

ELIQUIS MARKET FORECAST FOR GERMANY

**Internship Training
at
PharmacACE Analytics Pvt. Ltd., Pune**

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**MBA Hospital & Health Management
2013–15**


**Institute of Health Management Research
Jaipur
2015**

Dissertation Report
At
PharmaAce Analytics Private LTD.

Title: Eliquis Market Forecast for Germany

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TO WHOMSOEVER MAY CONCERN

This is to certify that **Rashmeet Singh Chhabra** student of MBA Hospital and Health Management from IIHMR University, Jaipur has undergone internship training at **PharmaAce Analytics Private Ltd.** from **3rd March, 2015 to 2nd May, 2015.**

The Candidate has successfully carried out the study designated to his during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.



Col. (Dr.) Ashok Kaushik
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DISSERTATION CERTIFICATE

The Certificate is awarded to

Dr. Rashmeet Singh

In recognition of having successfully completed his training at

PharmaACE Analytics Private Limited

By working on the Project

“Eliquis market Forecast for Germany”

He is a quick learner with great commitment to his work, and a virtuous team player

We wish him all the best for all future endeavours



Authorized Signatory

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **“Eliquis Market Forecast in Germany”** and submitted by **Rashmeet Singh Chhabra** Enrollment No **IIHMR/PGDHM/2013-15/1486** under the supervision of **Maj. (Dr.) Vinod Kumar** for award of MBA Hospital and Health Management/ MBA Pharmaceutical Management of the university carried out during the period from **2nd Feb,2015 to 12th May,2015** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



Signature

Abstract: Elikuis Market Forecast for German

Rashmeet Singh Chhabra

Keywords: *Atrial Fibrillation (AF), Elikuis, Treatment days and CAGR*

Background

In the last 20 years, atrial fibrillation (AF) has become one of the most important public health problems and a significant cause of increasing health care costs in western countries. The prevalence of AF is increasing due to our greater ability to treat chronic cardiac and noncardiac diseases, and the improved ability to suspect and diagnose AF. At the present time, the prevalence of AF (2%) is double that reported in the last decade Europe is more than double that reported just one decade earlier ranging from 1.9% in Italy, Iceland, and England to 2.3% in Germany and 2.9% in Sweden.

Objective

To develop the Forecast model flow for Elikuis to assess the number of patients, revenues and overall growth in Germany till 2018.

Method

Secondary Data Analysis was done by selecting the data points from secondary data sources and flow was developed in MS Excel.

Result

The number of NOAC patients from 2013-2018 are increasing by 8% CAGR and the Elikuis treatment days market share is expected to increase till 40% by Dec 18 from 0% in Jan 13 and revenues are expected to reach by \$ 376 Million in Dec 18 from \$18 Million in Jan 13 with CAGR of 52%.

Acknowledgement

I started off my internship with a vision in my mind so as to be able to learn about the practical aspects healthcare industry. Hereby, I take this opportunity to express my deep sense of gratitude to all those who have been instrumental in successful completion of my internship.

Any accomplishment requires blessings and efforts of numerous individuals and this work is no exception. I thank god Almighty for giving me this great opportunity to study and learn at this prestigious organization and help me to implement my theoretical knowledge into practical aspect.

I am thankful to **Dr.S.D.Gupta** (Director IIHMR University) and **Dr. Ashok Kaushik** (Dean, IIHMR University) for supporting and guiding me during academic session.

I am grateful to my guide **Dr. Vinod Kumar S.V.** whose detailed suggestions have vastly enhanced the quality of my work. It's my proud privilege that I have had the opportunity to complete my dissertation under such experts of Healthcare industry.

My profound and heartfelt gratitude is to **Mr. Aayush Tandon, Project Manager PharmaAce Analytics Private LTD.** who, despite having such a hectic schedule, rendered expert advice and valuable feedback and suggestions during and after conducting my project and has been a great help in completion of my work.

I place on record, my sincere gratitude to all my teammates for being such a supportive and a wonderful team, it was pleasure working with them.

I owe a debt of gratitude to our Alumni Mr. Dinesh Pandey, Engagement Manager and Ms. Pratima Chaoudhary, Project Manager at PharmaAce Analytics Private LTD. and all my teachers for grooming me and my classmates for the inspiration needed to work with dedication and motivation at PharmaAce Analytics Private LTD, Pune.

I hope that I can build upon the experience and knowledge that I have gained and make a valuable contribution towards the industry in the coming future.

16th May, 2015

Dated:

Dr Rashmeet Singh Chhabra (PT)

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Abbreviation's used in model flow:

1. AF- Atrial Fibrillation
2. BMS- Bristol Myers Squibb
3. DOT- Days Of therapy
4. DVT- Deep Vein Thrombosis
5. GP- General Practitioner.
6. GTN- Gross to Net
7. MS- Market Share
8. NOAC- New Oral Anticoagulants
9. PE- Pulmonary Embolism
10. TD- Treatment Days

1. INTRODUCTION

Forecasting is a process of predicting or estimating the future based on past and present data. Forecasting provides information about the potential future events and their consequences for the organisation. It may not reduce the complications and uncertainty of the future. However, it increases the confidence of the management to make important decisions. Forecasting is the basis of premising. Forecasting uses many statistical techniques. Therefore, it is also called as Statistical Analysis [1].

Forecasting feeds into and influences many other functional areas within an organization (see Figure). These linkages may be unidirectional or bidirectional. The links reflect the varied uses to which a forecast can be applied – such as revenue planning, production planning, resource allocation, project prioritization, partnering decisions, compensation plans, lobbying efforts and so forth. These varied uses, and the effect of forecasting on many functional areas in an organization, reflect the first major challenge of forecasting – meeting the needs of varied and diverse stakeholders.

Forecasts may be done at a global, regional, country, or business unit level. Each forecast has differing levels of data required, both at the input and output level. These forecasts need different structural constructs – for example, if doing a regional forecast for a product in Europe do I assume one European launch date or individual launch dates in each of the key countries? Is there a ‘pan-European’ adoption curve for the product or should

individual country's adoption patterns be modeled? The answer to these, and many other, questions dictate the design of the forecast model.

