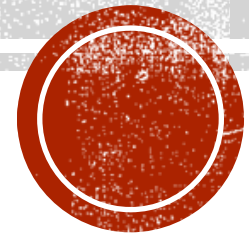


Dissertation Project on

MARKET ANALYSIS OF ANGIOTENSIN CONVERTING ENZYME (ACE) INHIBITORS

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INTRODUCTION

- Hypertension is one of the strongest modifiable risk factors for cardiovascular and kidney diseases. Prospective studies collaboration has reported that reducing BP can substantially decrease cardiovascular risk.
- There is a shift observed in the choice of drugs prescribed from beta blockers to ACE inhibitors especially due to their favorable effect on the accompanying concomitant disorders.



OBJECTIVES

- **Broad Objective**

- To determine the market potential of ACE Inhibitors in Hyderabad.

- **Specific Objective:**

- To estimate the market value and market volume of ACE inhibitors
 - To quantify the market of drug molecules and brands of ACE Inhibitors.
 - To determine the market drivers and challenges for ACE Inhibitors.
 - To study the competitor landscape of ACE Inhibitors.



LITERATURE REVIEW

- According to (Kaur, 2012), 25% of the world's adult population has hypertension and this is likely to increase further by 2015. Modelled projections indicate an increase to 1.15 billion hypertensive patients by 2025 in developing countries including India. The prevalence of hypertension in India is highest in age group of 50-59 years in males and 60-64 in females in urban areas whereas in rural areas an age related increase is seen in both sexes in age group 60-64.
- In a study conducted by (Arief, 2013), it was observed that the physicians had preferred monotherapy more often than the combinations and the most frequently prescribed agent among monotherapy was ACE-Inhibitor class. ACE-Inhibitors are the only class of drugs that are often prescribed to diabetic hypertensive patients.



METHODOLOGY

Research Problem:

- Indian Anti-hypertensive market is expanding with a CAGR of 12.6% but the market share is diluting with increasing number of brands. This calls for the need to assess its highly fragmented market and competitive landscape to facilitate effective decision making for new entrants and competitive advantage.

Research Question:

- What is the market potential of ACE inhibitors in Hyderabad city?
- What are the market drivers and challenges of ACE Inhibitors?

Research Design:

- Study type: Descriptive
- Data source: Mainly Primary data and some data points were obtained through secondary research
- Data collection technique: Survey
- Data collection tool: Researcher administered questionnaire.

Sample Design:

- Target population: Dispensing Pharmacist
- Sampling method: Non-probability convenience sampling
- Sample size: 162 Dispensing Pharmacist (at 95% Confidence Interval and 8% Margin of error)
- Study Location: Hyderabad
- **Analysis Software:** MS Excel 2016 and SPSS 20.
- **Study duration:** February 4 to May 6, 2016.



RESULT & ANALYSIS



MARKET VOLUME & VALUE

- **Epidemiology based Model:**

Population		11,723,548
Prevailance Rate (%)	33%	3,868,771
Diagnosis Rate (%)	25%	967,193
Treatment Rate (%)	38%	367,533
Antihypertensive share of ACE-I	14%	51,455
Doses per day		2
Total Market Volume		37,561,896
Average Selling Price (INR)		4.95
Total Market Value (INR)		185,931,386



Ramipril		
Market Volume	32%	12,019,806.75
ASP (INR)		5.28
Market Value (INR)		63,464,580
Enalapril		
Market Volume	28%	10,517,331
ASP (INR)		2.50
Market Value (INR)		26,293,327
Lisinopril		
Market Volume	16%	6,009,903
ASP (INR)		4.68
Market Value (INR)		28,126,348
Fosinopril		
Market Volume	9%	3,380,571
ASP (INR)		9.71
Market Value (INR)		32,825,341
Captopril		
Market Volume	6%	2,253,714
ASP (INR)		2.74
Market Value (INR)		6,175,176
Imidapril		
Market Volume	5%	1,878,095
ASP (INR)		4.46
Market Value (INR)		8,376,303
Perindopril		
Market Volume	2%	751,238
ASP (INR)		7.66
Market Value (INR)		5,754,482
Benazepril		
Market Volume	2%	751,238
ASP (INR)		6.09
Market Value (INR)		4,575,039



