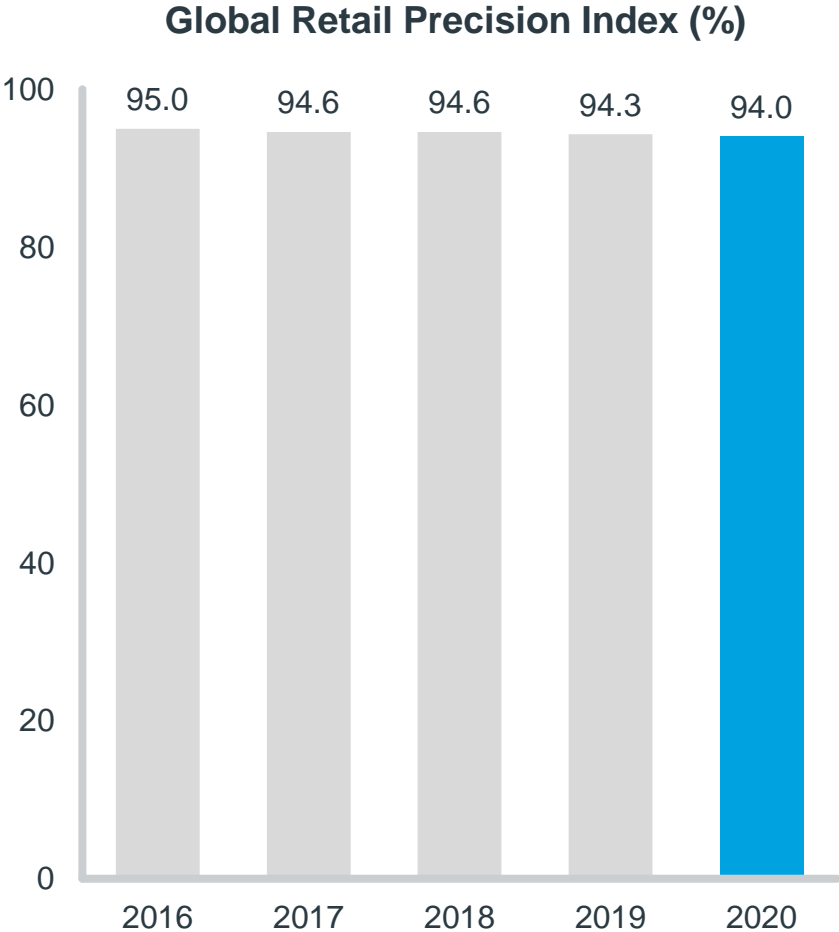| Region	Precision 2020 %	Change vs. PY %p
World	94.0	-0.3
Asia Pacific	80.6	+0.1
Europe	93.5	-0.8
Latin America	86.3	-1.5
AMESA	91.2	-2.5
North America	96.4	+0.4

Summary

- Global precision index slightly reduced by 0.3% points in 2020 but remains at 94%

- 2020 result of 94.0% is lowest in recent years, mainly caused by deteriorations in Hospital

- North America turned out to be the leading region with highest precision of 96.4%

- Asia Pacific region is ranked with lowest precision of 80.6% but has improved vs. previous year

Countries with improved and deteriorated precision

Retail Validation Results

Global Retail Precision Index (%)

Year	Value
2016	95.0
2017	94.6
2018	94.6
2019	94.3
2020	94.0

Improvement

Country	Precision 2020 %	Change vs. 2019 %p
Bolivia	60.2	+6.4
Dominican Rep.	92.9	+7.4
Greece	93.4	+3.8
Jordan	89.9	+4.0
Latvia	90.1	+6.5
Slovenia	99.3	+4.0
Venezuela	88.0	+13.7

Deterioration

Country	Precision 2020 %	Change vs. 2019 %p
Bangladesh	72.6	-11.4
Chile	75.3	-16.4
Colombia	80.6	-6.4
Egypt	88.5	-6.8
Uruguay	76.8	-8.5

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Countries with improved and deteriorated precision

Hospital Validation Results

Global Hospital Precision Index (%)
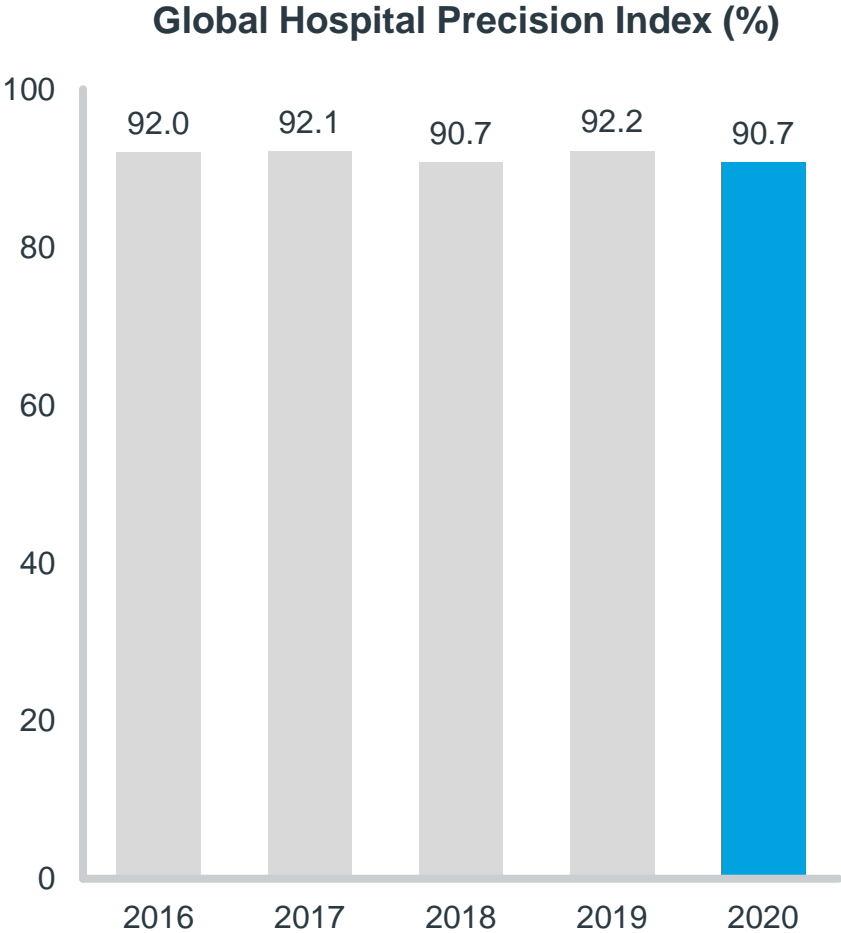
Improvement				Deterioration		
Country	**Precision 2020 %**	**Change vs. 2019 %p**		**Country**	**Precision 2020 %**	**Change vs. 2019 %p**
Slovakia	99.7	+1.4		Bosnia	96.5	-3.2
Slovenia	99.3	+4.0		Italy	82.2	-5.9
South Korea	57.0	+3.7		Russia	83.2	-5.8

Countries with improved and deteriorated precision

Pharmacy Sell-out (PharmaTrend PTR) Validation Results

Global PTR Precision Index (%)
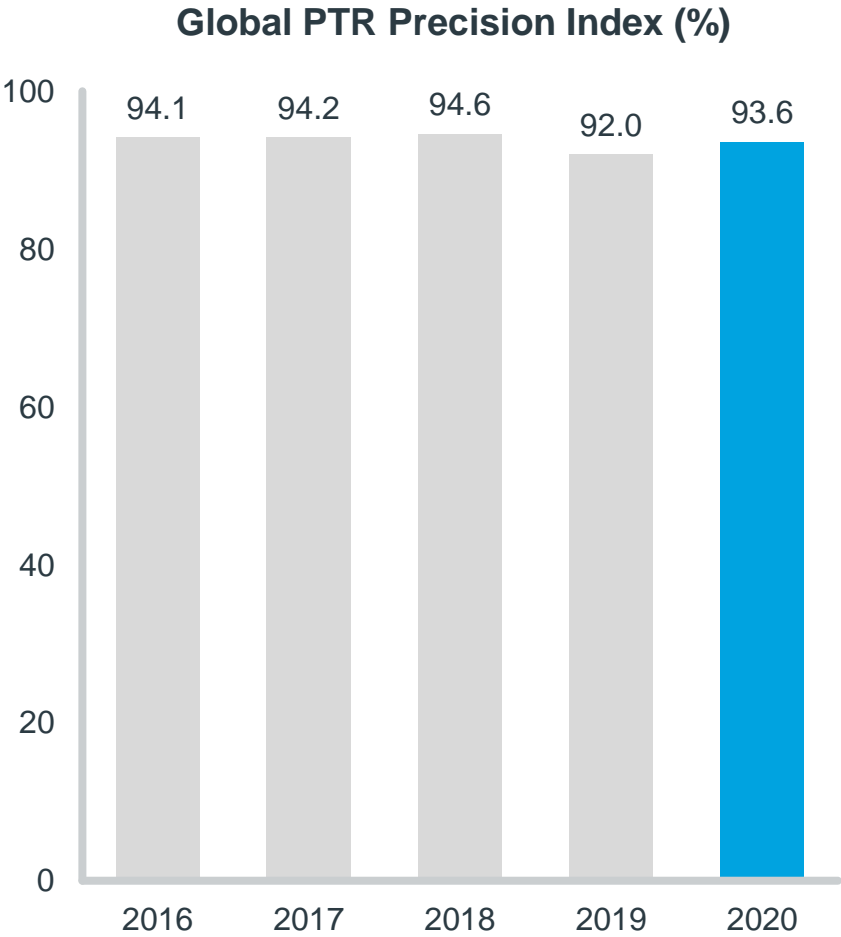
Improvement		
Country	**Precision 2020 %**	**Change vs. 2019 %p**
Croatia	99.2	+4.2
Italy	91.9	+4.0

Deterioration		
Country	**Precision 2020 %**	**Change vs. 2019 %p**
Finland	91.7	-3.1
Spain	92.3	-2.7

Countries with improved and deteriorated precision

Retail OTC Validation Results

Global Retail OTC Precision Index (%)
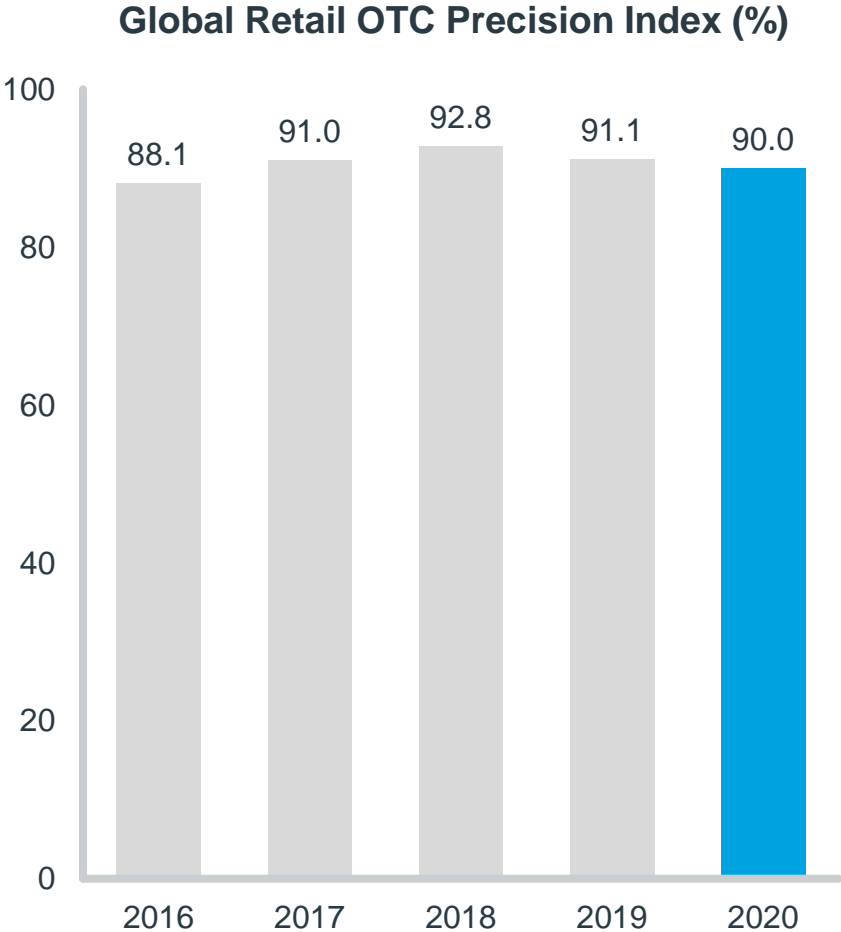
Improvement			Deterioration		
Country	Precision 2020 %	Change vs. 2019 %p	Country	Precision 2020 %	Change vs. 2019 %p
Greece	84.9	+3.4	Argentina	82.8	-9.5
Mexico	85.5	+6.4	Brazil	78.2	-17.9
Slovakia	94.0	+3.8	Italy	82.9	-11.3
Spain	92.9	+3.4	South Africa	87.7	-5.6
			South Korea	64.2	-18.9

Timeliness
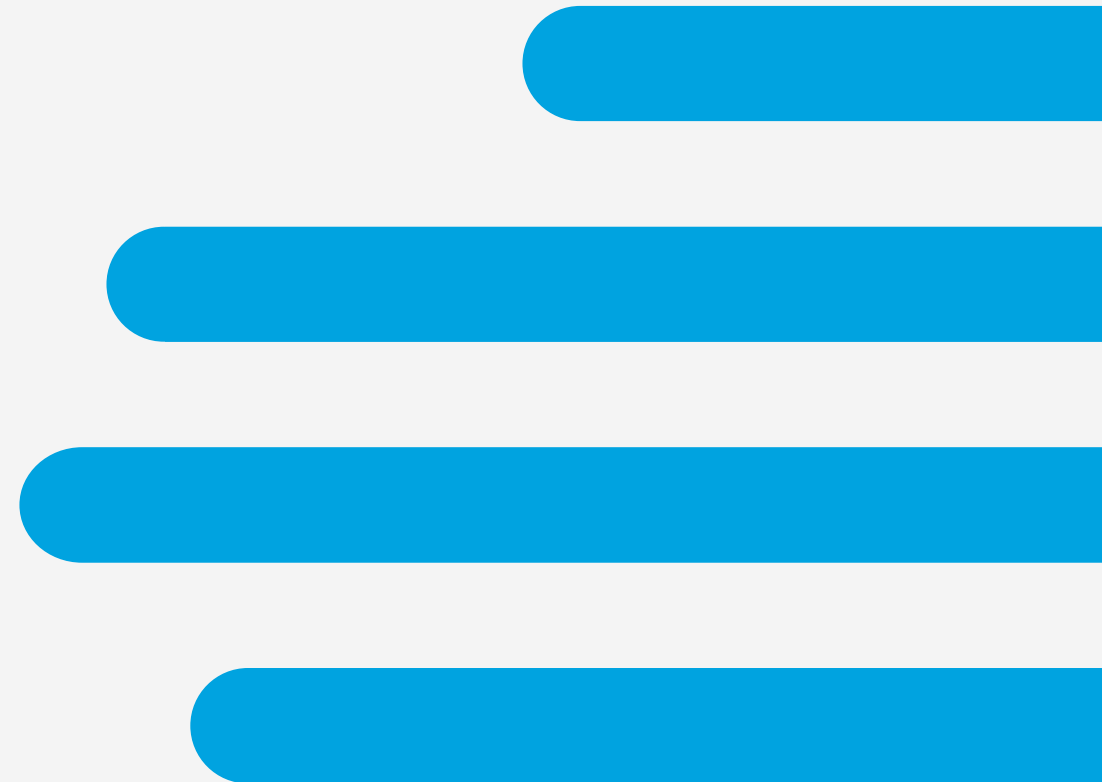
Content covered in this section

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

DAP continued improving on both monthly and quarterly deliverables

Elapsed Days after Reporting Period (Average)

Monthly: 2017: 27, 2018: 27, 2019: 26, 2020: 25, 2021: 24
Quarterly: 2017: 31, 2018: 30, 2019: 29, 2020: 28, 2021: 28

Percent On-Target

Monthly: 2017: 64, 2018: 63, 2019: 71, 2020: 73, 2021: 74
Quarterly: 2017: 86, 2018: 85, 2019: 86, 2020: 87, 2021: 90
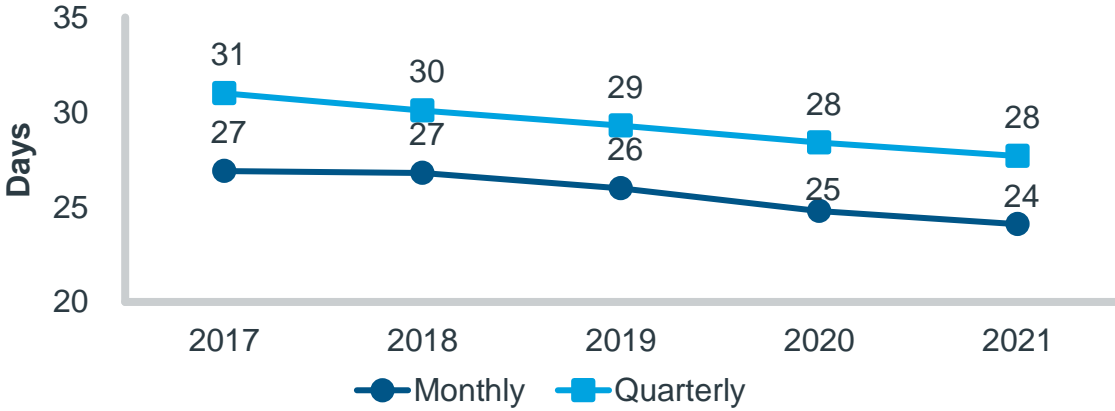
Region Percent On-Target 2021

Region	Monthly	Quarterly
World	74	90
North America	17	100
Latin America	69	100
Europe	82	94
Africa, Middle East, South Asia	94	91
Asia Pacific	56	66
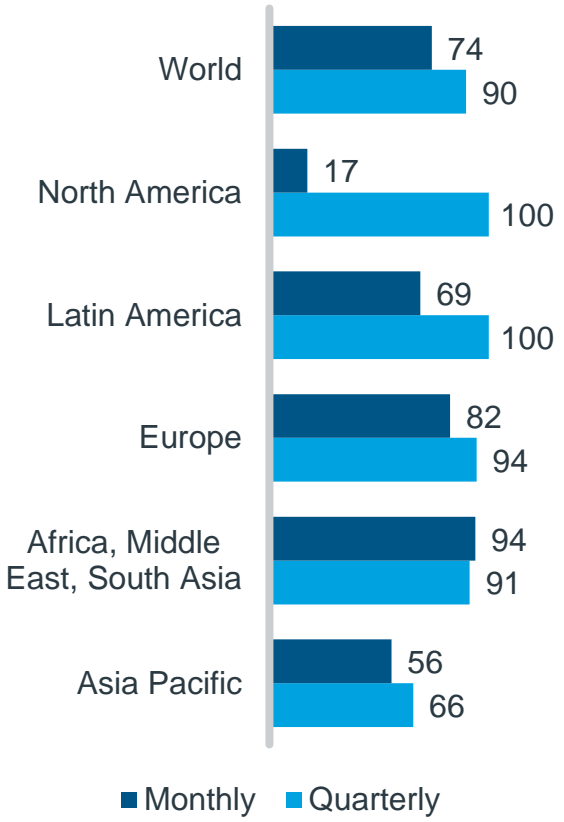
Channel Percent On-Target 2021
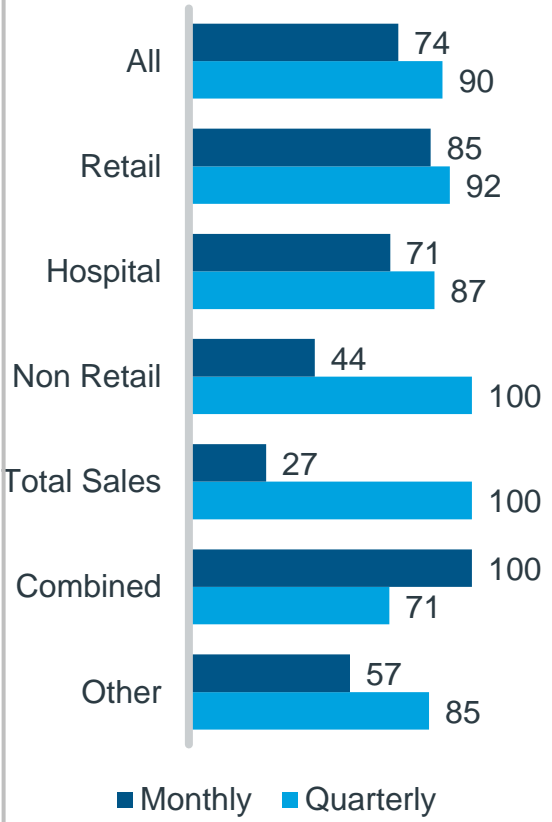
Channel	Monthly	Quarterly
All	74	90
Retail	85	92
Hospital	71	87
Non Retail	44	100
Total Sales	27	100
Combined	100	71
Other	57	85

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

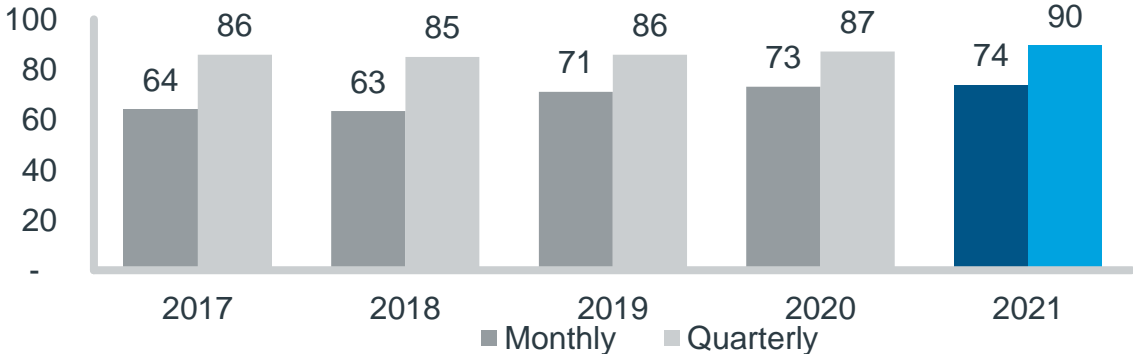|	2017		2018		2019		2020		2021	
	Month	**Quarter**	**Month**	**Quarter**	**Month**	**Quarter**	**Month**	**Quarter**	**Month**	**Quarter**
Channel										
Combined	60	32	60	32	60	32	60	32	60	32
Hospital	455	180	456	180	456	180	456	180	456	180
Non-Retail	36	12	36	12	36	12	36	12	36	12
Other	96	46	96	44	96	44	96	44	96	44
Retail	756	288	756	288	754	288	756	288	756	287
Total Sales	132	48	132	48	132	48	132	48	132	48
Total	**1,535**	**604**	**1,536**	**604**	**1,534**	**604**	**1,536**	**604**	**1,536**	**603**
Region										
North America	132	48	132	48	132	48	132	48	132	48
Latin America	192	68	192	68	190	68	190	68	192	68
Europe	839	284	840	284	840	284	840	284	840	284
Africa, M. East, S. Asia	216	92	216	92	216	92	216	92	216	91
Asia Pacific	156	112	156	112	156	112	156	112	156	112
Total	**1,535**	**604**	**1,536**	**604**	**1,534**	**604**	**1,536**	**604**	**1,536**	**603**

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

IQVIA

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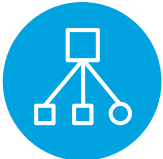
- Bias and Precision by Specialty markets (Anti-TNF, Hep-B & HIV, Oncology and Others)
- Data basis used: Countries and Specialty products surveyed

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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

ATC 4ᵗʰ level definition of Specialty

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

Specialty has consistently shown higher growth than the traditional market globally

Specialty has been the major driver of growth

Global market growth dynamics by segmentation (MAT Q3 2021)
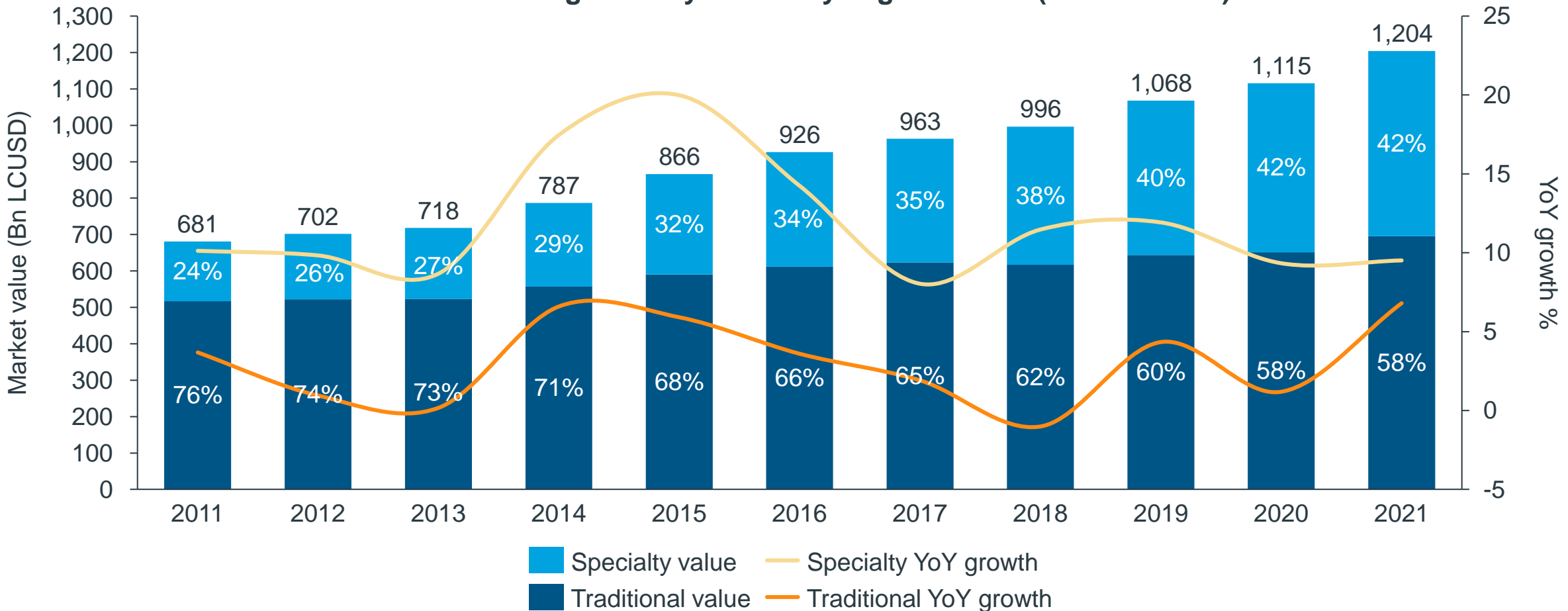
Legend:
- Specialty value
- Traditional value
- Specialty YoY growth
- Traditional YoY growth

Y-axis left: Market value (Bn LCUSD)
Y-axis right: YoY growth %

Bar values:
- 2011: 681 (Specialty 24%, Traditional 76%)
- 2012: 702 (Specialty 26%, Traditional 74%)
- 2013: 718 (Specialty 27%, Traditional 73%)
- 2014: 787 (Specialty 29%, Traditional 71%)
- 2015: 866 (Specialty 32%, Traditional 68%)
- 2016: 926 (Specialty 34%, Traditional 66%)
- 2017: 963 (Specialty 35%, Traditional 65%)
- 2018: 996 (Specialty 38%, Traditional 62%)
- 2019: 1,068 (Specialty 40%, Traditional 60%)
- 2020: 1,115 (Specialty 42%, Traditional 58%)
- 2021: 1,204 (Specialty 42%, Traditional 58%)

IQVIA

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At ex man prices the top 4 TAs accounted for nearly all global growth; Immunology overtaking Diabetes

MAT Q3'21 Global Sales | Top 10 Therapy Areas in Bn US$
Total global PPG: 7.8% (MAT Q3'20 - MAT Q3'21)

Therapy Area	2020-21 Absolute Growth	2020-21 Growth (%)	Contribution to global growth (%)
Oncologics	17.8	11%	21%
Immunology	18.2	18%	21%
Antidiabetics	13.2	13%	16%
Anticoagulants	5.7	12%	7%
Respiratory Agents	0.9	2%	1%
Pain	3.6	8%	4%
Antihypertensives	1.1	3%	1%
Mental Health	1.7	5%	2%
Hiv Antivirals	-0.2	-1%	0%
Antibacterials	0.01	0%	0%

Chart bar values:
- Oncologics: US 43%, EU5 24%, Japan 8%, Pharmerging 10%, RoW 15% — $177 bn
- Immunology: US 72%, EU5 13%, Japan 3%, Pharmerging 2%, RoW 10% — $120 bn
- Antidiabetics: US 68%, EU5 8%, Japan 4%, Pharmerging 11%, RoW 9% — $117 bn
- Anticoagulants: US 48%, EU5 18%, Japan 6%, Pharmerging 14%, RoW 14% — $53 bn
- Respiratory Agents: US 62%, EU5 14%, Japan 4%, Pharmerging 10%, RoW 11% — $50 bn
- Pain: US 35%, EU5 16%, Japan 6%, Pharmerging 28%, RoW 15% — $47 bn
- Antihypertensives: US 21%, EU5 17%, Japan 10%, Pharmerging 31%, RoW 22% — $40 bn
- Mental Health: US 51%, EU5 14%, Japan 6%, Pharmerging 14%, RoW 15% — $35 bn
- Hiv Antivirals: US 73%, EU5 14%, Japan 1%, Pharmerging 3%, RoW 9% — $35 bn
- Antibacterials: US 2%, EU5 11%, Japan 3%, Pharmerging 61%, RoW 13% — $33 bn

Legend: US, EU5, Japan, Pharmerging, RoW

Note: Growth in LCUS on YoY basis
Sorche: IQVIA MIDAS MAT Q3 2021, Rx only

Key for TA Growth %: Above average; Below average

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At ex man prices the top 4 TAs accounted for nearly all global growth of innovative brands, dominated by developed markets

MAT Q3 '21 Global Sales | Top 5 Therapy Areas in Bn US$

Branded innovative products PPG: 8.6% (MAT Q3 '20 - MAT Q3 '21)

Therapy Area	US	EU5	Japan	Pharmerging	RoW	Total	2020-21 Absolute Growth	2020-21 Growth (%)	Contribution to global growth (%)
Oncologics	45%	24%	8%	8%	15%	$162 bn	17.1	12%	27%
Immunology	73%	13%	3%	1%	10%	$118 bn	18.2	18%	29%
Antidiabetics	71%	8%	4%	8%	9%	$107 bn	12.5	13%	20%
Anticoagulants	54%	18%	6%	8%	14%	$45 bn	4.8	12%	8%
Respiratory Agents	64%	14%	4%	6%	11%	$41 bn	0.9	2%	1%
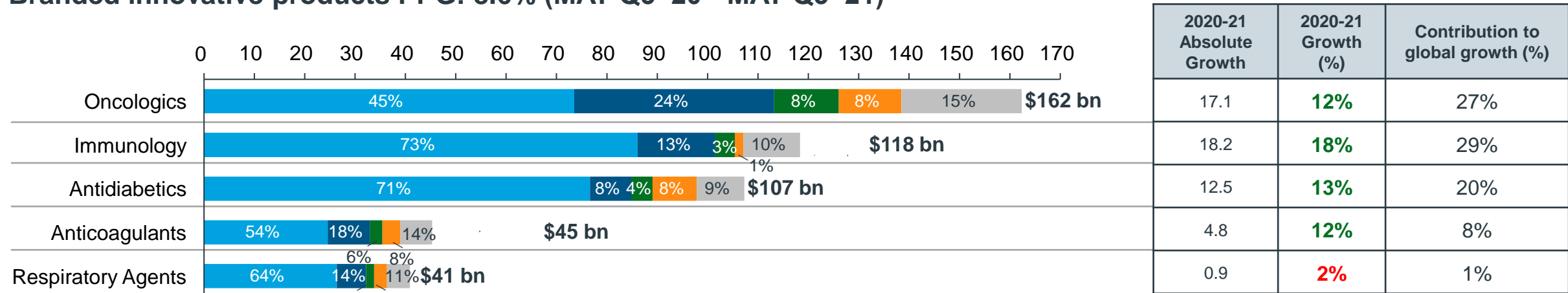
Branded and unbranded Gx Global PPG: 6.3% (MAT Q3 '20 - MAT Q3 '21)
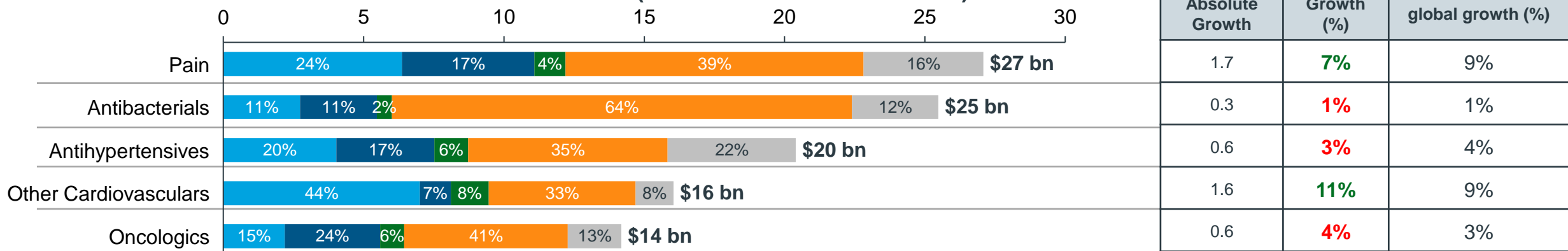
Therapy Area	US	EU5	Japan	Pharmerging	RoW	Total	2020-21 Absolute Growth	2020-21 Growth (%)	Contribution to global growth (%)
Pain	24%	17%	4%	39%	16%	$27 bn	1.7	7%	9%
Antibacterials	11%	11%	2%	64%	12%	$25 bn	0.3	1%	1%
Antihypertensives	20%	17%	6%	35%	22%	$20 bn	0.6	3%	4%
Other Cardiovasculars	44%	7%	8%	33%	8%	$16 bn	1.6	11%	9%
Oncologics	15%	24%	6%	41%	13%	$14 bn	0.6	4%	3%

Legend: US | EU5 | Japan | Pharmerging | RoW

Note: Growth in LCUS on YoY basis
Sorche: IQVIA MIDAS MAT Q3 2021, Rx only

Key for TA Growth %: Above average; Below average

IQVIA

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Specialty market "Others" show largest improvement*

Accuracy Results

Bias (%)
- Anti-TNF & more: 2019 = -1.6, 2020 = -2.2
- Hepatitis B & HIV: 2019 = -3.6, 2020 = -8.7
- Oncology: 2019 = -1.7, 2020 = -2.4
- Others: 2019 = -5.6, 2020 = -3.8
- All Specialty Groups: 2019 = -2.0, 2020 = -3.0

Precision (%)
- Anti-TNF & more: 2019 = 99.6, 2020 = 98.3
- Hepatitis B & HIV: 2019 = 86.7, 2020 = 91.0
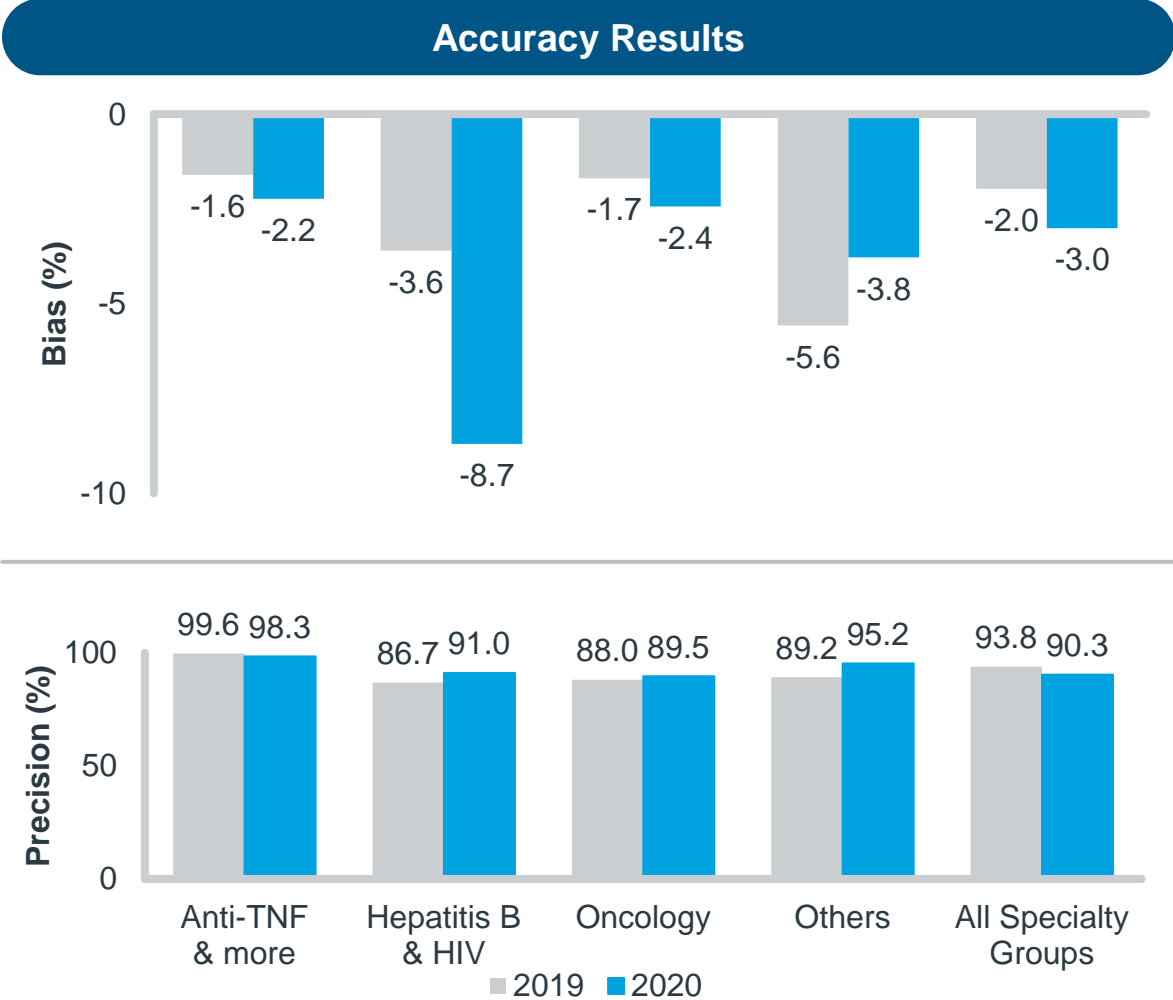- Oncology: 2019 = 88.0, 2020 = 89.5
- Others: 2019 = 89.2, 2020 = 95.2
- All Specialty Groups: 2019 = 93.8, 2020 = 90.3

■ 2019 ■ 2020

Survey Basis

	Anti-TNF	Hep B & HIV	Oncology	Others	All Specialty Groups	
Countries surveyed	Austria France Germany Czech R.	France Germany Pakistan	Austria Brazil Croatia Czech R. France Germany Hungary Italy Mexico Pakistan Russia Serbia Slovakia Slovenia South Africa Turkey	Czech R. France Germany Hungary Italy Pakistan Russia Serbia South Africa Turkey	Argentina Austria Bangladesh Brazil Colombia Croatia Czech R. Ecuador France Greece Hungary Italy Kazakhstan Latvia Lebanon Lithuania Mexico Pakistan	Paraguay Peru Philippines Poland Russia Saudi Arabia Serbia Slovakia Slovenia South Africa Spain Turkey UAE Uruguay
Specialty products surveyed	244	118	1,069	553	2,900	

* 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
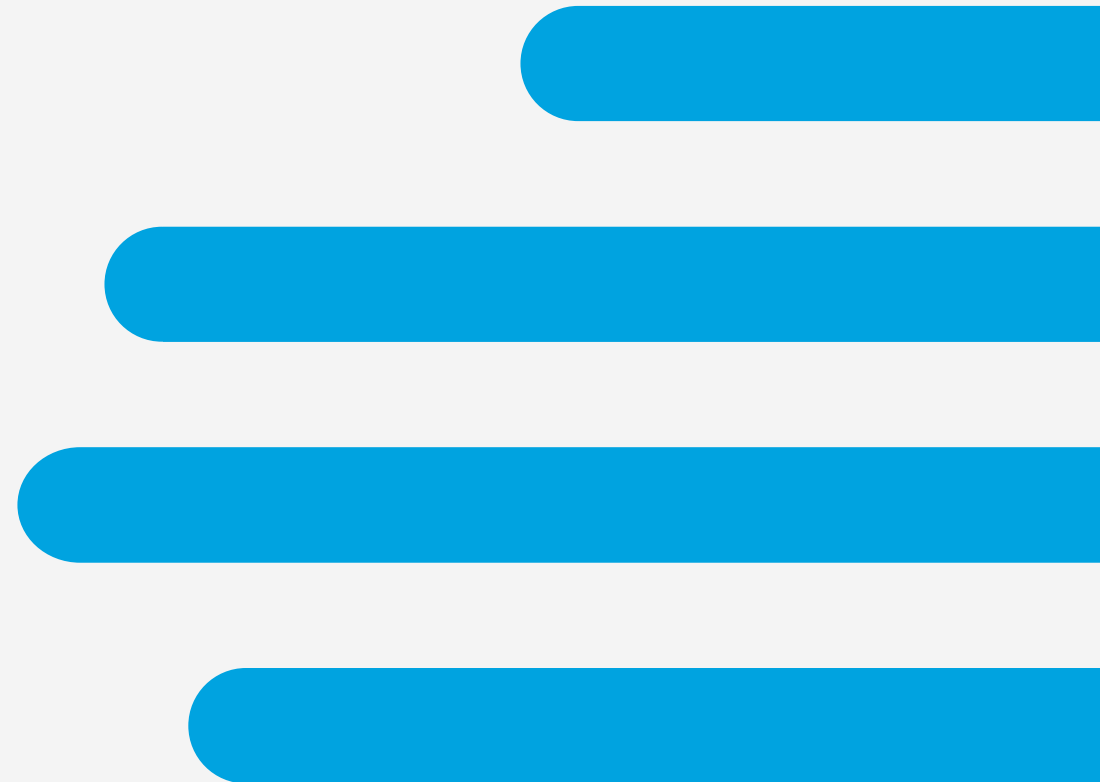
Content covered in this section

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 market place
- 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

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 48 Market Prognosis countries was -3.0%, a significant improvement on previous average error of -6.4%. The average error for year 5 of forecast was -4.4%

Regional

- Four of the five Market Prognosis regions showed improved 5-year errors compared to previous validation. Only North America showed a larger error, caused by over-estimation of the US market – see slide 5 for explanation.

Leading 10 Countries

- For the leading 10 countries, only three showed 5-year average errors greater than +/-5%, and only one showed a 1-year error greater than +/-3%.

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Market Prognosis

Validity of Annual Forecasts

Forecasting Bias (%) based on 48 Countries
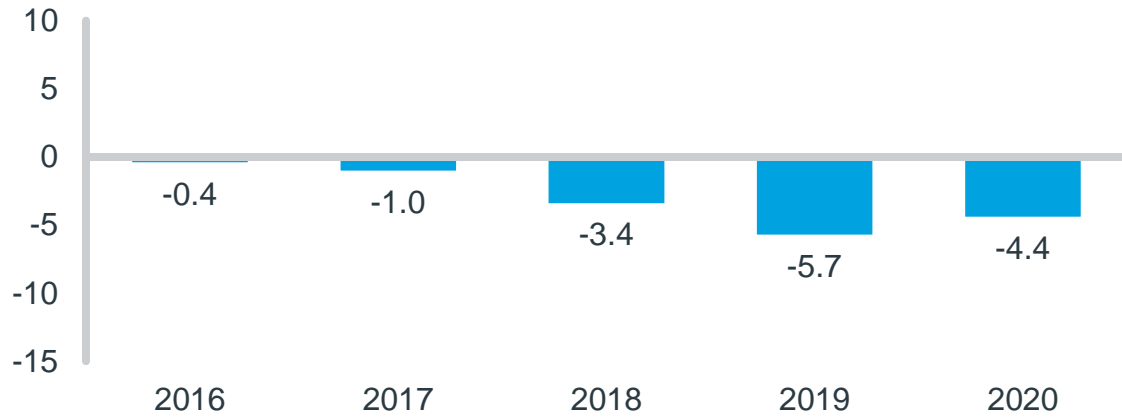
Region	Average Bias (%)	
	2015-2019	2016-2020
AMESA	-3.2	-3.1
Asia Pacific	-5.0	-1.5
Europe	-8.1	-4.9
Latin America	-9.0	-2.4
North America	-2.6	4.6
All Regions	**-6.4**	**-3.0**

Leading 10 Markets 5 years (2016-20)

USA	+10.6
China	-5.1
Japan	+2.9
Germany	-1.5
France	-7.1
Italy	-2.4
United Kingdom	+1.0
Spain	-2.4
Canada	-1.3
Brazil	-0.6
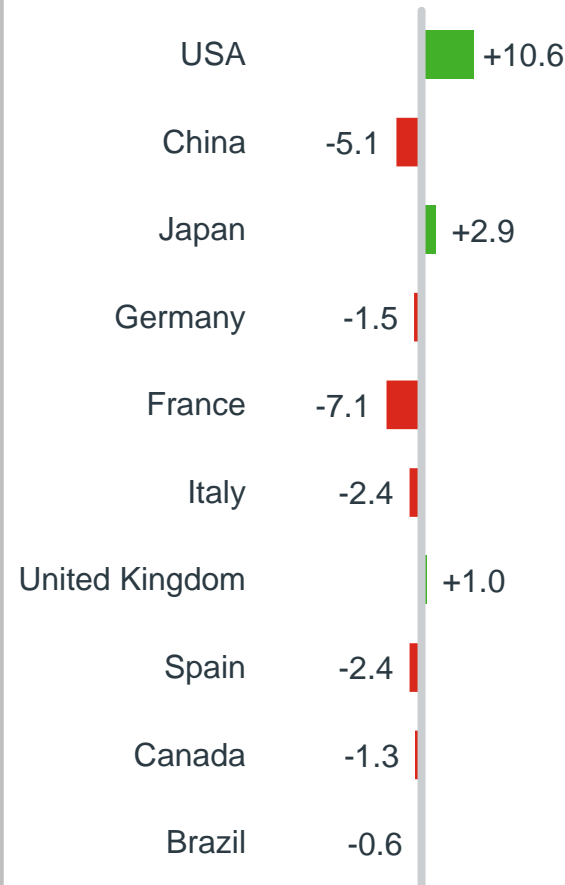
Leading 10 Markets 1 year (2020)

US	-0.6
CN	+3.8
JP	+2.6
GE	-0.5
FR	-0.6
IT	+3.0
UK	+1.1
SP	-2.5
CD	+1.6
BR	-2.4
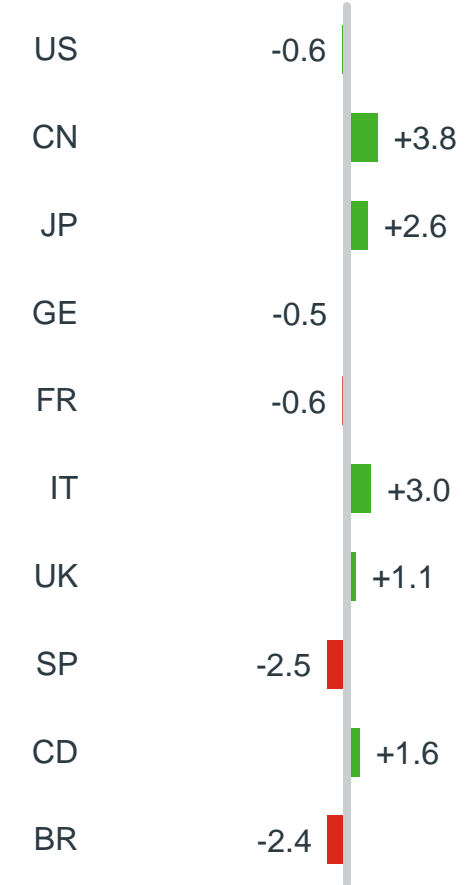
Market Prognosis on selected Markets

Commentary

United States

- After an acceleration of drug spending from mid-2013, which led to double-digit growth in 2014 and 2015, the US market slowed sharply in 2016 and 2017 as a set of new negative price factors emerged.

- Growth in the early part of the forecast was overestimated due to weaker than anticipated annual list price increases, particularly for older brands and generics from late 2016. 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 forecast 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. Market growth was also below expectations due to a higher-than-expected impact from loss of exclusivity of some major brands during this period.

China

- The underestimation of total market growth in China during 2016-2020 is to a large extent a result of the significant data enhancements introduced to the dominant hospital sector panel in January 2021, with backdata adjustments to 2019, which inflated overall hospital sector growth over the period.

- After a decade of strong, double-digit growth, growth in China's hospital sector had slowed sharply in 2015. Growing pricing pressures in the tender system, reform of the public hospital financing system, and tighter reimbursement claim controls all contributed to the slowdown. This trend had been expected to continue in the forecast, with planned hospital financing reforms and caps placed on drug budgets also expected to curb growth. While an uptick in new product registrations following regulatory reforms lifted growth briefly in 2016, growth slowed again in 2017-2018. Growth increased again in 2019, reflecting improving access to innovative new drugs as a growing number of drugs gained reimbursement listing following national price negotiations.

- The pick-up in growth in 2019, together with the COVID-19 crisis, contributed to an overestimation of growth in 2020. While a slowdown in sales had been expected for the year under the impact of the COVID-19 crisis, volume declined more sharply than expected, and although the second half of the year saw a gradual recovery, hospital sector sales declined in 2020.

Japan

- The Japanese pharmaceutical market contracted by a CAGR of -0.4% during 2015-2020, primarily due to a restrictive pricing framework and biennial price revisions.

- Hospital sector sales growth in 2017 declined more than anticipated due to a sharp reduction in selected hepatitis C drugs sales, in addition to an out-of-cycle price cut on Opdivo (nivolumab).

- The overestimation of retail sector sales growth in 2018 was due to more aggressive National Health Insurance (NHI) pricing reforms than assumed in the forecast, which included a drastic revision to the price maintenance premium (PMP) criteria and the long-listed products (LLP) pricing rules, which significantly impacted patented as well as off-patent originator brands. The year 2019 - an exception in trend over the five-year period – with the absence of any price revisions for the best part of the year and stronger than expected sales growth of certain specialty biologics contributing to market growth.

- Sales in the retail sector experienced the steepest decline in 2020 owing to the combined impact of biennial price cuts as well as disruptions in healthcare provision due to the COVID-19 outbreak. Reduced patient flow also contributed to contraction in hospital sector sales in 2020.

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Market Prognosis on selected Markets

Commentary

Germany

- The German pharmaceutical market witnessed faster than expected growth in the 2016-2020 period and in 2020, mainly as a result of stronger than expected average price growth.

- Cost-containment measures such as mandatory and voluntary discounts, reference pricing and the ongoing price moratorium were anticipated to keep a check on retail price growth. The use of innovative drugs however propelled average retail price growth slightly above forecast assumptions during the five-year period. Increased use of high-cost monoclonal antibody antineoplastics, viral vaccines and anti-inflammatory products in 2019, and a shift of anti-hemophilic drugs from the hospital to the retail sector in 2020, led to retail sales to expand marginally above expectation.

- Under the forecast assumptions, measures to contain costs and tackle overcapacity were expected to constrain hospital sector growth. In 2018-2019 the use of higher-priced therapies including monoclonal antibody antineoplastics and multiple sclerosis products, and in 2020 due to the uptake of the high-cost gene therapy, Zolgensma, and other new launches in oncology, resulted in average price growth accelerating marginally faster than assumed.

France

- The underestimation of total market growth in France from 2016-2020 is mainly the result of higher-than-expected growth in the dominant retail pharmacy sector over the period. Retail pharmacy sector growth was minimal or negative for almost a decade until 2017, under the pressure of intensifying cost-containment measures implemented with the objective of reducing the social security budget deficit. Patent expiries, a push to rationalize prescribing, price cuts and a sharp increase in generic substitution all contributed to a gradual decline in sales in the retail sector during this period, and these trends had been expected to continue.

- Retail sector sales began to grow again in 2018, however, when dispensing of oral hepatitis C drugs and certain oncology drugs shifted from hospitals to retail pharmacies. Since then, a growing number of hospital prescriptions – especially for anti-cancers – is being dispensed in retail pharmacies, driving growth in the average price per standard unit in the sector and lifting sales growth.

- Hospital sector growth has been volatile over the 2016-2020 period. While hospital volume saw a sharp contraction in 2020 under the impact of the COVID-19 crisis, this was accompanied by a spike in price growth (at list prices), which drove positive sales growth.

Italy

- Stronger-than-expected hospital sector growth, mainly due to the significant price-driven growth in 2015-2016 due to hepatitis C drugs, resulted in the underestimation of forecast during the period 2016-2020. While price growth began moderating from 2017, the launch of innovative specialty drugs, boosted by the establishment of an annual €1 billion Innovative drug fund (IDF) in 2017, sustained price growth. The development of direct-to-patient distribution of Class A specialty drugs through hospital pharmacies, as part of regional cost-containment strategies, also provided a boost to the hospital sector.

- Faster-than-expected roll-out of and the availability of innovative drugs through the DPC channel and slow application of cost-controlling measures, like therapeutic equivalence, led to an underestimation of the market growth during the period 2016-2020.

- The overestimation of the forecast in 2020 occurred due to the sharp contraction seen in hospital volume as a result of the COVID-19 pandemic, caused by the postponement of non-urgent treatments as well as reduced patient flow in the retail and DPC sectors.

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Market Prognosis on selected Markets

Commentary

United Kingdom

- The slight overestimation in UK market growth can be attributed mainly to downward pressure on retail volume growth during 2017-2019, as the combined effects of NHS cost containment and medicines optimization measures worked through the system. Hospital volume growth slowed over the same period reflecting the impact of financial pressures on access to inpatient care, with waiting times for routine procedures in particular increasing rapidly.

- Growth in 2020 was marginally below expectations due to the COVID-19 pandemic, which negatively impacted volume growth as patient flow was reduced and procedures and non-urgent care were suspended.

Spain

- 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 contributed to the underestimation of the forecast in 2016-2020.

- Hospital sales growth in Spain has accelerated since 2015, driven by an improving macroeconomic environment as well as the introduction of new product launches.

- Retail sales grew strongly in 2016 mainly due to a lack of control on expenditure resulting from the political gridlock in late 2015 and 2016. A return to more modest and stable growth was witnessed in 2017-2019.

- The COVID-19 outbreak, however, brought volatility and unpredictability to the market. The pandemic had a major impact on hospital sales in 2020, leading to a contraction in volume as hospitals prioritized COVID-19 patients and postponed or cancelled routine procedures. However, the unexpected rapid uptake of telemedicine and alternative dispensing services led to an overall underestimation of market growth in 2020.

Canada

- Historically (pre-2016), sales growth in the Canadian pharmaceutical market has been curbed by high generic utilization and restrictive formulary listing criteria by both private and public payers. Higher than anticipated price growth in 2019, propelled by the launch and strong uptake of specialty drugs in the hospital sector, led to market sales growth expanding at a rate marginally above expectation in 2016-2020.

- During the onset of the COVID-19 pandemic in Canada in early 2020, the negative impact of the contagion on pharmaceutical demand was not anticipated to be significant because new daily cases remained low and manageable. However, the unforeseen resurgence of a larger, prolonged second wave of the pandemic from September led to a deceleration in overall 2020 sales growth. The unexpected magnitude of the negative COVID-19 impact and resulting lockdown restrictions slowed pharmaceutical demand for acute therapies and led to a drop in patient footfall in hospitals and delays in hospital procedures as well as lower uptake of newly-launched drugs.

Market Prognosis on selected Markets

Commentary

Brazil

- The 2016-2020 forecast indicates only a marginal underestimation. The minor difference can be attributed to various factors. The entry of a centrist government at the end of 2016, followed by a right-wing conservative government in 2019, both of which focused on cost-containment and a reduction in healthcare spending, led to a conservative five-year forecast. In addition, for the first time in decades, the Pharmaceutical Market Regulatory Agency (CMED) set maximum price increases above inflation in 2016. This unforeseen price adjustment led to stronger than expected sales growth in 2016. The economy recovered much quickly than anticipated in 2017-2018, driving strong private healthcare and out-of-pocket spending into 2019.

- The unexpected outbreak of the COVID-19 pandemic in 2020 disrupted the pharmaceutical market across the world. The resilient Brazilian pharmaceutical market grew strongly in 2020, however. The retail sector benefited most with pharmacies becoming the key points of care, as the institutional market focused on treating soaring COVID-19 patients and cancelled non-urgent appointments and surgeries. Growth in telemedicine and online also underpinned retail sales. Rx and OTC products related to COVID-19, as well as for vitamins and supplements, boosted sales growth in 2020. Stockpiling in hospitals and pharmacies in H1 2020 was a major contributor to sales growth. Supply chain disruptions were not as impactful as expected.