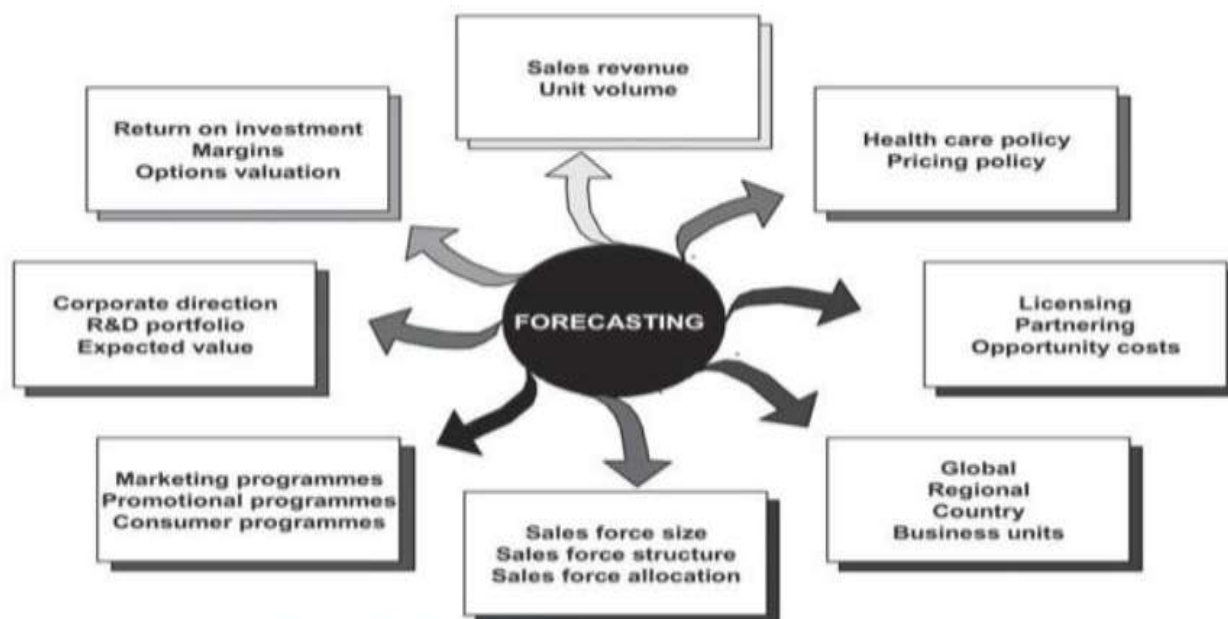


Figure 1: Forecasting

Besides having various different methods of forecasting, disease market forecasting is bit different which all together follows more logical way rather than the hard core mathematical equations.

Eliquis; molecule name *apixaban* is a BMS brand sold in more than 13 countries. Eliquis (*apixaban*) keeps the platelets in your blood from coagulating (clotting). Eliquis is used in people with atrial fibrillation (a heart rhythm disorder) to lower the risk of stroke caused by a blood clot. Eliquis is also used after hip or knee replacement surgery to prevent a type of blood clot called deep vein thrombosis (DVT), which can lead to blood clots in the lungs (pulmonary embolism). Eliquis is also used to treat DVT or pulmonary embolism (PE), and to lower your risk of having a repeat DVT or PE [2].

2. PROBLEM STATEMENT

Eliquis has generated roughly cent percent growth in the previous year in terms of sales and now, management wants to have a similar kind of aggressive growth rate for the outer years and they also want to see the various scenarios if more number of patient can come or not.

3. REVIEW OF LITERATURE

In virtually every decision they make, executives today consider some kind of forecast. Sound predictions of demands and trends are no longer luxury items, but a necessity, if managers are to cope with seasonality, sudden changes in demand levels, and price-cutting maneuvers of the competition, strikes, and large swings of the economy. Forecasting can help them deal with these troubles; but it can help them more, the more they know about the general principles of forecasting, what it can and cannot do for them currently, and which techniques are suited to their needs of the moment. Here the authors try to explain the potential of forecasting to managers, focusing special attention on sales forecasting for products of Corning Glass Works as these have matured through the product life cycle. Also included is a rundown of forecasting techniques [3].

In the last 20 years, atrial fibrillation (AF) has become one of the most important public health problems and a significant cause of increasing health care costs in western countries.

The prevalence of AF is increasing due to our greater ability to treat chronic cardiac and noncardiac diseases, and the improved ability to suspect and diagnose AF. At the present time, the prevalence of AF (2%) is double that reported in the last decade. The prevalence of AF varies with age and sex. AF is present in 0.12%–0.16% of those younger than 49 years, in 3.7%–4.2% of those aged 60–70 years, and in 10%–17% of those aged 80 years or older [4].

The prevalence of AF varies with age and sex. AF is present in 0.12%–0.16% of subjects younger than 49 years, 3.7%–4.2% of those aged 60–70 years, and 10%–17% of those aged 80 years or older. In addition, it occurs more frequently in males, with a male to female ratio of approximately 1.2:1. Despite the greater prevalence in men, women represent the bulk of patients with AF due to their longer survival [5-8]. In the general adult population of Europe is more than double that reported just one decade earlier, ranging from 1.9% in Italy, Iceland, and England to 2.3% in Germany and 2.9% in Sweden. [4]

4. RESERCH QUESTION

What will be the future growth rate of Eliquis (*apixaban*) for next 3 years in Germany?

5. OBJECTIVE OF THE STUDY

1. To prepare a Patient based forecast model to predict the growth of Eliquis (*apixaban*) in Germany for next 3 years.
2. To assess the no. of patients for Eliquis (*apixaban*) in Germany till 2018.
3. To assess the revenue for Eliquis (*apixaban*) in Germany till 2018.

6. METHEDODOLOGY

1. Type of study : Secondary Data Analysis
2. Location of study: PharmaAce Analytics Private LTD.
3. Duration of Study : 2 Months
4. Data collection tools : Secondary Data Sources (Explained In Methodology)
5. Statistical Analysis Tool : MS. Excel

6.1DETAILS

The Eliquis client gives the Data information from Data Sources (From IMS, purchased by client and its own data sources known as Pharmafkt/Pharmascope in Germany) to the Project Manager. The project manager then selects the relevant Data Points which can be used to make the forecast model.

In case of Eliquis Data Points Selected to make the model is;

- 1) Dynamic Patients - Patients pool consists of 4 categories- New (those who have never taken treatment), Switch on (shifted to eliquis from some other drug), Switch off (changed the treatment) and losses (died or stop taking treatment).
 - Dynamic Patients further splits according Doctor- Cardio and GP and GP Dynamic Patients further splits into GP Target and GP non Target.
- 2) Market Share (MS) - Share of eliquis in NOAC (New Oral Anticoagulants).
- 3) National Factor - a factor used to calculate the overall patients for the country.
- 4) Losses - Those who left the therapy or died.
- 5) Ongoing Patients - (Previous year patients + present year patients) – Losses
- 6) DOT (Days of Therapy) - Assumption from Client (BMS).

- 7) Compliance (Dropout Rate) - Assumption from Client (BMS).
- 8) Price - Assumption from Client (BMS).
- 9) GTN (Gross to Net Ratio) – Assumption from Client(BMS)

After selecting all the Data Points the flow and methodology of Model was decided after discussing with client in Germany by my manager which is shown below and Data was sent to me to make the model. After Discussing with my manager forecast model was run which assess the number of patients and revenues till 2018.

6.2 According to Epidemiology Data

- Population
 - Split by appropriate segment pattern.
 - Increased using Population Growth Rate.
- Epidemiology
 - Prevalence of given data for the Atrial Fibrillation
- Symptomatic
 - Percentage of Patients with the disease who are symptomatic
- Diagnosed
 - The percentage of symptomatic patients who are diagnosed properly
- Access
 - The Percentage of patients who have access to health care.
- Drug Treated
 - The percentage of symptomatic and drug treated patients who are treated with drug.

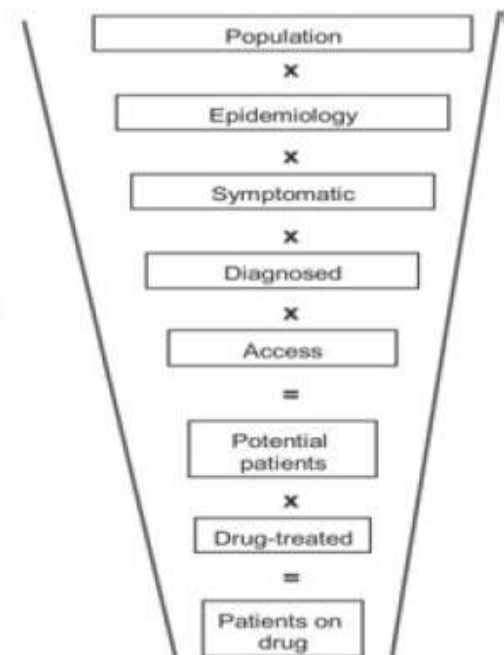


Figure 2: Epidemiology Flow

7. ASSUMPTIONS

Assumptions are the inputs which are not forecasted numbers but the actuals from data sources.

a) Dynamic Patients according to 3 segments.

