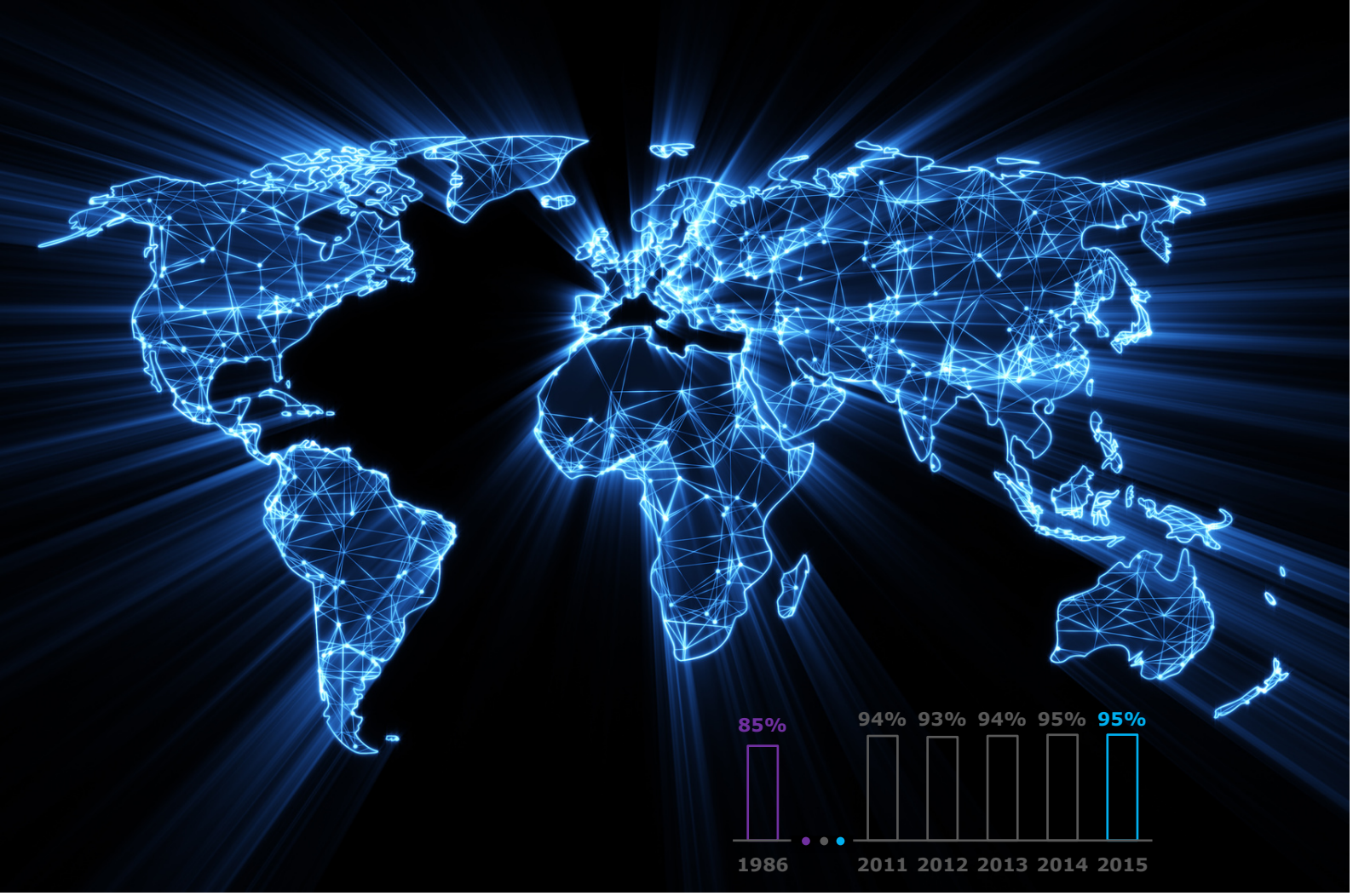


acts 2016

30th Edition

QuintilesIMS Quality Assurance

Statistical Services

http://imshealth.com/en/acts

QuintilesIMS™

Contents

Abstract

Dear Client:

We're proud to be publishing the 30th edition of the ACTS report, The QuintilesIMS Annual Report on Quality Assessment. This sustained effort demonstrates our strong commitment to meeting your information needs. As our valued customer, you depend upon having the right information at the right time in order to make effective decisions and react appropriately to rapidly changing markets. It is with this fundamental concept in mind that each year we evaluate our success in meeting your dual needs for *Accuracy* and *Timeliness* in our deliveries as an evaluation of our performance.

We also take particular pride in reporting that our efforts to improve data quality have resulted in a very high precision score, reaching an index of 94.6% in 2015. This index is an aggregate of the precision in our retail, hospital, and pharmacy-based services. The high degree of accuracy is visible in all underlying offering types: retail reached an index of 95%, hospital offerings came in at 93% (their best score in a five-year span), and PharmaTrend offerings at 95%. Please view the detailed results by region and country in the respective sections of this publication.

On the delivery side, we have achieved a slight improvement of 0.6 days, with an overall average delivery time of 21.2 days. We were able to achieve this improvement in overall delivery speed by implementing *ChannelDynamics* which allows us to shorten delivery times for *Promotion* services by more than two weeks on average. At the same time, the average on-target performance reached a sound result of 86%.

ACTS is a quality monitoring system that is both unique in our industry and possible only with your collaboration. We wish to express our deepest gratitude to more than 3,300 clients in headquarter facilities and local affiliates for devoting the time and effort to contribute their information. Your participation in the process is invaluable to QuintilesIMS and serves our entire clientele by supporting an objective assessment of data and service quality.

We are confident that this year's report will once again give you valuable insight into QuintilesIMS' quality commitment. Your comments and questions are very welcome; we invite you to keep the discussion alive and help us make ACTS a superior and relevant reference.

Yours sincerely,

Yilian Yuan, Ph.D. MBA

Vice President

QuintilesIMS Statistical Services
& Advanced Analytics

Accuracy

The QuintilesIMS validation studies, with their global reach and standardized measures, provide pharmaceutical companies with an impartial and forthright reference with which to judge the quality of QuintilesIMS data. By thus reporting on the precision of QuintilesIMS' decision-support tools, validation studies facilitate pharmaceutical companies' international decision making.

The Validation Process

QuintilesIMS conducts its validation studies in close co-operation with our service subscribers. Once we complete our year-end pharmacy audit, we supply our subscribers with software that presents our estimated yearly sales volume for each product pack. Subscribers then enter their *actual* sales volume based on what they supplied to retail pharmacies.

We then calculate an "R-Value" representing the ratio of *estimated* sales as projected by QuintilesIMS to *actual* sales as reported by our industry partners. For each product examined, we calculate an individual R-Value. We also calculate an average R-Value across all validated product forms.

R-Values indicate the scale of overestimation or underestimation in QuintilesIMS results. An R-Value of 1.0 is the ideal and would mean that our projection matched reality exactly. Due to the nature of statistical sampling, R-Values typically deviate from 1.0, and it is only practical to strive for individual R-Values that are clustered tightly around this theoretical ideal.

We express audit precision as the percentage of all *individual* R-Values that fall within a predefined range of deviation around the *average* R-Value. The standard precision range is ±22.5 percentage points around the average over/underestimation. The greater the data precision, the more tightly R-Values will be located in the centre of this range.

A precision value of 90 percent, paired with a zero percent bias, can be interpreted as follows: On average, QuintilesIMS audit data reflect a high degree of homogeneity since 90 percent of the validated product forms lie between –22.5 percent and +22.5 percent of the reported industry numbers.

Conceptually, comparing QuintilesIMS audit estimates with manufacturer sales data requires that the numbers be fully compatible. This compatibility hinges on the ability of companies participating in the validation study to segregate their internal sales data, isolating those sales channeled to the pharmacy retailing sector. The degree to which they can do this correlates closely with the technical infrastructure of the country and the complexity of the distribution system. When sales to other market sectors (e.g., tenders, exports) are not segregated and instead are included in a company's sales, the assumption is that QuintilesIMS data have underestimated reality, and consequently they are viewed as incorrect.

Parallel trade practices add another element of incompatibility to the data. Typically, manufacturers are unaware of the sales volume that sub-distributors and pharmacies *export to* other countries (parallel exports) or *import* from other countries (parallel imports). In parallel

export situations, the *industry* numbers are usually inflated by sales that never entered the domestic pharmacy market. Conversely, in parallel *import* situations in which the imported items are not isolated, for example through official parallel traders, *QuintilesIMS* numbers are usually inflated. QuintilesIMS excludes products that are typically traded to secure the relevance of the validation results.

Validation study results are considered to be representative of the survey universe if more than 20 percent of the market is reflected in what our data partners send us. If the total market coverage reported by our data partners falls between 10 and 20 percent, validation results may still give a good indication of change from one year to the next, but otherwise must be used with care. Studies with participation rates less than 10 percent are included in the ACTS report but marked as *not representative* by means of an uncolored bar.

The 2015 Validation Results

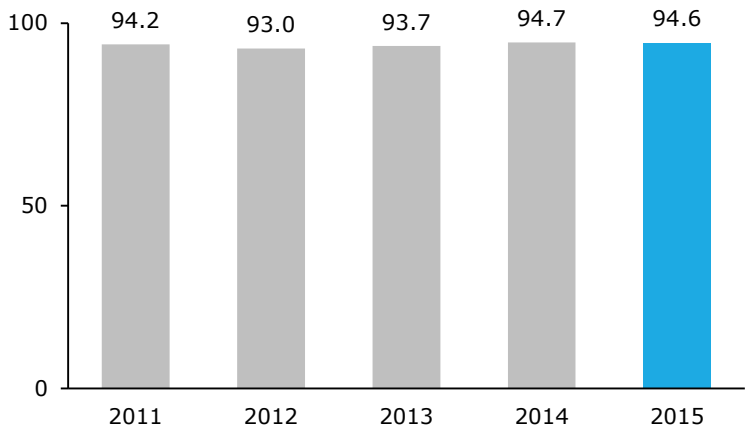
The validation process usually starts 2-3 months after the close of the year being validated. Typically, it can take up to ten months after we receive final feedback and can complete the analysis of any given country. This year, the last completed materials for 2015 were returned to us in January 2017. For the 2015 validation studies, we analyzed a total of 91,775 product forms from 3,370 company affiliates in 81 retail, hospital and PharmaTrend reports. OTC analyses were not counted as these are subsets of the corresponding retail or PharmaTrend reports. In 2015, 42 company affiliates world-wide participated in a validation study on average, up from 40 companies in 2014.

Global Validation Results

Until a couple of years ago, we only validated QuintilesIMS retail audits while hospital, OTC and PharmaTrend offerings were quality-assessed more on a sporadic basis. Along with an upgrading of the ACTS validation process, we also incorporated these other standard deliverables in ACTS and have provided you lately with individual validation results. One request from our readers' community was to summarize all individual validation results to one single metric – the *Global Precision Index*. This is an aggregate of all validations performed with uninterrupted 5-years data and serves as a high level indicator on QuintilesIMS data accuracy.

For 2015, this global index utilized the outcome from 94 validation studies and demonstrated a high degree of stability across the 5-year time period. Lately, a marginal overall decline of 0.1 percentage points was stated, from 94.7% in 2014 to 94.6% in 2015.

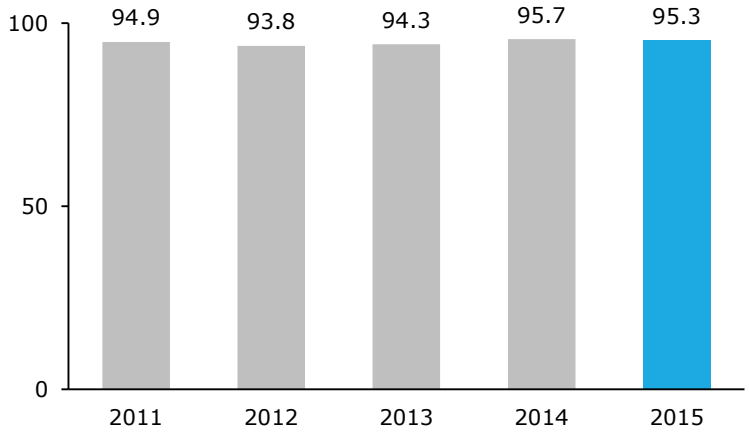
Global Precision Index (%)



Retail Validation Results

For the 2015 validation studies, 61 countries provided analyzable results. No validation study was necessary in Denmark, Finland, Norway and Sweden because we collect full census data in these countries. There, precision results are assumed to be 100 percent. This makes a total of 65 sets of validation results, of which 59 have uninterrupted five-year results. The overall degree of precision in QuintilesIMS retail pharmaceutical reports is best described by an aggregated precision index for these 59 countries:

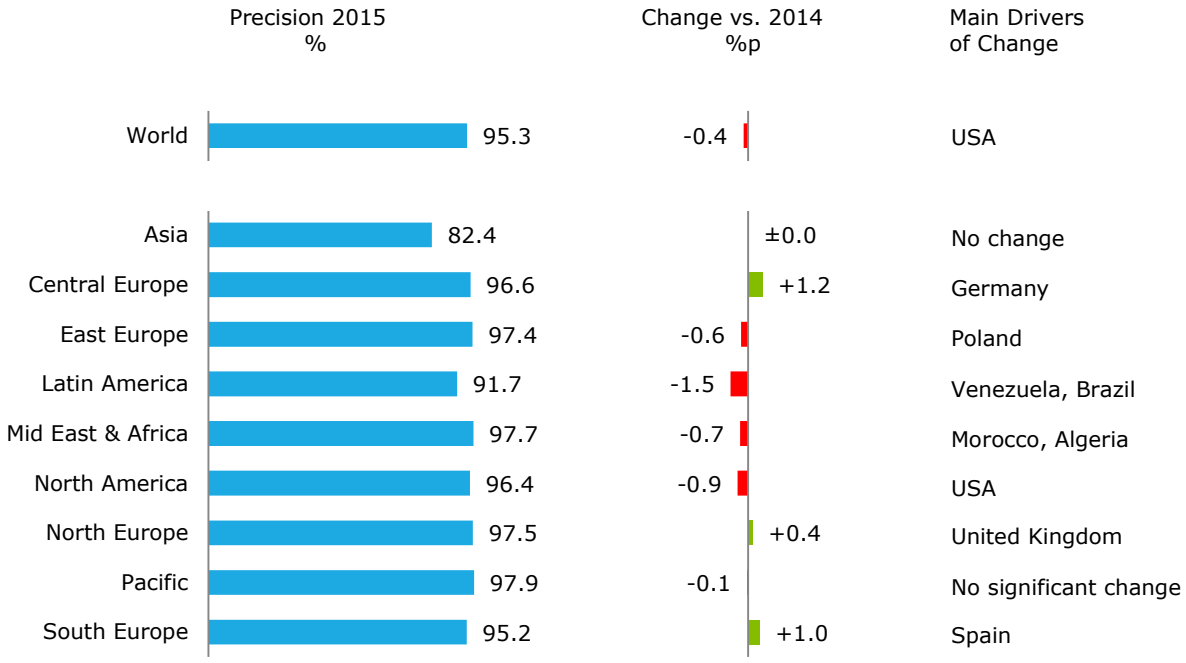
Retail Precision Index (%)



Overall, the retail precision index over the 5-year period documents solid outcome in maintaining existing levels of data quality well above 93%. In 2015, the index declined slightly by 0.4 percentage points over 2014 to 95.3% on average.

Regional Retail Validation Results

Four of the nine regions managed to improve or maintain their 2014 result also in 2015. *Pacific* achieved the highest precision score with 97.9%, closely followed by *Mid East & Africa* at 97.7%, *North Europe* at 97.5% and *East Europe* at 97.4%. The highest precision gain of 1.2 percentage points was reported for *Central Europe*. Five regions declined over 2014, most significantly *Latin America* by 1.5 percentage points to 91.7%. All regions in detail and their main contributors to changes are listed below:



Improvement & Deterioration by Country

More details on the markets with an improved or declined precision value are given in the table on the subsequent page.

Country	Improvement	
	Precision 2015 %	Change vs. 2014 %p
Bolivia	48.8	+7.2
Estonia	88.3	+3.8
Paraguay	36.1	+8.5
Peru	92.8	+4.6
Philippines	100.0	+2.5
Russia	88.7	+2.4
Serbia	99.6	+2.6
Spain	95.6	+3.7
Uruguay	76.3	+3.5
Vietnam	65.6	+6.7

Country	Deterioration	
	Precision 2015 %	Change vs. 2014 %p
Algeria	88.2	-2.3
Austria	96.1	-3.2
Central America	80.8	-4.3
Dominican Rep.	62.2	-11.3
Indonesia	63.7	-3.5
Ireland	92.8	-6.4
Morocco	93.2	-6.2
Pakistan	95.4	-3.1
Singapore	76.3	-2.3
Tunisia	97.3	-2.3
Venezuela	87.2	-2.4

Ten countries turned out with significant improvement of more than two percentage points over 2014. Remarkable precision gain of 8.5 percentage points was noted for *Paraguay*, followed by *Bolivia* (7.2), *Vietnam* (6.7) and *Peru* with a 4.6 percentage point improvement. Opposed to this pleasant achievement, eleven countries showed accentuated decline of more than two percentage points over 2014, with the *Dominican Republic* facing the biggest precision loss of more than eleven percentage points, followed by *Ireland* and *Morocco*. All these countries are in the focus of our quality-improving initiatives in 2017.

Country-specific Results

The validation studies mentioned on the subsequent country pages refer to the QuintilesIMS retail reports, with the following exceptions:

Country	Market covered
Australia, Croatia, Czech Republic, Hungary, India, Japan, Kazakhstan, Poland, Russia, Serbia, Slovak Republic, Slovenia, Switzerland, USA	Retail+hospital market
Hong Kong, Indonesia, Vietnam	Total market
Malaysia, Singapore	Total private market

Further parts of this accuracy section, which follow the retail validation pages, highlight other validation initiatives of high interest to our data subscribers:

- OTC validation studies
- PharmaTrend validation studies
- Hospital validation studies
- Specialty markets validation results
- Validating our forecasting services

In addition, we are providing updates on the latest measures we've taken to sustain today's quality levels:

- Universe updates
- Data capture

Algeria

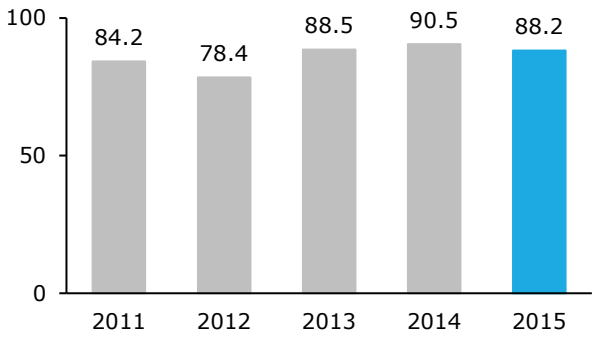
Retail Validation Study

Precision (%)

Overall precision index declined by 2.3 percentage points in 2015

Large product forms reached 97.0%, medium 84.8% and small 65.5%

Forms validated in both years, 2014 and 2015, improved by 5.2 percentage points to 93.9% in 2015

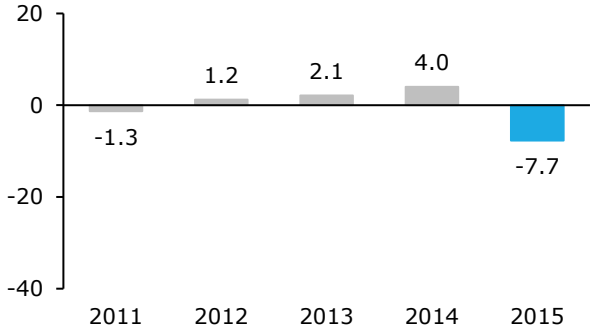


Over/Underestimation (%)

Overall bias turned to 7.7% underestimation in 2015

Large product forms were underestimated by 7.9%, medium by 6.9% and small by 8.6%

Bias of forms validated in both years, 2014 and 2015, turned from 4.8% overestimation in 2014 to 3.1% underestimation in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	11	13	12	16	**23**
Validated market share in unit terms	26%	27%	26%	28%	**33%**
Validated product forms	258	235	238	303	**367**

Actions

Evaluate panel representativeness

Argentina

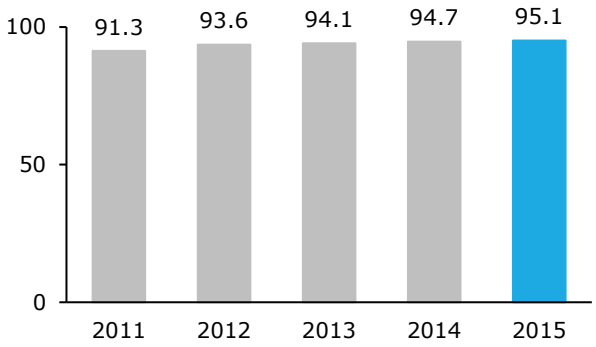
Retail Validation Study

Precision (%)

Overall precision index improved by 0.4 percentage points in 2015

Large product forms reached 95.2%, medium 95.7% and small 93.8%

Forms validated in both years, 2014 and 2015, improved by 0.7 percentage points to 96.2% in 2015

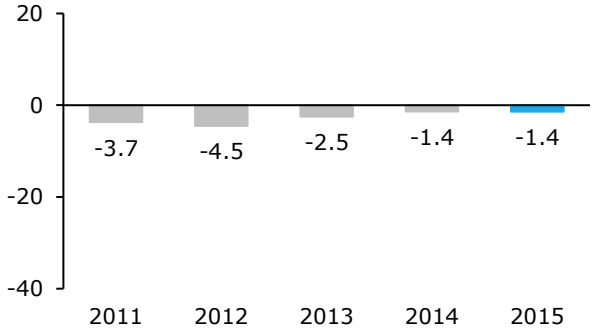


Over/Underestimation (%)

Overall underestimation remained unchanged in 2015

Large product forms were underestimated by 1.0%, medium by 1.7% and small by 2.1%

Bias of forms validated in both years, 2014 and 2015, turned from 0.3% overestimation in 2014 to 1.4% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	64	64	65	64	**35**
Validated market share in unit terms	63%	59%	57%	62%	**42%**
Validated product forms	3,074	2,929	2,836	3,140	**2,088**

Actions

No action required from the statistical point of view

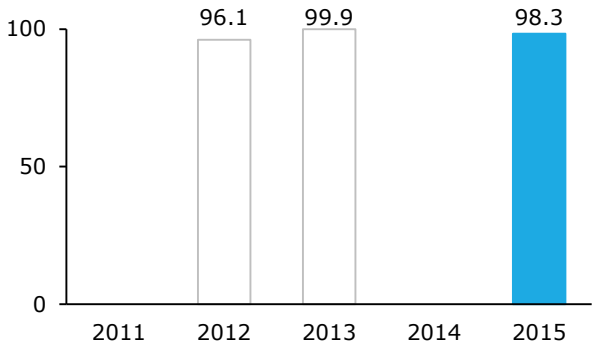
Australia

Retail+Hospital Validation Study

Precision (%)

Overall precision index declined by 1.6 percentage points in 2015

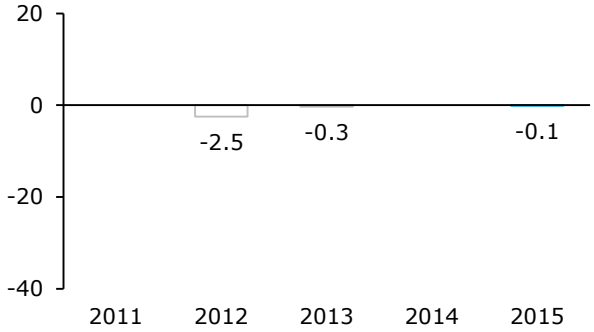
Large product forms reached 98.7%, medium 98.0% and small 97.3%



Over/Underestimation (%)

Overall underestimation improved by 0.2 percentage points in 2015

Large product forms were underestimated by 0.3%, medium forms were overestimated by 0.2% and small forms were underestimated by 0.5%



Participation	2011	2012	2013	2014	2015
Participating companies		18	16		**59**
Validated market share in unit terms		6%	2%		**15%**
Validated product forms		779	419		**2,546**

Actions

No action required from the statistical point of view

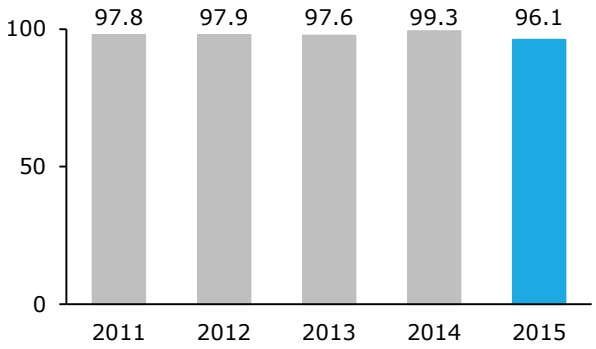
Austria

Precision (%)

Overall precision index declined by 3.2 percentage points in 2015

Large product forms reached 98.0%, medium 94.7% and small 92.6%

Forms validated in both years, 2014 and 2015, declined slightly by 0.5 percentage points to 98.6% in 2015

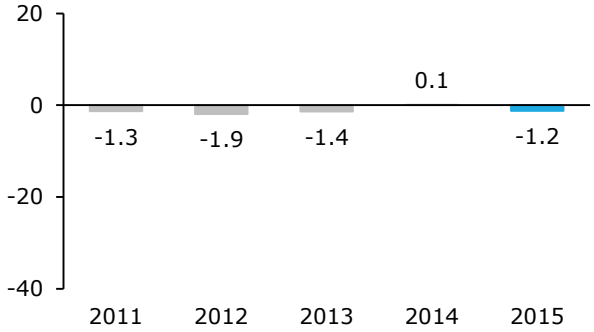


Over/Underestimation (%)

Overall bias turned from 0.1% overestimation in 2014 to 1.2% underestimation in 2015

Large product forms were underestimated by 1.1%, medium by 0.7% and small by 2.9%

Bias of forms validated in both years, 2014 and 2015, turned from 0.6% overestimation in 2014 to 1.4% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	16	16	14	13	**18**
Validated market share in unit terms	30%	25%	30%	23%	**33%**
Validated product forms	791	654	802	670	**976**

Actions

No action required from the statistical point of view

Bangladesh

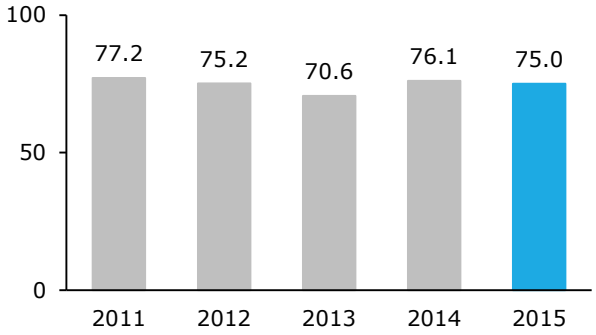
Retail Validation Study

Precision (%)

Overall precision index declined slightly by 1.1 percentage points in 2015

Large product forms reached 87.4%, medium 66.9% and small 49.8%

Forms validated in both years, 2014 and 2015, declined by 3.0 percentage points to 74.3% in 2015

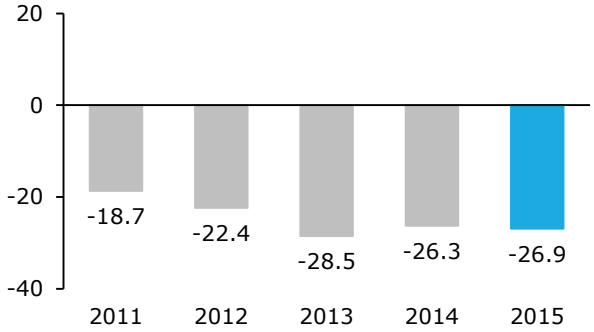


Over/Underestimation (%)

Overall underestimation increased slightly by 0.6 percentage points in 2015

Large product forms were underestimated by 26.8%, medium by 26.5% and small by 28.4%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.1 percentage points to 27.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	12	12	10	16	**14**
Validated market share in unit terms	36%	39%	40%	56%	**47%**
Validated product forms	1,306	1,617	1,599	2,147	**1,905**

Actions

Monitor projection level

Bolivia

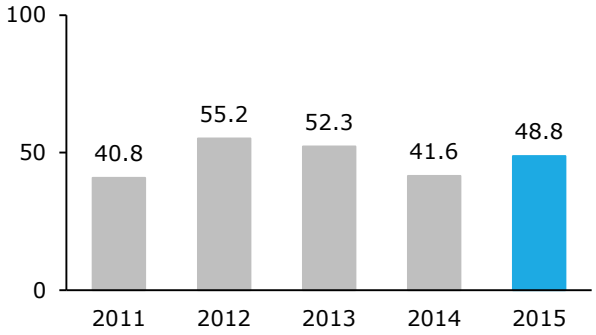
Retail Validation Study

Precision (%)

Overall precision index improved by 7.2 percentage points in 2015

Large product forms reached 56.9%, medium 42.1% and small 35.5%

Forms validated in both years, 2014 and 2015, improved by 2.8 percentage points to 52.7% in 2015

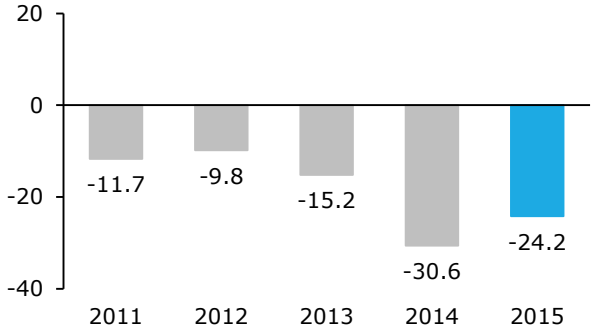


Over/Underestimation (%)

Overall underestimation improved by 6.4 percentage points in 2015

Large product forms were underestimated by 23.9%, medium by 26.2% and small by 20.7%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.3 percentage points to 20.0% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	62	45	35	58	**37**
Validated market share in unit terms	63%	55%	51%	66%	**57%**
Validated product forms	1,535	1,335	1,214	1,796	**1,714**

Actions

Complete sample design

Brazil

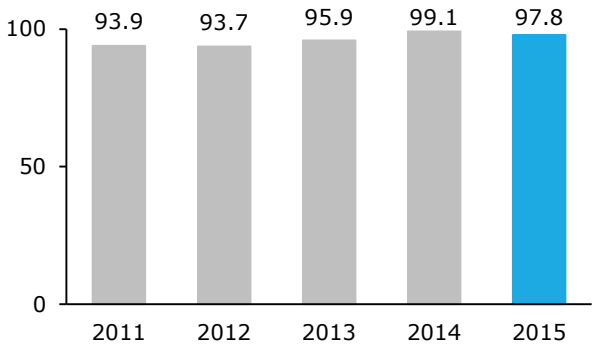
Retail Validation Study

Precision (%)

Overall precision index declined by 1.3 percentage points in 2015

Large product forms reached 99.3%, medium 96.7% and small 94.9%

Forms validated in both years, 2014 and 2015, declined marginally by 0.1 percentage points to 99.0% in 2015