Appendix

Accuracy: Country/Channel Results
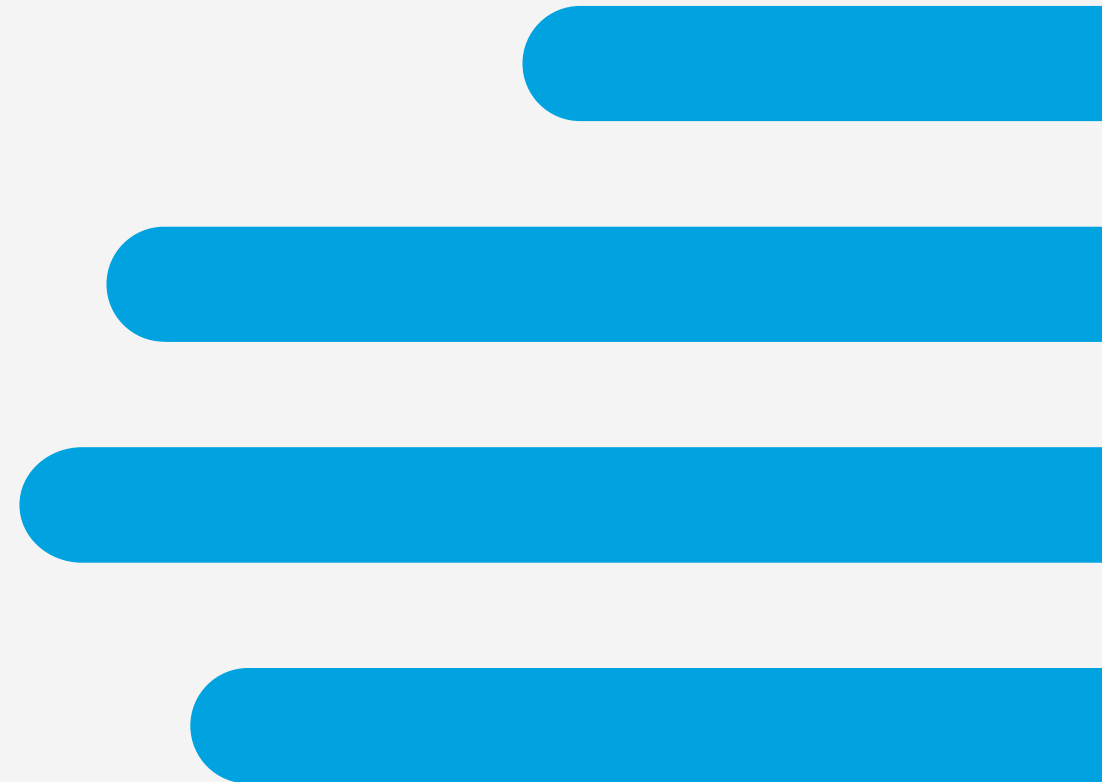
Validated Countries / Regions by Channel

(please use hyperlinks for navigation)

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

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

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

Combined (Sell-in)
+ Bosnia
+ 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 Africa
+ South Korea

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

Other (Sell-out)

Retail
+ France
+ Germany
+ Greece
+ United Kingdom

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

Hospital
+ Austria
+ Italy
+ United Kingdom

IQVIA

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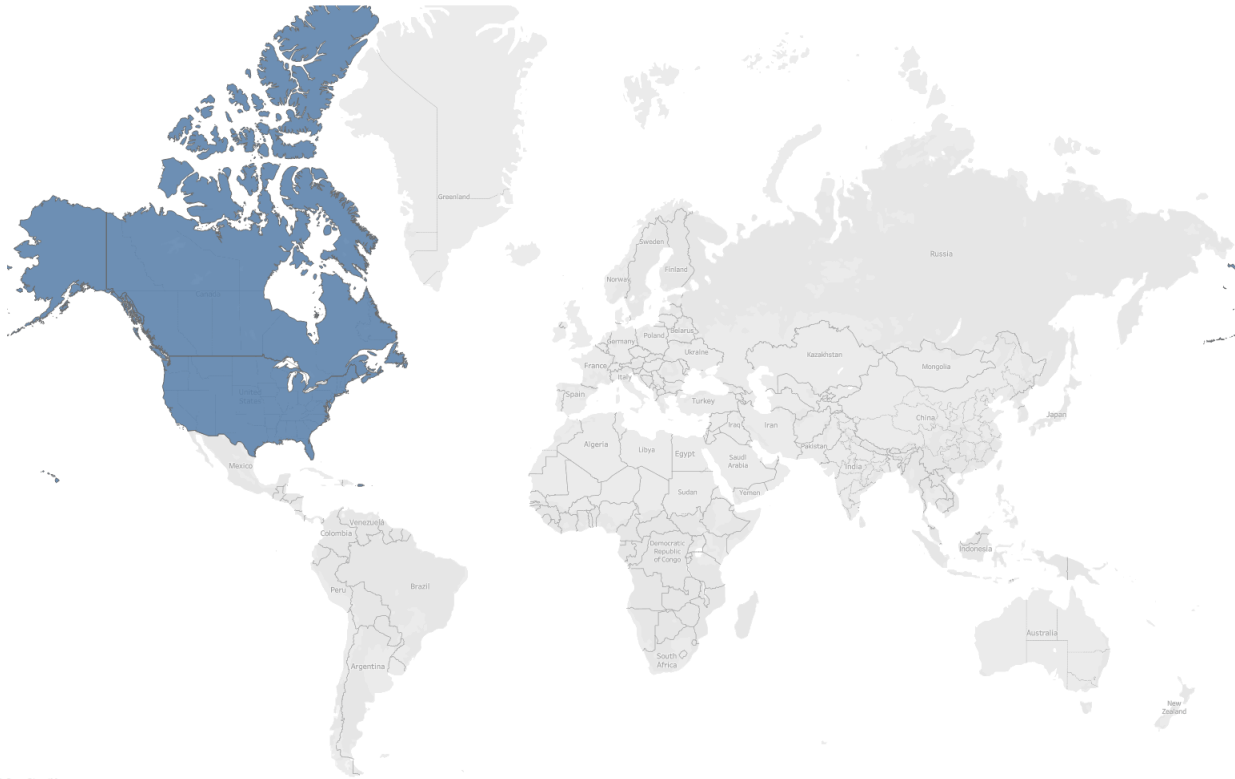
Countries
United States of America
Canada

IQVIA

USA Retail + Non-Retail Validation Study
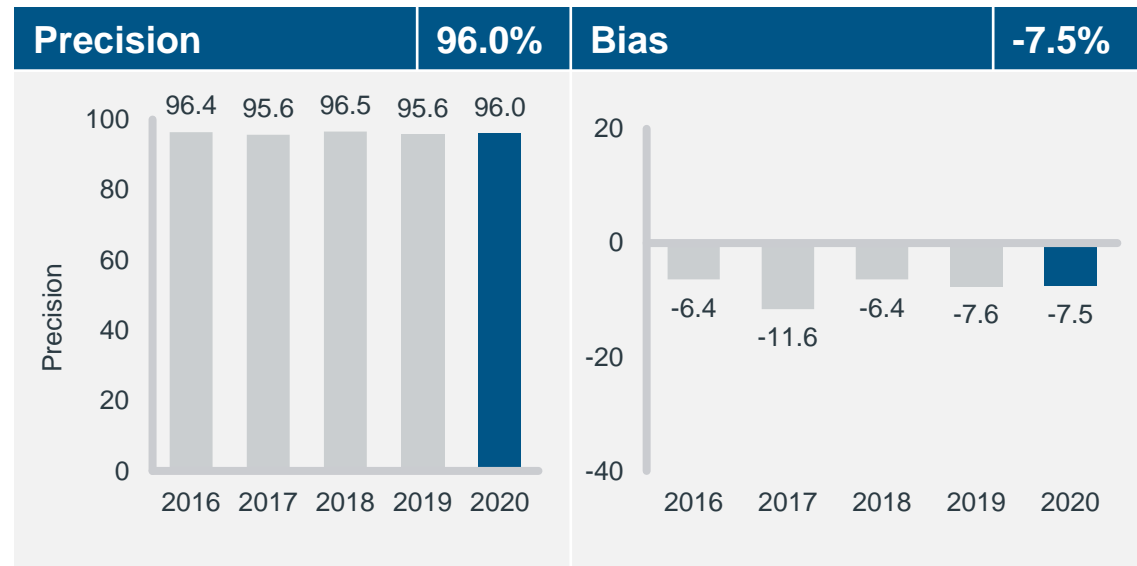
2020 Validation Study

Validation Results

| Precision | 96.0% | Bias | -7.5% |

Precision bar chart:
- 2016: 96.4
- 2017: 95.6
- 2018: 96.5
- 2019: 95.6
- 2020: 96.0

Bias bar chart:
- 2016: -6.4
- 2017: -11.6
- 2018: -6.4
- 2019: -7.6
- 2020: -7.5

Outcomes

- Overall precision index improved by 0.4 percentage points in 2020
- Overall underestimation improved by 0.1 percentage points in 2020
- Negative bias is expected due to supplier blocking of sales including federal government accounts and manufacturer-requested products and facilities

Distribution Channels Validated
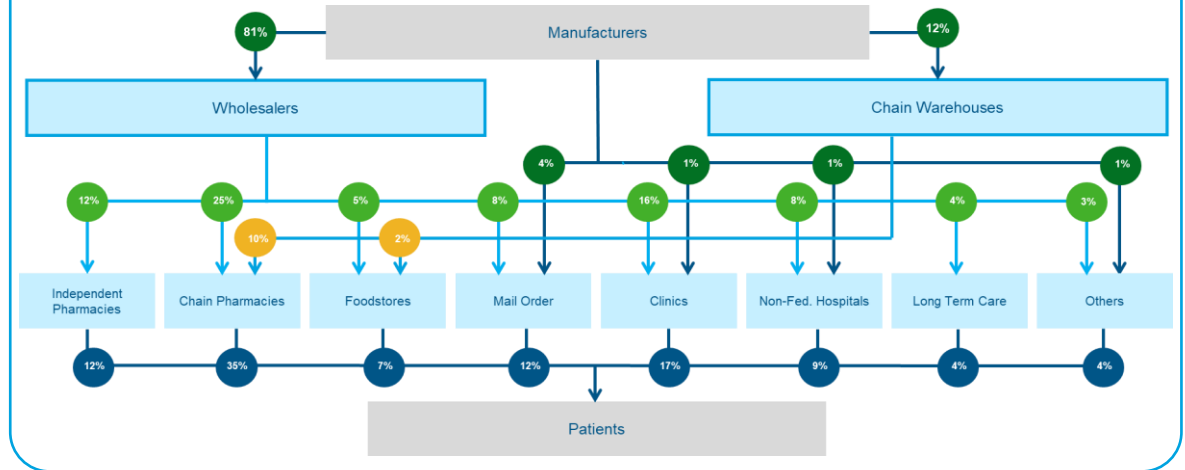
Participation

# Participating Companies	# Forms Validated	% Market Validated
77 (+6 vPY)	1,321 (+21 vPY)	81% (-2% Vpy)

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Canada Retail Validation Study
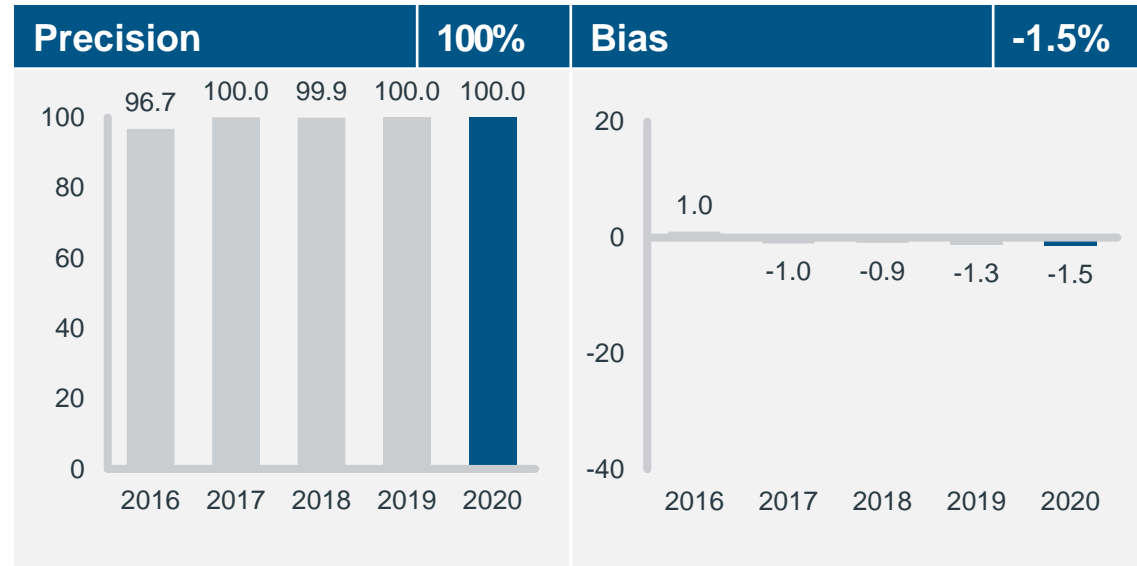
2020 Validation Study

Validation Results

Precision	100%	Bias	-1.5%

Precision bar chart: 2016: 96.7, 2017: 100.0, 2018: 99.9, 2019: 100.0, 2020: 100.0

Bias chart: 2016: 1.0, 2017: -1.0, 2018: -0.9, 2019: -1.3, 2020: -1.5

Outcomes

- Overall precision index remained unchanged in 2020
- Overall underestimation increased by 0.2 percentage points in 2020
- Improve the sample coverage for the Drugstore panel

Distribution Channels Validated

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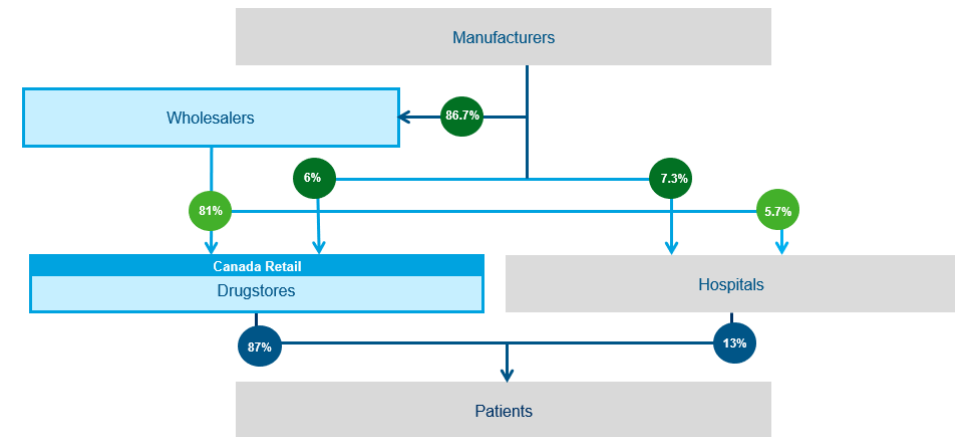
Participation

# Participating Companies	# Forms Validated	% Market Validated
259 *(+1 vPY)*	6,096 *(-119 vPY)*	95% *(no change vPY)*

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Canada OTC Validation Study
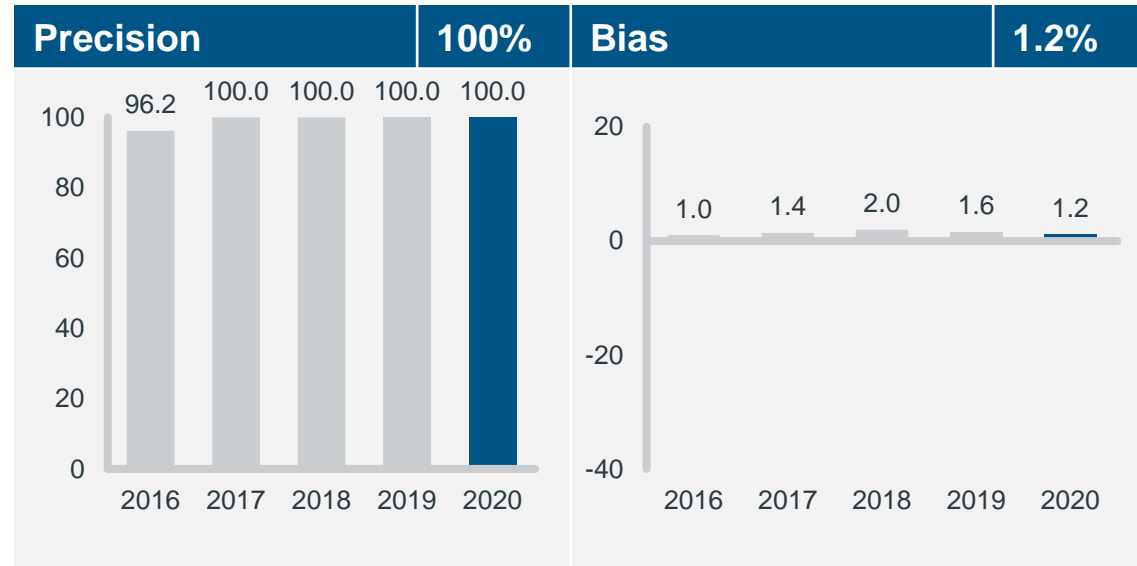
2020 Validation Study

Validation Results

Precision	100%	Bias	1.2%

Precision chart (2016–2020): 96.2, 100.0, 100.0, 100.0, 100.0

Bias chart (2016–2020): 1.0, 1.4, 2.0, 1.6, 1.2

Outcomes

- Overall precision index remained unchanged at 100% in 2020
- Overall underestimation improved by 0.4 percentage points in 2020
- Improve the sample coverage for the Drugstore panel

Distribution Channels Validated

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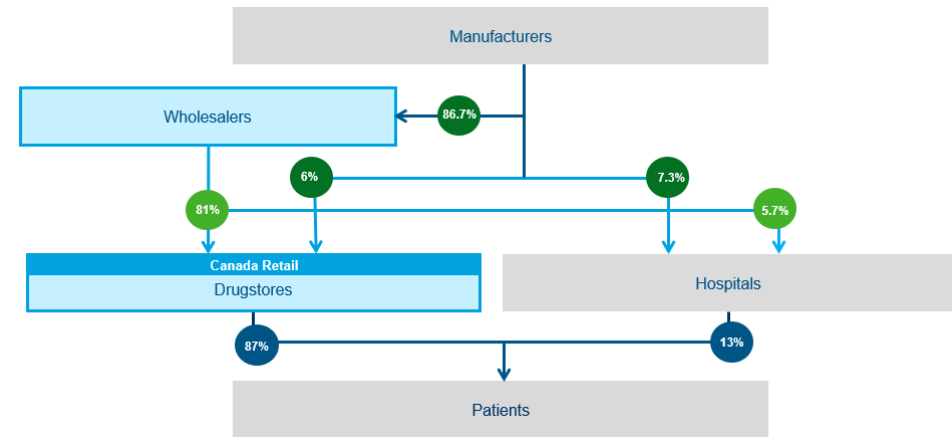
Participation

# Participating Companies	# Forms Validated	% Market Validated
165 *(-1 vPY)*	**2,835** *(-194 vPY)*	**100%** *(no change vPY)*

Canada Hospital Validation Study

2020 Validation Study

Validation Results

Precision	100%	Bias	0.3%

Precision bar chart: 2016: 99.8, 2017: 100.0, 2018: 100.0, 2019: 100.0, 2020: 100.0

Bias chart: 2016: 0.4, 2017: -0.1, 2018: -0.2, 2019: 0.0, 2020: 0.3
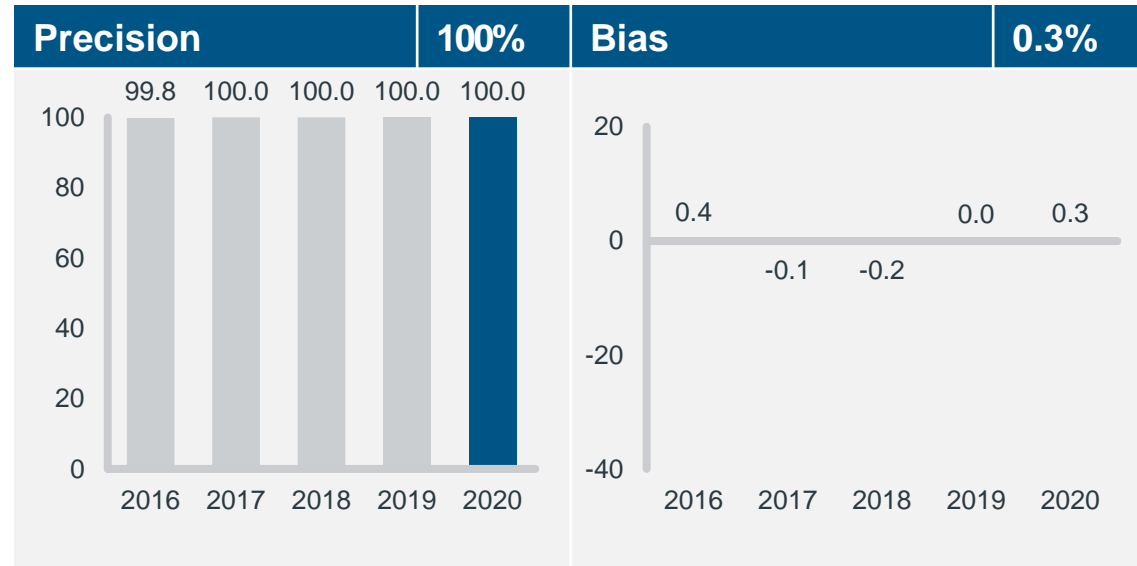
Outcomes

- Overall precision index remained unchanged in 2020
- Overall bias turned from no bias to 0.3% overestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

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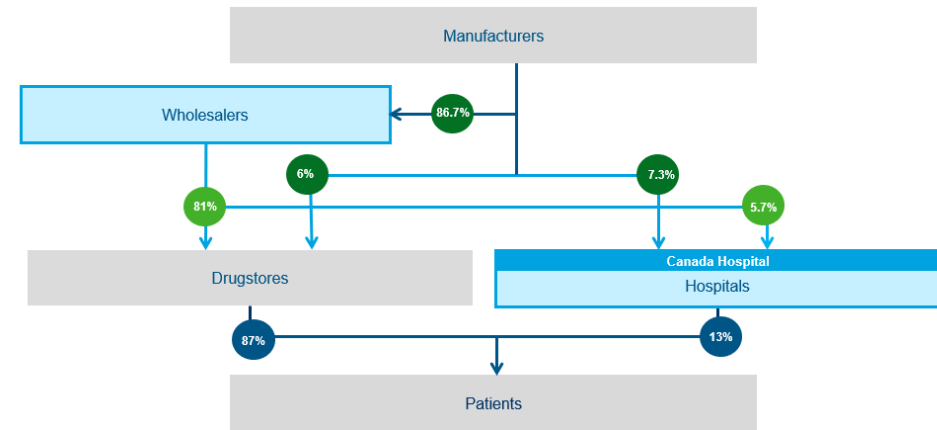
Participation

# Participating Companies	# Forms Validated	% Market Validated
120 (+2 vPY)	**1,177** (-22 vPY)	**95%** (no change vPY)

Latin America
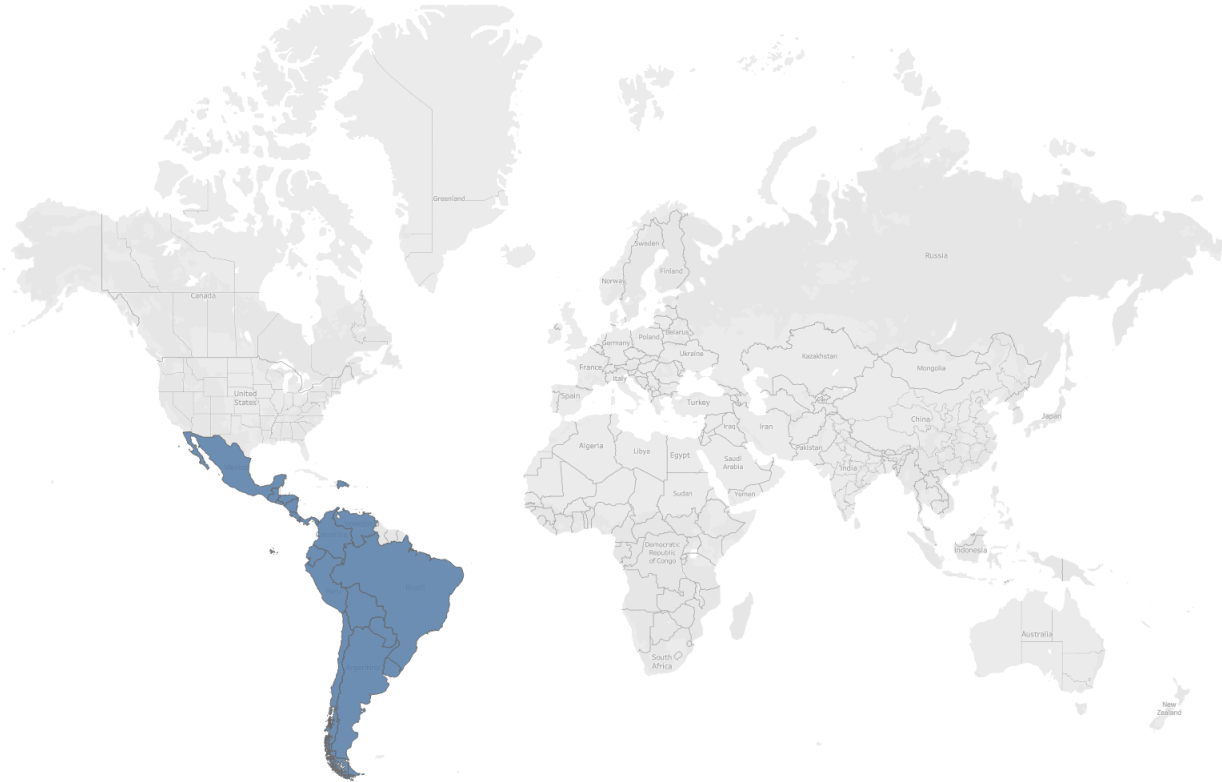
Countries

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

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IQVIA

Argentina Retail Validation Study
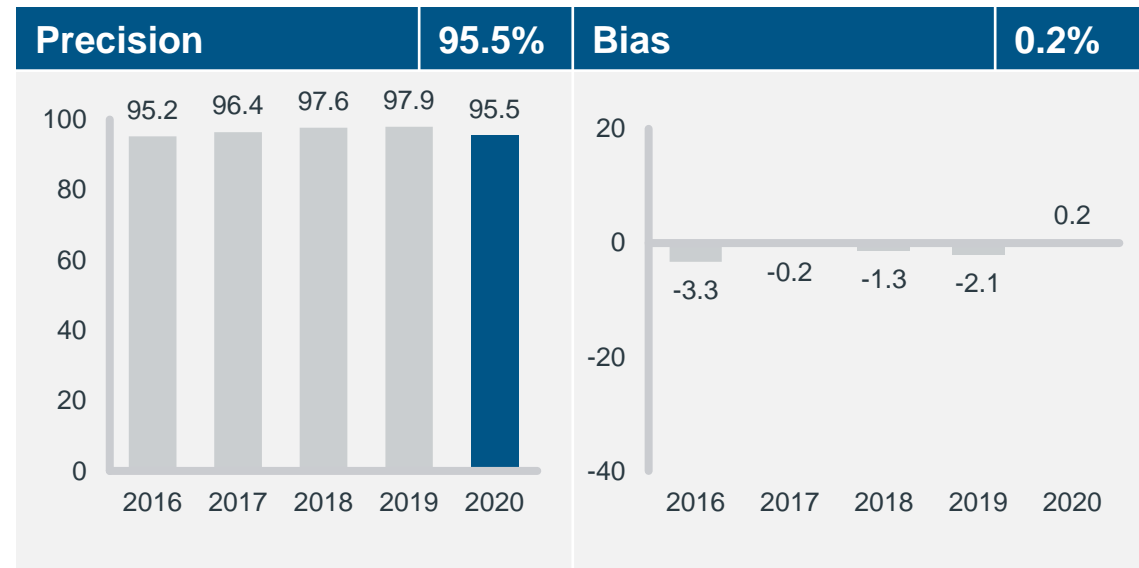
2020 Validation Study

Validation Results

Precision	95.5%	Bias	0.2%

Precision chart:
- 2016: 95.2
- 2017: 96.4
- 2018: 97.6
- 2019: 97.9
- 2020: 95.5

Bias chart:
- 2016: -3.3
- 2017: -0.2
- 2018: -1.3
- 2019: -2.1
- 2020: 0.2

Outcomes
- Overall precision index declined by 2.4 percentage points in 2020
- Overall bias turned from 2.1% underestimation in 2019 to 0.2% overestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 80%
- 2%, 3%, 1%, 13%, 1%
- Independent Pharmacies 58%
- Chain Pharmacies 19%
- Private Institutions 2%
- Public Institutions <1%
- Others* <1%
- Argentina Retail
- Independent Pharmacies → Patients 60%
- Chain Pharmacies → Patients 22%
- Private Institutions → Patients 4%
- Public Institutions → Patients 13%
- Others → Patients 1%
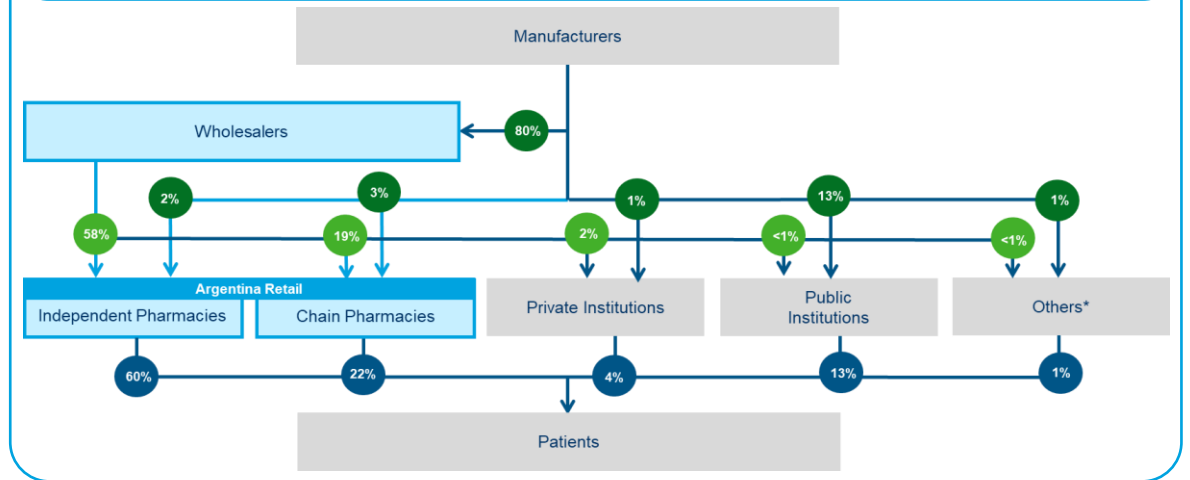
Participation

# Participating Companies	# Forms Validated	% Market Validated
37 *(+12 vPY)*	**1,939** *(+319 vPY)*	**47%** *(+11% vPY)*

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Argentina OTC Validation Study

2020 Validation Study

Validation Results

| Precision | 81.8% | Bias | -8.9% |

Precision chart (2016–2020): 79.0, 89.7, 85.6, 91.3, 81.8

Bias chart (2016–2020): -16.4, -4.6, -3.1, -6.3, -8.9
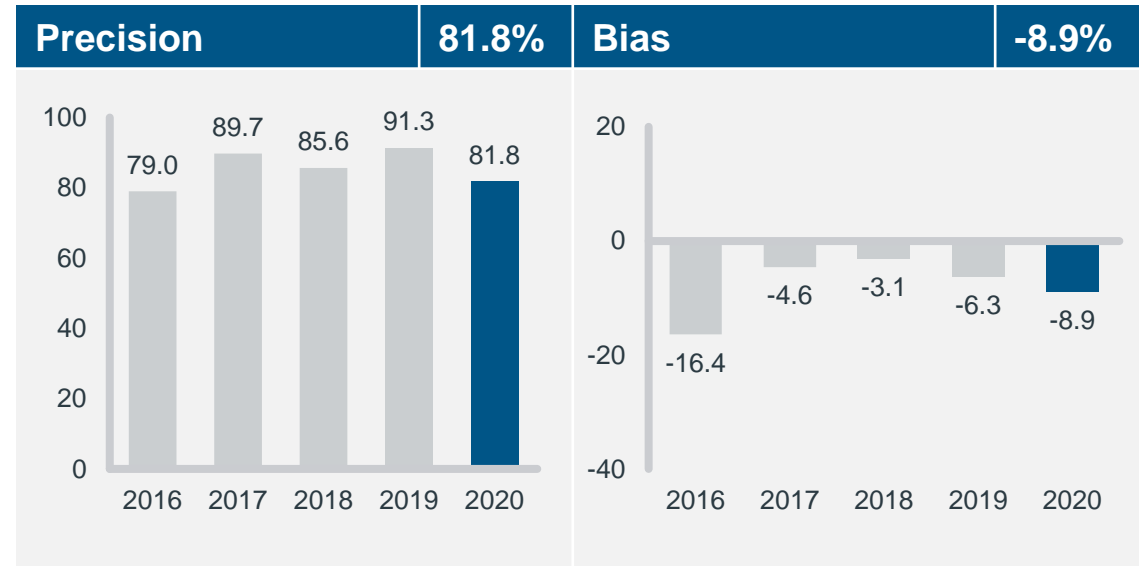
Outcomes
- Overall precision index declined by 9.5 percentage points in 2020
- Overall underestimation increased by 2.6 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 80%, Private Institutions 1%, Public Institutions 13%, Others* 1%

Wholesalers → Independent Pharmacies 58%, Chain Pharmacies 19%, Private Institutions 2%, Public Institutions <1%, Others* <1%

Independent Pharmacies 2%, Chain Pharmacies 3%

Independent Pharmacies → Patients 60%, Chain Pharmacies → Patients 22%, Private Institutions → Patients 4%, Public Institutions → Patients 13%, Others* → Patients 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
22 (+7 vPY)	**249** (+80 vPY)	**41%** (+23% vPY)

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Bolivia Retail Validation Study

2020 Validation Study

Validation Results

Precision	60.2%	Bias	-24.2%

Precision (chart):
- 2016: 49.5
- 2017: 53.6
- 2018: 56.3
- 2019: 53.8
- 2020: 60.2

Bias (chart):
- 2016: -23.8
- 2017: -20.4
- 2018: -23.0
- 2019: -25.5
- 2020: -24.2
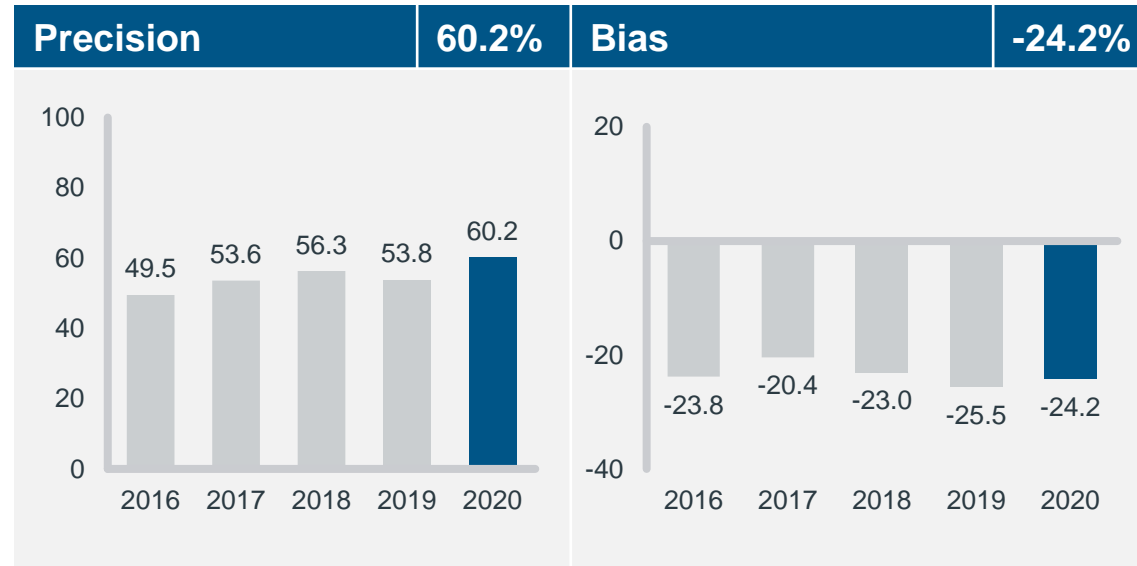
Outcomes
- Overall precision index improved by 6.4 percentage points in 2020
- Overall underestimation improved by 1.3 percentage points in 2020
- Fulfill the sample design

Distribution Channels Validated

Manufacturers

- 41% → Independent Pharmacies*
- 42% → Chains
- 6% → Private Institutions
- 5% → Public Institutions
- 7% → Others

- 41%
- 42%
- 6% → Patients
- 5%
- 7%

83% Market covered by IQVIA

Participation

# Participating Companies	# Forms Validated	% Market Validated
46 (+7 vPY)	**1,423** (-198 vPY)	**52%** (-7% vPY)

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Brazil Retail Validation Study

2020 Validation Study

Validation Results

Precision	87.8%	Bias	-3.8%

Precision chart:
- 2016: (no value)
- 2017: (no value)
- 2018: 94.3
- 2019: 93.8
- 2020: 87.8

Bias chart:
- 2016: (no value)
- 2017: (no value)
- 2018: -1.8
- 2019: -1.5
- 2020: -3.8
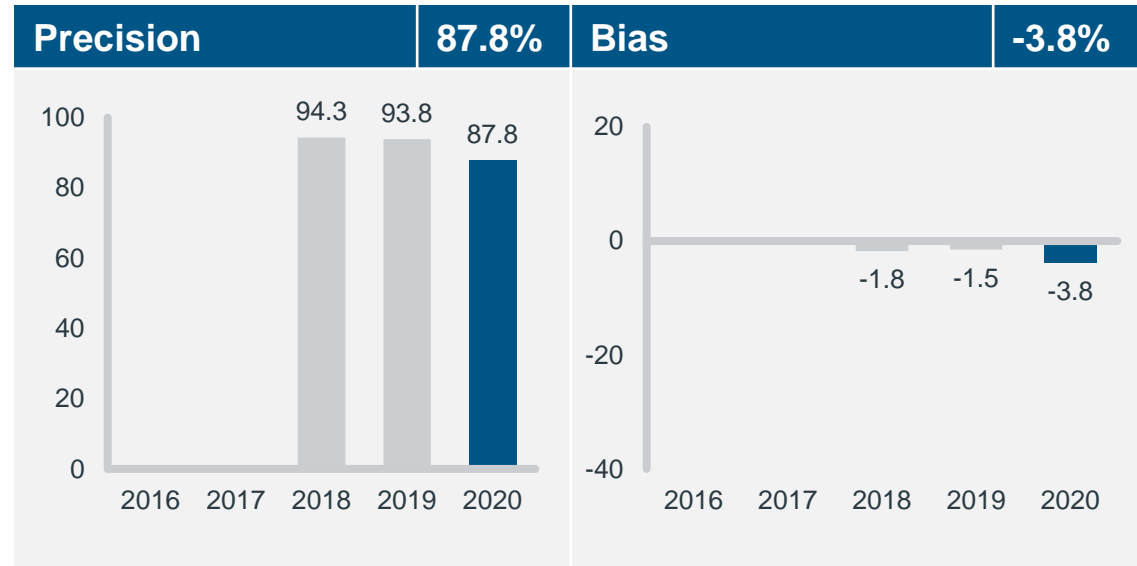
Outcomes

- Overall precision index declined by 6.0 percentage points in 2020
- Overall underestimation increased by 2.3 percentage points in 2020
- Identify and correct bridging factors

Distribution Channels Validated

Manufacturers → Chain Warehouse (10%), Wholesalers / Distributors (59%)
Wholesalers / Distributors → Chain Warehouse (17%)
Chain Warehouse → Chain Pharmacies (27%), (1%)
(16%), (29%), (24%), (2%), (<1%)
Brazil Retail, Brazil Retail PPP: Chain Pharmacies, Independent Pharmacies
Brazil Non-Retail: Non-Retail
Others
Chain Pharmacies → Patients (27%)
Independent Pharmacies → Patients (17%)
Non-Retail → (53%)
Others → (3%)

Participation

# Participating Companies	# Forms Validated	% Market Validated
27 (+7 vPY)	**1,266** (-40 vPY)	**15%** (no change vPY)

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Brazil OTC Validation Study

2020 Validation Study

Validation Results

Precision	78.2%	Bias	-11.1%

Precision chart: 2016, 2017, 2018 (91.6), 2019 (96.1), 2020 (78.2)

Bias chart: 2016, 2017, 2018 (-4.1), 2019 (-1.1), 2020 (-11.1)
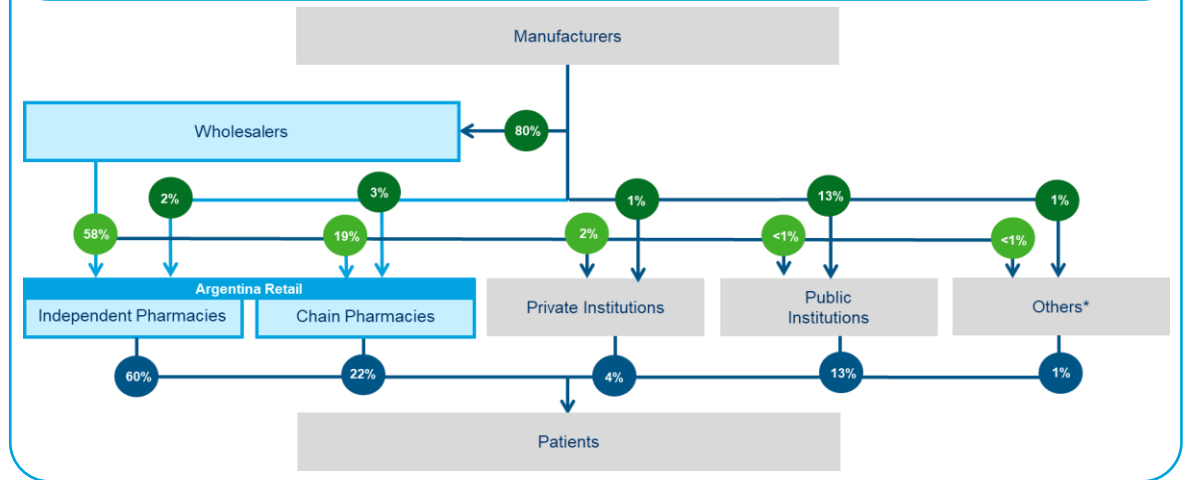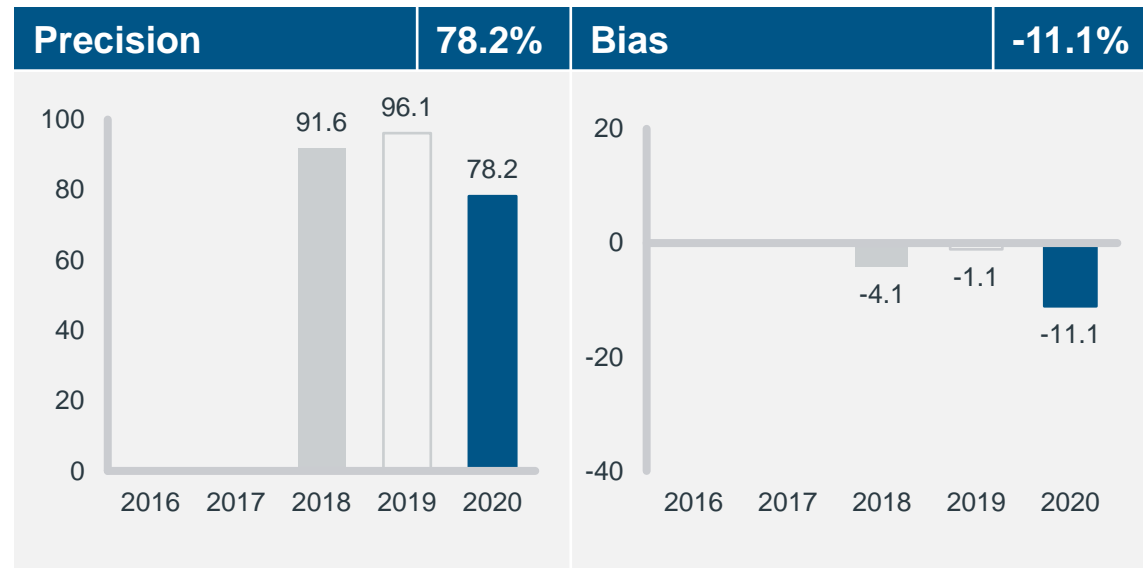
Outcomes

- Overall precision index declined by 17.9 percentage points in 2020
- Overall underestimation increased by 10.0 percentage points in 2020
- Identify and correct bridging factors

Distribution Channels Validated

Manufacturers

- 10% → Chain Warehouse
- 59% → Wholesalers / Distributors
- 17% Wholesalers/Distributors → Chain Warehouse
- 27% Chain Warehouse → Brazil Retail
- 1%
- 16%
- 29%
- <1%
- 24%
- 2%

Brazil Retail, Brazil Retail PPP: Chain Pharmacies, Independent Pharmacies

Brazil Non-Retail: Non-Retail, Others
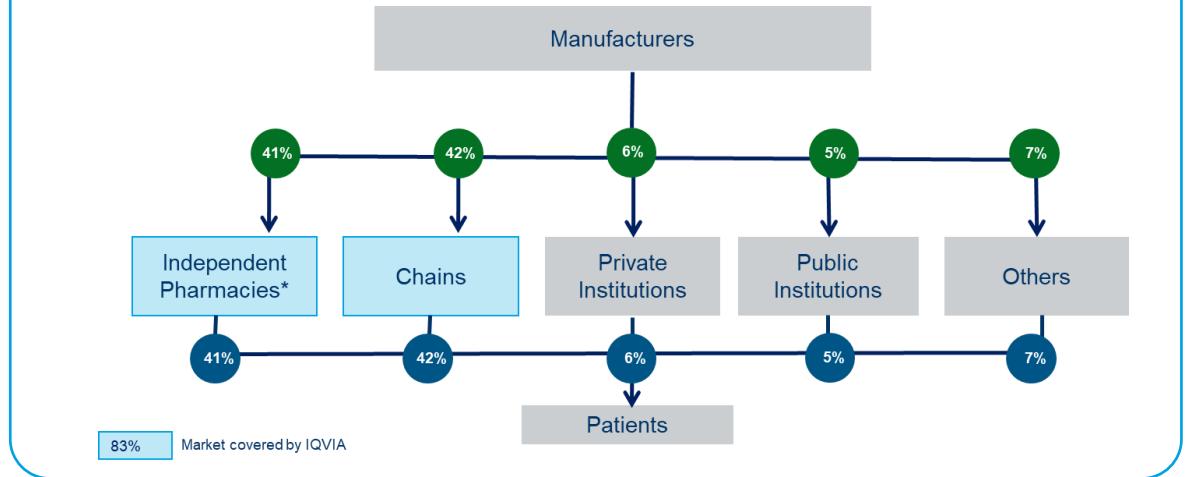
- Chain Pharmacies 27% → Patients
- Independent Pharmacies 17% → Patients
- Non-Retail 53% → Patients
- Others 3%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
18 (+4 vPY)	252 (+63 vPY)	10% (+4% vPY)

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Central America Retail Validation Study

2020 Validation Study

Validation Results

Precision	91.2%	Bias	-4.2%

Precision (chart, %):
- 2016: 89.5
- 2017: 84.5
- 2018: 88.3
- 2019: 94.6
- 2020: 91.2

Bias (chart, %):
- 2016: -4.0
- 2017: -4.8
- 2018: -8.9
- 2019: -2.3
- 2020: -4.2
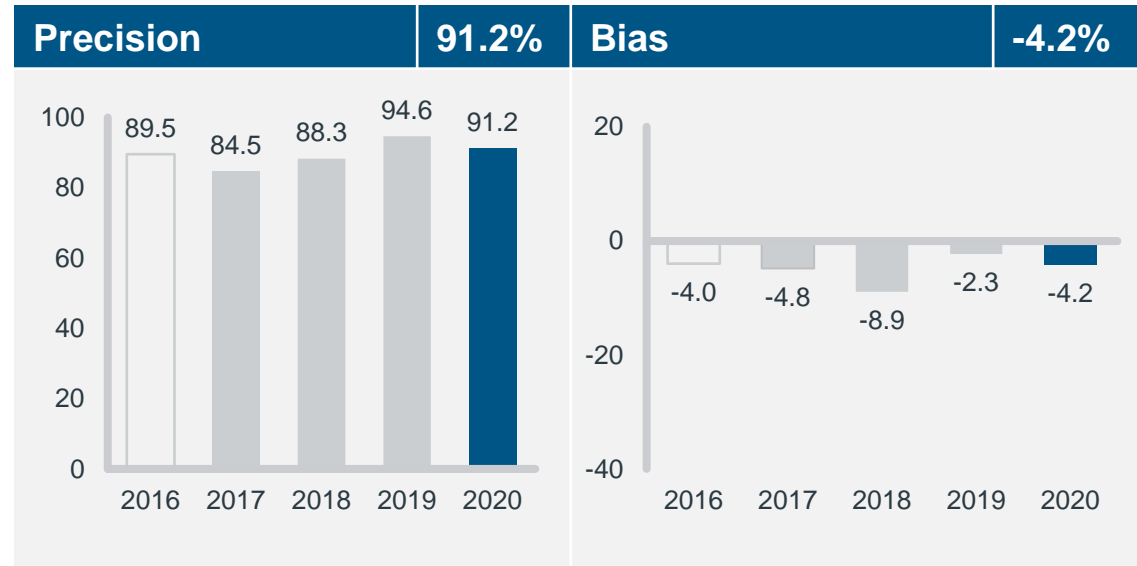
Outcomes
- Overall precision index declined by 3.4 percentage points in 2020
- Overall underestimation increased by 1.9 percentage points in 2020
- Explore new projection structure after channel survey
- Increase validated market share

Distribution Channels Validated

Manufacturers

Wholesalers — 75%

- 18%
- 59%
- 2%
- 9%
- 2%
- 3%
- 3%
- 4%

C. America Retail — Private Pharmacies

Government Institutions

Clinics/Hospitals

Others

- 77%
- 11%
- 5%
- 7%

Patients

Participation

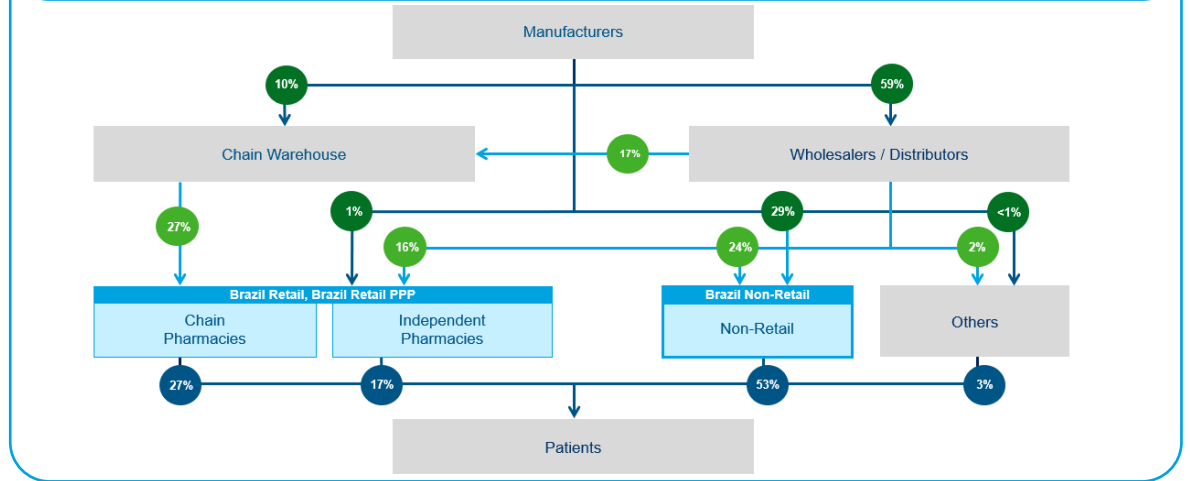| # Participating Companies	# Forms Validated	% Market Validated
16 (+2 vPY)	977 (+173 vPY)	14% (+3% vPY)

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IQVIA

Chile Retail Validation Study

2020 Validation Study

Validation Results

Precision	75.3%	Bias	-2.4%

Precision bar chart (2016–2020):
- 2016: 92.4
- 2017: 89.7
- 2018: 96.3
- 2019: 91.7
- 2020: 75.3

Bias bar chart (2016–2020):
- 2016: -6.9
- 2017: -5.7
- 2018: 0.3
- 2019: 2.9
- 2020: -2.4
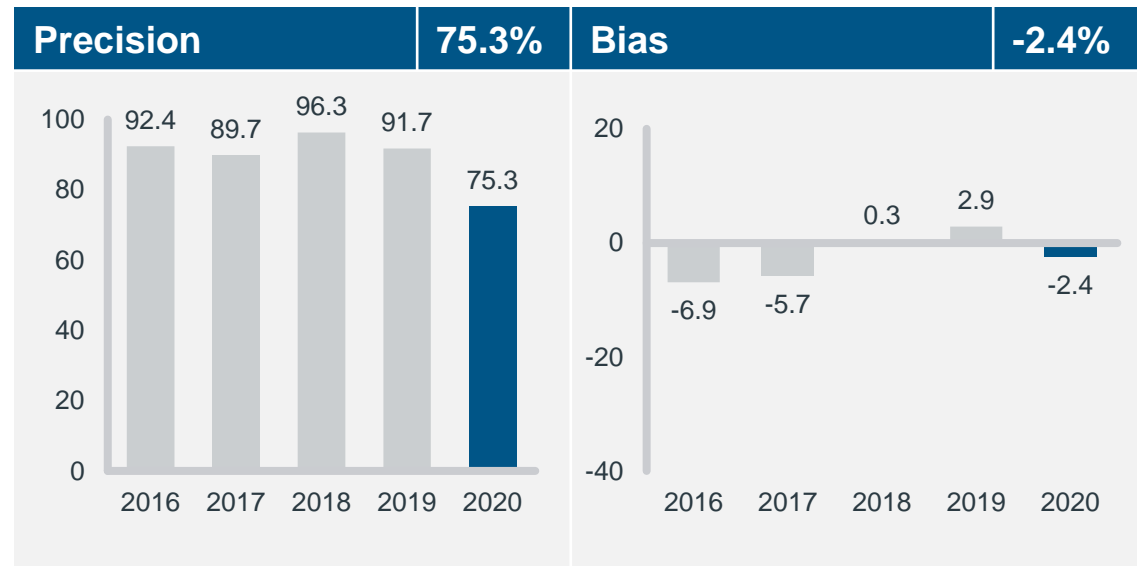
Outcomes

- Overall precision index declined by 16.4 percentage points in 2020
- Overall bias turned from 2.9% overestimation in 2019 to 2.4% underestimation in 2020
- Review internal processes

Distribution Channels Validated

Manufacturers → Wholesalers 7%
Wholesalers → Chile Retail Pharmacies 4%, → Government 87%, <1%, → Private Institutions 13%, 2%, → Others 10%, 3%, 1%
Chile Retail Pharmacies → Patients 71%
Government → Patients 13%
Private Institutions → Patients 12%
Others → Patients 4%
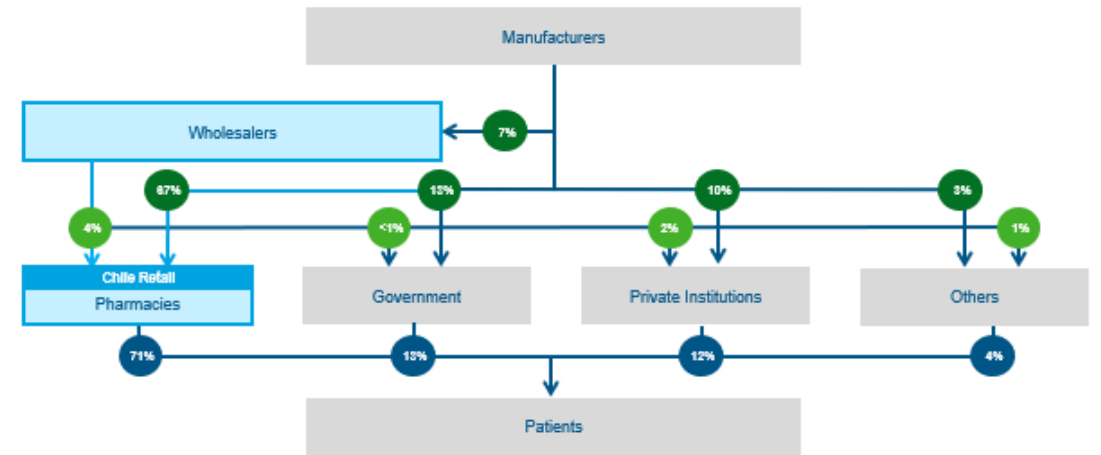
Participation

# Participating Companies	# Forms Validated	% Market Validated
9 (-4 vPY)	**555** (-9 vPY)	**11%** (no change vPY)

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Colombia Retail Validation Study
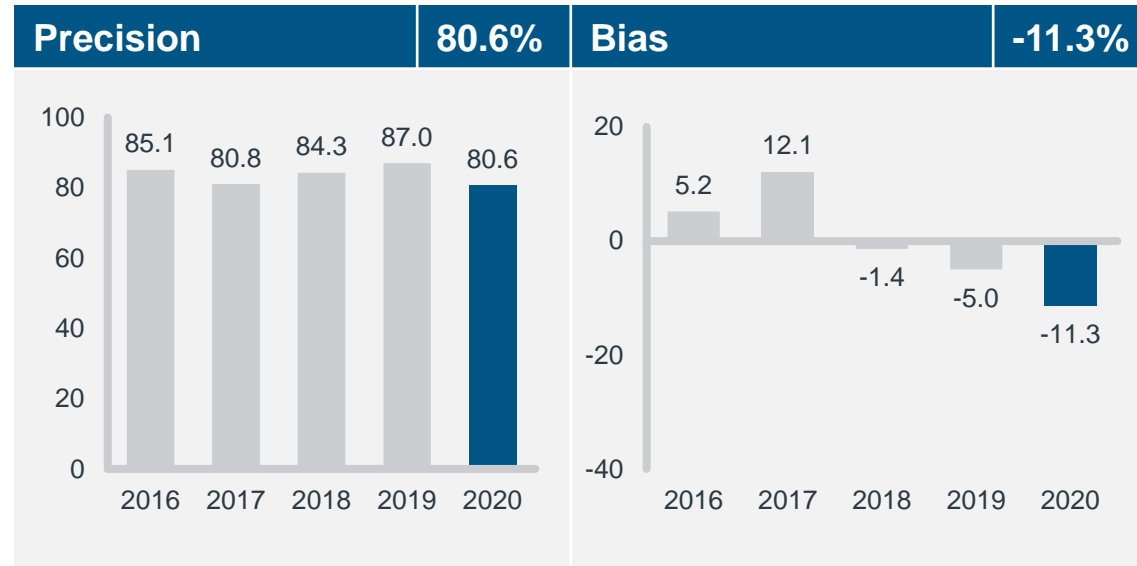
2020 Validation Study

Validation Results

Precision	80.6%	Bias	-11.3%

Precision chart: 2016: 85.1, 2017: 80.8, 2018: 84.3, 2019: 87.0, 2020: 80.6

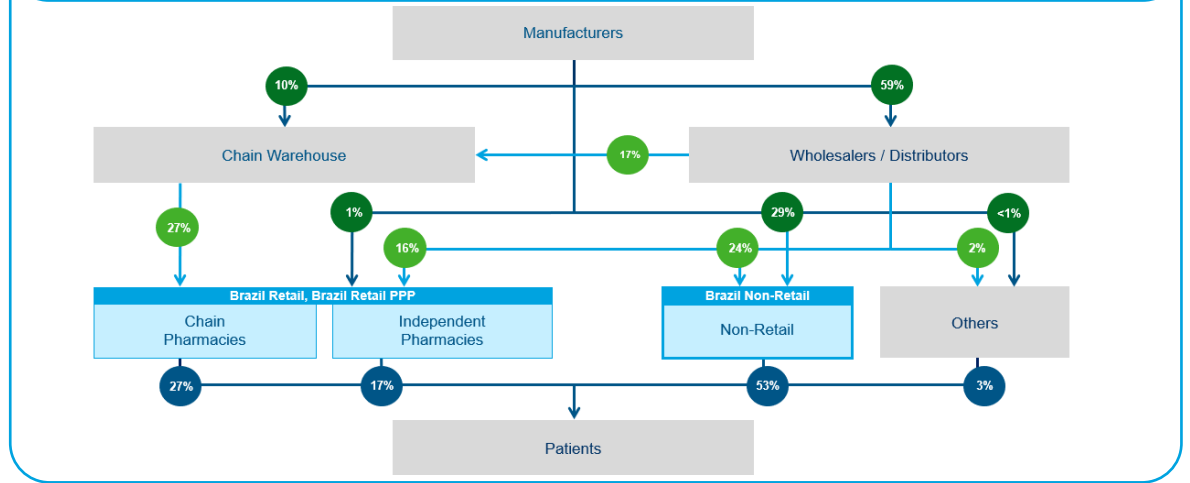Bias chart: 2016: 5.2, 2017: 12.1, 2018: -1.4, 2019: -5.0, 2020: -11.3

Outcomes

- Overall precision index declined by 6.4 percentage points in 2020
- Overall underestimation increased by 6.3 percentage points in 2020
- Review PMC scope & define the retail channels to be audited by PMC

Distribution Channels Validated

Participation

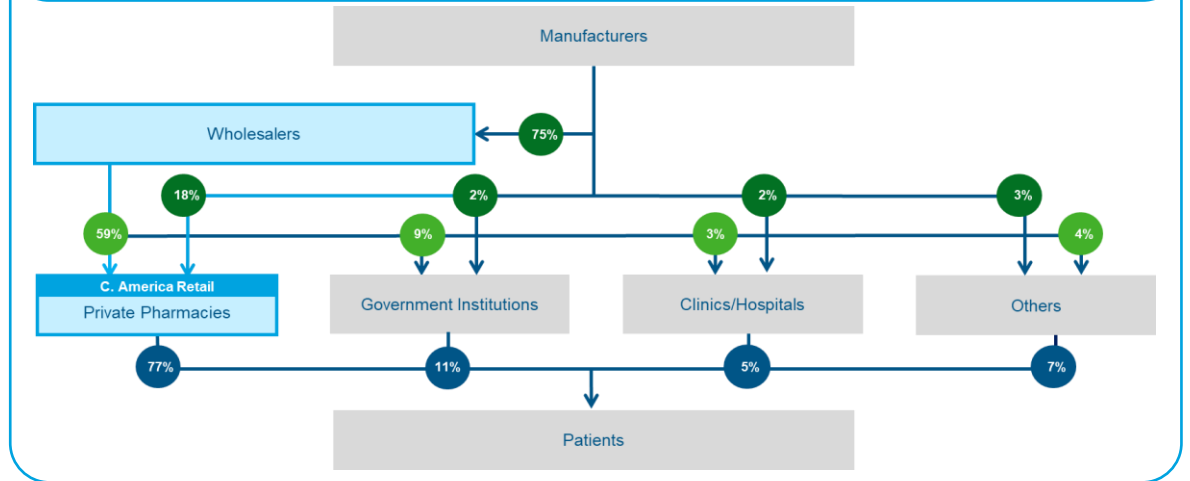| # Participating Companies	# Forms Validated	% Market Validated
29 *(-3 vPY)*	**1,127** *(-120 vPY)*	**26%** *(-2% vPY)*

Dominican Republic Retail Validation Study

2020 Validation Study

Validation Results

Precision	92.9%	Bias	-2.2%

Precision bars: 91.6 (2016), 80.7 (2017), 80.9 (2018), 85.5 (2019), 92.9 (2020)

Bias bars: -0.9 (2016), -4.8 (2017), -6.4 (2018), -8.5 (2019), -2.2 (2020)
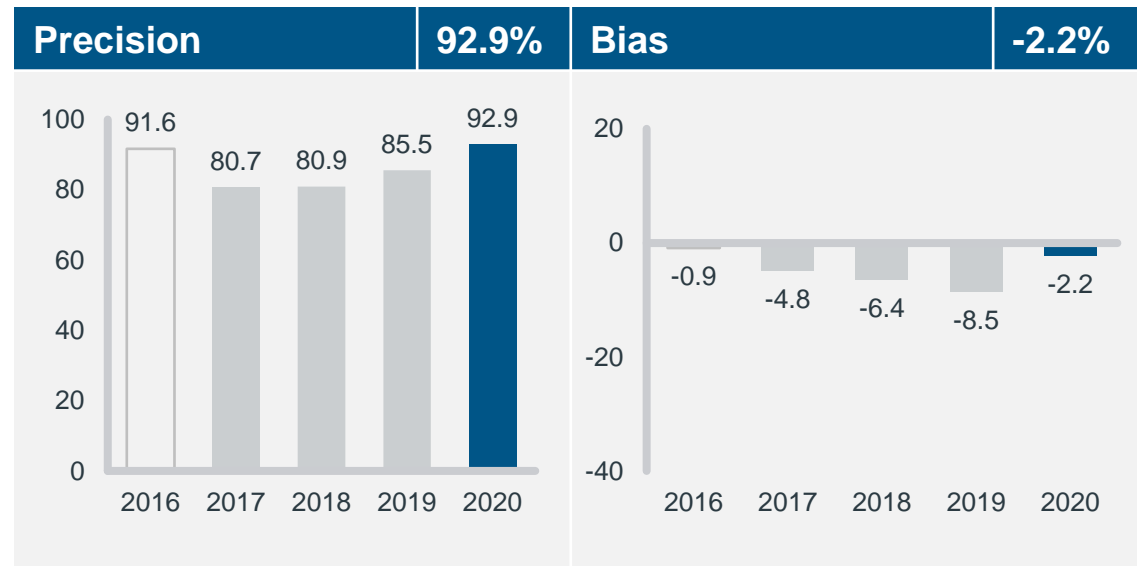
Outcomes

- Overall precision index improved by 7.4 percentage points in 2020
- Overall underestimation improved by 6.3 percentage points in 2020
- Increase validated market share

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
13 *(-1 vPY)*	**740** *(+99 vPY)*	**11%** *(+1% vPY)*

Ecuador Retail Validation Study

2020 Validation Study

Validation Results

Precision	91.7%	Bias	-4.0%

Precision chart (2016–2020): 94.0, 94.1, 91.3, 92.9, 91.7
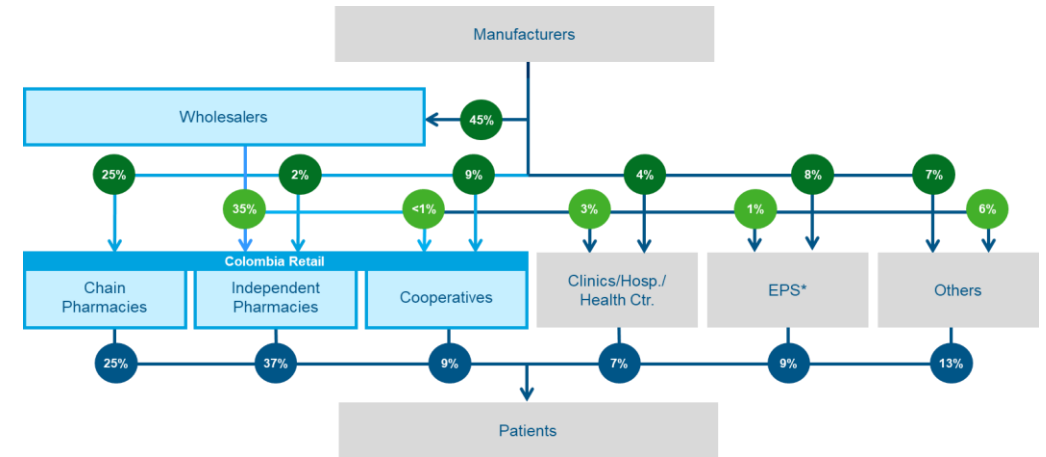
Bias chart (2016–2020): -3.6, -1.3, -2.7, -2.5, -4.0
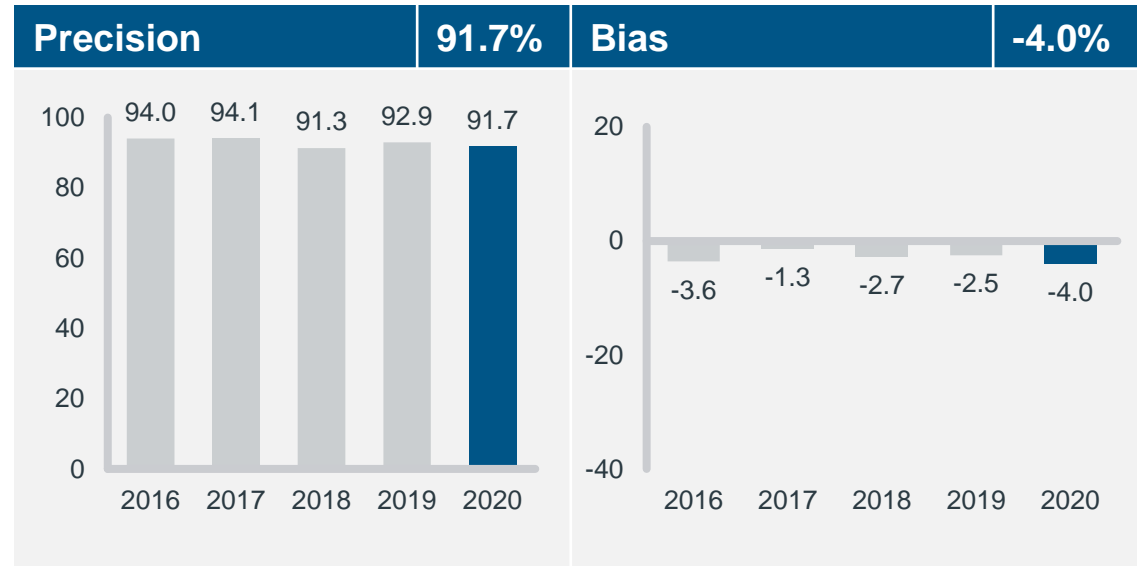
Outcomes

- Overall precision index declined by 1.2 percentage points in 2020
- Overall underestimation increased by 1.5 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 73%, 14%, 8%, 2%, 3%
Wholesalers → 61%, 7%, 3%, 2%
Ecuador Retail Pharmacies 75%, Public Institutions 15%, Private Institutions 5%, Others 5%

Participation

# Participating Companies	# Forms Validated	% Market Validated
44 *(-5 vPY)*	**1,769** *(+38 vPY)*	**55%** *(+2% vPY)*

IQVIA

Mexico Retail Validation Study

2020 Validation Study

Validation Results

Precision	83.9%	Bias	-5.4%

Precision (bar chart):
- 2016: 90.3
- 2017: 85.2
- 2018: 87.0
- 2019: 80.7
- 2020: 83.9