Table 1: Dynamic Patients according to product wise in 3 segments

Cardiac	2013	2014
Xarelto	11,582	12,034
Pradaxa	2,875	2,165
Eliquis	2,156	5,759
Edoxaban	(Not Launched)	(Not Launched)
GP Target	2013	2014
Xarelto	102,300	116,612
Pradaxa	21,534	16,760
Eliquis	10,985	37,244
Edoxaban	(Not Launched)	(Not Launched)
GP Non-Target	2013	2014
Xarelto	65,405	74,555
Pradaxa	12,647	9,843
Eliquis	4,935	16,733
Edoxaban	(Not Launched)	(Not Launched)

b) Split Percentage

It is percentage used to split the number of dynamic patients in three segments; Cardiac, GP Target and GP Non-Target which is shown in table 2, from the year 2013-2015.

Table 2: Split percentage for cardiac, GP Target and GP Non-Target

Split %	2013	2014	2015	2016	2017	2018
Cardiac	7.1%	6.8%	6.6%	6.6%	6.6%	6.6%
GP – Target	65.0%	63.0%	62.0%	62.0%	62.0%	62.0%
GP - Non Target	27.9%	30.2%	31.4%	31.4%	31.4%	31.4%

c) National Factor

As the number of patients are not for complete Germany therefore factor is applied calculate to total number of dynamic patients.

Table 3: National Factor

	2013	2014
Xarelto	38%	38%
Pradaxa	38%	38%
Eliquis	38%	38%
Edoxaban	0%	0%

d) Losses Percentage

Losses are the patients those who left the therapy or died and is shown in table 4 for Xarelto, Pradaxa, Eliquis and Edoxaban from 2013- 2015.

Table 4: Losses (%) of all the 4 Products

%	2013	2014	2015	2016	2017	2018
Xarelto	6%	5%	5%	5%	5%	5%
Pradaxa	6%	6%	5%	6%	6%	6%
Eliquis	7%	6%	5%	6%	6%	6%
Edoxaban	0%	0%	3%	4%	5%	5%

e) Days of therapy (DOT)

DOT is time for which patient is on therapy and is shown in table 5 for Xarelto, Pradaxa, Eliquis and Edoxaban from 2013- 2015.

Table 5: Days of Therapy for all the 4 Products

	2013	2014	2015	2016	2017	2018
Xarelto	365	365	365	365	365	365
Pradaxa	365	365	365	365	365	365
Eliquis	365	365	365	365	365	365
Edoxaban	365	365	365	365	365	365

f) Compliance

It is dropout rate shown in table 6, for Xarelto, Pradaxa, Eliquis and Edoxaban from 2013- 2015.

Table 6: Compliance of all the 4 Products.

	2013	2014	2015	2016	2017	2018
Xarelto	80%	80%	80%	80%	80%	80%
Pradaxa	75%	75%	75%	75%	75%	75%
Eliquis	75%	75%	75%	77%	79%	80%
Edoxaban	80%	80%	80%	80%	80%	80%

g) Price per Day

Cost of the therapy for a day for Xarelto, Pradaxa, Eliquis and Edoxaban from 2013- 2015.

Table 7: Price per Day of all the 4 Products from 2013- 2018

	2013	2014	2015	2016	2017	2018
Xarelto	€ 2.50	€ 2.50	€ 2.50	€ 2.50	€ 2.50	€ 2.50
Pradaxa	€ 2.50	€ 2.50	€ 2.50	€ 2.50	€ 2.50	€ 2.50

Eliquis	€ 2.63	€ 2.63	€ 2.63	€ 2.63	€ 2.63	€ 2.63
Edoxaban	Not Launched	Not Launched	€ 2.50	€ 2.50	€ 2.50	€ 2.50

h) Gross to Net Ratio(GTN)

Table 8: Gross to Net Ratio of Eliquis from 2013- 2018

	2013	2014	2015	2016	2017	2018
Eliquis	85.5%	75.7%	74.1%	70.0%	74.1%	69.7%

8. MODEL FLOW

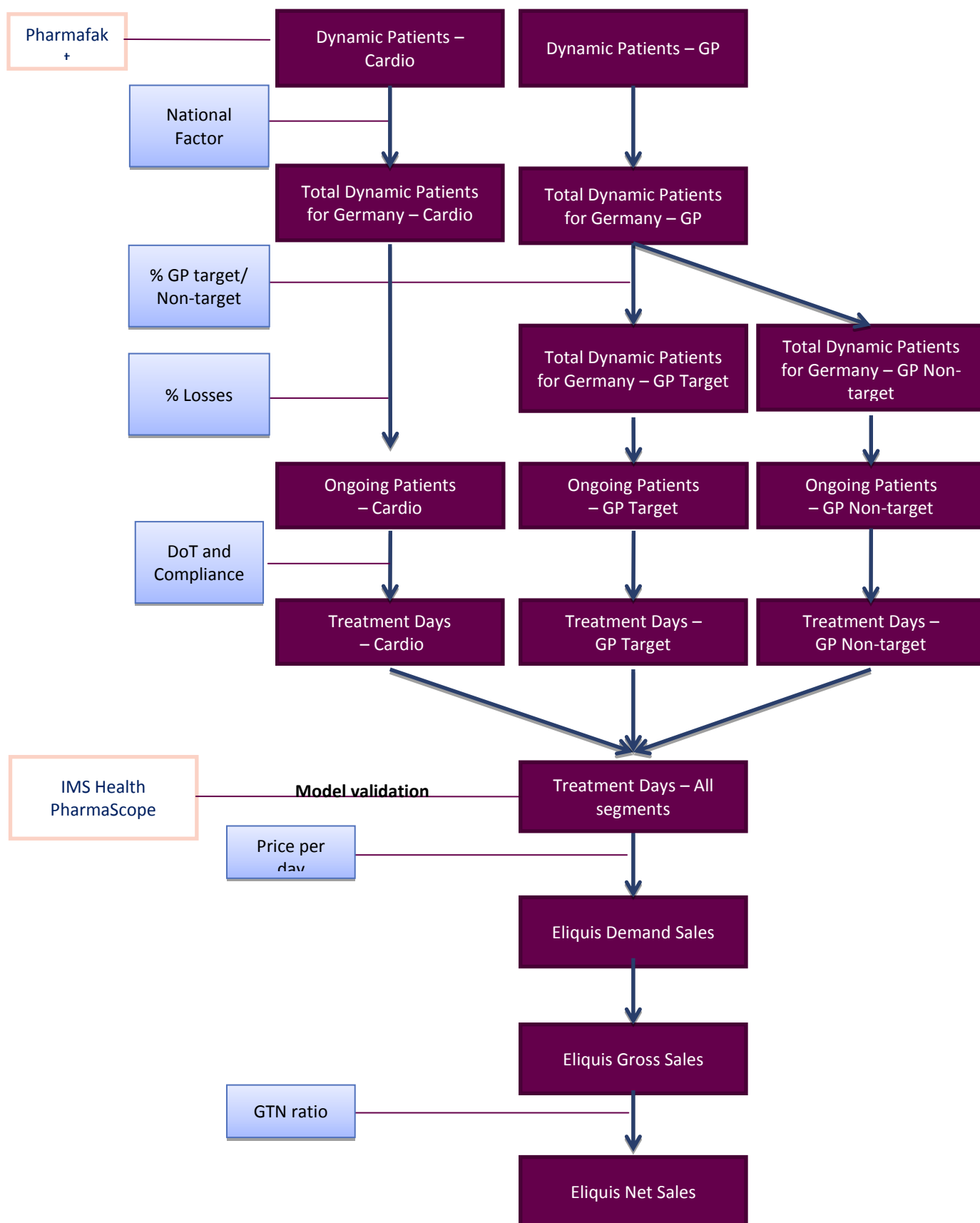
- Dynamic Patients (from Germany data sources; pharmafakt), segmented into to specialty and non-specialty which is cardio and GP.
- Total dynamic patients were calculated by applying national factor
- Total Dynamic patients- GP further segmented into GP target (General Practitioners which are on BMS list) and GP non-target (General Practitioners which are not on BMS list) by applying percentage split.
- Ongoing patients [(Previous month patients + Present month patients)- Losses] for 3 segments; Cardio, GP Target, and GP-Non-Target were calculated by applying losses percentage on Total Dynamic Patients for 3 segments
- Treatment Day's (TD's) for all 3 segments a were calculated by applying Days of therapy (DOT) and compliance