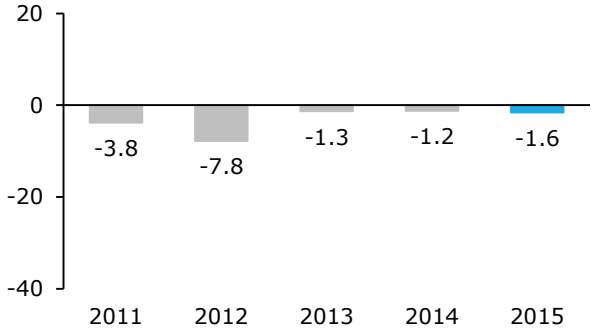


Over/Underestimation (%)

Overall underestimation increased slightly by 0.4 percentage points in 2015

Large product forms were underestimated by 1.1%, medium by 2.1% and small by 2.2%

Underestimation of forms validated in both years, 2014 and 2015, improved by 0.2 percentage points to 1.0% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	28	28	36	27	**32**
Validated market share in unit terms	16%	18%	20%	17%	**18%**
Validated product forms	997	1,250	1,353	1,052	**1,161**

Actions

No action required from the statistical point of view

Bulgaria

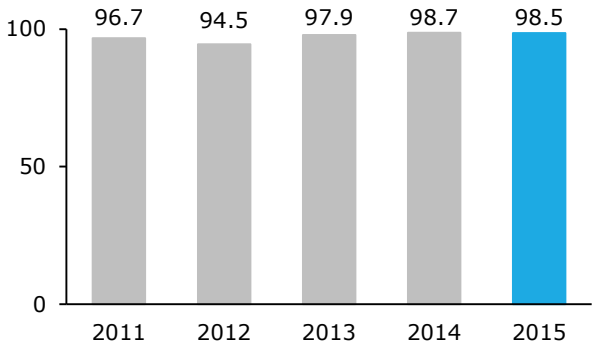
Retail Validation Study

Precision (%)

Overall precision index declined slightly by 0.2 percentage points in 2015

Large product forms reached a perfect 100%, medium forms reached 97.9% and small 94.7%

Forms validated in both years, 2014 and 2015, declined slightly by 1.4 percentage points to 98.6%



Over/Underestimation (%)

Overall overestimation improved to zero bias in 2015

Large product forms were underestimated by 0.1%, medium were overestimated by 0.4% and small forms were underestimated by 0.1%

Bias of forms validated in both years, 2014 and 2015, turned from 0.2% overestimation in 2014 to 0.3% underestimation in 2015

Participation	2011	2012	2013	2014	2015
Participating companies	49	59	58	46	**18**
Validated market share in unit terms	51%	58%	58%	52%	**21%**
Validated product forms	718	851	826	762	**246**

Actions

No action required from the statistical point of view

Canada

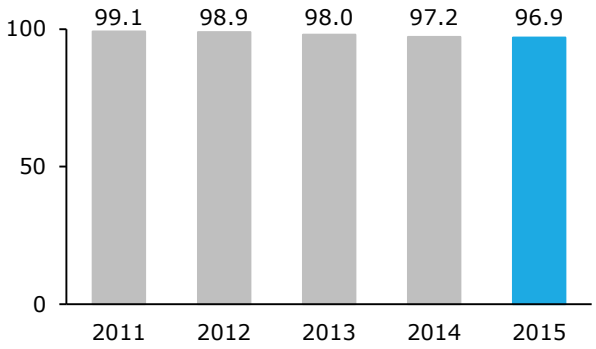
Retail Validation Study

Precision (%)

Overall precision index slightly declined by 0.3 percentage points in 2015

Large product forms reached 97.5%, medium 97.0% and small 94.9%

Forms validated in both years, 2014 and 2015, declined by 0.5 percentage points to 97.0% in 2015



Over/Underestimation (%)

Overall overestimation remained stable at 0.9% in 2015

Large product forms were overestimated by 0.7%, medium by 1.4% and small forms by 0.9%

Overestimation of forms validated in both years, 2014 and 2015, slightly improved by 0.1 percentage points to 0.9% in 2015

Participation	2011	2012	2013	2014	2015
Participating companies	87	88	94	100	**113**
Validated market share in unit terms	95%	95%	95%	95%	**95%**
Validated product forms	3,179	3,259	3,381	3,414	**3,439**

Actions

No action required from the statistical point of view

Central America

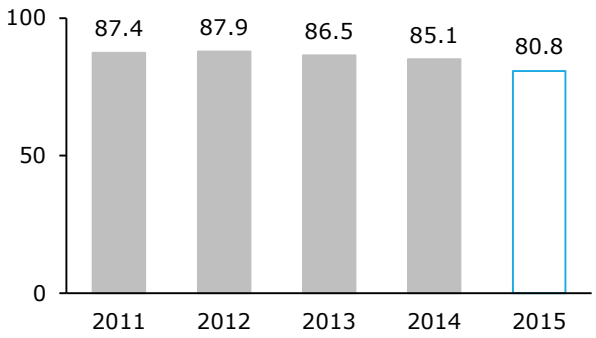
Retail Validation Study

Precision (%)

Overall precision index declined by 4.3 percentage points in 2015

Large product forms reached 79.2%, medium 87.7% and small 72.2%

Forms validated in both years, 2014 and 2015, improved by 4.2 percentage points to 81.3% in 2015

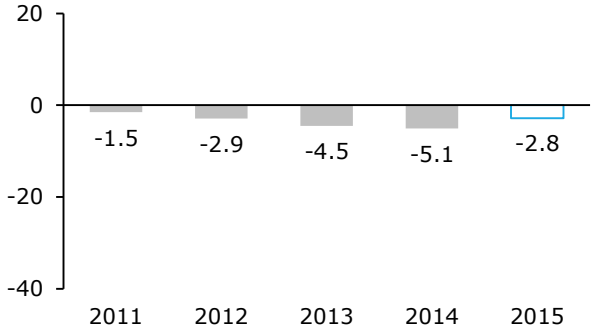


Over/Underestimation (%)

Overall underestimation improved by 2.3 percentage points in 2015

Large product forms were underestimated by 2.1%, medium by 4.5% and small forms showed no bias

Underestimation of forms validated in both years, 2014 and 2015, improved by 3.5 percentage points to 3.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	29	31	26	14	**4**
Validated market share in unit terms	30%	33%	32%	23%	**5%**
Validated product forms	1,692	1,833	1,675	1,124	**283**

Actions

Motivate more clients to participate in the validation study

Chile

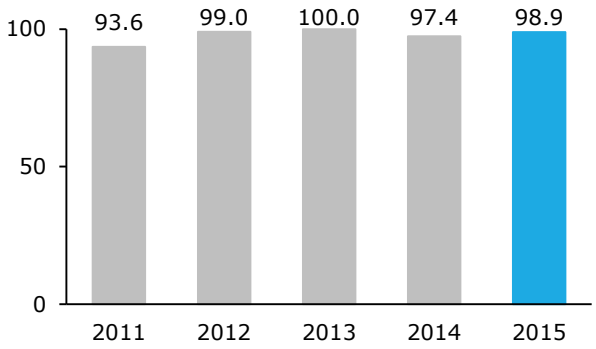
Retail Validation Study

Precision (%)

Overall precision index improved by 1.5 percentage points in 2015

Medium product forms reached 99.3% and small forms 98.2%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined by 0.7 percentage points to 98.8% in 2015

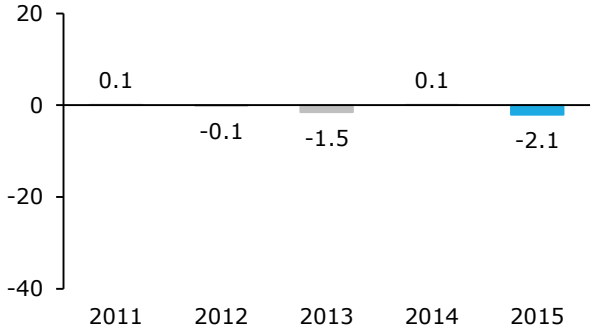


Over/Underestimation (%)

Overall bias turned from 0.1% overestimation in 2014 to 2.1% underestimation in 2015

Medium product forms were underestimated by 2.7% and small forms had no bias. A minor number of large product forms was grouped into the medium class for analysis

Underestimation of forms validated in both years, 2014 and 2015, increased marginally by 0.1 percentage points to 1.0% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	13	15	13	16	**9**
Validated market share in unit terms	14%	20%	18%	19%	**13%**
Validated product forms	669	842	709	838	**581**

Actions

No action required from the statistical point of view

Colombia

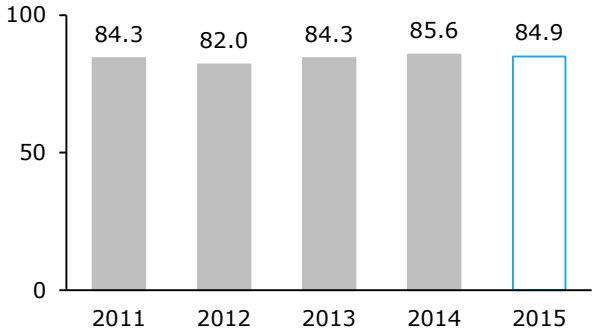
Retail Validation Study

Precision (%)

Overall precision index declined slightly by 0.7 percentage points in 2015

Medium product forms reached 89.2% and small 77.4%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined by 4.5 percentage points to 80.2% in 2015

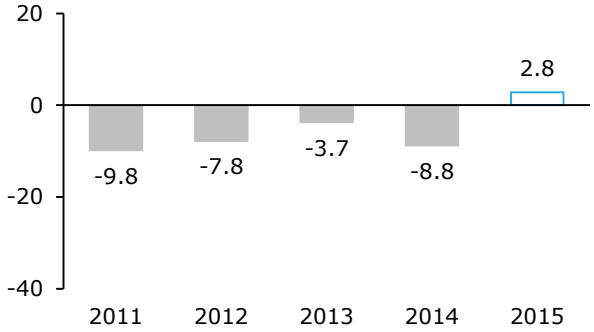


Over/Underestimation (%)

Overall bias turned from 8.8% underestimation in 2014 to 2.8% overestimation in 2015

Medium product forms were overestimated by 1.7% and small by 6.1%. A minor number of large product forms was grouped into the medium class for analysis

Overestimation of forms validated in both years, 2014 and 2015, improved by 2.8 percentage points to 4.8% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	8	18	14	11	**8**
Validated market share in unit terms	14%	23%	18%	16%	**5%**
Validated product forms	554	1,078	810	615	**371**

Actions

Motivate more companies to participate in the validation study

Croatia

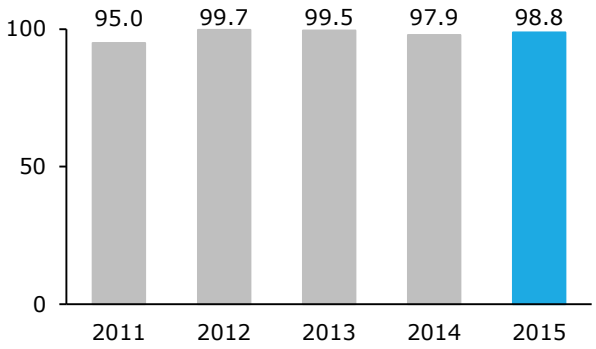
Retail+Hospital Validation Study

Precision (%)

Overall precision index improved by 0.9 percentage points in 2015

Large product forms reached a perfect 100%, medium forms reached 98.3% and small forms 96.1%

Forms validated in both years, 2014 and 2015, declined by 0.9 percentage points to 98.8% in 2015

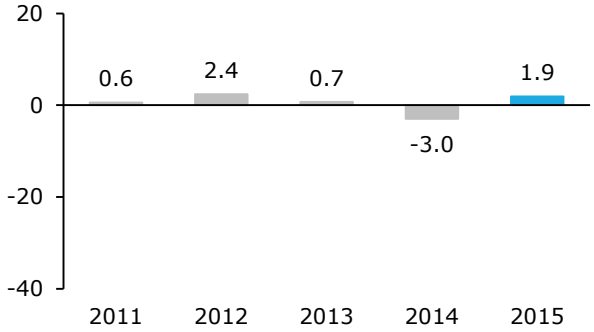


Over/Underestimation (%)

Overall bias turned from 3.0% underestimation in 2014 to 1.9% overestimation in 2015

Large product forms were overestimated by 2.0%, medium by 2.2% and small forms by 0.4%

Bias of forms validated in both years, 2014 and 2015, turned from 4.3% underestimation in 2014 to 2.5% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	8	10	11	9	**8**
Validated market share in unit terms	13%	41%	37%	49%	**24%**
Validated product forms	262	541	535	649	**350**

Actions

No action required from the statistical point of view

Czech Republic

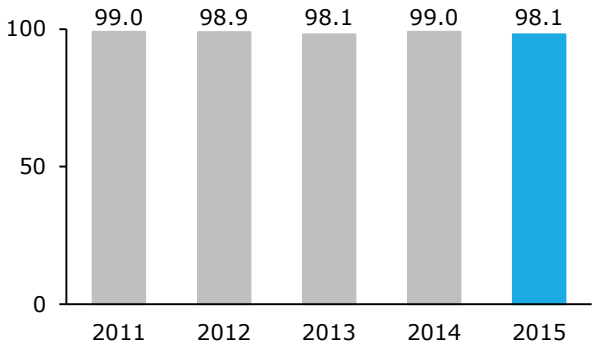
Retail+Hospital Validation Study

Precision (%)

Overall precision index slightly declined by 0.9 percentage points in 2015

Large product forms reached 98.4%, medium 98.9% and small 95.3%

Forms validated in both years, 2014 and 2015, declined by 1.3 percentage points to 98.2% in 2015

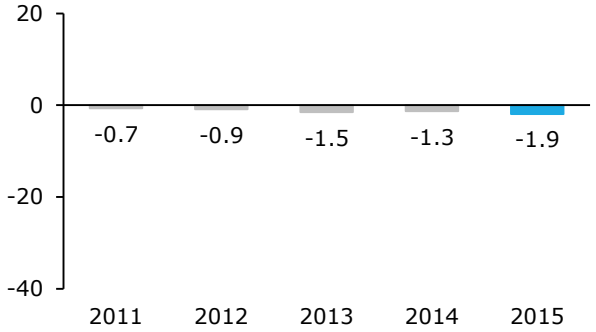


Over/Underestimation (%)

Overall underestimation slightly increased by 0.6 percentage points in 2015

Large product forms were underestimated by 1.9%, medium by 1.7% and small by 2.9%

Underestimation of forms validated in both years, 2014 and 2015, marginally increased by 0.1 percentage points to 1.5% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	25	29	22	27	**21**
Validated market share in unit terms	46%	48%	44%	43%	**40%**
Validated product forms	1,055	1,147	1,148	1,193	**982**

Actions

No action required from the statistical point of view. The slight deterioration is partly caused by comparing out-of-ordinary-cleaned QuintilesIMS data with uncleaned client data as of 2015

Dominican Republic

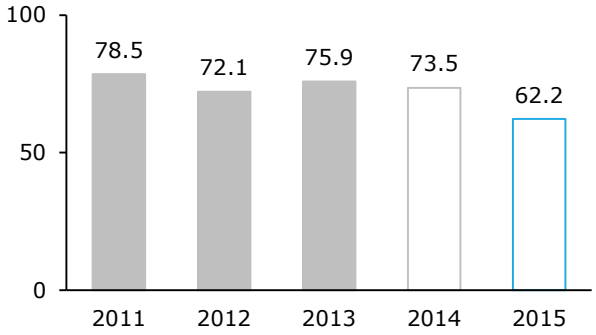
Retail Validation Study

Precision (%)

Overall precision index declined by 11.3 percentage points in 2015

Large product forms reached 58.7%, medium 68.3% and small 61.4%

Due to small availability of product forms validated in both years, 2014 and 2015, a reasonable analysis of this group was not possible

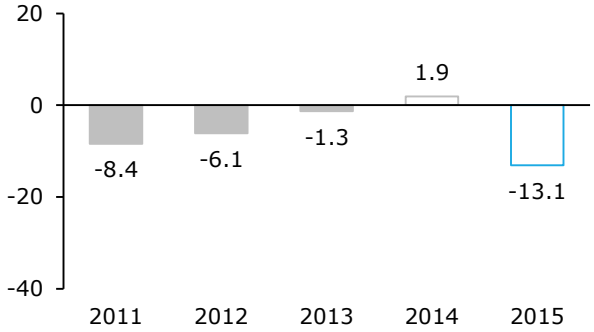


Over/Underestimation (%)

Overall bias turned from 1.9% overestimation in 2014 to 13.1% underestimation in 2015

Large product forms were underestimated by 17.4%, medium by 8.7% and small forms by 7.9%

Due to small availability of product forms validated in both years, 2014 and 2015, a reasonable analysis of this group was not possible



Participation	2011	2012	2013	2014	2015
Participating companies	31	19	22	10	**10**
Validated market share in unit terms	46%	27%	27%	9%	**6%**
Validated product forms	1,953	1,251	1,387	459	**351**

Actions

Motivate more companies to participate in the validation study. Due to low participation, the results of 2014 and 2015 are not considered representative

Ecuador

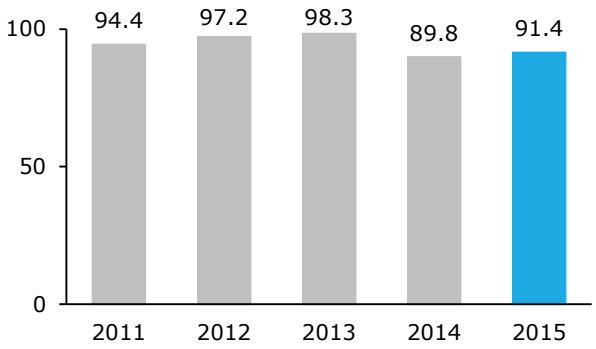
Retail Validation Study

Precision (%)

Overall precision index improved by 1.6 percentage points in 2015

Large product forms reached 91.1%, medium 92.8% and small 89.3%

Forms validated in both years, 2014 and 2015, improved by 0.9 percentage points to 91.1% in 2015

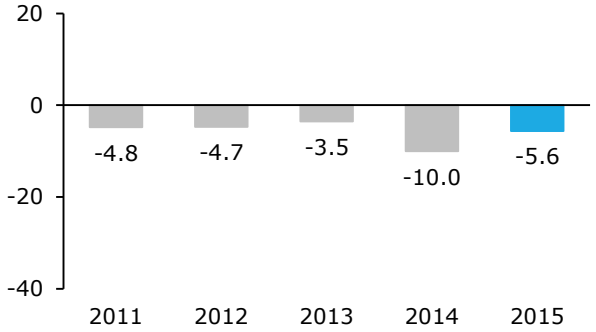


Over/Underestimation (%)

Overall underestimation improved by 4.4 percentage points in 2015

Large product forms were underestimated by 5.6%, medium by 5.8% and small forms by 4.8%

Underestimation of forms validated in both years, 2014 and 2015, improved by 3.2 percentage points to 5.4% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	88	89	80	49	**36**
Validated market share in unit terms	74%	72%	62%	47%	**24%**
Validated product forms	2,478	2,449	2,119	1,363	**896**

Actions

No action required from the statistical point of view

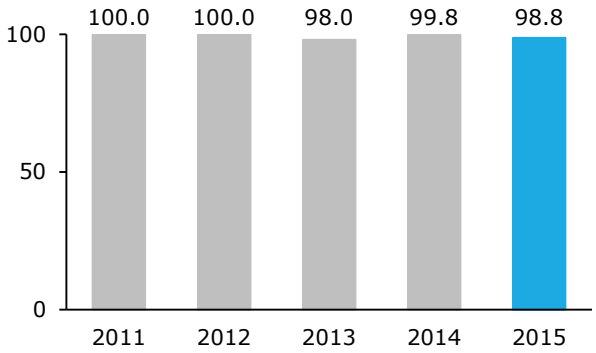
Egypt

Precision (%)

Overall precision index declined slightly by 1.0 percentage point in 2015

Large and medium product forms both reached a perfect 100%, small forms reached 92.7%

Forms validated in both years, 2014 and 2015, declined slightly by 0.6 percentage points to 99.0% in 2015

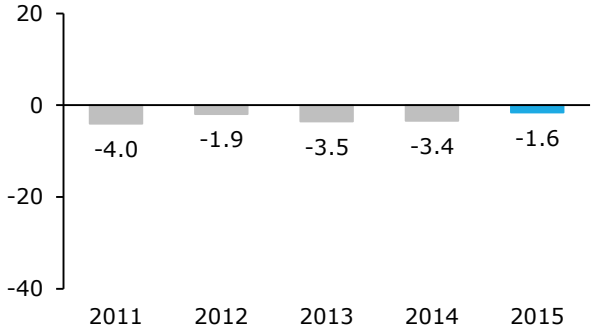


Over/Underestimation (%)

Overall underestimation improved by 1.8 percentage points in 2015

Large product forms were underestimated by 1.4%, medium by 1.9% and small by 2.1%

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.8 percentage points to 2.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	30	46	41	24	**50**
Validated market share in unit terms	30%	24%	22%	15%	**29%**
Validated product forms	748	604	542	408	**695**

Actions

No action required from the statistical point of view

Estonia

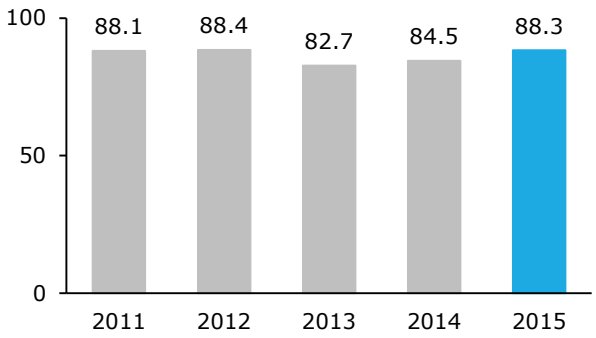
Retail Validation Study

Precision (%)

Overall precision index improved by 3.8 percentage points in 2015

Large product forms reached 94.6%, medium 83.5% and small 77.0%

Forms validated in both years, 2014 and 2015, improved by 1.6 percentage points to 90.2% in 2015

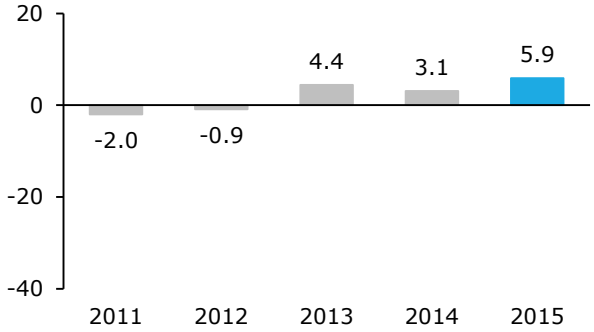


Over/Underestimation (%)

Overall overestimation increased by 2.8 percentage points in 2015

Large product forms were overestimated by 7.9%, medium by 3.4% and small forms by 1.4%

Overestimation of forms validated in both years, 2014 and 2015, improved by 0.6 percentage points to 6.2% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	6	17	10	14	**12**
Validated market share in unit terms	17%	15%	21%	25%	**17%**
Validated product forms	204	220	265	422	**277**

Actions

Adjust projection level for OTC products

Germany

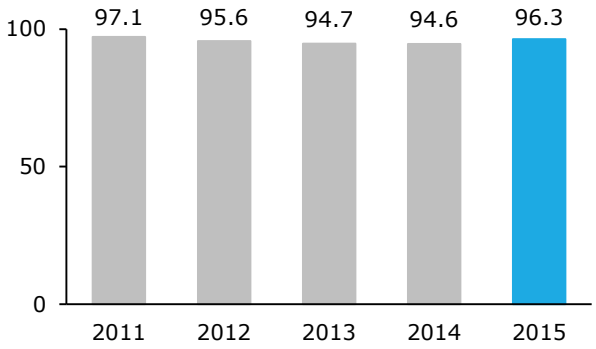
Retail Validation Study

Precision (%)

Overall precision index improved by 1.7 percentage points in 2015

Large product forms reached 96.9%, medium 96.6% and small 93.7%

Forms validated in both years, 2014 and 2015, improved slightly by 0.6 percentage points to 97.3% in 2015

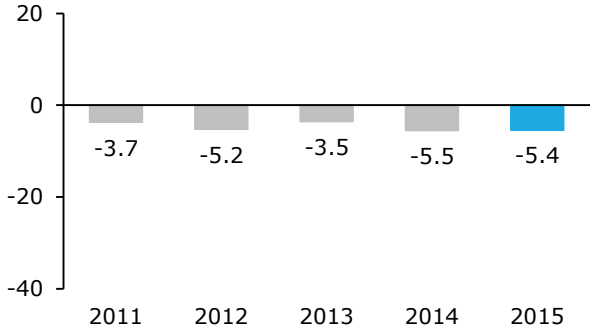


Over/Underestimation (%)

Overall underestimation improved slightly by 0.1 percentage points in 2015

Large product forms were underestimated by 5.8%, medium by 4.8% and small by 4.4%

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.3 percentage points to 6.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	33	35	30	32	**32**
Validated market share in unit terms	24%	24%	26%	26%	**25%**
Validated product forms	3,230	3,139	3,059	2,995	**3,010**

Actions

No action required from the statistical point of view

Greece

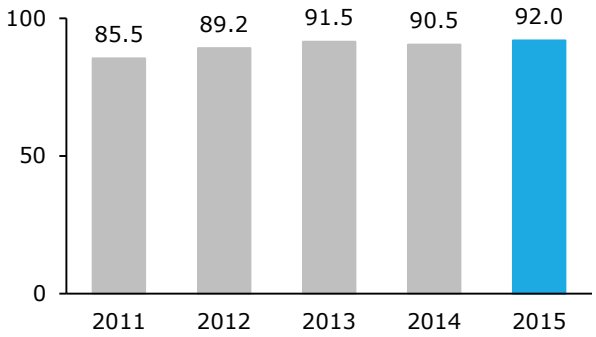
Retail Validation Study

Precision (%)

Overall precision index improved by 1.5 percentage points in 2015

Large product forms reached 98.0%, medium 89.5% and small 77.1%

Forms validated in both years, 2014 and 2015, improved by 1.8 percentage points to 92.9% in 2015

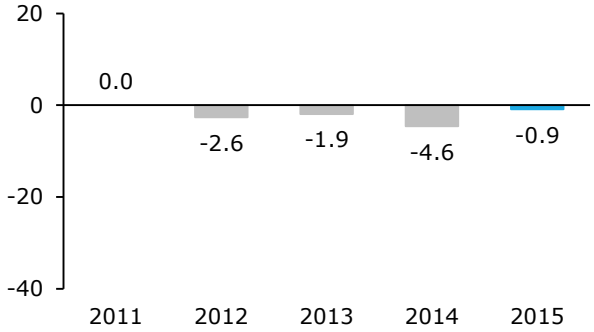


Over/Underestimation (%)

Overall underestimation improved by 3.7 percentage points in 2015

Large product forms were underestimated by 2.0%, medium forms were overestimated by 0.1% and small by 1.8%

Underestimation of forms validated in both years, 2014 and 2015, improved by 4.0 percentage points to 0.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	68	85	76	87	**86**
Validated market share in unit terms	60%	69%	68%	68%	**66%**
Validated product forms	962	1,074	964	1,083	**1,110**

Actions

No action required from the statistical point of view

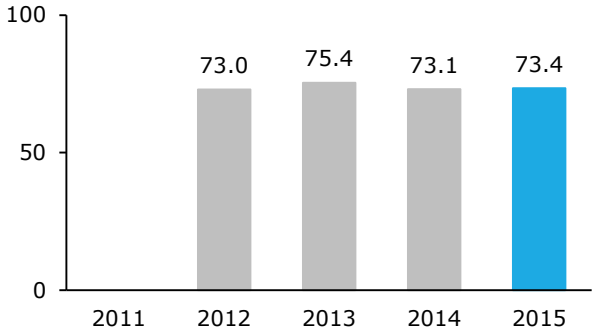
Hong Kong

Retail Validation Study

Precision (%)

Overall precision index improved slightly by 0.3 percentage points in 2015

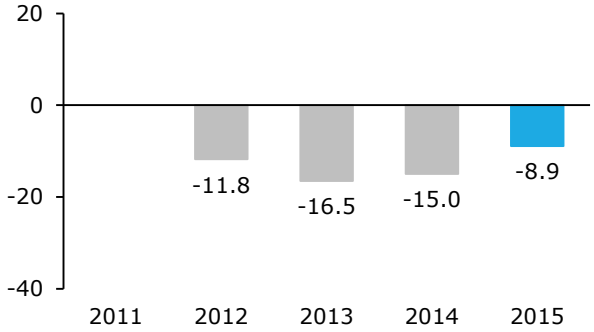
Medium product forms reached 75.3% and small 70.2%. A minor number of large product forms was grouped into the medium class for analysis



Over/Underestimation (%)

Overall underestimation improved by 6.1 percentage points in 2015

Medium product forms were underestimated by 7.4% and small by 15.7%. A minor number of large product forms was grouped into the medium class for analysis



Participation	2011	2012	2013	2014	2015
Participating companies		26	25	27	**31**
Validated market share in unit terms		20%	17%	16%	**19%**
Validated product forms		964	901	869	**943**

Actions

Review panel quality

Hungary

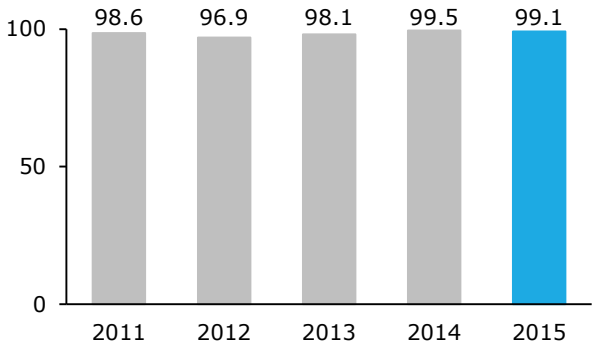
Retail+Hospital Validation Study

Precision (%)

Overall precision index declined slightly by 0.4 percentage points in 2015

Large product forms reached 99.1%, medium 99.6% and small 98.1%

Forms validated in both years, 2014 and 2015, declined slightly by 0.3 percentage points to 99.3% in 2015

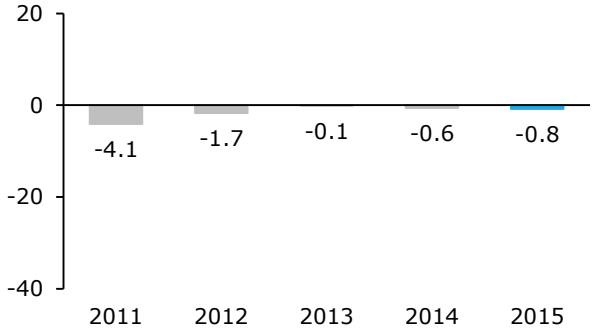


Over/Underestimation (%)

Overall underestimation increased slightly by 0.2 percentage points in 2015

Large product forms were underestimated by 0.2%, medium by 1.6% and small by 1.3%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.3 percentage points to 0.7%



Participation	2011	2012	2013	2014	2015
Participating companies	90	82	84	88	**91**
Validated market share in unit terms	77%	76%	76%	74%	**69%**
Validated product forms	1,697	1,703	1,696	1,743	**1,550**

Actions

No action required from the statistical point of view

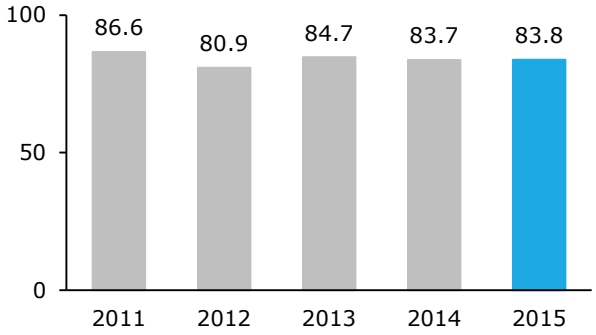
India

Total Market Validation Study

Precision (%)