Bias (bar chart):
- 2016: -8.0
- 2017: -9.3
- 2018: -4.7
- 2019: -13.5
- 2020: -5.4
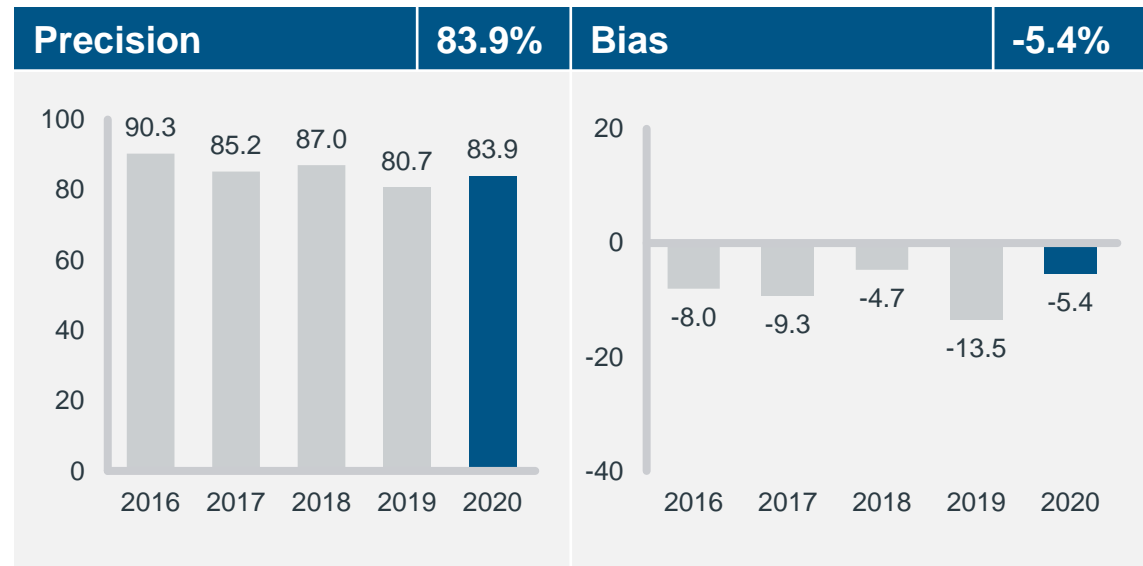
Outcomes
- Overall precision index improved by 3.2 percentage points in 2020
- Overall underestimation improved by 8.1 percentage points in 2020
- Update projection structure

Distribution Channels Validated

Participation

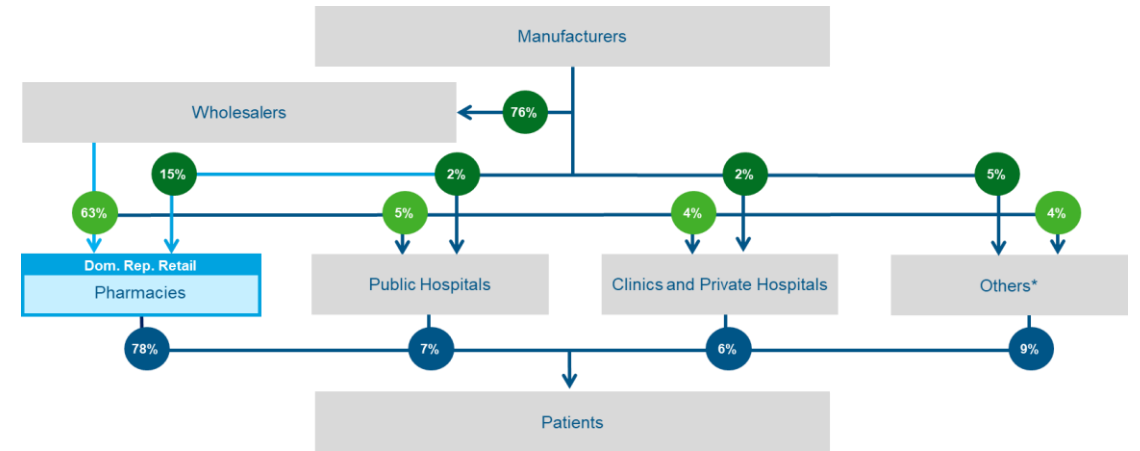| # Participating Companies	# Forms Validated	% Market Validated
34 *(+5 vPY)*	**987** *(+25 vPY)*	**14%** *(no change vPY)*

Mexico OTC Validation Study
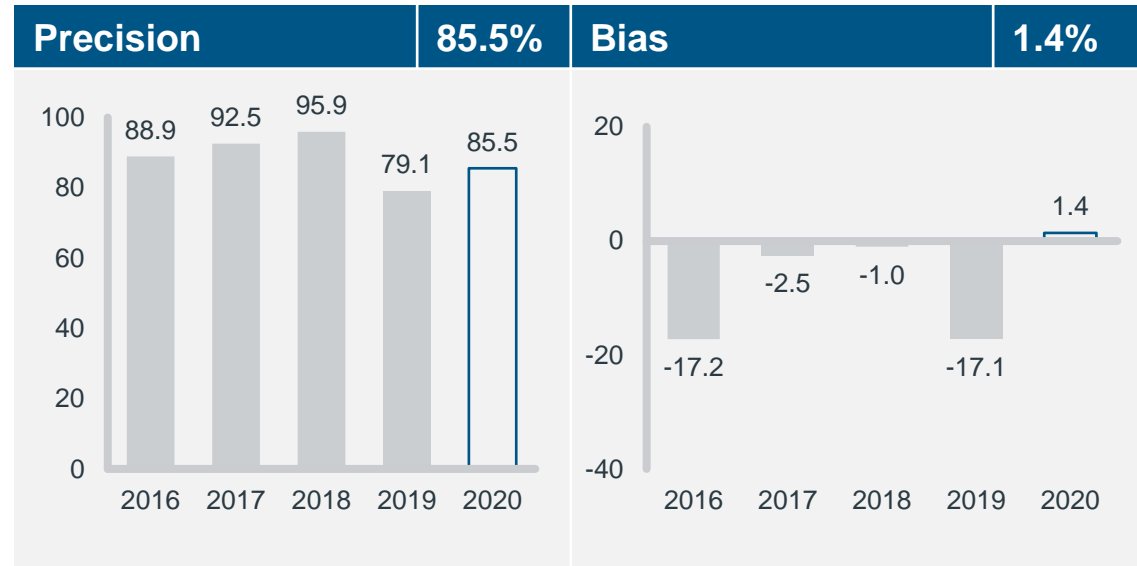
2020 Validation Study

Validation Results

Precision	85.5%	Bias	1.4%

Precision chart (2016-2020): 88.9, 92.5, 95.9, 79.1, 85.5

Bias chart (2016-2020): -17.2, -2.5, -1.0, -17.1, 1.4

Outcomes

- Overall precision index declined by 6.4 percentage points in 2020
- Overall bias turned from 17.1% underestimation in 2019 to 1.4% overestimation in 2020
- Update projection structure

Distribution Channels Validated
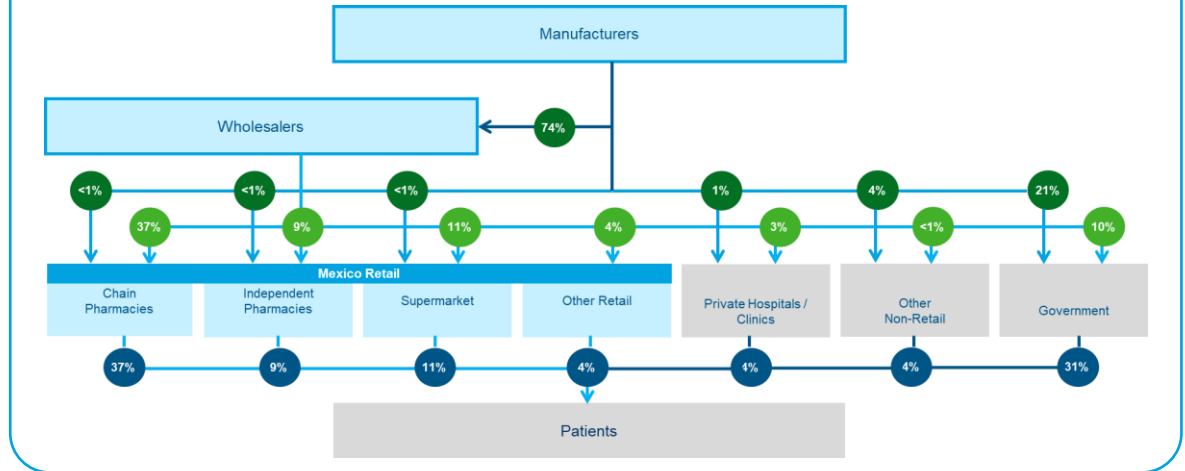
Participation

# Participating Companies	# Forms Validated	% Market Validated
12 (+3 vPY)	**116** (-40 vPY)	**7%** (-3 vPY)

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Paraguay Retail Validation Study

2020 Validation Study

Validation Results

Precision	41.9%	Bias	-26.1%

Precision values by year:
- 2016: 61.5
- 2017: 60.7
- 2018: 58.1
- 2019: 46.2
- 2020: 41.9

Bias values by year:
- 2016: -20.6
- 2017: -31.1
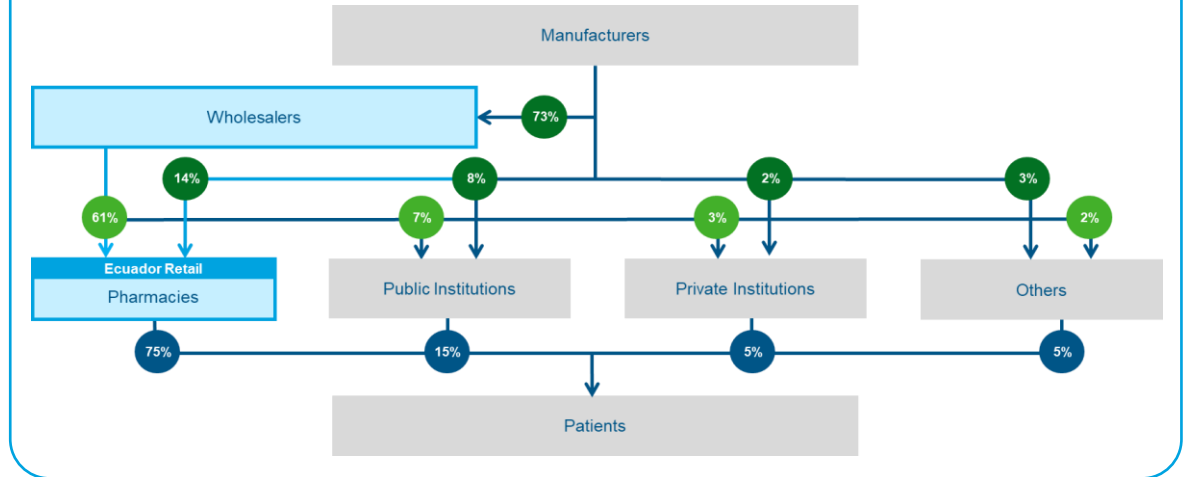- 2018: -35.9
- 2019: -29.9
- 2020: -26.1
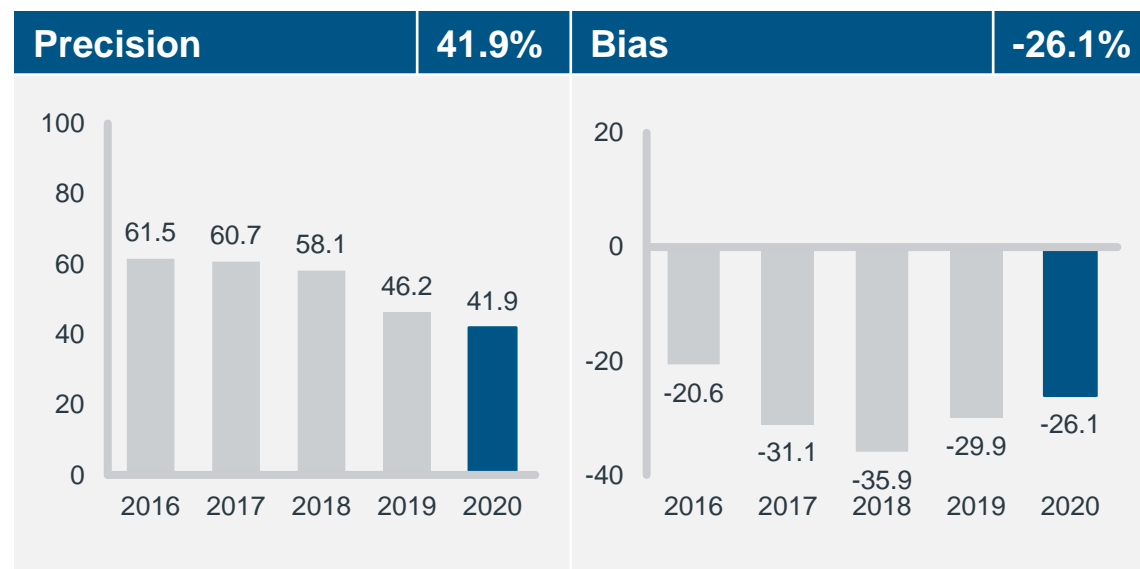
Outcomes

- Overall precision index declined by 4.3 percentage points in 2020
- Overall underestimation improved by 3.8 percentage points in 2020
- Review internal processes
- Fulfil sample design
- Increase chain and independent pharmacy panels and/or incorporate more census data

Distribution Channels Validated

88% Market covered by IQVIA

Participation

# Participating Companies	# Forms Validated	% Market Validated
53 (+13 vPY)	**1,019** (+307 vPY)	**32%** (+8% vPY)

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Peru Retail Validation Study

2020 Validation Study

Validation Results

Precision	85.1%	Bias	-7.5%

Precision bar chart:
- 2016: 88.4
- 2017: 91.8
- 2018: 91.1
- 2019: 90.6
- 2020: 85.1

Bias bar chart:
- 2016: -4.0
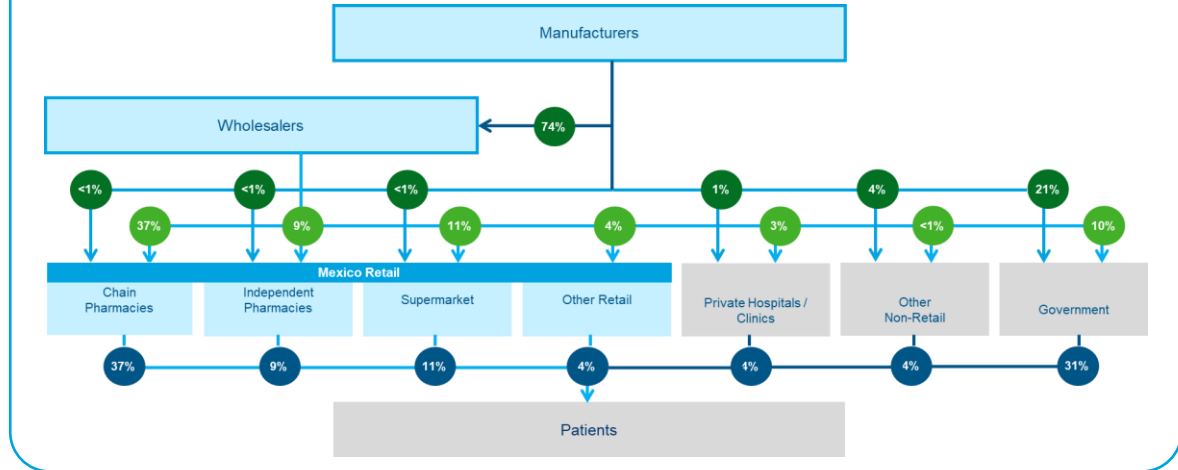- 2017: -2.5
- 2018: 0.1
- 2019: -6.2
- 2020: -7.5
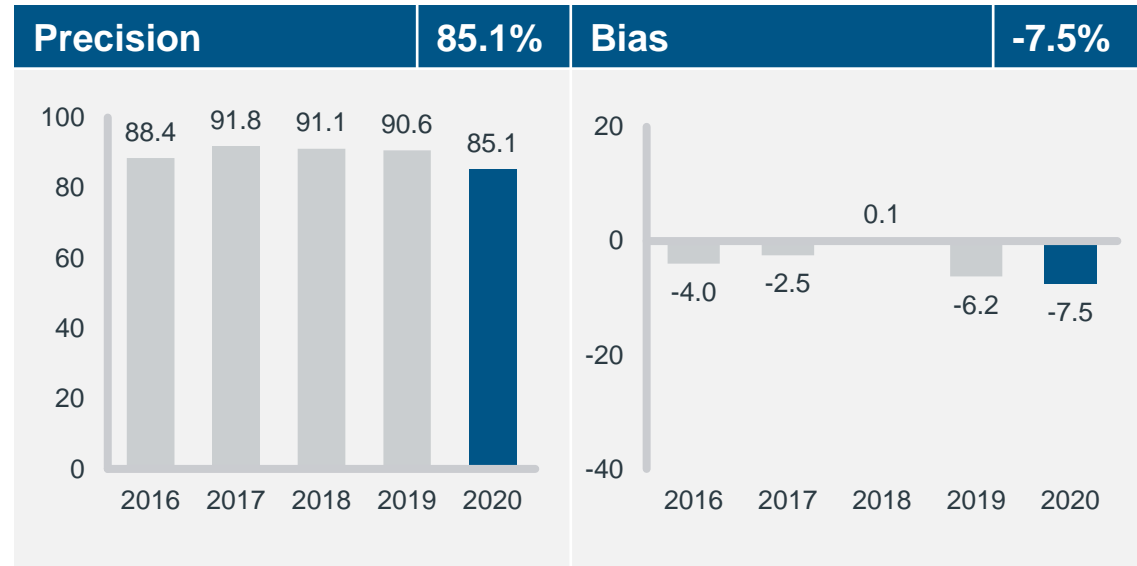
Outcomes

- Overall precision index declined by 5.5 percentage points in 2020
- Overall underestimation increased by 1.3 percentage points in 2020
- Review internal processes

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

- Private/Chain Pharmacies → Patients 67%
- Government Institutions 14%
- Private Institutions 25%
- Others 32%
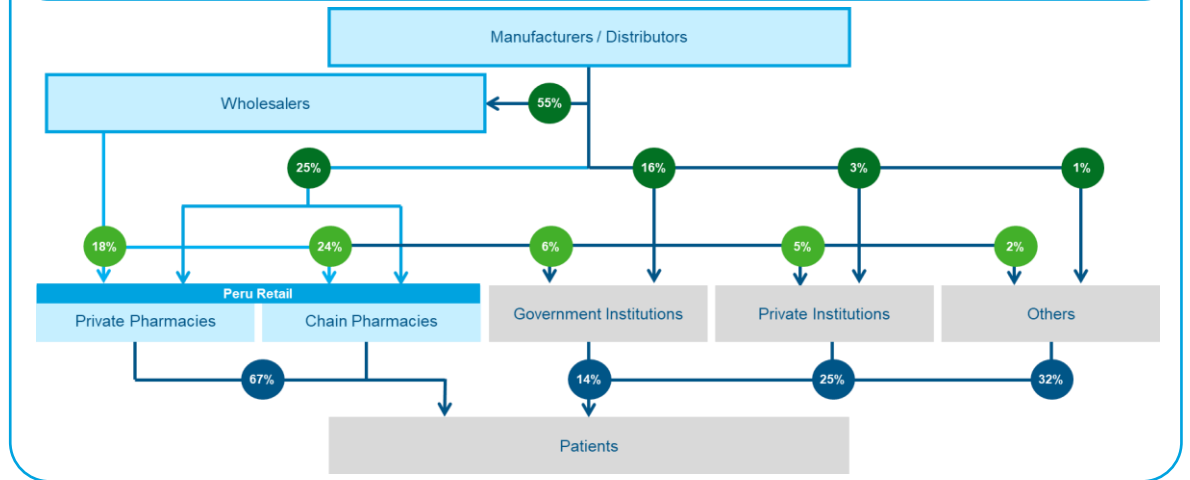
Participation

# Participating Companies	# Forms Validated	% Market Validated
20 (+6 vPY)	946 (+62 vPY)	34% (-2% vPY)

Uruguay Retail+Mutuales Validation Study

2020 Validation Study

Validation Results

Precision	76.8%	Bias	1.3%

Precision

- 2016: 83.8
- 2017: 86.7
- 2018: 84.2
- 2019: 85.3
- 2020: 76.8

Bias

- 2016: -3.0
- 2017: -1.1
- 2018: -4.0
- 2019: 1.5
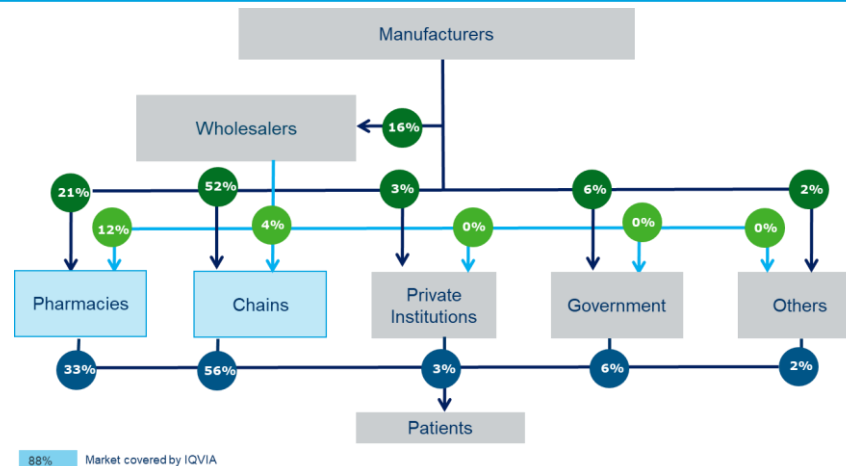- 2020: 1.3
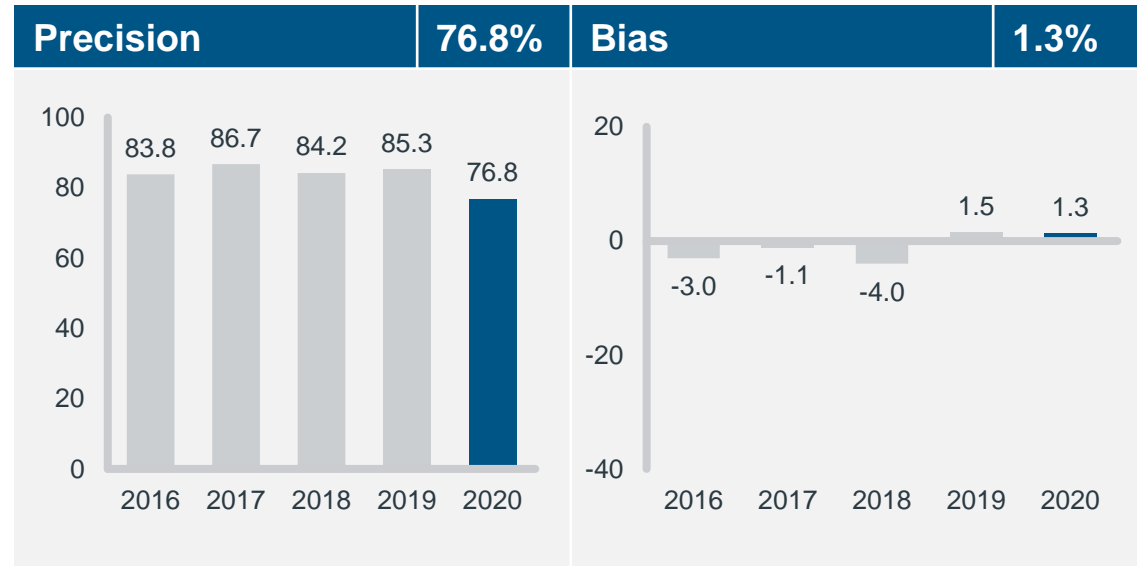
Outcomes

- Overall precision index declined by 8.5 percentage points in 2020
- Overall overestimation improved 0.2 percentage points in 2020
- Review internal processes

Distribution Channels Validated

Manufacturers

Wholesalers — 8%

Uruguay Retail Pharmacies — 8%, 19%, 42%

Mutuales — 0%

Private Institutions — 0%, 4%

Public Institutions — 0%, 26%

Others — 0%, 1%

Patients — 27%, 42%, 4%, 26%, 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
15 *(+1 vPY)*	907 *(+82 vPY)*	53% *(+6% vPY)*

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Venezuela Retail Validation Study

2020 Validation Study

Validation Results

Precision	88.0%	Bias	-0.7%

Precision chart (2016–2020): 92.7, 89.6, (2018 missing), 74.3, 88.0

Bias chart (2016–2020): -4.8, -1.1, (2018), 6.8, -0.7
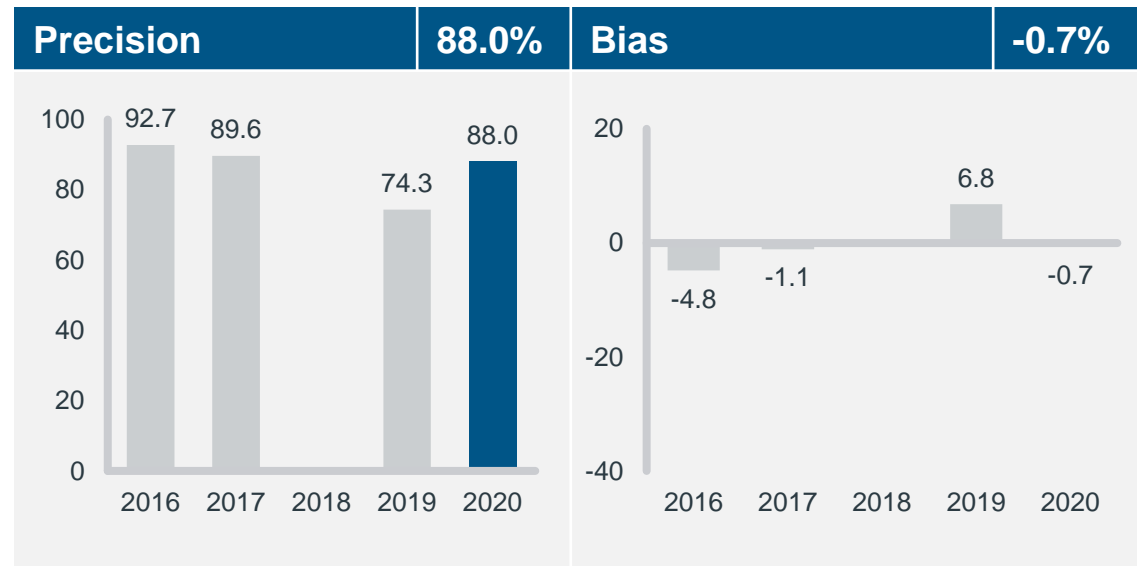
Outcomes

- Overall precision index improved by 13.7 percentage points in 2020
- Overall bias turned from 6.8% overestimation in 2019 to 0.7% underestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated
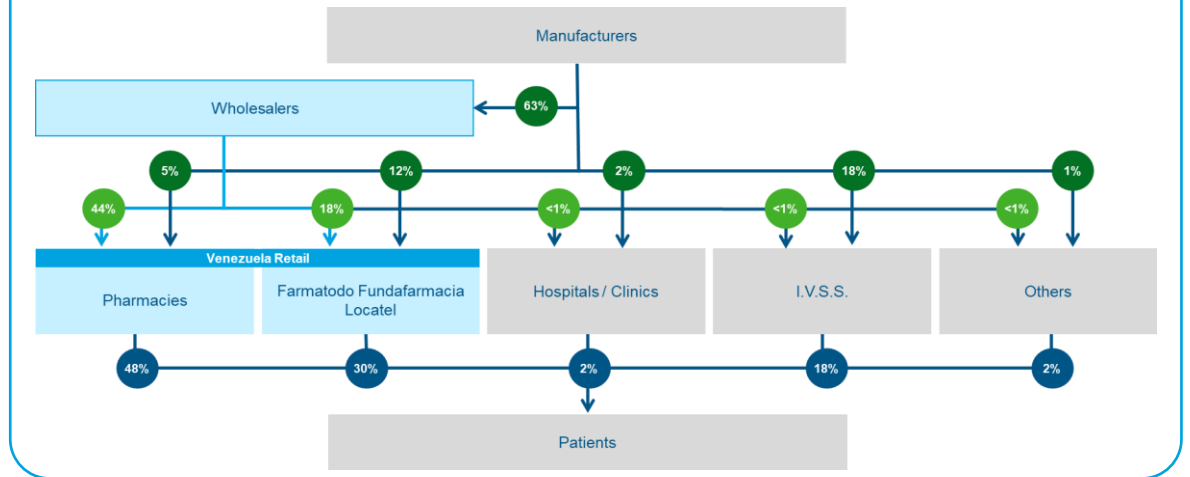
Participation

# Participating Companies	# Forms Validated	% Market Validated
18 *(-6 vPY)*	**491** *(+120 vPY)*	**29%** *(-2% vPY)*

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Europe
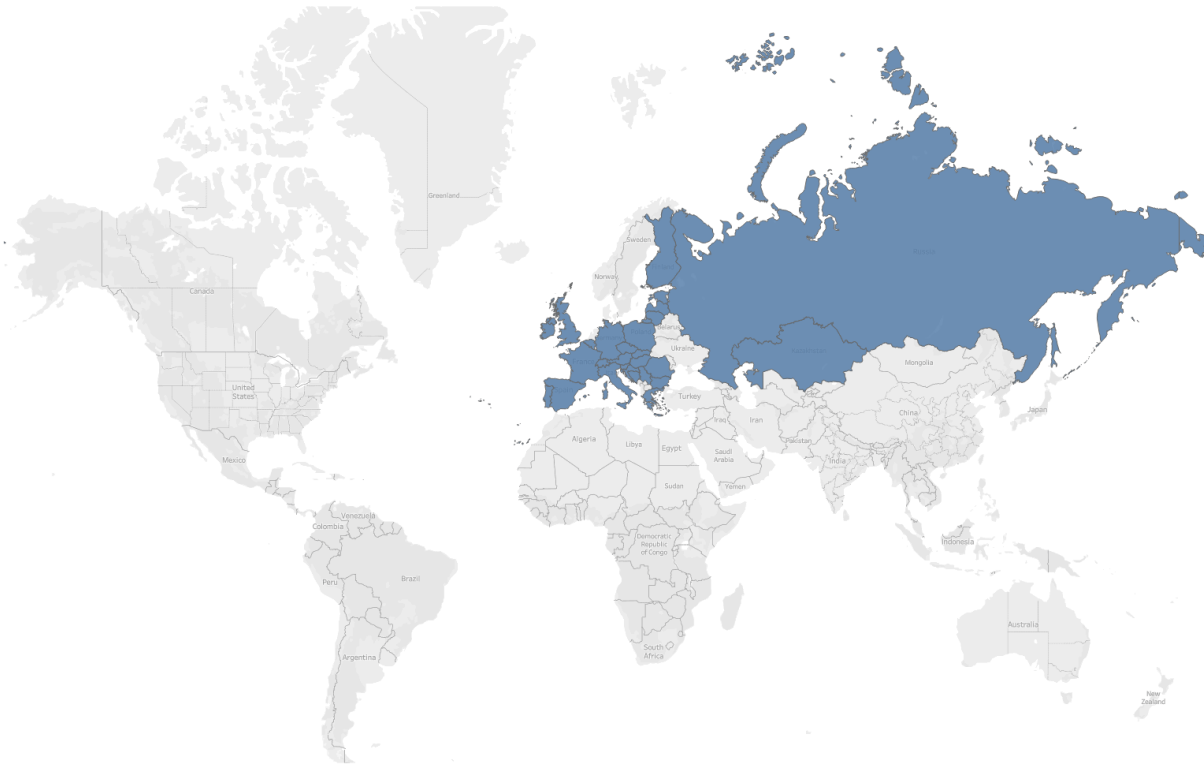
Countries

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

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Austria Retail Validation Study

2020 Validation Study

Validation Results

Precision	98.0%	Bias	-6.9%

Precision values: 96.2 (2016), 93.6 (2017), 95.1 (2018), 95.4 (2019), 98.0 (2020)

Bias values: -1.9 (2016), -4.2 (2017), -0.6 (2018), -3.5 (2019), -6.9 (2020)
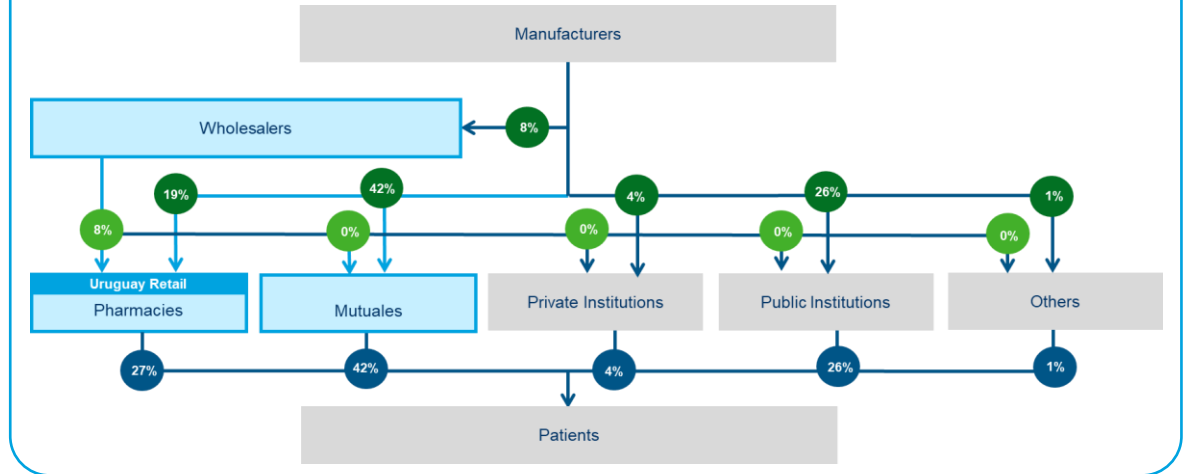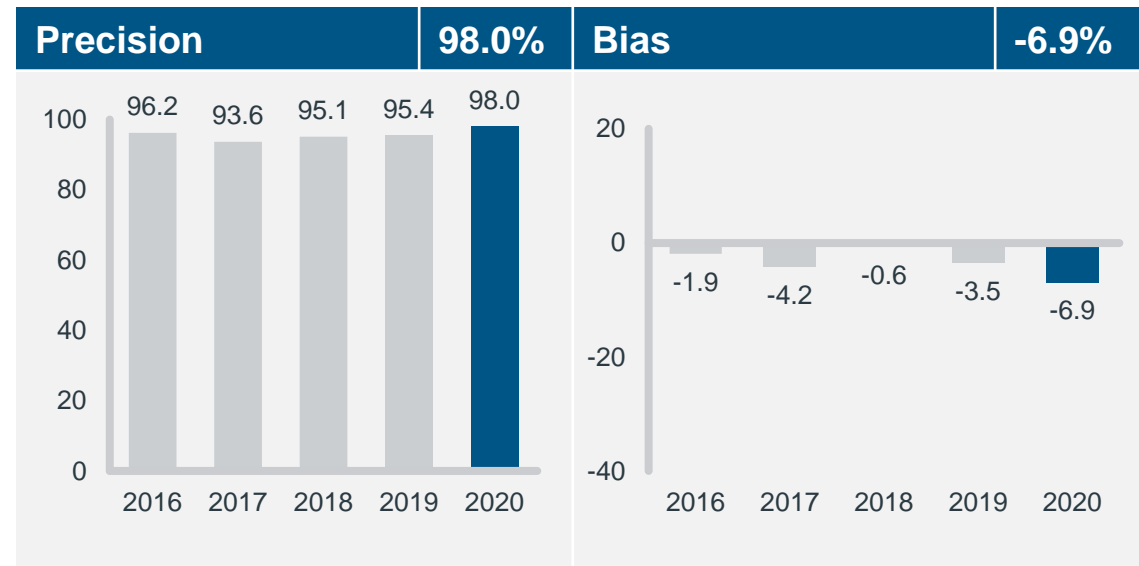
Outcomes

- Overall precision index improved by 2.6 percentage points in 2020
- Overall underestimation increased by 3.4 percentage points in 2020
- Analyze root cause of increased underestimation

Distribution Channels Validated

Manufacturers

Wholesalers — 62%

51% — 10% — 3% — 8% — 28%

Austria Retail: Retail Pharmacies — Dispensing Doctors — Hospitals

61% — 8% — 31%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
18 *(+1 vPY)*	**537** *(-40 vPY)*	**16%** *(-2% vPY)*

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Austria PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	93.6%	Bias	-2.2%

Precision chart: 2016: 95.6, 2017: 94.0, 2018: 95.9, 2019: 92.6, 2020: 93.6

Bias chart: 2016: -1.9, 2017: -4.4, 2018: -4.4, 2019: -1.3, 2020: -2.2
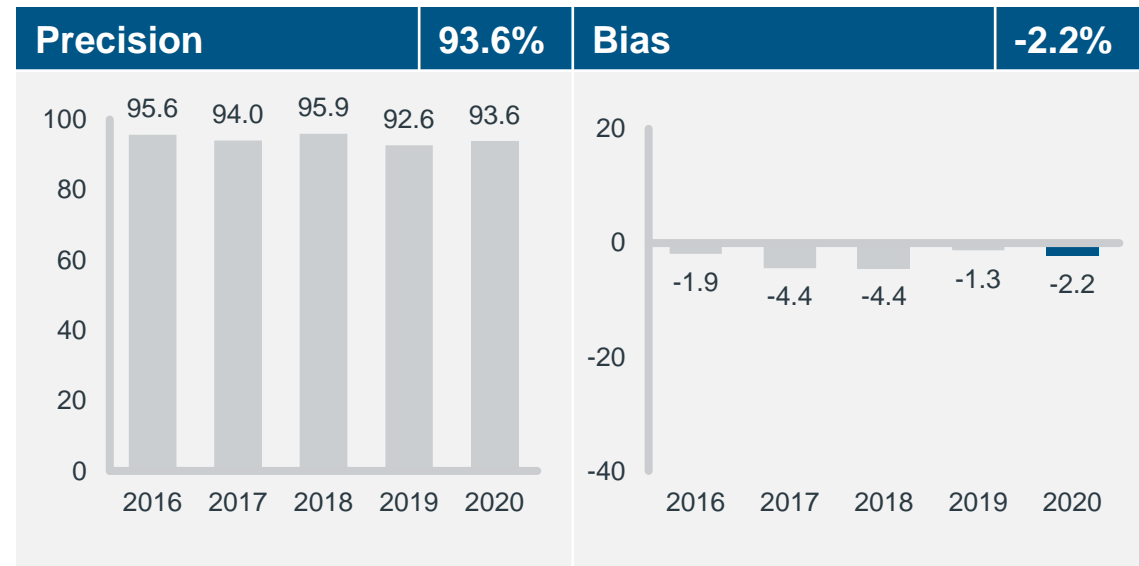
Outcomes
- Overall precision index improved by 1.0 percentage point in 2020
- Overall underestimation increased by 0.8 percentage points in 2020
- Update and implement new universe

Distribution Channels Validated

Manufacturers → Wholesalers 62%
Wholesalers: 51%, 10%
3%, 8%, 28%
Austria Retail: Retail Pharmacies, Dispensing Doctors
Hospitals
61%, 8%, 31%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
18 (+1 vPY)	**526** (-48 vPY)	**16%** (-3% vPY)

IQVIA

Austria OTC Validation Study
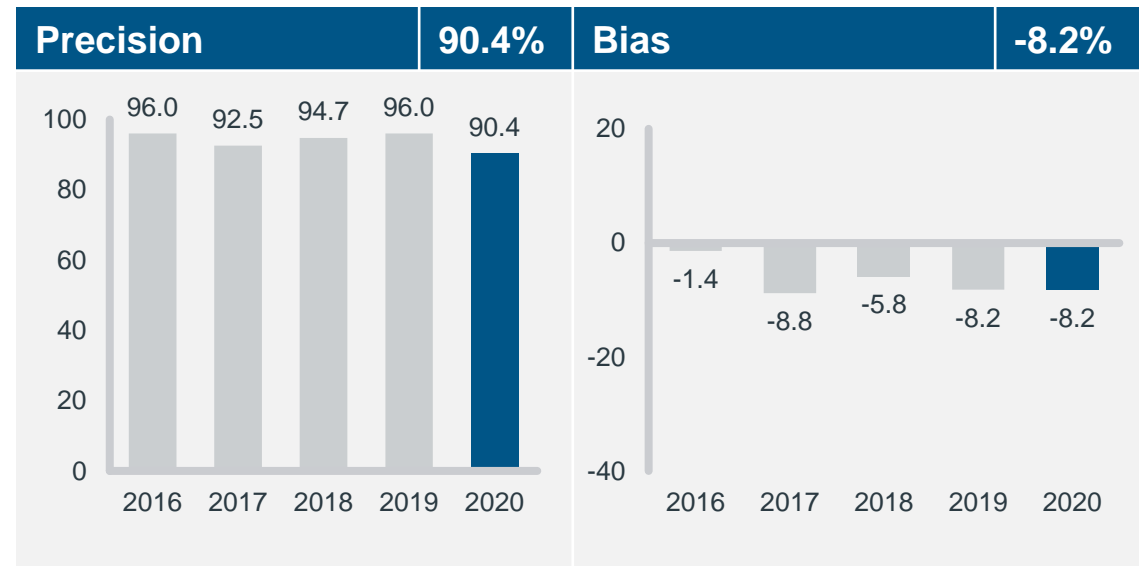
2020 Validation Study

Validation Results

Precision	**90.4%**	Bias	**-8.2%**

Precision chart:
- 2016: 96.0
- 2017: 92.5
- 2018: 94.7
- 2019: 96.0
- 2020: 90.4

Bias chart:
- 2016: -1.4
- 2017: -8.8
- 2018: -5.8
- 2019: -8.2
- 2020: -8.2

Outcomes

- Overall precision index declined by 5.6 percentage points in 2020
- Overall underestimation kept unchanged at 8.2% in 2020
- Update and implement new universe

Distribution Channels Validated

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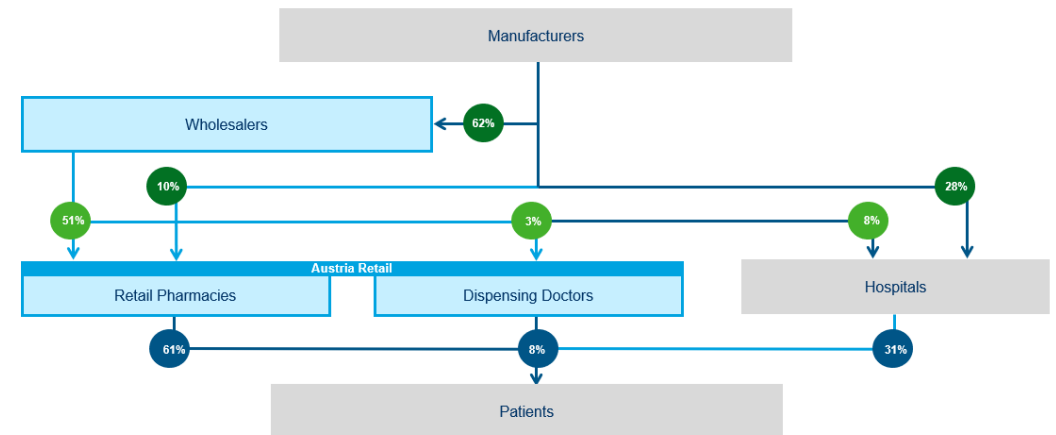
Participation

# Participating Companies	# Forms Validated	% Market Validated
7 *(no change vPY)*	**80** *(-4 vPY)*	**18%** *(-1% vPY)*

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Austria Hospital Validation Study

2020 Validation Study

Validation Results

Precision	89.3%	Bias	-1.9%

Precision bars: 88.6 (2016), 84.2 (2017), 82.7 (2018), 89.3 (2019), 89.3 (2020)

Bias bars: 2.2 (2016), 2.4 (2017), 2.4 (2018), -1.8 (2019), -1.9 (2020)
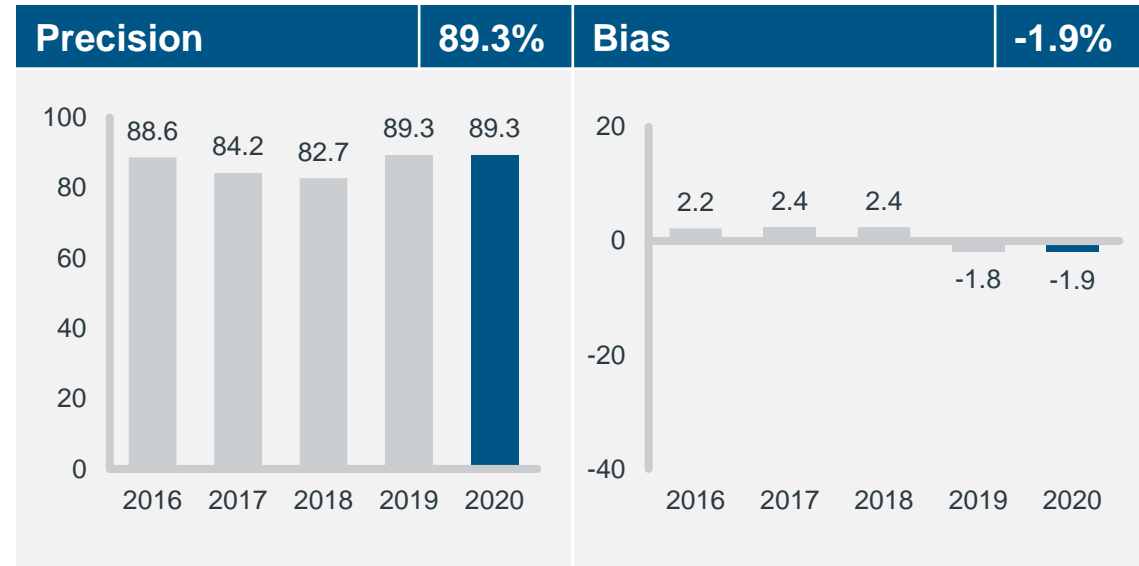
Outcomes

- Overall precision index kept unchanged in 2020
- Overall underestimation increased by 0.1 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

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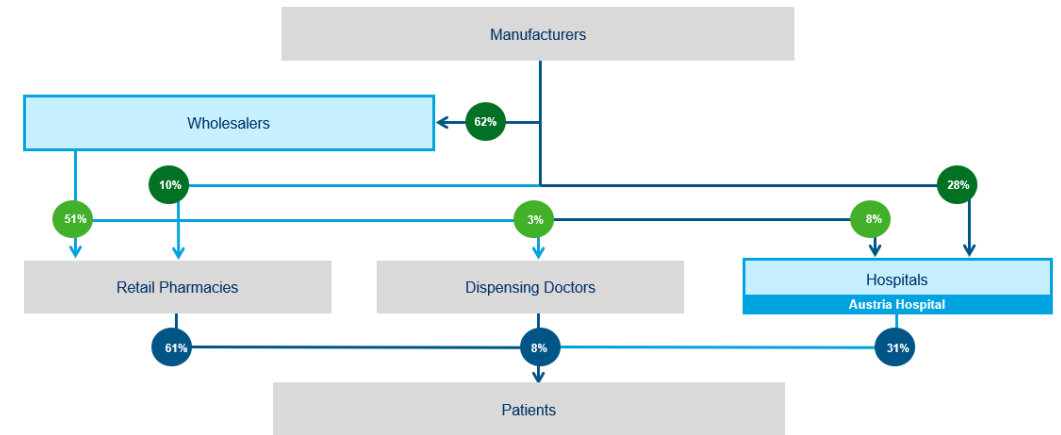
Participation

# Participating Companies	# Forms Validated	% Market Validated
14 (+4 vPY)	**266** (-97 vPY)	**14%** (-7% vPY)

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Bosnia Retail+Hospital Validation Study

2020 Validation Study

Validation Results

Precision	96.5%	Bias	1.9%

Precision chart (2016–2020): 95.6, 100.0, 99.4, 99.7, 96.5
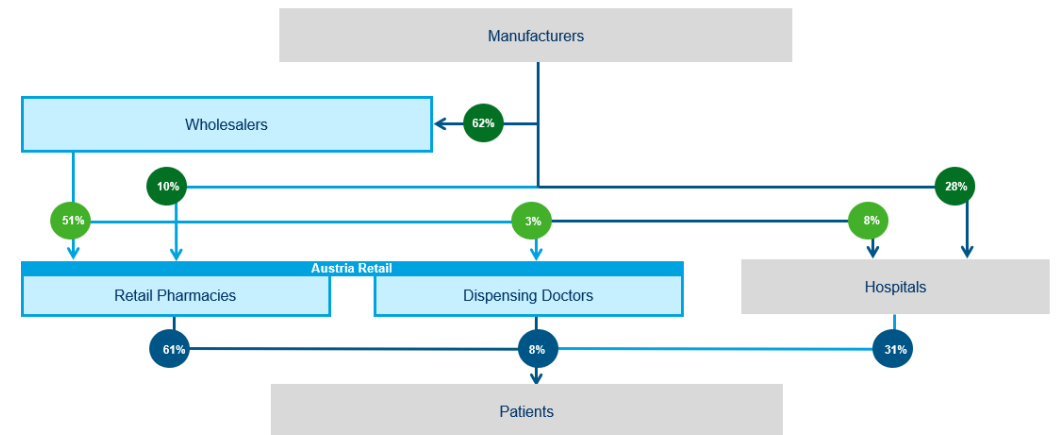
Bias chart (2016–2020): 0.9, 4.6, 0.1, 1.0, 1.9
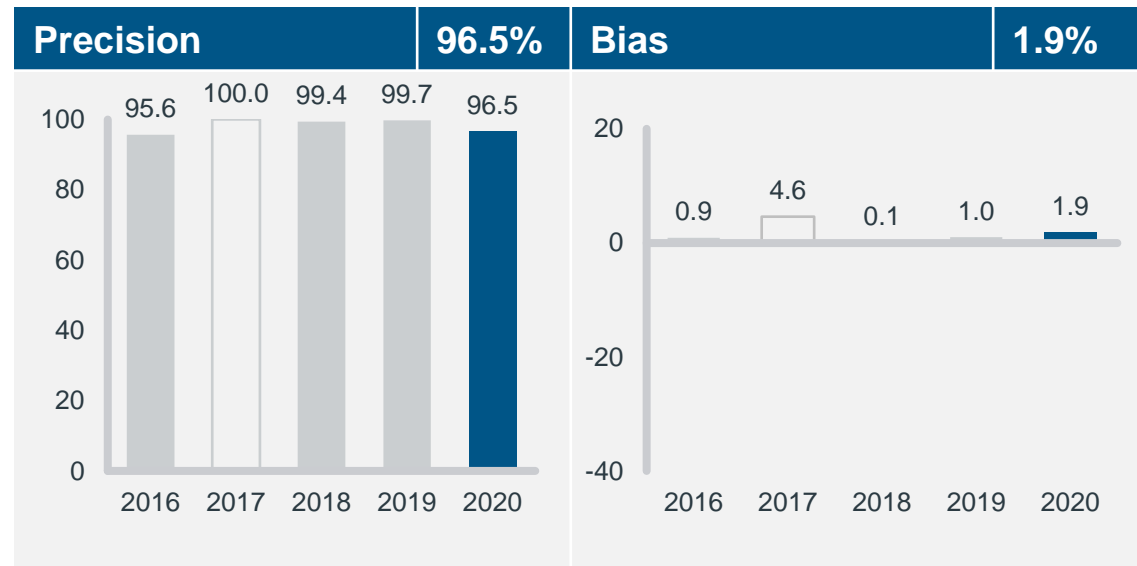
Outcomes

- Overall precision index declined by 3.2 percentage points in 2020
- Overall overestimation increased by 0.9 percentage points in 2020
- 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 — 5%
Wholesalers — 75%, 10%, 10%

Bosnia Combined:
Pharmacies — 78%
Hospitals (clinical pharmacies) — 11%
Others — 11%

Patients
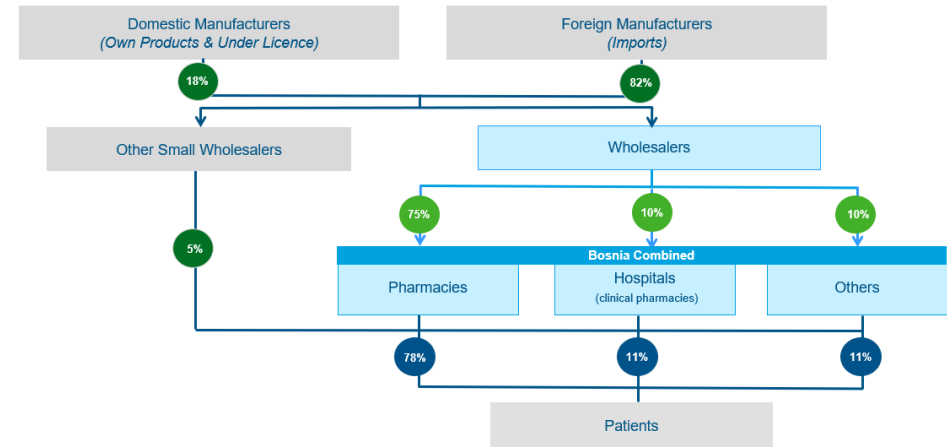
Participation

# Participating Companies	# Forms Validated	% Market Validated
18 (+3 vPY)	**638** (+76 vPY)	**52%** (+6% vPY)

Bulgaria Retail Validation Study

2020 Validation Study

Validation Results

| Precision | 95.3% | Bias | -0.8% |

Precision chart values: 2016: 96.1, 2017: 89.5, 2018: 95.0, 2019: 92.0, 2020: 95.3

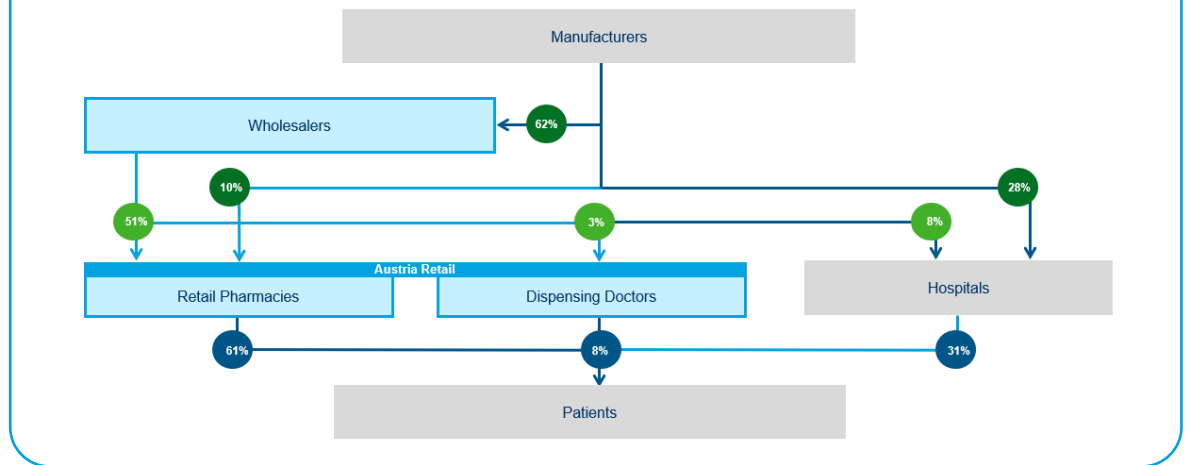Bias chart values: 2016: -2.7, 2017: -1.0, 2018: -0.5, 2019: -0.2, 2020: -0.8
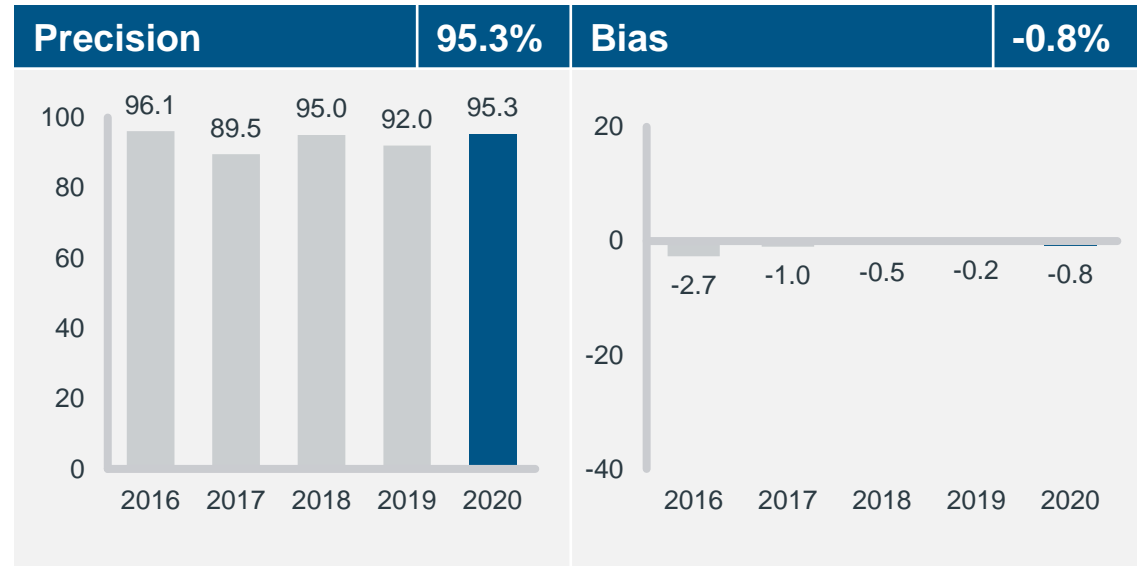
Outcomes

- Overall precision index improved by 3.3 percentage points in 2020
- Overall underestimation increased by 0.6 percentage points in 2020
- 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% → Hospitals, 2% → Others

Bulgaria Retail Pharmacies & Drugstores — 80% → Patients, Hospitals — 18% → Patients, Others — 2%

Participation

# Participating Companies	# Forms Validated	% Market Validated
43 (-15 vPY)	**584** (-63 vPY)	**32%** (-2% vPY)

IQVIA

Croatia Retail+Hospital Validation Study

2020 Validation Study

Validation Results

Precision	99.5%	Bias	0.7%

Precision chart:
- 2016: 99.8
- 2017: 99.8
- 2018: 99.2
- 2019: 99.9
- 2020: 99.5

Bias chart:
- 2016: -0.6
- 2017: 1.2
- 2018: -0.9
- 2019: -0.6
- 2020: 0.7
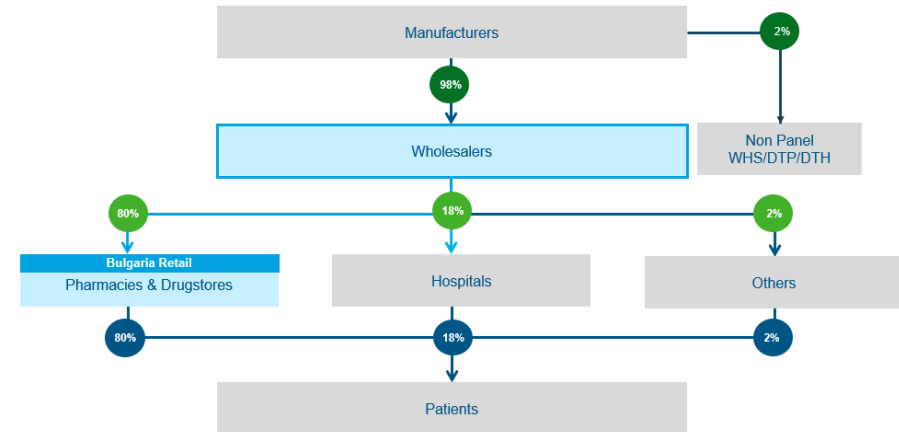
Outcomes

- Overall precision index declined by 0.4 percentage points in 2020
- Overall bias turned from 0.6% underestimation in 2019 to 0.7% overestimation in 2020
- No action required from the statistical point of view
- 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
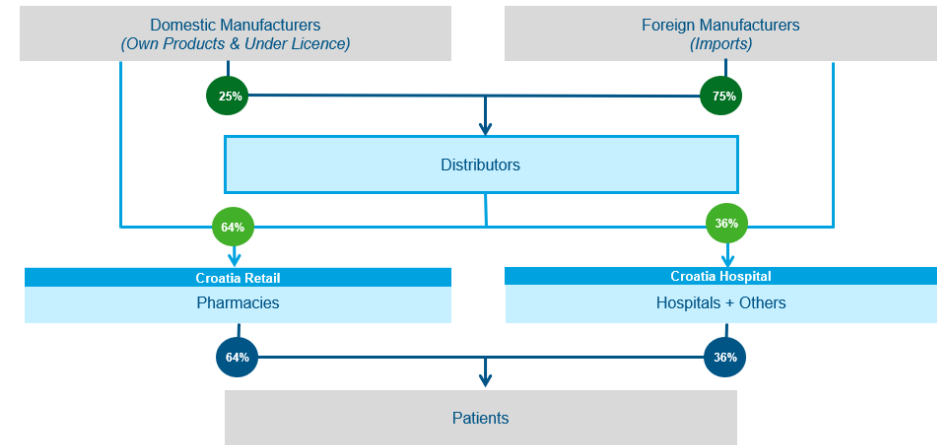
Participation

# Participating Companies	# Forms Validated	% Market Validated
10 *(+1 vPY)*	**226** *(-108 vPY)*	**11%** *(-8% vPY)*

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Croatia PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	99.2%	Bias	-1.0%

Precision chart (2016-2020): 95.2, 93.4, 92.3, 95.0, 99.2

Bias chart (2016-2020): -4.7, 0.6, -0.8, 0.2, -1.0
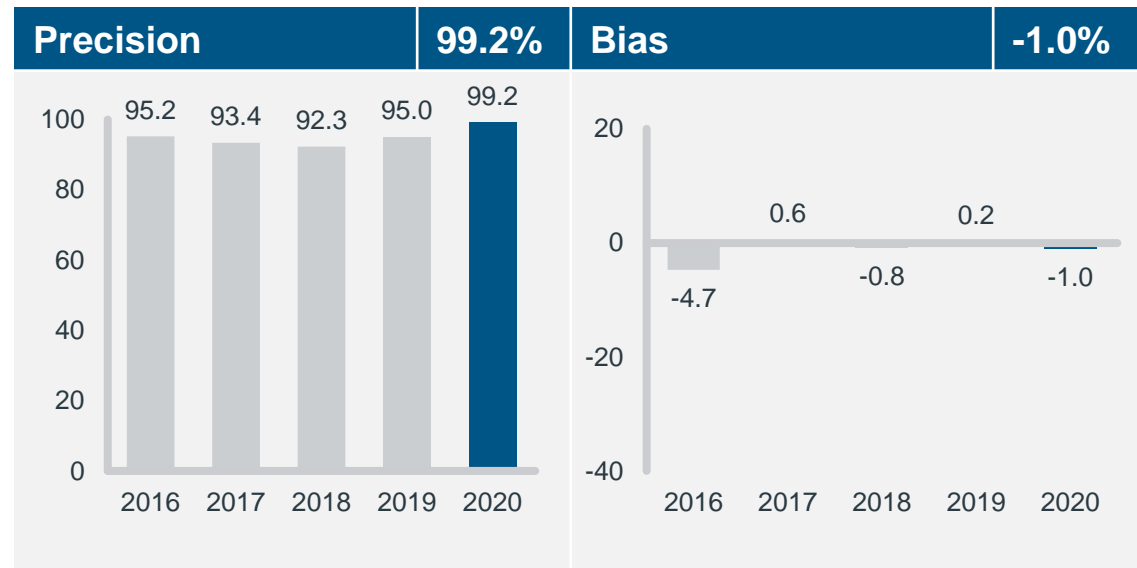
Outcomes
- Overall precision index improved by 4.2 percentage points in 2020
- Overall bias turned from 0.2% overestimation to 1.0% underestimation in 2020
- Increase collaboration in the validation

Distribution Channels Validated

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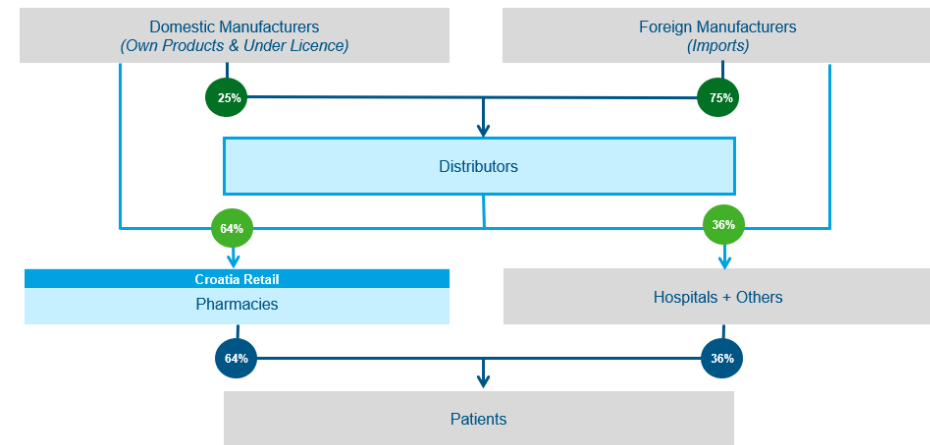
Participation