- Total TD's of all the segments were calculated by summing up the TD's of Cardio, GP Target and Non Target.
- Total TD of all the segments were validated with IMS health data month.
- Price per Day (Assumption) was applied on Total TD's of all the segments to get the Eliquis Gross Sales.
- GTN Ratio (Assumption) was applied on Eliquis Gross Sales to get the Eliquis Net Sales.

Note: By using all the above steps the results are generated which is shown in results section.

Sources

Model Flow



9. RESULTS

9.1 New Oral Anticoagulants Patient (Monthly)

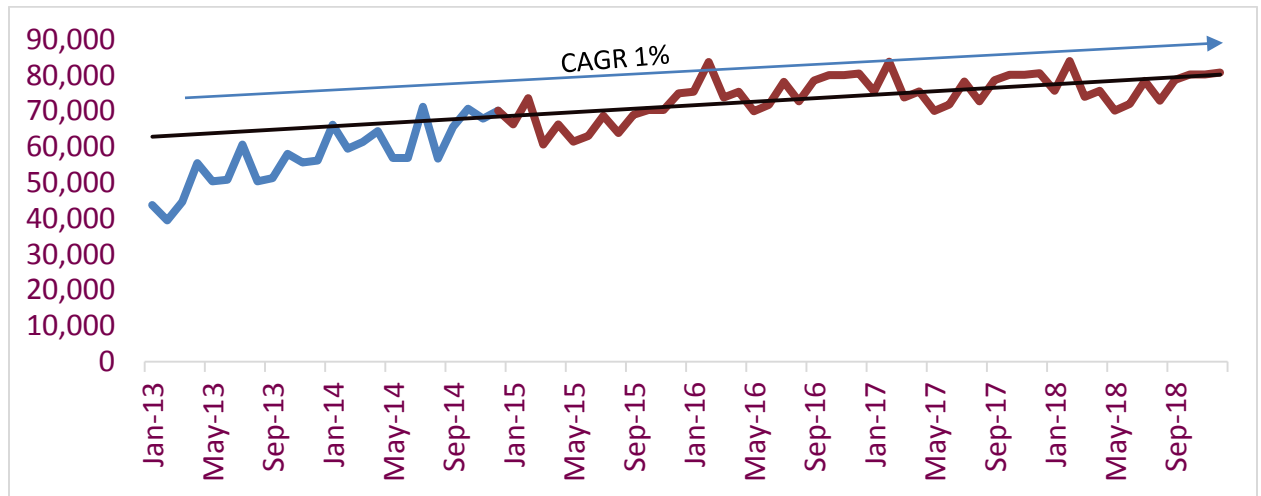


Figure 3: Monthly NOAC Market Patients

Till Dec 2014 Actual patients are plotted and after that patients are forecasted which is shown in red shade. In Jan 13, the number of patients were 43746 an expected maximum, NOAC Dynamic Patients is in Feb 16; 83750 and in Dec 18 the expected number patients are 80756 which is increased by CAGR of 1% from Jan 13

9.2 NOAC Dynamic Patients Yearly

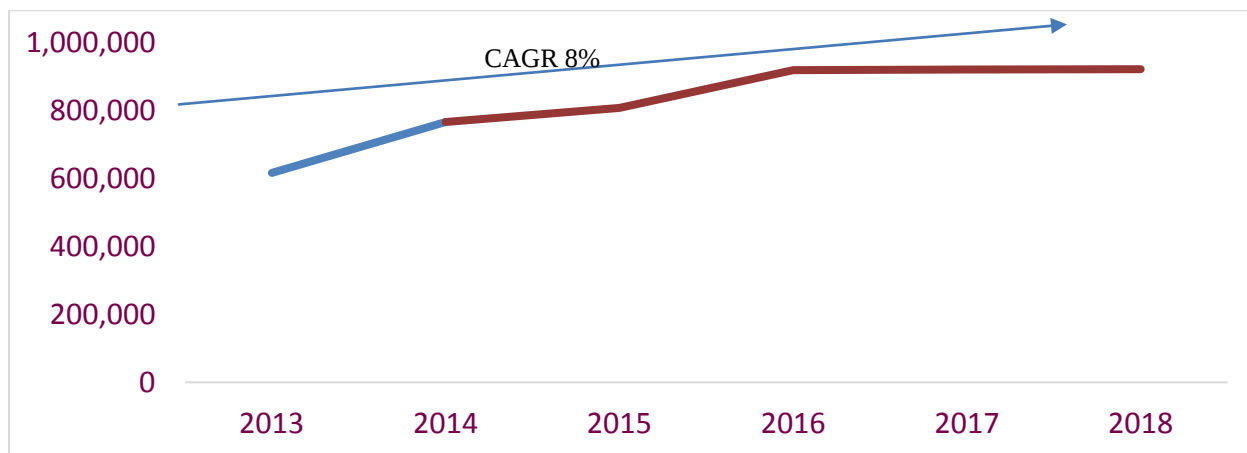


Figure 4: NOAC Patients Yearly

- Total NOAC dynamic patients expected to increase by 8% from 2013 to 2018.

9.3 Patients Dynamic share- Total (including all three segments)

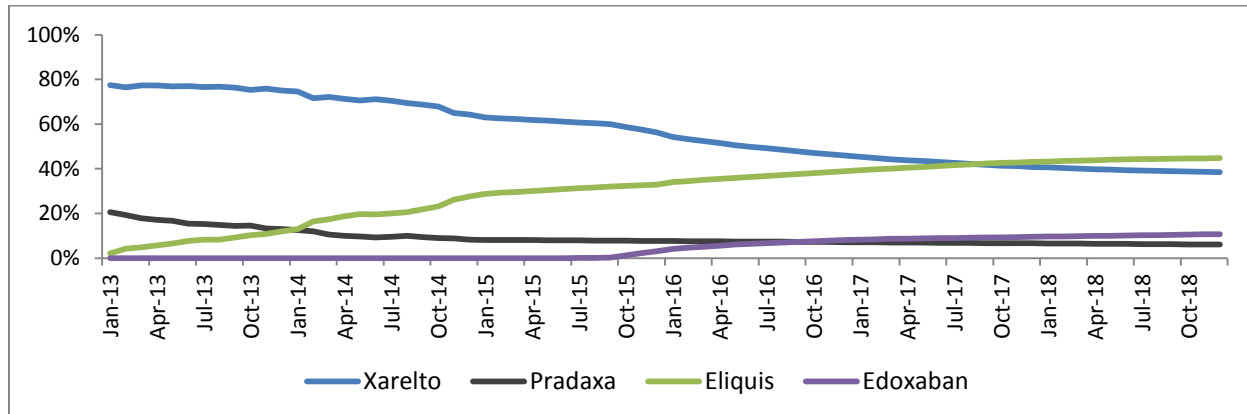


Figure 10: Dynamic Patients Share- Total, for Xarelto, Pradaxa, Eliquis, and Edoxaban

- Eliquis crossed Pradaxa in Jan- 14 having 13% of total market share.
- In Aug-17 it will cross Xarelto; the market leader with 42% share.