Overall precision index improved slightly by 0.1 percentage points in 2015

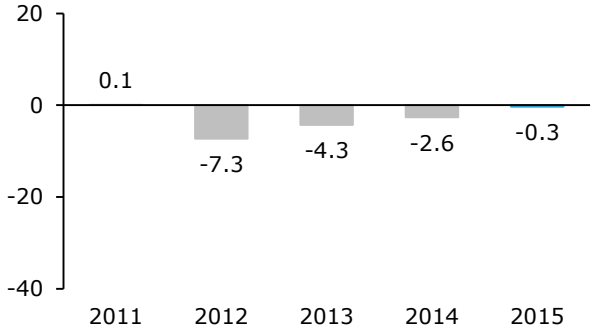
Forms validated in both years, 2014 and 2015, improved by 1.4 percentage points to 85.4% in 2015



Over/Underestimation (%)

Overall underestimation improved by 2.3 percentage points in 2015

Bias of forms validated in both years, 2014 and 2015, improved from 2.9% underestimation in 2014 to 1.0% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	11	17	20	28	**28**
Validated market share in unit terms	7%	8%	14%	16%	**18%**
Validated product forms	770	1,221	2,010	2,293	**2,545**

Actions

Implement new census and stockist lists

Motivate more clients to participate in the validation study

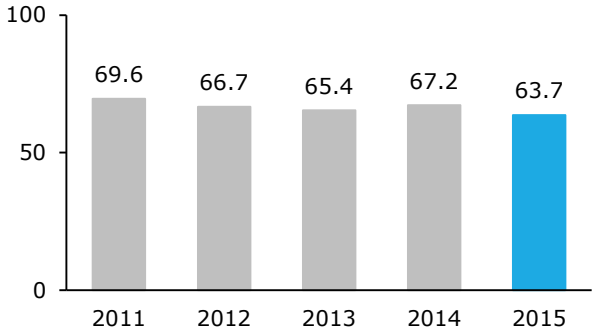
Indonesia

Total Market Validation Study

Precision (%)

Overall precision index declined by 3.5 percentage points in 2015

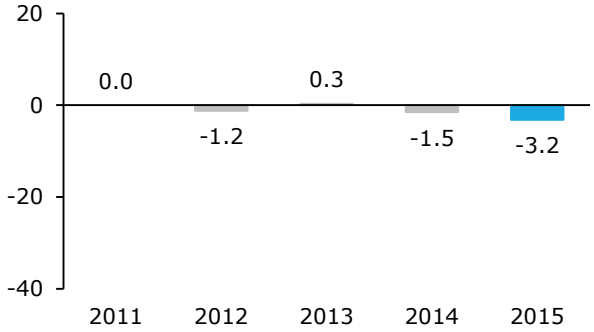
Large product forms reached 61.9%, medium 63.4% and small 70.5%



Over/Underestimation (%)

Overall underestimation increased by 1.7 percentage points in 2015

Large product forms were underestimated by 2.3%, medium forms by 5.0% and small forms by 7.5%



Participation	2011	2012	2013	2014	2015
Participating companies	78	62	64	66	**69**
Validated market share in unit terms	48%	43%	44%	42%	**38%**
Validated product forms	5,641	4,981	4,367	4,536	**4,124**

Actions

No action required as the Indonesian Total Market Audit will be replaced by a newly launched manufacturer data-based offering as of 2017

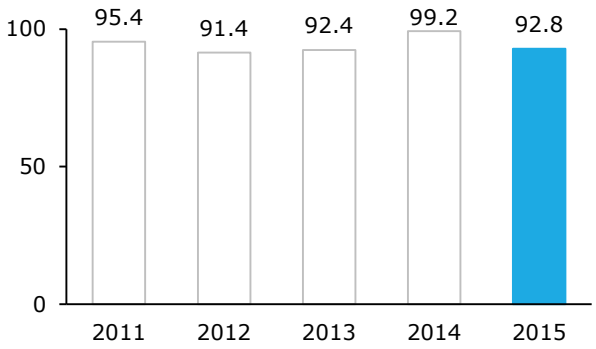
Ireland

Precision (%)

Overall precision index declined by 6.4 percentage points in 2015

Large product forms reached 95.7%, medium 90.1% and small 88.8%

Forms validated in both years, 2014 and 2015, declined by 3.9 percentage points to 96.1% in 2015

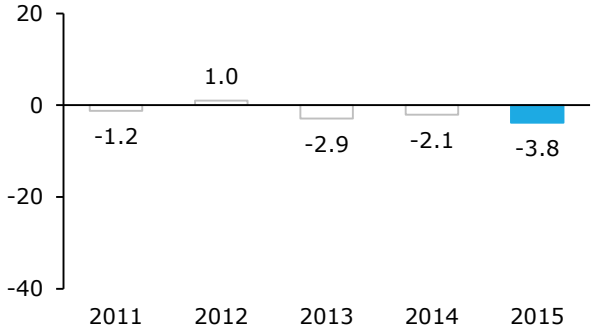


Over/Underestimation (%)

Overall underestimation increased by 1.7 percentage points in 2015

Large product forms were underestimated by 2.1%, medium by 4.9% and small by 5.8%

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.1 percentage points to 4.1% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	23	12	14	15	**33**
Validated market share in unit terms	9%	6%	6%	8%	**16%**
Validated product forms	261	188	166	186	**475**

Actions

Review parallel trade

Italy

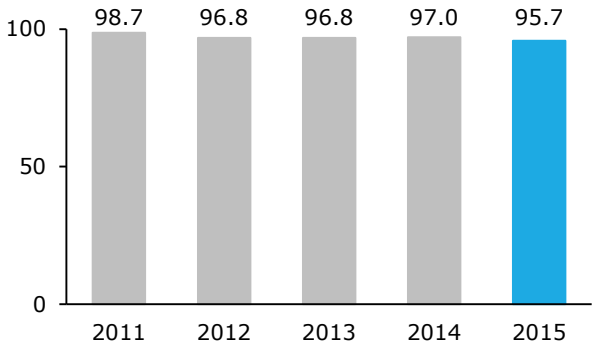
Retail Validation Study

Precision (%)

Overall precision index declined by 1.3 percentage points in 2015

Large product forms reached 95.7%, medium 96.2% and small 94.5%

Forms validated in both years, 2014 and 2015, slightly declined by 0.4 percentage points to 95.4% in 2015

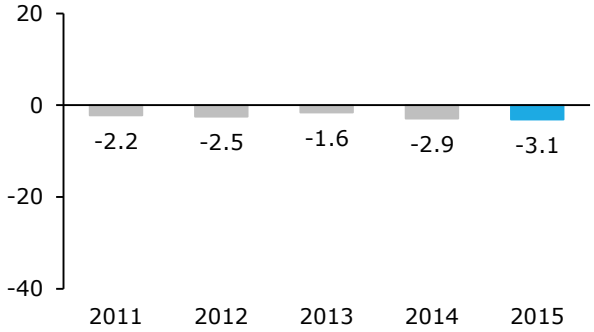


Over/Underestimation (%)

Overall underestimation increased slightly by 0.2 percentage points in 2015

Large product forms were underestimated by 4.7%, medium by 1.4% and small by 2.3%

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.7 percentage points to 3.7% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	28	29	31	22	**15**
Validated market share in unit terms	33%	32%	28%	21%	**11%**
Validated product forms	997	1,081	1,001	684	**485**

Actions

Motivate more companies to participate in the validation study

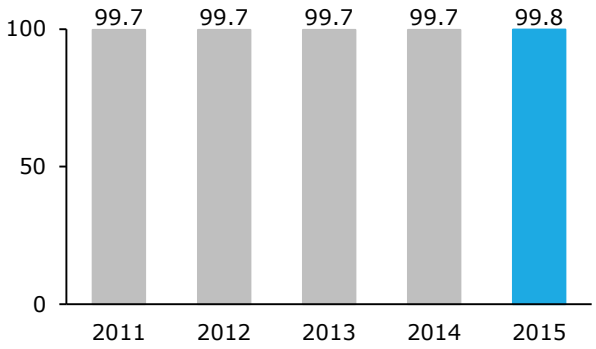
Japan

Retail+Hospital Validation Study

Precision (%)

Overall precision index improved slightly by 0.1 percentage points in 2015

Large product forms reached a perfect 100%, medium 99.8% and small 99.0%



Over/Underestimation (%)

Overall bias turned out at 0.2% overestimation in 2015

Large product forms were overestimated by 0.2%, medium by 1.0% and small by 0.6%

Participation	2011	2012	2013	2014	2015
Participating companies	51	53	55	59	**62**
Validated market share in unit terms	68%	71%	70%	73%	**65%**
Validated product forms	2,989	3,056	3,096	3,571	**3,443**

Actions

No action required from the statistical point of view

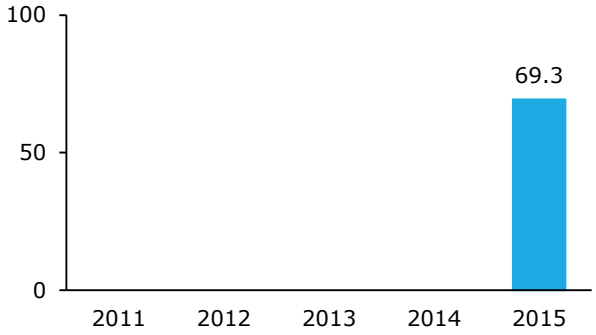
Kazakhstan

Retail+Hospital Validation Study

Precision (%)

Overall precision turned out at 69.3% in 2015

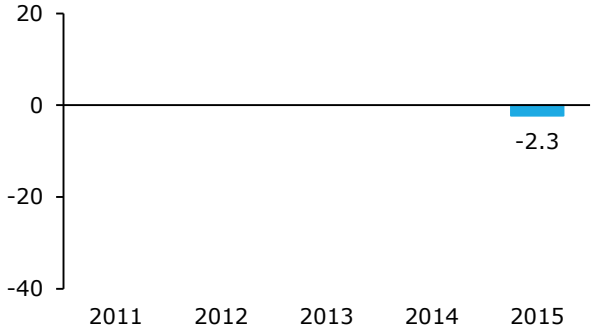
Medium product forms reached 71.3% and small forms reached 65.8%. A minor number of large product forms was grouped into the medium class for analysis



Over/Underestimation (%)

Overall bias turned out at 2.3% underestimation in 2015

Medium product forms were underestimated by 3.2% and small forms were overestimated by 1.4%. A minor number of large product forms was grouped into the medium class for analysis



Participation

	2011	2012	2013	2014	2015
Participating companies					**18**
Validated market share in unit terms					**14%**
Validated product forms					**468**

Actions

Panel expansion initiated

Motivate more companies to participate in the validation study

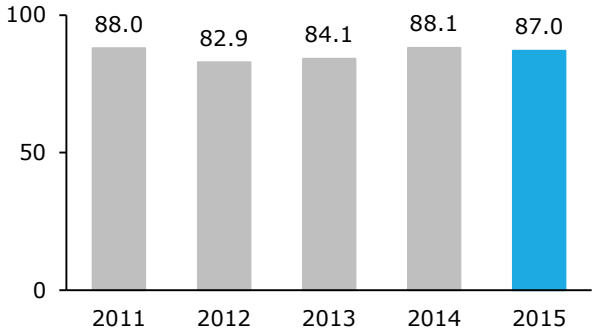
Korea

Precision (%)

Overall precision index declined by 1.1 percentage points in 2015

Large product forms reached 94.1%, medium 82.5% and small 72.3%

Forms validated in both years, 2014 and 2015, declined slightly by 1.8 percentage points to 89.6% in 2015

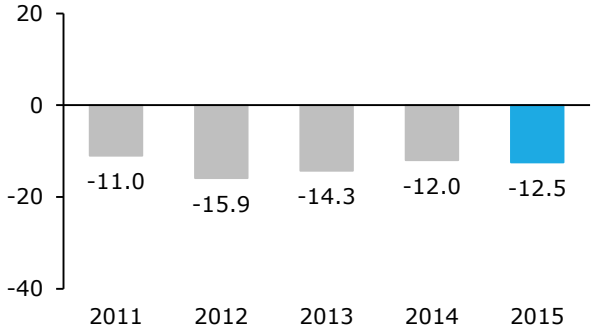


Over/Underestimation (%)

Overall underestimation increased slightly by 0.5 percentage points in 2015

Large product forms were underestimated by 11.0%, medium by 12.6% and small by 16.3%

Underestimation of forms validated in both years, 2014 and 2015, improved marginally by 0.1 percentage points to 12.0% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	19	16	12	19	**13**
Validated market share in unit terms	22%	12%	18%	12%	**12%**
Validated product forms	887	696	734	770	**795**

Actions

Review projection level and panel composition

Kuwait

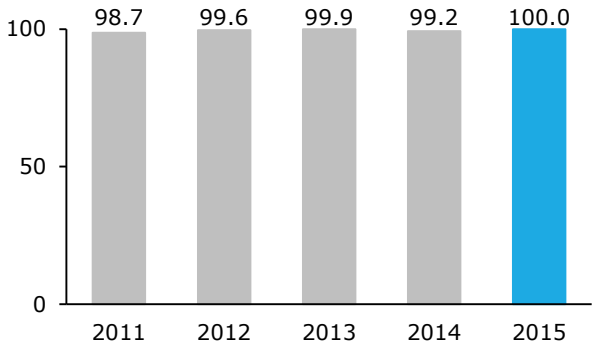
Retail Validation Study

Precision (%)

Overall precision index improved by 0.8 percentage points to a perfect 100% in 2015

All volume categories reached 100%

Forms validated in both years, 2014 and 2015, improved by 0.9 percentage points to 100% in 2015

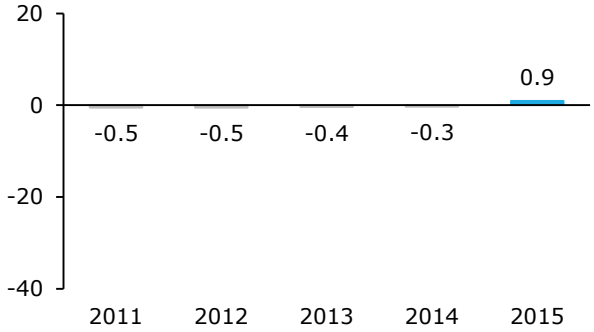


Over/Underestimation (%)

Overall bias turned to 0.9% overestimation in 2015

Medium product forms were overestimated by 1.0% and small forms by 0.4%. A minor number of large product forms was grouped into the medium class for analysis

Bias of forms validated in both years, 2014 and 2015, turned from 0.4% underestimation in 2014 to 1.1% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	23	26	33	22	**9**
Validated market share in unit terms	36%	46%	51%	34%	**11%**
Validated product forms	484	520	579	419	**196**

Actions

No action required from the statistical point of view

Latvia

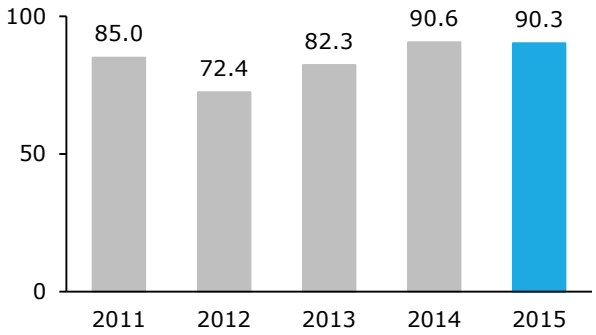
Retail Validation Study

Precision (%)

Overall precision index declined slightly by 0.3 percentage points in 2015

Large product forms reached 91.8%, medium 92.7% and small 80.4%

Forms validated in both years, 2014 and 2015, declined by 6.7 percentage points to 89.1% in 2015

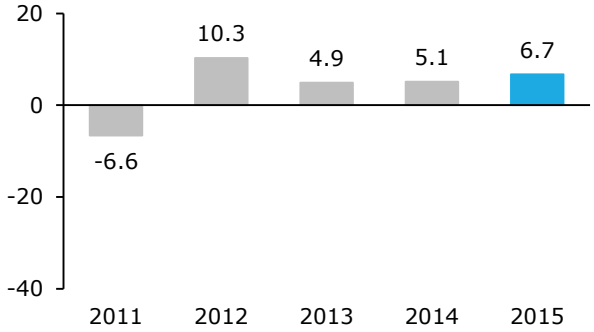


Over/Underestimation (%)

Overall overestimation increased by 1.6 percentage points in 2015

Large product forms were overestimated by 6.8%, medium by 7.6% and small by 3.8%

Overestimation of forms validated in both years, 2014 and 2015, increased by 1.8 percentage points to 7.1% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	17	13	11	25	**22**
Validated market share in unit terms	21%	15%	19%	36%	**15%**
Validated product forms	483	303	335	737	**398**

Actions

Conduct platform upgrade and projection calibration

Lebanon

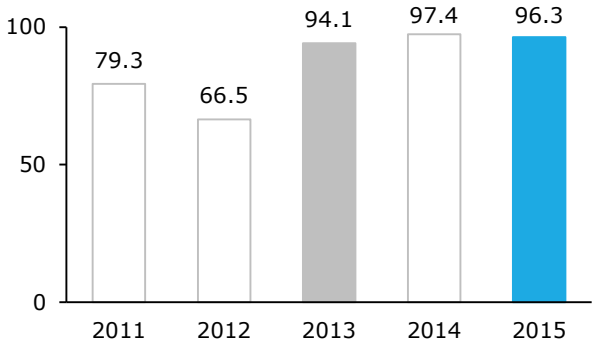
Retail Validation Study

Precision (%)

Overall precision index declined by 1.1 percentage points in 2015

Large product forms reached 97.8%, medium 95.3% and small forms 93.1%

Forms validated in both years, 2014 and 2015, improved slightly by 0.2 percentage points to 97.3% in 2015

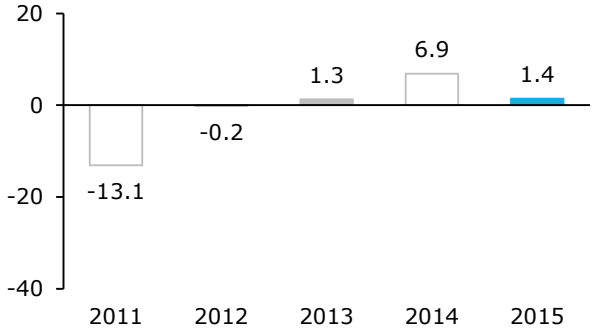


Over/Underestimation (%)

Overall overestimation improved by 5.5 percentage points in 2015

Large product forms were overestimated by 3.9%, medium forms were underestimated by 0.5% and small by 4.9%

Overestimation of forms validated in both years, 2014 and 2015, improved by 3.7 percentage points to 3.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	24	8	19	8	**26**
Validated market share in unit terms	9%	6%	15%	8%	**18%**
Validated product forms	192	131	290	118	**355**

Actions

No action required from the statistical point of view

Lithuania

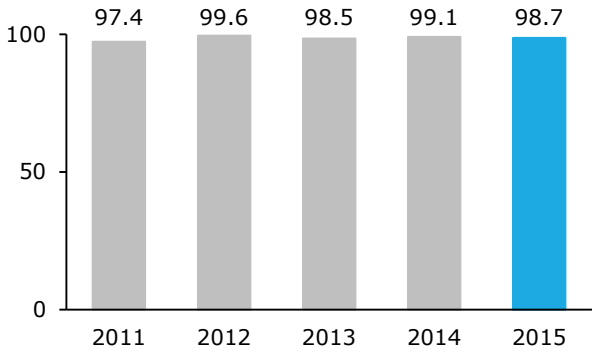
Retail Validation Study

Precision (%)

Overall precision index slightly declined by 0.4 percentage points in 2015

Large product forms reached a perfect 100%, medium forms reached 98.2% and small forms 95.3%

Forms validated in both years, 2014 and 2015, slightly declined by 0.3 percentage points to 99.1% in 2015

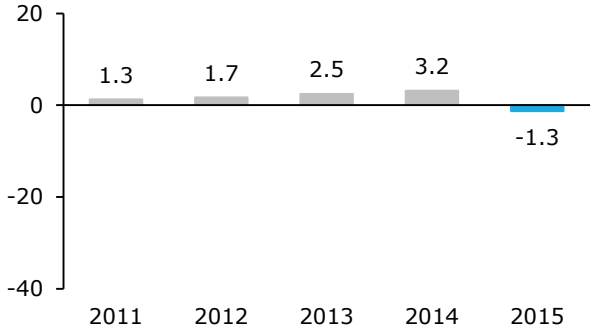


Over/Underestimation (%)

Overall bias turned from 3.2% overestimation in 2014 to 1.3% underestimation in 2015

Large product forms were underestimated by 1.0%, medium by 1.3% and small forms by 2.9%

Bias of forms validated in both years, 2014 and 2015, turned from 2.7% overestimation in 2014 to 1.3% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	21	12	11	25	**25**
Validated market share in unit terms	19%	13%	17%	30%	**26%**
Validated product forms	364	203	266	619	**496**

Actions

No action required from the statistical point of view

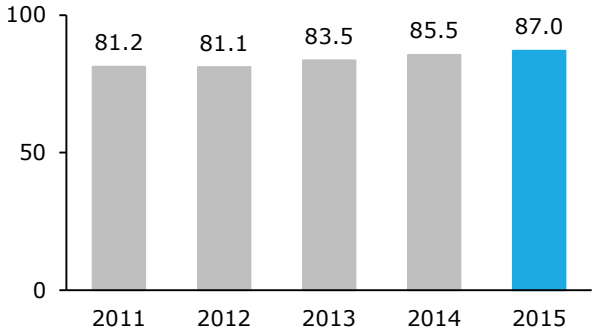
Malaysia

Retail Validation Study

Precision (%)

Overall precision index improved by 1.5 percentage points in 2015

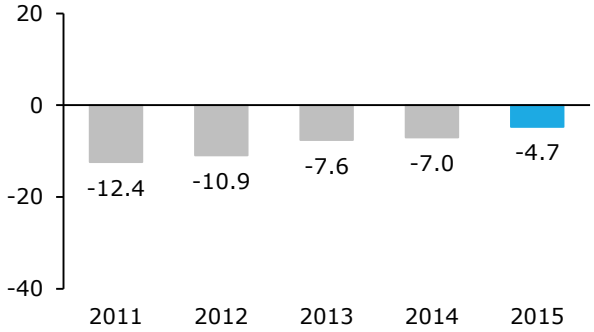
Large product forms reached 89.8%, medium 85.6% and small 80.7%



Over/Underestimation (%)

Overall underestimation improved by 2.3 percentage points in 2015

Large product forms were underestimated by 2.9%, medium by 6.4% and small by 8.1%



Participation	2011	2012	2013	2014	2015
Participating companies	63	64	74	88	**89**
Validated market share in unit terms	35%	33%	32%	29%	**30%**
Validated product forms	2,519	2,795	3,392	4,430	**5,074**

Actions

Increase sample size

Advance projection methodology

Include additional data suppliers

Mexico

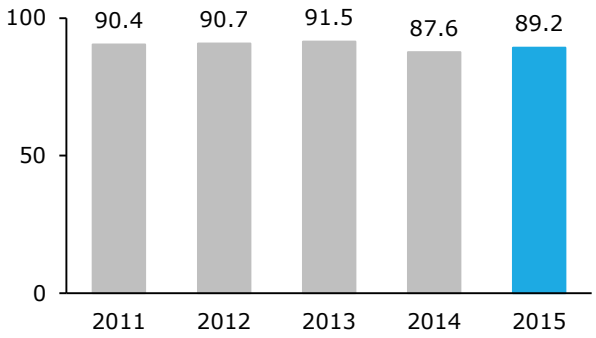
Retail Validation Study

Precision (%)

Overall precision index improved by 1.6 percentage points in 2015

Large product forms reached 92.5%, medium 88.7% and small 79.1%

Forms validated in both years, 2014 and 2015, improved by 5.7 percentage points to 91.0% in 2015

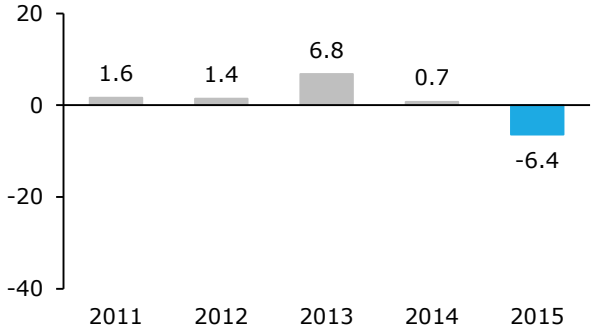


Over/Underestimation (%)

Overall bias turned from 0.7% overestimation in 2014 to 6.4% underestimation in 2015

Large product forms were underestimated by 7.8%, medium by 6.9% and small by 1.8%

Bias of forms validated in both years, 2014 and 2015, turned from 1.1% overestimation in 2014 to 5.3% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	37	25	23	16	**18**
Validated market share in unit terms	35%	35%	31%	24%	**17%**
Validated product forms	1,722	1,619	1,548	1,151	**1,008**

Actions

Review projection structure and adjust projection level

Motivate more companies to participate in the validation study

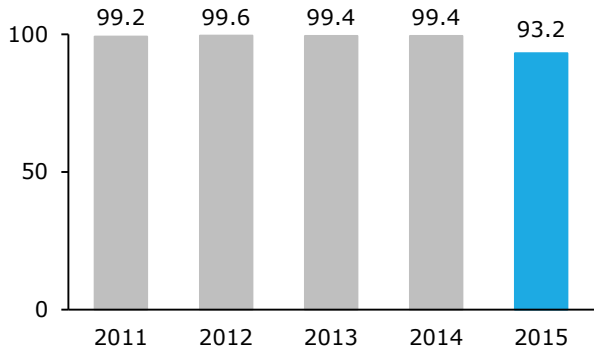
Morocco

Precision (%)

Overall precision index declined by 6.2 percentage points in 2015

Large product forms reached 95.5%, medium 92.3% and small forms 87.1%

Forms validated in both years, 2014 and 2015, declined by 3.8 percentage points to 94.9% in 2015

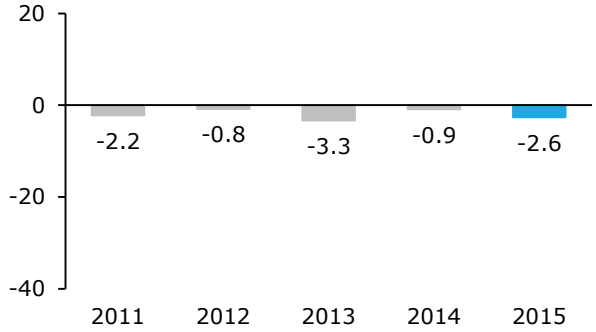


Over/Underestimation (%)

Overall underestimation increased by 1.7 percentage points in 2015

Large product forms were underestimated by 1.8%, medium by 4.3% and small by 3.3%

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.4 percentage points to 2.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	155	95	63	66	**37**
Validated market share in unit terms	80%	59%	36%	47%	**20%**
Validated product forms	1,347	958	650	703	**336**

Actions

Review quality control mechanisms

New Zealand

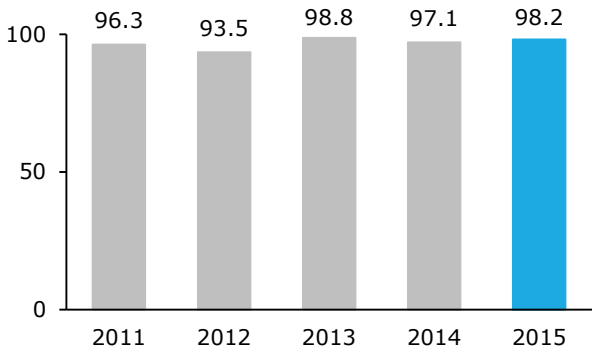
Retail Validation Study

Precision (%)

Overall precision index improved by 1.1 percentage points in 2015

Large product forms reached a perfect 100%, medium forms reached 97.3% and small 94.2%

Forms validated in both years, 2014 and 2015, declined slightly by 0.2 percentage points to 97.2% in 2015

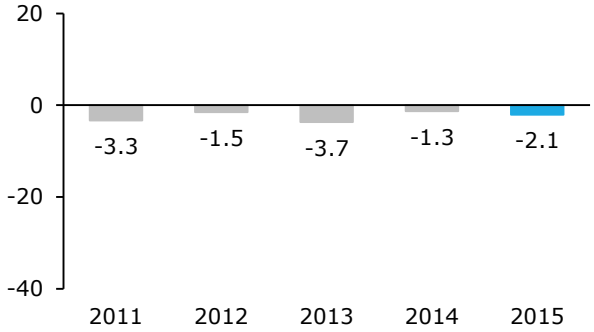


Over/Underestimation (%)

Overall underestimation increased slightly by 0.8 percentage points in 2015

Large product forms were underestimated by 1.6%, medium by 2.3% and small by 2.9%

Underestimation of forms validated in both years, 2014 and 2015, increased marginally by 0.1 percentage points to 1.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	35	43	34	32	**40**
Validated market share in unit terms	58%	69%	50%	36%	**45%**
Validated product forms	416	506	410	336	**430**

Actions

No action required from the statistical point of view

Pakistan

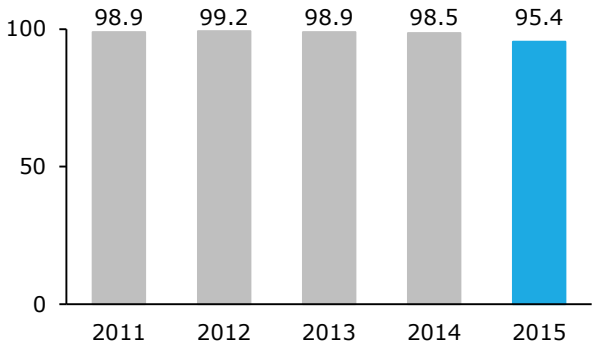
Retail Validation Study

Precision (%)

Overall precision index declined by 3.1 percentage points in 2015

Large product forms reached 97.9%, medium 94.8% and small 88.5%

Forms validated in both years, 2014 and 2015, declined by 2.8 percentage points to 95.9% in 2015

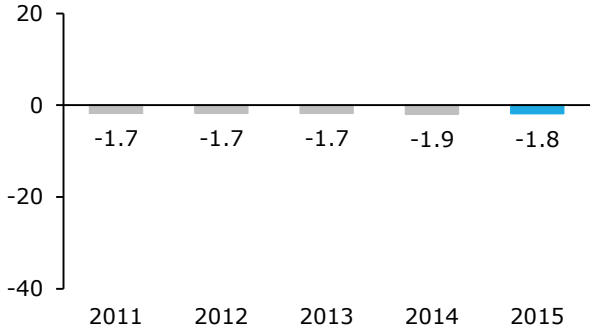


Over/Underestimation (%)

Overall underestimation improved slightly by 0.1 percentage points in 2015

Large product forms were underestimated by 1.1%, medium by 2.4% and small by 3.9%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.9 percentage points to 1.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	108	104	101	94	**93**
Validated market share in unit terms	78%	78%	70%	73%	**77%**
Validated product forms	2,881	2,843	2,474	2,524	**2,506**