# Participating Companies	# Forms Validated	% Market Validated
10 (+1 vPY)	**154** (-88 vPY)	**11%** (-8% vPY)

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Czech Republic Retail+Hospital Validation Study
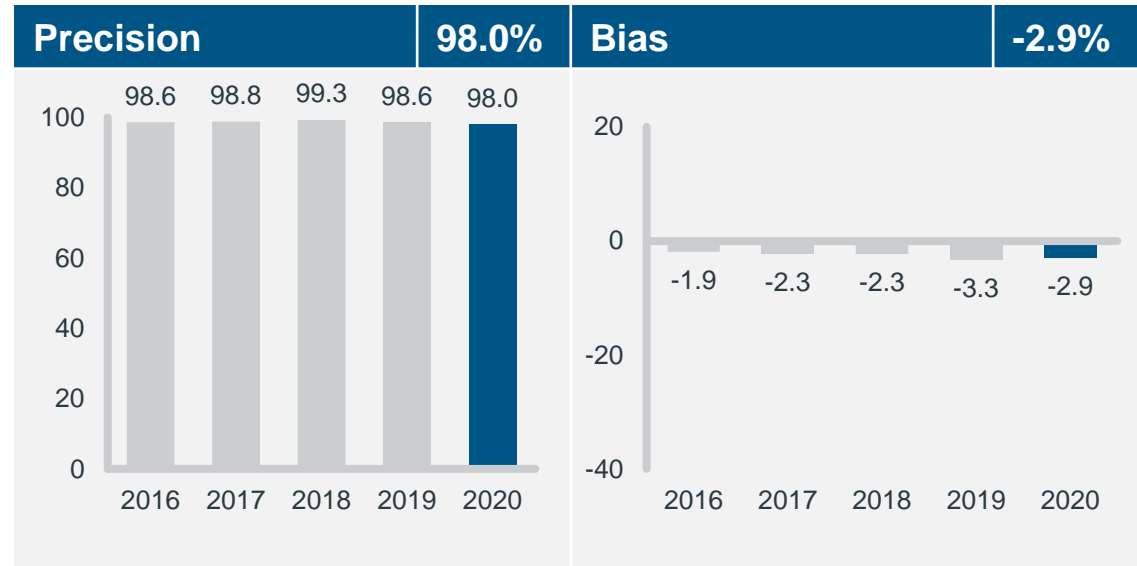
2020 Validation Study

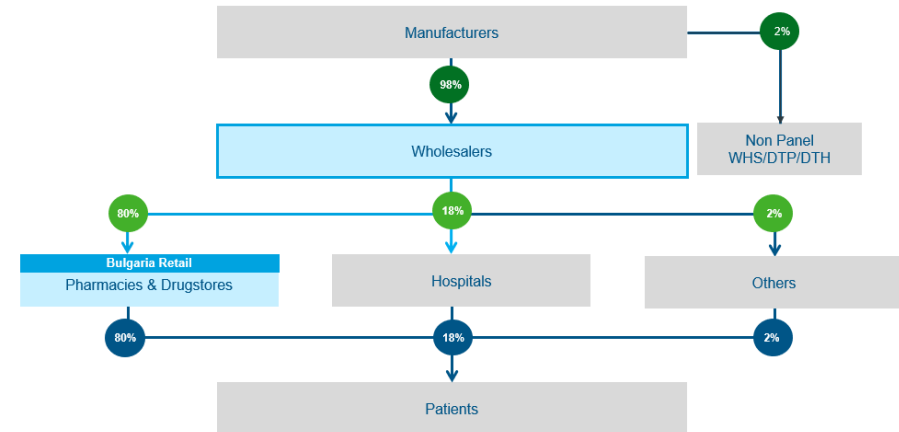## Validation Results

| Precision | 98.0% | Bias | -2.9% |

Outcomes

- Overall precision index declined by 0.6 percentage points in 2020
- Overall underestimation improved by 0.4 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated
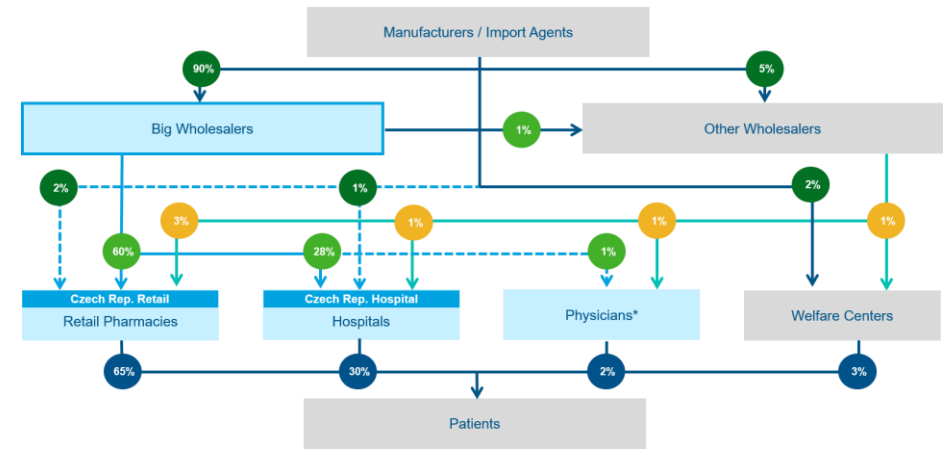
Participation

# Participating Companies	# Forms Validated	% Market Validated
17 *(-6 vPY)*	**866** *(-310 vPY)*	**34%** *(-3% vPY)*

Czech Republic PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	94.4%	Bias	-6.2%

Precision chart:
- 2016: 95.1
- 2017: 95.6
- 2018: 95.8
- 2019: 95.3
- 2020: 94.4

Bias chart:
- 2016: -4.8
- 2017: -6.8
- 2018: -5.8
- 2019: -6.8
- 2020: -6.2
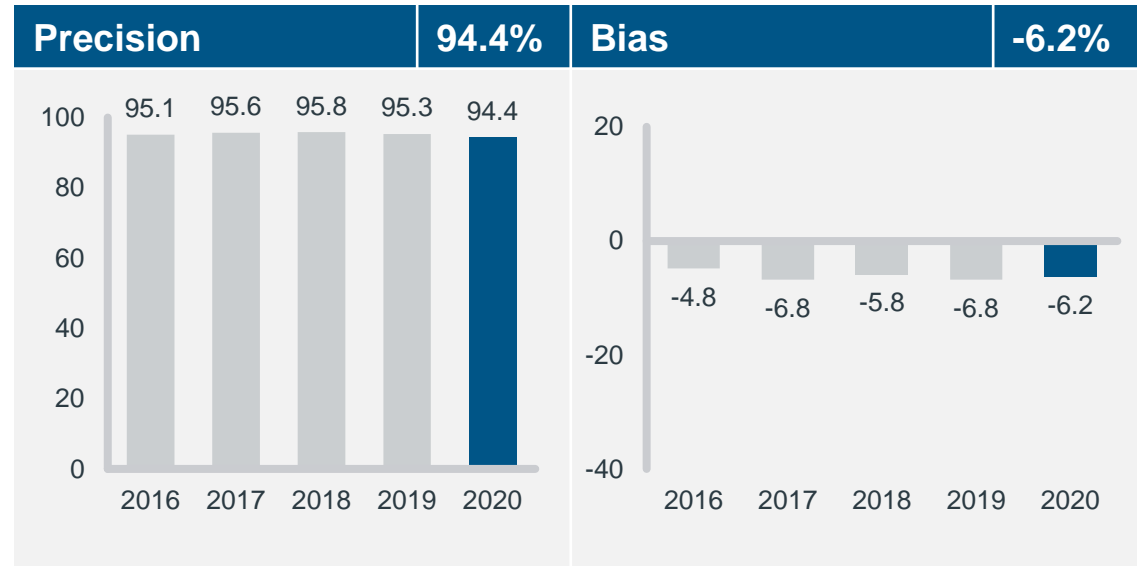
Outcomes

- Overall precision index declined by 0.9 percentage points in 2020
- Overall underestimation improved by 0.6 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers / Import Agents
- 90% → Big Wholesalers
- 5% → Other Wholesalers
- 1% → Other Wholesalers

Big Wholesalers
- 2%
- 1%
- 3%
- 60% → Czech Rep. Retail Retail Pharmacies
- 28% → Hospitals
- 1% → Physicians*
- 2% → Welfare Centers
- 1%
- 1%

Czech Rep. Retail / Retail Pharmacies
- 65% → Patients

Hospitals
- 30% → Patients

Physicians*
- 2% → Patients

Welfare Centers
- 3% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
17 *(-5 vPY)*	565 *(-203 vPY)*	31% *(-2% vPY)*

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Czech Republic OTC Validation Study

2020 Validation Study

Validation Results

Precision	96.1%	Bias	-6.8%

Precision values: 96.3 (2016), 94.3 (2017), 95.7 (2018), 97.2 (2019), 96.1 (2020)

Bias values: -4.9 (2016), -7.3 (2017), -5.0 (2018), -5.0 (2019), -6.8 (2020)
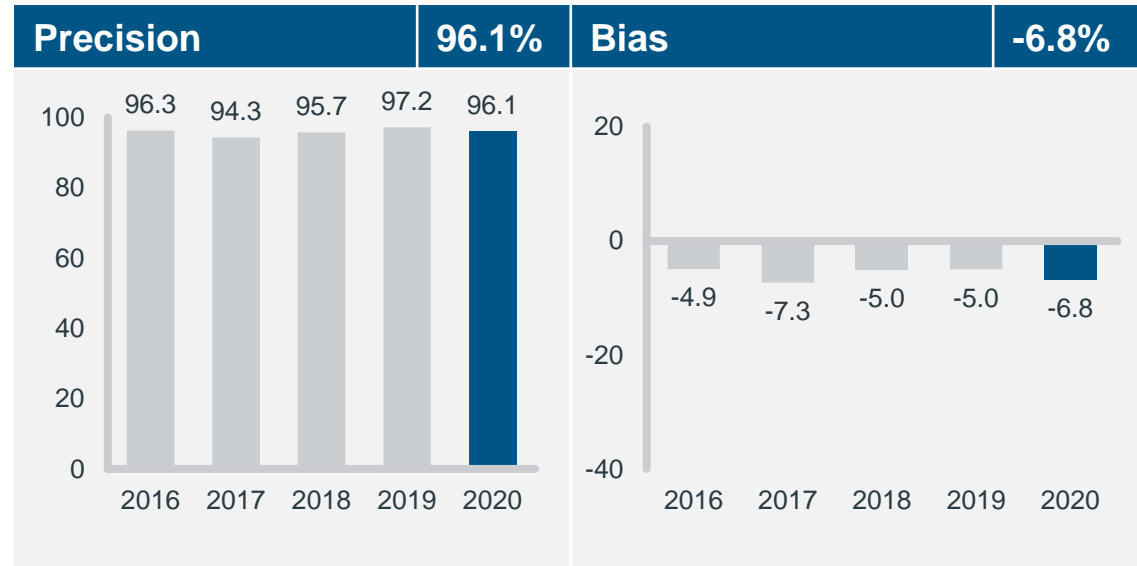
Outcomes

- Overall precision index declined by 1.1 percentage points in 2020
- Overall underestimation increased by 1.8 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
11 (no change vPY)	**160** (+2 vPY)	**44%** (+6% vPY)

Estonia Retail Validation Study

2020 Validation Study

Validation Results

Precision	85.3%	Bias	8.4%

Precision chart (2016–2020): 84.7, 87.4, 81.9, 83.7, 85.3

Bias chart (2016–2020): 8.0, 8.3, 14.3, 4.7, 8.4
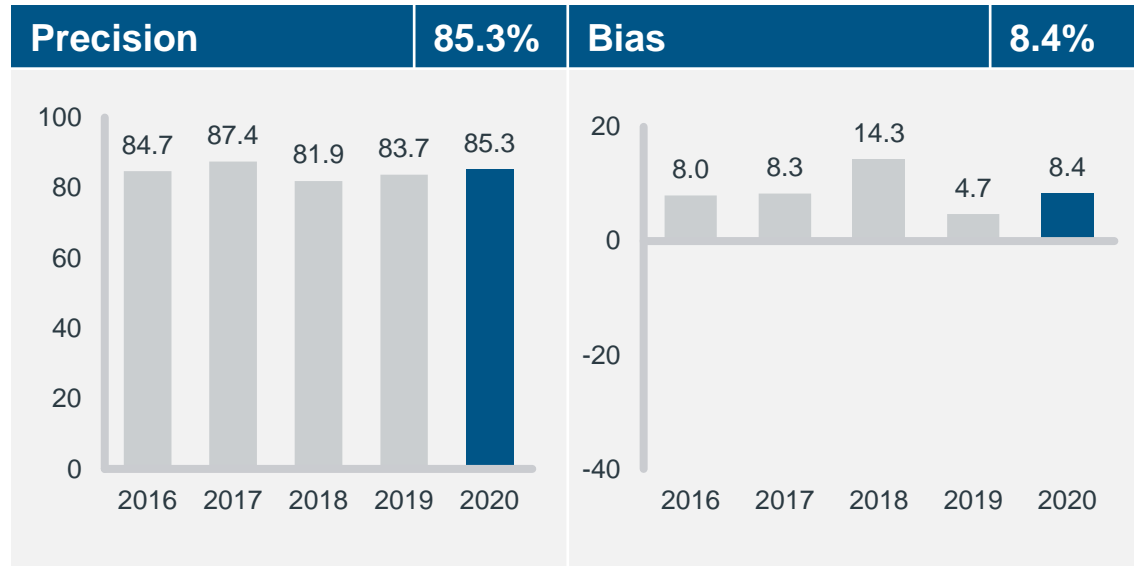
Outcomes

- Overall precision index improved by 1.6 percentage points in 2020
- Overall overestimation increased by 3.7 percentage points in 2020
- Review projection method

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 88% → Estonia Retail Retail Pharmacies / 12% → Hospitals → Patients (88% / 12%)
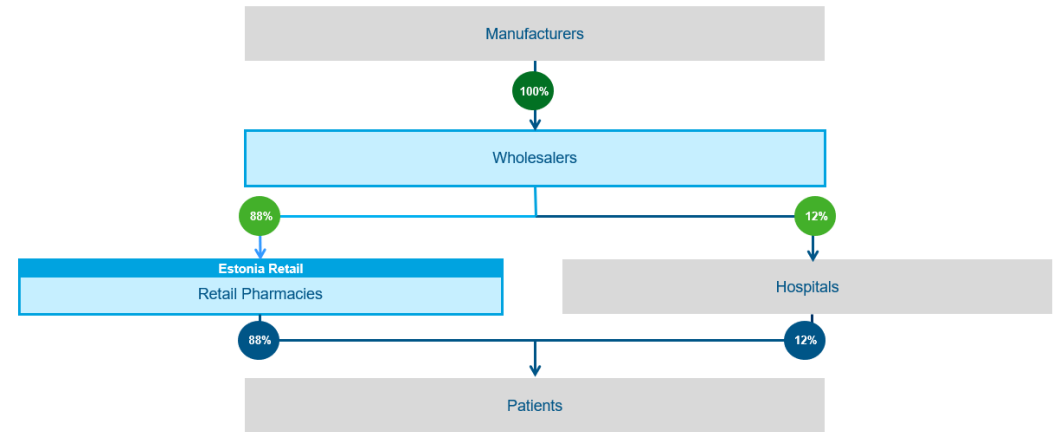
Participation

# Participating Companies	# Forms Validated	% Market Validated
12 (-5 vPY)	352 (-87 vPY)	20% (-9% vPY)

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Finland PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	91.7%	Bias	1.5%

Precision chart:
- 2016: 94.9
- 2017: 95.3
- 2018: 96.3
- 2019: 94.8
- 2020: 91.7

Bias chart:
- 2016: 5.6
- 2017: 5.3
- 2018: -1.0
- 2019: -1.3
- 2020: 1.5
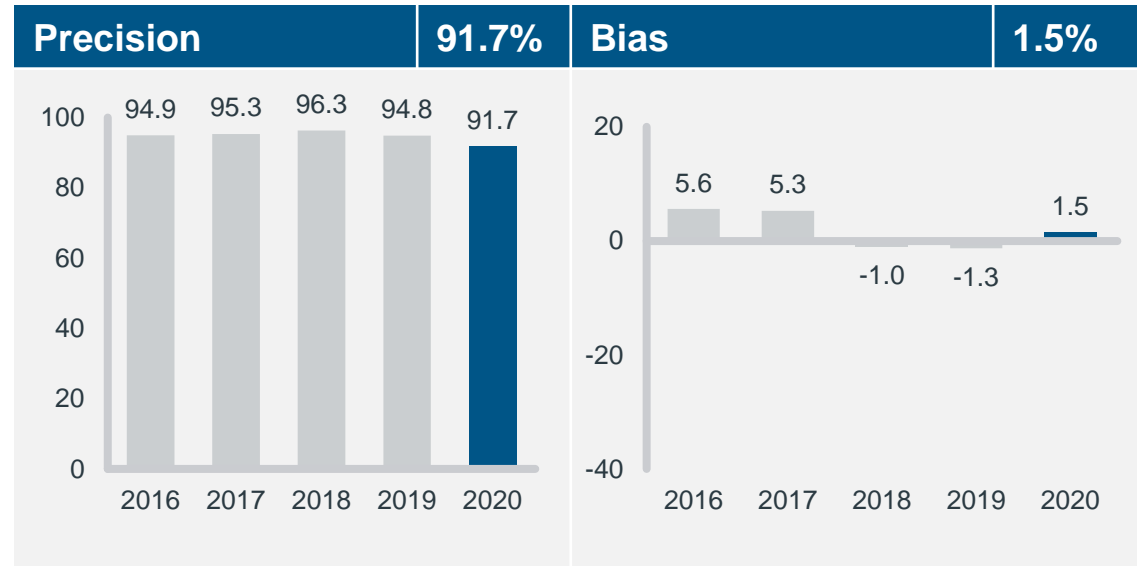
Outcomes

- Overall precision index declined by 3.1 percentage points in 2020
- Overall bias turned from 1.3% underestimation in 2019 to 1.5% overestimation in 2020
- Evaluate input data quality

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 73% / 27%
Finland Retail / Retail Pharmacies — Hospitals
73% — 27% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
140 (+7 vPY)	**1,840** (+201 vPY)	**61%** (+5% vPY)

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France Retail Validation Study
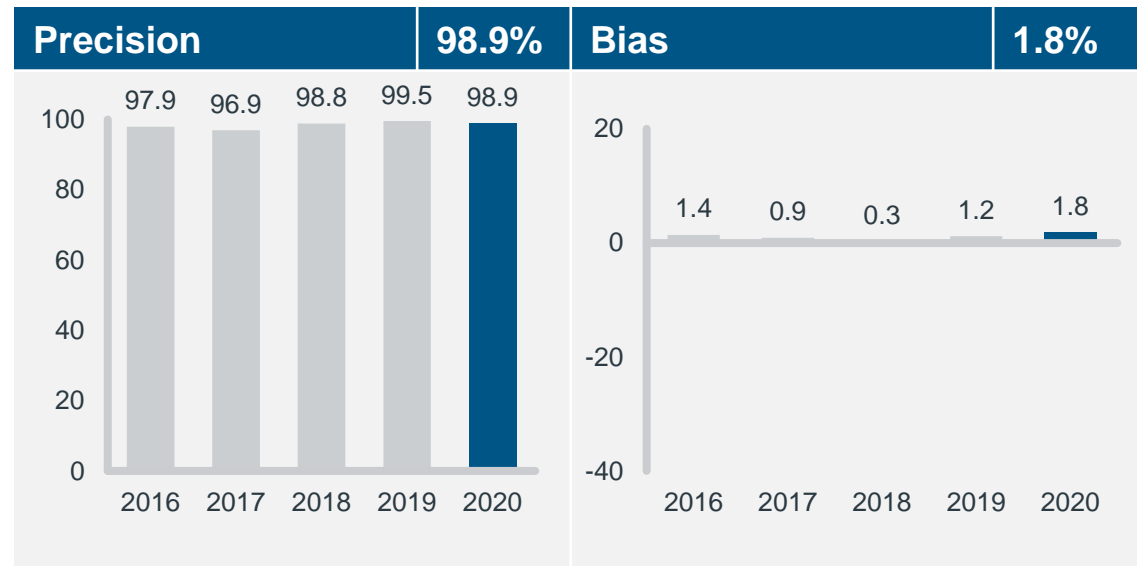
2020 Validation Study

Validation Results

Precision	98.9%	Bias	1.8%

Precision chart (2016–2020): 97.9, 96.9, 98.8, 99.5, 98.9

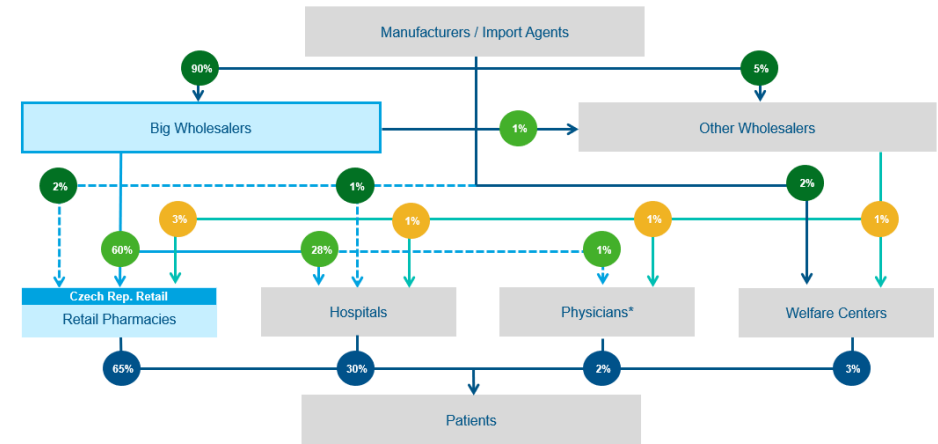Bias chart (2016–2020): 1.4, 0.9, 0.3, 1.2, 1.8

Outcomes

- Overall precision index declined by 0.6 percentage points in 2020
- Overall overestimation increased by 0.6 percentage points in 2020
- Review projection levels

Distribution Channels Validated

Manufacturers → Wholesalers 65%, 14%, 21%, <1%
Wholesalers 65% → Pharmacies (France Retail)
Pharmacies 79% / Hospitals 21% → Patients

Participation

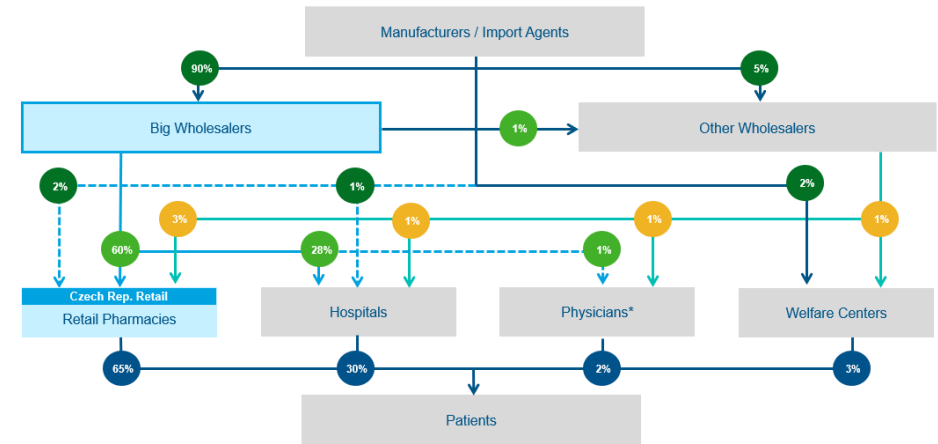| # Participating Companies	# Forms Validated	% Market Validated
159 *(no change vPY)*	**3,518** *(+3 vPY)*	**88%** *(-1% vPY)*

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Germany Retail Validation Study

2020 Validation Study (Sell-in Data)

Validation Results

Precision — **92.8%**   **Bias** — **-6.9%**

Precision:
- 2016: 95.9
- 2017: 95.9
- 2018: 94.0
- 2019: 93.3
- 2020: 92.8

Bias:
- 2016: -5.7
- 2017: -7.7
- 2018: -8.3
- 2019: -6.9
- 2020: -6.9
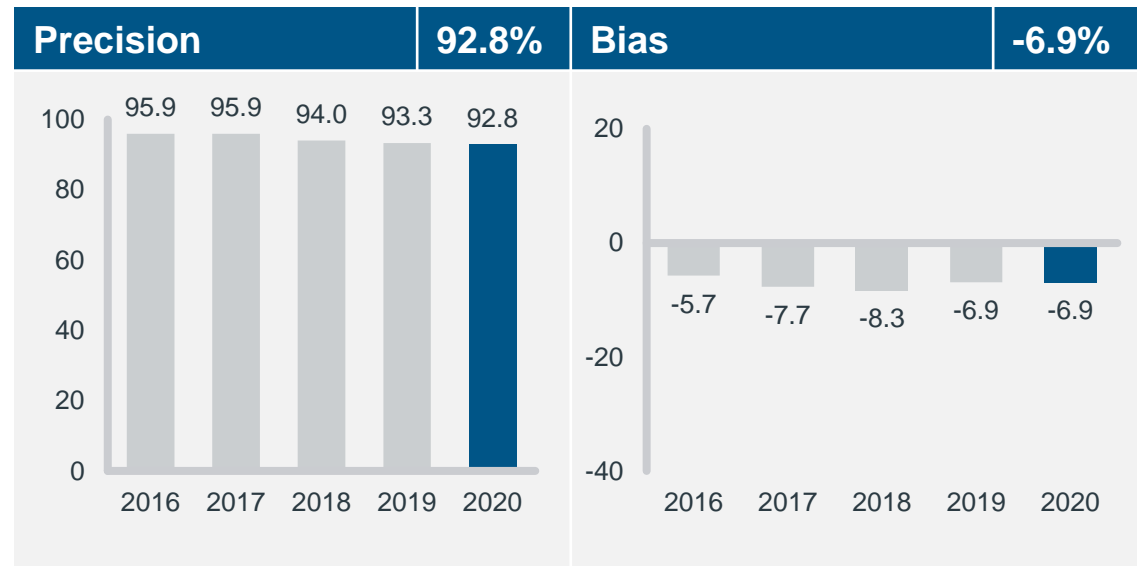
Outcomes
- Overall precision index declined by 0.5 percentage points in 2020
- Overall underestimation kept unchanged as 6.9% in 2020
- Win more clients to increase data basis for validation
- No imminent improvement action required from a statistical point of view

Distribution Channels Validated

- Manufacturers
- Wholesalers (74%)
- Hospital Supply Pharmacies (5%)
- Hospital Pharmacies (9%)
- Germany Retail — Public Pharmacies — Germany Pharmascope (74%, 12%, 5%, 9%)
- Hospitals
- Patients (86%, 14%)
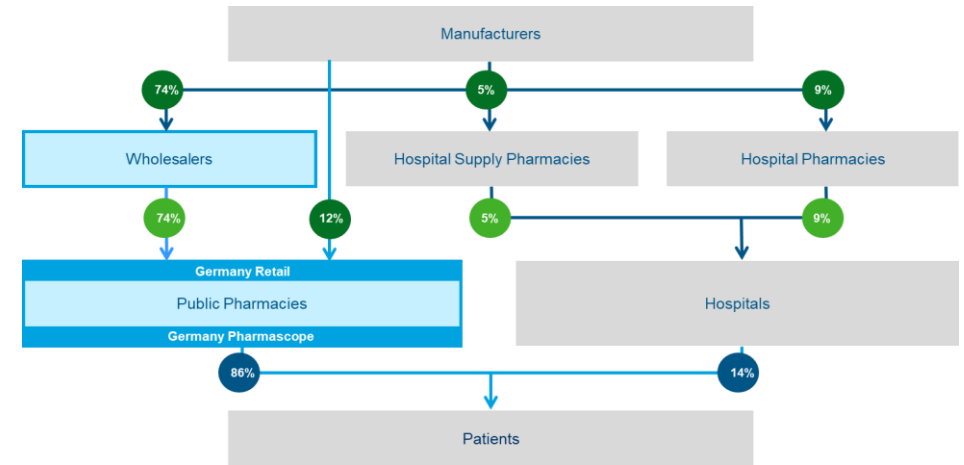
Participation

# Participating Companies	# Forms Validated	% Market Validated
28 *(+2 vPY)*	**1,587** *(-3 vPY)*	**11%** *(no change vPY)*

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Germany PharmaScope Validation Study

2020 Validation Study (Sell-out Data)

Validation Results

Precision	94.0%	Bias	0.6%

Precision chart (2016–2020): 96.4, 96.0, 92.4, 96.4, 94.0 (with 14% annotation on 2017)

Bias chart (2016–2020): 0.8, 0.7, -0.5, -0.4, 0.6
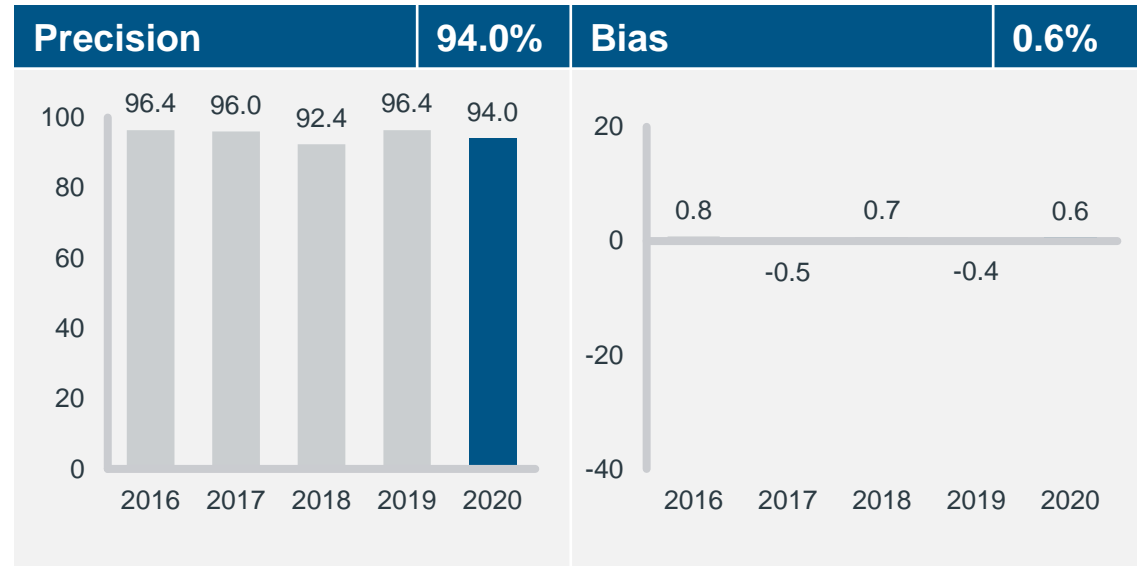
Outcomes

- Result are based on counting units (ZE)
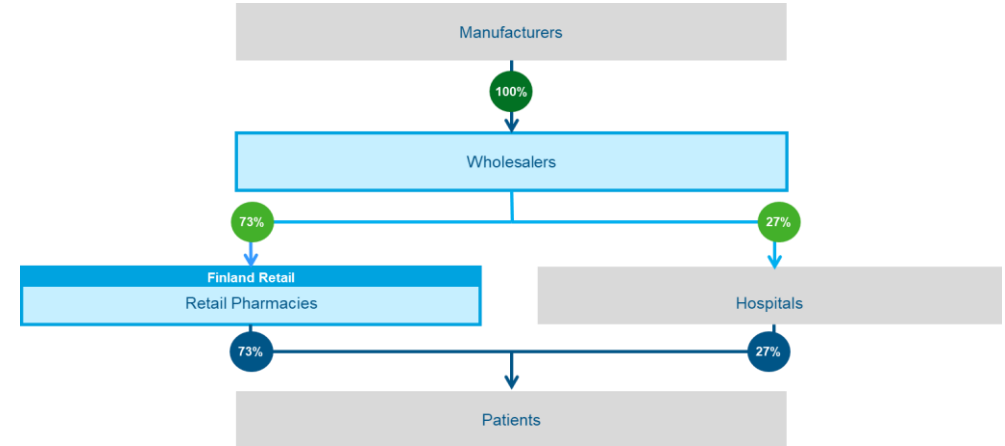- Overall precision index declined by 2.4 percentage points in 2020. Overall bias changed from 0.4% underestimation in 2019 to 0.6% overestimation in 2020
- Win more clients to increase data basis for validation
- No imminent improvement action required from a statistical point of view

Distribution Channels Validated

Distribution channel diagram: Manufacturers → Wholesalers (74%), Hospital Supply Pharmacies (5%), Hospital Pharmacies (9%); Wholesalers (74%, 12%) → Germany Retail Public Pharmacies (Germany Pharmascope); Hospital Supply Pharmacies (5%), Hospital Pharmacies (9%) → Hospitals; Public Pharmacies (86%) and Hospitals (14%) → Patients
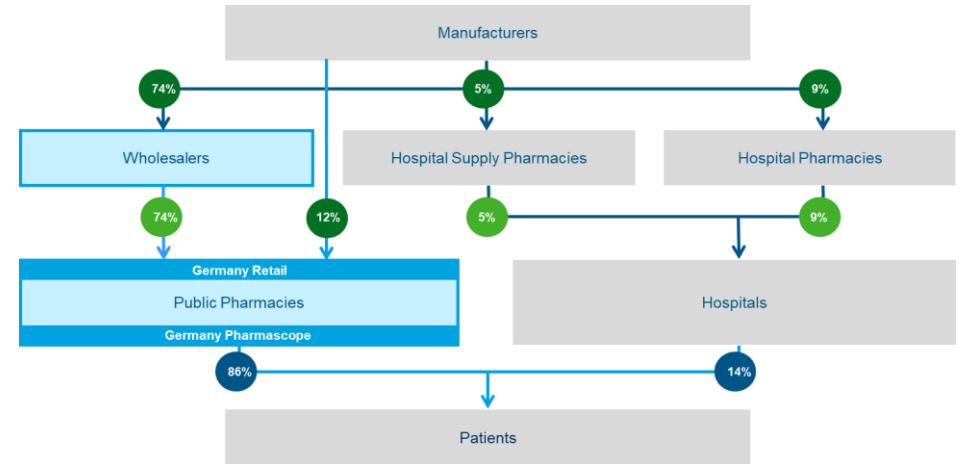
Participation

# Participating Companies	# Forms Validated	% Market Validated
28 (+2 vPY)	**1,618** (+26 vPY)	**12%** (+1% vPY)

Germany PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	89.5%	Bias	4.9%
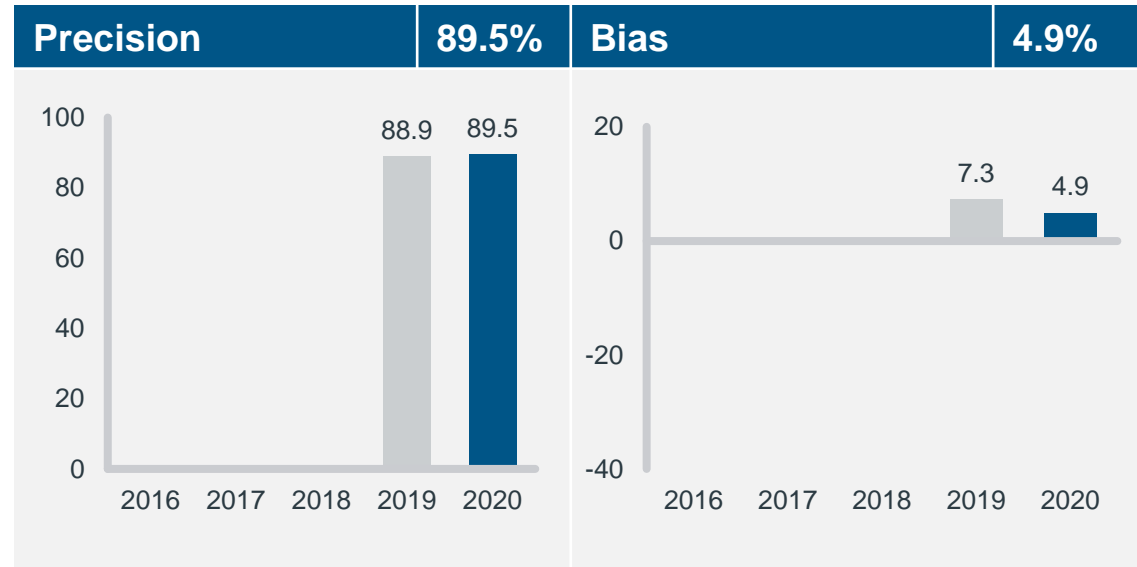
Outcomes

- Validation results prior to 2019 are based on previous methodology and dropped from reporting
- Overall precision index improved by 0.6 percentage points in 2020. Overall overestimation improved by 2.4 percentage points in 2020
- Analyses confirmed that high bias originates partially from increased stock/inventory consumption
- Review of data collection and QC methodologies

Distribution Channels Validated
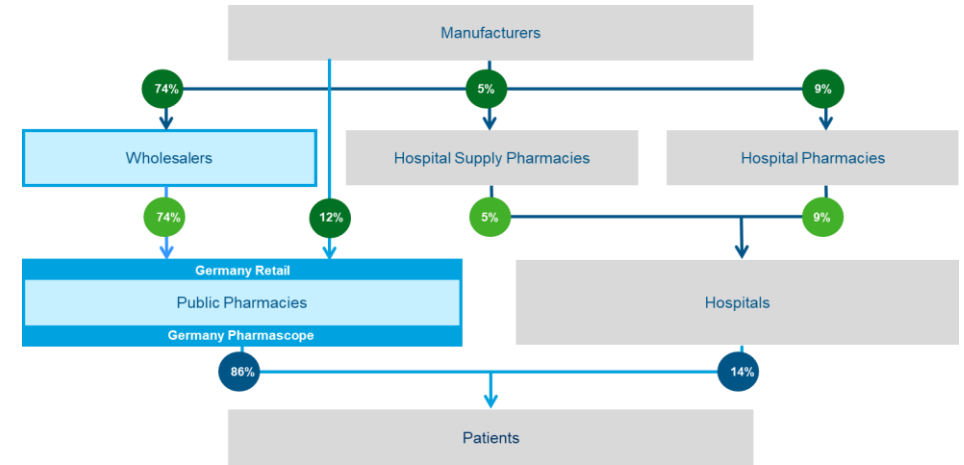
Participation

# Participating Companies	# Forms Validated	% Market Validated
37 (+4 vPY)	**2,392** (+338 vPY)	**14%** (-1% vPY)

Greece Retail Validation Study
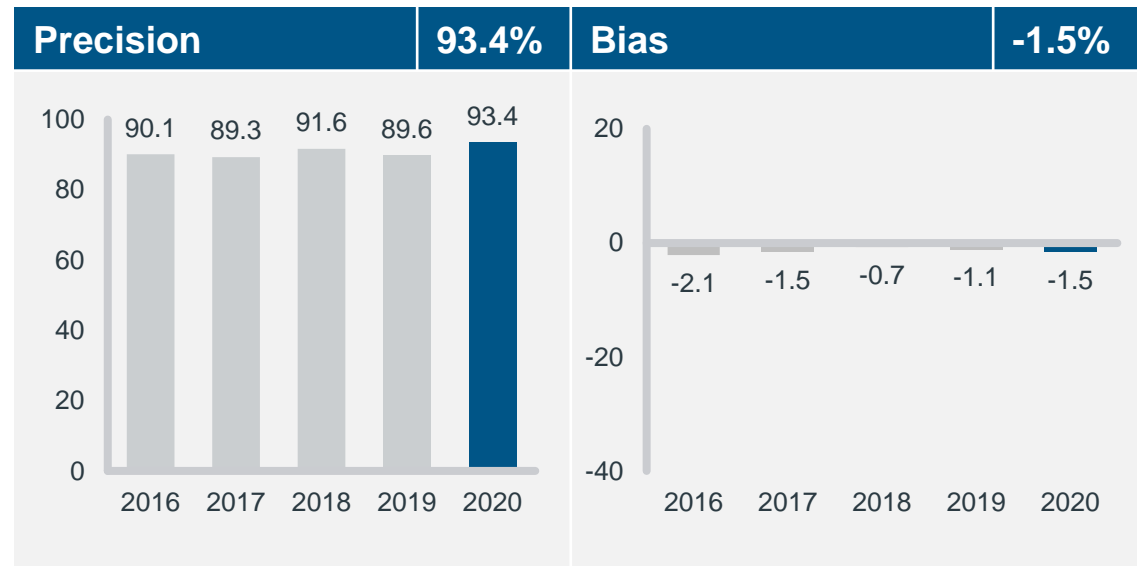
2020 Validation Study

Validation Results

Precision	93.4%	Bias	-1.5%

Precision chart:
- 2016: 90.1
- 2017: 89.3
- 2018: 91.6
- 2019: 89.6
- 2020: 93.4

Bias chart:
- 2016: -2.1
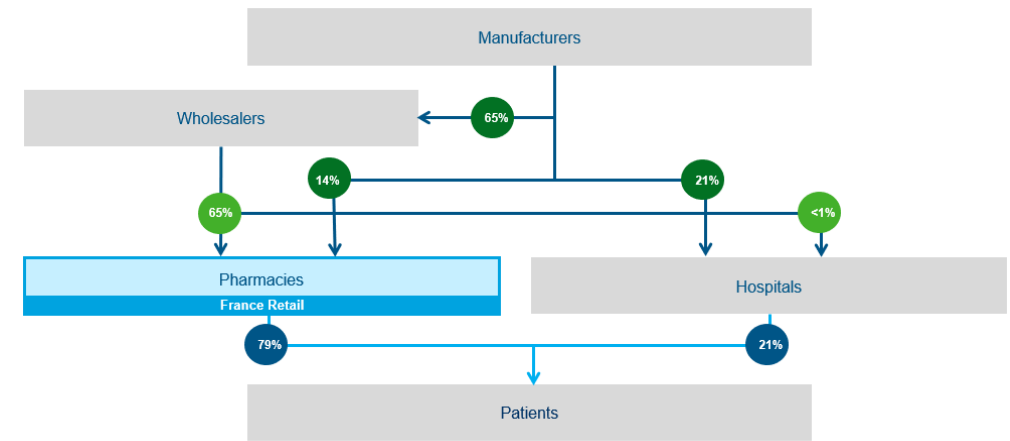- 2017: -1.5
- 2018: -0.7
- 2019: -1.1
- 2020: -1.5

Outcomes
- Overall precision index improved by 3.8 percentage points in 2020
- Overall underestimation increased by 0.4 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 65% — Export

30%

5%

58%

Hospitals + State Pharmacies (EOPYY)

Pharmacies — Greece Retail — 3% — Private Clinics

30%

60%

7%

3%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
48 *(+3 vPY)*	**868** *(-94 vPY)*	**48%** *(-4% vPY)*

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Greece OTC Validation Study
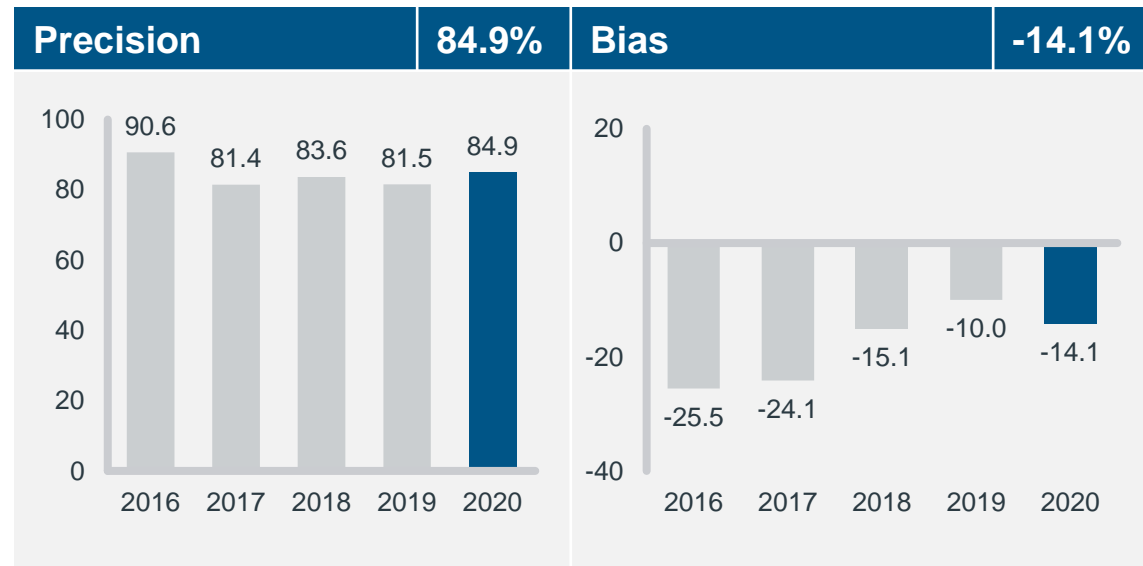
2020 Validation Study

Validation Results

Precision	84.9%	Bias	-14.1%

Precision

- 2016: 90.6
- 2017: 81.4
- 2018: 83.6
- 2019: 81.5
- 2020: 84.9

Bias

- 2016: -25.5
- 2017: -24.1
- 2018: -15.1
- 2019: -10.0
- 2020: -14.1

Outcomes

- Overall precision index improved by 3.4 percentage points in 2020
- Overall underestimation increased by 4.1 percentage points in 2020
- Explore channels distribution

Distribution Channels Validated

Manufacturers

Wholesalers — 65%, 30%, 5%

Export — 7%

Hospitals + State Pharmacies (EOPYY)

Pharmacies — Greece Retail — 58%, 3%

Private Clinics

30%, 60%, 3%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
18 *(+3 vPY)*	**86** *(+2 vPY)*	**36%** *(No change vPY)*

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Hungary Retail+Hospital Validation Study
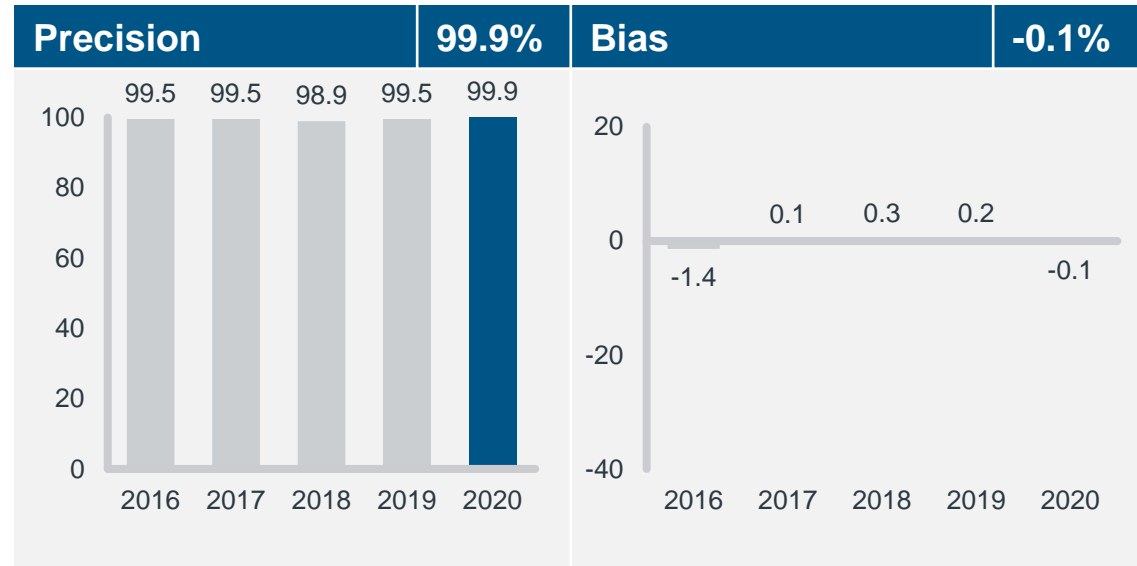
2020 Validation Study

Validation Results

Precision	99.9%	Bias	-0.1%

Precision chart:
- 2016: 99.5
- 2017: 99.5
- 2018: 98.9
- 2019: 99.5
- 2020: 99.9

Bias chart:
- 2016: -1.4
- 2017: 0.1
- 2018: 0.3
- 2019: 0.2
- 2020: -0.1

Outcomes
- Overall precision index improved by 0.4 percentage points in 2020
- Overall bias turned from 0.2% overestimation in 2019 to 0.1% underestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 95%

<1% — 5%

77% — 18%

Hungary Retail — Pharmacies

Hungary Hospital — Hospitals

77% — 23%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
66 *(-4 vPY)*	**1,534** *(-7 vPY)*	**72%** *(+4% vPY)*

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IQVIA

Hungary PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	97.2%	Bias	-1.1%

Precision values: 96.2 (2016), 96.8 (2017), 96.6 (2018), 97.4 (2019), 97.2 (2020)

Bias values: -6.0 (2016), -1.7 (2017), -0.7 (2018), -1.9 (2019), -1.1 (2020)
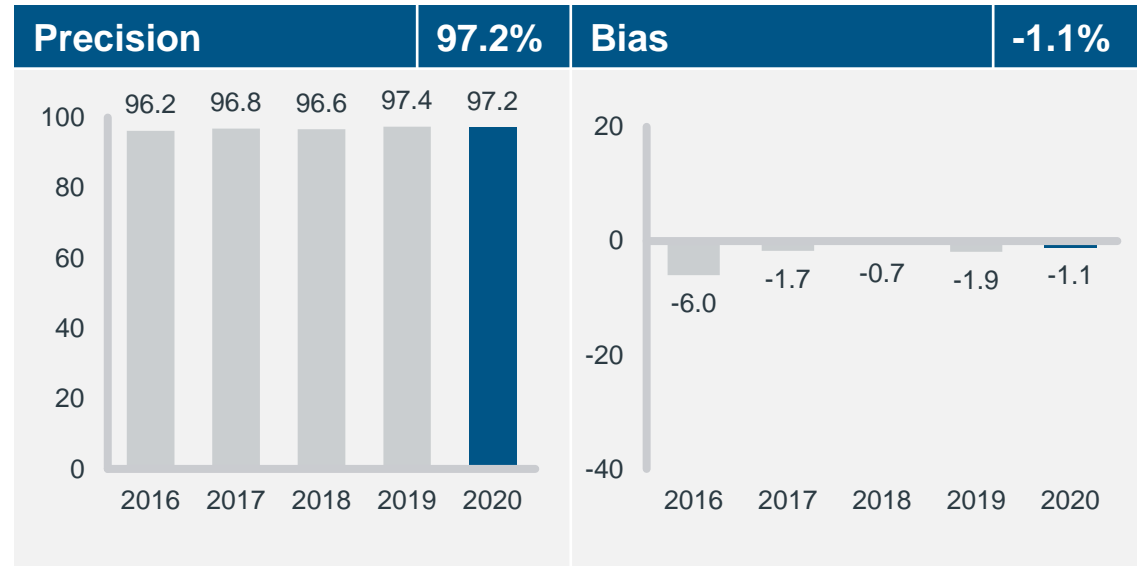
Outcomes

- Overall precision index declined by 0.2 percentage points in 2020
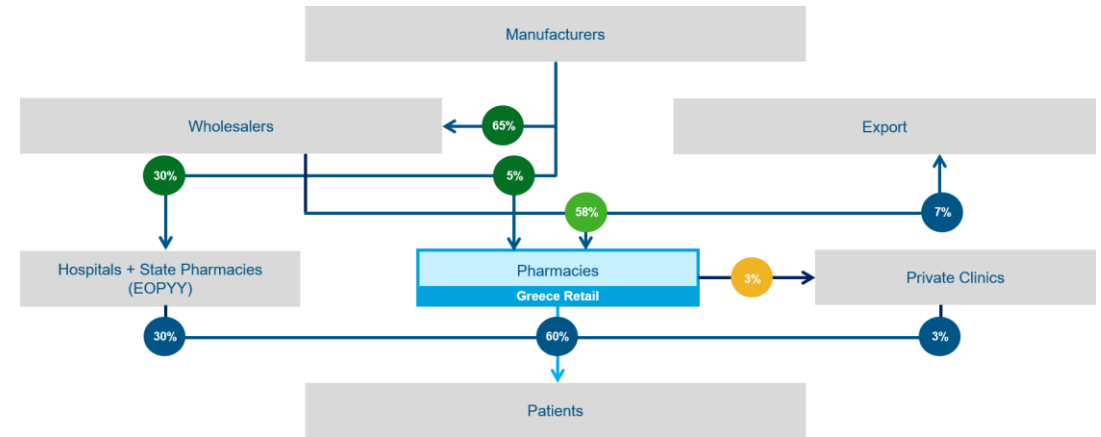- Overall underestimation improved by 0.8 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 95%
<1%, 5%, 18%
77% Hungary Retail Pharmacies
Hospitals
77% → Patients ← 23%

Participation

# Participating Companies	# Forms Validated	% Market Validated
64 *(-5 vPY)*	**1,312** *(+18 vPY)*	**71%** *(+4% vPY)*

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Hungary OTC Validation Study

2020 Validation Study

Validation Results

Precision	97.9%	Bias	-0.6%

Precision chart (2016–2020):
- 2016: 95.5
- 2017: 96.8
- 2018: 98.0
- 2019: 99.4
- 2020: 97.9

Bias chart (2016–2020):
- 2016: -4.5
- 2017: -3.1
- 2018: 0.8
- 2019: -2.4
- 2020: -0.6
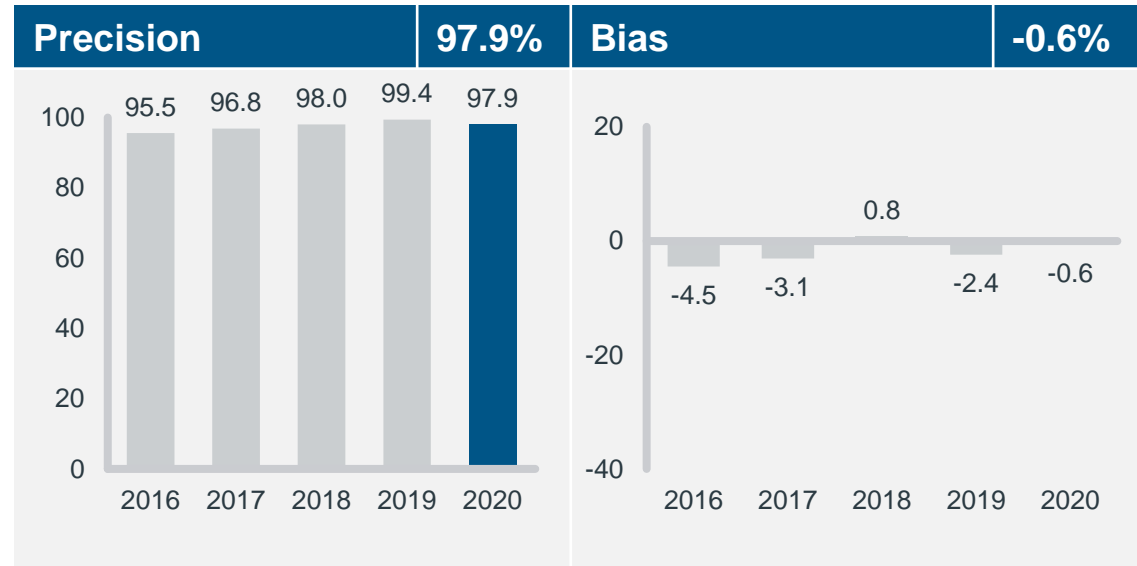
Outcomes
- Overall precision index declined by 1.5 percentage points in 2020
- Overall underestimation improved 1.8 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers (95%)
<1%
5%
77%
18%
Hungary Retail Pharmacies
Hospitals
77%
23%
Patients
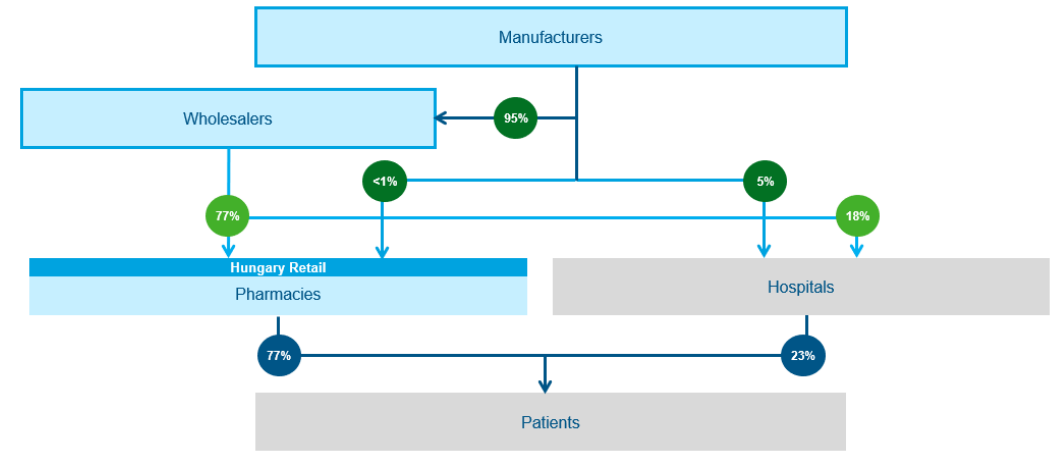
Participation

# Participating Companies	# Forms Validated	% Market Validated
35 (-7 vPY)	329 (-4 vPY)	66% (+2% vPY)

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Ireland PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	89.1%	Bias	-3.6%
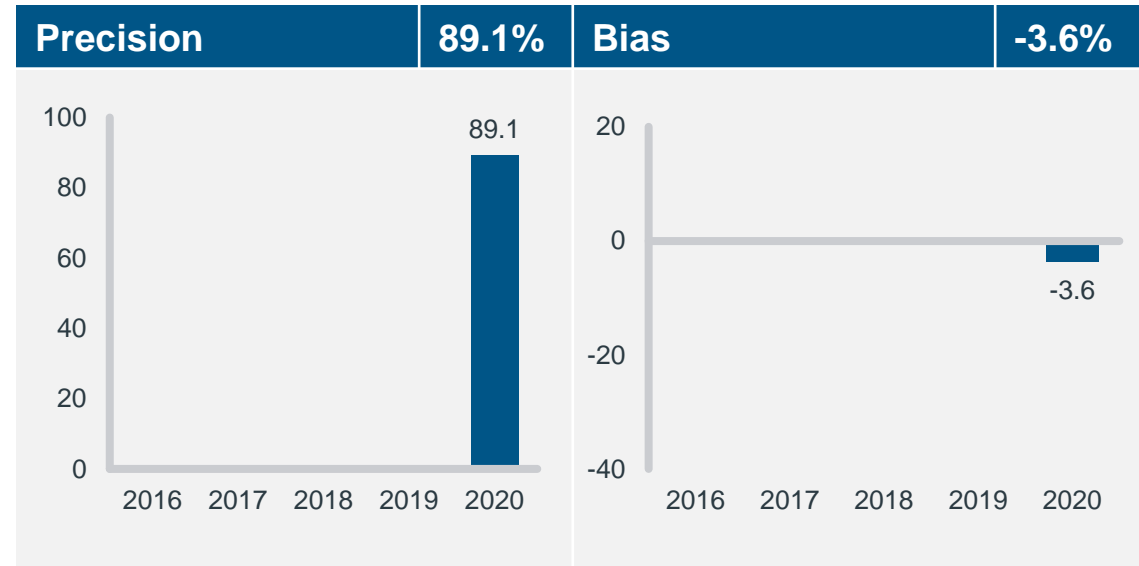
Outcomes

- Overall precision index at 89.1% in 2020
- Overall underestimation at 3.6% in 2020
- Investigate input data quality

Distribution Channels Validated
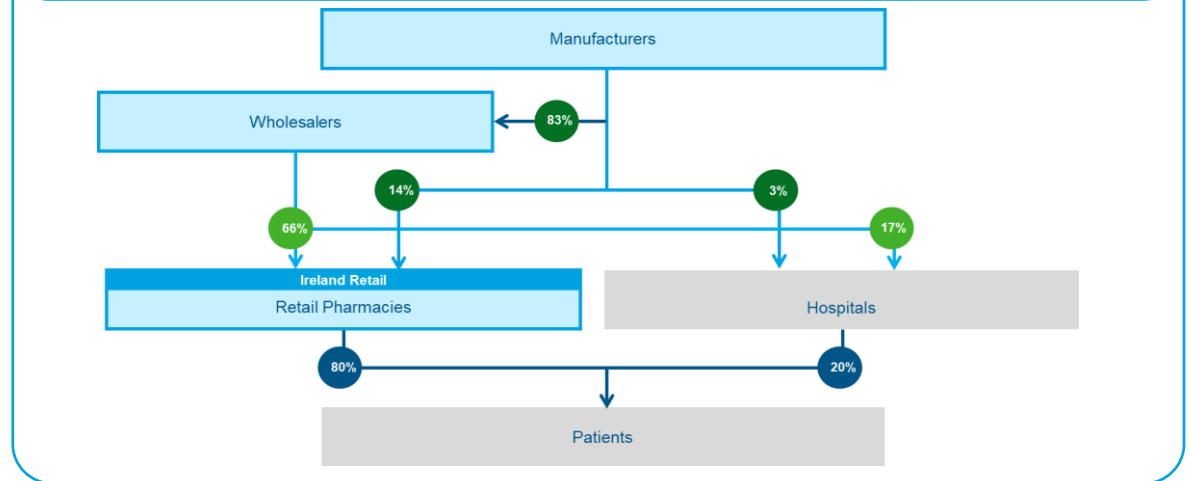
Participation

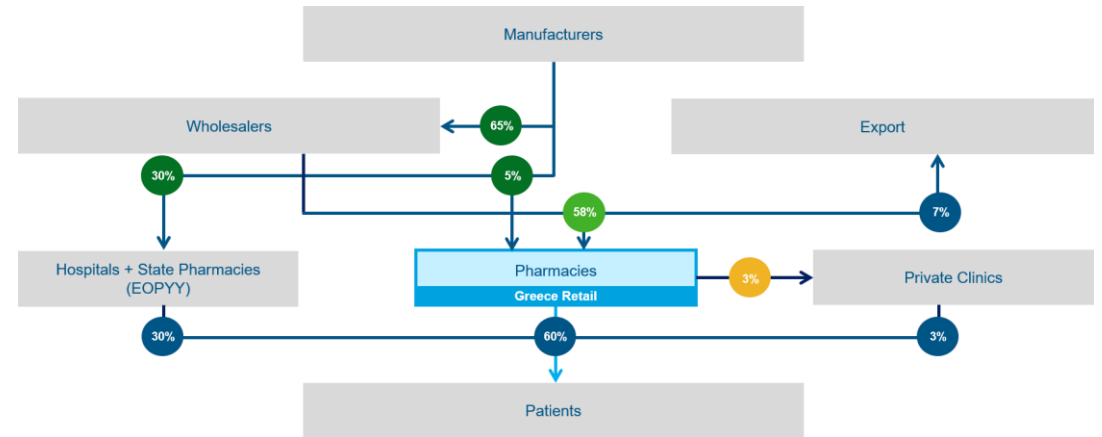| # Participating Companies	# Forms Validated	% Market Validated
117 (vPY)	1,543 (vPY)	86% (vPY)

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Italy Retail Validation Study
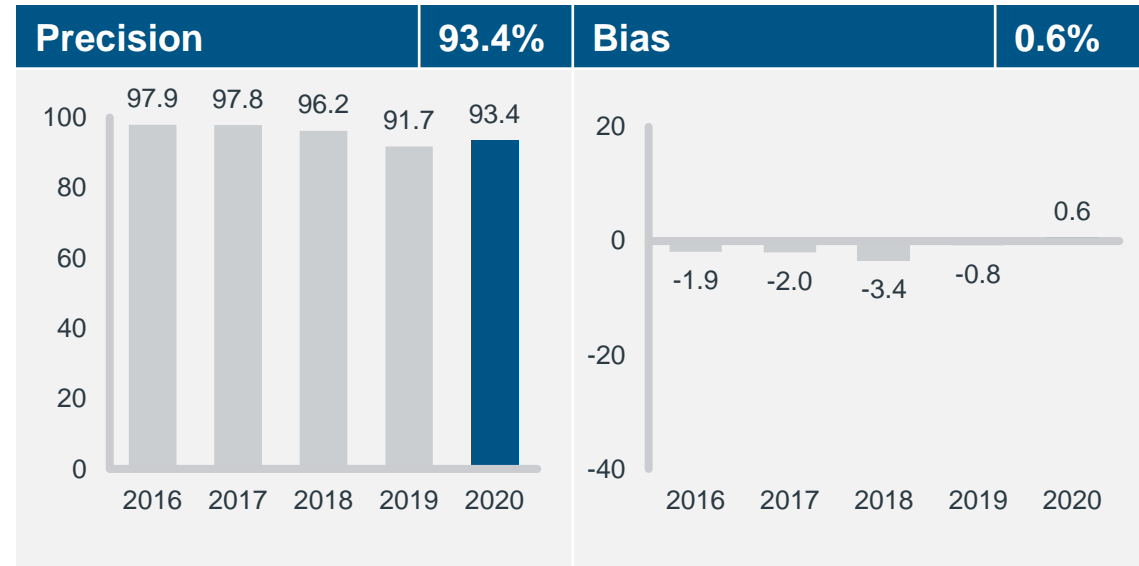
2020 Validation Study