9.4 Patients Dynamic share- Cardiac

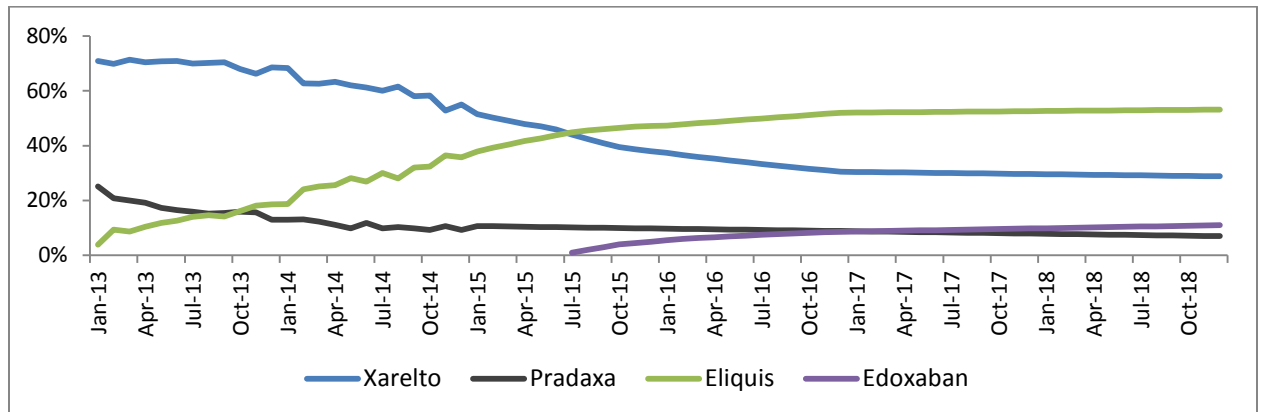


Figure 6: Dynamic Patients Share- Cardiac, for Xarelto, Pradaxa, Eliquis, and Edoxaban

- Eliquis crossed Pradaxa at 16% share of the total market in Oct-13
- Eliquis crossed Xarelto, the market leader at 45% of total market share in July 15

9.5 Patients Dynamic share- GP Target

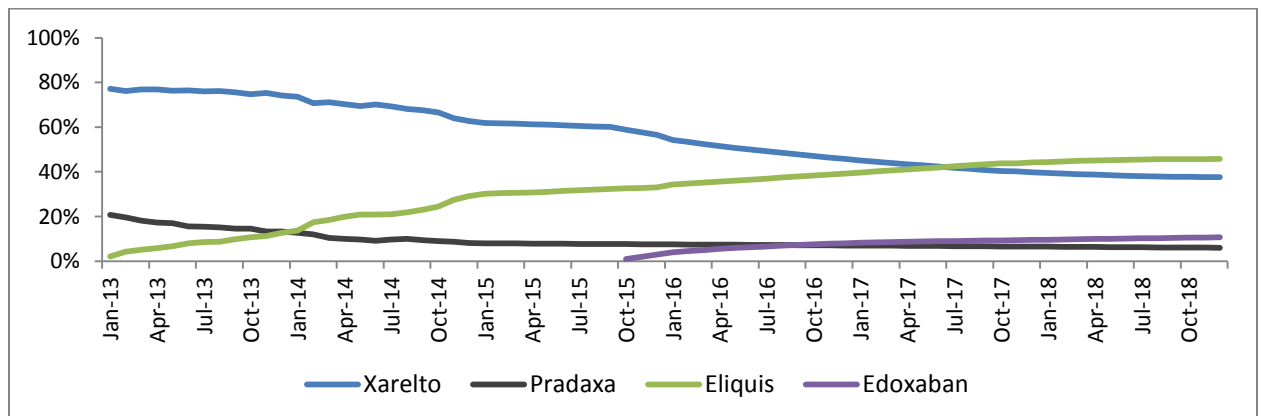


Figure 7: Dynamic Patients Share- GP Target, for Xarelto, Pradaxa, Eliquis, and Edoxaban

- Eliquis crossed Pradaxa at 14% share of the total market in Jan-14
- Eliquis crossed Xarelto, the market leader at 42% of total market share in July- 17.

9.6 Patients Dynamic share- GP Non Target

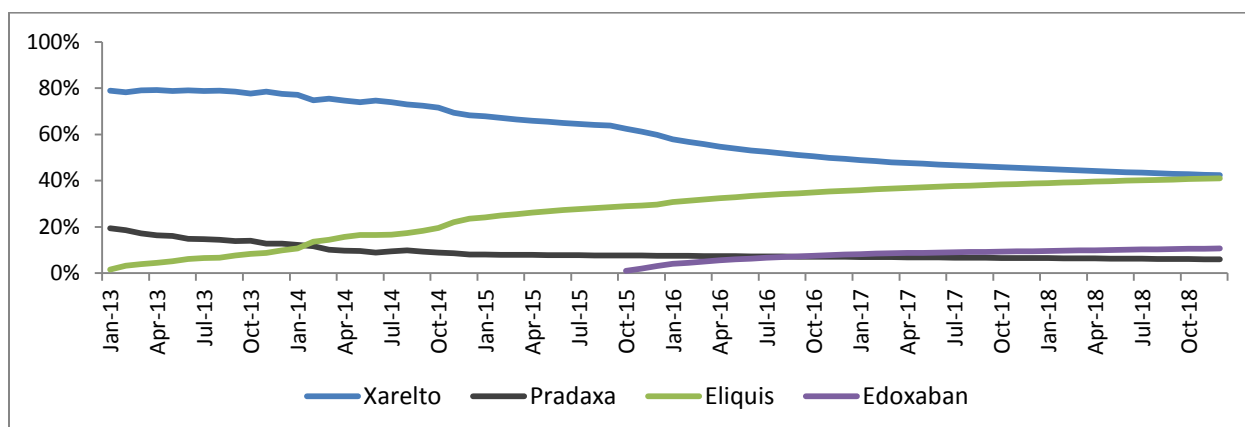


Figure 8: Dynamic Patients Share- GP Non-Target, for Xarelto, Pradaxa, Eliquis, and Edoxaban

- Eliquis crossed Pradaxa at 14% share of the total market in Feb-14.
- Eliquis is growing slowly as compare to Cardio and GP target segment and is equaling its patient share with Xarelto at 41% of total market share in Nov-18.