Actions

Improve panel composition by covering non-DDM data

Maintain client base participating in validation survey

Paraguay

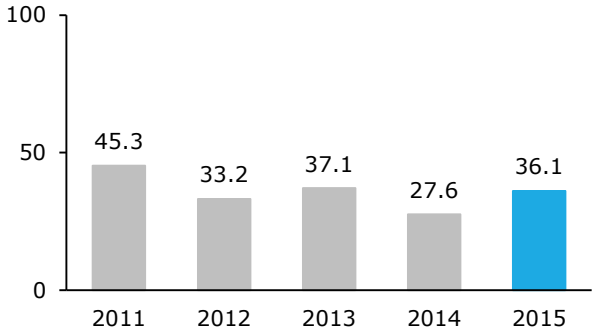
Retail Validation Study

Precision (%)

Overall precision index improved by 8.5 percentage points in 2015

Large product forms reached 29.6%, medium 43.6% and small 43.0%

Forms validated in both years, 2014 and 2015, declined by 7.4 percentage points to 53.6% in 2015

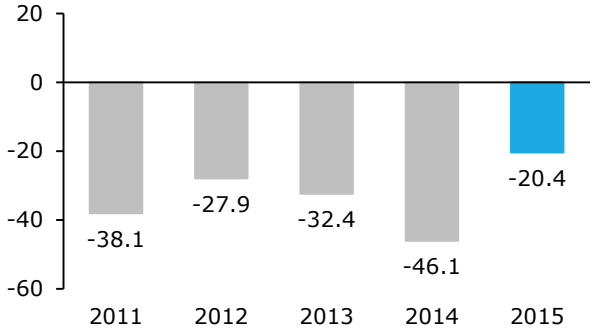


Over/Underestimation (%)

Overall underestimation improved by 25.7 percentage points in 2015

Large product forms were underestimated by 25.4%, medium by 14.8% and small by 13.3%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.2 percentage points to 10.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	81	106	68	82	**83**
Validated market share in unit terms	57%	48%	47%	51%	**44%**
Validated product forms	1,622	1,459	1,386	1,553	**1,508**

Actions

Improve panel fulfillment

Update distribution channel study

Update pharmacy universe

Peru

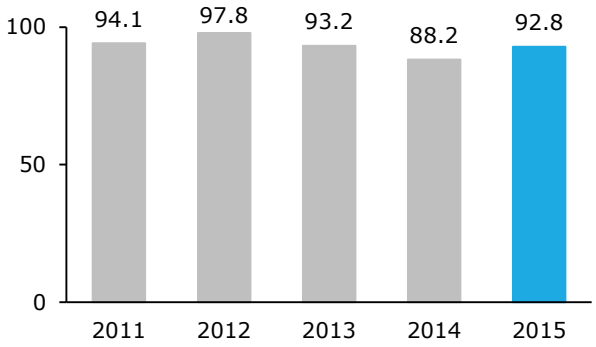
Retail Validation Study

Precision (%)

Overall precision index improved by 4.6 percentage points in 2015

Large product forms reached 98.1%, medium 88.1% and small 84.6%

Forms validated in both years, 2014 and 2015, improved by 10.2 percentage points to 95.8% in 2015

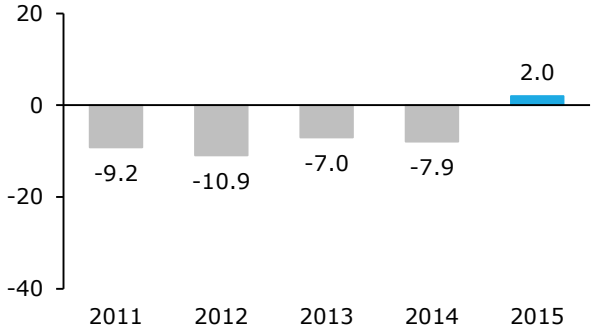


Over/Underestimation (%)

Overall bias turned from 7.9% underestimation in 2014 to 2.0% overestimation in 2015

Large product forms were overestimated by 2.5%, medium by 1.1% and small by 2.0%

Bias of forms validated in both years, 2014 and 2015, turned from 8.4% underestimation in 2014 to 2.3% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	28	14	14	14	**9**
Validated market share in unit terms	44%	23%	24%	21%	**17%**
Validated product forms	1,281	710	749	627	**448**

Actions

Motivate more clients to participate in the validation study

Philippines

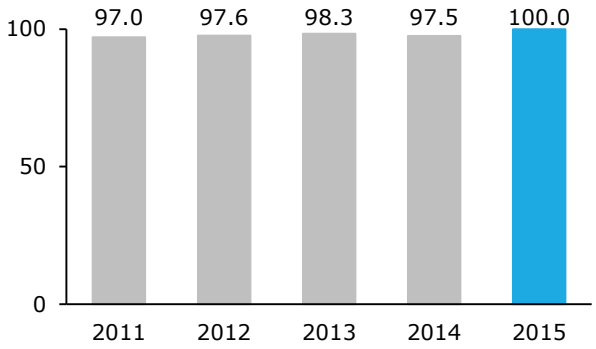
Retail Validation Study

Precision (%)

Overall precision index improved by 2.5 percentage points in 2015 to a perfect 100%

All sales volume classes reached 100%

Forms validated in both years, 2014 and 2015, improved by 2.1 percentage points to 100% in 2015

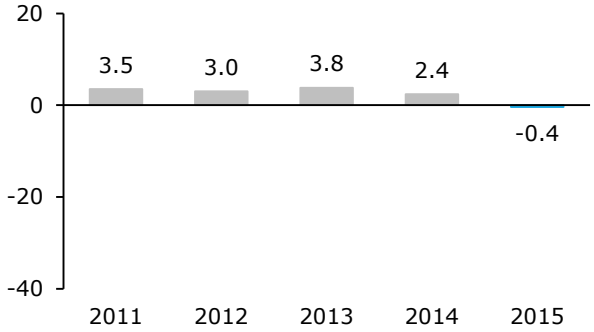


Over/Underestimation (%)

Overall bias turned from 2.4% overestimation in 2014 to 0.4% underestimation in 2014

Large product forms were underestimated by 0.5%, medium by 0.3% and small forms showed no bias

Bias of forms validated in both years, 2014 and 2015, turned from 2.5% overestimation in 2014 to 0.1% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	23	19	17	23	**71**
Validated market share in unit terms	42%	35%	34%	40%	**66%**
Validated product forms	805	616	613	792	**2,076**

Actions

No action required from the statistical point of view

Poland

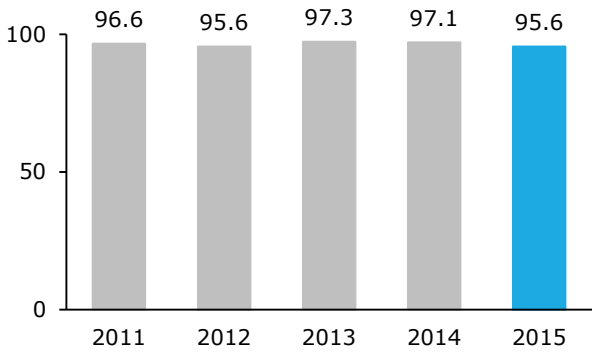
Retail+Hospital Validation Study

Precision (%)

Overall precision index declined by 1.5 percentage points in 2015

Large product forms reached 97.0%, medium 94.5% and small 93.1%

Forms validated in both years, 2014 and 2015, improved by 1.1 percentage points to 98.8% in 2015

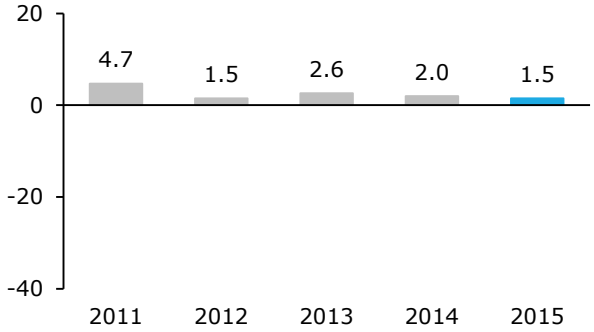


Over/Underestimation (%)

Overall overestimation improved by 0.5 percentage points in 2015

Large product forms were overestimated by 2.8%, medium by 0.4% and small forms were underestimated by 0.6%

Overestimation of forms validated in both years, 2014 and 2015, increased marginally by 0.1 percentage points to 2.0%



Participation

	2011	2012	2013	2014	2015
Participating companies	82	90	74	75	**75**
Validated market share in unit terms	55%	39%	30%	34%	**41%**
Validated product forms	1,667	1,383	1,139	1,301	**1,678**

Actions

No action required from the statistical point of view

Russia

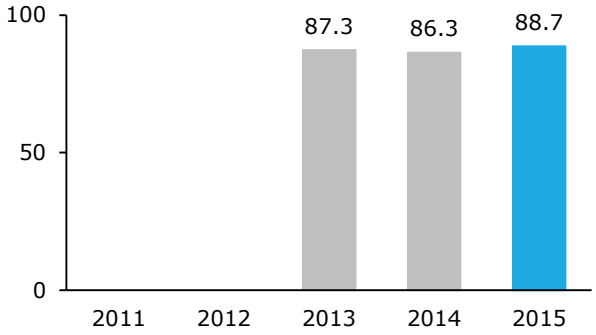
Retail+Hospital Validation Study

Precision (%)

Overall precision index improved by 2.4 percentage points in 2015

Large product forms reached 90.7%, medium 91.0% and small 77.2%

Forms validated in both years, 2014 and 2015, slightly improved by 0.5 percentage points to 88.6% in 2015

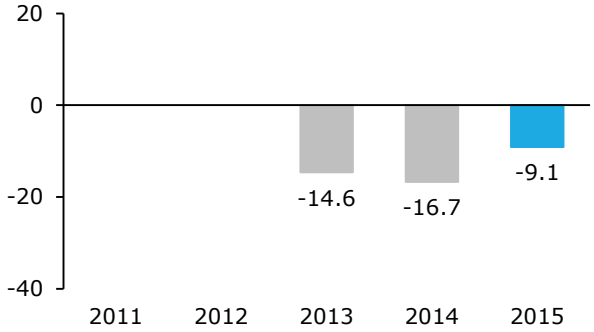


Over/Underestimation (%)

Overall underestimation improved by 7.6 percentage points in 2015

Large product forms were underestimated by 8.1%, medium by 9.9% and small forms by 12.2%

Underestimation of forms validated in both years, 2014 and 2015, improved by 7.7 percentage points to 8.6% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies			65	70	**97**
Validated market share in unit terms			27%	22%	**29%**
Validated product forms			1,555	1,254	**1,603**

Actions

No action required from the statistical point of view

Saudi Arabia

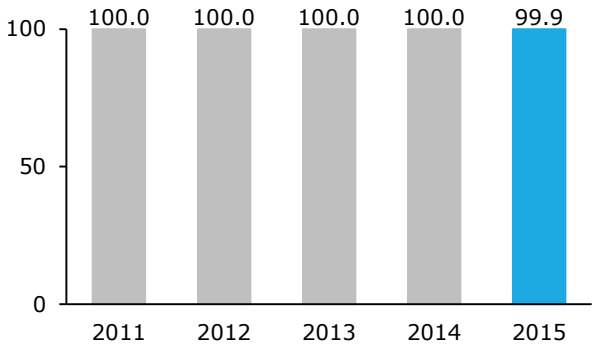
Retail Validation Study

Precision (%)

Overall precision index declined marginally by 0.1 percentage points in 2015

Large and medium product forms both reached 100%, small forms reached 99.6%

Forms validated in both years, 2014 and 2015, remained unchanged at a perfect 100%

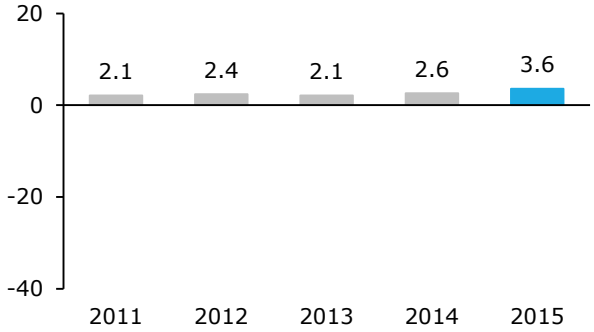


Over/Underestimation (%)

Overall overestimation increased slightly by 1.0 percentage point in 2015

Large product forms were overestimated by 3.8%, medium by 3.3% and small by 3.6%

Overestimation of forms validated in both years, 2014 and 2015, increased slightly by 1.1 percentage points to 3.4% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	50	48	60	38	**27**
Validated market share in unit terms	59%	53%	65%	49%	**32%**
Validated product forms	763	726	917	661	**481**

Actions

No action required from the statistical point of view

Serbia

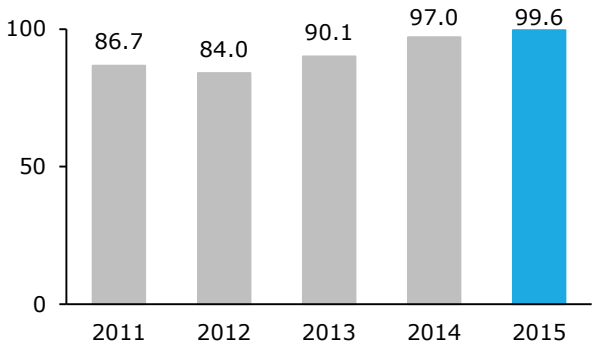
Retail+Hospital Validation Study

Precision (%)

Overall precision index improved by 2.6 percentage points in 2015

Large product forms reached a perfect 100%, medium forms reached 99.5% and small 98.6%

Forms validated in both years, 2014 and 2015, improved by 1.9 percentage points to 99.9% in 2015

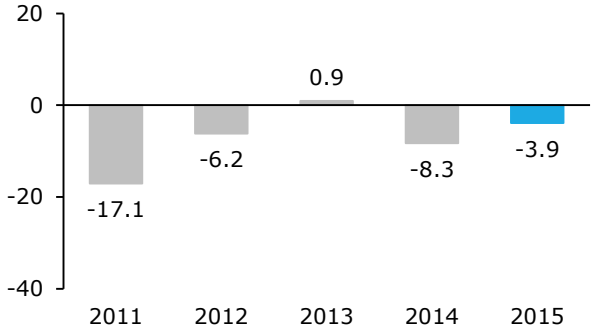


Over/Underestimation (%)

Overall underestimation improved by 4.4 percentage points in 2015

Large product forms were underestimated by 4.0%, medium by 3.9% and small by 3.3%

Underestimation of forms validated in both years, 2014 and 2015, improved by 4.4 percentage points to 3.7%



Participation

	2011	2012	2013	2014	2015
Participating companies	15	21	16	30	**35**
Validated market share in unit terms	47%	57%	56%	67%	**68%**
Validated product forms	349	478	456	609	**626**

Actions

No action required from the statistical point of view

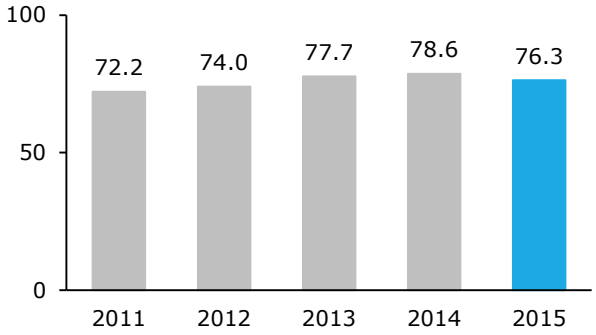
Singapore

Retail Validation Study

Precision (%)

Overall precision index declined by 2.3 percentage points in 2015

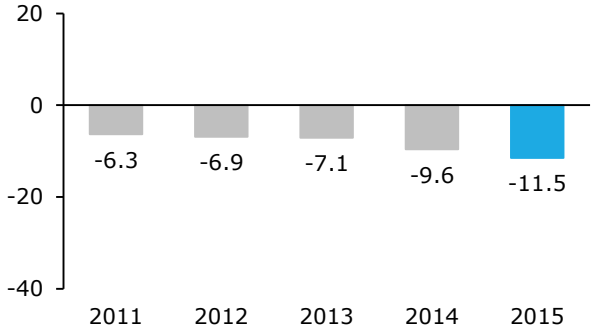
Large product forms reached 77.0%, medium 77.3% and small 72.0%



Over/Underestimation (%)

Overall underestimation increased by 1.9 percentage points in 2015

Large product forms were underestimated by 9.4%, medium by 12.4% and small by 15.8%



Participation	2011	2012	2013	2014	2015
Participating companies	50	49	51	54	**63**
Validated market share in unit terms	39%	38%	40%	34%	**30%**
Validated product forms	1,936	2,035	2,392	2,382	**2,276**

Actions

Adjust projection level

Advance projection methodology

Review sample design

Slovak Republic

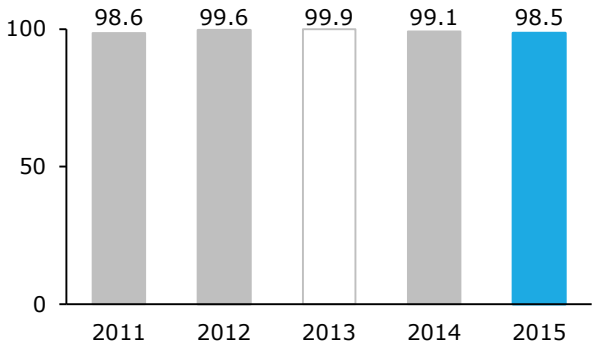
Retail+Hospital Validation Study

Precision (%)

Overall precision index declined slightly by 0.6 percentage points in 2015

Large product forms reached 98.3%, medium 98.3% and small 99.5%

Forms validated in both years, 2014 and 2015, declined slightly by 0.5 percentage points to 98.4% in 2015

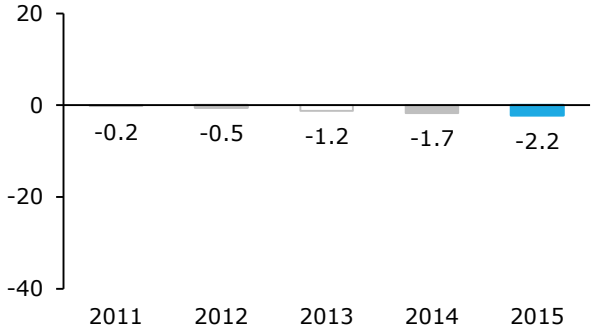


Over/Underestimation (%)

Overall underestimation increased slightly by 0.5 percentage points in 2015

Large product forms were underestimated by 2.3%, medium by 2.0% and small by 1.7%

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.4 percentage points to 2.0% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	35	13	16	17	**12**
Validated market share in unit terms	49%	12%	8%	27%	**30%**
Validated product forms	1,049	397	252	443	**498**

Actions

No action required from the statistical point of view

Slovenia

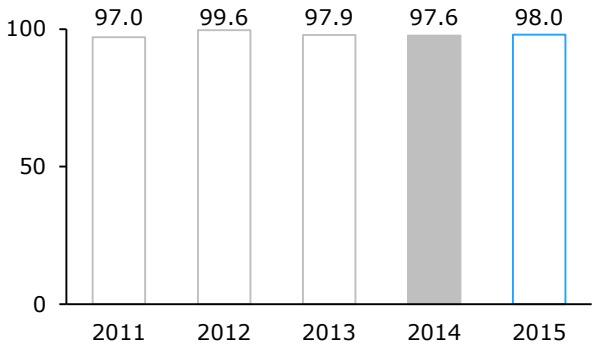
Retail+Hospital Validation Study

Precision (%)

Overall precision index slightly improved by 0.4 percentage points in 2015

Medium product forms reached a perfect 100% and small forms reached 94.6%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined slightly by 1.1 percentage points to 98.9% in 2015

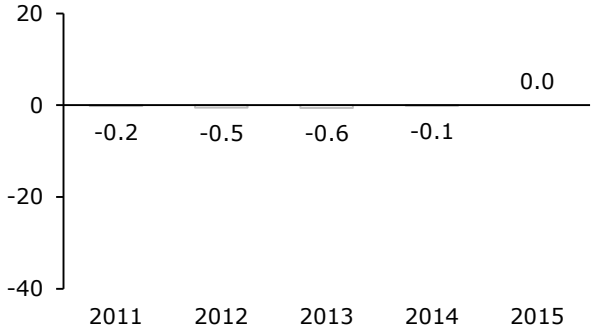


Over/Underestimation (%)

Overall underestimation improved to a favorable 0.0% bias in 2015

Medium product forms were underestimated by 0.1% and small forms were overestimated by 0.7%. A minor number of large product forms was grouped into the medium class for analysis

Bias of forms validated in both years, 2014 and 2015, turned from 1.3% overestimation in 2014 to 0.7% underestimation in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	9	5	7	11	**6**
Validated market share in unit terms	8%	6%	5%	30%	**6%**
Validated product forms	255	141	95	356	**103**

Actions

Motivate more companies to participate in the validation study

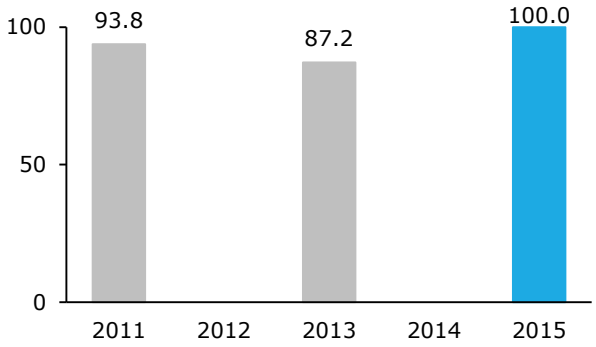
South Africa

Total Private Market Validation Study

Precision (%)

Overall precision index improved by 12.8 percentage points to a perfect 100% in 2015

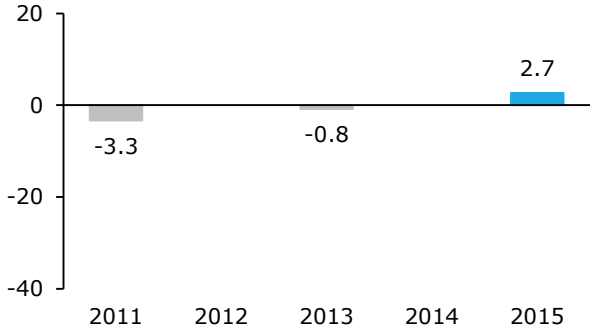
All sales volume groups reached 100%



Over/Underestimation (%)

Overall bias turned from 0.8% underestimation in 2013 to 2.7% overestimation in 2015

Large product forms were overestimated by 2.6%, medium by 3.1% and small by 3.1%



Participation	2011	2012	2013	2014	2015
Participating companies	63		29		**17**
Validated market share in unit terms	81%		13%		**31%**
Validated product forms	2,549		627		**790**

Actions

No action required from the statistical point of view

Spain

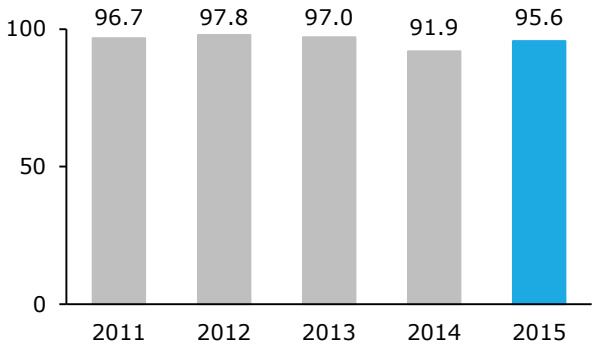
Retail Validation Study

Precision (%)

Overall precision index improved by 3.7 percentage points in 2015

Large product forms reached 95.8%, medium 97.5% and small 91.3%

Forms validated in both years, 2014 and 2015, improved by 2.4 percentage points to 92.9% in 2015

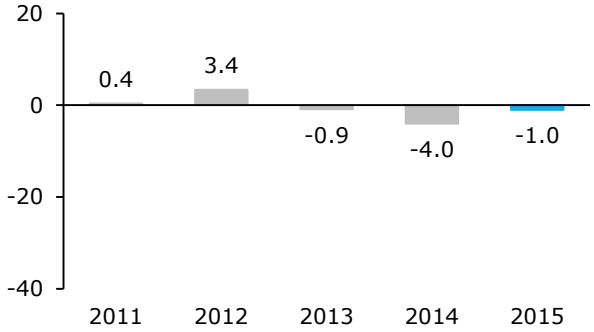


Over/Underestimation (%)

Overall underestimation improved by 3.0 percentage points in 2015

Large product forms were underestimated by 1.0%, medium by 0.5% and small by 2.6%

Underestimation of forms validated in both years, 2014 and 2015, improved by 3.3 percentage points to 2.5% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	28	24	15	17	**19**
Validated market share in unit terms	23%	18%	14%	17%	**21%**
Validated product forms	745	682	548	635	**746**

Actions

No action required from the statistical point of view

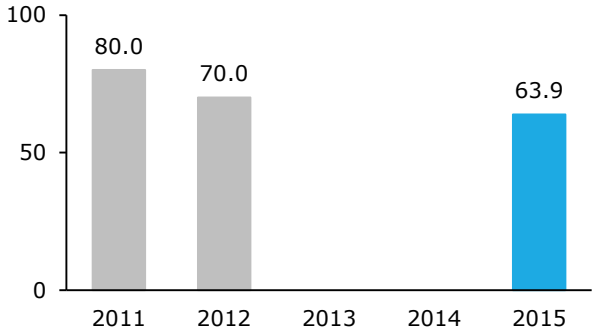
Sri Lanka

Retail Validation Study

Precision (%)

Overall precision index declined by 6.1 percentage points in 2015

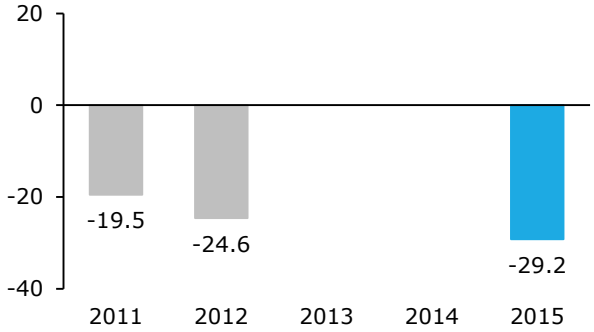
Medium product forms reached 58.9% and small 72.6%. A minor number of large product forms was grouped into the medium class for analysis



Over/Underestimation (%)

Overall underestimation increased by 4.6 percentage points in 2015

Medium product forms were underestimated by 30.4% and small by 20.4%. A minor number of large product forms was grouped into the medium class for analysis



Participation	2011	2012	2013	2014	2015
Participating companies	20	17			**10**
Validated market share in unit terms	15%	15%			**10%**
Validated product forms	305	283			**196**

Actions

Identify and analyze root cause of the deterioration

Motivate more companies to participate in the validation study

Switzerland

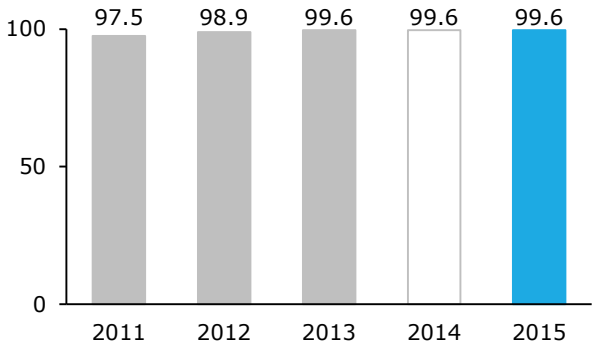
Retail+Hospital Validation Study

Precision (%)

Overall precision index remained unchanged in 2015

Large product forms reached a perfect 100%, medium forms 99.7% and small forms reached 97.9%

Forms validated in both years, 2014 and 2015, improved slightly by 0.1 percentage points to 99.8% in 2015

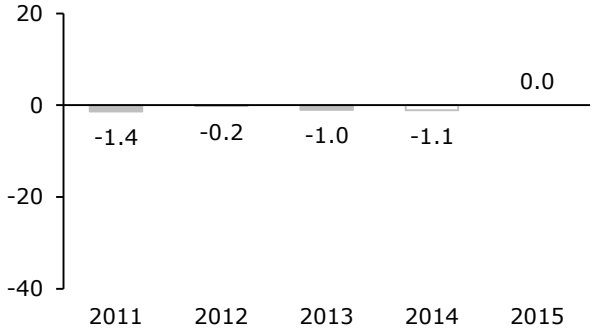


Over/Underestimation (%)

Overall underestimation improved to zero bias in 2015

Large product forms were overestimated by 0.3%, medium forms were underestimated by 0.4% and small by 0.8%

Underestimation of forms validated in both years, 2014 and 2015, slightly improved by 0.1 percentage points to 0.9% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	55	31	26	17	**48**
Validated market share in unit terms	55%	39%	27%	9%	**43%**
Validated product forms	2,459	1,899	1,280	591	**2,019**

Actions

No action required from the statistical point of view

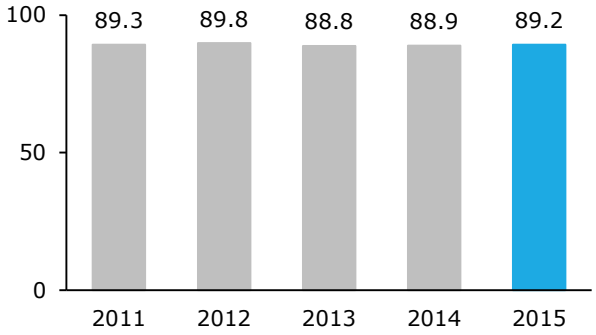
Thailand

Retail Validation Study

Precision (%)

Overall precision index improved slightly by 0.3 percentage points in 2015

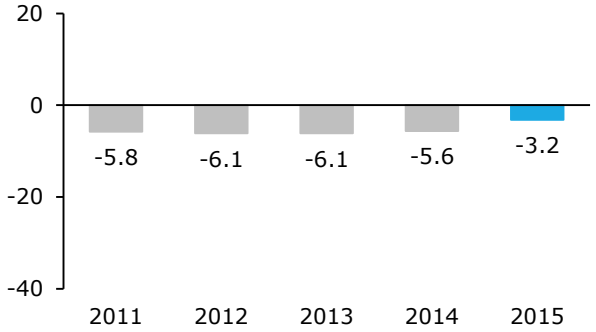
Large product forms reached 91.0%, medium 88.0% and small 85.6%



Over/Underestimation (%)

Overall underestimation improved by 2.4 percentage points in 2015

Large product forms were underestimated by 3.0%, medium by 3.3% and small by 4.2%



Participation	2011	2012	2013	2014	2015
Participating companies	44	47	46	43	**46**
Validated market share in unit terms	32%	35%	37%	34%	**35%**
Validated product forms	1,011	999	1,063	983	**996**

Actions

Improve panel quality

Update sample design

Improve projection factor methodology

Tunisia

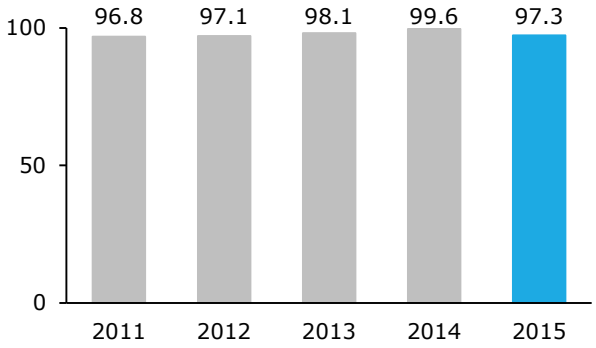
Retail Validation Study

Precision (%)

Overall precision index declined by 2.3 percentage points in 2015

Large product forms reached 98.8%, medium 96.0% and small 94.8%

Forms validated in both years, 2014 and 2015, declined slightly by 0.4 percentage points to 99.4% in 2015