Validation Results

Precision	93.4%	Bias	0.6%

Precision

Bar chart values by year:
- 2016: 97.9
- 2017: 97.8
- 2018: 96.2
- 2019: 91.7
- 2020: 93.4

Bias

Bias values by year:
- 2016: -1.9
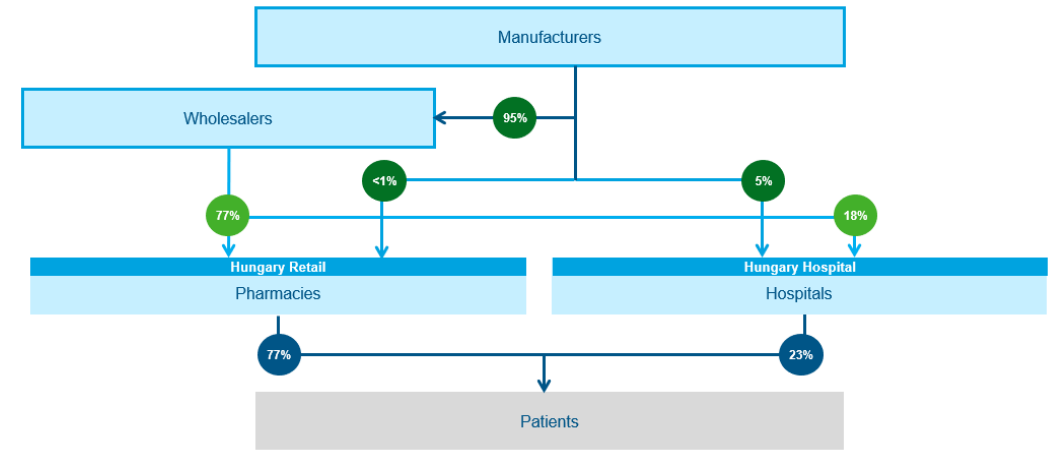- 2017: -2.0
- 2018: -3.4
- 2019: -0.8
- 2020: 0.6

Outcomes

- Overall precision index improved by 1.7 percentage points in 2020
- Overall bias turned from 0.8% underestimation in 2019 to 0.6% overestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

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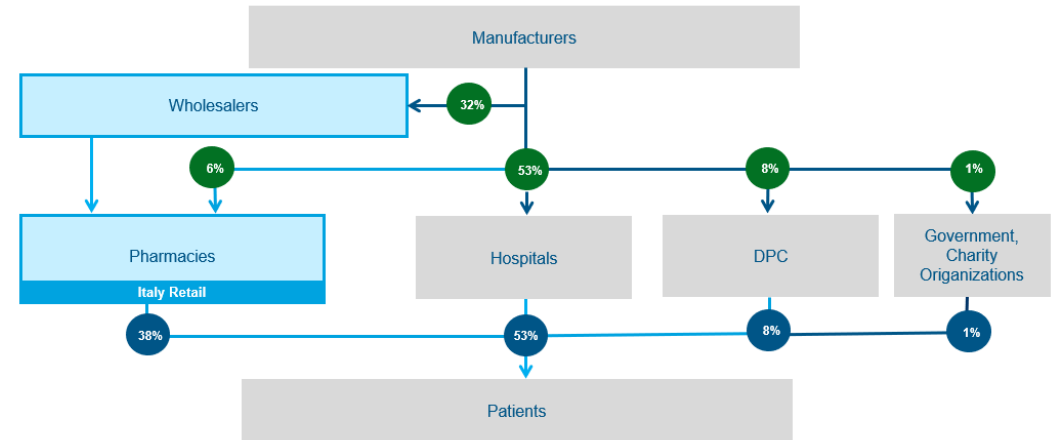
Participation

# Participating Companies	# Forms Validated	% Market Validated
25 *(-12 vPY)*	**1,135** *(-501 vPY)*	**25%** *(-11% vPY)*

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Italy PharmaTrend Validation Study
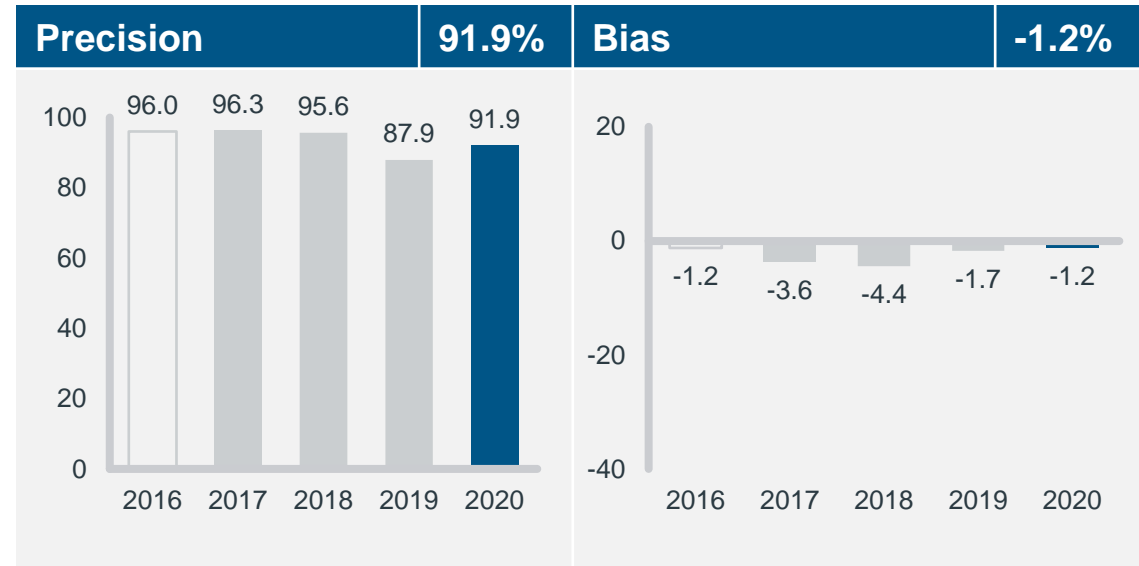
2020 Validation Study

Validation Results

Precision	91.9%	Bias	-1.2%

Precision (bars):
- 2016: 96.0
- 2017: 96.3
- 2018: 95.6
- 2019: 87.9
- 2020: 91.9

Bias (bars):
- 2016: -1.2
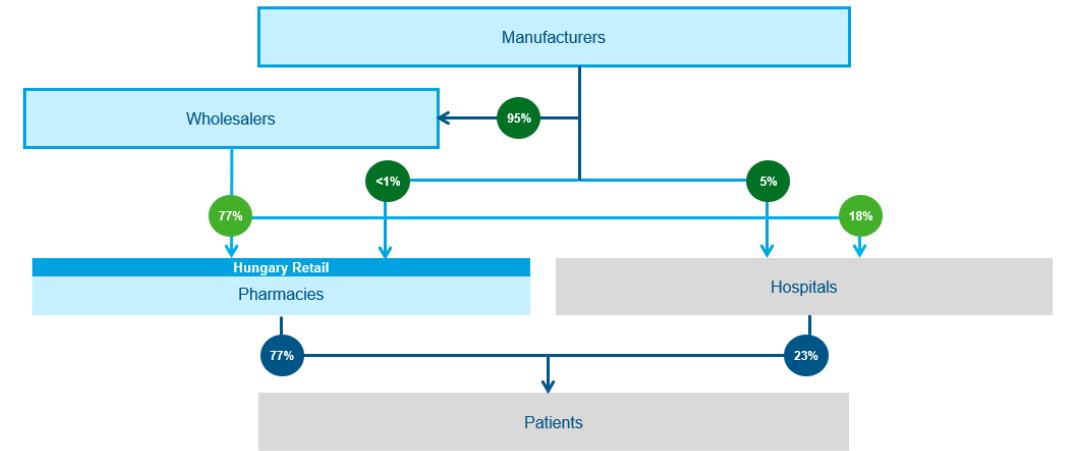- 2017: -3.6
- 2018: -4.4
- 2019: -1.7
- 2020: -1.2

Outcomes
- Overall precision index improved by 4.0 percentage points in 2020
- Overall underestimation improved by 0.5 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 32%

Pharmacies — Italy Retail — 6%

Hospitals — 53%

DPC — 8%

Government, Charity Organizations — 1%

Patients — 38% / 53% / 8% / 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
24 *(-12 vPY)*	**1,100** *(-476 vPY)*	**26%** *(-10% vPY)*

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Italy OTC Validation Study

2020 Validation Study

Validation Results

Precision	82.9%	Bias	-8.5%

Precision chart (2016–2020): 89.7, 89.6, 91.2, 94.2, 82.9

Bias chart (2016–2020): -5.1, -9.3, -13.2, -8.8, -8.5
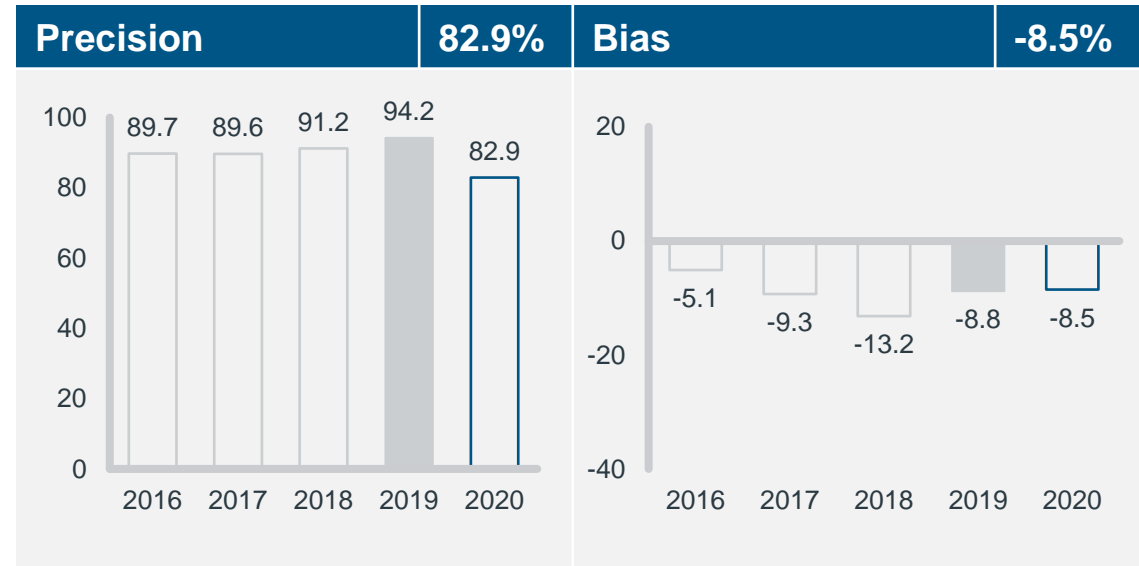
Outcomes

- Overall precision index declined by 11.3 percentage points in 2020
- Overall underestimation improved by 0.3 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Wholesalers 32%; 53%; 8%; 1%
Wholesalers → Pharmacies 6%
Pharmacies (Italy Retail) → Patients 38%
Hospitals 53%
DPC 8%
Government, Charity Organizations 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
11 (-8 vPY)	**70** (-25 vPY)	**9%** (-2% vPY)

Italy Hospital Validation Study

2020 Validation Study

Validation Results

Precision	82.2%	Bias	-7.1%

Precision bar chart (2016–2020): 83.9, 90.8, 85.2, 88.1, 82.2

Bias bar chart (2016–2020): -15.2, -6.7, -8.8, -8.4, -7.1
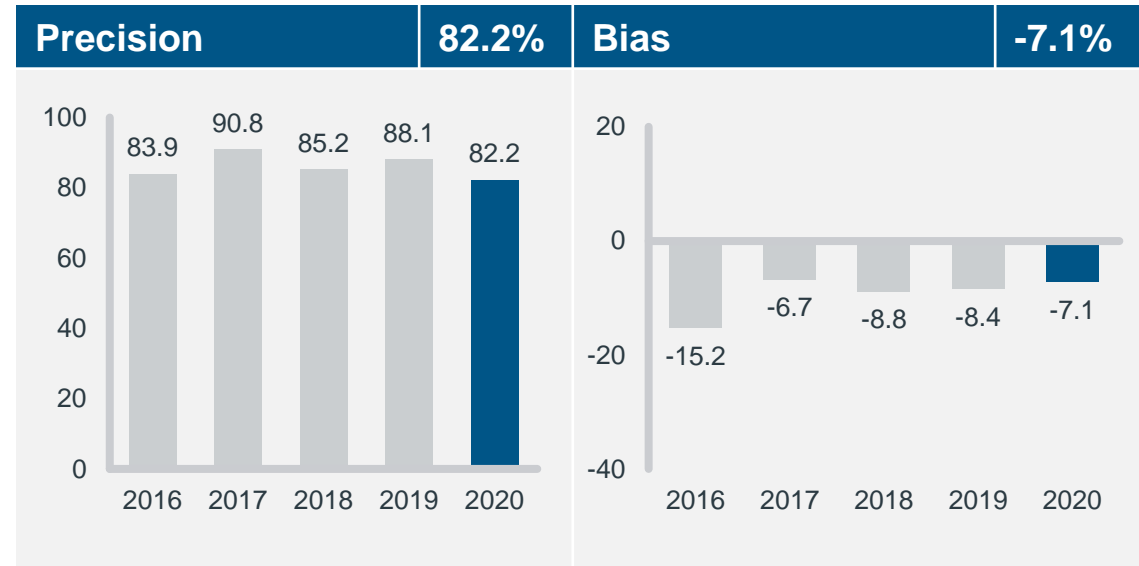
Outcomes

- Overall precision index declined by 5.9 percentage points in 2020
- Overall underestimation improved by 1.3 percentage points in 2020
- Increased variability in the data related to COVID-19 pandemic impact on hospital services and consumption
- Continue implementation of quality-improving actions

Distribution Channels Validated

Manufacturers → Wholesalers 32%; Manufacturers 53%; 8%; 1%
Wholesalers → Pharmacies 6%
Pharmacies 38%; Hospitals (Italy Hospital) 53%; DPC (Italy DPC) 8%; Government, Charity Organizations 1%
Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
16 *(-4 vPY)*	**306** *(-53 vPY)*	**29%** *(no change vPY)*

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Kazakhstan Retail+Hospital Validation Study
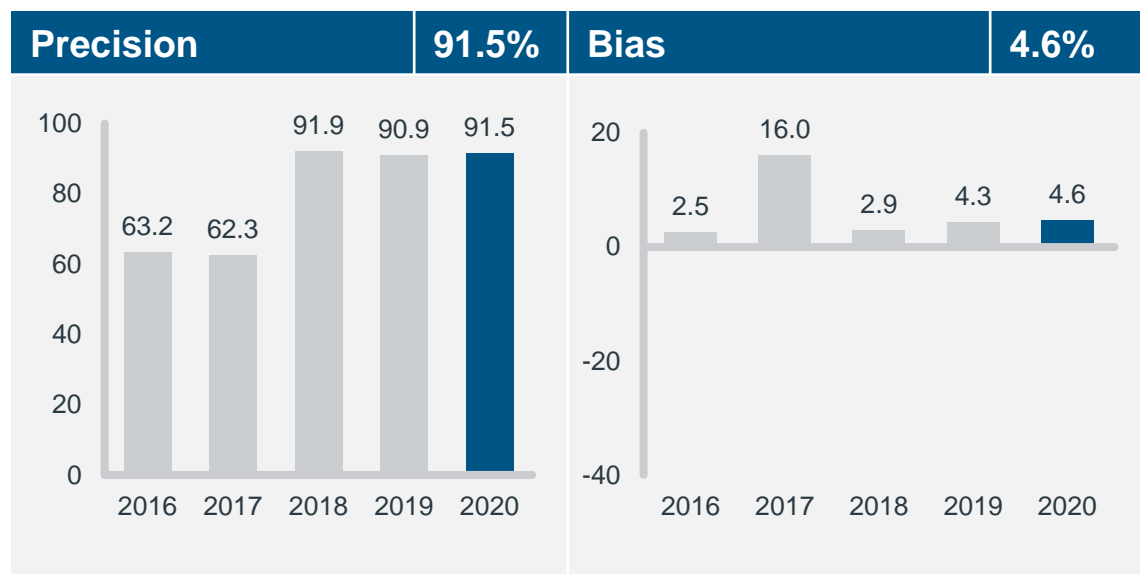
2020 Validation Study

Validation Results

Precision	91.5%	Bias	4.6%

Precision chart (2016–2020): 63.2, 62.3, 91.9, 90.9, 91.5

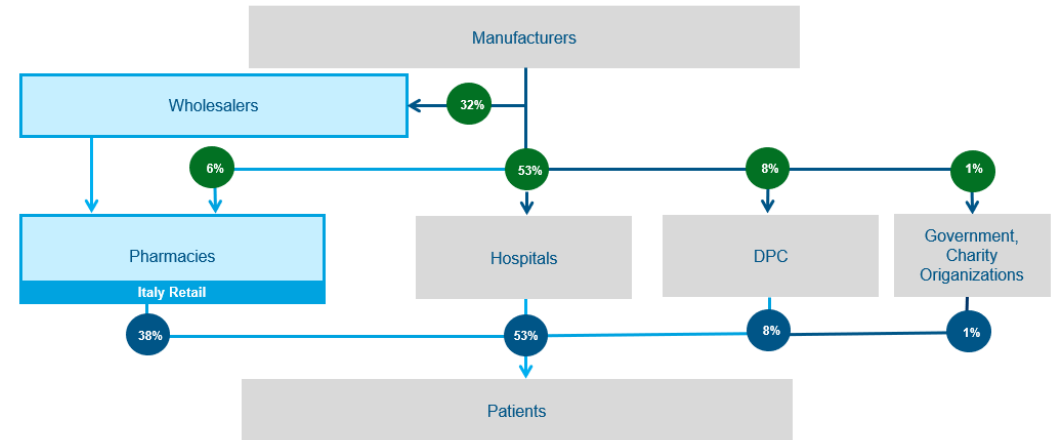Bias chart (2016–2020): 2.5, 16.0, 2.9, 4.3, 4.6

Outcomes

- Overall precision index improved by 0.6 percentage points in 2020
- Overall overestimation increased by 0.3 percentage points in 2020
- Add new rapidly developing regional distributors in the sample

Distribution Channels Validated

Manufacturers/Importers — 78% / 22%

Wholesalers/Depots ← State distribution*

60% — 25% — 15%

Kazakhstan Retail: Pharmacies
Kazakhstan Non-Retail: Hospitals / Reimbursement

60% — 25% — 15%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
69 *(+27 vPY)*	**656** *(+197 vPY)*	**14%** *(+4% vPY)*

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IQVIA

Latvia Retail Validation Study

2020 Validation Study

Validation Results

| Precision | 90.1% | Bias | 1.2% |

Precision bar chart (2016-2020): 85.2, 89.5, 87.8, 83.6, 90.1

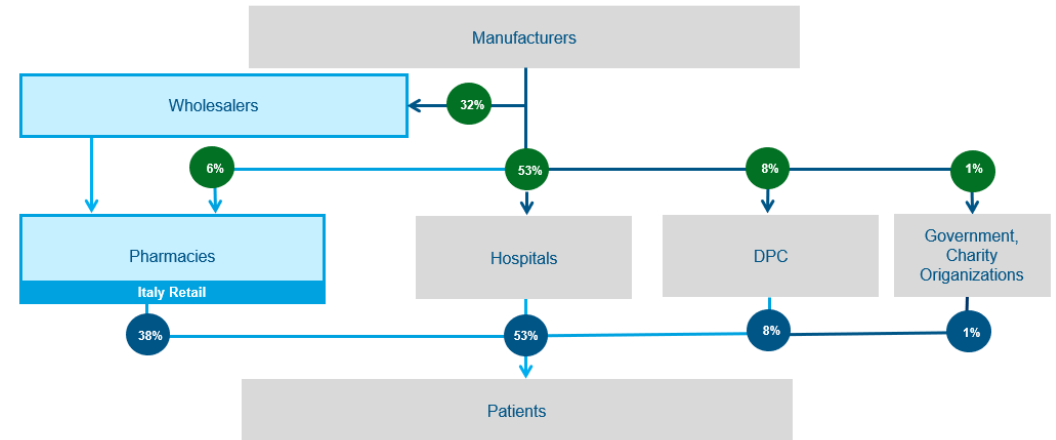Bias bar chart (2016-2020): 10.9, 14.3, 4.7, 4.2, 1.2
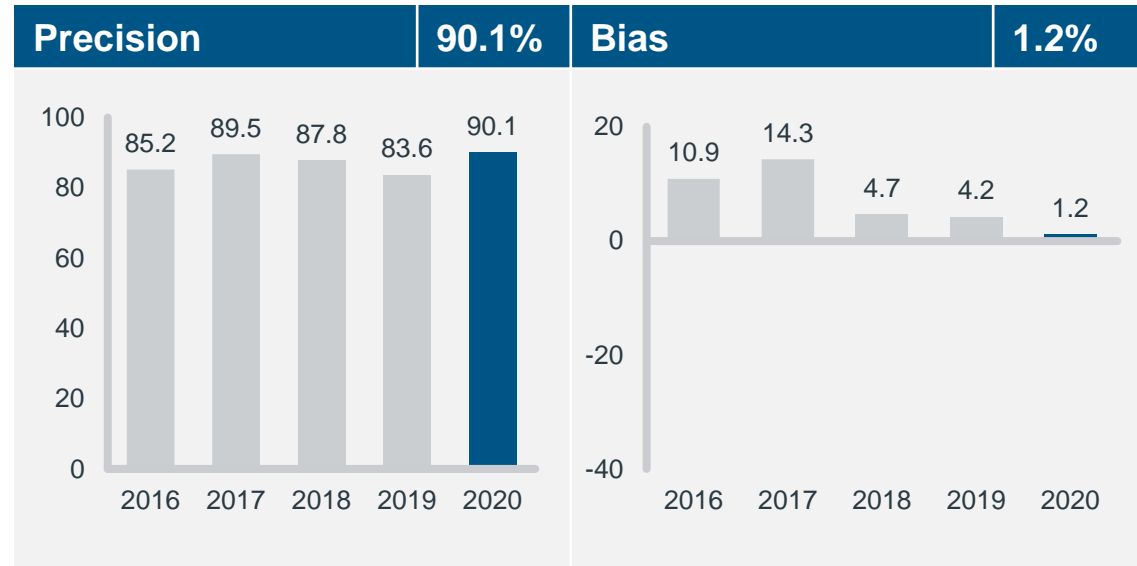
Outcomes
- Overall precision index improved by 6.5 percentage points in 2020
- Overall overestimation improved by 3.0 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 92% → Latvia Retail Retail Pharmacies; Wholesalers → 8% → Hospitals; Retail Pharmacies → 97% → Patients; Hospitals → 8%

Participation

# Participating Companies	# Forms Validated	% Market Validated
15 (-7 vPY)	**486** (-114 vPY)	**21%** (-7% vPY)

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Lithuania Retail Validation Study
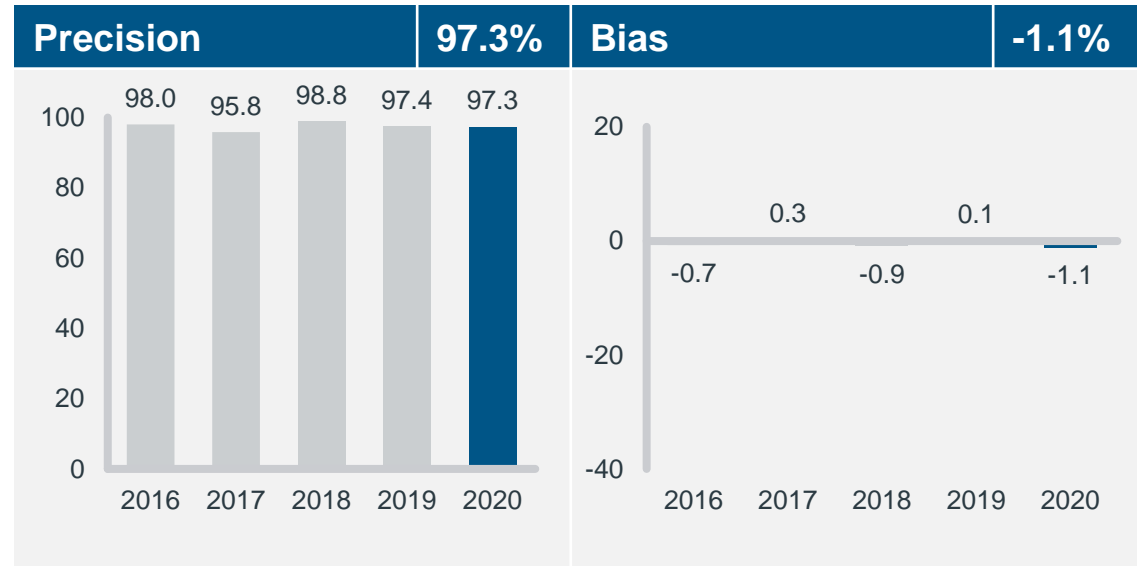
2020 Validation Study

Validation Results

| Precision | 97.3% | Bias | -1.1% |

Precision bar chart:
- 2016: 98.0
- 2017: 95.8
- 2018: 98.8
- 2019: 97.4
- 2020: 97.3

Bias chart:
- 2016: 0.3
- 2017: -0.7
- 2018: -0.9
- 2019: 0.1
- 2020: -1.1

Outcomes

- Overall precision index declined by 0.1 percentage points in 2020
- Overall bias turned from 0.1% overestimation in 2019 to 1.1% underestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 92% → Lithuania Retail Retail Pharmacies → 92% → Patients
Wholesalers → 8% → Hospitals → 8% → Patients
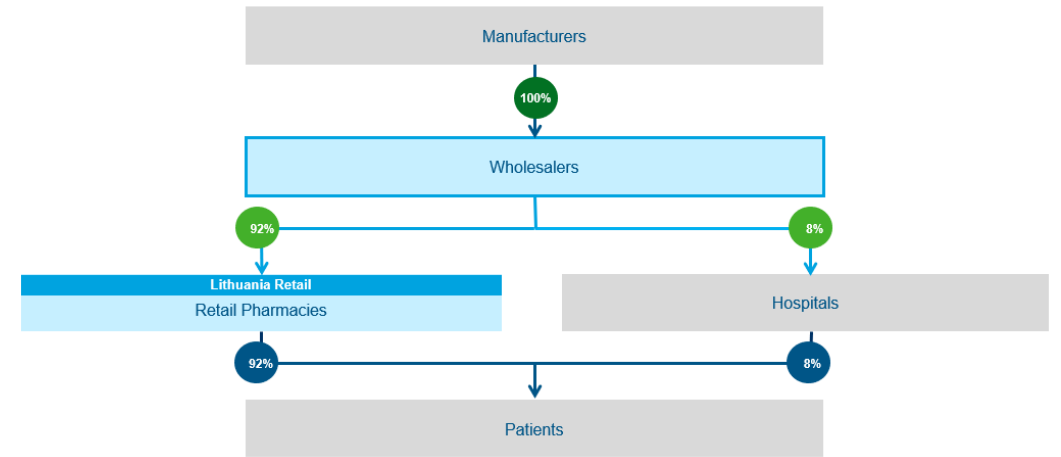
Participation

# Participating Companies	# Forms Validated	% Market Validated
25 (+4 vPY)	706 (+110 vPY)	36% (+6% vPY)

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Poland Retail+Hospital Validation Study
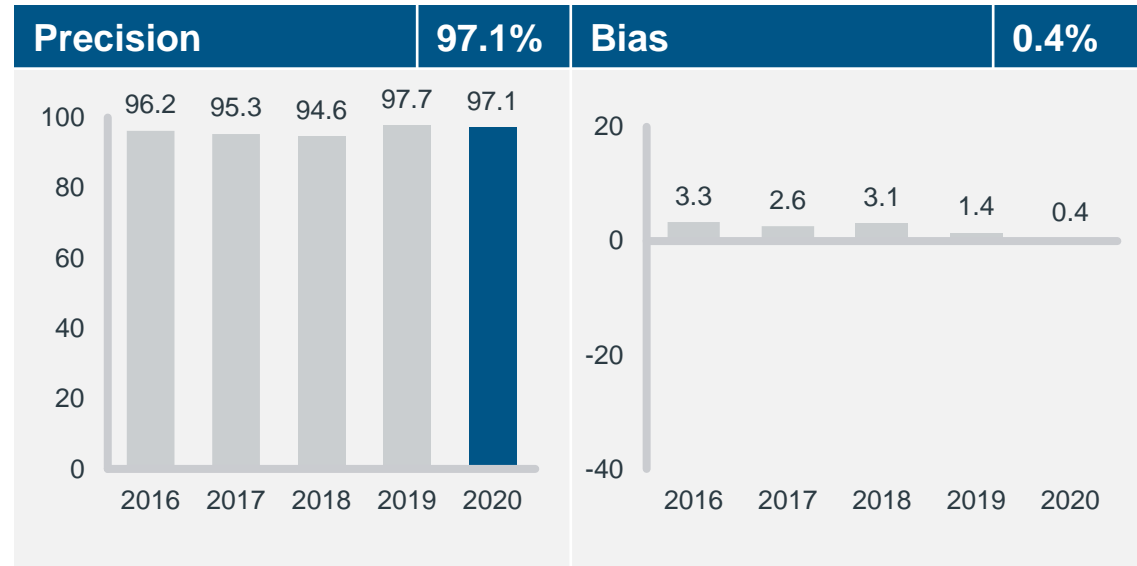
2020 Validation Study

Validation Results

Precision	97.1%	Bias	0.4%

Precision chart:
- 2016: 96.2
- 2017: 95.3
- 2018: 94.6
- 2019: 97.7
- 2020: 97.1

Bias chart:
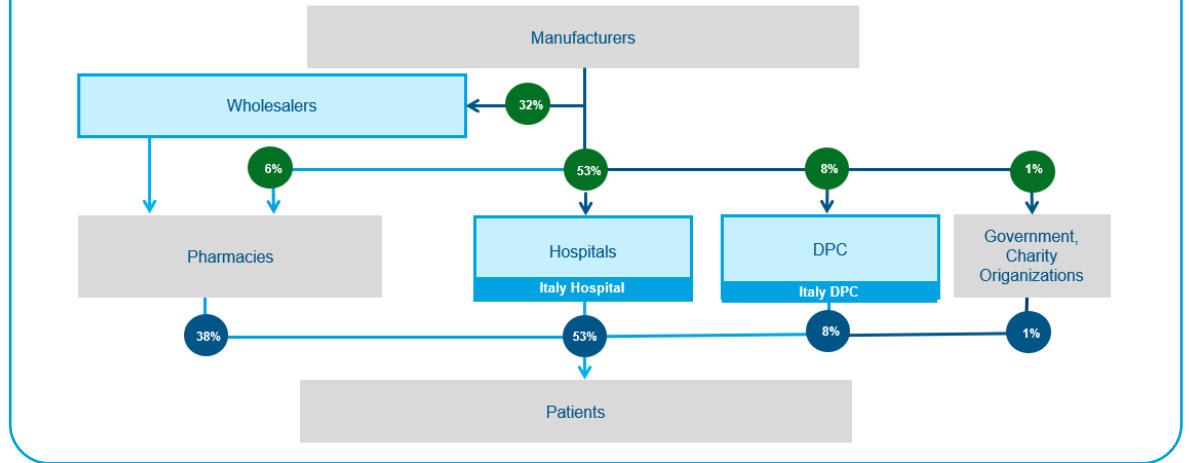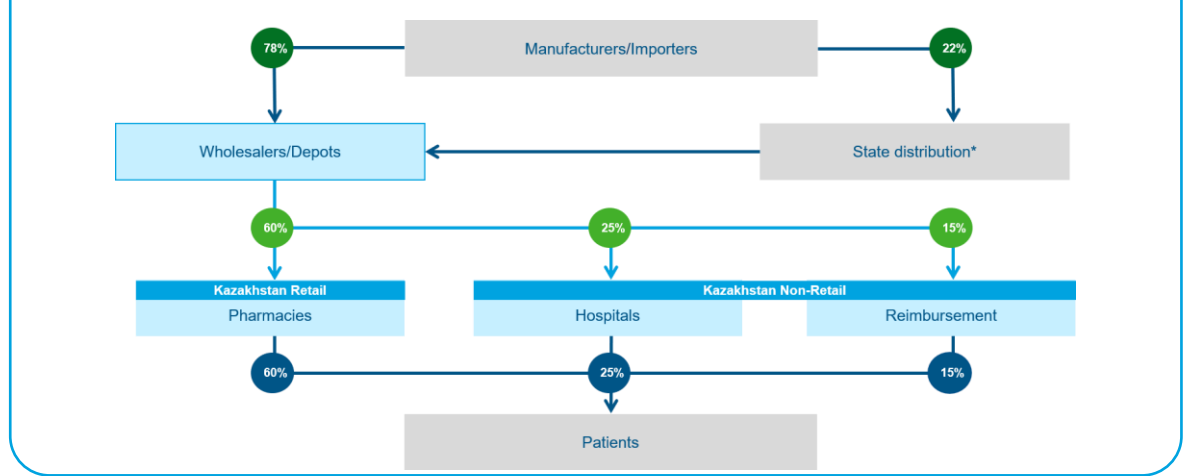- 2016: 3.3
- 2017: 2.6
- 2018: 3.1
- 2019: 1.4
- 2020: 0.4

Outcomes

- Overall precision index declined by 0.6 percentage points in 2020
- Overall overestimation improved by 1.0 percentage point in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers / Import Agents

Wholesalers — 93%

81% — 4% — 3% — 12%

Poland Retail — Pharmacies
Poland Hospital — Hospitals

85% — 15%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
55 (+21 vPY)	1,236 (+521 vPY)	30% (+16% vPY)

IQVIA

Poland PharmaTrend Validation Study
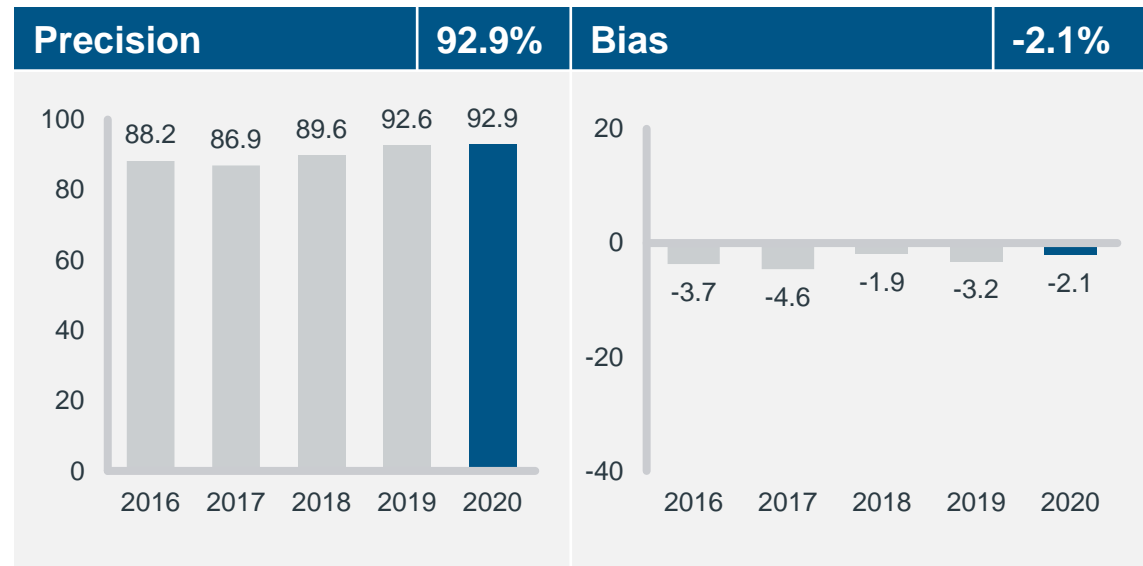
2020 Validation Study

Validation Results

Precision	92.9%	Bias	-2.1%

Precision chart (2016–2020): 88.2, 86.9, 89.6, 92.6, 92.9

Bias chart (2016–2020): -3.7, -4.6, -1.9, -3.2, -2.1

Outcomes

- Overall precision index improved by 0.3 percentage points in 2020
- Overall underestimation improved by 1.1 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers / Import Agents

Wholesalers — 93%

4% — 3% — 12%

81%

Poland Retail Pharmacies

Hospitals

85% — 15%

Patients

Participation

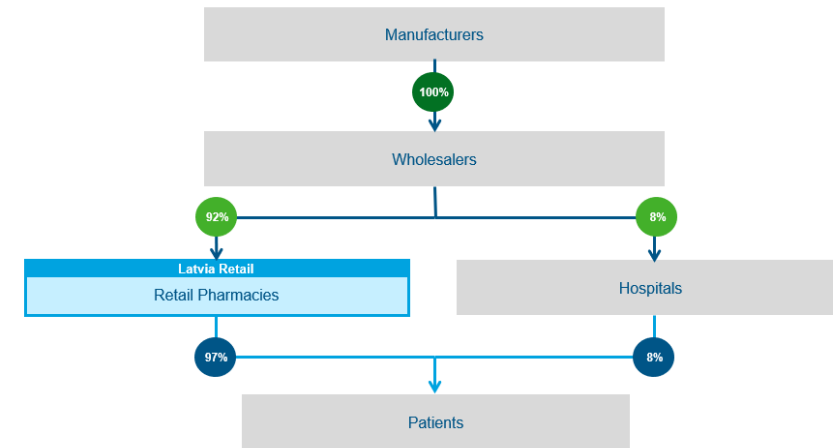| # Participating Companies	# Forms Validated	% Market Validated
53 (+20 vPY)	1,103 (+492 vPY)	30% (+16% vPY)

IQVIA

Poland OTC Validation Study
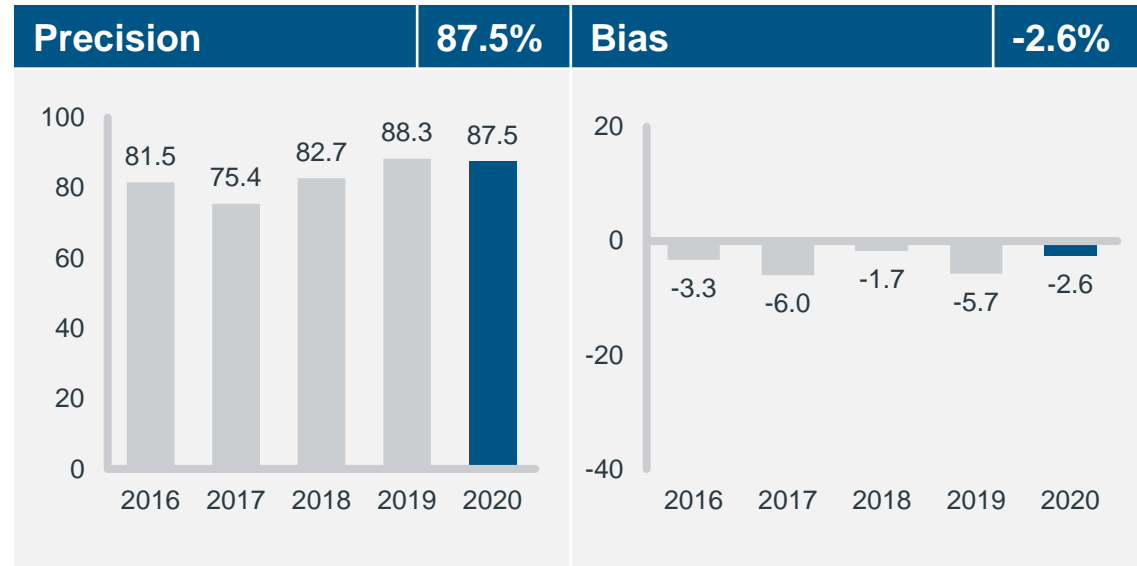
2020 Validation Study

Validation Results

Precision	87.5%	Bias	-2.6%

Precision chart (2016: 81.5, 2017: 75.4, 2018: 82.7, 2019: 88.3, 2020: 87.5)

Bias chart (2016: -3.3, 2017: -6.0, 2018: -1.7, 2019: -5.7, 2020: -2.6)

Outcomes

- Overall precision index declined by 0.8 percentage points in 2020
- Overall underestimation improved by 3.1 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers / Import Agents → Wholesalers 93% → Poland Retail Pharmacies 81%, 4%, 3% Hospitals 12%; Pharmacies → Patients 85%, 15%

Participation

# Participating Companies	# Forms Validated	% Market Validated
37 (+18 vPY)	**351** (+157 vPY)	**31%** (+18% vPY)

Russia Retail+Hospital Validation Study

2020 Validation Study

Validation Results

Precision	83.2%	Bias	-11.4%

Precision chart (2016–2020): 89.2, 88.0, 88.8, 89.0, 83.2

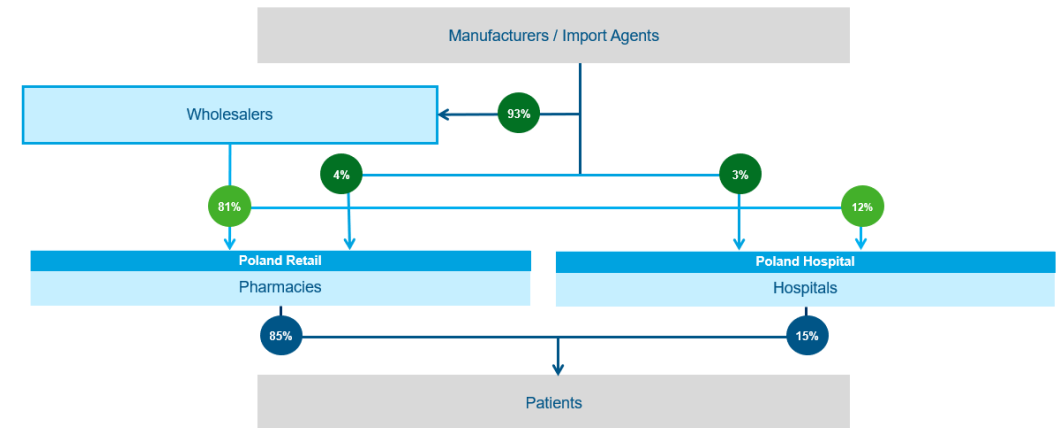Bias chart (2016–2020): -12.8, -11.7, -15.3, -9.8, -11.4
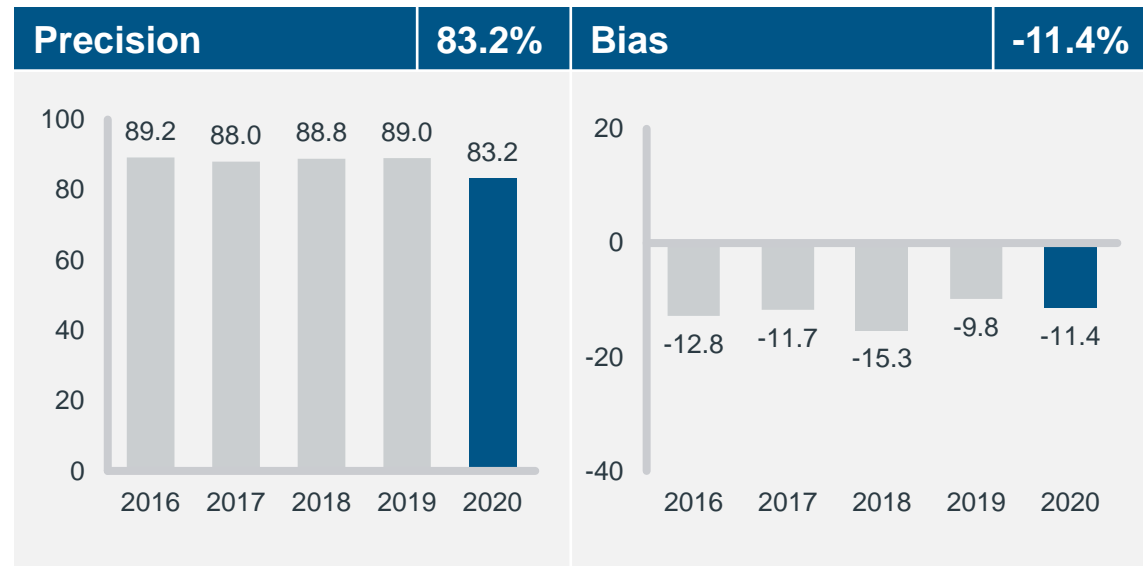
Outcomes

- Overall precision index declined by 5.8 percentage points in 2020
- Overall underestimation increased by 1.6 percentage points in 2020
- Add new important pharmacy chains in the sample
- Improve the quality checks of incoming raw data by comparing different data sources

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
125 *(-1 vPY)*	**2,100** *(-37 vPY)*	**37%** *(-2% vPY)*

Serbia Retail+Hospital Validation Study
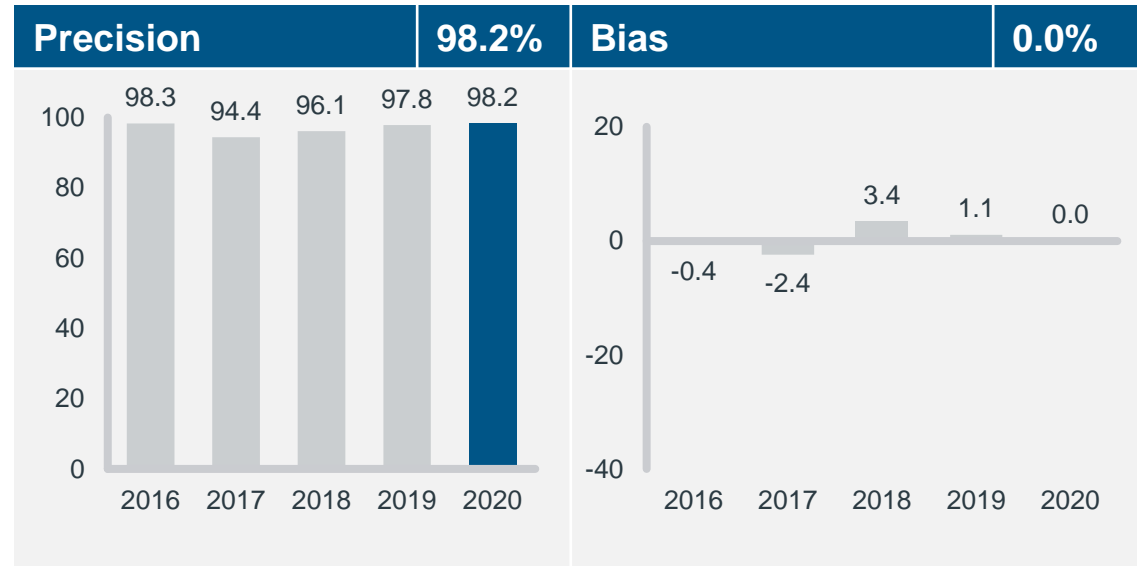
2020 Validation Study

Validation Results

Precision	98.2%	Bias	0.0%

Precision chart (2016–2020): 98.3, 94.4, 96.1, 97.8, 98.2
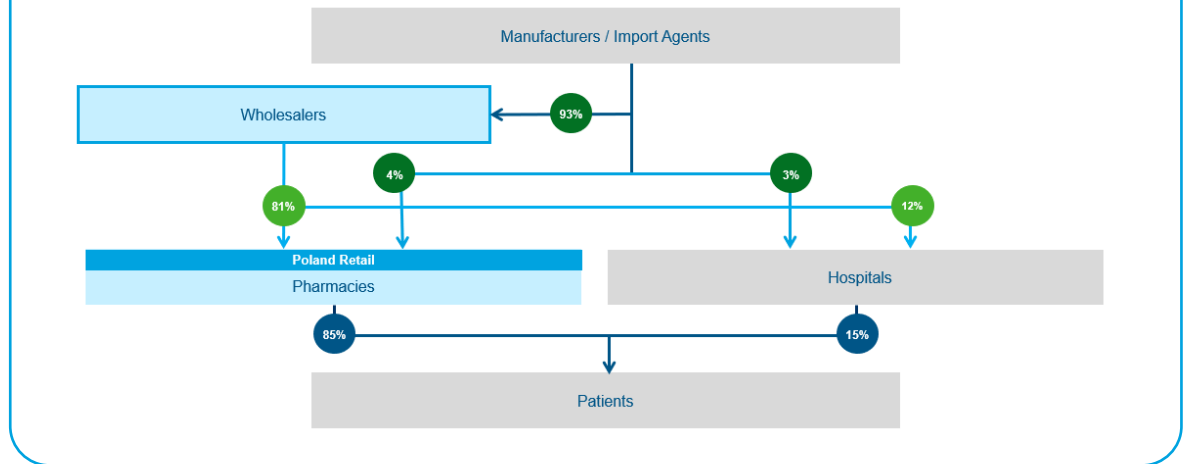
Bias chart (2016–2020): -0.4, -2.4, 3.4, 1.1, 0.0

Outcomes

- Overall precision index improved by 0.4 percentage points in 2020
- Overall overestimation improved by 1.1 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Domestic Manufacturers *Own products & under licence* — 25%, 2%, 55%
Foreign Manufacturers *Imports* — 67%, 6%, 2%
Wholesalers — 21%, 22%
Serbia Combined: Private Pharmacies, State Owned Pharmacies, Hospital, Others*
Patients — 76%, 22%, 2%

Participation

# Participating Companies	# Forms Validated	% Market Validated
36 *(-1 vPY)*	**800** *(-86 vPY)*	**71%** *(-5% vPY)*

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Slovakia Retail+Hospital Validation Study

2020 Validation Study

Validation Results

Precision	99.7%	Bias	-0.4%

Precision

98.2 99.4 99.6 98.3 99.7

100
80
60
40
20
0

2016 2017 2018 2019 2020

Bias

20
0
-20
-40

0.2
-0.9 -0.1 -0.2 -0.4

2016 2017 2018 2019 2020
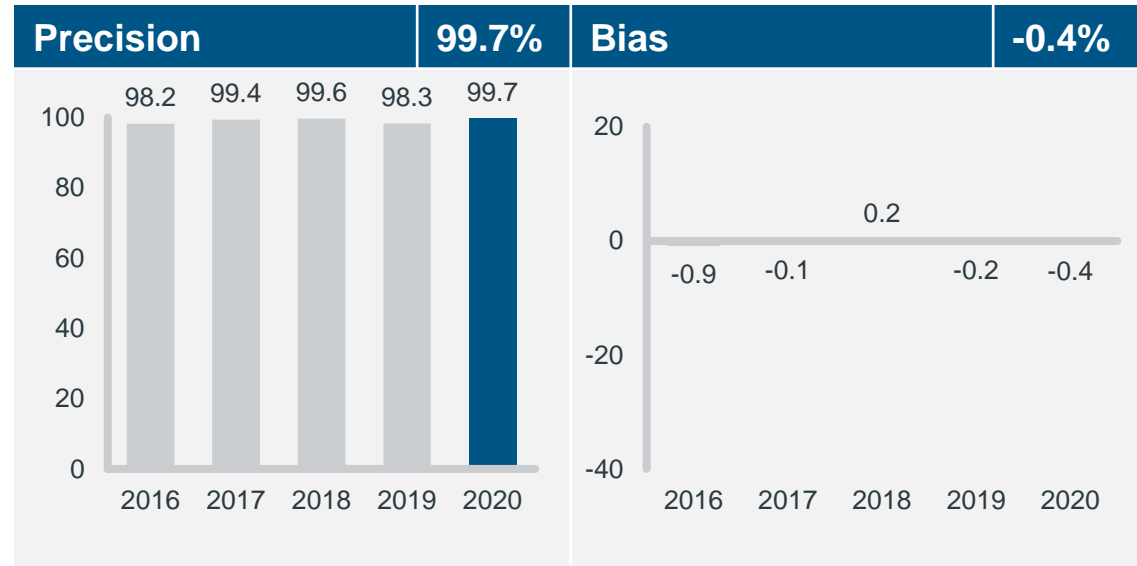
Outcomes

- Overall precision index improved by 1.4 percentage points in 2020
- Overall underestimation increased by 0.2 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

79% 21%

Big Wholesalers   Other Wholesalers

16%   4.5%   0.5%

69%   7.5%   2.5%

Slovakia Retail — Retail Pharmacies

Slovakia Hospital — Hospital Pharmacies

Others*

85%   12%   3%

Patients
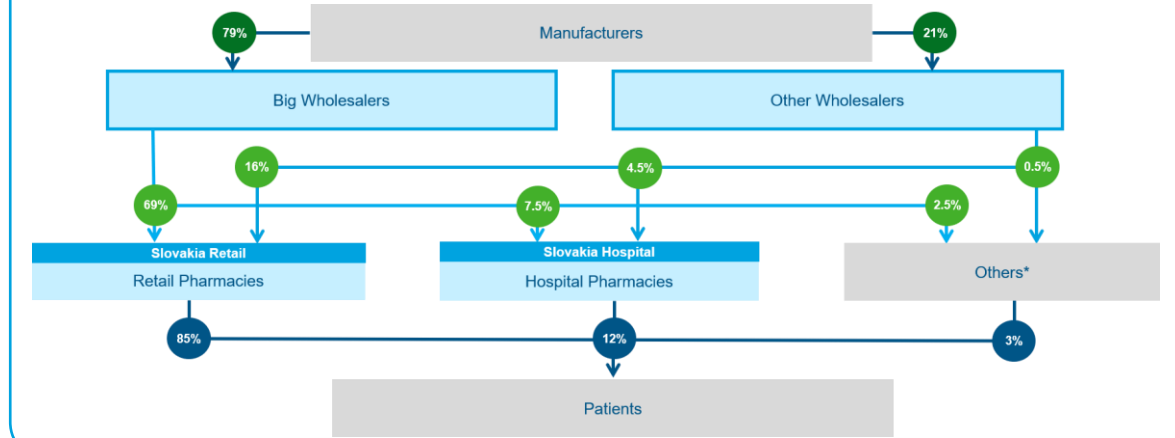
Participation

# Participating Companies	# Forms Validated	% Market Validated
22 (+8 vPY)	**718** (+94 vPY)	**32%** (+5% vPY)

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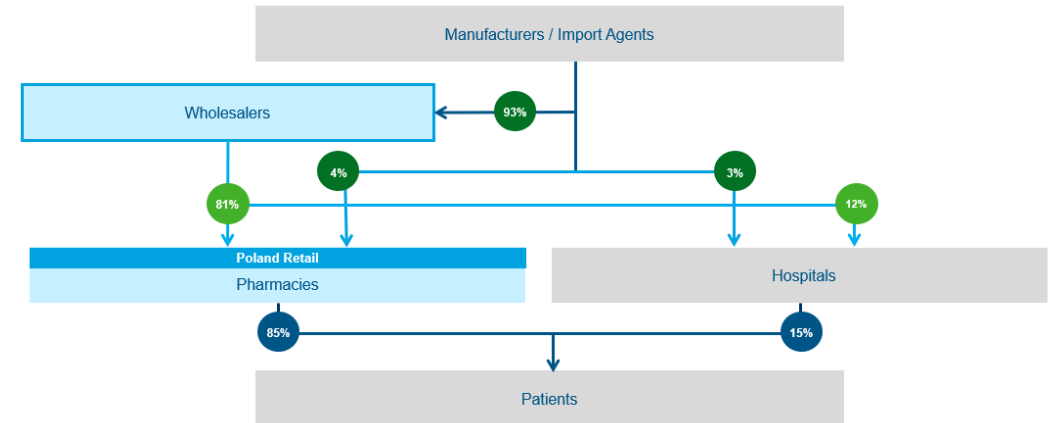# Slovakia PharmaTrend Validation Study
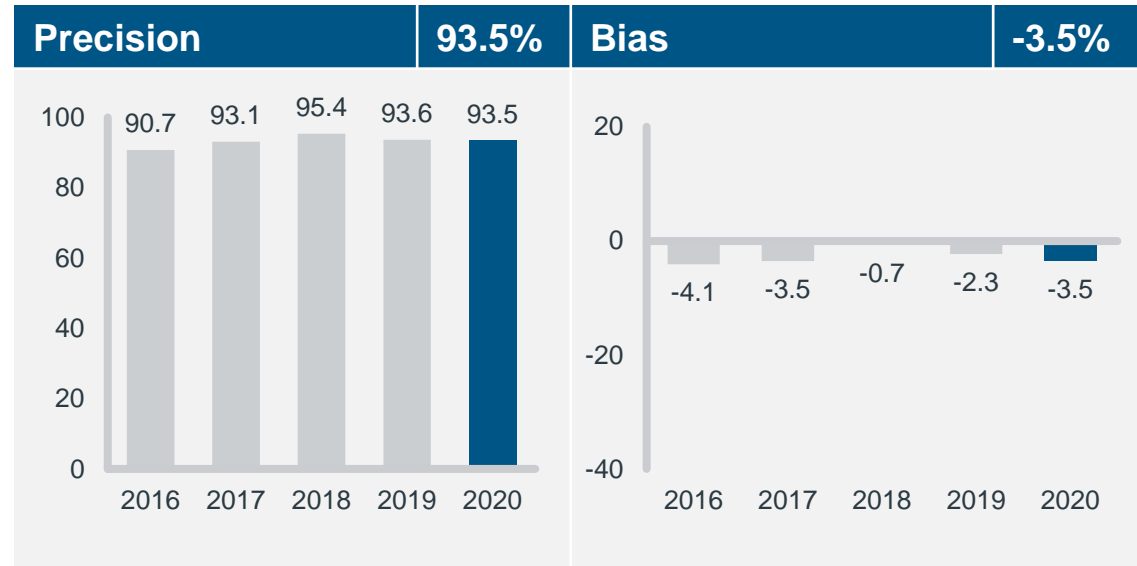
2020 Validation Study

Validation Results
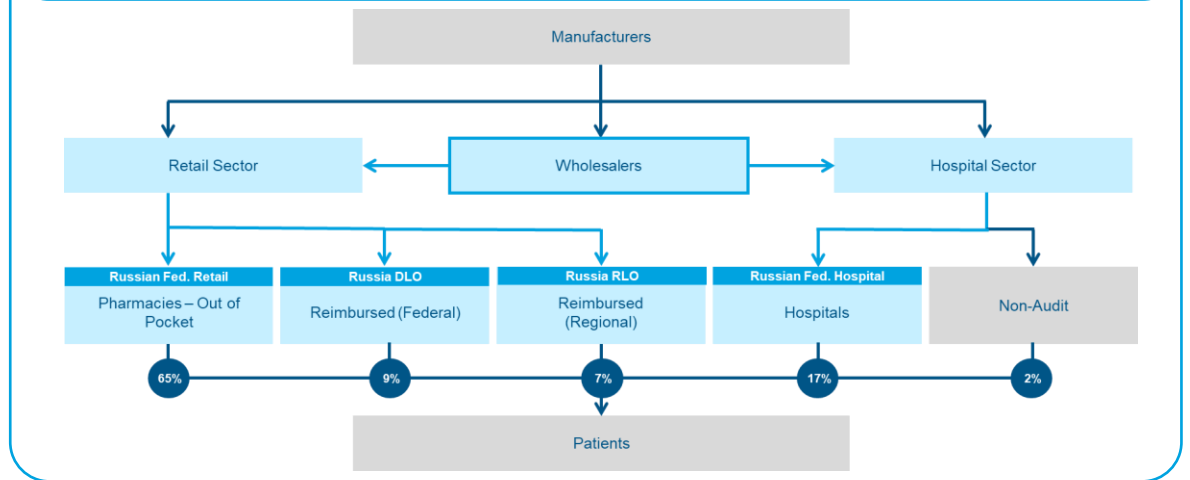
| Precision | 93.5% | Bias | -3.5% |

Outcomes

- Overall precision index declined by 0.1 percentage points in 2020
- Overall underestimation increased by 1.2 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
22 (+8 vPY)	**616** (+85 vPY)	**32%** (+5% vPY)

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Slovakia OTC Validation Study
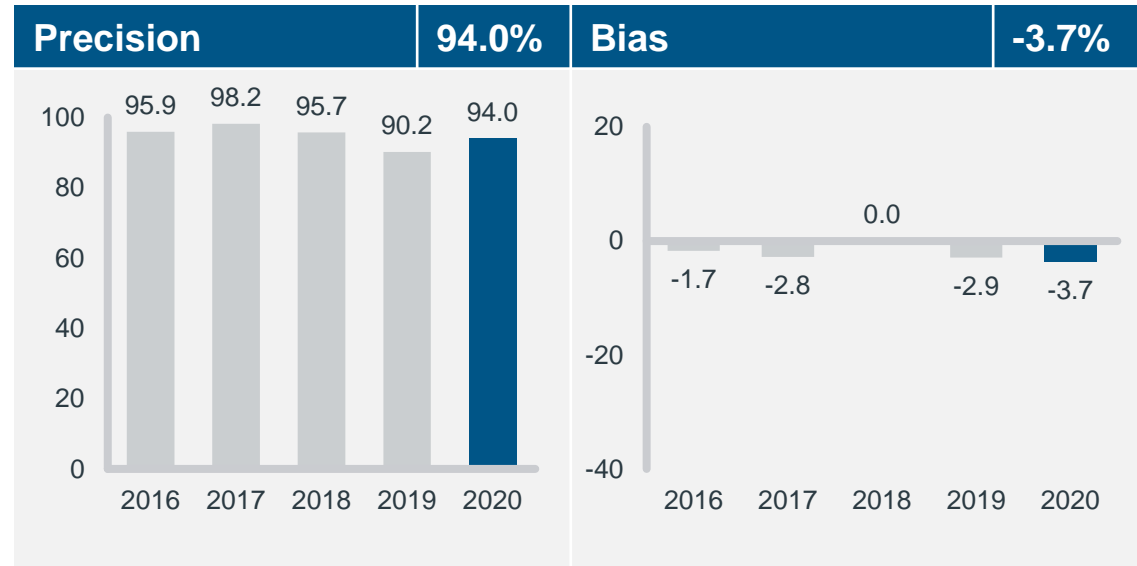
2020 Validation Study

Validation Results

Precision	**94.0%**	Bias	**-3.7%**

Precision bar chart:
- 2016: 95.9
- 2017: 98.2
- 2018: 95.7
- 2019: 90.2
- 2020: 94.0

Bias bar chart:
- 2016: -1.7
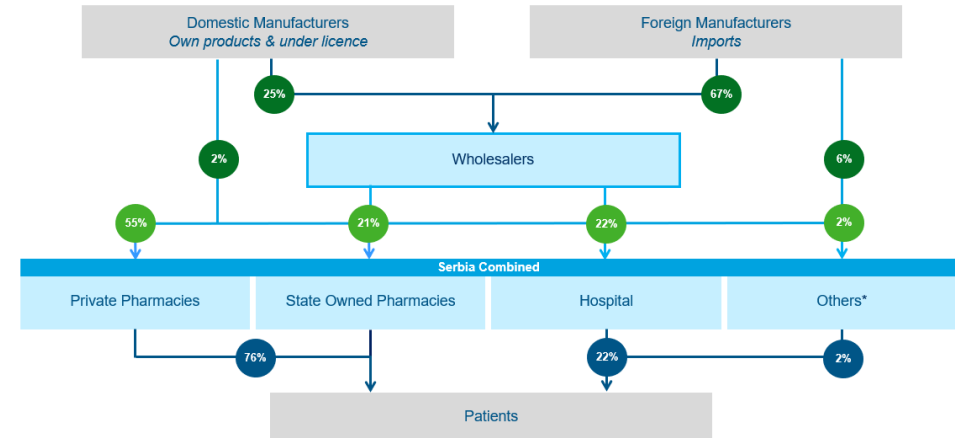- 2017: -2.8
- 2018: 0.0
- 2019: -2.9
- 2020: -3.7

Outcomes
- Overall precision index improved by 3.8 percentage points in 2020
- Overall underestimation increased by 0.8 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers — 79% → Big Wholesalers; 21% → Other Wholesalers

Big Wholesalers: 16%, 69% → Slovakia Retail Retail Pharmacies
Other Wholesalers: 4.5%, 7.5%, 0.5%, 2.5%