Table 9: Forecasted Dynamic Patients

Cardiac	2013	2014	2015	2016	2017	2018
Xarelto	30,479	31,668	23,796	20,502	18,277	17,795
Pradaxa	7,566	5,696	5,478	5,661	5,093	4,527
Eliquis	5,674	15,154	23,237	30,175	31,813	32,222
Edoxaban			1,735	4,404	5,625	6,365

GP Target	2013	2014	2015	2016	2017	2018
Xarelto	269,210	306,873	301,703	283,670	241,108	219,293
Pradaxa	56,669	44,105	38,941	41,399	38,527	35,670
Eliquis	28,909	98,009	158,282	209,728	240,606	259,138
Edoxaban			10,029	35,805	50,982	58,076
GP Non-Target	2013	2014	2015	2016	2017	2018
Xarelto	172,118	196,198	163,782	153,394	135,692	126,317
Pradaxa	33,282	25,903	19,722	20,967	19,512	18,065
Eliquis	12,988	44,033	69,178	96,488	108,272	115,986
Edoxaban			5,079	18,134	25,820	29,413
Total	2013	2014	2015	2016	2017	2018
Xarelto	471,807	534,739	489,281	457,566	395,077	363,405
Pradaxa	97,517	75,704	64,141	68,026	63,132	58,262
Eliquis	47,570	157,197	250,697	336,392	380,691	407,346
Edoxaban	0	0	16,842	58,343	82,426	93,854

9.7 Ongoing Patient Share Total Market

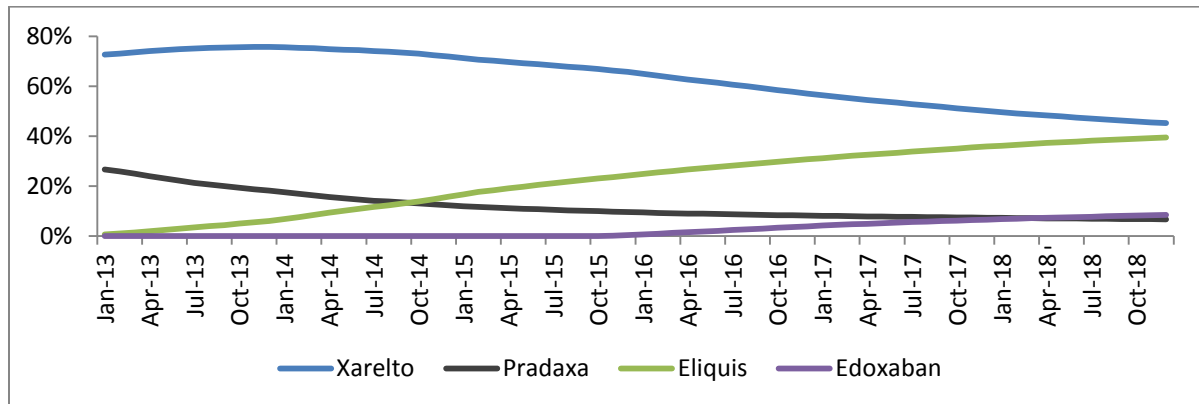


Figure 9: Ongoing Patient Share- Total Market, for Xarelto, Pradaxa, Eliquis and Edoxaban

- Eliquis crossed Pradaxa at 14% in Oct-14
- After Dec-14 the Eliquis share is increasing in a linear fashion and reached 40% in Dec-18, which is 5 % less than the market leader; Xarelto.

9.8 Ongoing Patient Share – Cardiac

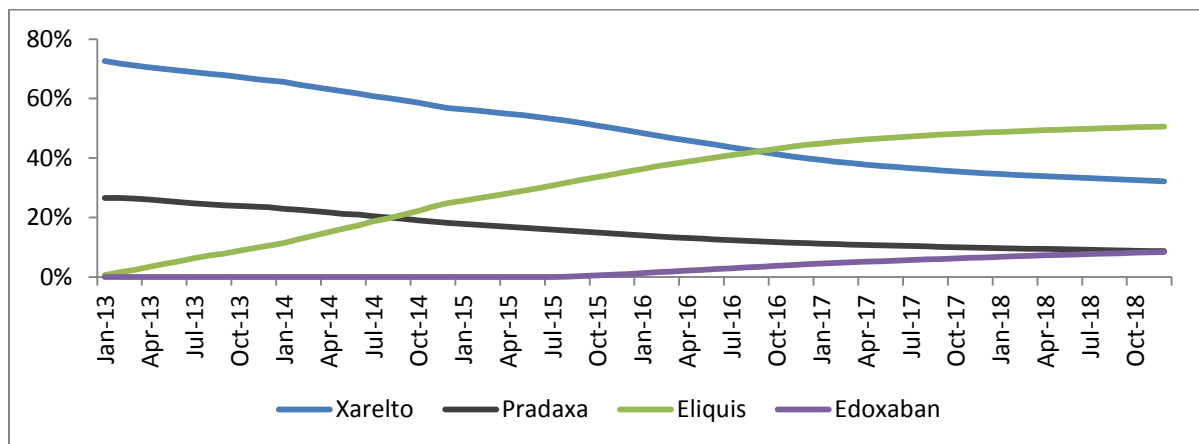


Figure 10: Ongoing Patient Share- Cardiac Market, for Xarelto, Pradaxa, Eliquis and Edoxaban

- Eliquis crossed Pradaxa with 21% share in sept 14.
- Eliquis expected to be market leader in sept 16 with 42% market share.

9.9 Ongoing Patient Share – GP Target

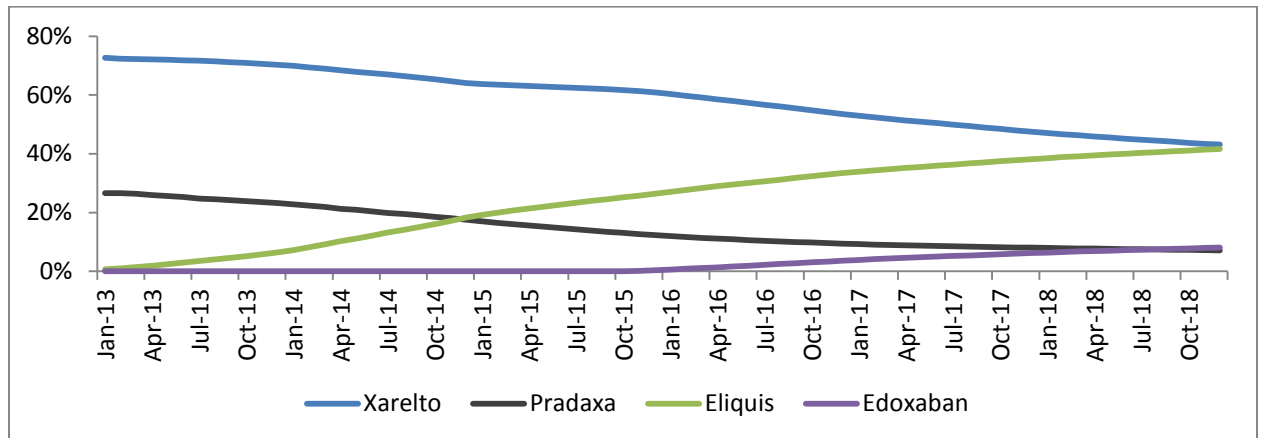


Figure 11: Ongoing Patient Share- GP Target Market, for Xarelto, Pradaxa, Eliquis and Edoxaban

- Eliquis crossed Pradaxa at 18% in Dec-14.
- Eliquis expected to reach 42% in Dec -18, equaling with the market leader; Xarelto.