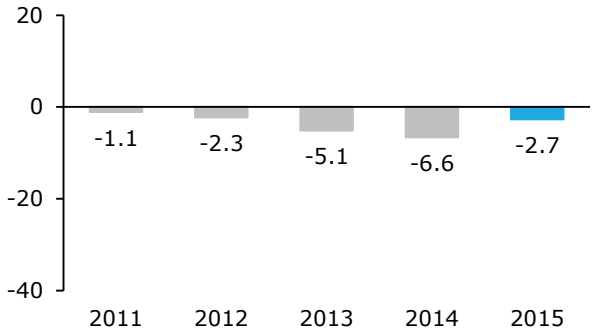


Over/Underestimation (%)

Overall underestimation improved by 3.9 percentage points in 2015

Large product forms were underestimated by 3.0%, medium by 1.8% and small forms by 3.5%

Underestimation of forms validated in both years, 2014 and 2015, improved by 3.4 percentage points to 3.4% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	27	22	19	19	**23**
Validated market share in unit terms	45%	45%	37%	39%	**42%**
Validated product forms	591	571	431	506	**612**

Actions

No action required from the statistical point of view

Turkey

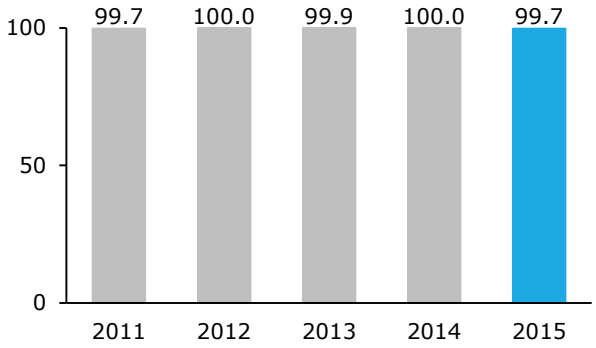
Retail Validation Study

Precision (%)

Overall precision index slightly declined by 0.3 percentage points in 2015

Large product forms reached 99.4%, medium and small both reached a perfect 100%

Forms validated in both years, 2014 and 2015, slightly declined by 0.4 percentage points to 99.6% in 2015

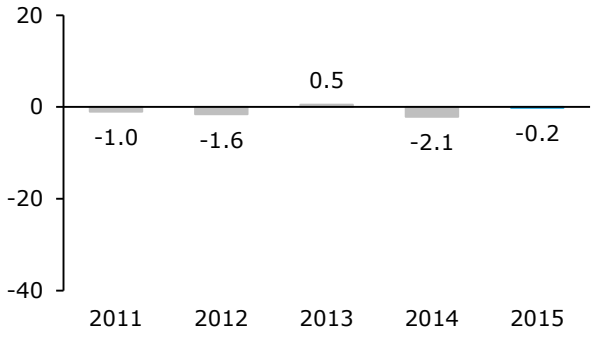


Over/Underestimation (%)

Overall underestimation improved by 1.9 percentage points in 2015

Large product forms had no bias, medium forms were underestimated by 0.3% and small forms by 0.9%

Underestimation of forms validated in both years, 2014 and 2015, improved by 2.0 percentage points to 0.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	34	54	42	60	**68**
Validated market share in unit terms	37%	55%	35%	47%	**51%**
Validated product forms	763	1,241	847	1,005	**1,207**

Actions

No action required from the statistical point of view

United Arab Emirates

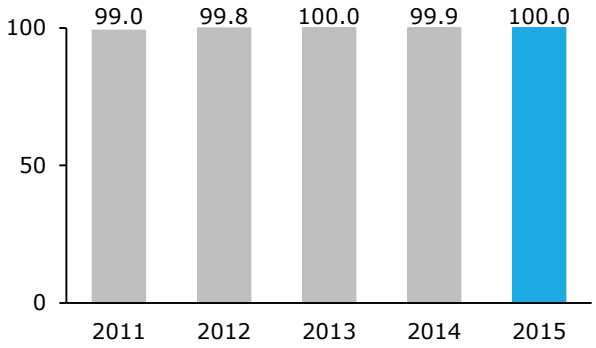
Retail Validation Study

Precision (%)

Overall precision index improved by 0.1 percentage points to a perfect 100% in 2015

All volume categories reached 100%

Forms validated in both years, 2014 and 2015, remained at 100% in 2015

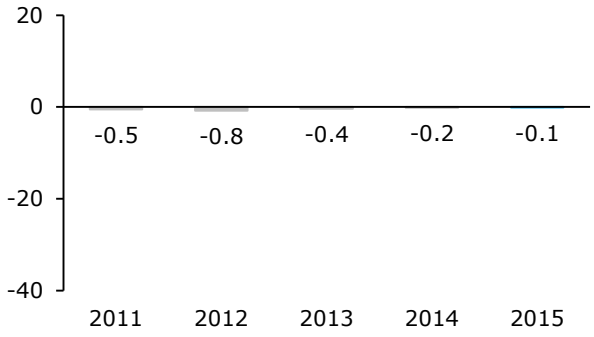


Over/Underestimation (%)

Overall underestimation slightly improved by 0.1 percentage points in 2015

Large product forms were underestimated by 0.4%, medium forms were overestimated by 0.2% and small forms by 0.5%

Underestimation of forms validated in both years, 2014 and 2015, improved by 0.3 percentage points to 0.3% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	30	37	43	26	**19**
Validated market share in unit terms	40%	62%	70%	35%	**20%**
Validated product forms	675	936	1,019	651	**420**

Actions

No action required from the statistical point of view

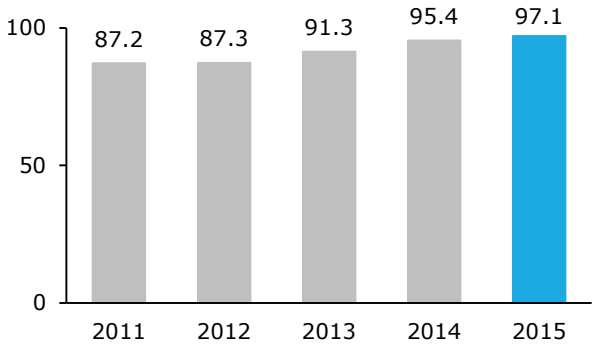
United Kingdom

Retail Validation Study

Precision (%)

Overall precision index improved by 1.7 percentage points in 2015

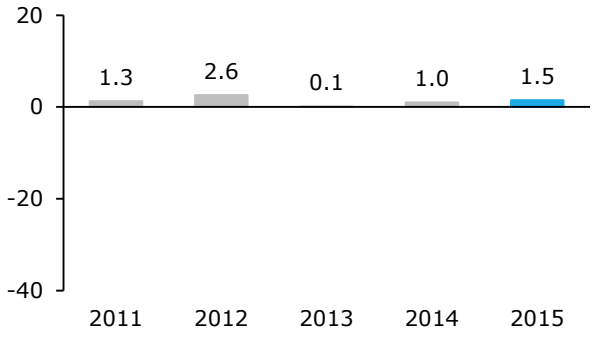
Large product forms reached a perfect 100%, medium 98.3% and small 85.0%



Over/Underestimation (%)

Overall overestimation increased slightly by 0.5 percentage points in 2015

Large product forms were overestimated by 1.2%, medium by 3.0% and small by 2.4%



Participation

	2011	2012	2013	2014	2015
Participating companies	88	82	85	42	**43**
Validated market share in value terms	31%	29%	29%	13%	**14%**
Validated product forms	613	665	638	318	**301**

Actions

No action required from the statistical point of view

Uruguay

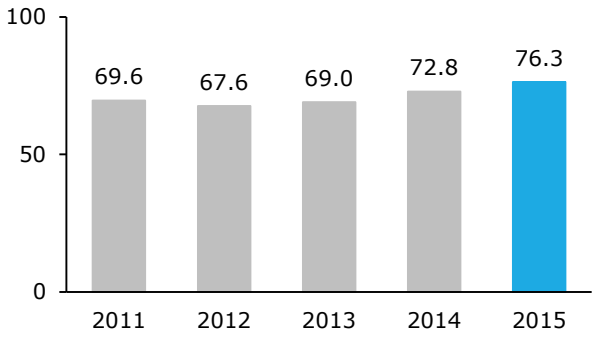
Retail+Mutuales Validation Study

Precision (%)

Overall precision index improved by 3.5 percentage points in 2015

Large product forms reached 80.2%, medium 75.0% and small 66.2%

Forms validated in both years, 2014 and 2015, improved by 7.5 percentage points to 77.0% in 2015

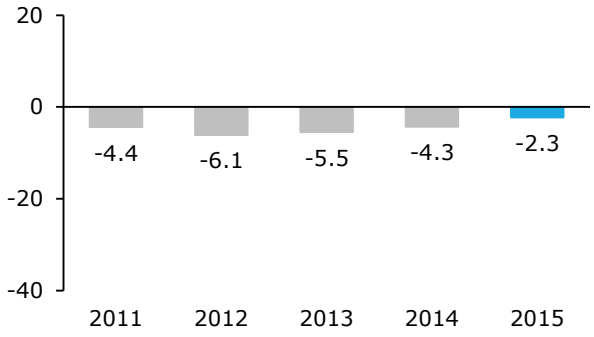


Over/Underestimation (%)

Overall underestimation improved by 2.0 percentage points in 2015

Large product forms were overestimated by 0.7%, medium forms were underestimated by 3.9% and small by 9.2%

Underestimation of forms validated in both years, 2014 and 2015, improved by 0.6 percentage points to 2.5% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	19	15	19	18	**12**
Validated market share in unit terms	46%	50%	53%	57%	**43%**
Validated product forms	995	1,156	1,257	1,271	**1,005**

Actions

Increase mutuales panel

USA

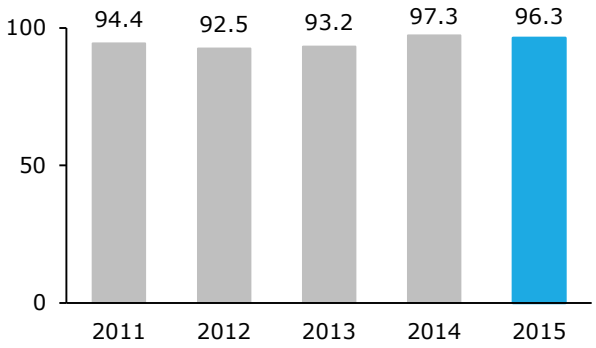
Retail+Hospital Validation Study

Precision (%)

Overall precision index declined by 1.0 percentage point in 2015

Large product forms reached a perfect 100%, medium forms reached 92.0% and small 92.3%

Forms validated in both years, 2014 and 2015, declined by 1.4 percentage points to 96.2% in 2015

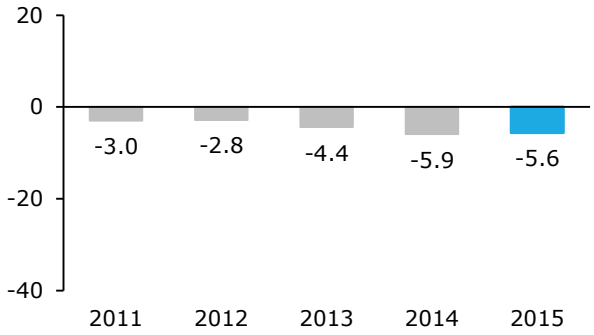


Over/Underestimation (%)

Overall underestimation improved slightly by 0.3 percentage points in 2015

Large product forms were underestimated by 5.4%, medium by 6.0% and small by 5.5%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.6 percentage points to 5.7% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	61	58	60	66	**60**
Validated market share in value terms *				88%	**78%**
Validated product forms	1,188	1,114	1,099	1,062	**1,014**

Actions

As expected, the retail projection methodology enhancement (implemented January 2016, restating 6 years of history) slightly reduced the overall bias

* The validated market refers to branded prescription products
The share is calculated in value terms

Venezuela

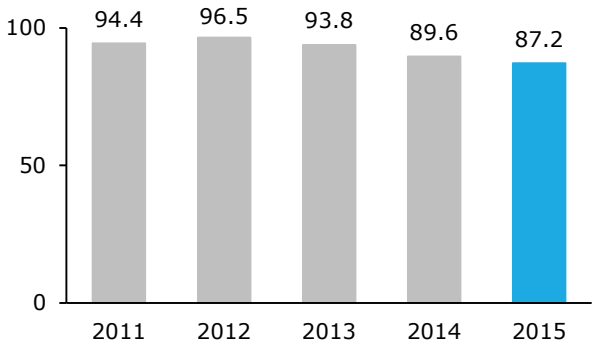
Retail Validation Study

Precision (%)

Overall precision index declined by 2.4 percentage points in 2015

Large product forms reached 92.5%, medium 81.7% and small 80.8%

Forms validated in both years, 2014 and 2015, declined by 2.6 percentage points to 89.2% in 2015

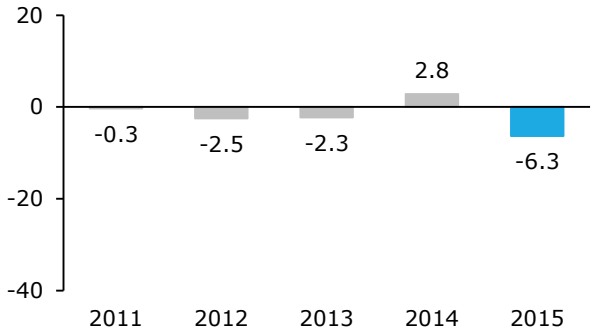


Over/Underestimation (%)

Overall bias turned from 2.8% overestimation in 2014 to 6.3% underestimation in 2015

Large product forms were underestimated by 4.9%, medium by 7.7% and small by 8.7%

Bias of forms validated in both years, 2014 and 2015, turned from 2.7% overestimation in 2014 to 4.7% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	78	45	48	37	**32**
Validated market share in unit terms	62%	37%	57%	39%	**41%**
Validated product forms	1,866	1,246	1,504	1,160	**1,002**

Actions

Implement monthly data transformation process to better control market irregularities

Vietnam

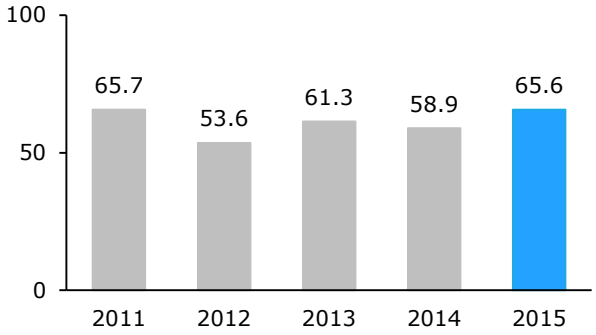
Total Market Validation Study

Precision (%)

Overall precision index improved by 6.7 percentage points in 2015

Large product forms reached 75.8%, medium 56.6% and small 49.3%

Forms validated in both years, 2014 and 2015, improved by 7.0 percentage points to 70.3% in 2015

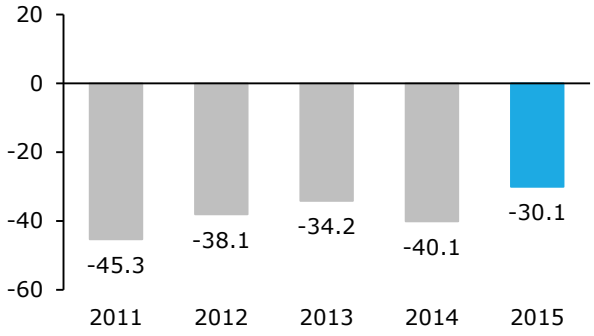


Over/Underestimation (%)

Overall underestimation improved by 10.0 percentage points in 2015

Large product forms were underestimated by 30.0%, medium by 30.8% and small by 28.7%

Underestimation of forms validated in both years, 2014 and 2015, improved by 10.0 percentage points to 28.1% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	62	59	53	60	**30**
Validated market share in unit terms	20%	14%	11%	13%	**10%**
Validated product forms	757	632	661	736	**597**

Actions

Adding rural pharmacy channel led to improvement

Further improve data quality through enhanced data collection and quality control methodologies

Replace low-quality panel stores and enhance sample design in hospital channel

OTC Validation Studies

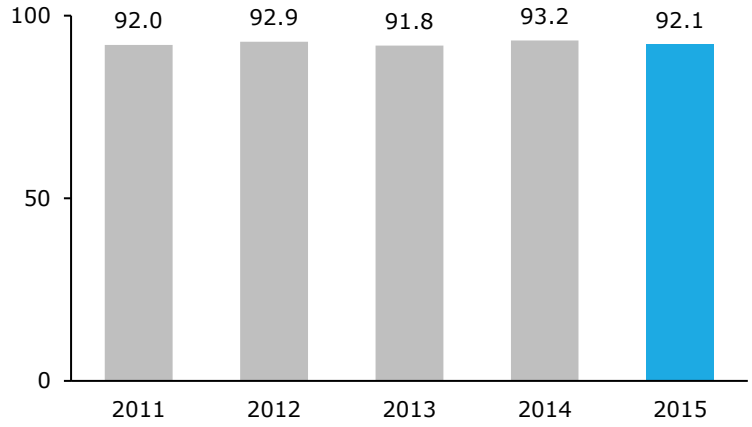
Given the increasing importance of Over-The-Counter (OTC) markets, we regularly evaluate our accuracy measures for OTC products that are sub-groupings of the standard national retail or PharmaTrend services. These "sub-validations" are made possible simply by restricting the national standard validation analysis for a clearly defined subset of products. Due to their small prescription share, these products typically follow distinct distribution routes, and their consumption is more customer-driven than that of prescription-bound products. As a general rule, we find that a higher proportion of these products are sold directly from manufacturer to retail outlet so that QuintilesIMS retail pharmacy samples have a higher impact on our ultimate audit estimates.

Global OTC Validation Results

While in previous years we focused exclusively on QuintilesIMS sell-in services as sub-offerings from our retail services portfolio, since the 2013 ACTS report we are now including also sell-out services in countries where they have become our standard OTC deliverable. For that purpose, five years of data got re-evaluated and summary statistics in this ACTS report are now a mix of metrics originating from either sell-in or sell-out services.

For the 2015 OTC validation studies, 18 countries provided analyzable results. No validation study was necessary in *Norway* as we collect full census data in this country. There, precision results are assumed to be 100 percent. This makes a total of 19 sets of validation results, of which 16 had uninterrupted five-year results. The overall degree of precision in the OTC reports is best described by an aggregated precision index for these 16 countries:

OTC Precision Index (%)



The world-wide OTC precision index declined by 1.1 percentage points, from 93.2% in 2014 to 92.1% in 2015. However, this outcome is in line with previous years and demonstrates high-level accuracy at around 92%.

Improvement & Deterioration

Country	Improvement	
	Precision 2015 %	Change vs. 2014 %p
Korea	68.1	+2.7
Mexico	88.9	+4.4
Slovak Republic	95.9	+2.2

Country	Deterioration	
	Precision 2015 %	Change vs. 2014 %p
Argentina	74.9	-8.2
Bulgaria	95.4	-4.6
Greece	84.2	-4.4
Poland	79.4	-3.5
Venezuela	89.4	-5.3

Three countries demonstrated significant improvement of more than two percentage points over 2014. Remarkable growth of 4.4 percentage points is reported for *Mexico*. *Korea* improved by 2.7 percentage points and the *Slovak Republic* by 2.2 percentage points. Five countries declined by more than two percentage points in 2015, most significantly *Argentina* by 8.2 percentage points.

OTC Validation Results by Country

The validation studies mentioned on the subsequent country pages refer to the QuintilesIMS OTC reports.

Argentina

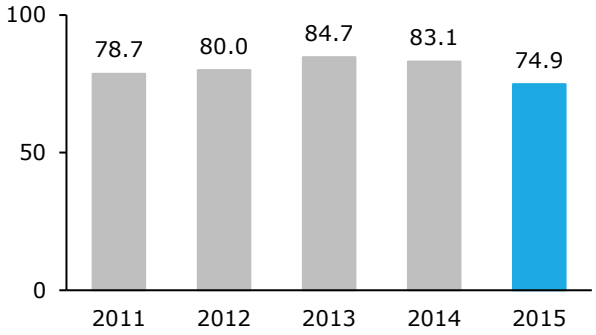
OTC Validation Study

Precision (%)

Overall precision index declined by 8.2 percentage points in 2015

Medium product forms reached 77.2% and small forms 70.9%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined by 8.2 percentage points to 78.4% in 2015

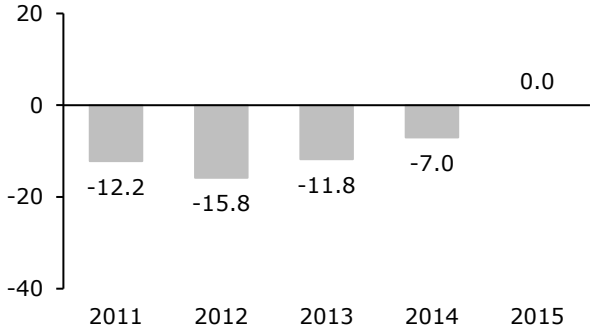


Over/Underestimation (%)

Overall underestimation improved to no bias in 2015

Medium product forms were underestimated by 0.3% and small forms were overestimated by 2.5%. A minor number of large product forms was grouped into the medium class for analysis

Bias of forms validated in both years, 2014 and 2015, increased by 1.0 percentage point to 1.0% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	40	38	37	40	**20**
Validated market share in unit terms	51%	48%	46%	47%	**16%**
Validated product forms	424	405	360	431	**156**

Actions

Motivate more clients to participate in the validation study

Austria

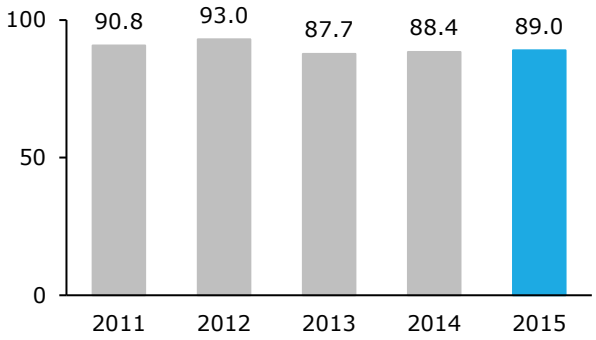
OTC Validation Study

Precision (%)

Overall precision index improved slightly by 0.6 percentage points in 2015

Large product forms reached 86.8%, medium 92.3% and small 89.6%

Forms validated in both years, 2014 and 2015, improved by 1.2 percentage points to 89.8% in 2015

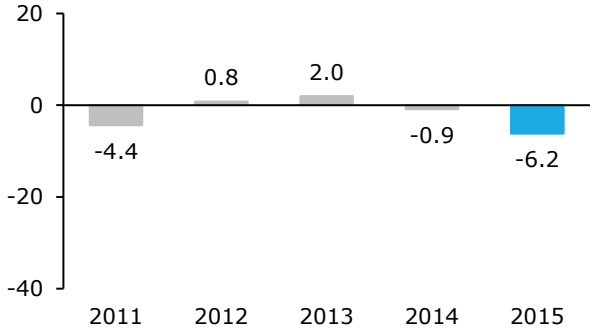


Over/Underestimation (%)

Overall underestimation increased by 5.3 percentage points in 2015

Large product forms were underestimated by 4.9%, medium by 8.0% and small by 8.8%

Underestimation of forms validated in both years, 2014 and 2015, increased by 4.8 percentage points to 5.6% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	85	84	86	86	**87**
Validated market share in unit terms	86%	89%	92%	90%	**89%**
Validated product forms	481	467	507	509	**505**

Actions

No action required from the statistical point of view

Brazil

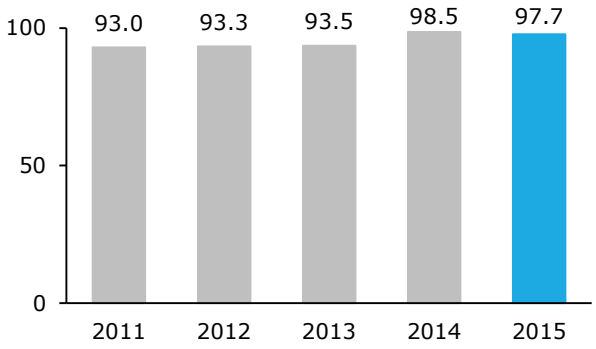
OTC Validation Study

Precision (%)

Overall precision index declined slightly by 0.8 percentage points in 2015

Large product forms reached 98.0%, medium 98.2% and small 95.4%

Forms validated in both years, 2014 and 2015, improved by 1.2 percentage points to a perfect 100% in 2015

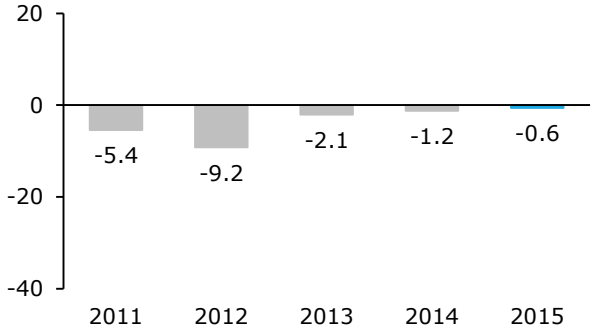


Over/Underestimation (%)

Overall underestimation improved slightly by 0.6 percentage points in 2015

Large product forms were underestimated by 0.2%, medium by 1.2% and small by 1.9%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.7 percentage points to 0.4% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	21	19	26	16	**16**
Validated market share in unit terms	13%	17%	20%	16%	**18%**
Validated product forms	243	319	432	263	**292**

Actions

No action required from the statistical point of view

Bulgaria

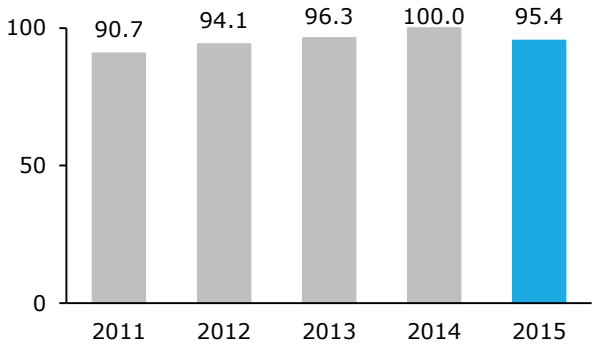
OTC Validation Study

Precision (%)

Overall precision index declined by 4.6 percentage points in 2015

Medium product forms reached 98.2% and small 90.5%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined by 3.9 percentage points to 96.1% in 2015

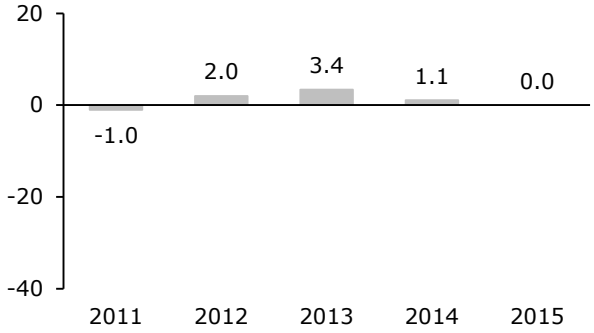


Over/Underestimation (%)

Overall overestimation improved to zero bias in 2015

Medium product forms were underestimated by 0.1% and small forms were overestimated by 1.0%. A minor number of large product forms was grouped into the medium class for analysis

Bias of forms validated in both years, 2014 and 2015, turned from 0.2% overestimation in 2014 to 0.5% underestimation in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	25	29	31	24	**13**
Validated market share in unit terms	43%	54%	56%	44%	**29%**
Validated product forms	120	156	155	151	**78**

Actions

Motivate more clients to participate in the validation study

Canada

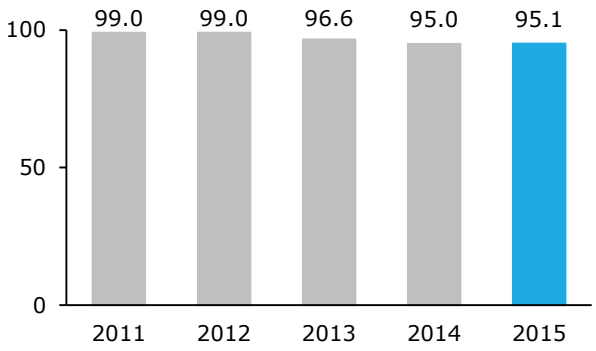
OTC Validation Study

Precision (%)

Overall precision index improved slightly by 0.1 percentage points in 2015

Large product forms reached 94.4%, medium 96.8% and small 93.9%

Forms validated in both years, 2014 and 2015, remained stable at 95.0% in 2015



Over/Underestimation (%)

Overall overestimation slightly improved by 0.3 percentage points in 2015

Large product forms were underestimated by 0.1%, medium forms were overestimated by 2.0% and small by 2.2%

Overestimation of forms validated in both years, 2014 and 2015, slightly improved by 0.3 percentage points to 0.8% in 2015

Participation	2011	2012	2013	2014	2015
Participating companies	50	51	53	56	**60**
Validated market share in unit terms	95%	95%	95%	95%	**95%**
Validated product forms	987	911	909	874	**923**

Actions

No action required from the statistical point of view

Czech Republic

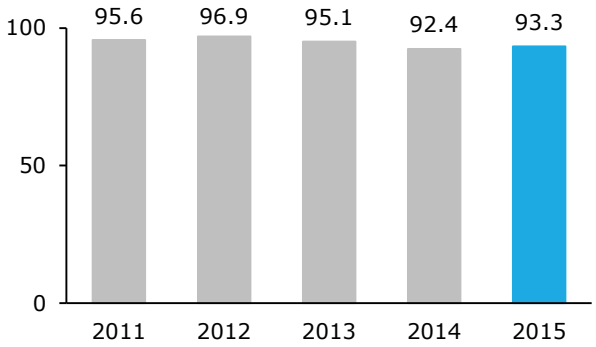
OTC Validation Study

Precision (%)

Overall precision index improved slightly by 0.9 percentage points in 2015

Large product forms reached 93.8%, medium 95.8% and small 86.8%

Forms validated in both years, 2014 and 2015, declined by 2.4 percentage points to 94.2% in 2015

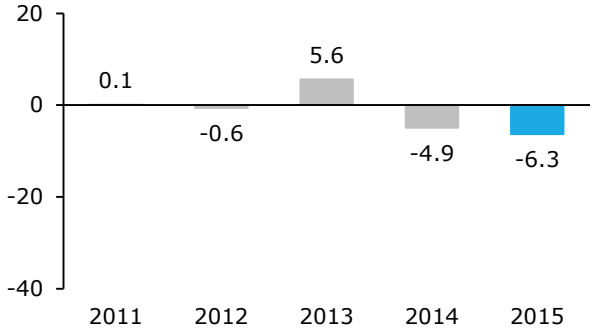


Over/Underestimation (%)

Overall underestimation increased by 1.4 percentage points in 2015

Large product forms were underestimated by 6.6%, medium by 5.3% and small by 7.1%

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.9 percentage points to 7.6% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	19	21	15	20	**15**
Validated market share in unit terms	48%	52%	51%	43%	**47%**
Validated product forms	186	217	213	211	**213**

Actions

Expand panel

Finland

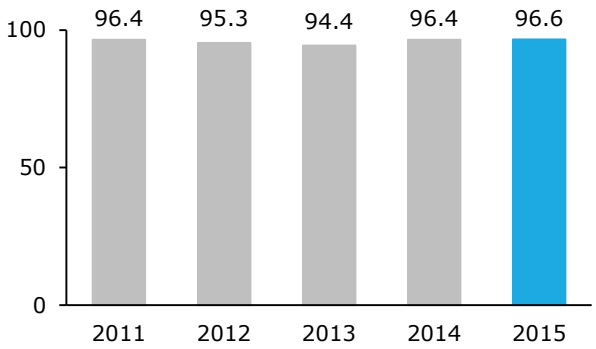
OTC Validation Study

Precision (%)