Slovakia Retail Retail Pharmacies → 85% → Patients
Hospital Pharmacies → 12% → Patients
Others* → 3% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
12 (+6 vPY)	**139** (+53 vPY)	**36%** (+11% vPY)

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Slovenia Retail+Hospital Validation Study

2020 Validation Study

Validation Results

| Precision | 99.3% | Bias | 0.4% |

Precision bar chart:
- 2016: 98.2
- 2017: 98.1
- 2018: 99.7
- 2019: 95.3
- 2020: 99.3

Bias chart:
- 2016: -2.1
- 2017: -2.5
- 2018: -1.0
- 2019: -0.1
- 2020: 0.4

Outcomes

- Overall precision index improved by 4.0 percentage points in 2020
- Overall bias turned from 0.1% underestimation in 2019 to 0.4% overestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Domestic Manufacturers (Own products and under licence) — 16%
Foreign Manufacturers, Imports — 82%
Wholesalers
73% Private Pharmacies
1% Others
24% Hospitals (Pharmacies)
2%
Slovenia Combined
Patients
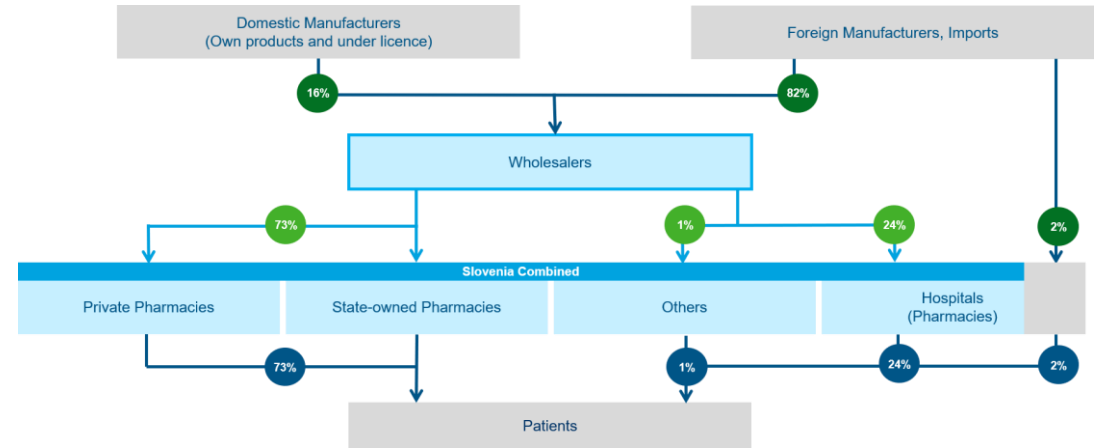
Participation

# Participating Companies	# Forms Validated	% Market Validated
13 (+2 vPY)	**292** (+48 vPY)	**12%** (+1% vPY)

Spain Retail Validation Study
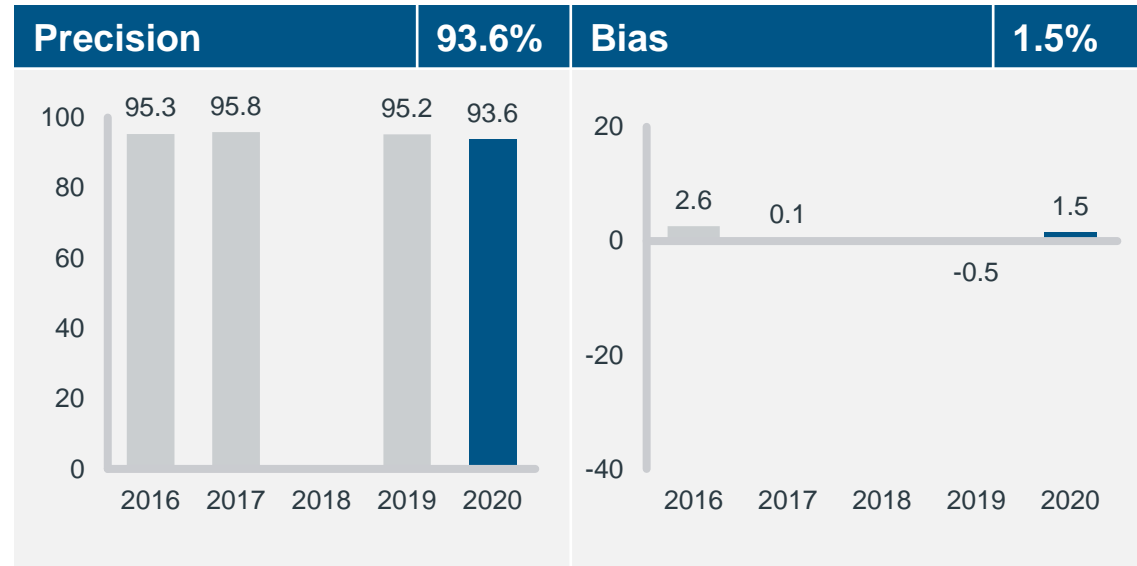
2020 Validation Study

Validation Results

Precision	93.6%	Bias	1.5%

Precision chart (2016–2020): 95.3, 95.8, (2018 blank), 95.2, 93.6

Bias chart (2016–2020): 2.6, 0.1, -0.5, 1.5

Outcomes

- Overall precision index declined by 1.6 percentage points in 2020
- Overall bias turned from 0.5% underestimation in 2019 to 1.5% overestimation in 2020
- Review projection levels and increase manufacturer participation on the validation

Distribution Channels Validated

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

*Other: Military, government
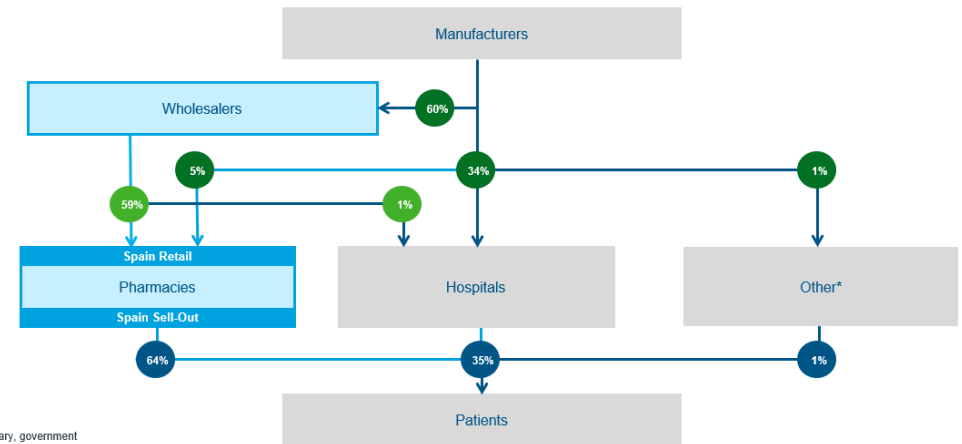
Participation

# Participating Companies	# Forms Validated	% Market Validated
21 *(-5 vPY)*	**786** *(-64 vPY)*	**15%** *(-2% vPY)*

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IQVIA

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Spain PharmaTrend Validation Study

2020 Validation Study

Validation Results

Precision	92.3%	Bias	-3.2%

Precision chart (2016–2020): 96.9, 95.9, —, 95.0, 92.3

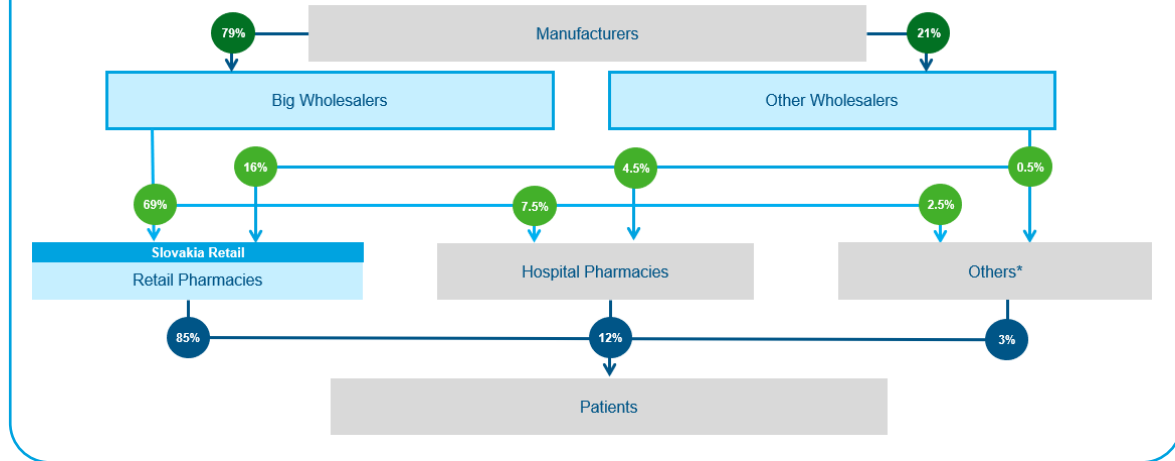Bias chart (2016–2020): -0.8, -3.9, —, -5.2, -3.2
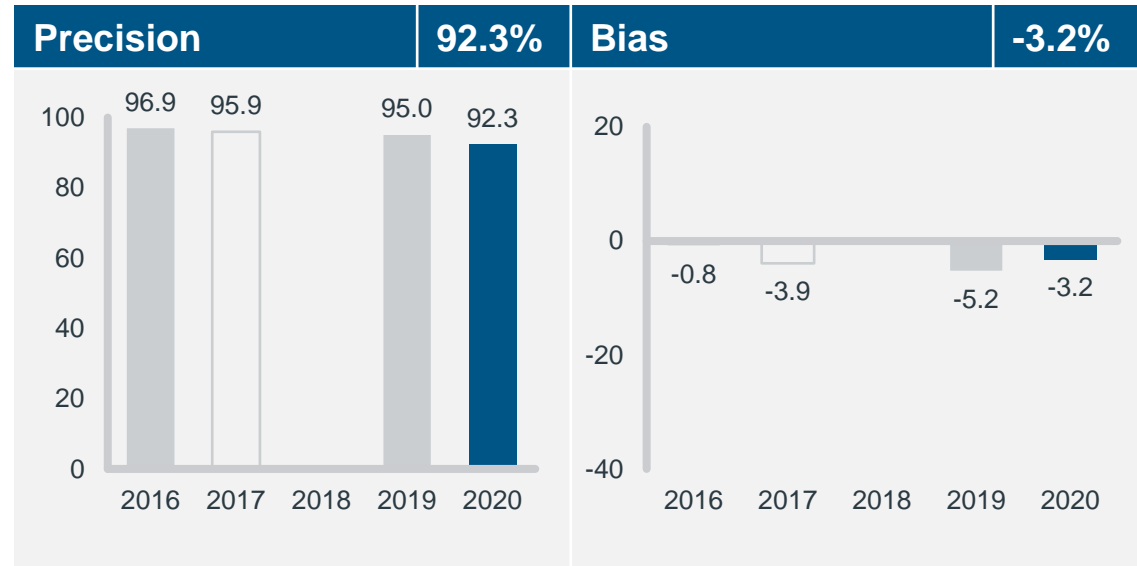
Outcomes
- Overall precision index declined by 2.7 percentage points in 2020
- Overall underestimation improved by 2.0 percentage points in 2020
- Increase manufacturer participation on the validation
- Review projection levels

Distribution Channels Validated

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

*Other: Military, government

Participation

# Participating Companies	# Forms Validated	% Market Validated
21 (-5 vPY)	**744** (-86 vPY)	**12%** (-4% vPY)

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Spain OTC Validation Study
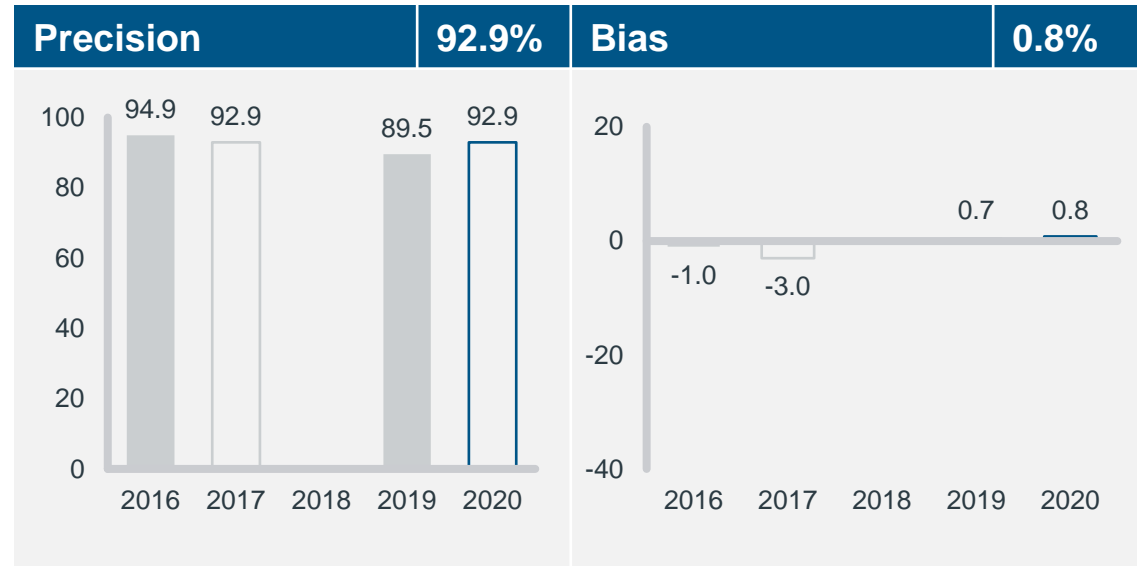
2020 Validation Study

Validation Results

Precision	92.9%	Bias	0.8%

Precision chart:
- 2016: 94.9
- 2017: 92.9
- 2019: 89.5
- 2020: 92.9

Bias chart:
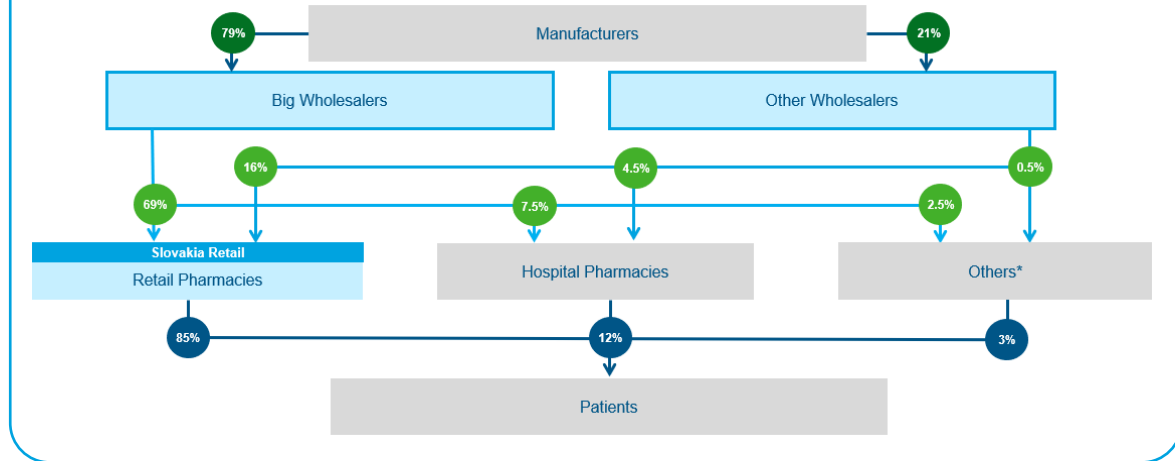- 2016: -1.0
- 2017: -3.0
- 2019: 0.7
- 2020: 0.8

Outcomes
- Overall precision index improved by 3.4 percentage points in 2020
- Overall overestimation increased by 0.1 percentage points in 2020
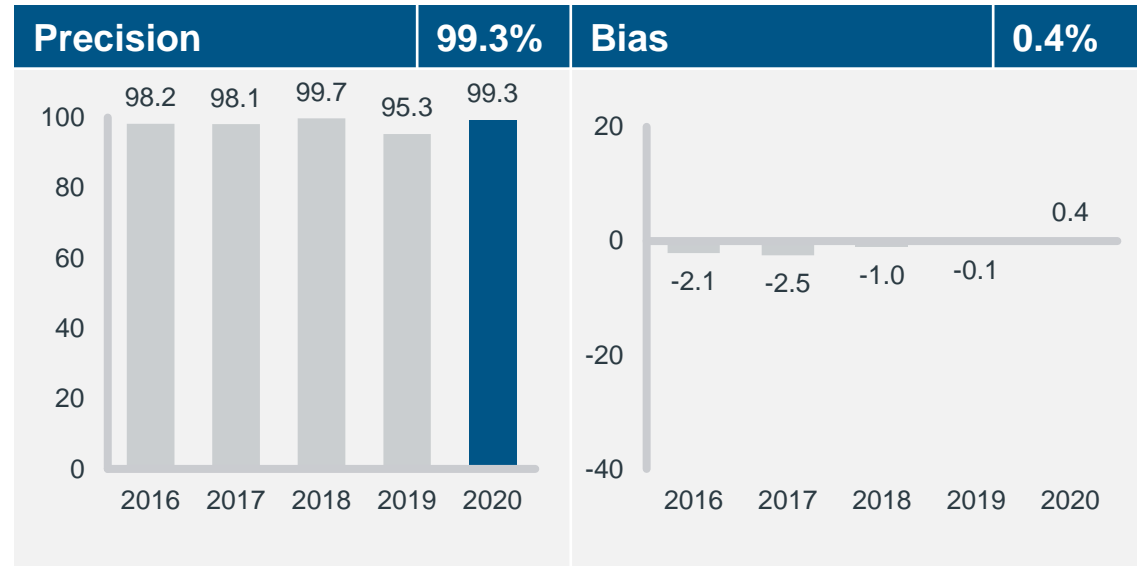- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers

Wholesalers — 60%

5% — 34% — 1%

59% — 1%

Spain Retail
Pharmacies
Spain Sell-Out

Hospitals

Other*

64% — 35% — 1%

Patients

*Other: Military, government

Participation

# Participating Companies	# Forms Validated	% Market Validated
9 (+2 vPY)	42 (+4 vPY)	9% (-3% vPY)

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Switzerland Retail+Hospital Validation Study
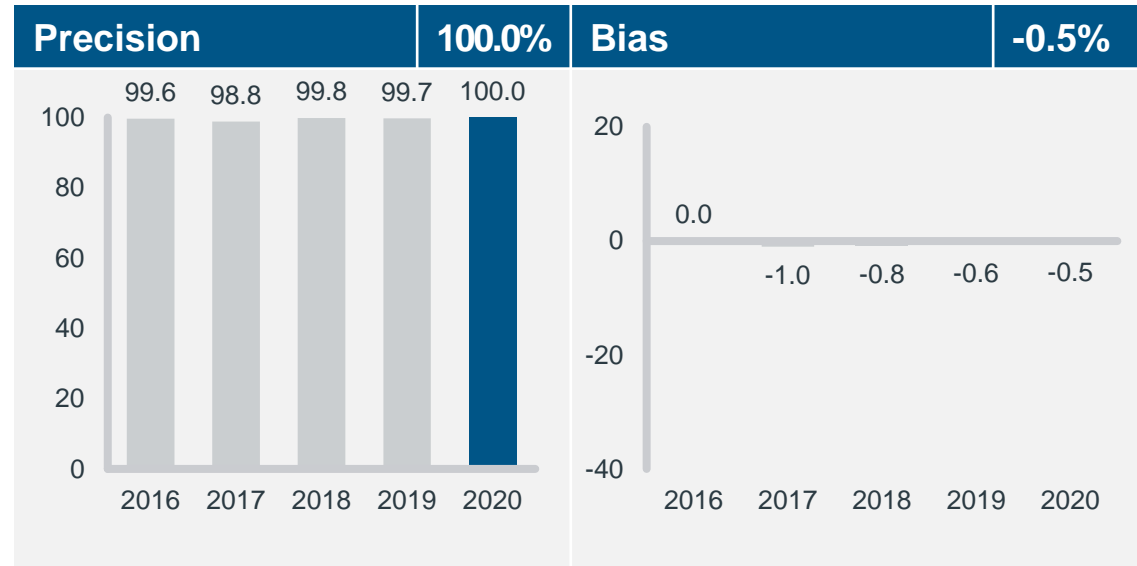
2020 Validation Study

Validation Results

Precision	100.0%	Bias	-0.5%

Precision chart (2016–2020): 99.6, 98.8, 99.8, 99.7, 100.0

Bias chart (2016–2020): 0.0, -1.0, -0.8, -0.6, -0.5

Outcomes
- Overall precision index improved by 0.3 percentage points in 2020
- Overall underestimation improved by 0.1 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated
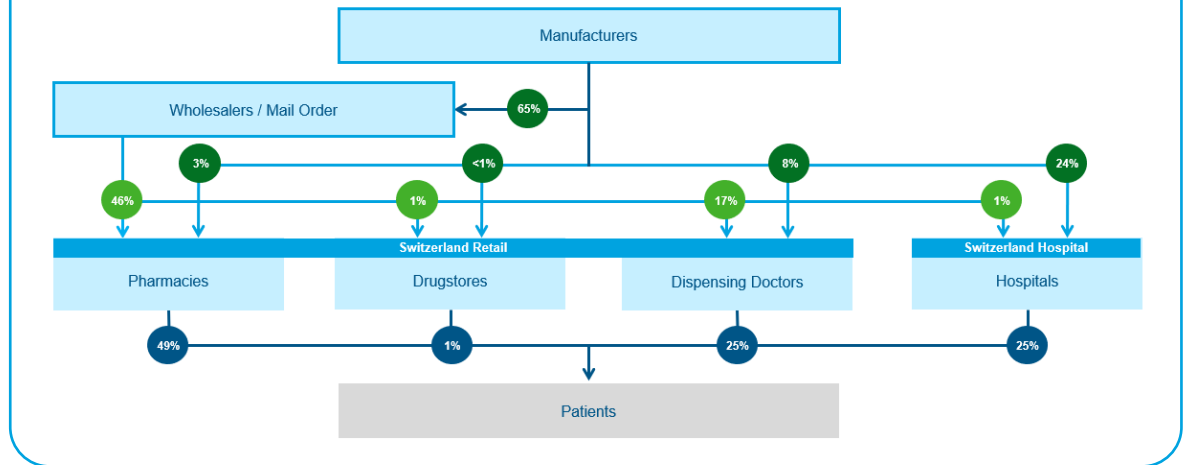
Participation

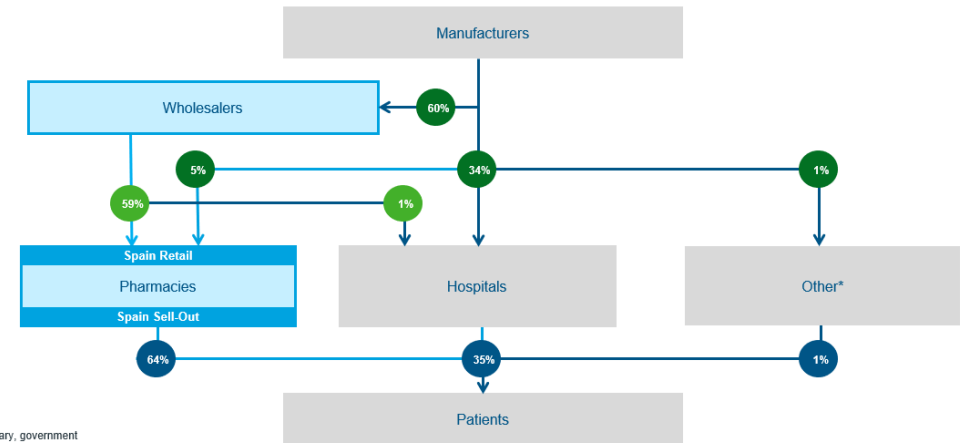| # Participating Companies	# Forms Validated	% Market Validated
32 (-12 vPY)	2,020 (+166 vPY)	51% (+6% vPY)

Switzerland PharmaTrend Validation Study
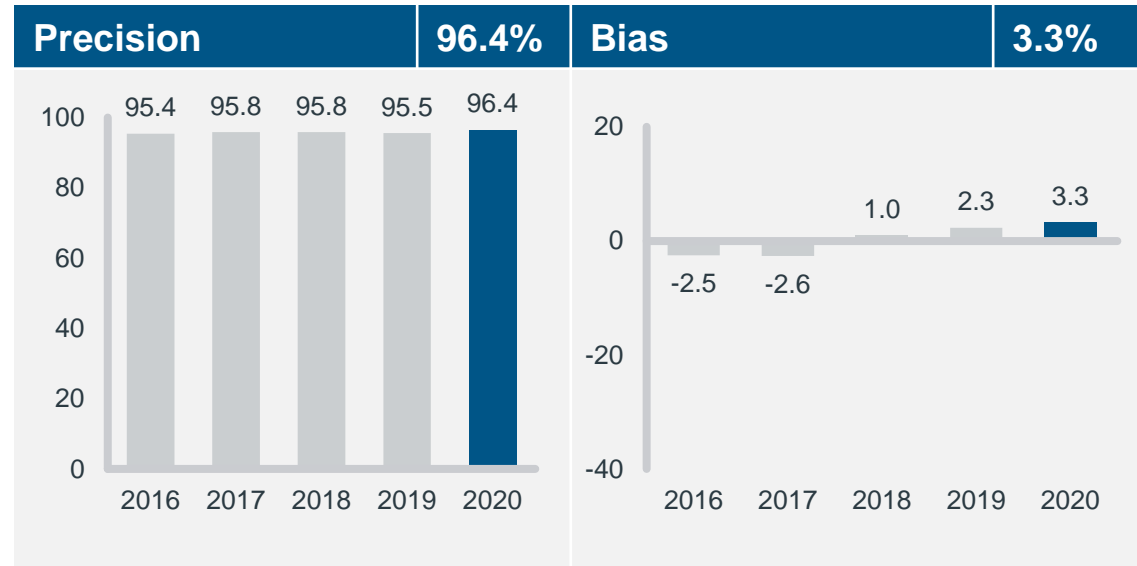
2020 Validation Study

Validation Results

Precision	96.4%	Bias	3.3%

Precision

- 2016: 95.4
- 2017: 95.8
- 2018: 95.8
- 2019: 95.5
- 2020: 96.4

(y-axis: 0, 20, 40, 60, 80, 100)

Bias

- 2016: -2.5
- 2017: -2.6
- 2018: 1.0
- 2019: 2.3
- 2020: 3.3

(y-axis: -40, -20, 0, 20)

Outcomes

- Overall precision index improved by 0.9 percentage points in 2020
- Overall overestimation increased by 1.0 percentage point in 2020
- Improve projection and analyze root cause for overestimation

Distribution Channels Validated

Manufacturers

Wholesalers / Mail Order — 65%

- 3%
- <1%
- 8%
- 24%
- 46%
- 1%
- 17%
- 1%

Switzerland Retail

- Pharmacies
- Drugstores
- Dispensing Doctors
- Hospitals

- 49%
- 1%
- 25%
- 25%

Patients
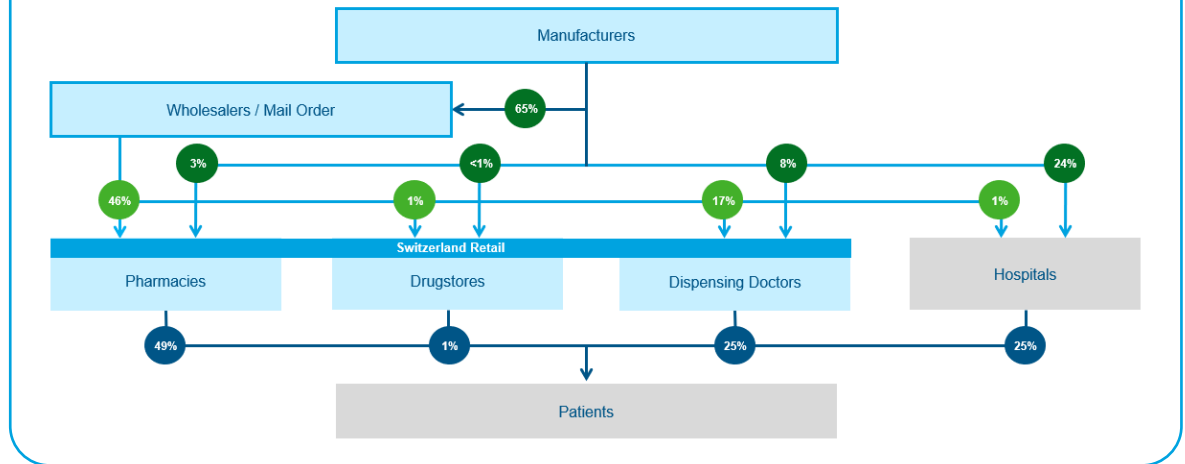
Participation

# Participating Companies	# Forms Validated	% Market Validated
174 (+1 vPY)	**3,712** (+82 vPY)	**92%** (no change vPY)

Switzerland OTC Validation Study
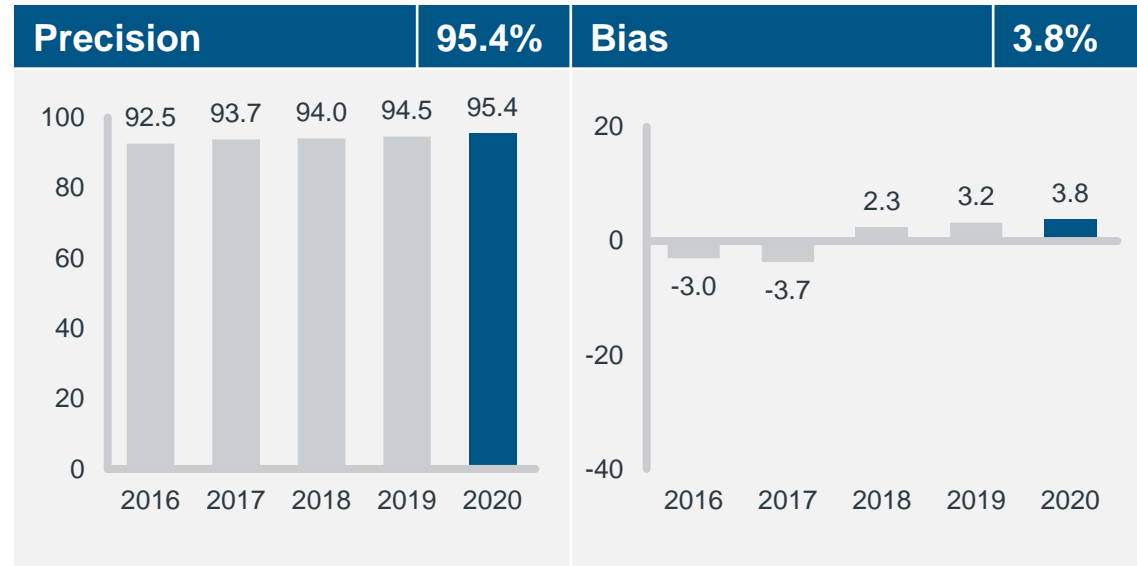
2020 Validation Study

Validation Results

Precision	95.4%	Bias	3.8%

Precision chart:
- 2016: 92.5
- 2017: 93.7
- 2018: 94.0
- 2019: 94.5
- 2020: 95.4

Bias chart:
- 2016: -3.0
- 2017: -3.7
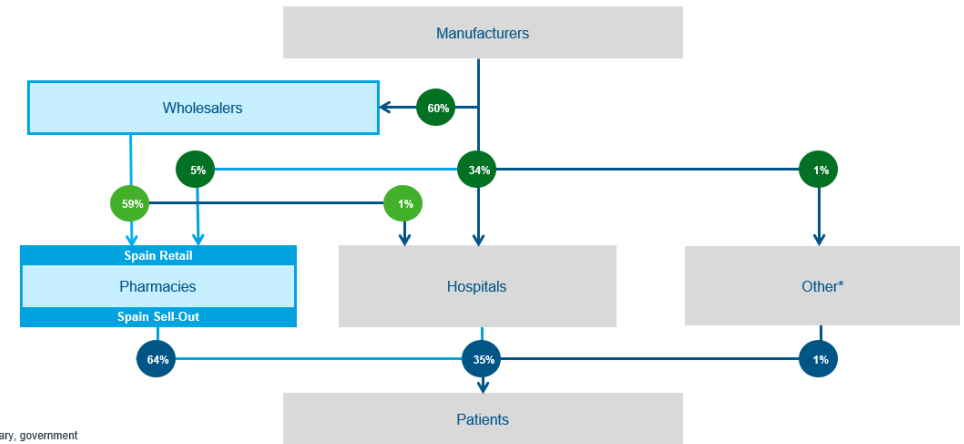- 2018: 2.3
- 2019: 3.2
- 2020: 3.8

Outcomes
- Overall precision index improved by 0.9 percentage points in 2020
- Overall overestimation increased by 0.6 percentage points in 2020
- Improve projection and analyze root cause for overestimation

Distribution Channels Validated

Manufacturers

Wholesalers / Mail Order — 65%

3% <1% 8% 24%

46% 1% 17% 1%

Switzerland Retail

Pharmacies — Drugstores — Dispensing Doctors — Hospitals

49% 1% 25% 25%

Patients
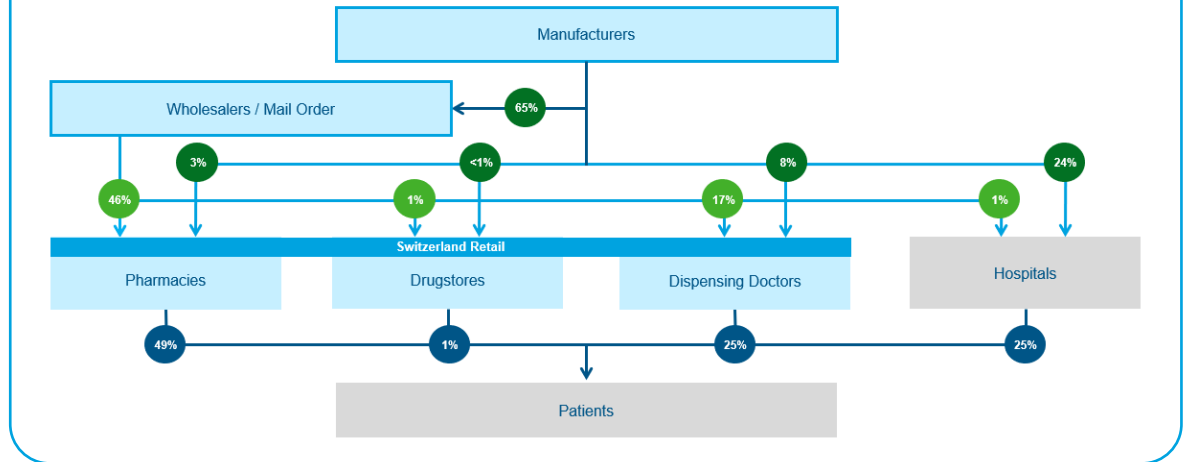
Participation

# Participating Companies	# Forms Validated	% Market Validated
106 (+2 vPY)	1,128 (-6 vPY)	96% (no change vPY)

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United Kingdom Retail Validation Study

2020 Validation Study

Validation Results

Precision	90.2%	Bias	-7.4%
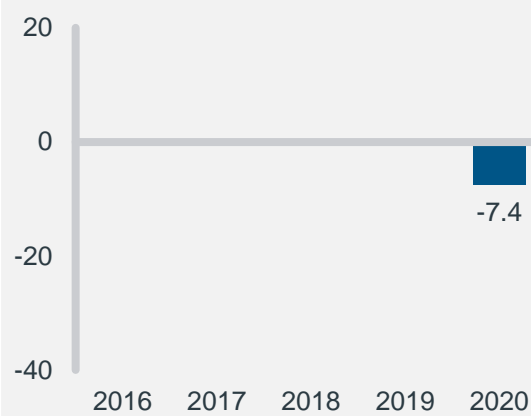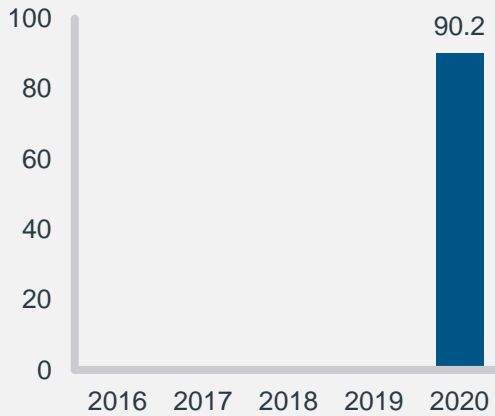
Outcomes

- Result are based on Rx count at Molecule/Form/Strength level
- Overall precision index at 90.2% in 2020
- Overall underestimation at 7.4% in 2020
- Validate new projection methodology

Distribution Channels Validated
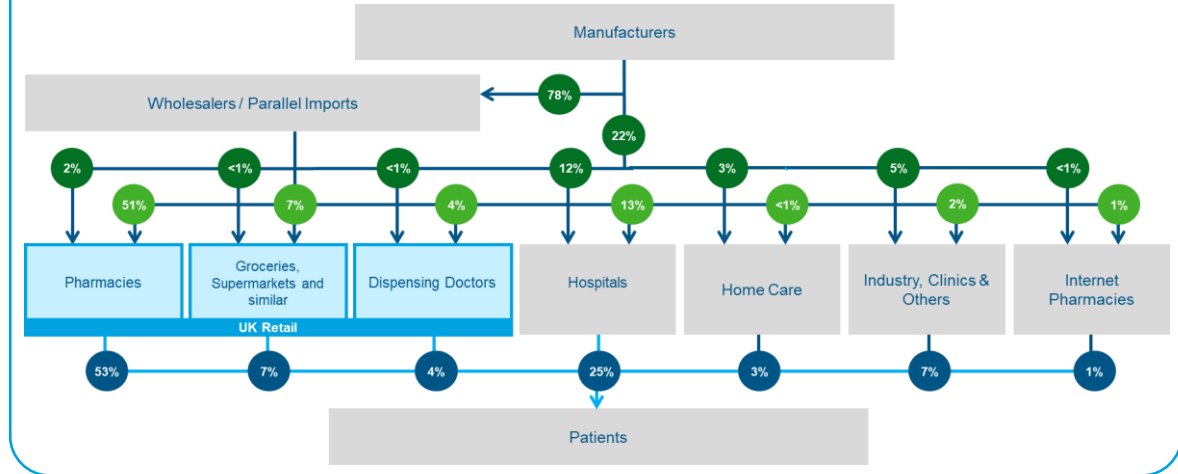
Participation

# Participating Molecules	# Molecule/Form/ Strength Validated	% Market Validated
944 (*vPY*)	**4,088** (*vPY*)	**92%** (*vPY*)

United Kingdom Hospital Validation Study

2020 Validation Study

Validation Results

Precision	100.0%	Bias	-0.7%
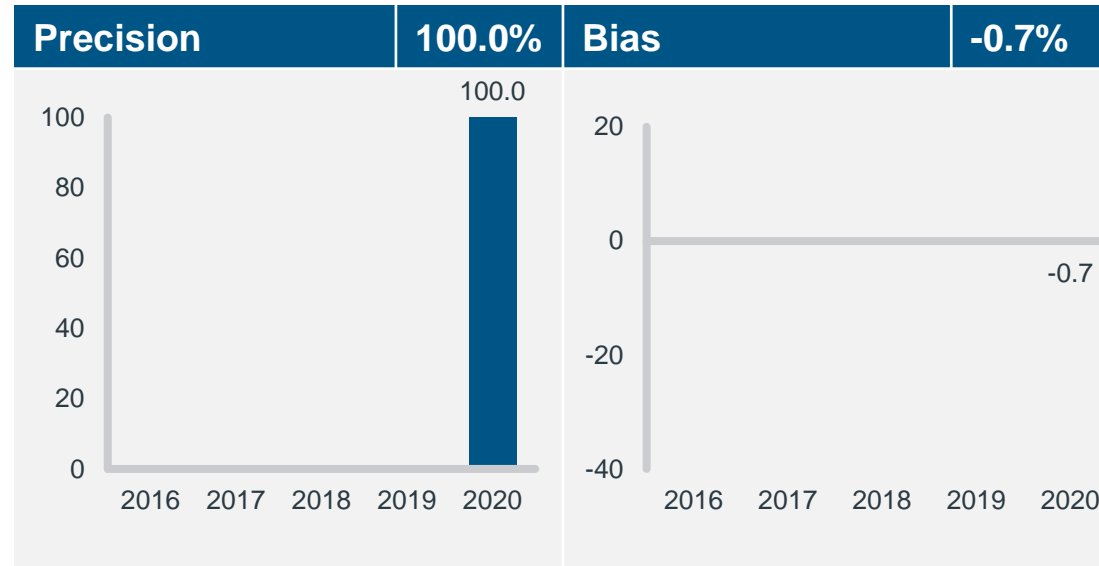
Outcomes

- Result are based on Molecule/Form/Strength level
- Overall precision index at 100% in 2020
- Overall underestimation at 0.7% in 2020
- No action required from the statistical point of view

Distribution Channels Validated
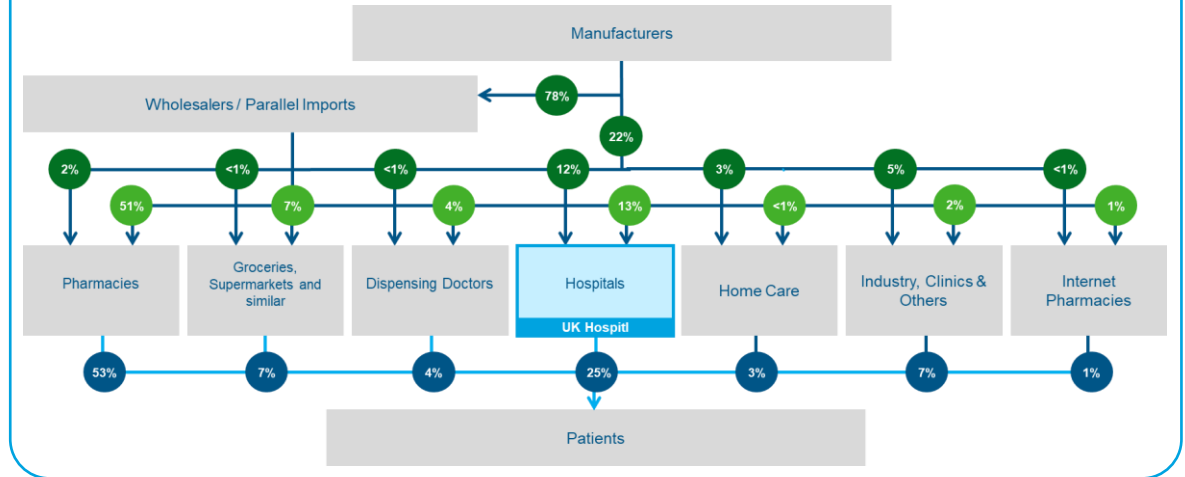
Participation

# Participating Molecules	# Molecule/Form/ Strength Validated	% Market Validated
247 (vPY)	501 (vPY)	23.0% (vPY)

Africa, Middle East, South Asia
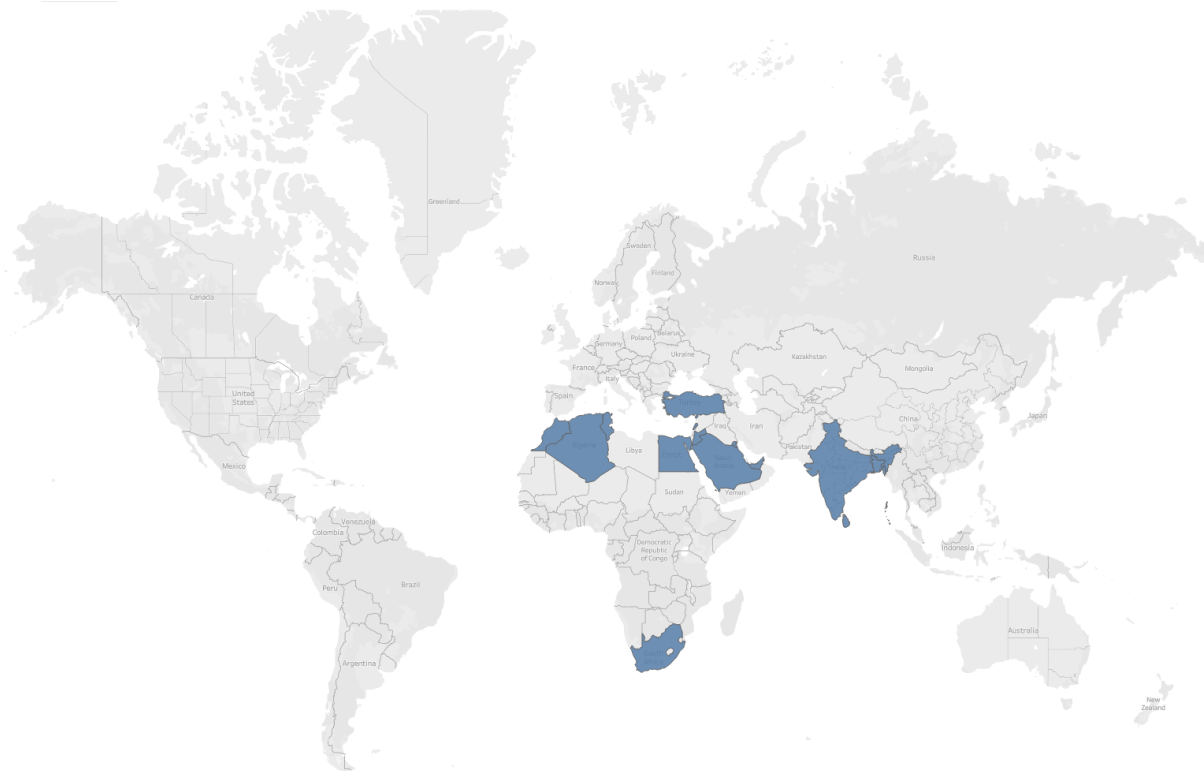
Countries

Africa
- Algeria
- Morocco
- South Africa
- Tunisia

South Asia
- Bangladesh
- Sri Lanka

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

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Algeria Retail Validation Study

2020 Validation Study

Validation Results

| Precision | 69.4% | Bias | -0.7% |

Precision chart:
- 2016: 78.2
- 2017: 74.0
- 2018: 68.0
- 2019: 68.6
- 2020: 69.4

Bias chart:
- 2016: -10.1
- 2017: -4.8
- 2018: -9.8
- 2019: 3.5
- 2020: -0.7
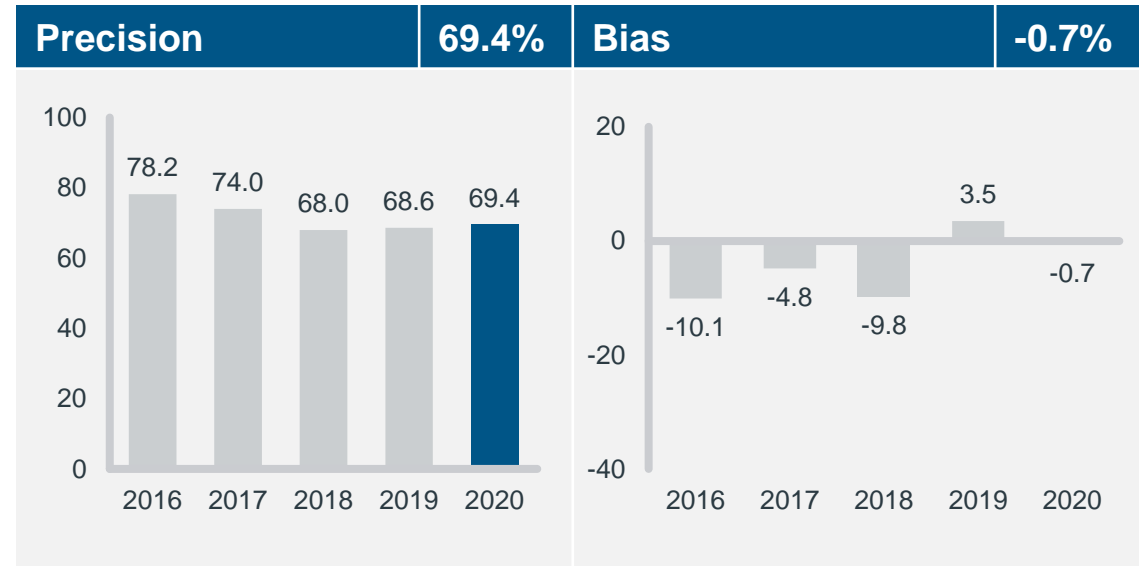
Outcomes

- Overall precision index improved by 0.8 percentage points in 2020
- Overall bias turned from 3.5% overestimation in 2019 to 0.7% underestimation in 2020
- Conduct wholesaler survey and review projection

Distribution Channels Validated

Local Manufacturers / Private Importers / Distributors
- 80% → Wholesalers
- 20% → Central Hospital Pharmacy

Wholesalers:
- 77% → Private Pharmacies
- 3% → Public Pharmacies/ Agencies Network (ENDIMED)

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

Algeria Retail
- Private Pharmacies: 77%
- Public Pharmacies/Agencies Network (ENDIMED): 3%
- Clinics: 1%
- Hospitals: 19%
→ Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
21 (+3 vPY)	**429** (+60 vPY)	**39%** (+7% vPY)

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Morocco Retail Validation Study
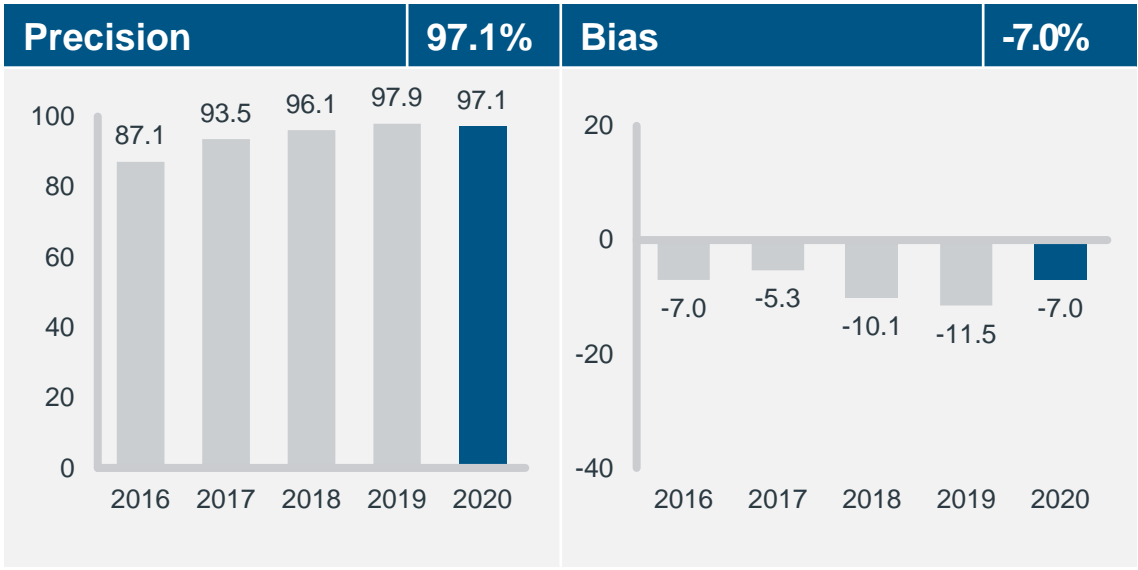
2020 Validation Study

Validation Results

Precision	97.1%	Bias	-7.0%

Precision

Bar chart values by year:
- 2016: 87.1
- 2017: 93.5
- 2018: 96.1
- 2019: 97.9
- 2020: 97.1

Bias

Bar chart values by year:
- 2016: -7.0
- 2017: -5.3
- 2018: -10.1
- 2019: -11.5
- 2020: -7.0

Outcomes

- Overall precision index declined by 0.8 percentage points in 2020
- Overall underestimation improved by 4.5 percentage points in 2020
- Implement new distribution survey results and adjustment of projection factors

Distribution Channels Validated

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

Participation

# Participating Companies	# Forms Validated	% Market Validated
78 (+51 vPY)	579 (+310 vPY)	23% (+4% vPY)

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South Africa Total Private Market Validation Study

2020 Validation Study

Validation Results

Precision	91.8%	Bias	-5.4%

Precision (bar chart)
- 2016: 100.0
- 2017: 94.0
- 2018: 85.8
- 2019: 96.2
- 2020: 91.8

Bias (bar chart)
- 2016: 2.4
- 2017: -3.3
- 2018: -5.9
- 2019: -1.7
- 2020: -5.4
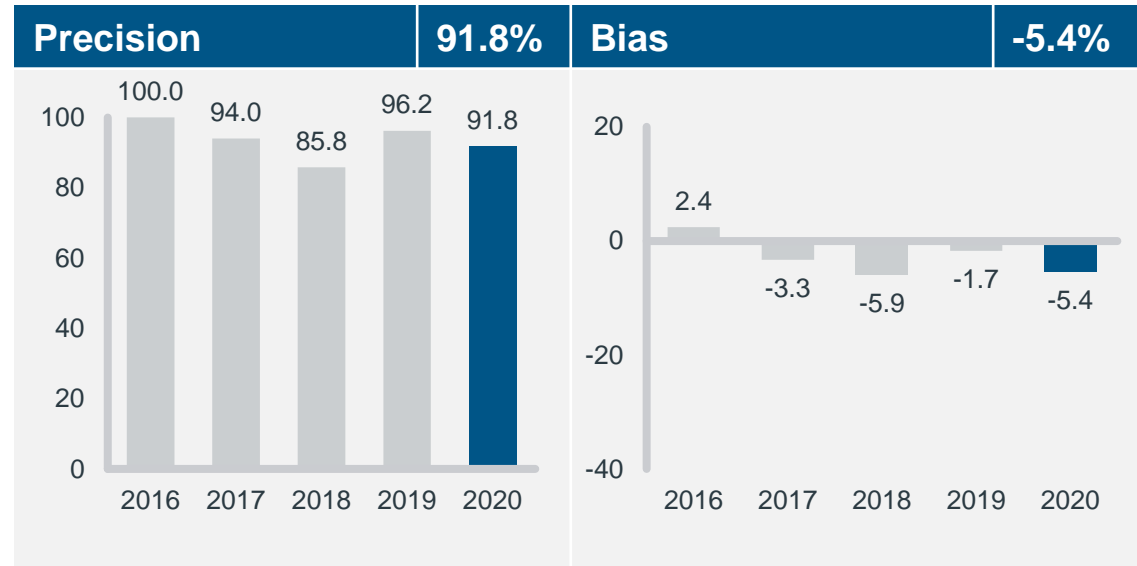
Outcomes
- Overall precision index declined by 4.4 percentage points in 2020
- Overall underestimation increased by 3.7 percentage points in 2020
- Review projection factors

Distribution Channels Validated

Manufacturers

Distributors/Wholesalers — 83%

5%, 1%, <1%, <1%, 5%, 6%

57%, 4%, 7%, <1%, 7%, 8%

South Africa Total Market

S. Africa Retail Retail Pharmacies	Private Hospitals	Medical Practitioners	Other Private	Buying Groups	Hospitals
62%	5%	7%	<1%	12%	14%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
31 (+4 vPY)	**1,372** (+187 vPY)	**50%** (+20% vPY)

South Africa OTC Validation Study
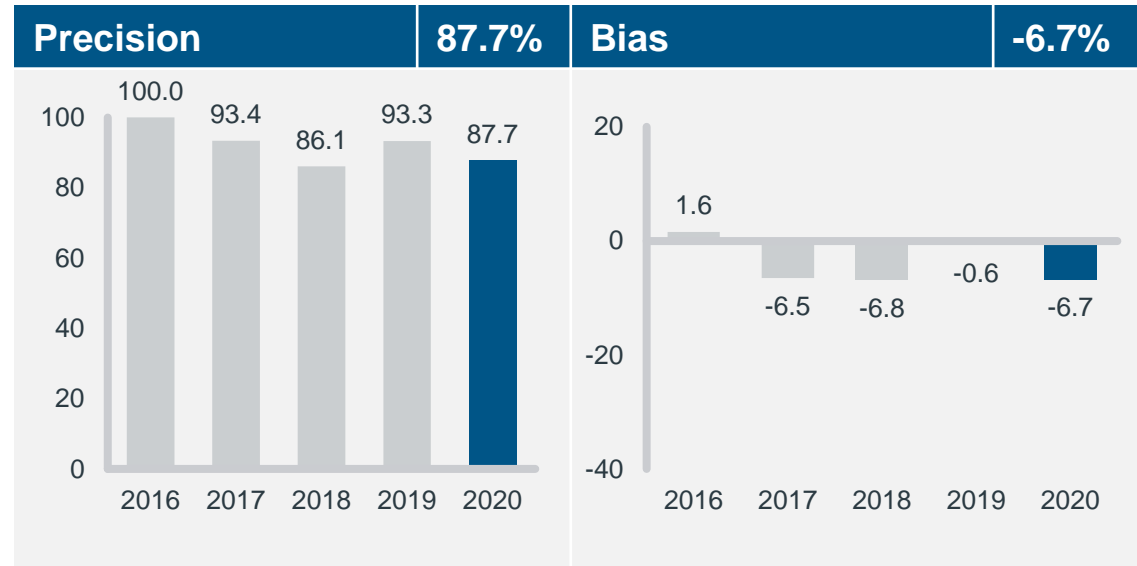
2020 Validation Study

Validation Results

Precision	87.7%	Bias	-6.7%

Precision chart (2016–2020): 100.0, 93.4, 86.1, 93.3, 87.7

Bias chart (2016–2020): 1.6, -6.5, -6.8, -0.6, -6.7

Outcomes
- Overall precision index declined by 5.6 percentage points in 2020
- Overall underestimation increased by 6.1 percentage points in 2020
- Review internal processes

Distribution Channels Validated

Manufacturers → Distributors/Wholesalers (83%)

5%, 1%, <1%, <1%, 5%, 6%
57%, 4%, 7%, <1%, 7%, 8%

S. Africa Retail Retail Pharmacies | Private Hospitals | Medical Practitioners | Other Private | Buying Groups | Hospitals

South Africa Total Market

62%, 5%, 7%, <1%, 12%, 14% → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
23 *(+3 vPY)*	**459** *(+252 vPY)*	**52%** *(+34% vPY)*

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Tunisia Retail Validation Study
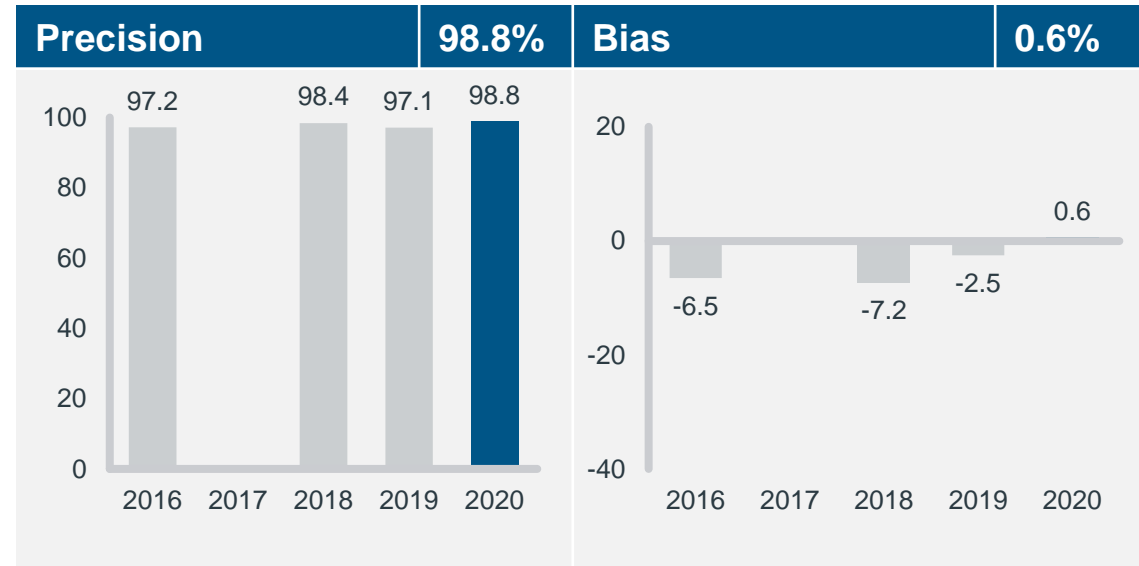
2020 Validation Study

Validation Results

Precision	98.8%	Bias	0.6%

Precision values by year:
- 2016: 97.2
- 2018: 98.4
- 2019: 97.1
- 2020: 98.8

Bias values by year:
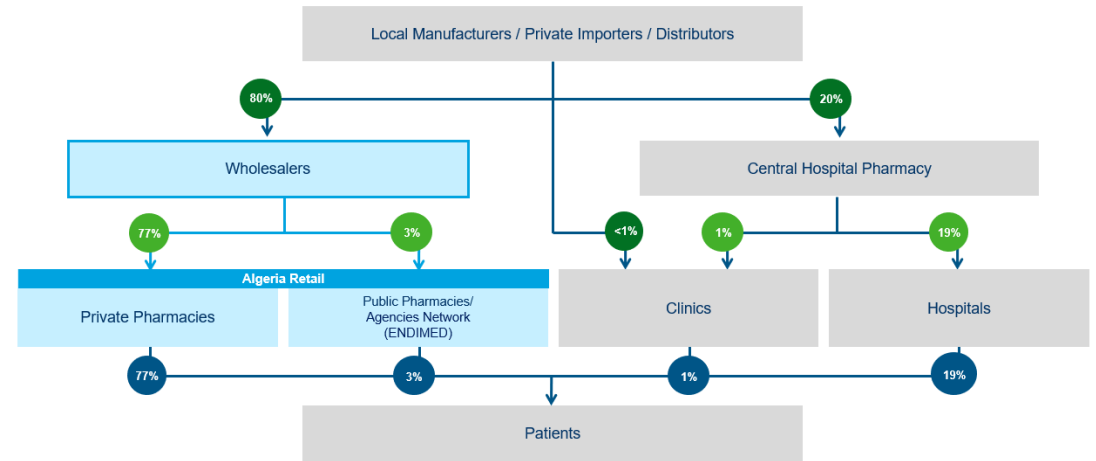- 2016: -6.5
- 2018: -7.2
- 2019: -2.5
- 2020: 0.6

Outcomes

- Overall precision index improved by 1.7 percentage points in 2020
- Overall bias turned from 2.5% underestimation in 2019 to 0.6% overestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated
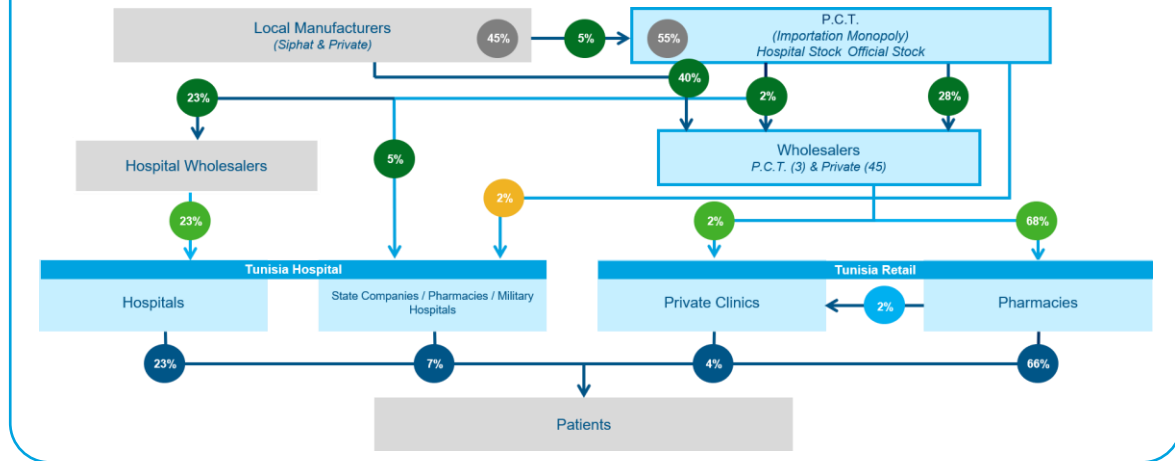
Participation

# Participating Companies	# Forms Validated	% Market Validated
26 *(-1 vPY)*	**691** *(-153 vPY)*	**40%** *(-16% vPY)*

Egypt Retail Validation Study

2020 Validation Study

Validation Results

Precision	88.5%	Bias	4.3%

Precision chart:
- 2016: 99.6
- 2017: 99.6
- 2018: 99.7
- 2019: 95.3
- 2020: 88.5