9.10 Ongoing Patient Share - GP Non Target

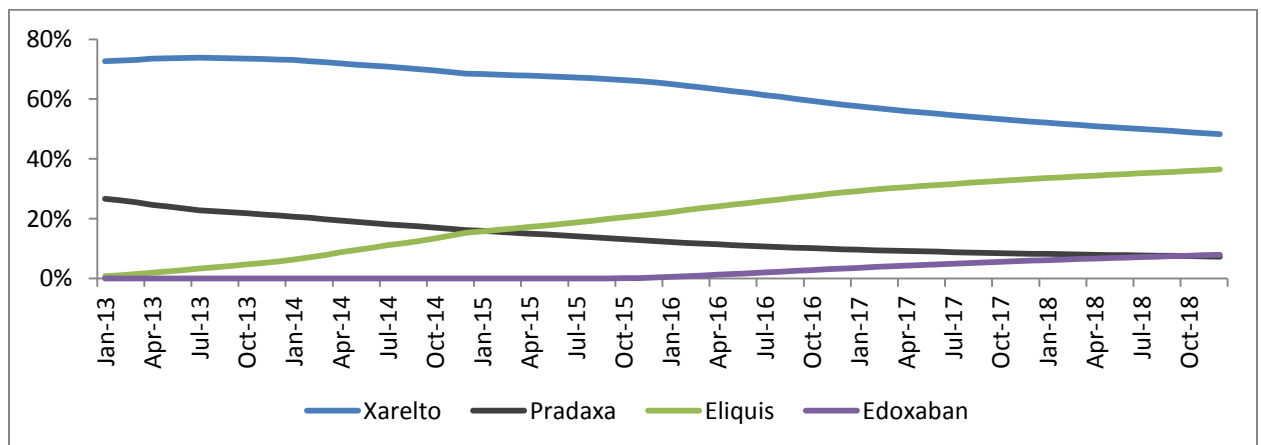


Figure 12: Ongoing Patient Share- GP Non-target, for Xarelto, Pradaxa, Eliquis and Edoxaban

- Eliquis crossed Pradaxa at 16% in Feb-15.

- Eliquis struggling to cross Xarelto with 36% share which 12% less as compare to Xarelto in Dec 18.

Table 10: Ongoing Patients According to segments

Cardiac	2013	2014	2015	2016	2017	2018
Xarelto	25,978	35,592	39,923	37,263	33,725	31,224
Pradaxa	8,061	8,180	8,349	8,400	8,193	7,666
Eliquis	2,116	8,966	19,906	30,657	38,800	43,409
Edoxaban	0	0	196	2,541	5,329	7,369

GP Target	2013	2014	2015	2016	2017	2018
Xarelto	231,454	328,778	407,725	436,121	422,065	391,710
Pradaxa	68,763	66,427	64,464	62,810	61,180	58,226
Eliquis	10,794	54,306	131,823	206,894	274,207	326,733
Edoxaban	0	0	364	16,835	44,007	64,760

GP Non- Target	2013	2014	2015	2016	2017	2018
Xarelto	120,008	197,044	240,904	246,269	235,791	221,402
Pradaxa	32,808	35,628	34,718	32,858	31,512	29,755
Eliquis	4,823	24,387	57,919	93,086	124,340	146,821
Edoxaban	0	0	184	8,526	22,287	32,798

9.11 Treatment Days Market Share

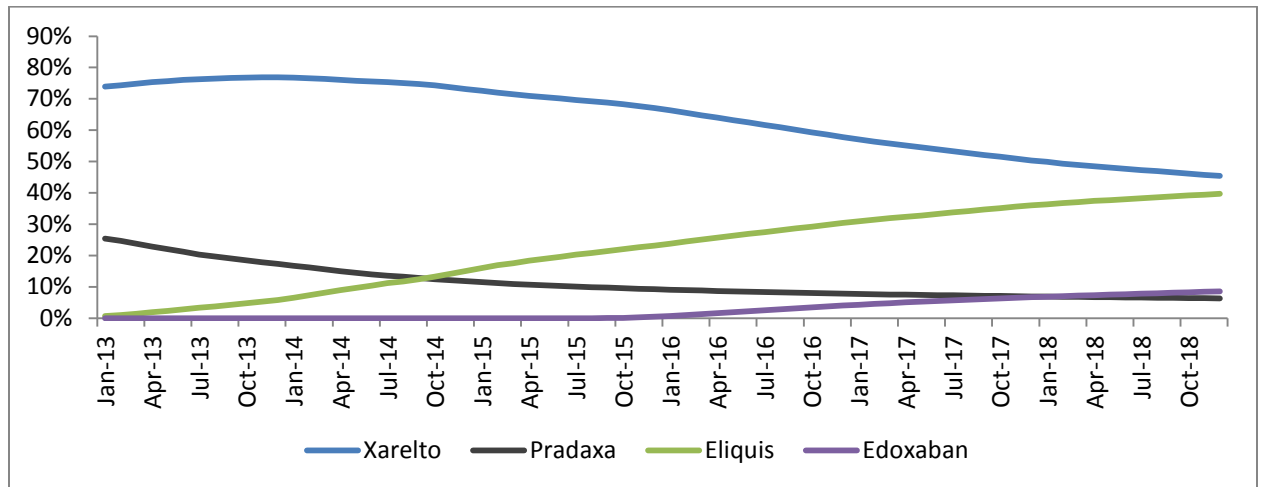


Figure 13: Treatment Days Market Share, for Xarelto, Pradaxa, Eliquis and Edoxaban

- Eliquis crossed Pradaxa at 12% in Sept-14.
- Eliquis struggling to cross Xarelto with 40% share which 5% less as compare to Xarelto in Dec 18.

9.12 Treatment Days Share of Eliquis according to segments.

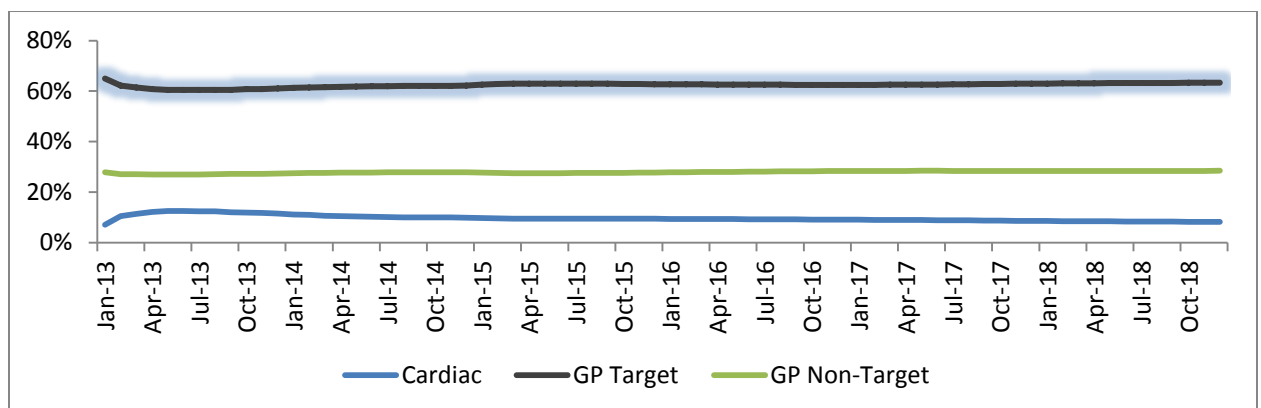


Figure 14: Treatment Days Market Share, of Eliquis in cardiac, GP target and GP-Non target

- Eliquis TD's Share in GP Target segment is maximum which is 65% in Jan-13 and 63% in Dec 18 and between Jan-13 and Dec-18 share is fluctuating between ranges of 3%.