Overall precision index improved by 0.2 percentage points in 2015

Large product forms reached 98.2%, medium 96.2% and small 92.1%

Forms validated in both years, 2014 and 2015, improved by 0.1 percentage points to 96.7% in 2015

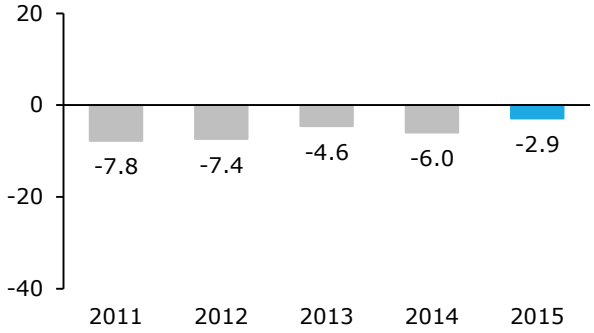


Over/Underestimation (%)

Overall underestimation improved by 3.1 percentage points in 2015

Large product forms were underestimated by 1.9%, medium by 3.8% and small by 8.5%

Underestimation of forms validated in both years, 2014 and 2015, improved by 3.2 percentage points to 2.8% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	53	52	52	52	**52**
Validated market share in unit terms	85%	89%	92%	94%	**94%**
Validated product forms	440	455	458	456	**460**

Actions

No action required from the statistical point of view

Germany

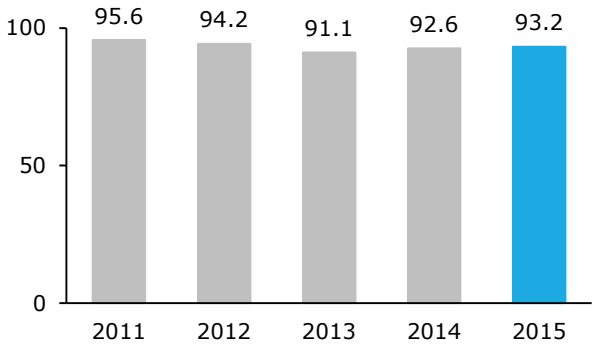
OTC Validation Study

Precision (%)

Overall precision index improved slightly by 0.6 percentage points in 2015

Large product forms reached 95.2%, medium 90.3% and small 92.5%

Forms validated in both years, 2014 and 2015, slightly improved by 0.1 percentage points to 93.5% in 2015

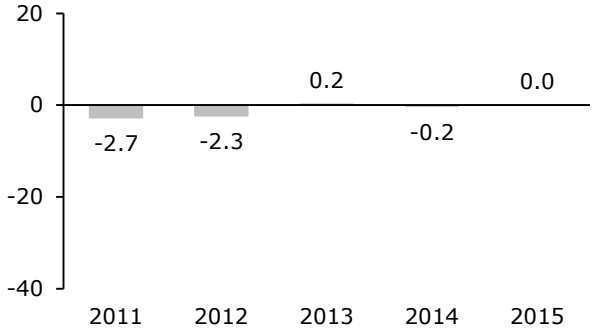


Over/Underestimation (%)

Overall underestimation improved to no bias in 2015

Large product forms were underestimated by 0.4%, medium forms were overestimated by 1.5% and small forms were underestimated by 0.1%

Bias of forms validated in both years, 2014 and 2015, turned from 0.3% underestimation in 2014 to 0.6% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	25	30	23	23	**25**
Validated market share in unit terms	26%	32%	33%	33%	**30%**
Validated product forms	595	710	684	690	**690**

Actions

No action required from the statistical point of view

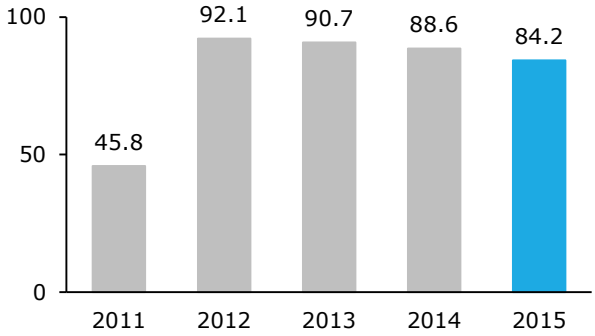
Greece

Precision (%)

Overall precision index declined by 4.4 percentage points in 2015

Medium product forms reached 82.3% and small 87.5%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined by 10.1 percentage points to 82.4% in 2015

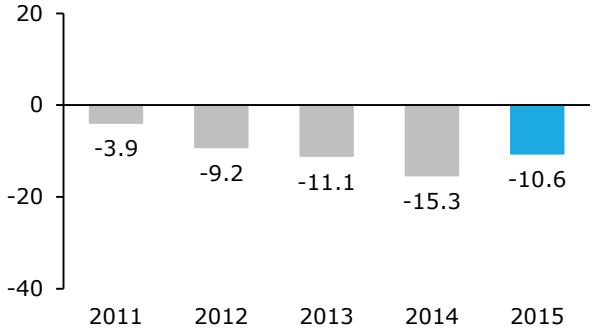


Over/Underestimation (%)

Overall underestimation improved by 4.7 percentage points in 2015

Medium product forms were underestimated by 10.9% and small by 5.4%. A minor number of large product forms was grouped into the medium class for analysis

Underestimation of forms validated in both years, 2014 and 2015, improved by 6.0 percentage points to 9.9% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	34	31	27	30	**27**
Validated market share in unit terms	56%	52%	47%	41%	**47%**
Validated product forms	123	101	75	80	**94**

Actions

Review quality control process and projection methodology

Hungary

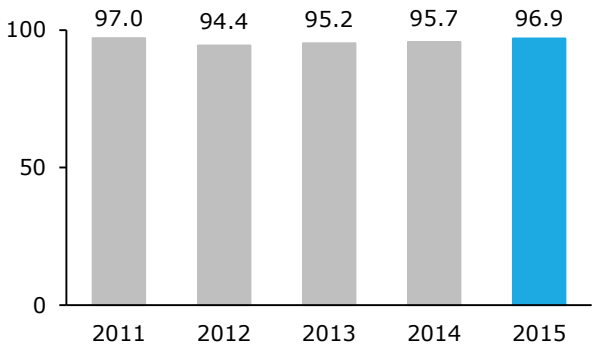
OTC Validation Study

Precision (%)

Overall precision index improved by 1.2 percentage points in 2015

Large product forms reached 98.5%, medium 97.5% and small 90.6%

Forms validated in both years, 2014 and 2015, improved by 1.2 percentage points to 97.5% in 2015

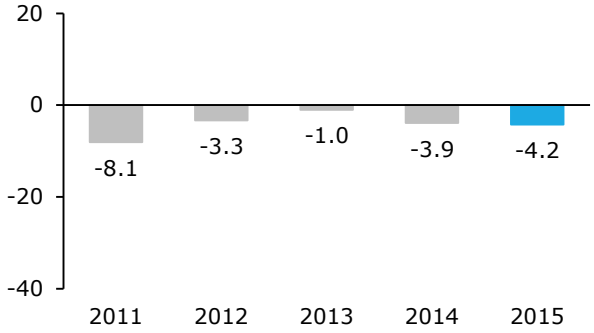


Over/Underestimation (%)

Overall underestimation increased slightly by 0.3 percentage points in 2015

Large product forms were underestimated by 3.9%, medium by 5.1% and small by 4.2%

Underestimation of forms validated in both years, 2014 and 2015, remained unchanged at 3.8% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	41	41	42	40	**41**
Validated market share in unit terms	71%	67%	69%	67%	**65%**
Validated product forms	270	262	308	315	**296**

Actions

Enhance projection methodology

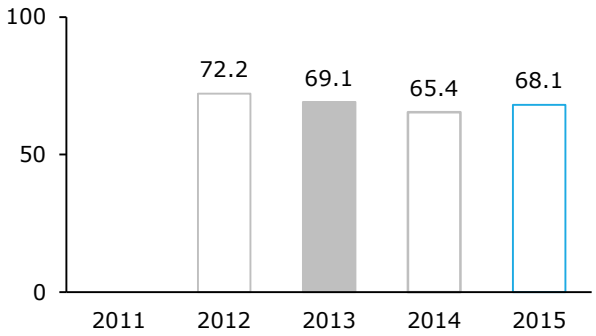
Korea

Precision (%)

Overall precision index improved by 2.7 percentage points in 2015

Medium product forms reached 72.6% and small 60.4%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, declined by 4.1 percentage points to 70.4% in 2015

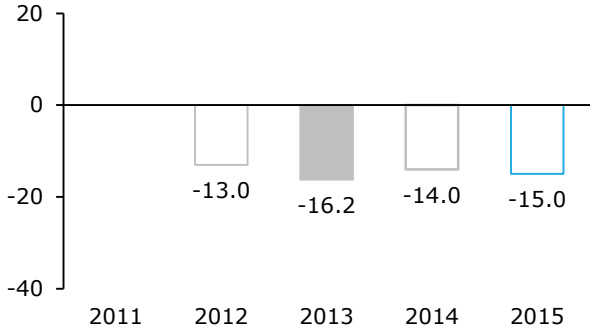


Over/Underestimation (%)

Overall underestimation increased by 1.0 percentage point in 2015

Medium product forms were underestimated by 14.6% and small by 19.0%. A minor number of large product forms was grouped into the medium class for analysis

Underestimation of forms validated in both years, 2014 and 2015, increased by 2.8 percentage points to 12.8% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies		11	8	11	**8**
Validated market share in unit terms		6%	17%	5%	**7%**
Validated product forms		144	204	195	**214**

Actions

Improve data collection and coding quality

Advance quality control mechanisms and input validity checks

Mexico

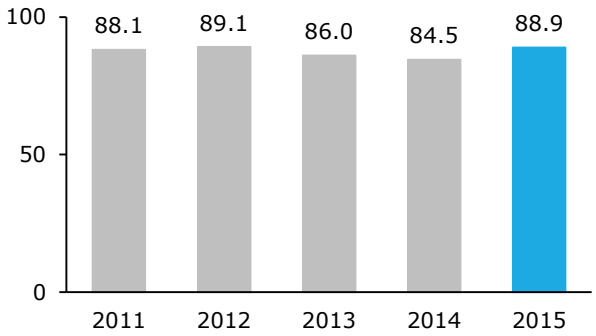
OTC Validation Study

Precision (%)

Overall precision index improved by 4.4 percentage points in 2015

Large product forms reached 94.3%, medium 83.6% and small 81.6%

Forms validated in both years, 2014 and 2015, improved by 2.5 percentage points to 87.8% in 2015

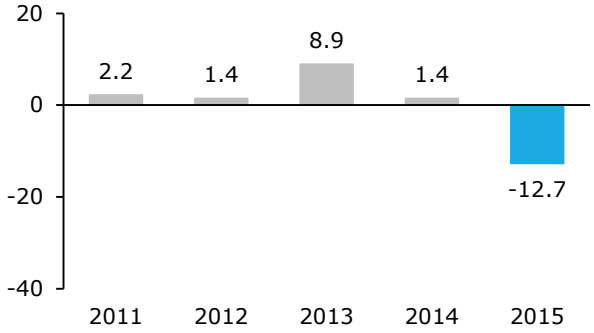


Over/Underestimation (%)

Overall bias turned from 1.4% overestimation in 2014 to 12.7% underestimation in 2015

Large product forms were underestimated by 15.1%, medium by 8.1% and small by 5.0%

Bias of forms validated in both years, 2014 and 2015, increased from no bias in 2014 to 13.0% underestimation in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	19	13	12	10	**8**
Validated market share in unit terms	28%	36%	27%	16%	**13%**
Validated product forms	286	352	254	175	**134**

Actions

Review projection structure and adjust projection level

Motivate more companies to participate in the validation study

Poland

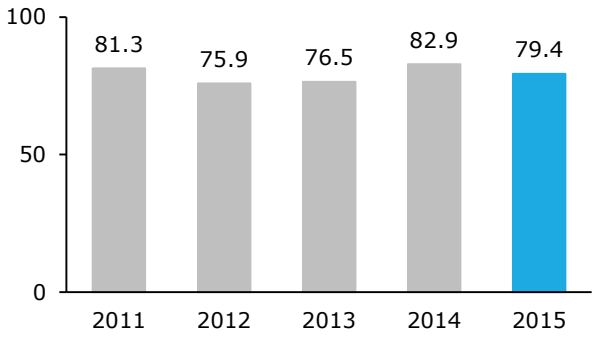
OTC Validation Study

Precision (%)

Overall precision index declined by 3.5 percentage points in 2015

Large product forms reached 85.9%, medium 72.6% and small 71.6%

Forms validated in both years, 2014 and 2015, declined by 5.4 percentage points to 83.3% in 2015

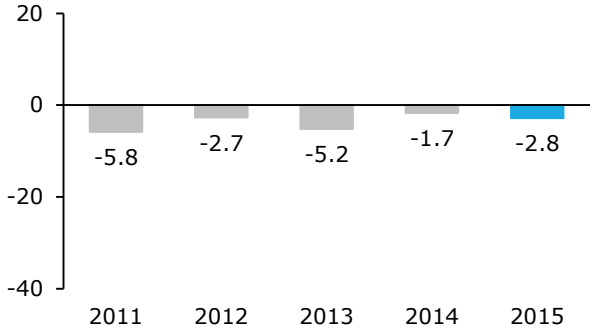


Over/Underestimation (%)

Overall underestimation increased by 1.1 percentage points in 2015

Large product forms were overestimated by 0.7%, medium forms were underestimated by 7.6% and small by 12.4%

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.9 percentage points to 2.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	47	53	40	45	**41**
Validated market share in unit terms	42%	27%	21%	31%	**37%**
Validated product forms	331	289	231	325	**412**

Actions

Enhance quality controls

Slovak Republic

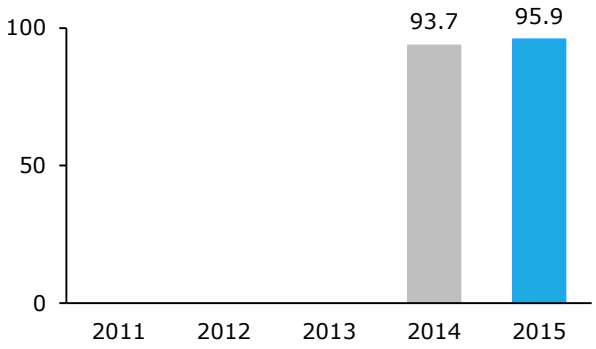
OTC Validation Study

Precision (%)

Overall precision index improved by 2.2 percentage points in 2015

Large product forms reached 97.3%, medium 94.3% and small 94.7%

Forms validated in both years, 2014 and 2015, improved by 1.0 percentage point to 95.1% in 2015

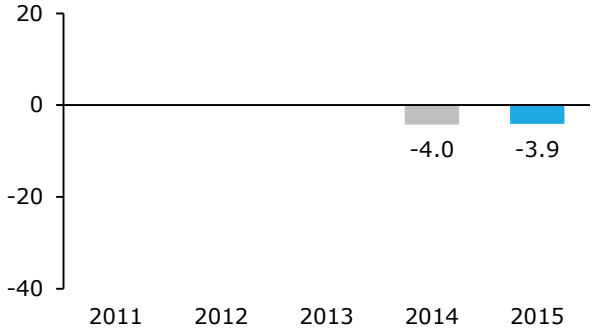


Over/Underestimation (%)

Overall underestimation improved slightly by 0.1 percentage points in 2015

Large product forms were underestimated by 3.7%, medium by 4.2% and small by 4.3%

Underestimation of forms validated in both years, 2014 and 2015, increased marginally by 0.1 percentage points to 3.7% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies				9	**7**
Validated market share in unit terms				31%	**30%**
Validated product forms				107	**109**

Actions

No action required from the statistical point of view

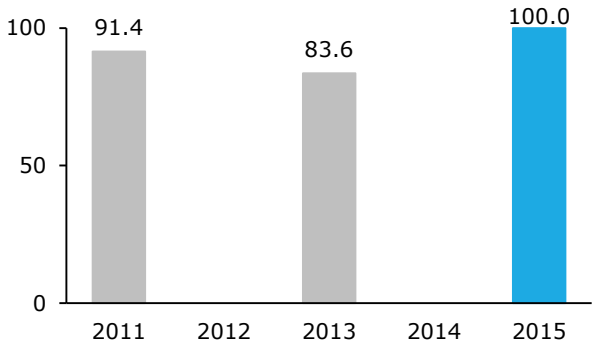
South Africa

OTC Validation Study

Precision (%)

Overall precision index improved by 16.4 percentage points to a perfect 100% in 2015

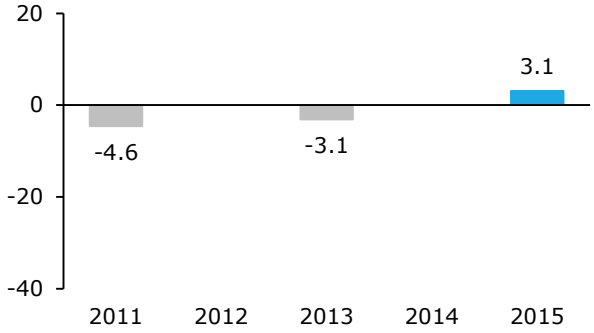
All sales volume groups reached 100%



Over/Underestimation (%)

Overall bias turned from 3.1% underestimation in 2013 to 3.1% overestimation in 2015

Large product forms were overestimated by 3.0%, medium by 3.0% and small by 3.8%



Participation	2011	2012	2013	2014	2015
Participating companies	49		21		**15**
Validated market share in unit terms	77%		11%		**31%**
Validated product forms	859		193		**286**

Actions

Review panel coverage

Spain

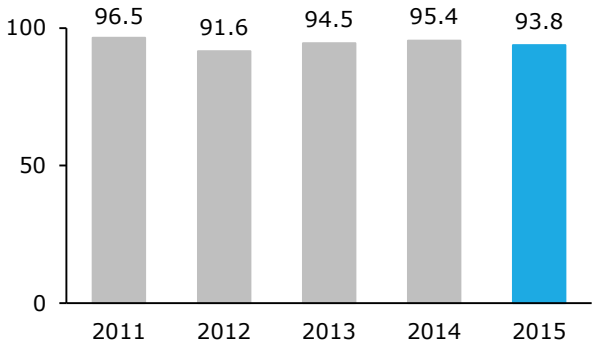
OTC Validation Study

Precision (%)

Overall precision index declined by 1.6 percentage points in 2015

Due to small availability of product forms, a reasonable breakdown into sales volume groups was not possible

Forms validated in both years, 2014 and 2015, improved by 2.5 percentage points to 96.3% in 2015

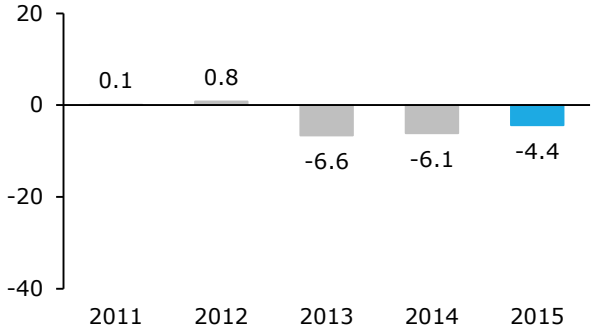


Over/Underestimation (%)

Overall underestimation improved by 1.7 percentage points in 2015

Due to small availability of product forms, a reasonable breakdown into sales volume groups was not possible

Underestimation of forms validated in both years, 2014 and 2015, improved by 2.3 percentage points to 4.6% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	16	10	8	11	**7**
Validated market share in unit terms	27%	23%	15%	26%	**20%**
Validated product forms	77	69	55	82	**65**

Actions

Motivate more companies to participate in the validation study

Switzerland

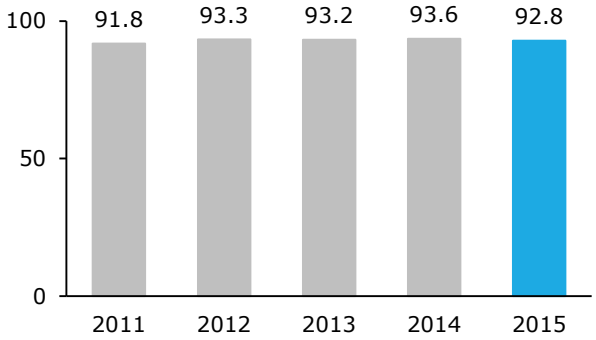
OTC Validation Study

Precision (%)

Overall precision index slightly declined by 0.8 percentage points in 2015

Large product forms reached 93.6%, medium 91.3% and small 93.4%

Forms validated in both years, 2014 and 2015, slightly declined by 0.8 percentage points to 93.2% in 2015

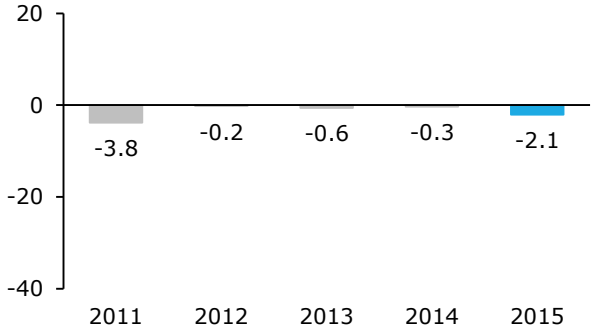


Over/Underestimation (%)

Overall underestimation increased by 1.8 percentage points in 2015

Large product forms were underestimated by 2.2%, medium by 1.5% and small by 2.8%

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.3 percentage points to 1.8% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	134	128	124	127	**125**
Validated market share in unit terms	82%	83%	83%	83%	**81%**
Validated product forms	1,253	1,208	1,236	1,234	**1,198**

Actions

No action required from the statistical point of view

Venezuela

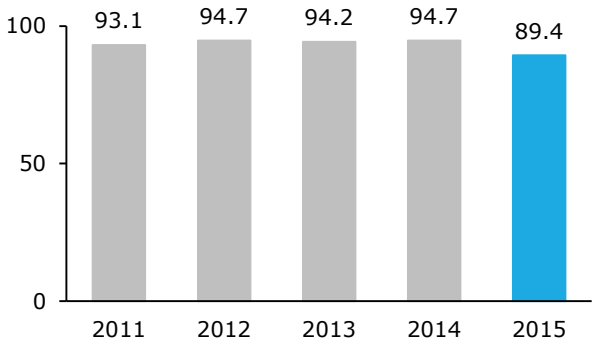
OTC Validation Study

Precision (%)

Overall precision index declined by 5.3 percentage points in 2015

Large product forms reached 94.6%, medium 81.4% and small 88.2%

Forms validated in both years, 2014 and 2015, declined by 2.6 percentage points to 91.6% in 2015

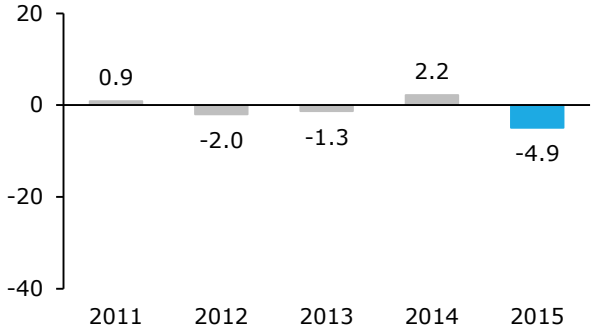


Over/Underestimation (%)

Overall bias turned from 2.2% overestimation in 2014 to 4.9% underestimation in 2015

Large product forms were underestimated by 3.9%, medium by 6.7% and small by 9.8%

Bias of forms validated in both years, 2014 and 2015, turned from 2.6% overestimation in 2014 to 2.6% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	55	34	37	25	**27**
Validated market share in unit terms	58%	39%	55%	34%	**46%**
Validated product forms	470	278	376	220	**246**

Actions

Implement monthly data transformation process to better control market irregularities

PharmaTrend Validation Studies

Unlike OTC audits for which only direct sales information is taken from pharmacy panels, PharmaTrend studies (PTR) are derived from a panel of computerized pharmacies that report not only on sales, but also on purchases and stock inventory. These panels are used in multiple ways:

- Providing direct sales information to national and regional pharmaceutical reports
- Monitoring of new product launches weekly
- Tracking patient care and personal care products
- Estimating OTC *vs*. prescription shares
- Conducting stock and pipeline studies
- Performing sell-out studies

In most countries, we are in a position to validate PTR estimates against real data provided by QuintilesIMS customers in the standard annual validation process. Thus we are consistently using the same underlying methodology, and the results are comparable. All ethical and OTC pharmaceutical items, excluding patient care and personal care products, are subject to this validation.

Overall PharmaTrend Validation Results

For the 2015 PharmaTrend validation studies, 10 countries provided analyzable data, of which 9 had uninterrupted 5-year results. We excluded the *Netherlands* and the *United Kingdom* because the data are incompatible with the national retail audit. The overall degree of precision in QuintilesIMS PharmaTrend reports is best described by an aggregated precision index for these nine countries:

PharmaTrend Precision Index (%)

The 2015 index showed improvement of 1.3 percentage points over 2014, ending at 94.5% precision for PharmaTrend reports on average.

Improvement & Deterioration

All eleven reports achieved precision results exceeding 92% considerably in 2015. Two countries turned out with significant improvement (more than two percentage points) over 2014. The biggest precision growth was seen for *Poland* that gained 5.8 percentage points, followed by *Spain* with 3.3 percentage points. No country showed significant deterioration of more than two percentage points.

Country	Improvement	
	Precision 2015 %	Change vs. 2014 %p
Poland	94.7	+5.8
Spain	96.1	+3.3

PharmaTrend Validation Results by Country

The validation studies mentioned on the subsequent country pages refer to the QuintilesIMS PharmaTrend reports.

Austria

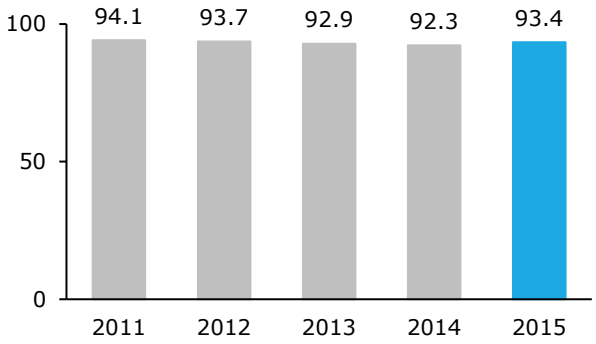
PharmaTrend Validation Study

Precision (%)

Overall precision index improved by 1.1 percentage points in 2015

Large product forms reached 93.8%, medium 94.8% and small 89.1%

Forms validated in both years, 2014 and 2015, improved by 1.7 percentage points to 94.3% in 2015



Over/Underestimation (%)

Overall bias turned from 0.8% overestimation in 2014 to 1.0% underestimation in 2015

Large product forms were underestimated by 0.1%, medium by 1.8% and small by 2.3%

Bias of forms validated in both years, 2014 and 2015, turned from 1.0% overestimation in 2014 to 0.9% underestimation in 2015

Participation	2011	2012	2013	2014	2015
Participating companies	180	210	209	210	**209**
Validated market share in unit terms	78%	71%	72%	72%	**70%**
Validated product forms	1,939	2,528	2,754	2,795	**2,781**

Actions

No action required from the statistical point of view

Czech Republic

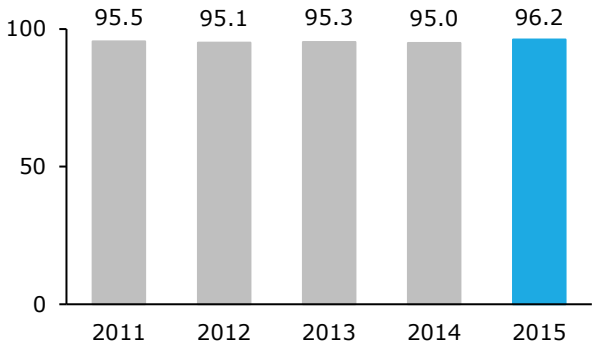
PharmaTrend Validation Study

Precision (%)

Overall precision index improved by 1.2 percentage points in 2015

Large product forms reached 98.0%, medium 95.8% and small 90.8%

Forms validated in both years, 2014 and 2015, declined slightly by 0.4 percentage points to 96.2% in 2015

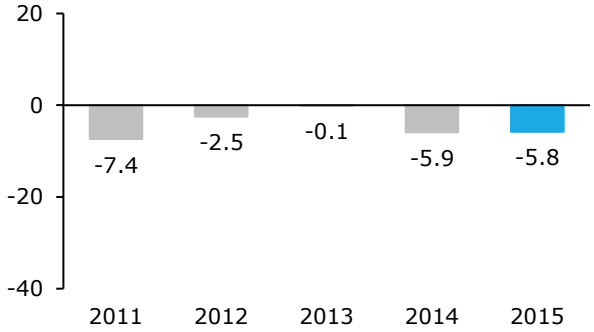


Over/Underestimation (%)

Overall underestimation improved marginally by 0.1 percentage points in 2015

Large product forms were underestimated by 5.9%, medium by 5.0% and small forms by 7.8%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.6 percentage points to 5.5% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	24	29	21	26	**20**
Validated market share in unit terms	31%	33%	30%	29%	**26%**
Validated product forms	718	828	857	843	**709**

Actions

No action required from the statistical point of view

Finland

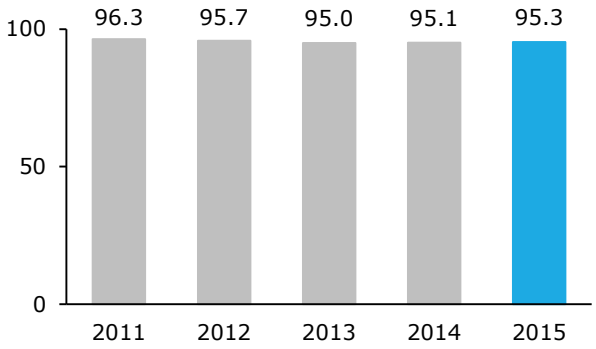
PharmaTrend Validation Study

Precision (%)

Overall precision index improved slightly by 0.2 percentage points in 2015

Large product forms reached 98.5%, medium 96.0% and small 83.0%

Forms validated in both years, 2014 and 2015, improved slightly by 0.4 percentage points to 95.5% in 2015

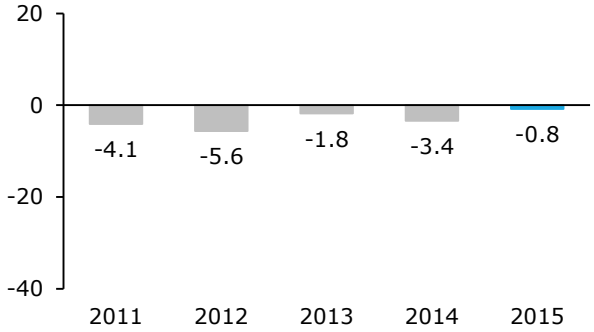


Over/Underestimation (%)

Overall underestimation improved by 2.6 percentage points in 2015

Large product forms were underestimated by 0.2%, medium by 1.3% and small by 2.6%