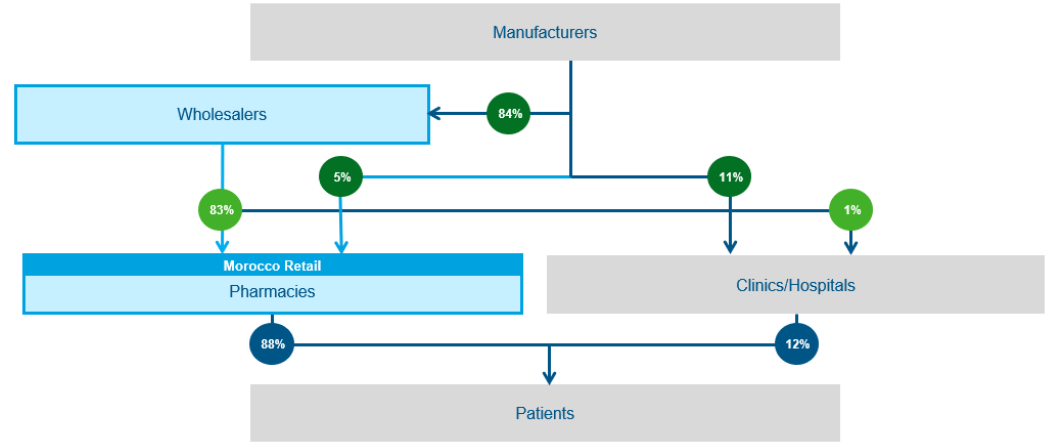Bias chart:
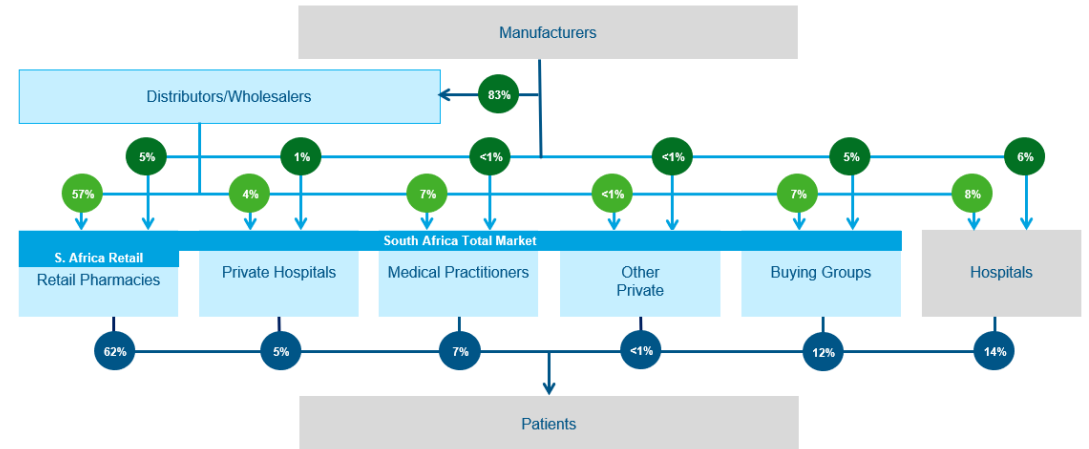- 2016: -3.4
- 2017: 1.1
- 2018: 4.0
- 2019: 1.2
- 2020: 4.3
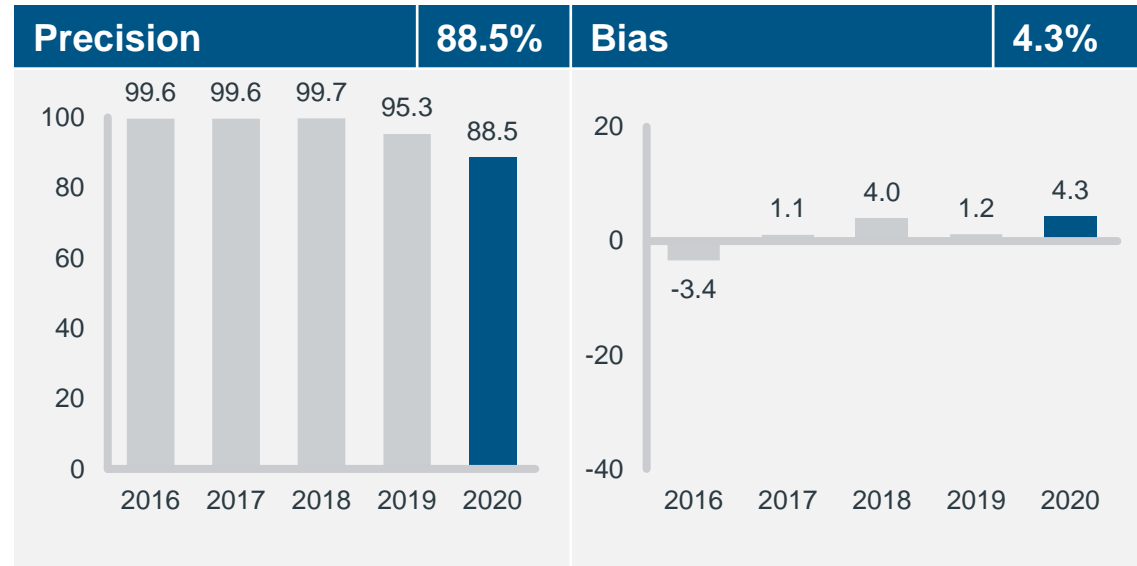
Outcomes
- Overall precision index declined by 6.8 percentage points in 2020
- Overall overestimation increased by 3.1 percentage points in 2020
- Review projection factors

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%
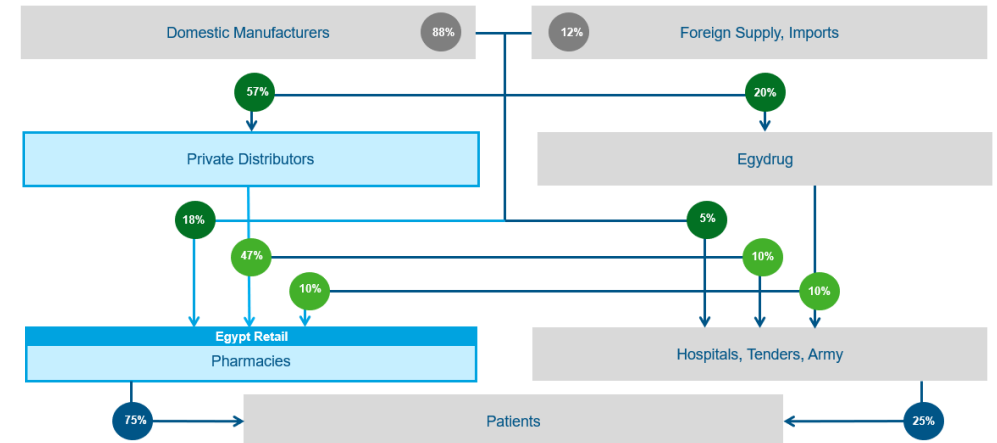
Participation

# Participating Companies	# Forms Validated	% Market Validated
43 (+6 vPY)	510 (+20 vPY)	28% (+6% vPY)

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Jordan Retail Validation Study
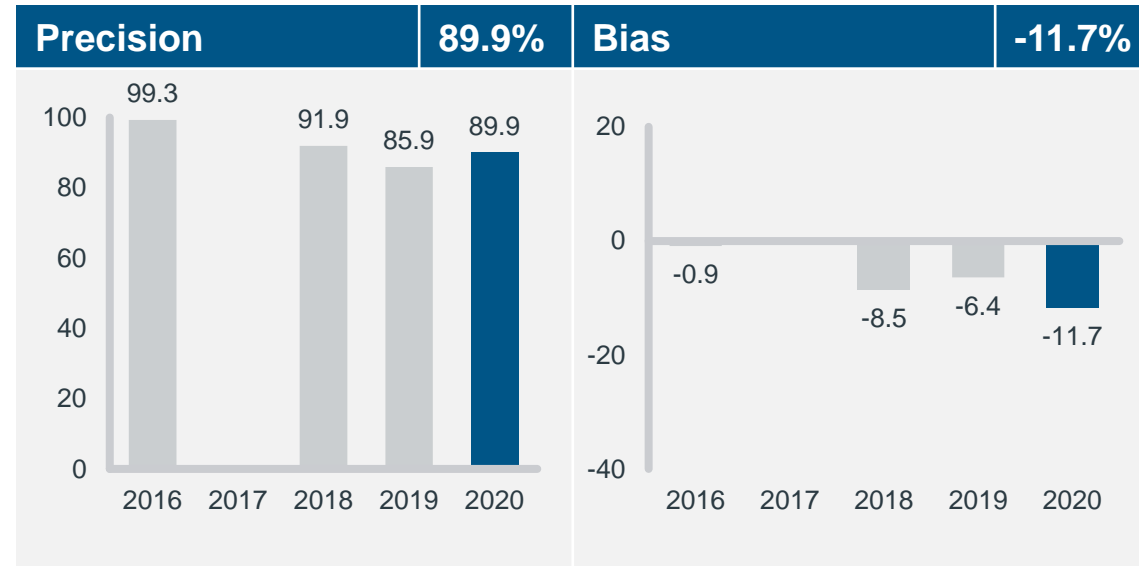
2020 Validation Study

Validation Results

Precision	89.9%	Bias	-11.7%

Precision chart (2016–2020):
- 2016: 99.3
- 2018: 91.9
- 2019: 85.9
- 2020: 89.9

Bias chart (2016–2020):
- 2016: -0.9
- 2018: -8.5
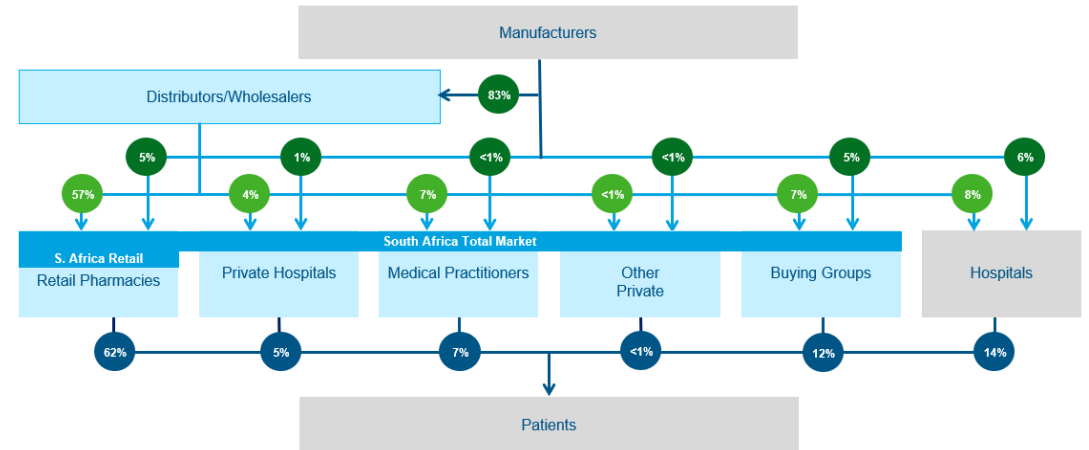- 2019: -6.4
- 2020: -11.7

Outcomes
- Overall precision index improved by 4.0 percentage points in 2020
- Overall underestimation increased by 5.3 percentage points in 2020
- Review extension for agent data usage

Distribution Channels Validated

Domestic Manufacturers — 35%
Foreign Supply, Imports — 65%

Agents / Distributors: 3%, 65%

Jordan Retail / Private Pharmacies: 18%, 53%
Private Hospitals: 6%, 5%
Tenders, Institutions, MOH, University: 9%, 9%

Patients: 71%, 11%, 18%
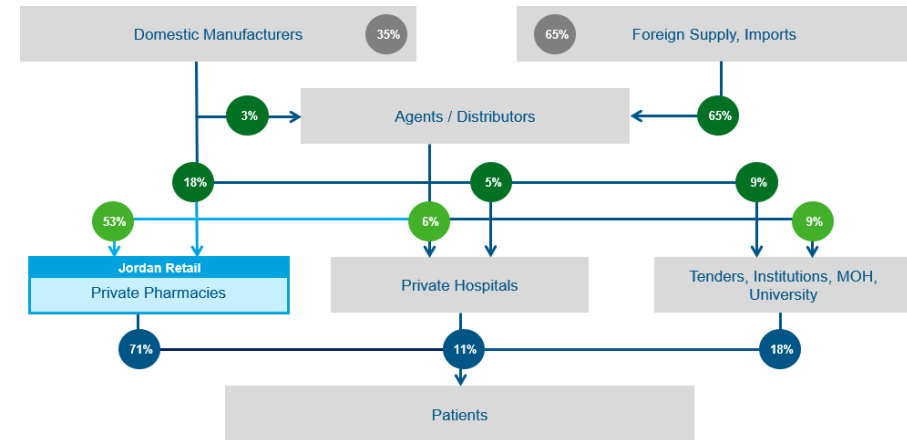
Participation

# Participating Companies	# Forms Validated	% Market Validated
18 (+4 vPY)	**588** (+249 vPY)	**36%** (+14% vPY)

Kuwait Retail Validation Study

2020 Validation Study

Validation Results

Precision	100%	Bias	0.2%

Precision chart values:
- 2016: 99.2
- 2017: 100.0
- 2018: 100.0
- 2019: 98.7
- 2020: 100.0

Bias chart values:
- 2016: -0.2
- 2017: -1.1
- 2018: -0.1
- 2019: 0.2
- 2020: 0.2
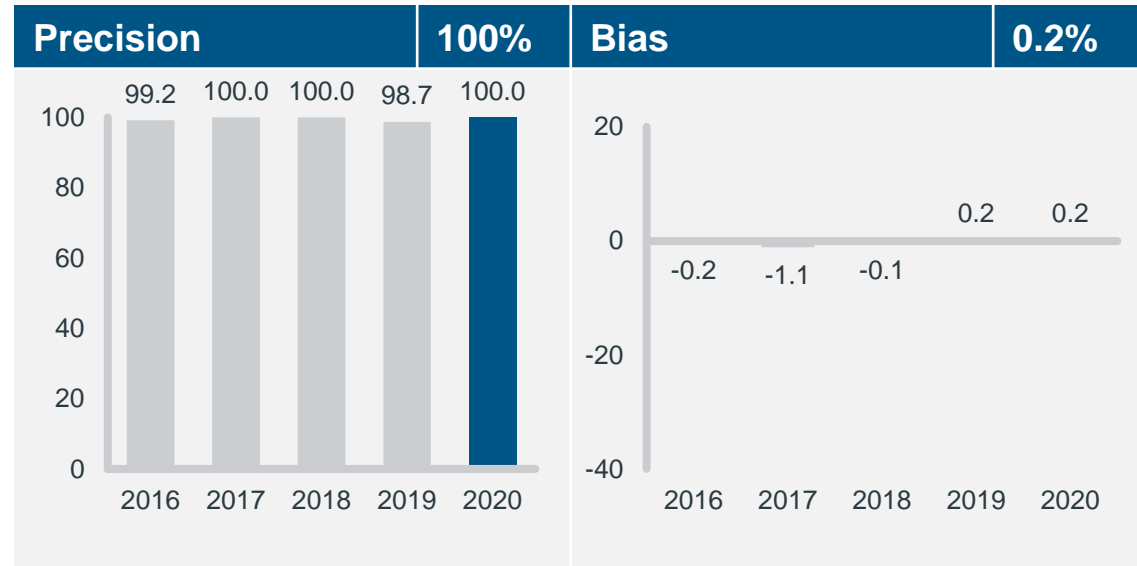
Outcomes

- Overall precision index increased by 1.3 percentage points in 2020
- Overall overestimation remained unchanged at 0.2% in 2020
- 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

Government Hospitals and Institutions

- 35%
- 65%

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
16 (-2 vPY)	305 (-61 vPY)	24% (-3% vPY)

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Lebanon Retail Validation Study
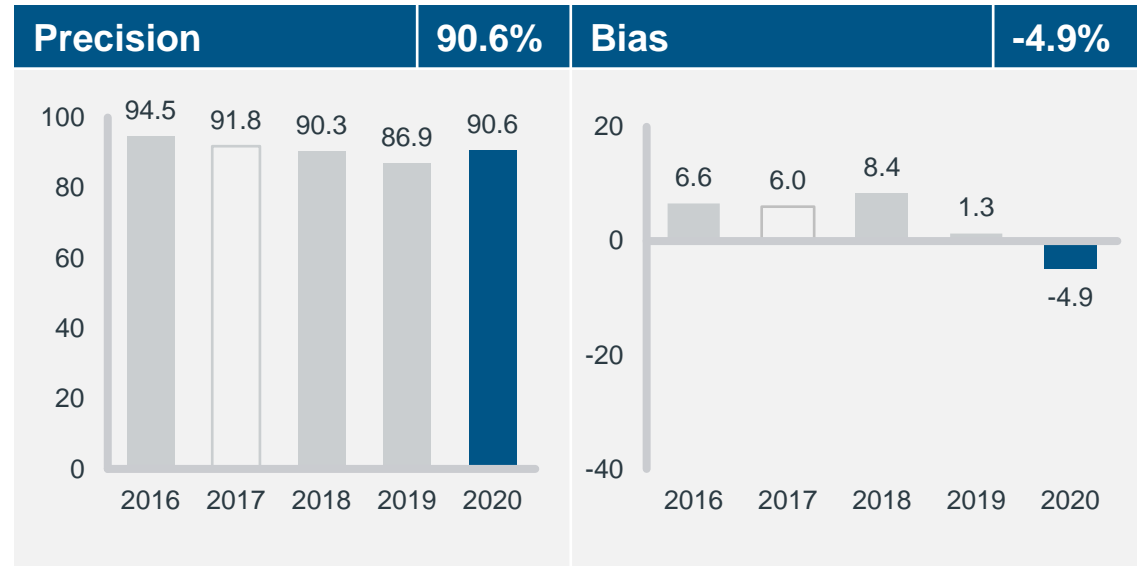
2020 Validation Study

Validation Results

Precision	90.6%	Bias	-4.9%

Precision:
- 2016: 94.5
- 2017: 91.8
- 2018: 90.3
- 2019: 86.9
- 2020: 90.6

Bias:
- 2016: 6.6
- 2017: 6.0
- 2018: 8.4
- 2019: 1.3
- 2020: -4.9

Outcomes
- Overall precision index improved by 3.7 percentage points in 2020
- Overall bias turned from 1.3% overestimation in 2019 to 4.9% underestimation in 2020
- Review projection factors

Distribution Channels Validated

- Domestic Manufacturers — 20%
- Foreign Supply, Imports — 80%
- 100%
- Agents
- Wholesalers — 30%
- 60%
- 5%
- 5%
- 17%
- 1%
- 12%
- Lebanon Retail / Private Pharmacies
- Private Hospitals
- Institutional
- 77%
- 6%
- 17%
- Patients
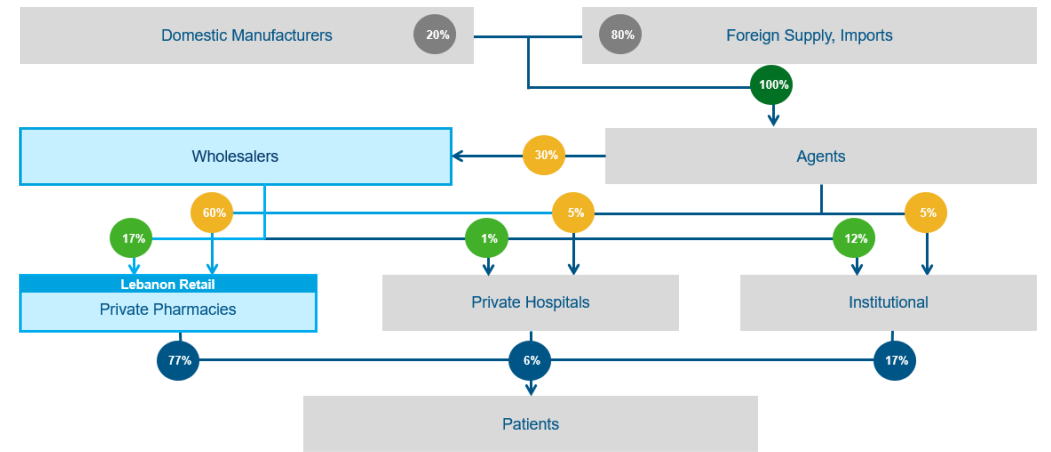
Participation

# Participating Companies	# Forms Validated	% Market Validated
43 (+10 vPY)	530 (+29 vPY)	28% (+3% vPY)

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Saudi Arabia Retail Validation Study

2020 Validation Study

Validation Results

Precision	100%	Bias	-0.1%

Precision bars (2016–2020): 98.2, 100.0, 100.0, 100.0, 100.0

Bias values (2016–2020): 1.1, 2.7, 1.9, 1.2, -0.1
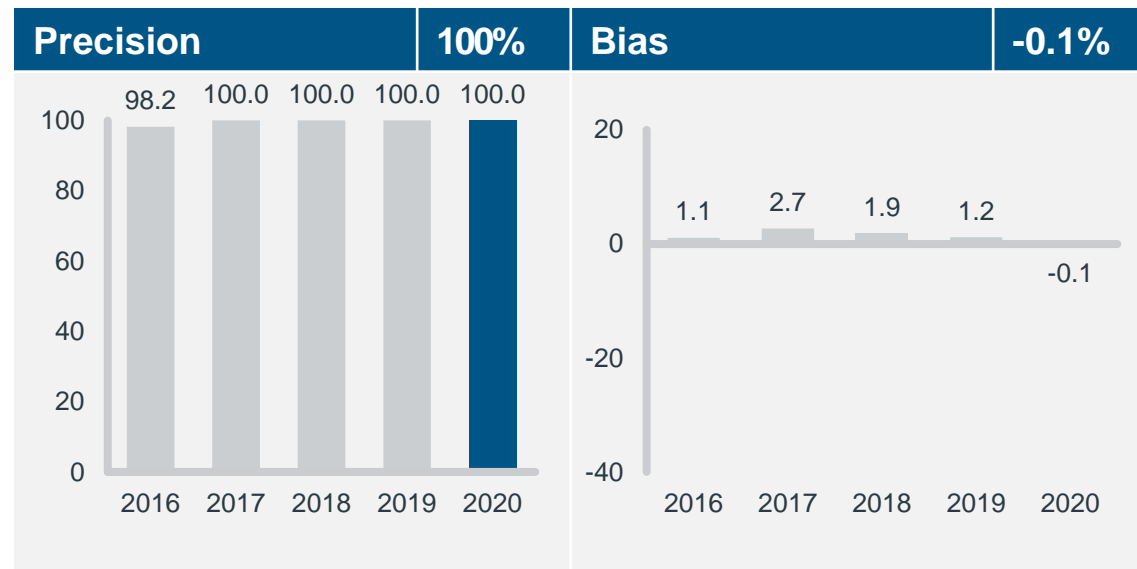
Outcomes

- Overall precision index remained unchanged at 100% in 2020
- Overall bias turned from 1.2% overestimation in 2019 to 0.1% underestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers → Agents/Distributors (88%)

Manufacturers → Saudi Arabia Retail (2%)

Agents/Distributors → Tender (40%)

Agents/Distributors → Local Purchase Order (Non MOH) (15%)

Agents/Distributors → Saudi Arabia Retail (45%)

Brokers (Direct Overseas) → (10%), (40%)

Saudi Arabia Retail — Private: Street Pharmacies, Clinics, Hospitals, Sub Agents, Chain Pharmacies

Patients (45%, 15%, 40%)

Institutions, MOH, Government & Semi-Government Hospitals
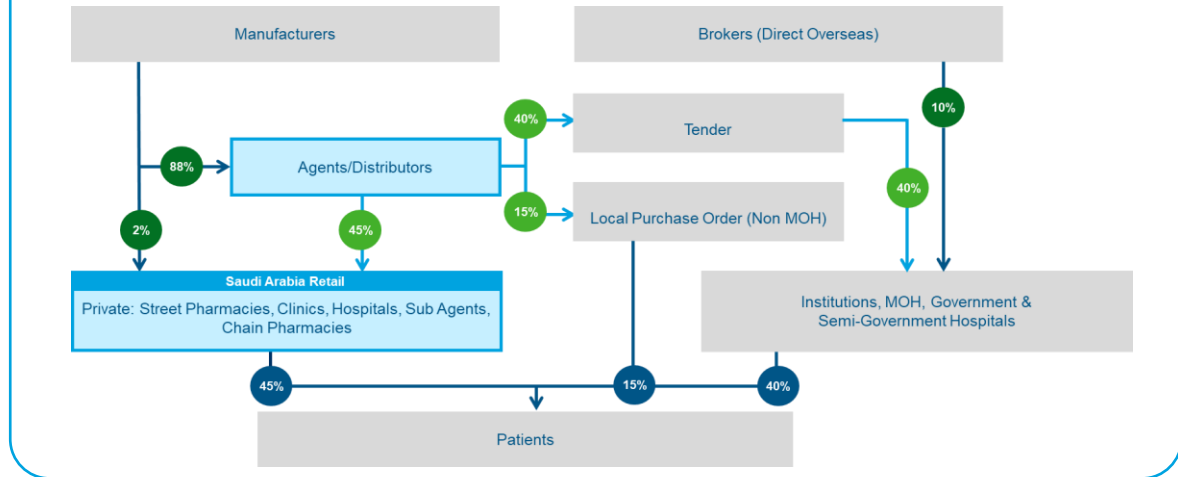
Participation

# Participating Companies	# Forms Validated	% Market Validated
44 (+10 vPY)	**429** (-70 vPY)	**23%** (-10% vPY)

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Turkey Retail Validation Study

2020 Validation Study

Validation Results

Precision	99.9%	Bias	-1.8%

Precision bar chart:
- 2016: 99.9
- 2017: 99.9
- 2018: 100.0
- 2019: 99.9
- 2020: 99.9

Bias chart:
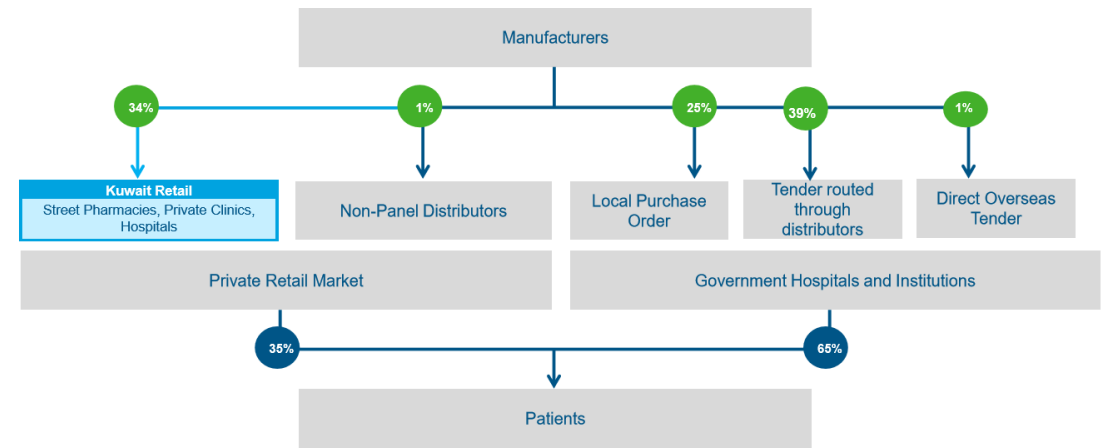- 2016: -2.0
- 2017: -2.5
- 2018: -1.6
- 2019: -1.8
- 2020: -1.8
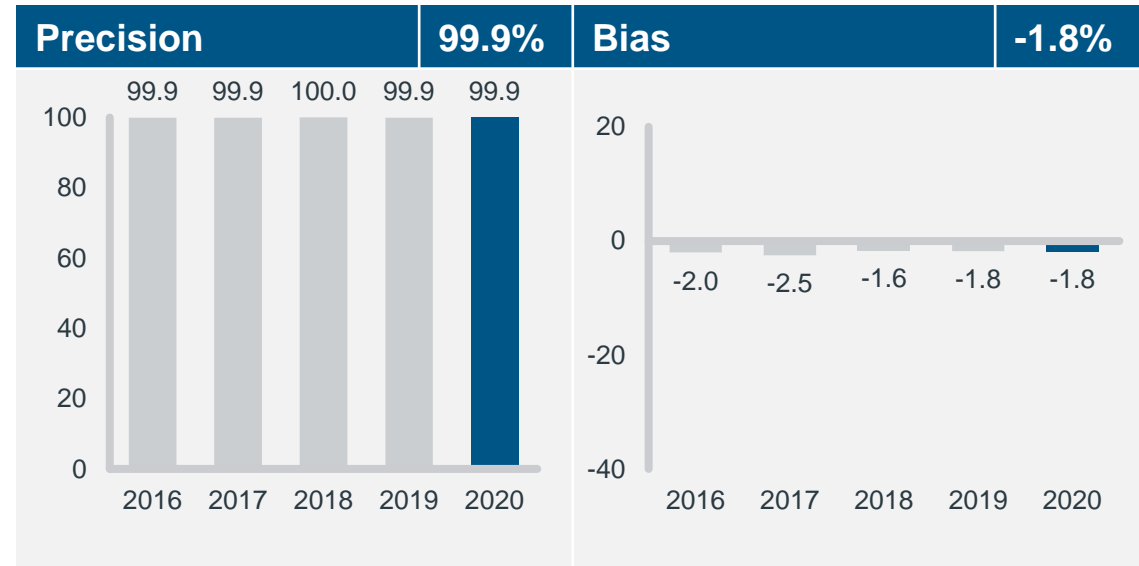
Outcomes

- Overall precision index remained unchanged in 2020
- Overall underestimation remained unchanged at 1.8% in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Domestic Manufacturers → Tender Wholesalers (6%), Line Wholesalers (94%)

Tender Wholesalers → Government & Private Hospitals and Clinics (5%), <1%
Line Wholesalers → 1%, Turkey Retail Pharmacies (94%)
Direct Sales (Government & Private Hospitals and Clinics) <1%

Government & Private Hospitals and Clinics → Patients (13%)
Direct Sales → Patients (<1%)
Pharmacies → Patients (87%)
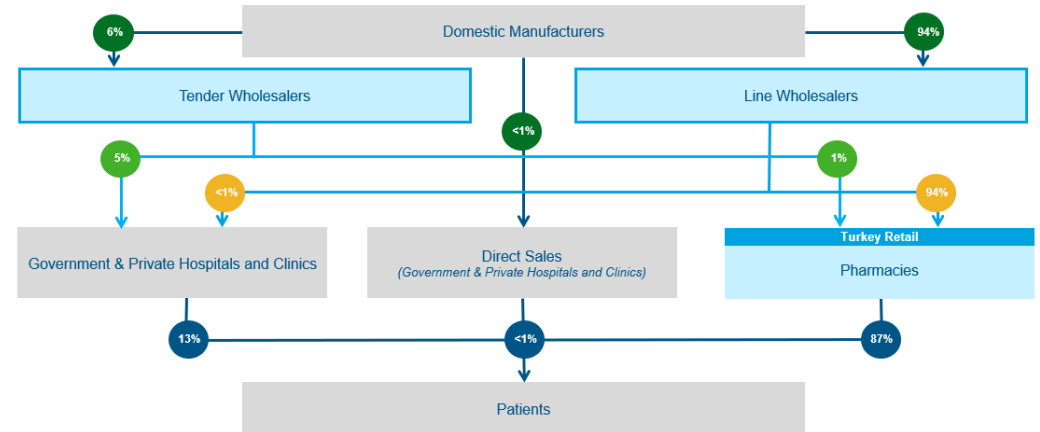
Participation

# Participating Companies	# Forms Validated	% Market Validated
66 (+2 vPY)	1,189 (-85 vPY)	51% (-3% vPY)

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United Arab Emirates Retail Validation Study

2020 Validation Study

Validation Results

Precision	100.0%	Bias	0.9%

Precision

- 2016: 99.9
- 2017: 99.8
- 2018: 100.0
- 2019: 99.8
- 2020: 100.0

(y-axis: 0, 20, 40, 60, 80, 100)

Bias

- 2016: -0.1
- 2017: -0.4
- 2018: 1.2
- 2019: 2.6
- 2020: 0.9

(y-axis: -40, -20, 0, 20)
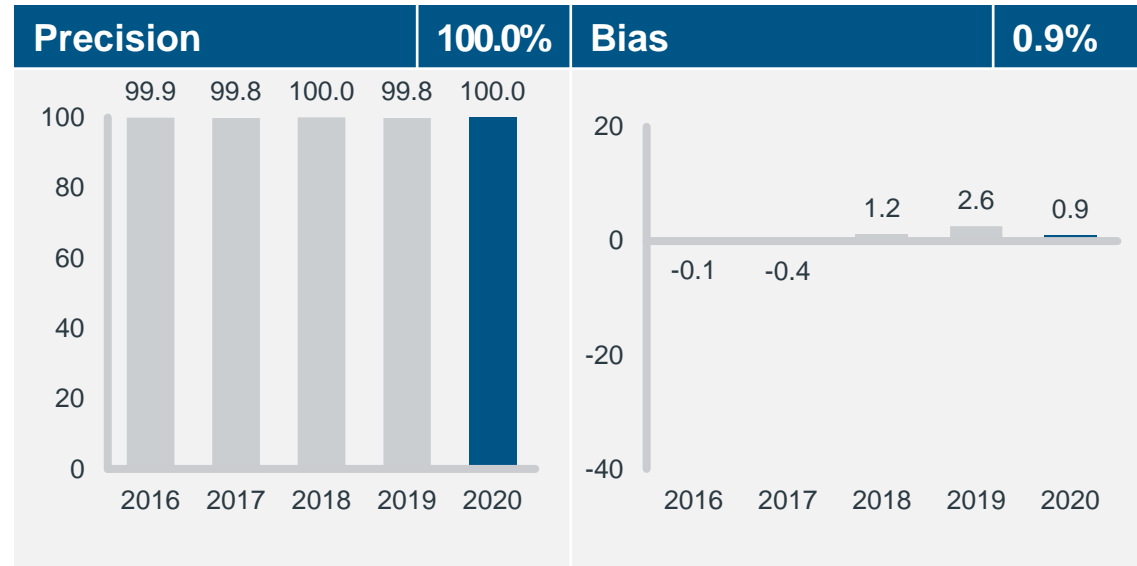
Outcomes

- Overall precision index improved by 0.2 percentage points in 2020
- Overall overestimation improved by 1.7 percentage points in 2020
- 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
33 (+11 vPY)	761 (+210 vPY)	43% (+21% vPY)

IQVIA

Bangladesh Retail Validation Study

2020 Validation Study

Validation Results

Precision	72.6%	Bias	-14.3%

Precision chart:
- 2016: 73.6
- 2017: 72.4
- 2018: 77.6
- 2019: 84.0
- 2020: 72.6

Bias chart:
- 2016: -10.5
- 2017: -15.1
- 2018: -17.1
- 2019: -19.9
- 2020: -14.3
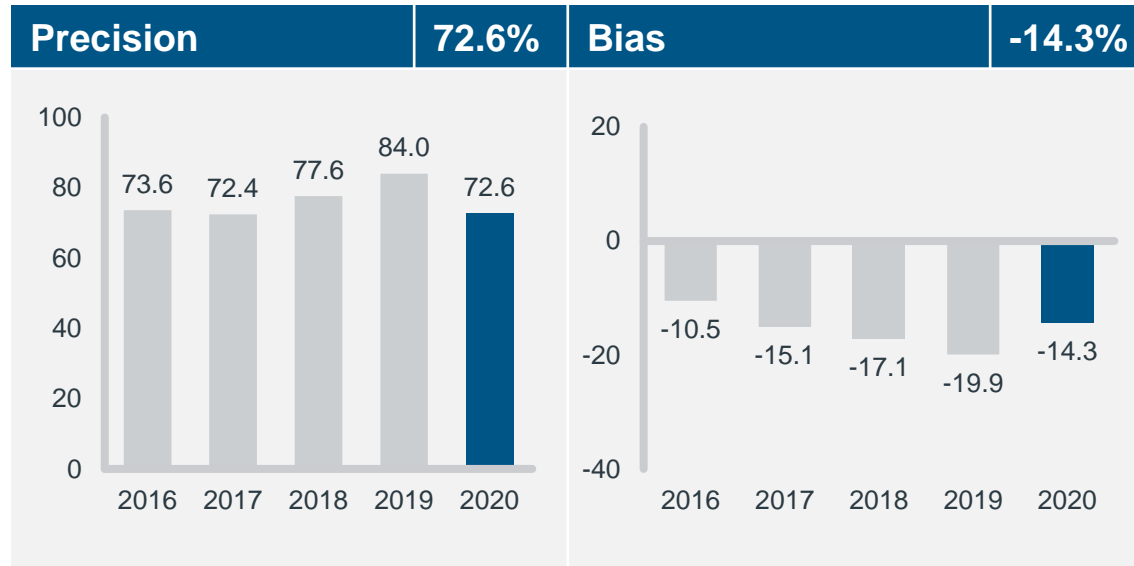
Outcomes
- Overall precision index declined by 11.4 percentage points in 2020
- Overall underestimation improved by 5.6 percentage points in 2020
- Implement new census data and adjustment of the projection level

Distribution Channels Validated

Manufacturers → 100% → Distributors
Distributors → 85% → Bangladesh Retail Pharmacies
Distributors → 15% → Clinics/Hospitals
Bangladesh Retail Pharmacies → 85% → Patients
Clinics/Hospitals → 15% → Patients

Participation

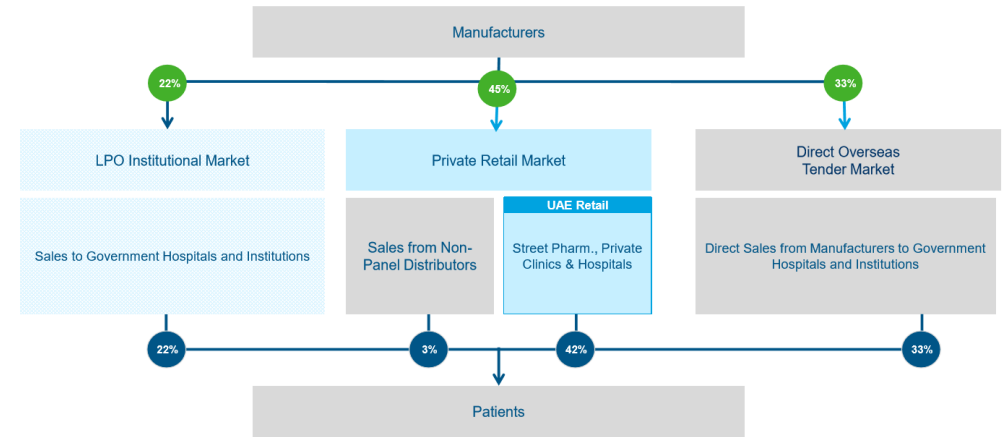| # Participating Companies	# Forms Validated	% Market Validated
17 (+1 vPY)	2,125 (+100 vPY)	54% (+7% vPY)

IQVIA

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Sri Lanka Retail Validation Study

2020 Validation Study

Validation Results

Precision	67.4%	Bias	-20.5%

Precision chart (2016–2020):
- 2016: 65.1
- 2017: 72.7
- 2018: —
- 2019: —
- 2020: 67.4

Bias chart (2016–2020):
- 2016: -18.9
- 2017: -25.6
- 2018: —
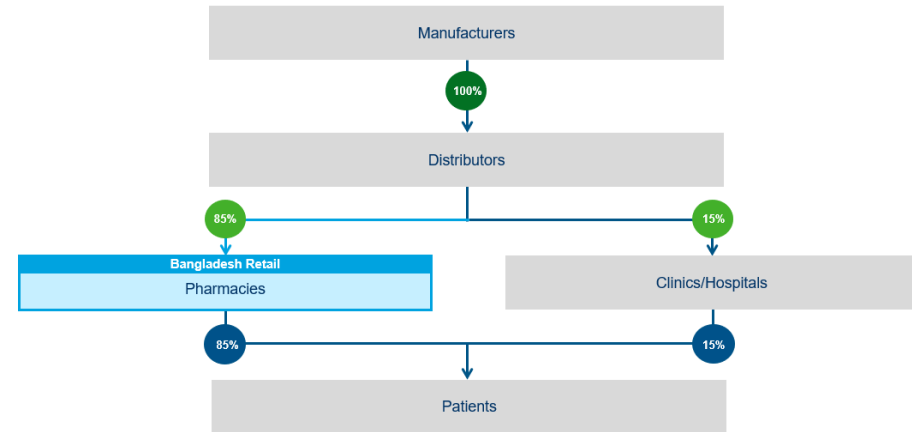- 2019: —
- 2020: -20.5
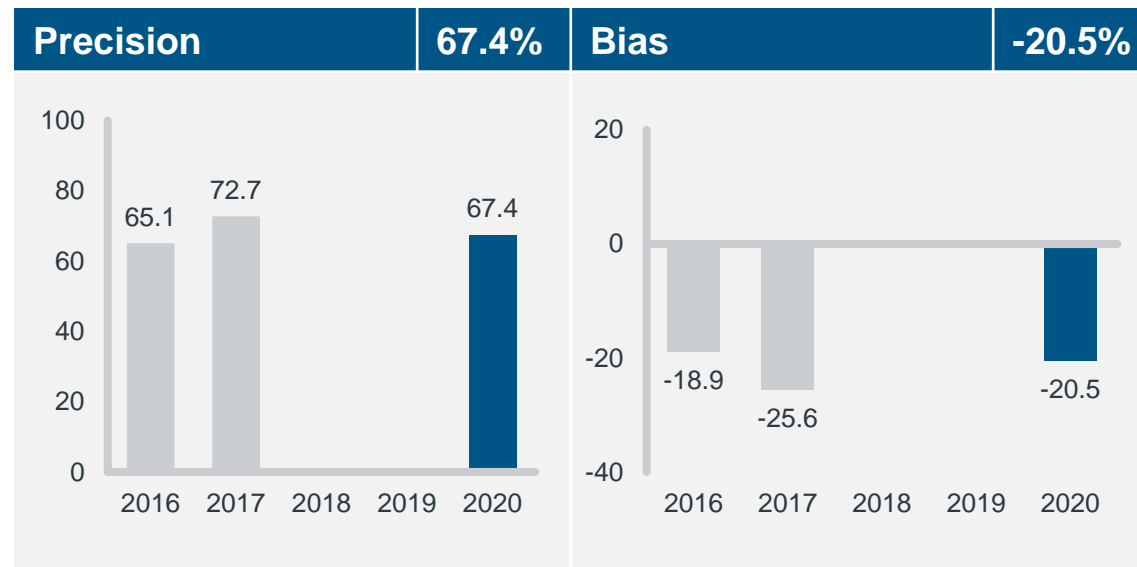
Outcomes
- Overall precision index declined by 5.3 percentage points in 2020
- Overall underestimation improved by 5.1 percentage points in 2020
- Implement new census and adjustment of the projection level

Distribution Channels Validated

Distribution flow chart showing channels: Agents / Distributors / Importers / Own Distribution, Manufacturers / Principals, State Pharmaceutical Corporation, Wholesalers, Department of Health Service, Sri Lanka Retail Pharmacies / Chemist Shops, Dispensing Doctors, Private Hospitals, Government Hospitals, Patients. Percentages shown: 75%, 25%, 62%, 10%, 25%, 7%, 1%, <1%, 1%, 1%, 25%, 56%, 1%, 1%, <1%, 1%, 10%, 2%, 1%, 58%, 1%, 12%, 29%.

Participation

# Participating Companies	# Forms Validated	% Market Validated
39 (-2 v2017)	**487** (-219 v2017)	**28%** (-10% v2017)
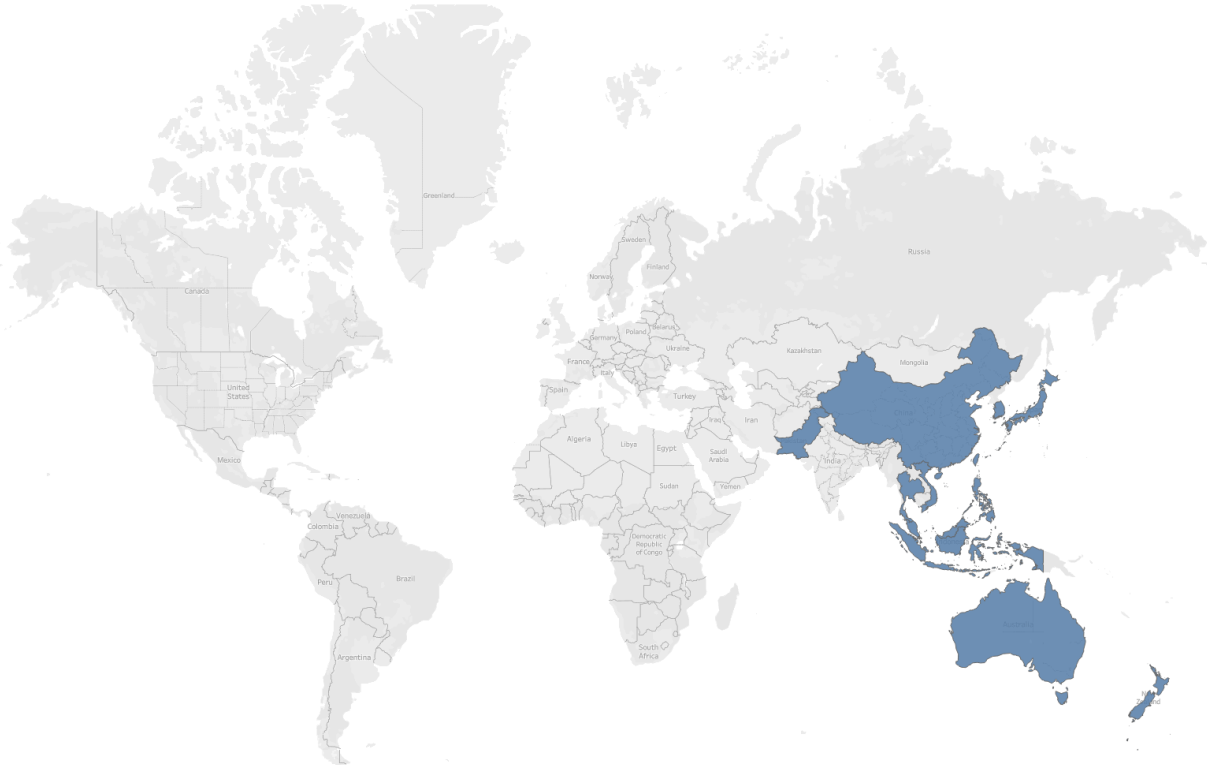
Asia Pacific

Regions/Countries

Greater China
- China
- Hong Kong

Pacific Asia
- South Korea
- Japan

Southeast Asia
- Indonesia
- Malaysia
- Pakistan
- Philippines
- Singapore
- Thailand
- Vietnam

Back

China Hospital Validation Study
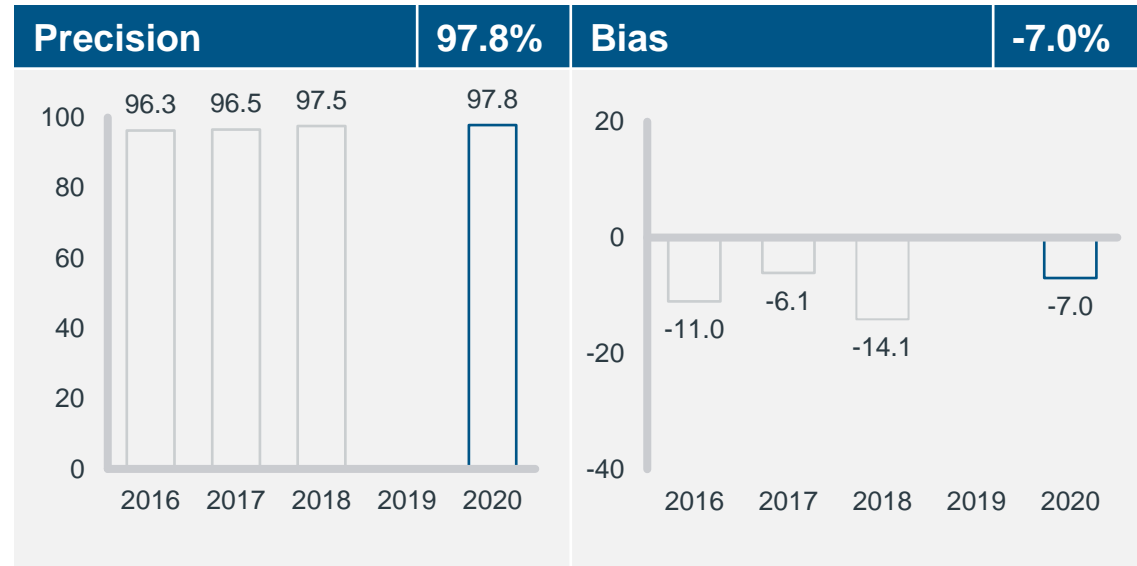
2020 Validation Study

Validation Results

| Precision | 97.8% | Bias | -7.0% |

Precision bar chart: 96.3 (2016), 96.5 (2017), 97.5 (2018), 97.8 (2020)

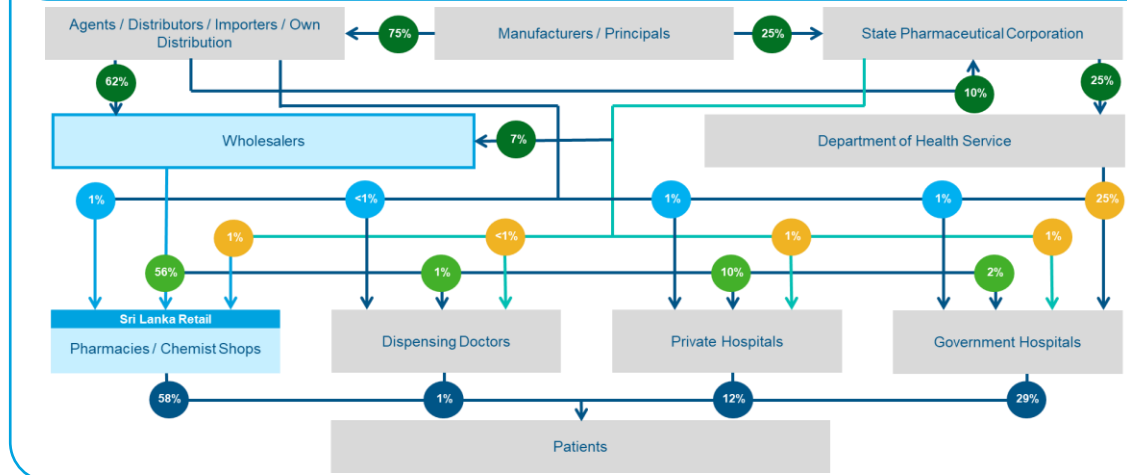Bias bar chart: -11.0 (2016), -6.1 (2017), -14.1 (2018), -7.0 (2020)

Outcomes
- Overall precision index improved by 0.3 percentage points in 2020
- Overall underestimation improved by 7.1 percentage points in 2020
- Continue to strengthen panel and evaluate alternative data sources in long-term

Distribution Channels Validated

Manufacturers → 100% → Wholesalers → 28% → Small Hospitals, Community Clinics, Others (28%); 12% → Retail Pharmacies; 60% → China Hospital / Large Hospitals → Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
22 (+1 v2018)	**144** (+14 v2018)	**4%** (+3% v2018)

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IQVIA

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Hong Kong Combined Validation Study

2020 Validation Study

Validation Results

Precision	82.7%	Bias	-7.3%

Precision chart:
- 2016: 79.6
- 2017: 75.4
- 2018: 80.0
- 2019: 81.5
- 2020: 82.7

Bias chart:
- 2016: -9.8
- 2017: -9.0
- 2018: -9.2
- 2019: -9.0
- 2020: -7.3
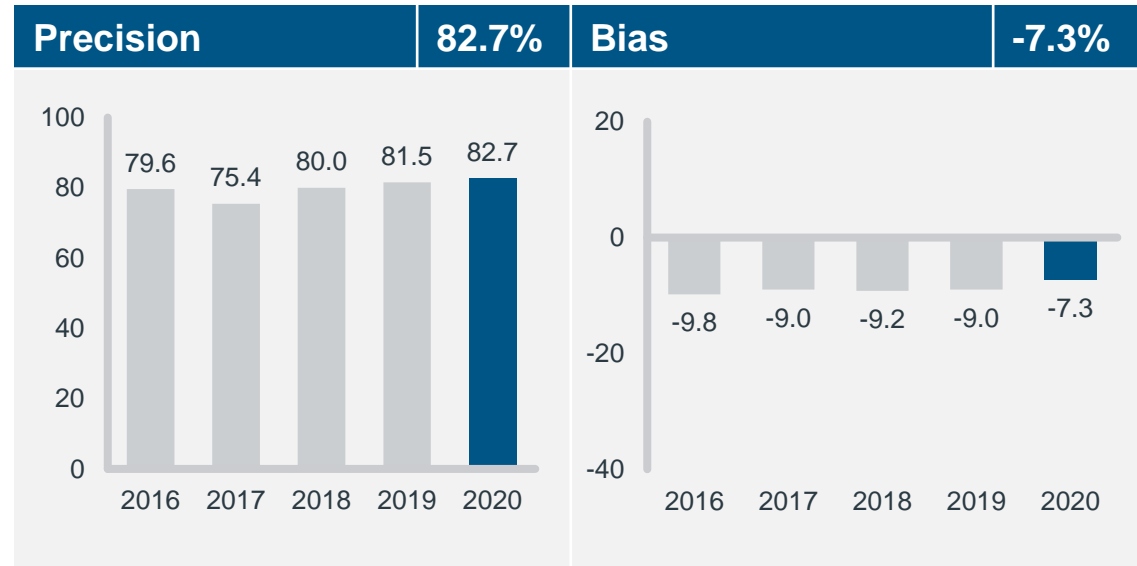
Outcomes

- Overall precision index improved by 1.2 percentage points in 2020
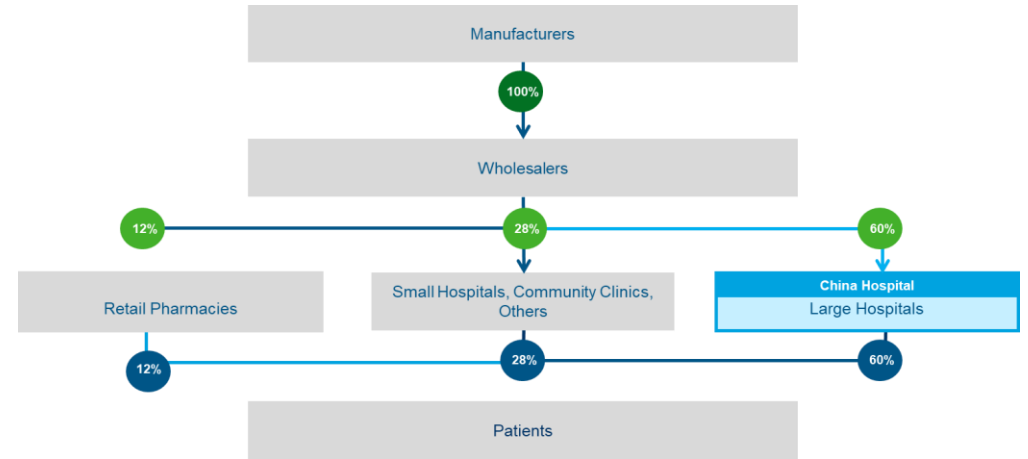- Overall underestimation improved by 1.7 percentage points in 2020
- No action required from the statistical point of view

Distribution Channels Validated

Manufacturers / Agents / Distributors

Wholesalers

Hong Kong Combined

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

Patients

Participation

# Participating Companies	# Forms Validated	% Market Validated
42 (+3 vPY)	**795** (+16 vPY)	**28%** (-2% vPY)

South Korea Retail Validation Study

2020 Validation Study

Validation Results

Precision	86.3%

Precision bars: 2016: 88.6, 2017: 90.1, 2018: 86.9, 2019: 87.6, 2020: 86.3

Bias	-17.5%

Bias bars: 2016: -12.4, 2017: -7.4, 2018: -10.1, 2019: -13.5, 2020: -17.5
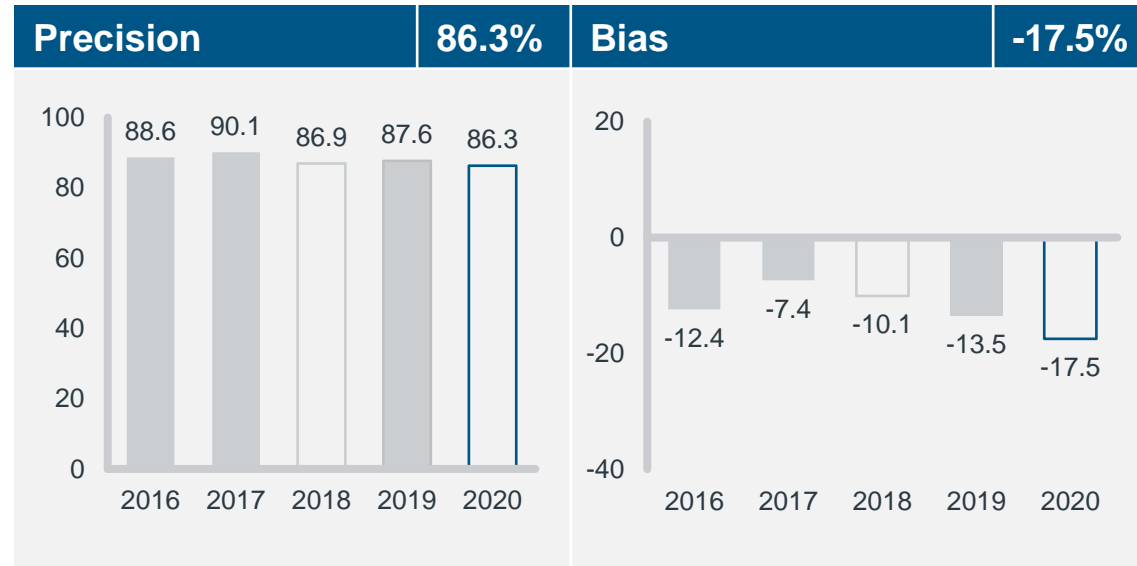
Outcomes

- Overall precision index declined by 1.3 percentage points in 2020
- Overall underestimation increased by 4.0 percentage points in 2020
- Review projection level and panel composition
- Check completeness and replace inadequate panel

Distribution Channels Validated

Participation

# Participating Companies	# Forms Validated	% Market Validated
14 (-1 vPY)	**699** (-44 vPY)	**8%** (-2% vPY)

South Korea OTC Validation Study

2020 Validation Study

Validation Results

Precision	64.2%	Bias	-16.6%

Precision (2016–2020): 65.9, 83.3, 73.3, 83.1, 64.2

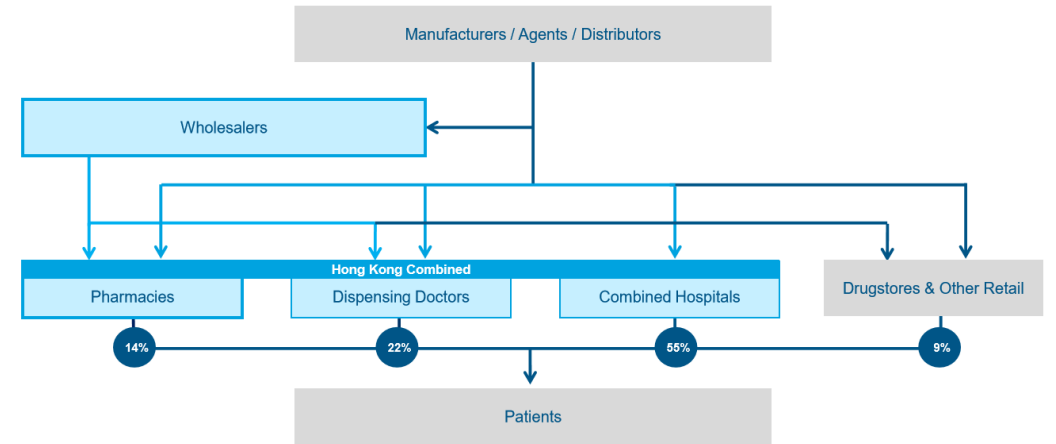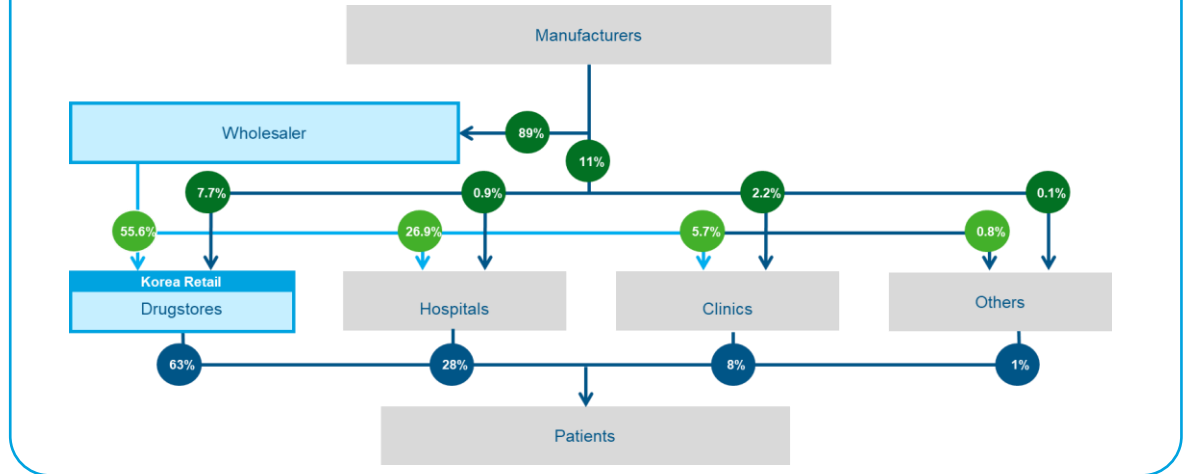Bias (2016–2020): -19.2, -3.6, -14.3, -13.8, -16.6
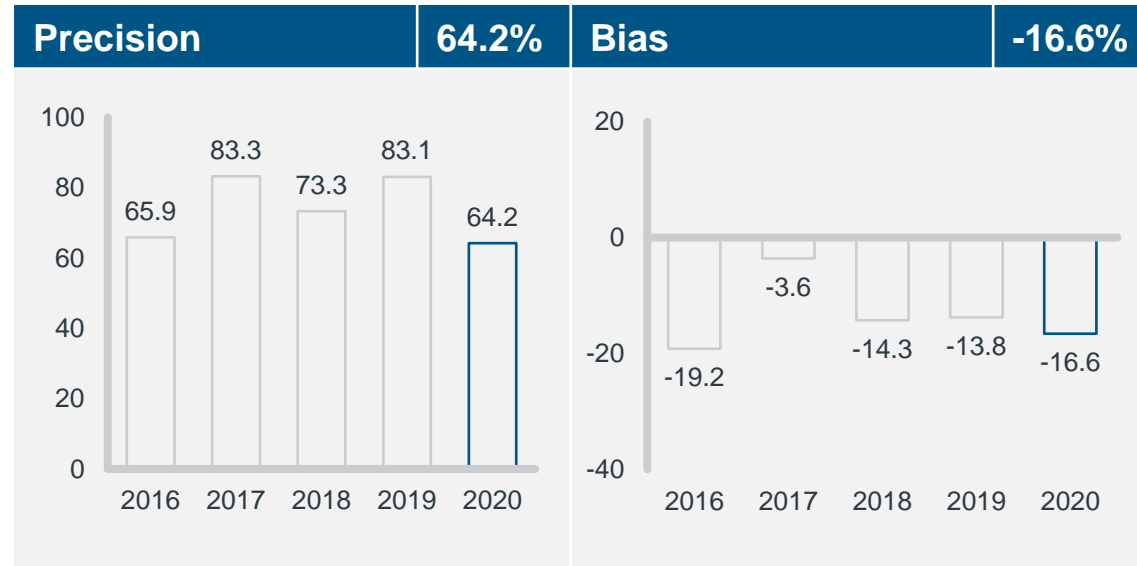
Outcomes

- Overall precision index declined by 18.9 percentage points in 2020
- Overall underestimation increased by 2.8 percentage points in 2020
- Review projection level and panel composition
- Check completeness and replace inadequate panel