- Eliquis TD's Share in Cardiac segment is minimum which is 7% in Jan-13 and 8% in Dec 18 and between Jan-13 and Dec-18 share is fluctuating between ranges of 5%.
- Eliquis TD's Share in GP Non-Target segment is 28% in Jan-13 and 28 and is almost stable from 2013 till 2018

Table11: Expected Treatment Days of all the segments in millions

All Segments	2013	2014	2015	2016	2017	2018
Xarelto	110	164	201	210	202	188
Pradaxa	30	30	29	28	28	26
Eliquis	5	24	57	92	126	151
Edoxaban	0	0	0.2	8	21	30
Total	145	218,	288	339	339	395

9.13 Revenues

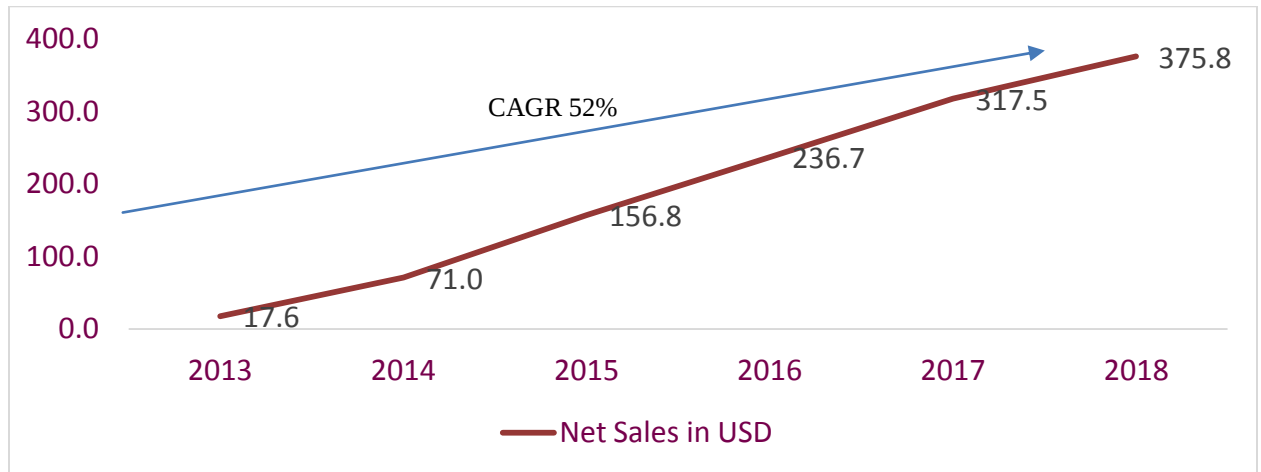


Figure 15: Net Sales of Eliquis from 2013-2014

From 2013 Net sales from 17.6M is expected to grow by 375.8M in 2017 in linear fashion with CAGR 52% and in 2018 revenues are not growing as in earlier years because from 2018 market is stabilizing.

Table 12: Eliquis Revenues

In Millions (USD)	2014	2015	2016	2017	2018
Demand					
Sales	85.0	202.9	326.8	446.3	533.3
Gross Sales	93.5	212.9	338.1	455.4	539.1
Net Sales	71.0	156.8	236.7	317.5	375.8

10. MARKET VALIDATION

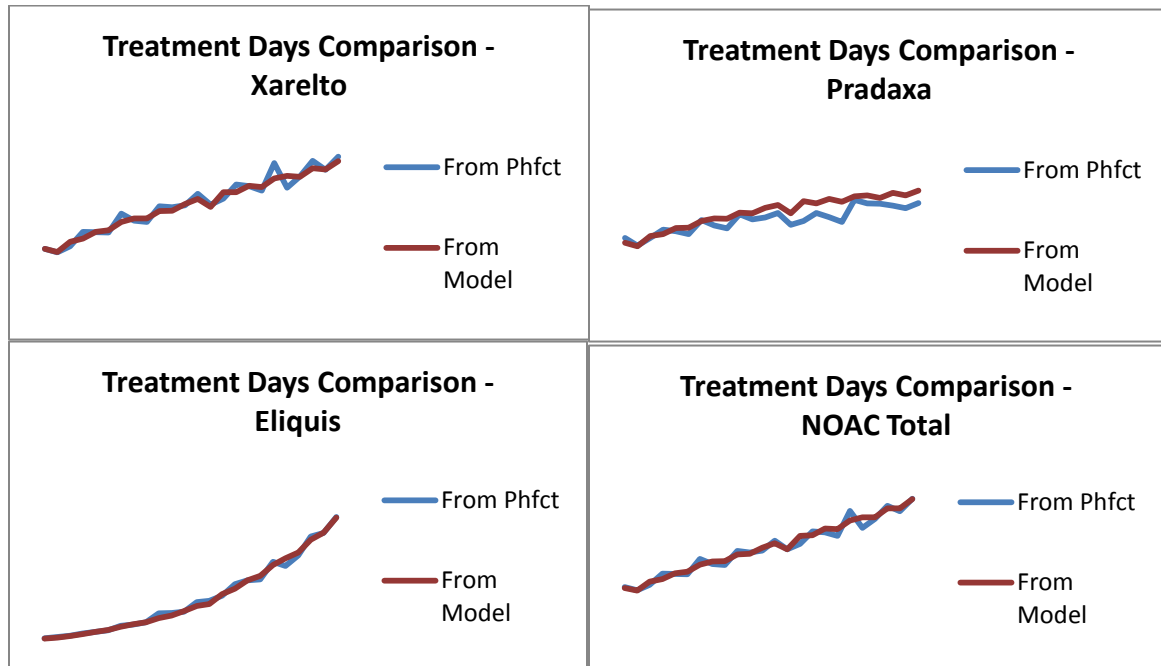


Figure 16: Market Validation

Market Validation is done to validate the forecast model. Market Validation of Treatment Days is done from Model with IMS Actual Data from Jan 13 till Dec 14 to check the phasing pattern which is same.

11.CONCLUSION

The number of NOAC patients from 2013-2018 are increasing by 8% CAGR and the Eliquis treatment days market share is expected to increase till 40% by Dec 18 from 0% in Jan 13 and revenues are expected to reach by \$ 376 Million in Dec 18 from \$18 Million in Jan 13 with CAGR of 52%.

12. LIMITATIONS

- Model flow is not based on indication.
- Data capture for country is 35%.
- Assumption for total dynamic patients.
- Losses percent can vary.

13. ETHICAL CONSIDERATIONS

Data is the property of the organization & client and confidentiality of Data must be maintained.

14. REFERENCES

1. What is forecasting? Meaning Features Steps Importance [internet] [cited 2015 21st April]
Available from : <http://kalyan-city.blogspot.com/2011/08/what-is-forecasting-meaning-features.html>
2. Eliquis [internet] [cited 2015 21st April] Available from:
<http://www.drugs.com/eliquis.html>
3. John C, Satinder K. Mullick, Donald D. Smith How to choose the right forecasting technique; issue 1971 July [cited 2015 21st April] Available from:
<https://hbr.org/1971/07/how-to-choose-the-right-forecasting-technique>
4. Massimo Zoni-Berisso, Fabrizio L, Tiziana C, and Stefano D Epidemiology of atrial fibrillation: European perspective; Clin Epidemiol. 2014; 6: 213–220.
5. Friberg L, Bergfeldt L. Atrial fibrillation prevalence revisited. J Intern Med. 2013; 274:461–468.

6. Cowan C, Healicon R, Robson I, et al. The use of anticoagulants in the management of atrial fibrillation among general practices in England. *Heart*. 2013; 99:1166–1172.
7. Chugh SS, Havmoeller R, Narayanan K, et al. Worldwide epidemiology of atrial fibrillation: a global burden of disease study. *Circulation*. 2014;129:837–847
8. Gomez-Doblas JJ, Muniz J, Alonso Martin JJ, et al. Prevalence of atrial fibrillation in Spain. OFRECE study results. *Rev Esp Cardiol*. 2014; 67(4):259–269.