Underestimation of forms validated in both years, 2014 and 2015, improved by 2.5 percentage points to 0.9% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	120	120	126	127	**133**
Validated market share in unit terms	75%	76%	76%	75%	**89%**
Validated product forms	1,951	1,933	1,969	1,962	**2,003**

Actions

No action required from the statistical point of view

Germany

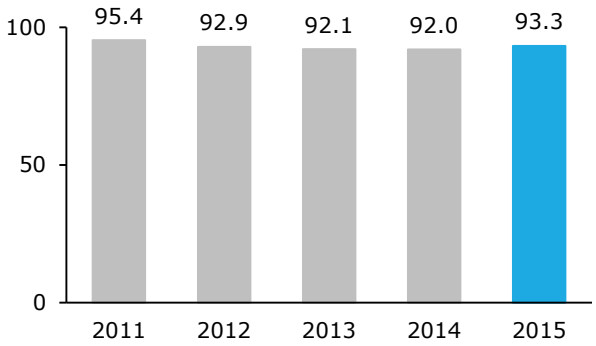
PharmaTrend Validation Study

Precision (%)

Overall precision index improved by 1.3 percentage points in 2015

Large product forms reached 94.9%, medium 93.7% and small 87.0%

Forms validated in both years, 2014 and 2015, improved slightly by 0.2 percentage points to 93.7% in 2015

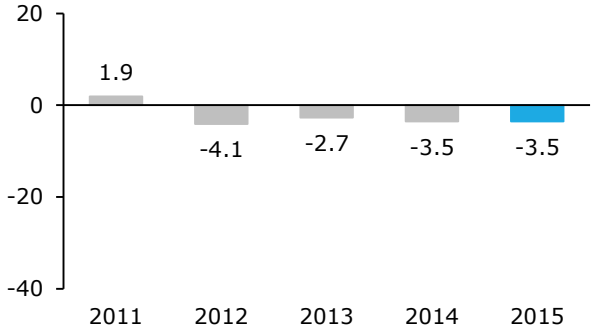


Over/Underestimation (%)

Overall underestimation remained stable at 3.5% in 2015

Large product forms were underestimated by 3.8%, medium by 2.6% and small by 3.8%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.4 percentage points to 3.0% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	39	48	39	41	**38**
Validated market share in unit terms	24%	25%	26%	25%	**24%**
Validated product forms	3,630	3,831	3,489	3,554	**3,363**

Actions

No action required from the statistical point of view

Hungary

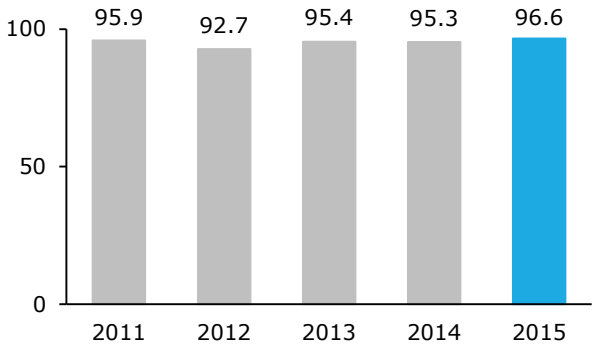
PharmaTrend Validation Study

Precision (%)

Overall precision index improved by 1.3 percentage points in 2015

Large product forms reached 99.5%, medium 96.9% and small 86.3%

Forms validated in both years, 2014 and 2015, improved by 1.2 percentage points to 97.0% in 2015

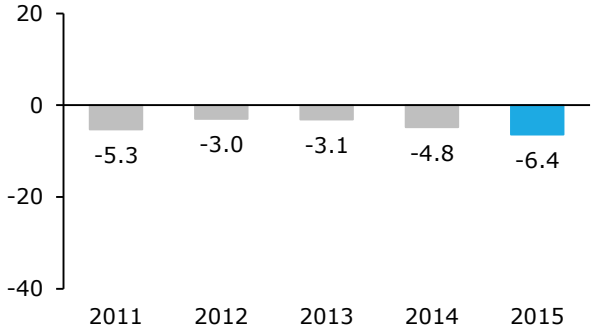


Over/Underestimation (%)

Overall underestimation increased by 1.6 percentage points in 2015

Large product forms were underestimated by 6.2%, medium by 6.5% and small by 7.6%

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.0 percentage point to 6.2% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	86	79	80	82	**83**
Validated market share in unit terms	50%	44%	40%	34%	**29%**
Validated product forms	1,381	1,390	1,376	1,403	**1,257**

Actions

Enhance projection methodology

Italy

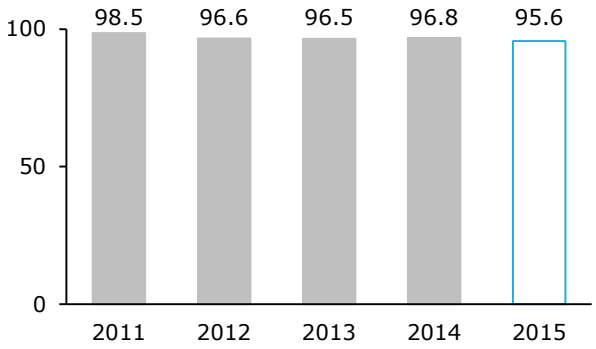
PharmaTrend Validation Study

Precision (%)

Overall precision index declined by 1.2 percentage points in 2015

Large product forms reached 95.7%, medium 96.6% and small 93.3%

Forms validated in both years, 2014 and 2015, declined slightly by 0.3 percentage points to 94.8% in 2015

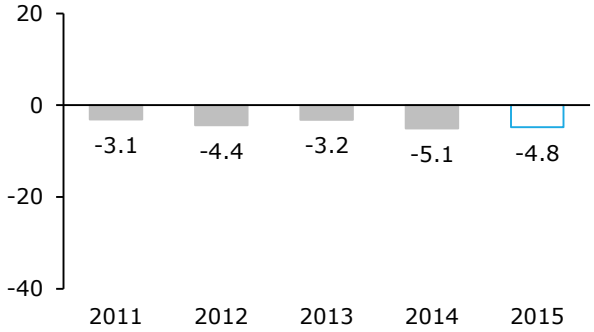


Over/Underestimation (%)

Overall underestimation slightly improved by 0.3 percentage points in 2015

Large product forms were underestimated by 6.0%, medium by 3.0% and small by 5.4%

Underestimation of forms validated in both years, 2014 and 2015, improved slightly by 0.9 percentage points to 3.3% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	27	29	31	22	**15**
Validated market share in unit terms	30%	29%	25%	18%	**9%**
Validated product forms	979	1,057	971	673	**475**

Actions

Motivate more companies to participate in the validation study

Poland

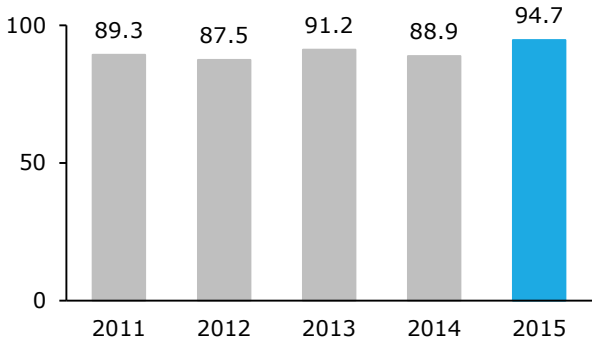
PharmaTrend Validation Study

Precision (%)

Overall precision index improved by 5.8 percentage points in 2015

Large product forms reached 95.9%, medium 93.8% and small 92.2%

Forms validated in both years, 2014 and 2015, improved by 6.7 percentage points to 98.2% in 2015

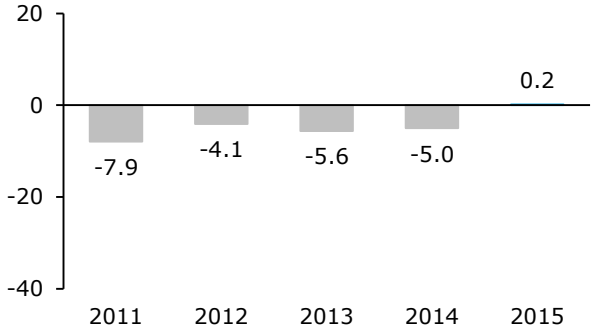


Over/Underestimation (%)

Overall bias improved from 5.0% underestimation in 2014 to 0.2% overestimation in 2015

Large product forms were overestimated by 1.5%, medium forms were underestimated by 1.0% and small by 2.1%

Bias of forms validated in both years, 2014 and 2015, improved from 5.3% underestimation in 2014 to 0.4% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	78	82	69	71	**71**
Validated market share in unit terms	37%	26%	20%	22%	**29%**
Validated product forms	1,407	1,185	994	1,135	**1,507**

Actions

No action required from the statistical point of view

Slovak Republic

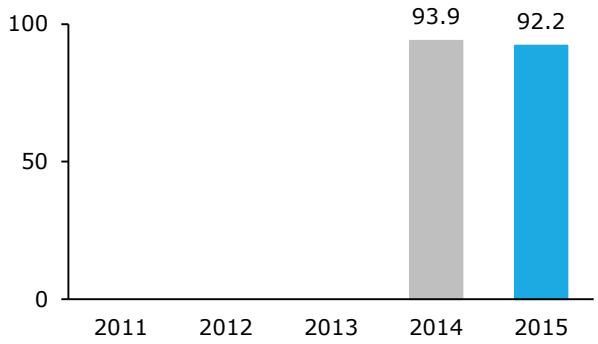
PharmaTrend Validation Study

Precision (%)

Overall precision index declined by 1.7 percentage points in 2015

Large product forms reached 98.2%, medium 90.1% and small 76.3%

Forms validated in both years, 2014 and 2015, improved slightly by 0.3 percentage points to 94.0% in 2015

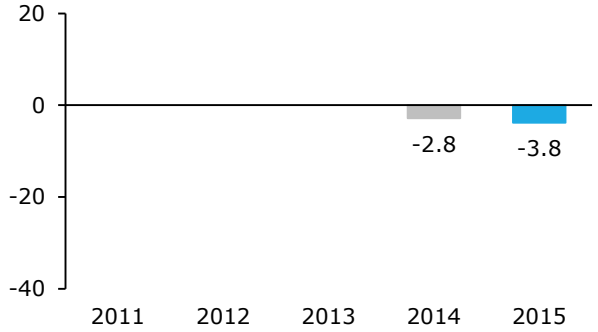


Over/Underestimation (%)

Overall underestimation increased by 1.0 percentage point in 2015

Large product forms were underestimated by 4.4%, medium by 2.7% and small by 0.9%

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.0 percentage point to 3.9% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies				17	**12**
Validated market share in unit terms				15%	**15%**
Validated product forms				386	**437**

Actions

No immediate action required

Spain

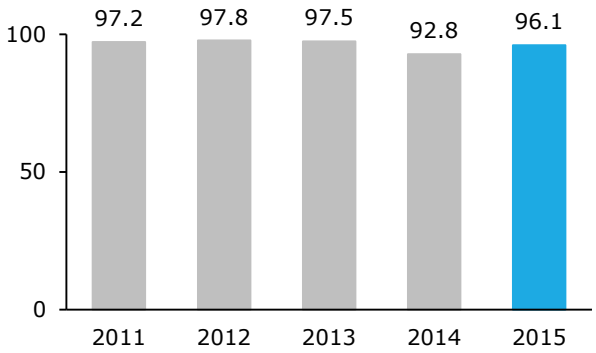
PharmaTrend Validation Study

Precision (%)

Overall precision index improved by 3.3 percentage points in 2015

Large product forms reached 97.6%, medium 96.4% and small 90.3%

Forms validated in both years, 2014 and 2015, improved by 4.0 percentage points to 94.7% in 2015

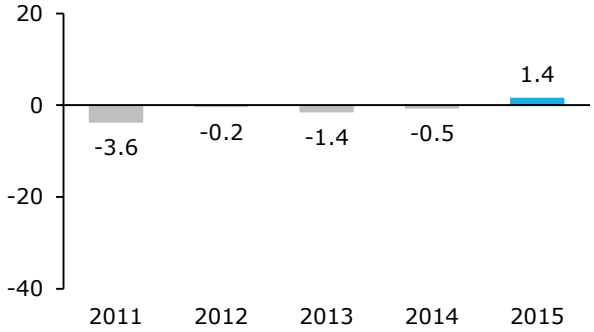


Over/Underestimation (%)

Overall bias turned from 0.5% underestimation in 2014 to 1.4% overestimation in 2015

Large product forms were overestimated by 2.2% and medium by 0.3%, small forms were underestimated by 0.7%

Bias of forms validated in both years, 2014 and 2015, turned from 0.9% underestimation in 2014 to 3.0% overestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	28	24	15	17	**19**
Validated market share in unit terms	22%	13%	11%	13%	**15%**
Validated product forms	701	670	536	616	**732**

Actions

No action required from the statistical point of view

Switzerland

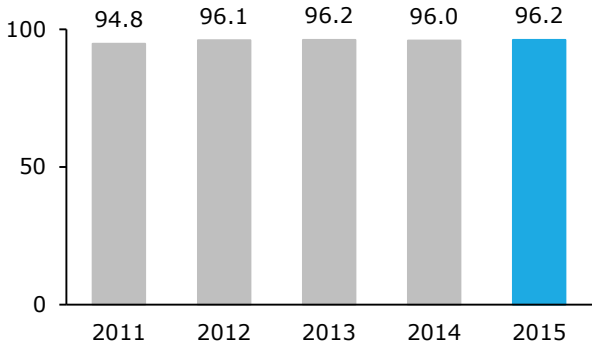
PharmaTrend Validation Study

Precision (%)

Overall precision index slightly improved by 0.2 percentage points in 2015

Large product forms reached 96.5%, medium 95.9% and small forms 96.1%

Forms validated in both years, 2014 and 2015, remained unchanged at 96.3% in 2015

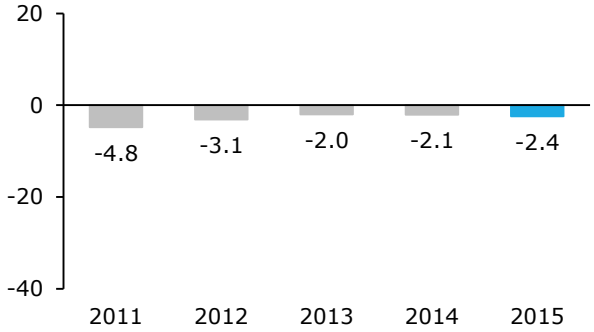


Over/Underestimation (%)

Overall underestimation increased slightly by 0.3 percentage points in 2015

Large product forms were underestimated by 2.6%, medium by 2.0% and small by 2.7%

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.2 percentage points to 2.4% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	206	191	188	190	**184**
Validated market share in unit terms	88%	87%	88%	89%	**89%**
Validated product forms	3,177	3,074	3,163	3,226	**3,197**

Actions

No action required from the statistical point of view

Hospital Validation Studies

QuintilesIMS offers two types of hospital audits: purchase-based and consumption-based audits. Although both types target the national hospital market segment, the data collection methodology may produce values that are not directly comparable with the industry's internal sales figures. Several factors lead to this incompatibility, and thus to a failure of the traditional validation process. Examples are:

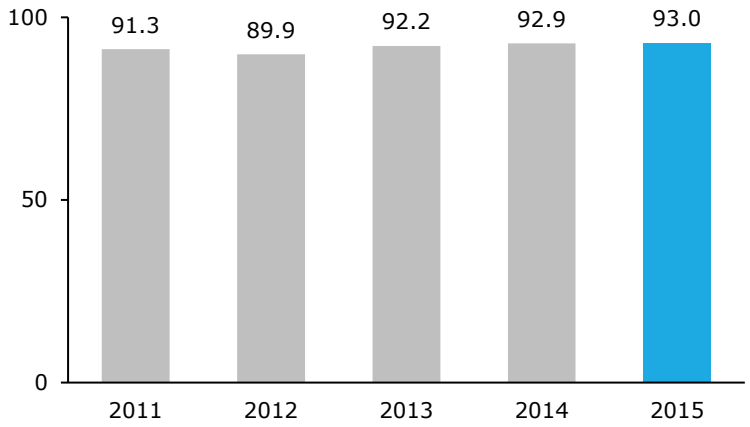
- Indirect sales through secondary distribution entities (wholesalers, subdistributors etc.) are not separable.
- Consumption often does not give an indication of the original pack dispensation.
- Generic products cannot be assigned to individual manufacturers.

Hospital consumption audits measure deliveries from hospital pharmacies to hospital departments. These measures are not fully compatible with manufacturer sales into pharmacies. Large gaps or inconsistencies in the points of measurement between the two tracking systems result in lower precision values. Therefore, when interpreting the validation results, we less focus on their absolute value, but more on changes from one year to another.

Global Hospital Validation Results

For the 2015 validation studies, 25 countries provided analyzable results. No validation study was necessary in *Denmark*, *Finland*, *New Zealand*, *Norway* and *Sweden* because we collect full census data in these countries and we suppose 100% precision in these five markets. This makes a total of 30 sets of validation results, of which 26 had uninterrupted five-year results. The overall degree of precision in QuintilesIMS hospital reports is best described by an aggregated precision index for these 26 countries:

Hospital Precision Index (%)



The world-wide precision index of hospital reports improved slightly by 0.1 percentage points, from 92.9% in 2014 to 93.0% in 2015. This result represents the best achievement of the last five years and stabilizes hospital reports well above the 90% margin.

Improvement & Deterioration

Country	Improvement	
	Precision 2015 %	Change vs. 2014 %p
Italy	93.6	+8.0
Korea	61.7	+4.2
Philippines	100.0	+5.1
Russia	88.7	+2.4
Serbia	99.6	+2.6
Vietnam	65.6	+6.7

Country	Deterioration	
	Precision 2015 %	Change vs. 2014 %p
Austria	86.5	-5.4
United Kingdom	92.8	-2.1

Six countries showed significant improvement of more than 2 percentage points over 2014. The biggest gain of 8.0 percentage points is reported for *Italy*, followed by *Vietnam* with 6.7 percentage points. The remaining four countries improved their previous year's precision value by 2.4 to 5.1 percentage points. Two countries declined by more than 2 percentage points, most significantly *Austria* with a 5.4 percentage point loss. The *United Kingdom* declined by 2.1 percentage points.

Hospital Validation Results by Country

From the 25 countries with analyzable results, 15 were validated jointly with their equivalent retail audits (*Australia*, *Croatia, Czech Republic, Hungary, India, Japan, Kazakhstan, Poland, Russia, Serbia, Slovak Republic, Slovenia, Switzerland, USA and Vietnam*). The detailed results for these countries can be found in the retail section of this Accuracy part. The remaining 10 countries with pure hospital validation results are presented on the subsequent pages.

Austria

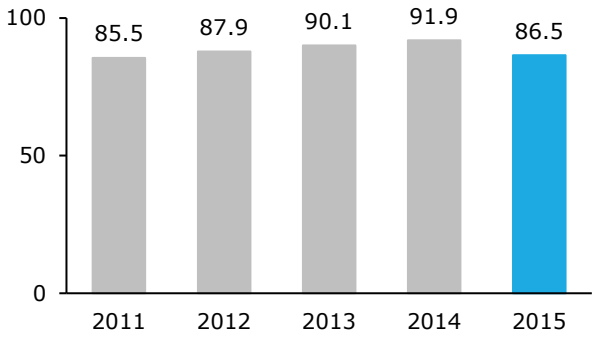
Hospital Validation Study

Precision (%)

Overall precision index declined by 5.4 percentage points in 2015

Large product forms reached 92.2%, medium 80.8% and small 78.6%

Forms validated in both years, 2014 and 2015, declined by 2.3 percentage points to 90.0% in 2015

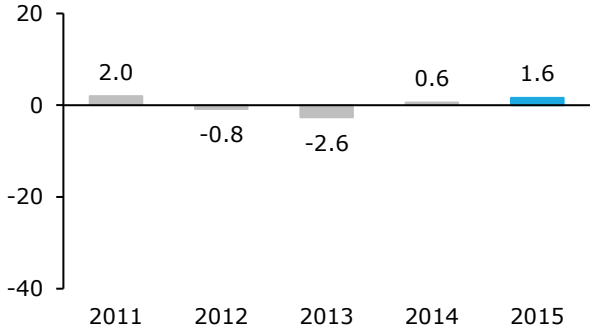


Over/Underestimation (%)

Overall overestimation increased slightly by 1.0 percentage point in 2015

Large product forms were overestimated by 3.4%, medium forms were underestimated by 0.5% and small by 1.6%

Overestimation of forms validated in both years, 2014 and 2015, increased by 3.1 percentage points to 3.9% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	9	11	10	12	**14**
Validated market share in unit terms	21%	24%	23%	27%	**35%**
Validated product forms	347	380	417	472	**626**

Actions

Review input quality controls

Bulgaria

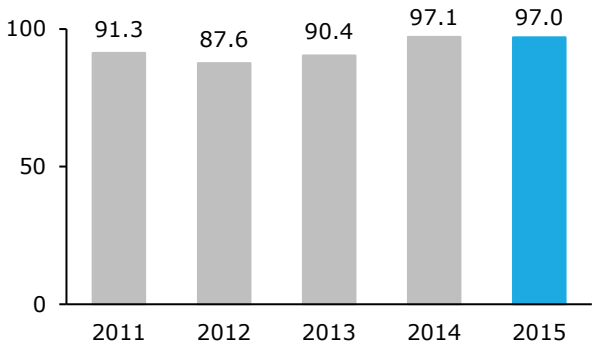
Hospital Validation Study

Precision (%)

Overall precision index declined marginally by 0.1 percentage points in 2015

Due to low availability of product forms, a reasonable breakdown into sales volume groups was not possible

Forms validated in both years, 2014 and 2015, remained unchanged at 97.1%

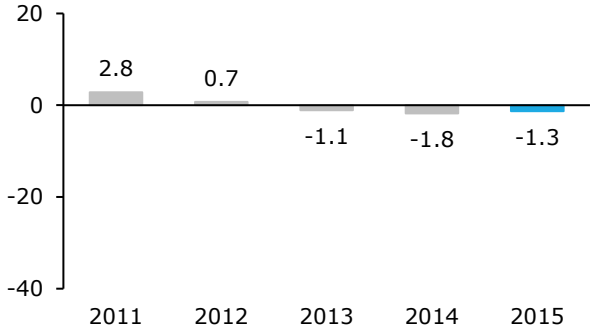


Over/Underestimation (%)

Overall underestimation improved slightly by 0.5 percentage points in 2015

Due to low availability of product forms, a reasonable breakdown into sales volume groups was not possible

Underestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.3 percentage points to 1.1% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	24	29	34	19	**11**
Validated market share in unit terms	62%	53%	55%	28%	**24%**
Validated product forms	153	153	149	69	**67**

Actions

No action required from the statistical point of view

Canada

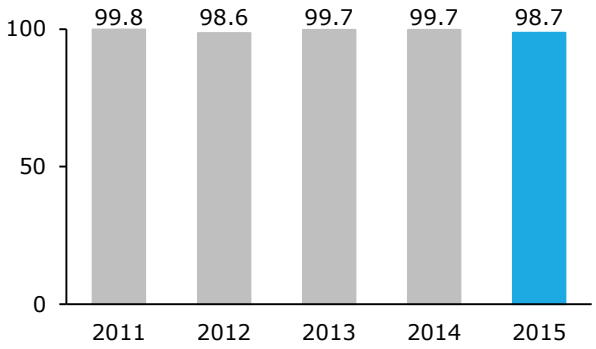
Hospital Validation Study

Precision (%)

Overall precision index declined slightly by 1.0 percentage point in 2015

Large product forms reached 98.0%, medium 99.5% and small forms 99.4%

Forms validated in both years, 2014 and 2015, slightly declined by 1.1 percentage points to 98.6% in 2015



Over/Underestimation (%)

Overall overestimation remained stable at 0.9% in 2015

Large product forms were overestimated by 0.9%, medium by 0.9% and small by 1.1%

Overestimation of forms validated in both years, 2014 and 2015, remained stable at 0.9% in 2015

Participation	2011	2012	2013	2014	2015
Participating companies	56	60	59	63	**64**
Validated market share in unit terms	95%	95%	95%	95%	**95%**
Validated product forms	870	873	865	851	**885**

Actions

No action required from the statistical point of view

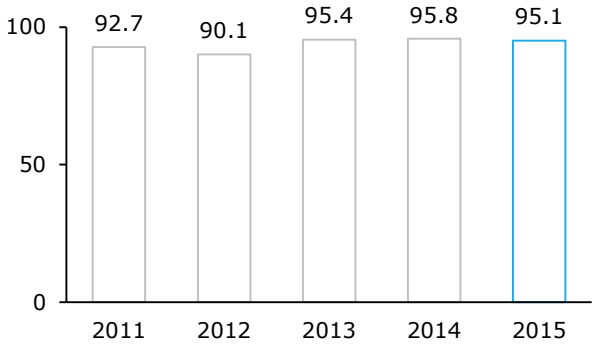
China

Hospital Validation Study

Precision (%)

Overall precision index slightly declined by 0.7 percentage points in 2015

Forms validated in both years, 2014 and 2015, slightly declined by 0.9 percentage point to 95.1% in 2015

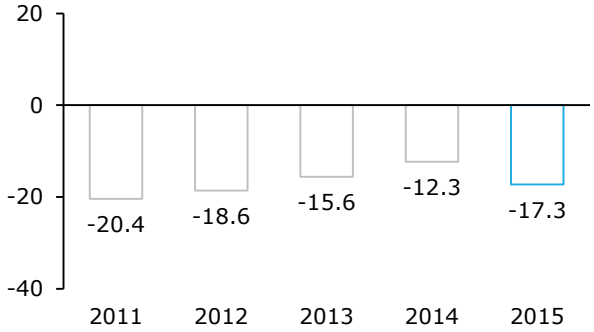


Over/Underestimation (%)

Overall underestimation increased by 5.0 percentage points in 2015

Large product forms were underestimated by 19.1%, medium by 13.0% and small by 10.3%

Underestimation of forms validated in both years, 2014 and 2015, increased by 5.7 percentage points to 17.9% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	35	39	44	39	**43**
Validated market share in unit terms	4%	4%	5%	4%	**5%**
Validated product forms	248	273	330	286	**342**

Actions

Update projection universe

Germany

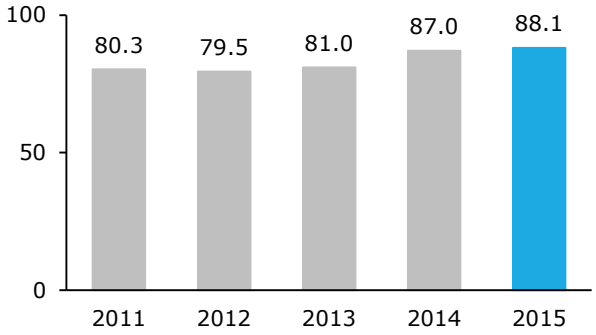
Hospital Validation Study

Precision (%)

Overall precision index improved by 1.1 percentage points in 2015

Large product forms reached a perfect 100%, medium forms reached 86.4% and small 51.7%

Forms validated in both years, 2014 and 2015, declined by 2.6 percentage points to 85.0% in 2015

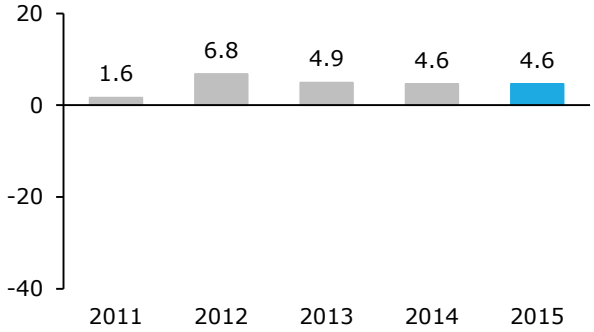


Over/Underestimation (%)

Overall overestimation remained stable at 4.6% in 2015

Large product forms were overestimated by 3.0%, medium by 5.1% and small by 5.9%

Overestimation of forms validated in both years, 2014 and 2015, increased slightly by 0.8 percentage point to 4.8% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	21	19	21	22	**23**
Validated market share in value terms	54%	40%	42%	50%	**47%**
Validated product forms	952	805	820	1,244	**1,173**

Actions

No action required from the statistical point of view

Italy

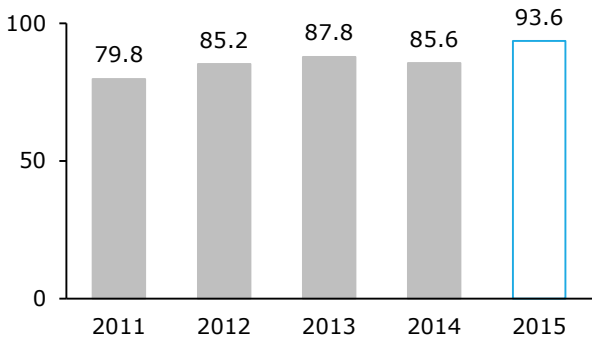
Hospital Validation Study

Precision (%)

Overall precision index improved by 8.0 percentage points in 2015

Medium product forms reached 97.6% and small 86.8%. A minor number of large product forms was grouped into the medium class for analysis

Forms validated in both years, 2014 and 2015, improved by 4.9 percentage points to 93.5% in 2015

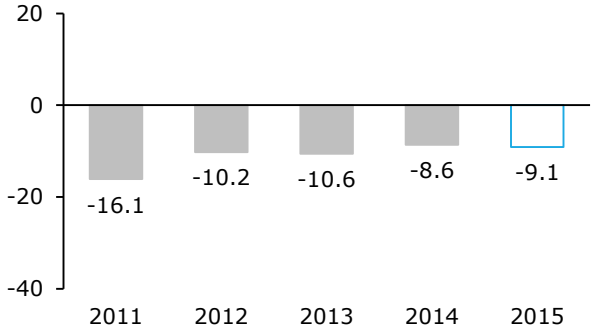


Over/Underestimation (%)

Overall underestimation increased slightly by 0.5 percentage points in 2015

Medium product forms were underestimated by 7.8% and small by 19.3%. A minor number of large product forms was grouped into the medium class for analysis

Underestimation of forms validated in both years, 2014 and 2015, increased by 1.9 percentage points to 8.5% in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	11	13	13	10	**6**
Validated market share in unit terms	18%	16%	15%	12%	**6%**
Validated product forms	187	207	184	143	**80**

Actions

Motivate more companies to participate in the validation study

Korea

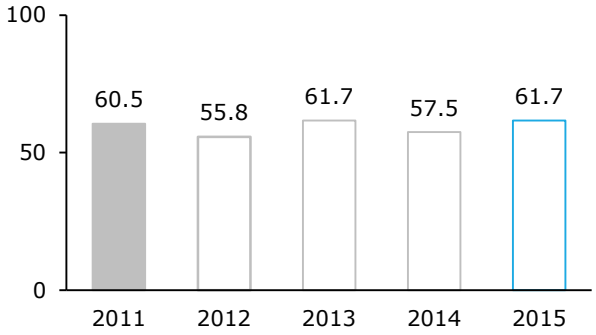
Hospital Validation Study

Precision (%)

Overall precision index improved by 4.2 percentage points in 2015

Due to low participation, a reasonable breakdown into sales volume groups was not possible

Forms validated in both years, 2014 and 2015, declined by 5.5 percentage points to 54.8% in 2015