Distribution Channels Validated

Manufacturers → Wholesaler 89%, 11%

Wholesaler: 7.7%, 0.9%, 2.2%, 0.1%

55.6% Korea Retail Drugstores, 26.9% Hospitals, 5.7% Clinics, 0.8% Others

Patients: Drugstores 63%, Hospitals 28%, Clinics 8%, Others 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
7 (-3 vPY)	**126** (-9 vPY)	**6%** (no change vPY)

South Korea Hospital Validation Study
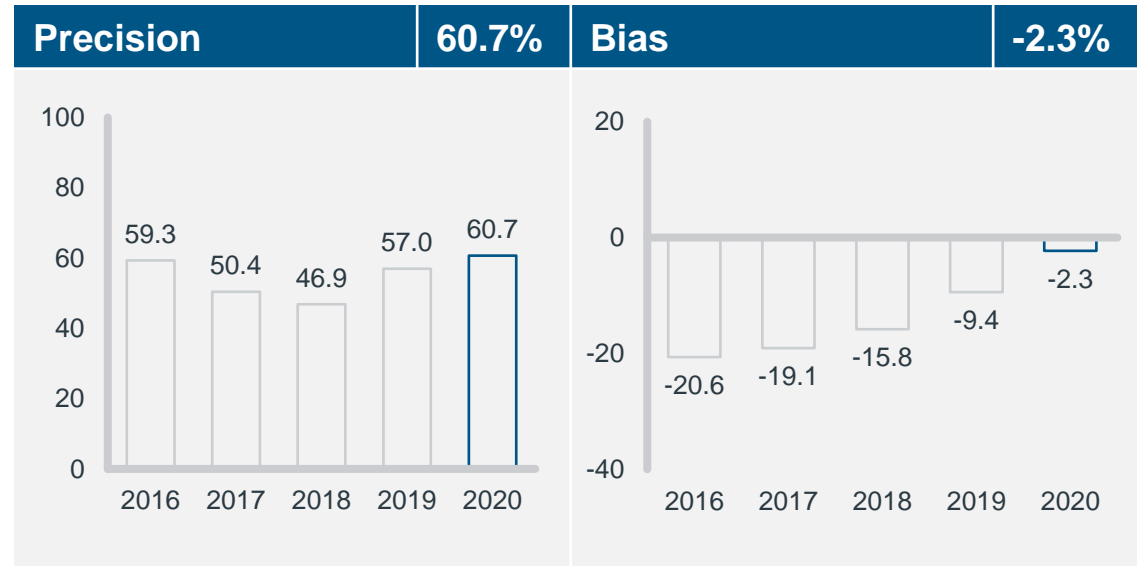
2020 Validation Study

Validation Results

Precision	60.7%	Bias	-2.3%

Precision chart: 2016: 59.3, 2017: 50.4, 2018: 46.9, 2019: 57.0, 2020: 60.7

Bias chart: 2016: -20.6, 2017: -19.1, 2018: -15.8, 2019: -9.4, 2020: -2.3

Outcomes

- Overall precision index improved by 3.7 percentage points in 2020
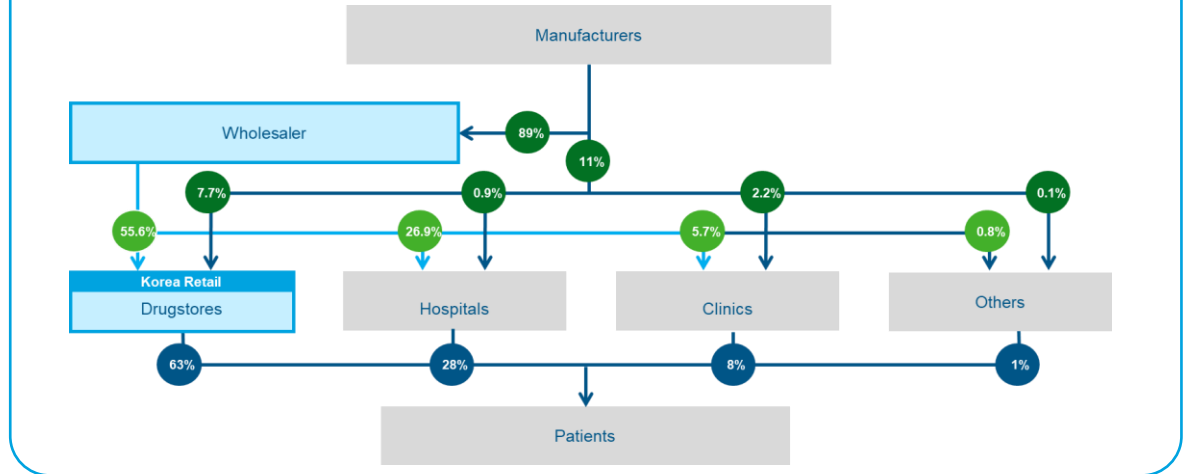- Overall underestimation improved by 7.1 percentage points in 2020
- Review projection level and panel composition
- Improve QC process

Distribution Channels Validated

Manufacturers → Wholesaler 89%, 11%
Wholesaler → Drugstores 55.6%, 7.7%, Korea Hospital Hospitals 26.9%, 0.9%, Clinics 5.7%, 2.2%, Others 0.8%, 0.1%
Drugstores → Patients 63%, Hospitals 28%, Clinics 8%, Others 1%

Participation

# Participating Companies	# Forms Validated	% Market Validated
13 *(no change vPY)*	**170** *(+17 vPY)*	**5%** *(+1% vPY)*

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Japan Retail+Hospital Validation Study

2020 Validation Study

Validation Results

Precision	99.3%	Bias	-0.1%

Precision chart:
- 2016: 99.5
- 2017: 99.8
- 2018: 99.6
- 2020: 99.3

Bias chart:
- 2016: 0.3
- 2017: 0.3
- 2018: 0.0
- 2020: -0.1
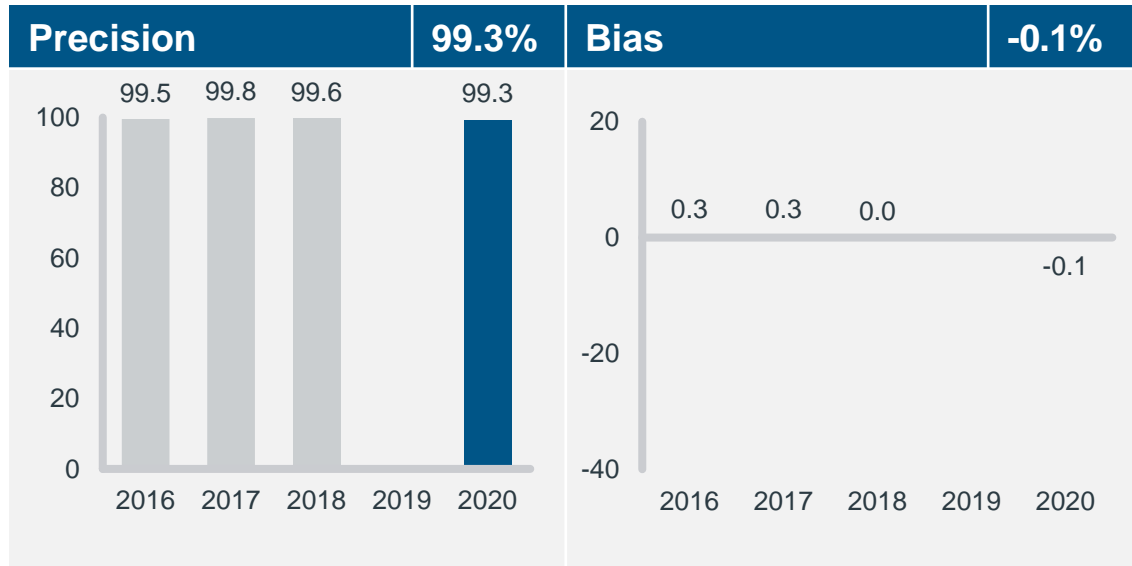
Outcomes

- Overall precision index declined by 0.3 percentage points in 2020
- Overall bias turned from no bias in 2018 to 0.1% underestimation in 2020
- No action required from the statistical point of view

Distribution Channels Validated

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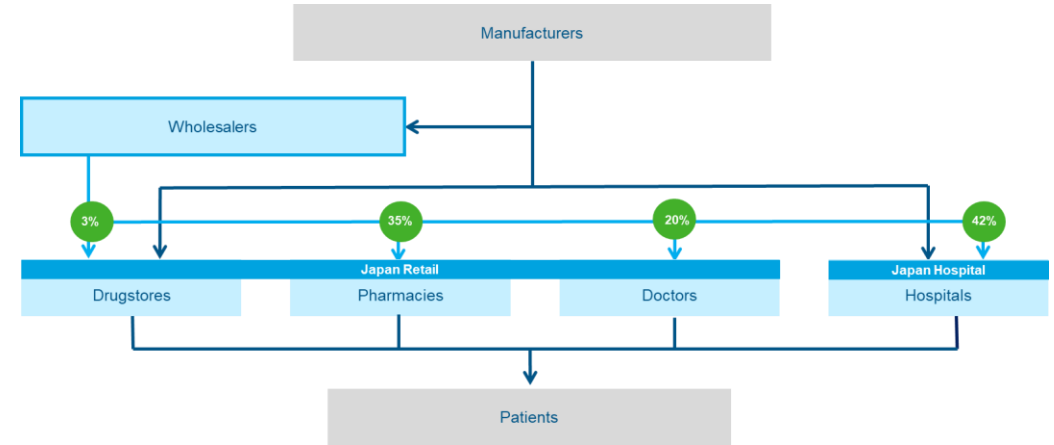
Participation

# Participating Companies	# Forms Validated	% Market Validated
37 *(-13 v2018)*	**2,172** *(-841 v2018)*	**36%** *(-9% v2018)*

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Indonesia Total Market Validation Study

2020 Validation Study

Validation Results

Precision	44.1%	Bias	-6.6%

Precision bar chart:
- 2016: 61.5
- 2017: 64.7
- 2018: 50.9
- 2019: 61.4
- 2020: 44.1

Bias bar chart:
- 2016: -2.9
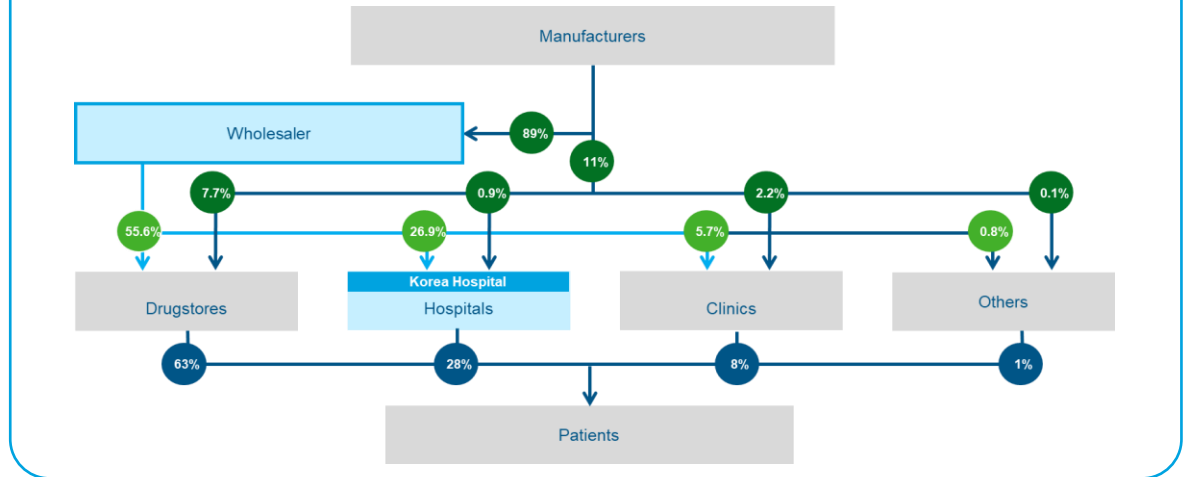- 2017: -3.2
- 2018: -8.7
- 2019: -7.7
- 2020: -6.6
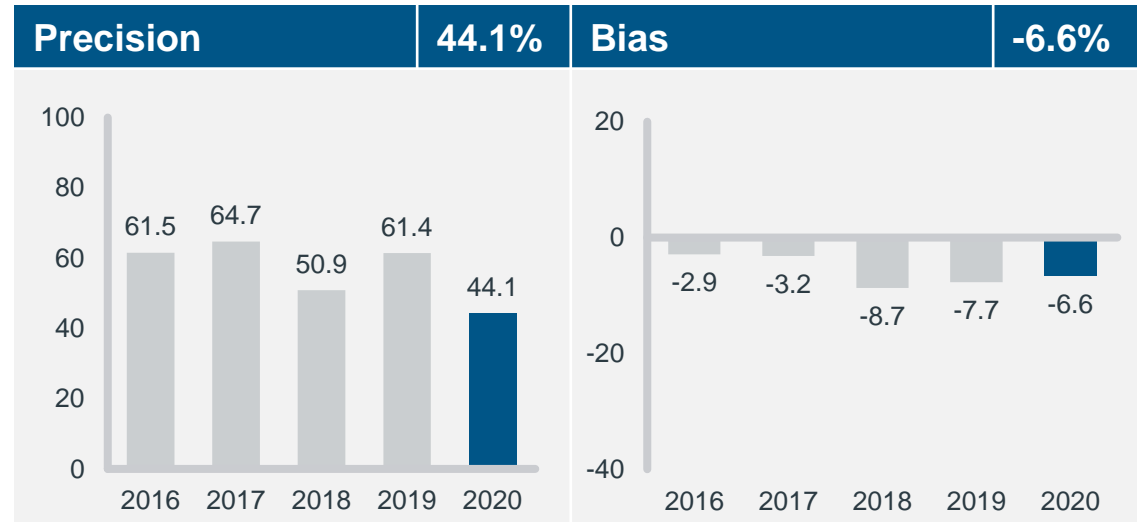
Outcomes

- Overall precision index declined by 17.3 percentage points in 2020
- Overall underestimation improved by 1.1 percentage points in 2020
- 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

Manufacturers → 100% → Distributors → Sub-Distributors and Wholesalers

- Indonesia Drugstore — Drugstores — 5%
- Indonesia Retail — Pharmacies — 26%
- Indonesia Hospital — Hospitals — 32%
- Others* — 37%
- Patients

Validation Participation

# Participating Companies	# Forms Validated	% Market Validated*
50 (+11 vPY)	1,423 (+424 vPY)	19% (+6% vPY)

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

Malaysia Combined Validation Study

2020 Validation Study

Validation Results

Precision	83.2%	Bias	-7.7%

Precision chart: 2016: 87.6, 2017: 85.4, 2018, 2019, 2020: 83.2

Bias chart: 2016: -4.3, 2017: -2.3, 2018, 2019, 2020: -7.7
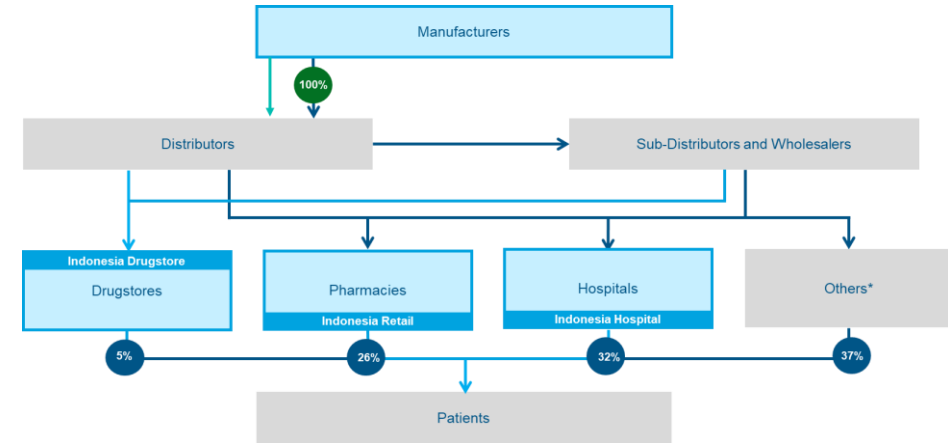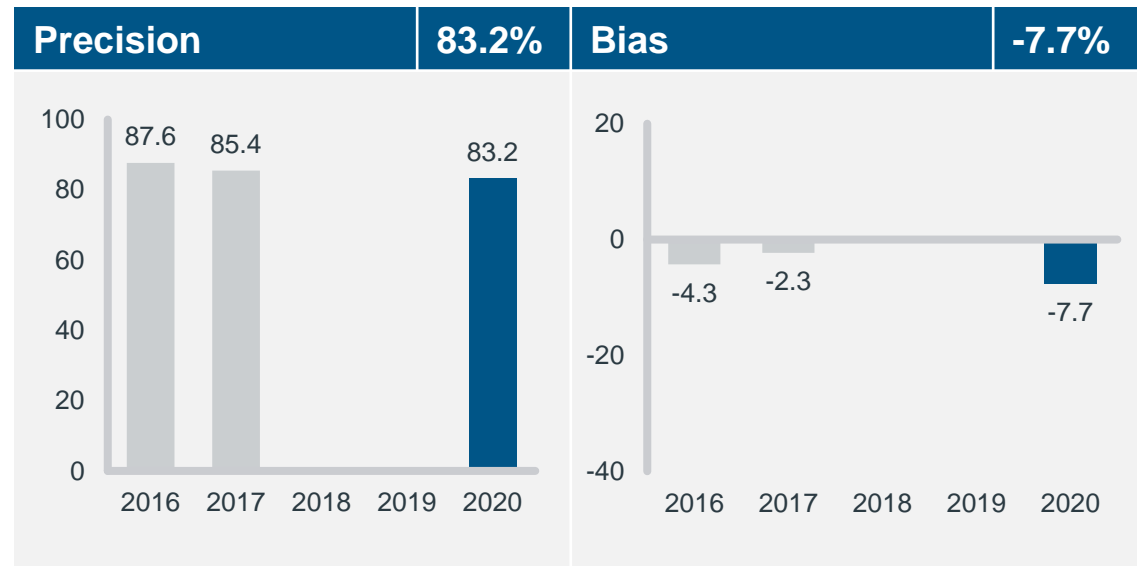
Outcomes

- Overall precision index declined by 2.2 percentage points in 2020
- Overall underestimation increased by 5.4 percentage points in 2020
- Continue to secure additional direct data and continue to strengthen panel

Distribution Channels Validated

Manufacturers → Retail, Hospital

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

Malaysia Combined: *Others, 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
75 (-6 v2017)	**1,412** (-46 v2017)	**44%** (-7% v2017)

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Pakistan Retail Validation Study

2020 Validation Study

Validation Results

Precision	95.6%	Bias	-0.7%

Precision bars: 94.7 (2016), 95.9 (2017), 94.4 (2018), 97.4 (2019), 95.6 (2020)

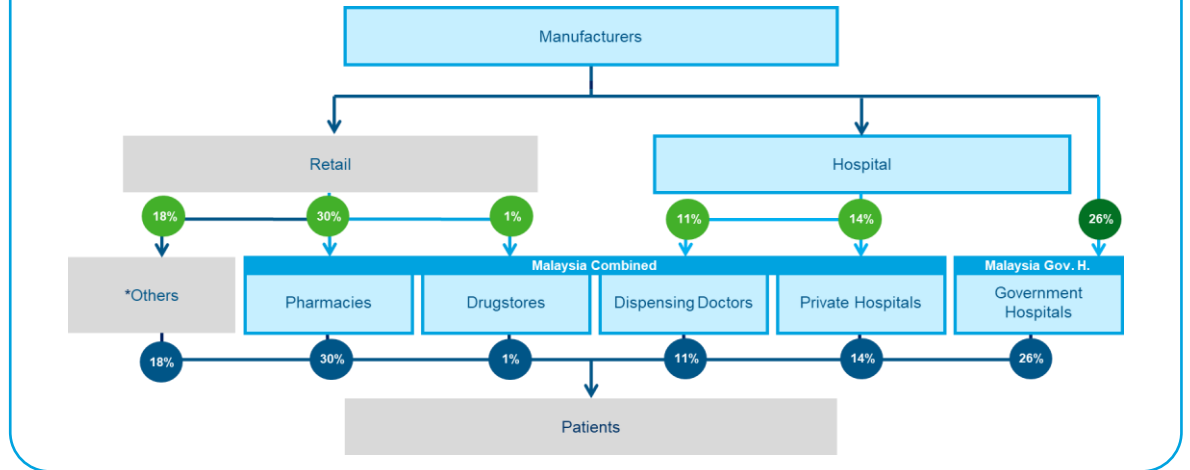Bias values: -0.3 (2016), -0.7 (2017), -2.7 (2018), -1.3 (2019), -0.7 (2020)
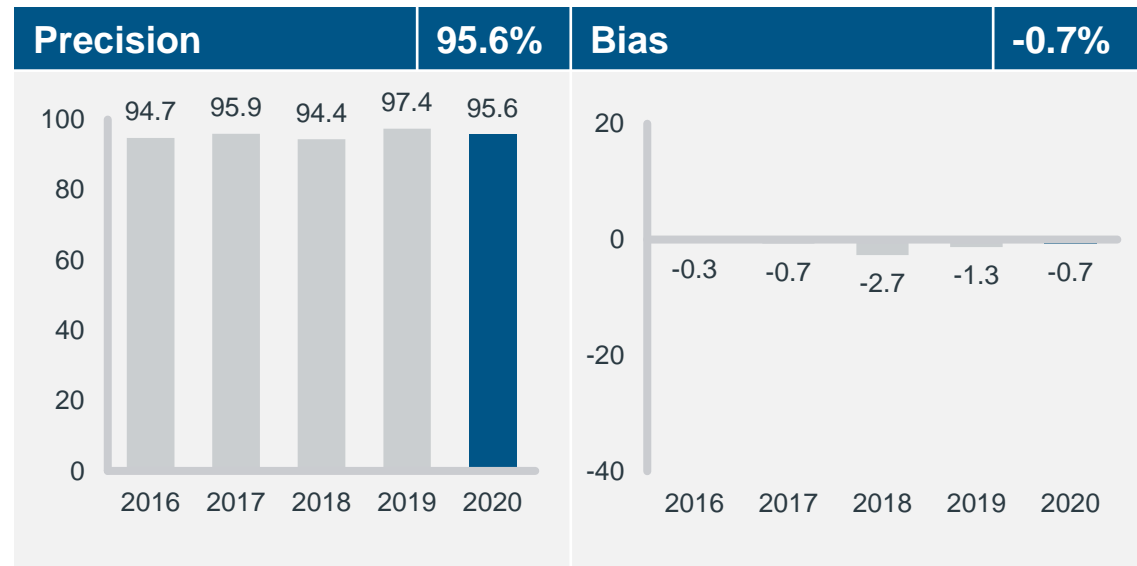
Outcomes

- Overall precision index declined by 1.8 percentage points in 2020
- Overall underestimation improved by 0.6 percentage points in 2020
- Maintain the participation level of the validation study

Distribution Channels Validated

Participation

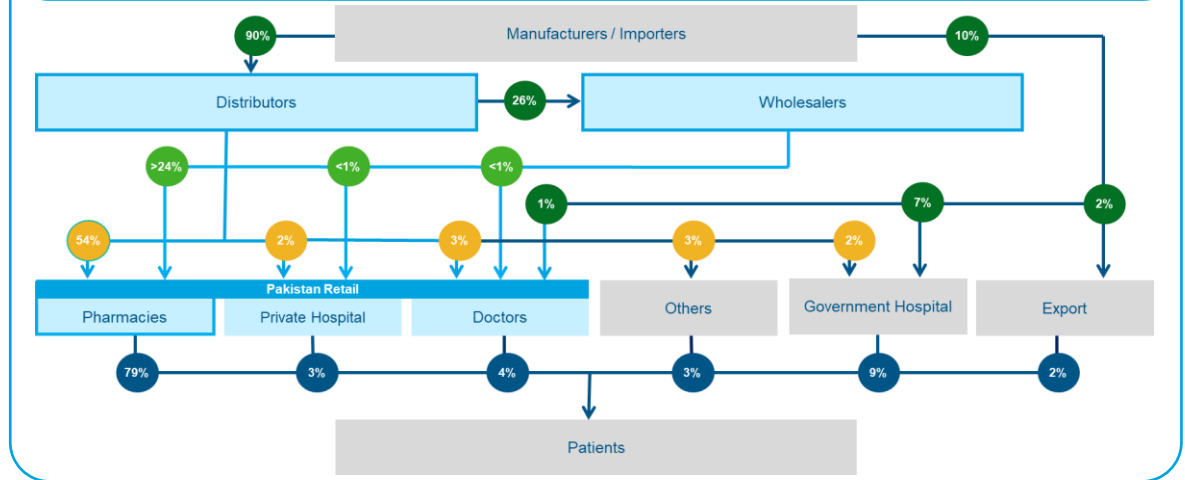| # Participating Companies	# Forms Validated	% Market Validated
57 (-12 vPY)	**2,036** (-338 vPY)	**64%** (-7% vPY)

Philippines Retail Validation Study

2020 Validation Study

Validation Results

Precision	99.7%	Bias	-1.1%

Precision bar chart: 2016, 2017, 2018 = 100.0, 2019 = 99.1, 2020 = 99.7

Bias chart: 0.0, -0.2, -1.1 across 2016-2020
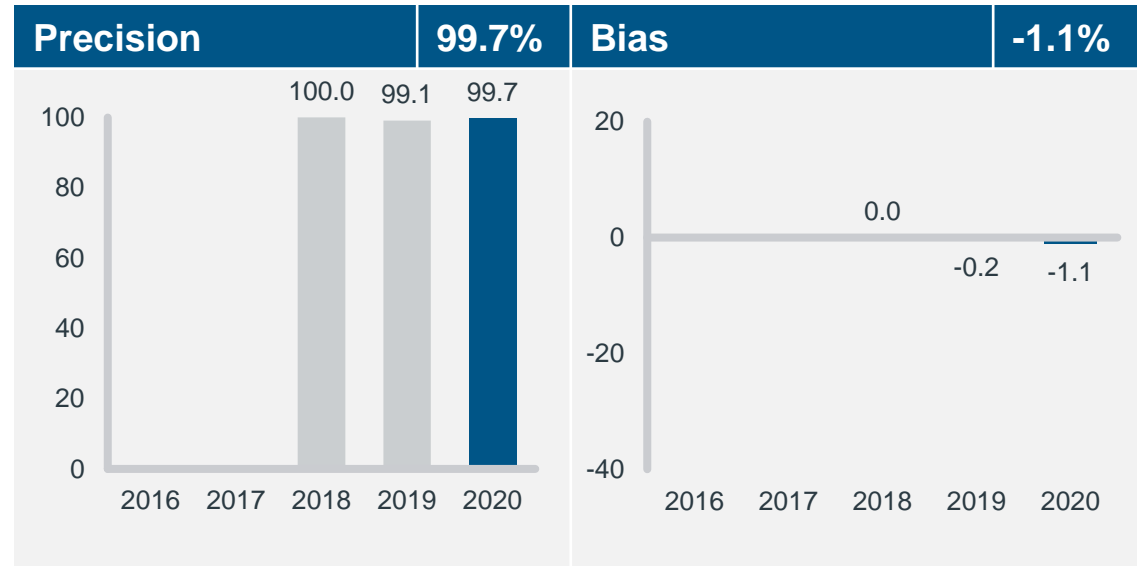
Outcomes

- Overall precision index improved slightly by 0.6 percentage points in 2020
- Overall underestimation increased slightly by 0.9 percentage points in 2020
- Continue to strengthen panel data in long term

Distribution Channels Validated

Manufacturers / Distributors

Philippines Retail: Independent Drugstores (4%), Chain Drugstores (80%), Others* (5%), Govt. Agencies (1%), Private Hospitals (7%), Govt. Hospitals (3%)

Patients: 4%, 80%, 5%, 1%, 7%, 3%
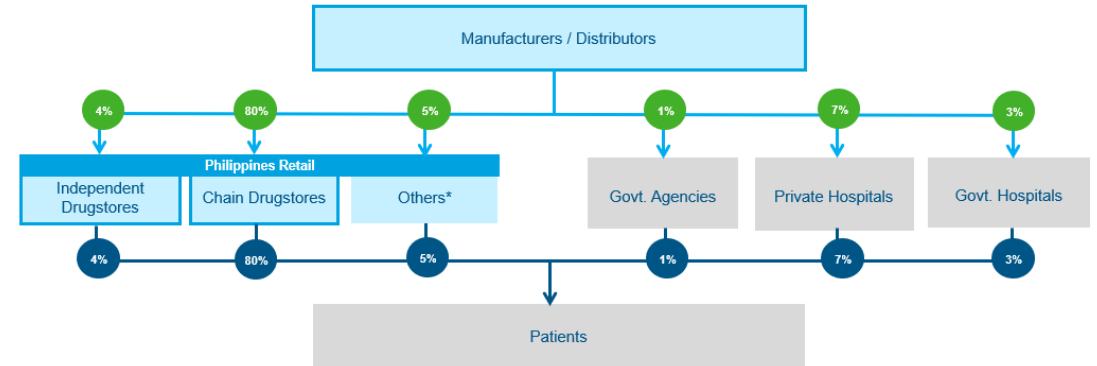
*Others: DP/Industrials/Clinic w/o Beds

Participation

# Participating Companies	# Forms Validated	% Market Validated
26 (+8 vPY)	692 (+57 vPY)	29% (+4% vPY)

Philippines Hospital Validation Study

2020 Validation Study

Validation Results

Precision	99.0%	Bias	0.3%

Precision chart:
- 2016: (no data)
- 2017: (no data)
- 2018: 100.0
- 2019: 99.4
- 2020: 99.0

Y-axis: 0, 20, 40, 60, 80, 100

Bias chart:
- 0.0
- -1.4
- 0.3

Y-axis: 20, 0, -20, -40
X-axis: 2016, 2017, 2018, 2019, 2020
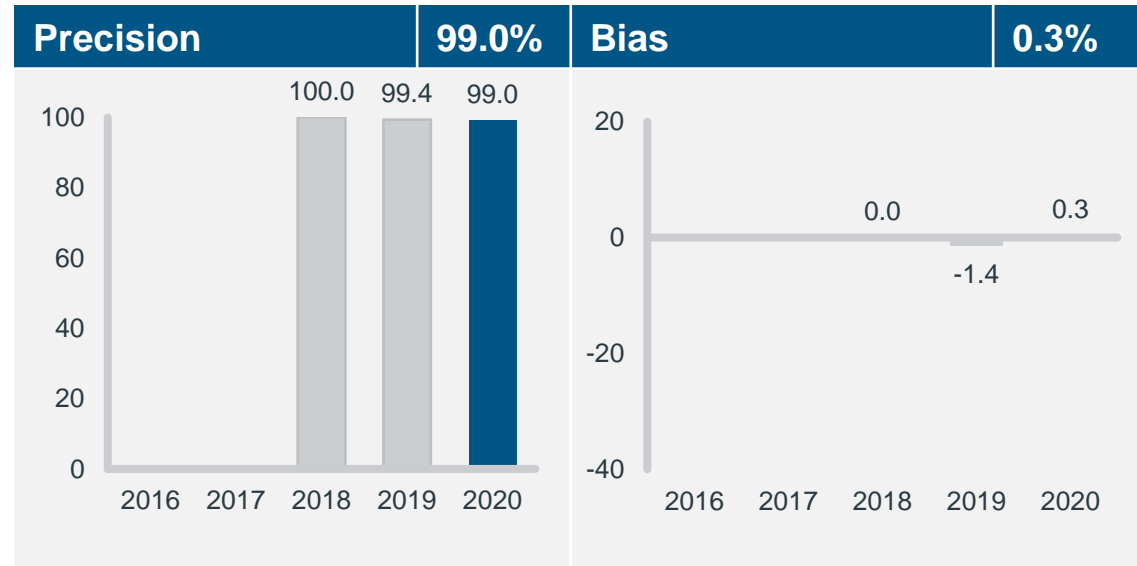
Outcomes

- Overall precision index declined slightly by 0.4 percentage points in 2020
- Overall bias turned from 1.4% underestimation in 2019 to 0.3% overestimation in 2020
- Continue to strengthen panel data in long term
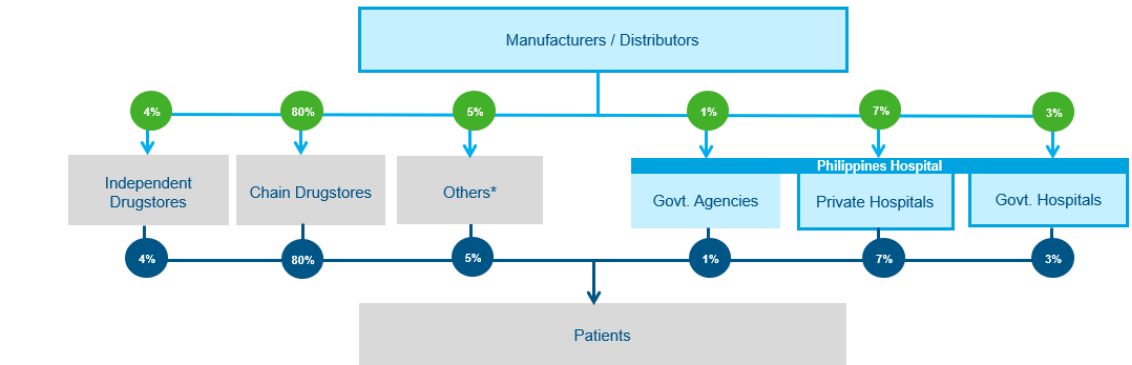
Distribution Channels Validated

Manufacturers / Distributors

- Independent Drugstores — 4% / 4%
- Chain Drugstores — 80% / 80%
- Others* — 5% / 5%
- Govt. Agencies — 1% / 1%
- Private Hospitals — 7% / 7%
- Govt. Hospitals — 3% / 3%

Philippines Hospital

Patients

*Others: DP/Industrials/Clinic w/o Beds

Participation

# Participating Companies	# Forms Validated	% Market Validated
21 (+7 vPY)	**245** (+15 vPY)	**15%** (-3% vPY)

Singapore Combined Validation Study
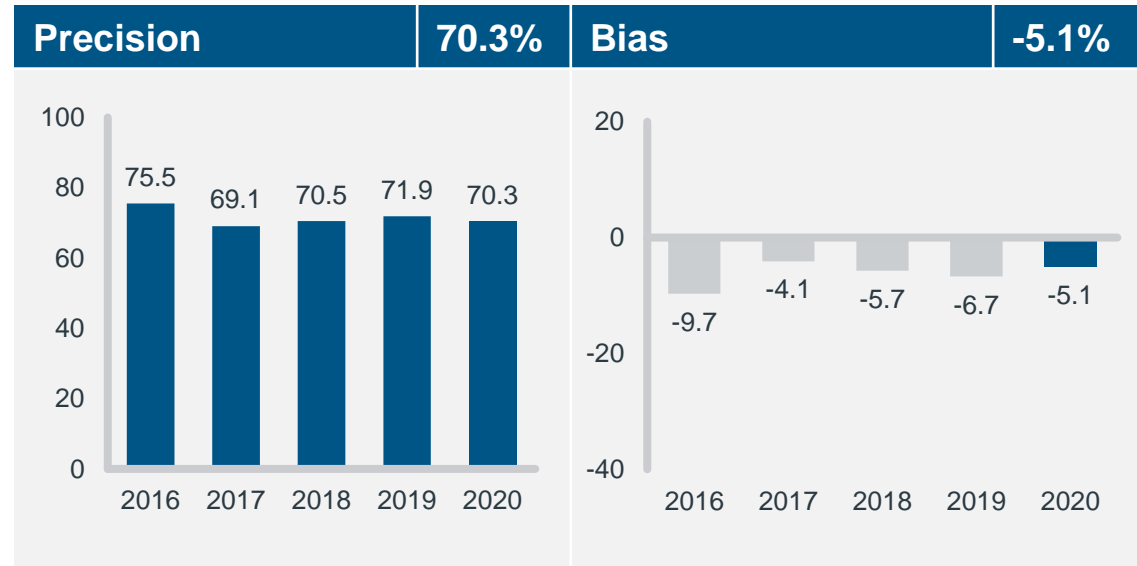
2020 Validation Study

Validation Results

Precision	70.3%	Bias	-5.1%

Precision (bar chart):
- 2016: 75.5
- 2017: 69.1
- 2018: 70.5
- 2019: 71.9
- 2020: 70.3

Bias (bar chart):
- 2016: -9.7
- 2017: -4.1
- 2018: -5.7
- 2019: -6.7
- 2020: -5.1

Outcomes

- Overall precision index declined by 1.6 percentage points in 2020
- Overall underestimation improved by 1.6 percentage points in 2020
- Continue to secure additional direct data and continue to strengthen panel

Distribution Channels Validated

Manufacturers / Agents / Distributors

Retail — Others 13%, Pharmacies 19%
Hospital — Dispensing Doctors 26%, Private & Restructured Hospitals 37%, Polyclinics & Dialysis Center 5%

Singapore Combined: Pharmacies, Dispensing Doctors, Private & Restructured Hospitals
Singapore Gov. Hos.: Polyclinics & Dialysis Center

Patients — 13%, 19%, 26%, 37%, 5%

Participation

# Participating Companies	# Forms Validated	% Market Validated
73 *(-2 vPY)*	**1,058** *(-58 vPY)*	**35%** *(no change vPY)*

Thailand Retail Validation Study

2020 Validation Study

Validation Results

Precision	79.4%	Bias	-1.7%

Precision chart:
- 2016: (no value)
- 2017: (no value)
- 2018: 83.9
- 2019: 84.5
- 2020: 79.4

Bias chart:
- 2016: (no value)
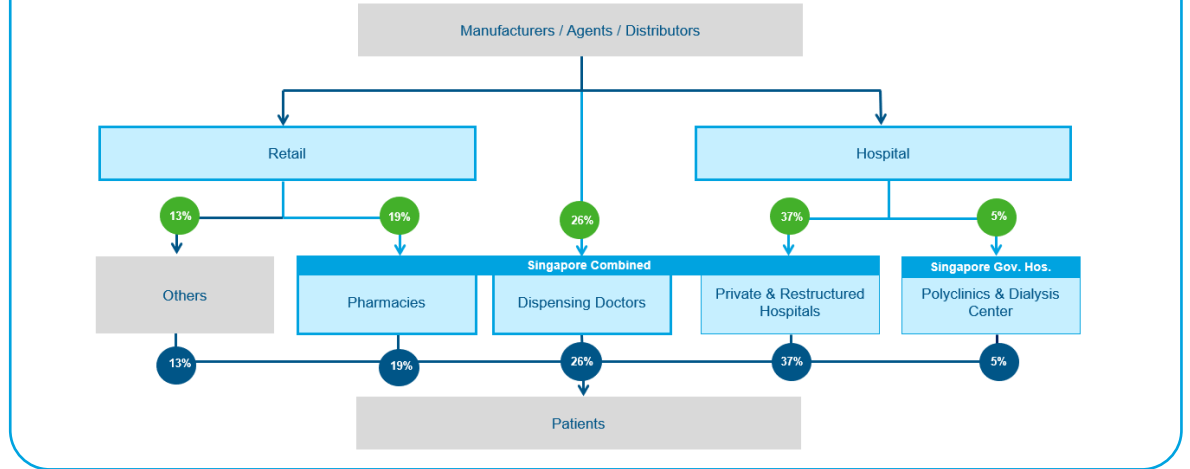- 2017: (no value)
- 2018: -0.9
- 2019: -1.3
- 2020: -1.7
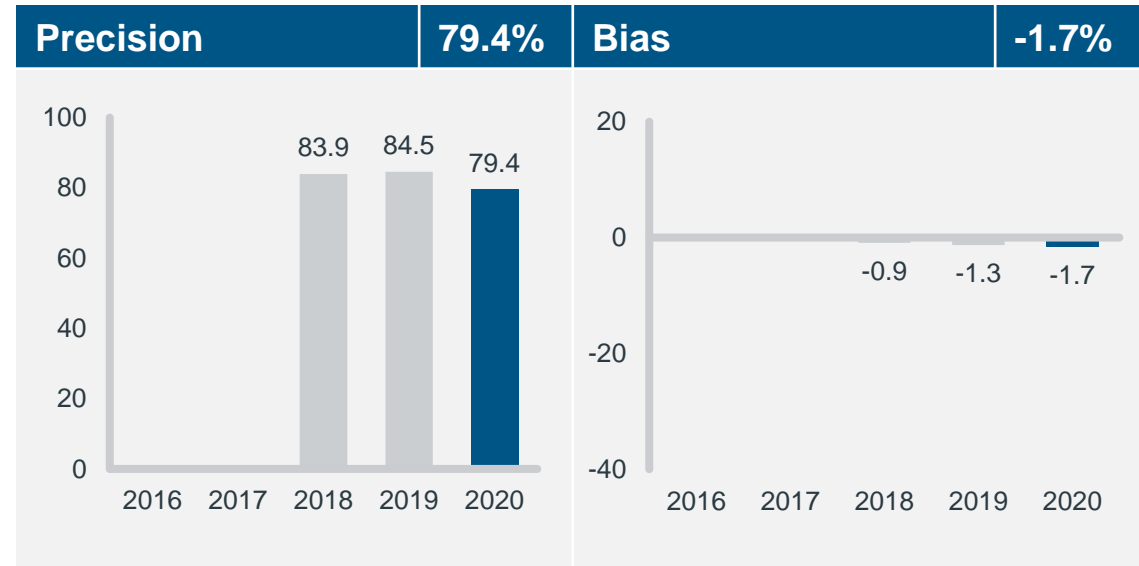
Outcomes

- Overall precision index declined by 5.1 percentage points in 2020
- Overall underestimation increased by 0.4 percentage points in 2020
- Continue to maintain data consistency in long term

Distribution Channels Validated

- Manufacturers
- Agents / Distributors / Own Distributors
- Wholesalers 6%
- 5%
- 1%
- 18%
- 5%
- 1%
- 70%
- Health Centers and Private Clinics
- Thailand Retail — Retail Drugstores Type A and B
- Non-Drugstore Outlets
- General and Special Hospitals
- Patients
- 6%
- 22%
- 1%
- 71%

Participation

# Participating Companies	# Forms Validated	% Market Validated
86 (+6 vPY)	1,151 (+49 vPY)	37% (-3% vPY)

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Vietnam Total Market Validation Study

2020 Validation Study

Validation Results

Precision	79.5%	Bias	-2.9%

Precision chart: 2016, 2017 (79.7), 2018 (81.5), 2019 (81.5), 2020 (79.5)

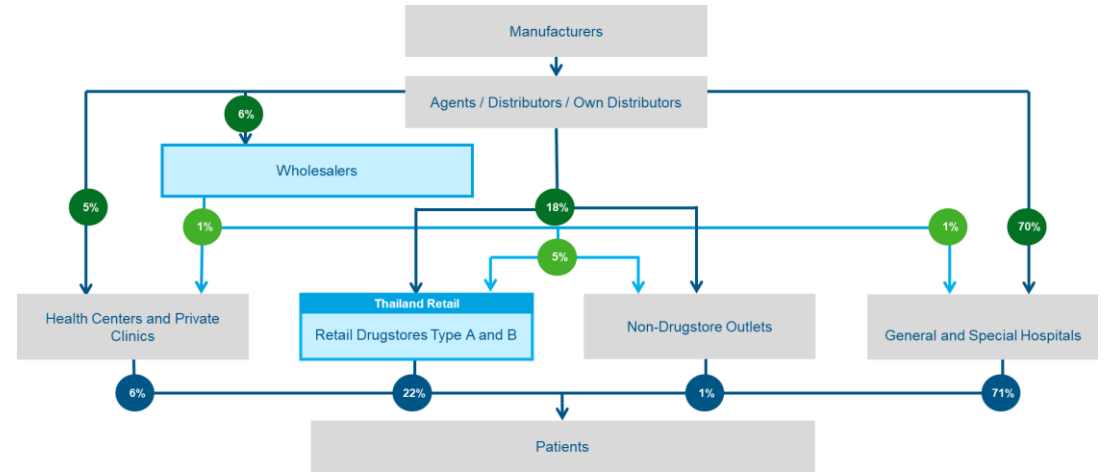Bias chart: 2016, 2017 (-3.7), 2018 (-1.7), 2019 (-1.5), 2020 (-2.9)
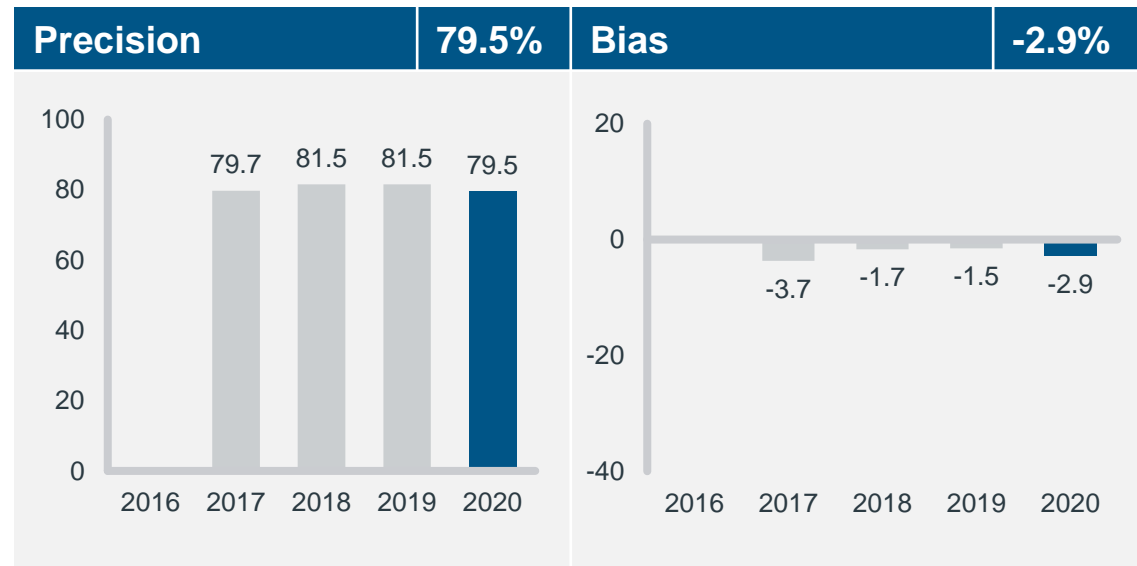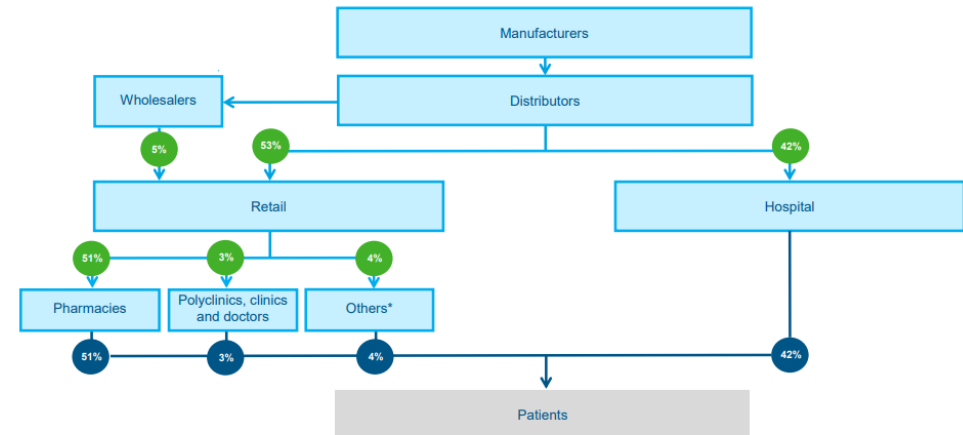
Outcomes

- Overall precision index declined by 2.0 percentage points in 2020
- Overall underestimation increased by 1.4 percentage points in 2020
- Channel level VTMA has been launched in 2021 successfully, will review region level granularity and further expand coverage of benchmark

Distribution Channels Validated

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

Others: Institutes & Vaccination Centers and any other existing channel that is not defined as an out-patient or in-patient hospital.

Participation

# Participating Companies	# Forms Validated	% Market Validated
91 (+3 vPY)	**1,450** (-15 vPY)	**23%** (-2% vPY)

Methodology

Content covered in this section

Validation Studies ① 1

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

Accuracy ② 2

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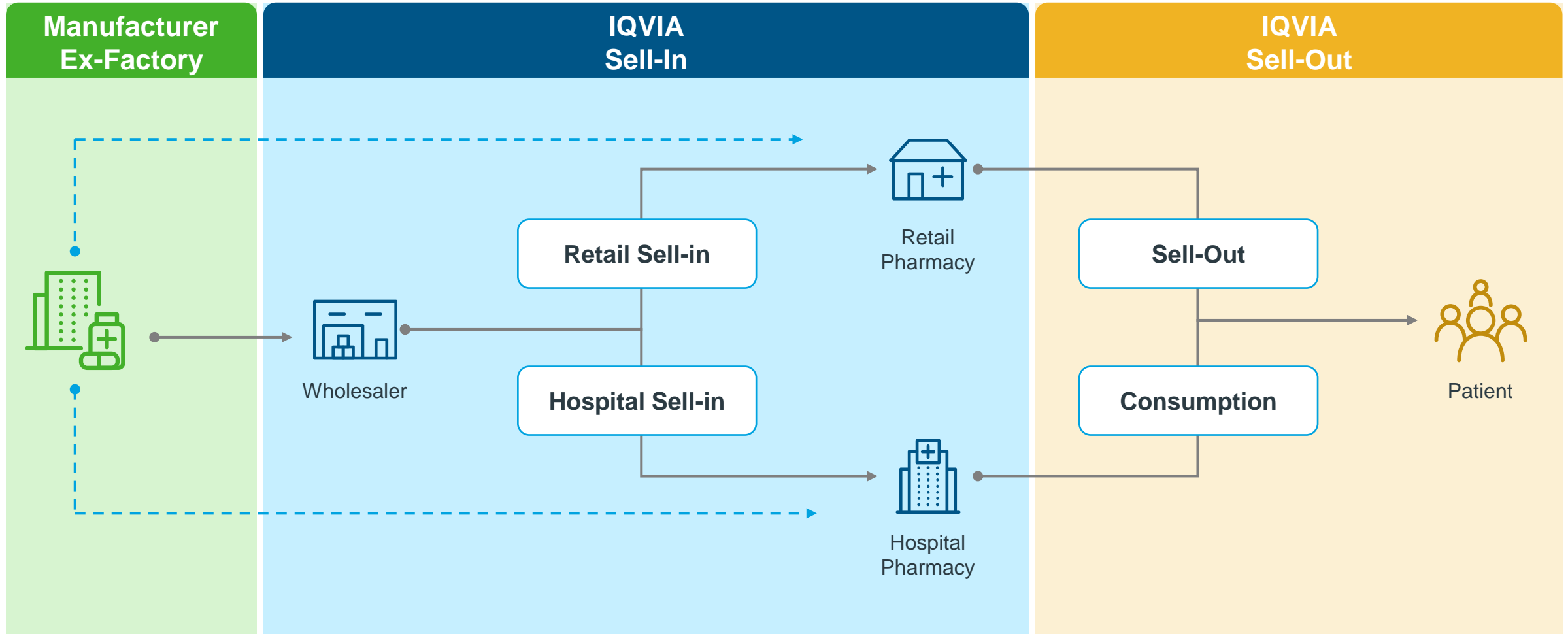- Precision (interpretation – calculus – illustration)

Timeliness ③ 3

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

Distribution Channels validated

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

Manufacturer Ex-Factory	IQVIA Sell-In	IQVIA Sell-Out

Wholesaler

Retail Sell-in

Hospital Sell-in

Retail Pharmacy

Hospital Pharmacy

Sell-Out

Consumption

Patient

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	#Forms	Upper Limit (FY Units)	Total (FY Units)	Segment
1	16,746	288,316	421,249,733	Small 10%
2	874	795,338	421,315,079	Next 10% included
3	385	1,541,503	421,089,812	Medium 30% Included
4	206	2,782,743	421,471,438	
5	118	4,572,060	421,329,006	
6	66	9,143,464	427,161,847	Large 50% included
7	36	15,617,602	424,827,107	
8	20	34,458,310	444,648,076	
9	8	89,798,547	507,434,006	
10	2	206,855,970	299,757,682	
Total	**18,461**		**4,210,283,786**	
ACTS	**1,715**		**3,789,034,053**	

Decile 1 breakdown

Decile	#Forms	Upper Limit (FY Units)	Total (FY Units)	Segment
1.01	12,546	20,349	42,128,674	
1.02	1,386	44,263	42,143,302	
1.03	771	67,192	42,167,630	Low 5% excluded
1.04	530	93,364	42,200,606	
1.05	390	122,163	42,163,778	
1.06	313	148,246	42,209,105	
1.07	258	181,048	42,244,392	
1.08	215	214,823	42,284,130	Next 5% included
1.09	183	248,645	42,301,336	
1.10	154	288,316	41,406,780	
	16,746		**421,249,733**	
	1,123		**210,445,743**	

ACTS breakdown

Decile	#Forms	Upper Limit (FY Units)	Total (FY Units)	Segment
1.01-1.05	15,623	210,803,990	210,803,990	Small 5% excluded
1.06-2	1,997	631,760,822	631,760,822	Small 15% included
3-5	709	1,263,890,256	1,263,890,256	Medium 30% included
6-10	132	2,103,828,718	2,103,828,718	Large 50% included
	18,461	**4,210,283,786**	**4,210,283,786**	
	2,838	**3,999,479,796**	**3,999,479,796**	

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

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

IQVIA

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 %

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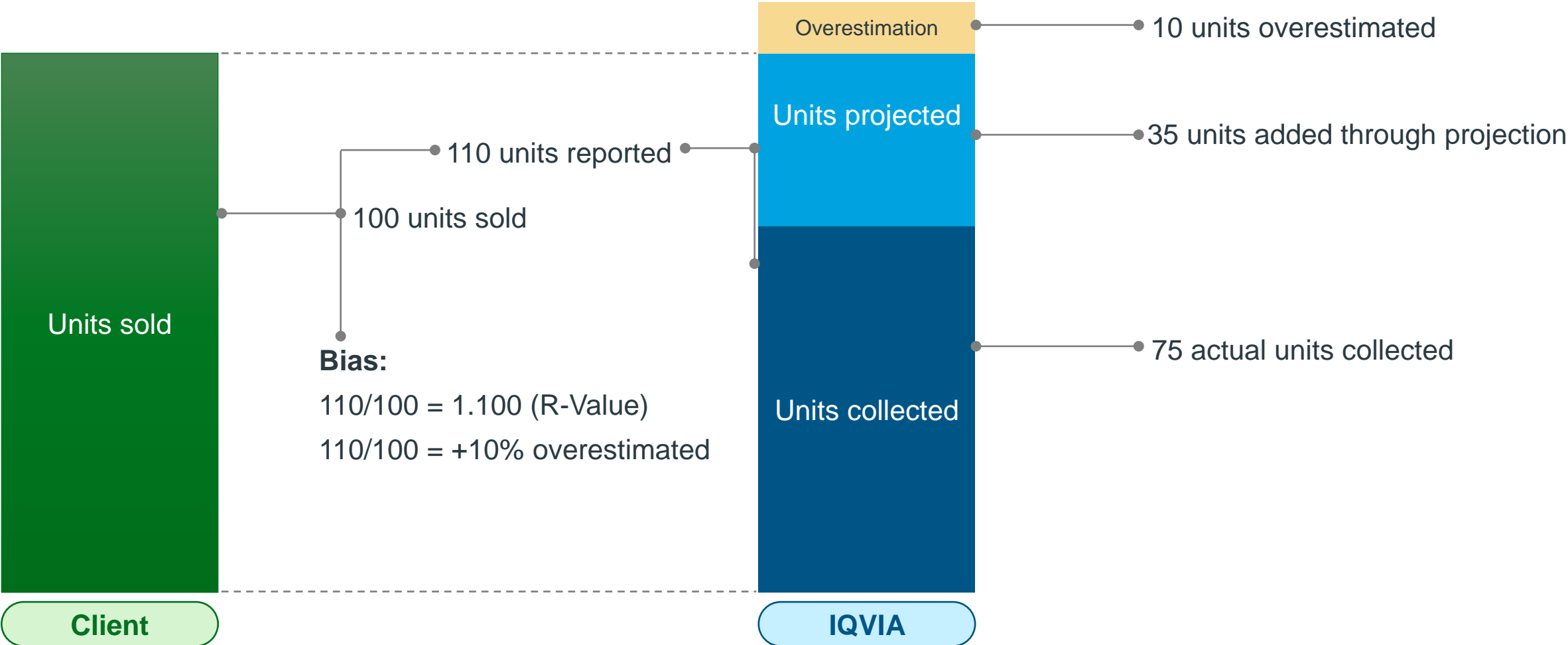
Limitations

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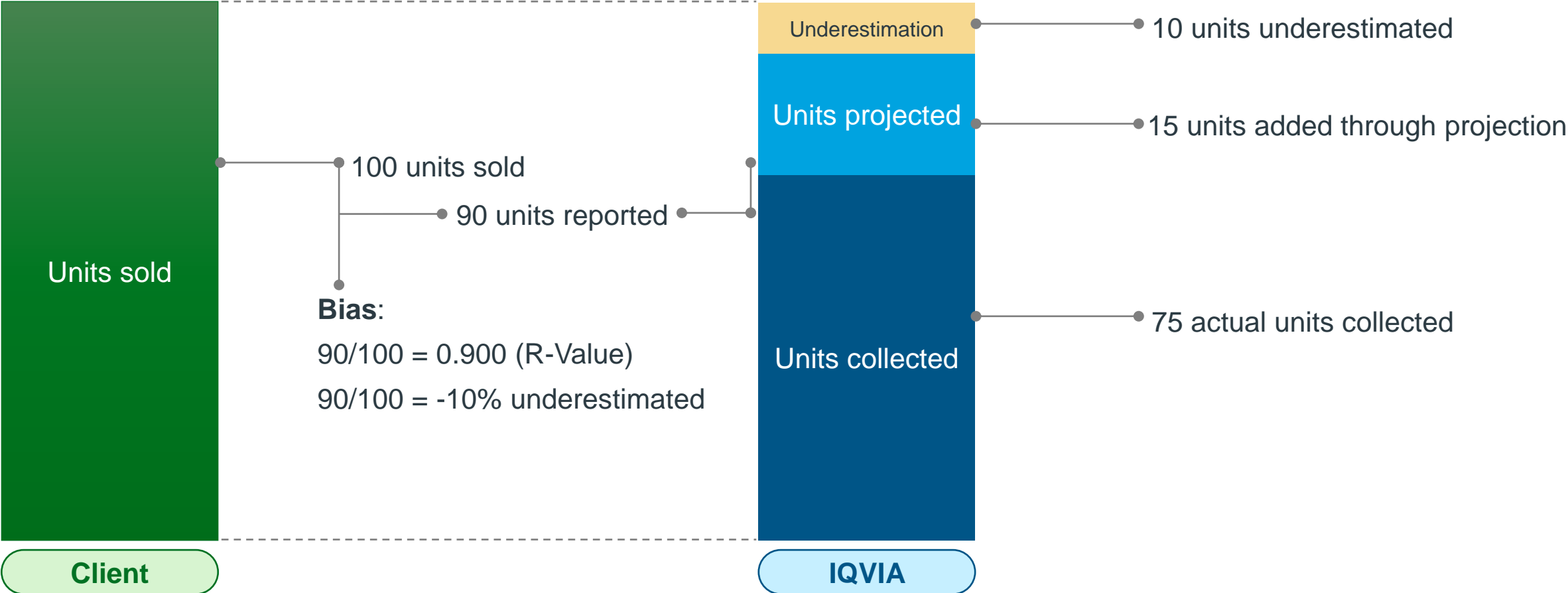
Clients Ex-Factory data vs. IQVIA's audited channel data

Example 1: Overestimation

Overestimation — 10 units overestimated

Units projected — 35 units added through projection

110 units reported

100 units sold

Bias:

110/100 = 1.100 (R-Value)

110/100 = +10% overestimated

Units sold

Units collected — 75 actual units collected

Client

IQVIA

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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

75 actual units collected

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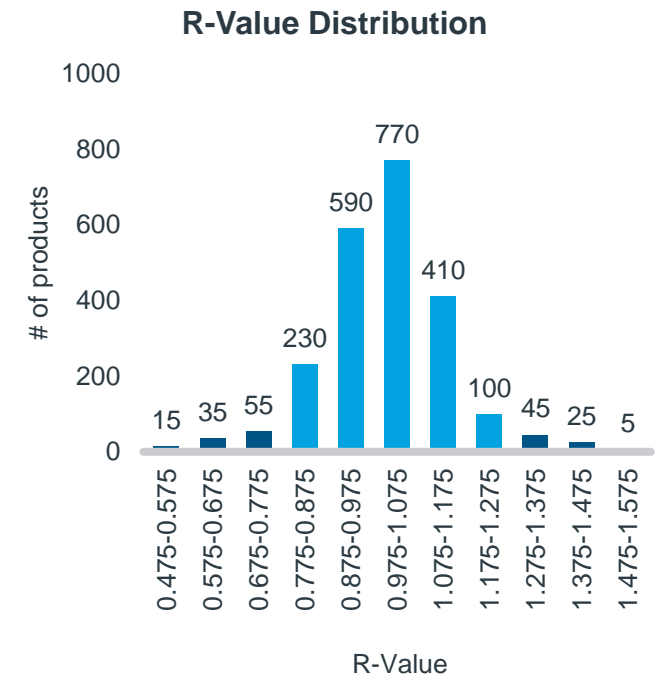
$$Precision = \frac{2,100}{2,280} \times 100 = 92.1\%$$

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

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IQVIA MIDAS

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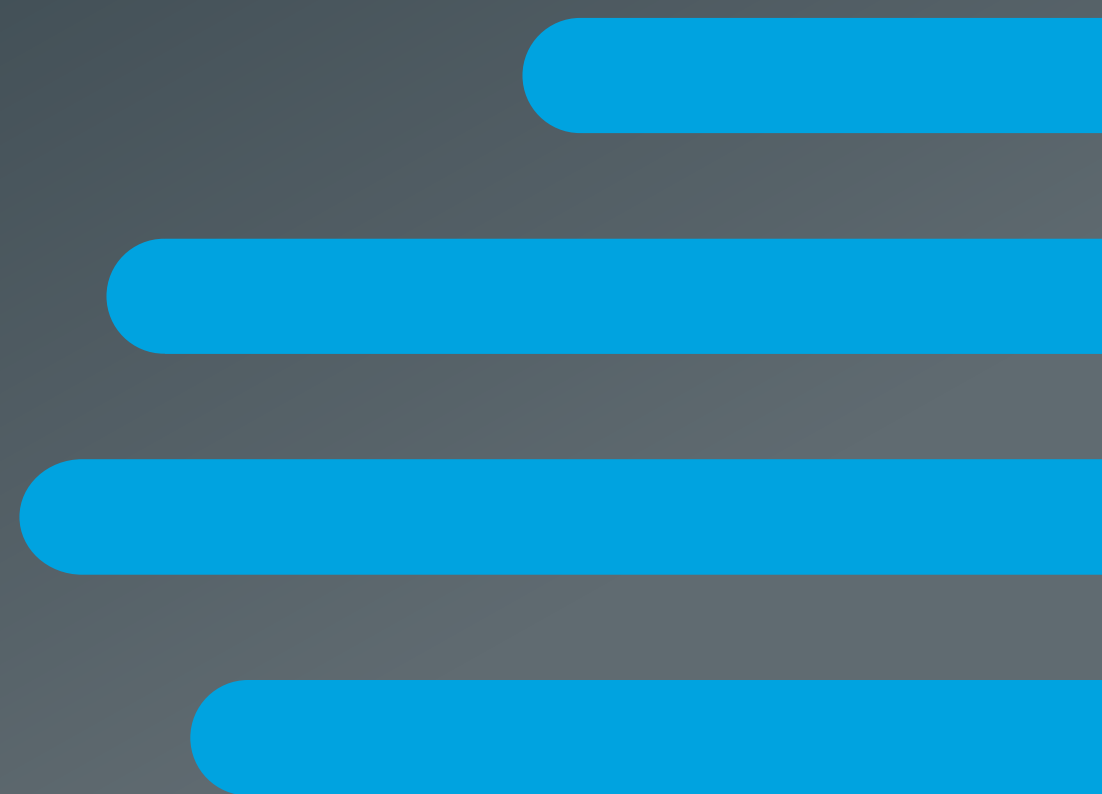
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2021 ACTS Annual Report

Presented to you by IQVIA's Global Data Science and Advanced Analytics Team with offices in Plymouth Meeting (United States), Frankfurt (Germany) and Beijing (China)

Thank You