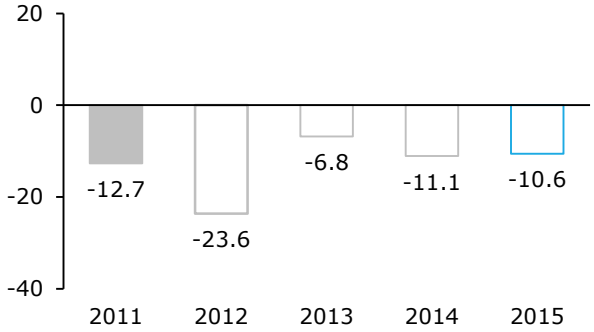


Over/Underestimation (%)

Overall underestimation improved slightly by 0.5 percentage points in 2015

Due to low participation, a reasonable breakdown into sales volume groups was not possible

Underestimation of forms validated in both years, 2014 and 2015, increased by 6.7 percentage points to 24.8% in 2015



Participation

	2011	2012	2013	2014	2015
Participating companies	18	15	12	17	**12**
Validated market share in unit terms	34%	9%	7%	5%	**6%**
Validated product forms	348	264	175	181	**154**

Actions

Review projection level and panel composition

Improve coding and data quality check methodology

Philippines

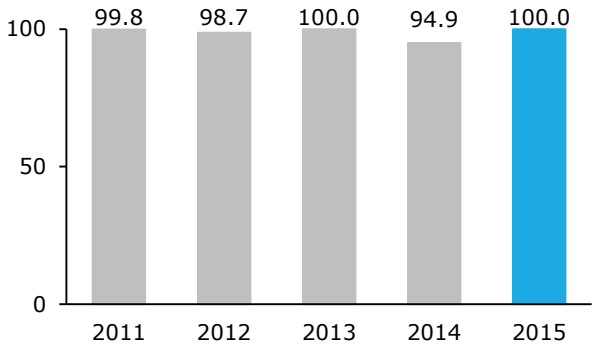
Hospital Validation Study

Precision (%)

Overall precision index improved by 5.1 percentage points in 2015 to a perfect 100%

All sales volume classes reached 100%

Forms validated in both years, 2014 and 2015, improved by 4.2 percentage points to 100% in 2015

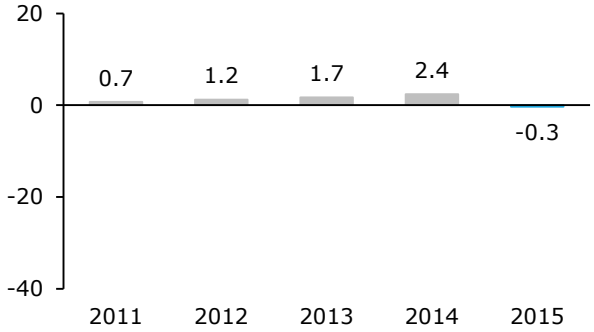


Over/Underestimation (%)

Overall bias turned from 2.4% overestimation in 2014 to 0.3% underestimation in 2015

Large product forms were underestimated by 0.4%, medium by 0.3% and small by 0.2%

Bias of forms validated in both years, 2014 and 2015, turned from 2.2% overestimation in 2014 to 0.7% underestimation in 2015



Participation	2011	2012	2013	2014	2015
Participating companies	21	16	15	19	**66**
Validated market share in unit terms	23%	21%	21%	24%	**49%**
Validated product forms	330	272	254	332	**809**

Actions

No action required from the statistical point of view

Spain

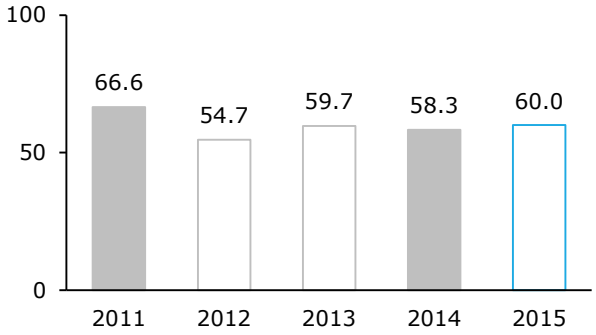
Hospital Validation Study

Precision (%)

Overall precision index improved by 1.7 percentage points in 2015

Due to low participation, a reasonable breakdown into sales volume groups was not possible

Forms validated in both years, 2014 and 2015, declined by 13.1 percentage points to 71.7% in 2015



Over/Underestimation (%)

Overall overestimation improved by 1.9 percentage points in 2015

Due to low participation, a reasonable breakdown into sales volume groups was not possible

Underestimation of forms validated in both years, 2014 and 2015, improved by 1.9 percentage points to 3.3% in 2015

Participation	2011	2012	2013	2014	2015
Participating companies	13	7	8	9	**6**
Validated market share in unit terms	11%	9%	2%	10%	**5%**
Validated product forms	470	106	72	132	**75**

Actions

Motivate more companies to participate in the validation study

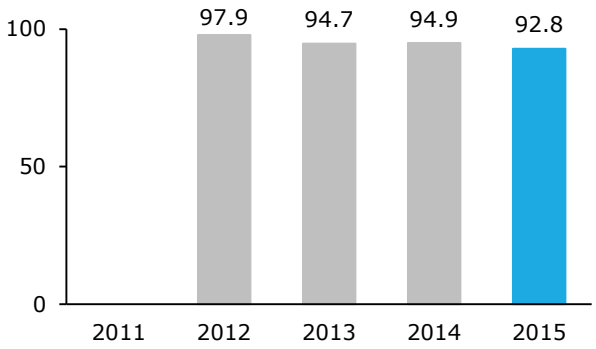
United Kingdom

Hospital Validation Study

Precision (%)

Overall precision index declined by 2.1 percentage points in 2015

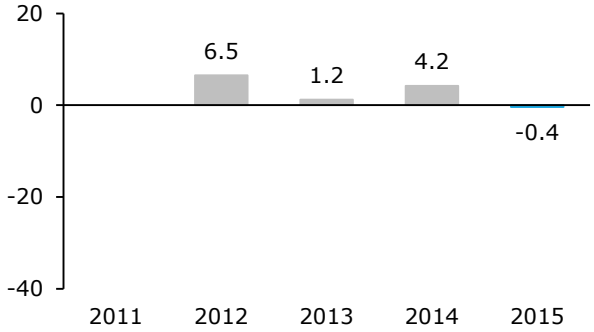
Medium product forms reached 92.6% and small 93.1%. A minor number of large product forms was grouped into the medium class for analysis



Over/Underestimation (%)

Overall bias turned from 4.2% overestimation in 2014 to 0.4% underestimation in 2015

Medium product forms were underestimated by 0.5% and small forms were overestimated by 0.7%. A minor number of large product forms was grouped into the medium class for analysis



Participation	2011	2012	2013	2014	2015
Participating companies		8	9	9	**92**
Validated market share in value terms		21%	16%	13%	**11%**
Validated product forms		402	410	419	**430**

Actions

Continue to improve the quality control process

Specialty Markets Validation Results

Given the increasing importance of specialty pharmaceutical markets, we have calculated separate accuracy measures for sub-groups of specialty products captured within our standard national retail and hospital services. These "sub-validations" are derived by filtering out the following four product groups from the standard services:

- Anti-TNF, specific anti-rheumatic agents and immunosuppressants
- Hepatitis B & HIV
- Oncology
- Others

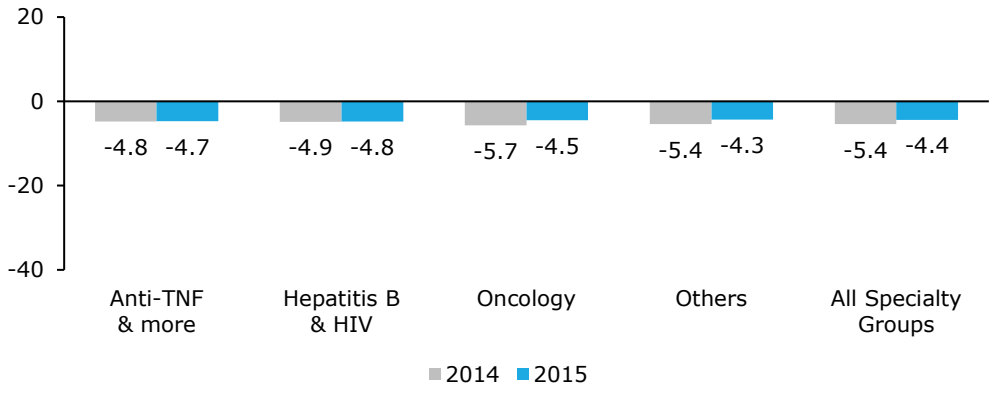
Others includes e.g., interferons, immunoglobulins, and drugs for the treatment of acromegaly, Alzheimer's disease, anemia, hemophilia, osteoporosis and metabolic diseases.

From a statistical perspective, specialty products typically occur in small quantities across multiple distribution channels and thus produce highly variable results in any statistical survey. However, due to their importance to the pharmaceutical industry in value terms, we conducted more detailed analyses on their overall validity.

Global Specialty Markets Validation Results

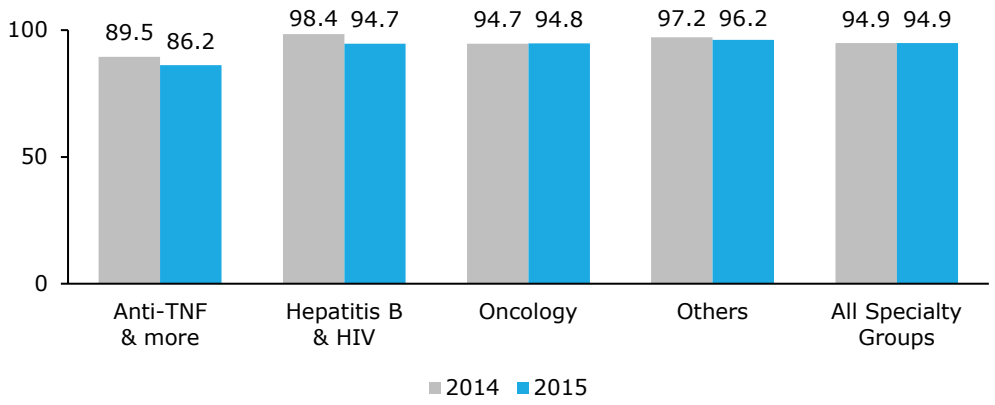
In order to ensure that our analysis was based on fairly solid samples, we've calculated results only for groups that contain a minimum of 20 product forms in the corresponding validation study. The aggregated bias and precision indices below are provided only for groups that met this criterion in both 2014 *and* 2015. The group *Anti-TNF, specific anti-rheumatic agents and immunosuppressants* represents 3 reports, *Hepatitis B & HIV* contains 3 reports, *Oncology* has 15 reports, *Others* involves 13 reports and *All Specialty Groups* comprises 34 reports:

Specialty Markets Bias (%)



As illustrated in the graph on the previous page, the total underestimation improved by 1.0 percentage point, from 5.4% in 2014 to 4.4% in 2015. Improvement was achieved across all specialty groups that revealed a homogeneous picture of less than 5% underestimation. The most significant improvement was stated for the *Oncology* class with an underestimation reduction of 1.2 percentage points.

Specialty Markets Precision Index (%)



The overall precision index (*All Specialty Groups*) maintained with 94.9% its previous year's result. *Oncology* showed slight improvement of 0.1 percentage points, while the remaining specialty categories turned out with decline. The *Hepatitis B & HIV* group revealed a precision loss of 3.7 percentage points, followed by *Anti-TNF and more* with a 3.3 and *Others* with a 1.0 percentage point decline.

Validating QuintilesIMS Forecasting Services

QuintilesIMS Global Forecasting & Opportunity Assessment produces market forecasts at country levels to help our clients in their strategic planning. Clearly, the forecast is only one element of the planning process, but it does offer guidance on strategic decisions and business development.

For this purpose, *QuintilesIMS Market Prognosis* – this year providing five-year forecasts on 31 countries and one-year forecasts on 43 countries and covering about 90 percent of the total world market – uses a combination of quantitative and qualitative techniques.

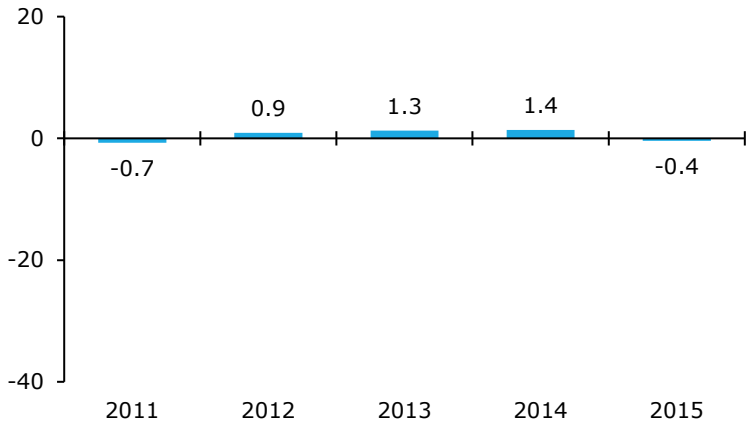
Market Prognosis uses an econometric model to derive baseline forecasts. These are then integrated along with qualitative input by means of an event-driven forecasting technique, which allows the forecasting team to finalize the forecasts. The validation process was designed as a two-fold measurement of forecast validity, one step for the five-year forecast and another for the latest one-year forecast:

1) Compare the five-year forecasts published in the base year with the actual results ultimately attained. In this report we have compared forecasts for 2011–2015 with actual data for the same years.

2) Compare the published forecast for the most recent year (generated in the preceding year) with the real market sales for the same year. In this case we have compared forecasts for 2015, produced in 2014, with real 2015 results.

Validity of Annual Forecasts – All Countries

Forecasting Bias (%) based on 31 Countries



The overall market prognosis for the 31 countries validated this year showed forecasting bias ranging between -0.7% and +1.4%, pointing at very good quality of the baseline forecasting model. The one-year forecast for 2015 turned out at an average -2.6 percent bias for 43 validated countries.

For the entire five-year period, the results by region were as follows:

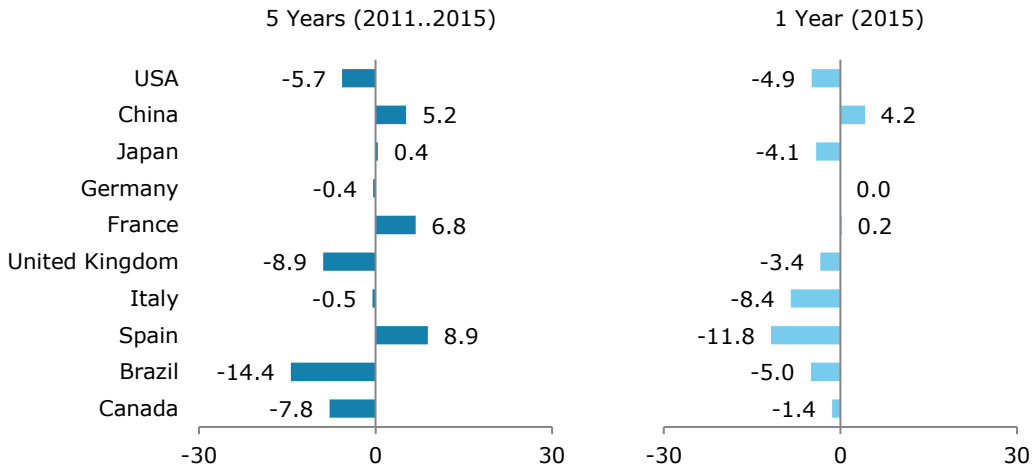
Region	Average Bias (%)	
	2010..2014	2011..2015
AsiaPacific	+3.4	+1.8
Europe	+4.8	+4.0
Latin America	-8.5	-9.8
North America	+6.7	-6.7
All Regions	**+2.4**	**+0.5**

The total bias for *all regions* improved to +0.5%. *AsiaPacific* improved by 1.6 percentage points and *Europe* by 0.8 percentage points, while *Latin America* declined by 1.3 percentage points. *North America* turned from 6.7% overestimation to underestimation of identical amount. The regional one-year forecast for 2015 revealed bias results ranging between -1.5% for *AsiaPacific* and -5.5% for *Latin America*.

Validity of Annual Forecasts – The Ten Leading Markets

The forecast results of the ten leading markets (*USA, China, Japan, Germany, France, United Kingdom, Italy, Spain, Brazil and Canada*) are presented in descending economic order in the subsequent graph:

Forecasting Bias by Country (%)



The 5-year forecast showed accentuated bias for some countries. The results for *Spain* and *Canada* were impacted by cost containment measures in the healthcare sector, for *Brazil* the results were influenced by an instable economic situation and devaluation of the local currency, and in the United Kingdom, amongst other factors, high price-driven growth of the hospital sector led to underestimation. The remaining markets had clearly more accurate prognoses.

The one-year forecasts revealed accentuated bias for Italy and Spain, mostly due to higher than expected sales of Hepatitis C medicines.

Measures to Maintain and Increase Accuracy

There is a wide array of measures to first of all maintain the high level of data precision and also to improve the data accuracy where our validation results indicate the need. The range of measures include for example new access to large volumes of wholesale data, improved sample stratifications and projections, as well as quality control process improvements. Continuous measurement is crucial to ensuring that QuintilesIMS services remain a useful and accepted reference for pharmaceutical market research and performance measurement.

As we obtain data from samples of wholesalers, pharmacies, and doctors or hospitals, it is of utmost importance that we carefully monitor these market players and react quickly to any changes that could affect the underlying sampling process. To ensure the accuracy of the market estimates we derive, it is essential that we conduct sales channel analyses regularly as well as update the universe and sample distribution routinely.

Universe Updates

Our commitment to quality dictates that we update universe information in regular cycles – either annually or, in geographic areas with a less effective statistical infrastructure, in biennial cycles. Our Statistical Services department supervises the Company's compliance with these targets for updating universe information:

Region	Update Target
Europe, North America, parts of Pacific	Annual
All other regions	Biennial

In 2016, we monitored a total of 168 universe updates world-wide, of which 17 databases did not comply with the respective target cycles. The overall update index, therefore, is 90%, a 3 percentage point decline over last year's 93%. By universe type, the 2016 update indices are shown on the next page.

Universe Update Monitor 2016 (%)

The update index for pharmacy universes declined from 92% in 2015 to 90% in 2016. Medical universes decreased by 4 percentage points to 86% and hospital universes maintained their previous year's update percentage of 93%.

Wholesaler & Distributor Data

Statistical theory holds that a massive improvement in data accuracy can only be achieved by increasing the underlying sample, and even that works only up to a point. Beyond that point, any additional gains in accuracy from a larger sample are marginal. Still, larger sampling volumes are required to properly track smaller products and to assure acceptable levels of confidence even in geographical sub-areas.

Naturally, there are limitations with pharmacy panels, and samples cannot be increased at will. Even when pharmacies do become part of the panel, a huge technical effort is required for them to report data in a reasonable timeframe.

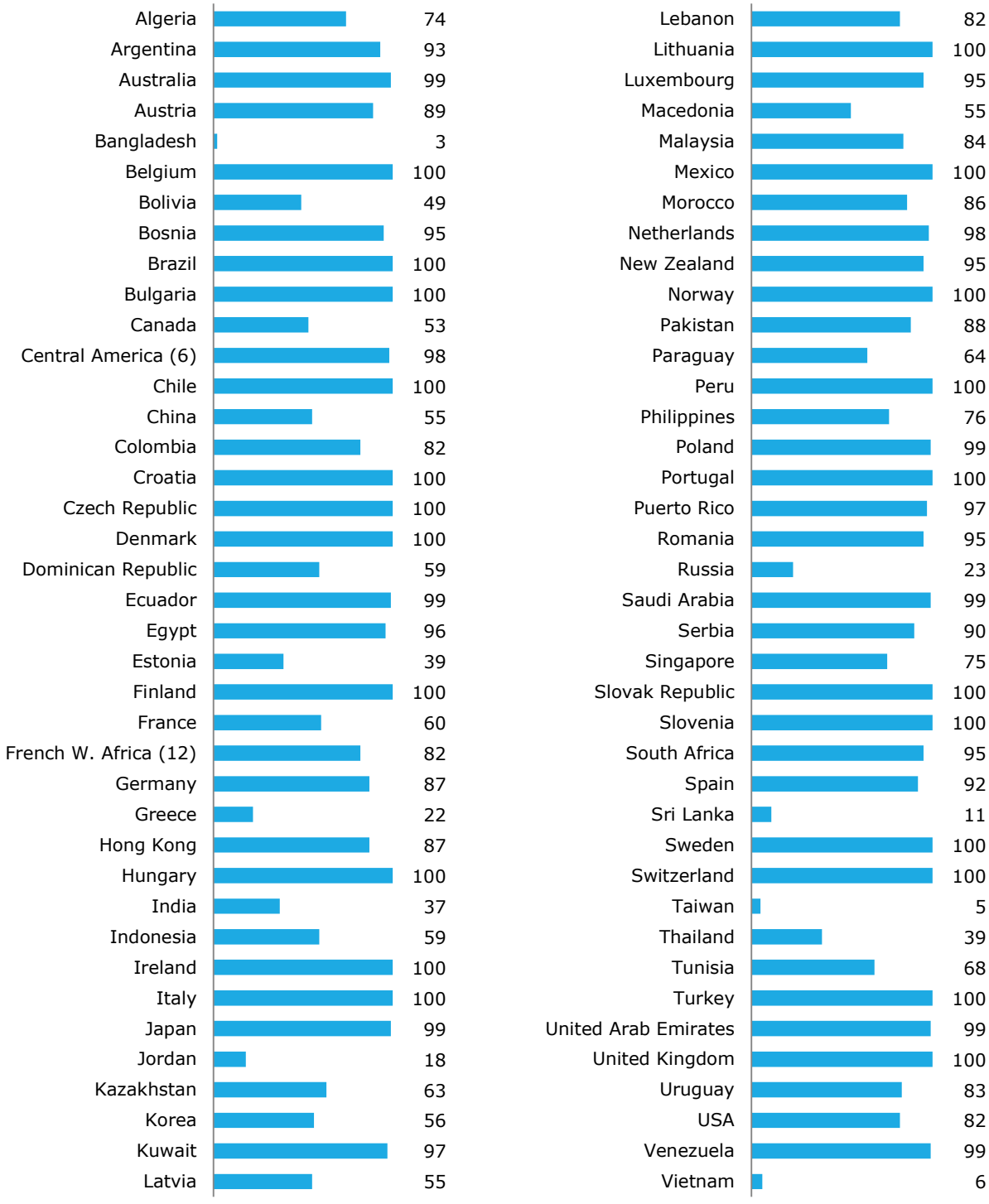
For that reason, QuintilesIMS decided to supplement pharmacy panel results by recruiting wholesalers, distributors, and in some cases, pharmaceutical manufacturers to supply data. Meanwhile, in some countries, these alternative sources have become the sole source of data and have brought about significant jumps in precision. In most countries today, we pursue multi-sampling approaches in which pharmacies are used to capture direct sales and wholesalers are used to capture indirect sales to pharmacies and hospitals. Pharmacy samples in turn have grown considerably in many places in order sustain the high quality standards set by the inclusion of near-census information.

By the end of the third quarter 2016, most of the QuintilesIMS countries were using wholesaler or distributor data as their major data source, either exclusively or in addition to other sample components.

72% of the countries have a sampling ratio of at least 70 percent, representing strong retail market coverage.

In ten countries (*Algeria, Austria, Germany, Greece, Hong Kong, Jordan, Lebanon, Lithuania, Tunisia, Venezuela*) we made significant progress of 3 to 16 percentage points by including new wholesalers into our panels. Please, see the subsequent page for more details.

QuintilesIMS Data Capture in % of Pharmaceutical Market



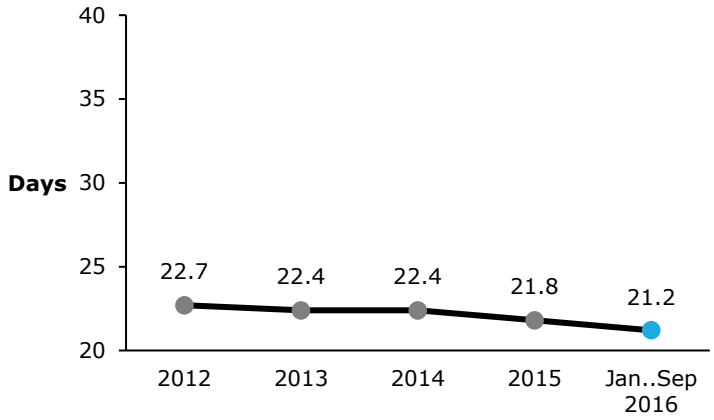
Timeliness

Besides a critical need for highest accuracy, we acknowledge our clients' desire for quick access to the data and analyses. This calls for a continuous drive for efficiency and upgrading of the product generation process. Streamlining these processes including process analytics, problem solving, and re-engineering is not an overnight task that yields immediate returns; it is a multi-year process that may shave off small increments of time each year.

In 2016, we have achieved a slight improvement of 0.6 days, with an overall average delivery time of 21.2 days. Although this number is still tentative for the entire year 2016 with three months missing, it represents the best result in the last five years. The improvement of the overall delivery speed is caused by the implementation of the *Channel Dynamics* processes, which allows a 2-weeks faster service delivery on average for this service type.

Although continuous reductions are a great achievement, we are fully aware that there is a limit to the amount of time we can trim from our production cycle, given that we also strive for the highest levels of accuracy. We are approaching this limit now in many countries, and further acceleration of delivery is hardly feasible.

Elapsed Days after Reporting Period (Average)

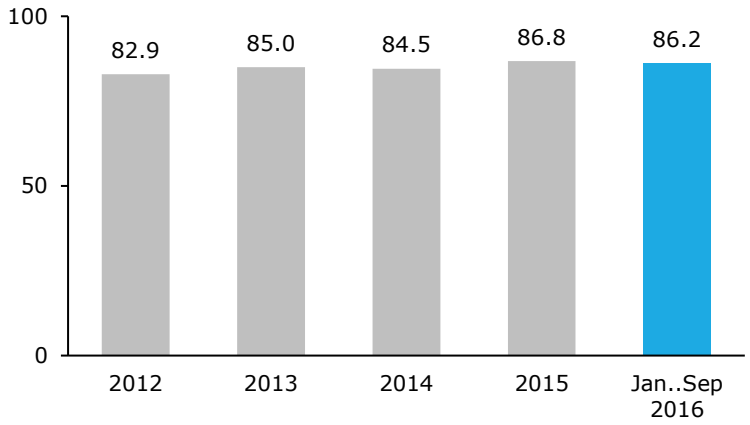


We have reduced our internal targets for data delivery over time. These targets are set independent from local contractual due dates and reflect a QuintilesIMS internal standard to stimulate further improvements in delivery time. Since 2005, our official delivery targets are:

Period	Weekly Services	Monthly Services	Quarterly Services
1986..1999		50 days	60 days
2000..2004		35 days	50 days
Since 2005	15 days	30 days	45 days

Applying the 2005 targets of 15/30/45 days to the more than 34,000 deliveries we made world-wide between January 2012 and September 2016, yields "On-Target Fulfillment" percentages of:

Percentage On-Target



The average on-target percentage of all reports declined slightly by 0.6 percentage points, from 86.8% in 2015 to 86.2% up to the third quarter 2016.

Delivery Performance in Detail

(1) Data Delivery Mode

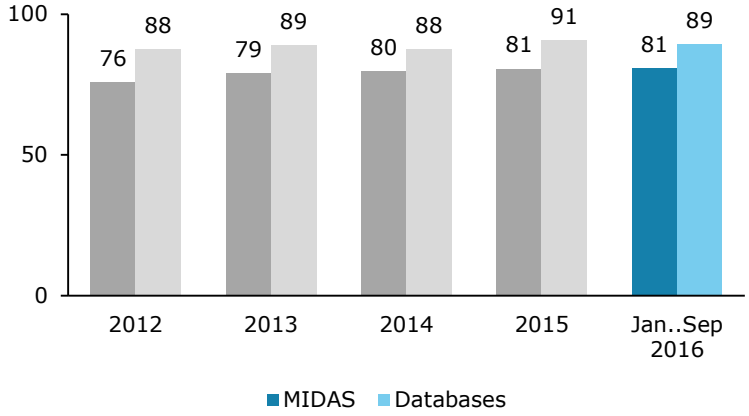
The following electronic data delivery systems are offered by QuintilesIMS:

MIDAS	Multi-national database – quarterly data, off-site
Monthly MIDAS	Multi-national database – monthly data, off-site
NDB	National database system, off-site
DataView, IMS+, Sales Analyzer	National/sub-national databases, on-site

As of the ACTS 2013 report, we do not separately analyze the delivery of printed editions due to the general decline of clients using print media. Furthermore we are now collapsing the results for National Database updates as well as Monthly and Quarterly MIDAS deliveries to one single number 'MIDAS'.

MIDAS deliveries continued to be on-target at 81%. The databases were compliant with our internal completion targets at 89% in the first three quarters of 2016, a 2 percentage point decline over 2015. The graph on the subsequent page illustrates this development.

Percentage On-Target



(2) Report Types

Delivery by Report Type

Report	Elapsed Days of Delivery			Percentage On-Target *	
	2015 Jan..Dec	2016 Jan..Sep	Earlier (-) Later (+)	2015 Jan..Dec	2016 Jan..Sep
Hospital	25.4	25.7	+0.3	83%	78%
Medical & Patient	34.3	34.9	+0.6	78%	78%
OTC	20.4	20.6	+0.2	94%	93%
PharmaTrend	9.7	9.7	±0.0	95%	96%
Prescription	19.9	19.8	-0.1	91%	92%
Promotion	31.6	15.8	-15.8	69%	97%
Retail	22.8	22.7	-0.1	88%	87%
Sales Territory	15.9	15.9	±0.0	90%	89%
Xponent	14.3	14.1	-0.2	88%	87%

* measured against delivery targets of 15/30/45 days for weekly/monthly/quarterly services

As mentioned at the beginning of this chapter, *Promotion* services improved their delivery speed by 15.8 days. Besides this significant improvement, analysis of the remaining services revealed only slight improvement over 2015 for *Xponent*, *Retail* and *Prescription* services. Three services have become slightly slower by 0.2 to 0.6 days.

Looking at the on-target performance, four services maintained or improved their previous year's results, most significantly again *Promotion* reports with a 28 percentage point improvement. *Hospital* and *Medical & Patient* services ended at 78% delivery on time measured against our internal targets and need improvement.

(3) Regions

Delivery by Region

Region	Elapsed Days of Delivery			Percentage On-Target *	
	2015 Jan..Dec	2016 Jan..Sep	Earlier (-) Later (+)	2015 Jan..Dec	2016 Jan..Sep
Asia	28.0	28.6	+0.6	80%	71%
Central Europe	14.8	14.7	-0.1	95%	95%
East Europe	17.2	17.2	±0.0	92%	90%
Latin America	28.1	26.4	-1.7	76%	80%
Mid East & Africa	25.2	25.0	-0.2	90%	90%
North America	22.6	22.0	-0.6	88%	86%
North Europe	18.6	17.3	-1.3	90%	92%
Pacific	24.4	23.2	-1.2	92%	91%
South Europe	21.4	19.5	-1.9	77%	83%

* measured against delivery targets of 15/30/45 days for weekly/monthly/quarterly services

In terms of delivery days, eight regions were successful in maintaining or reducing their average delivery time in the first three quarters of 2016, most significantly *South Europe* by almost two days, followed by *Latin America* with a 1.7 day reduction. Only Asia's delivery time increased, namely by 0.6 days.

Measuring on-target delivery, five regions managed to maintain or improve their 2015 delivery performance in the first three quarters of 2016, again most significantly *South Europe* by six percentage points, followed by *Latin America* with a four percentage point improvement. *Asia* declined by nine percentage points to 71% delivery on time.

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