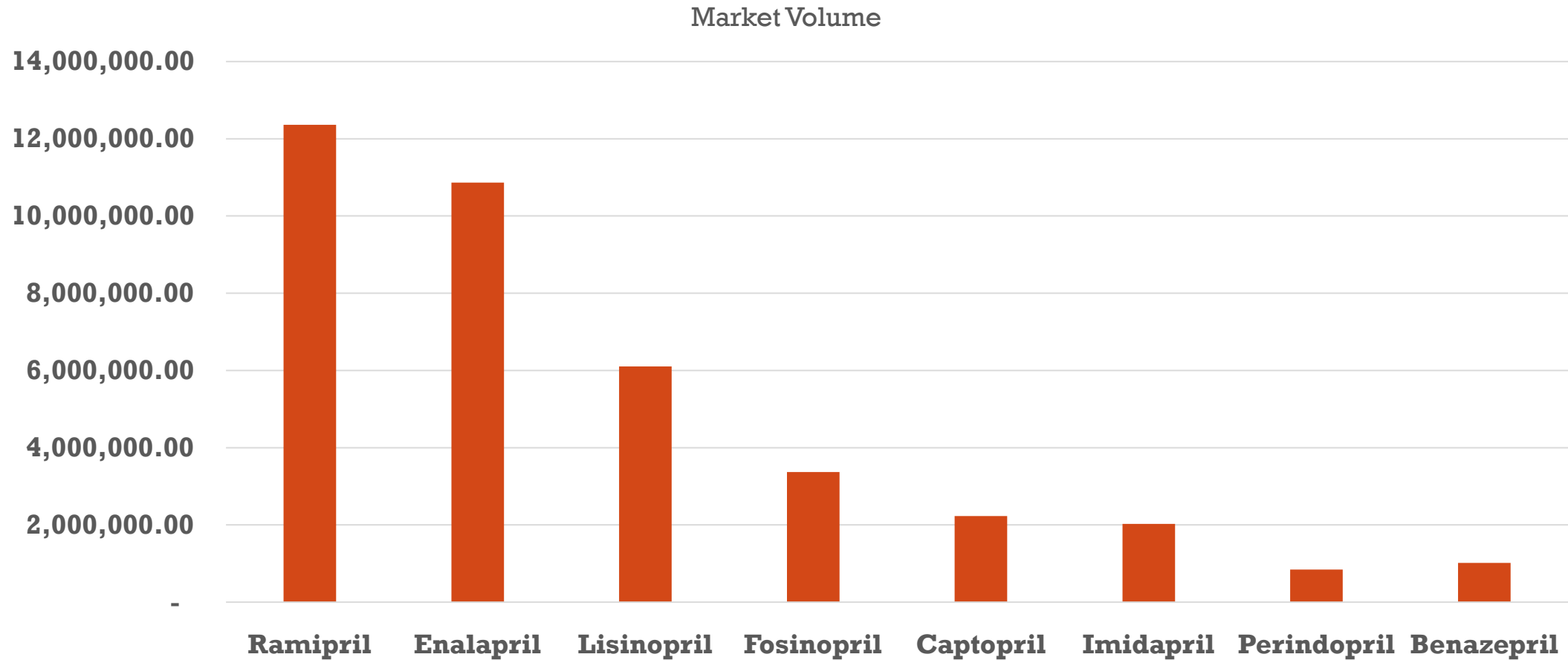
▪ **Retailer Based Model**

	Ramipril	Enalapril	Lisinopril	Fosinopril	Captopril	Imidapril	Perindopril	Benazepril	
No. of Pharmacies	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	
Strips/week	3.66	0.75	1.75	1.00	0.66	0.60	0.25	0.10	
Average Selling Price (INR)	5.28	2.50	4.68	9.71	2.74	4.46	7.66	6.09	
Avg. Units/strip	9.98	42.92	10.31	10.00	10.00	10.00	10.00	30.00	Total
Market Volume	12,361,466	10,863,106	6,100,900	3,371,309	2,230,800	2,028,000	845,000	1,014,000	38,814,581
Market Value (INR)	65,268,539	27,157,765	28,552,212	32,735,409	6,112,392	9,044,880	6,472,700	6,175,260	181,519,157

- The Market Volume and Market Value was determined using these two methods and the variation was found to be only 3.34% in Volume and 2.4% in Value.
- The individual Market Volume and Value is also calculated for individual Molecule of ACEI.



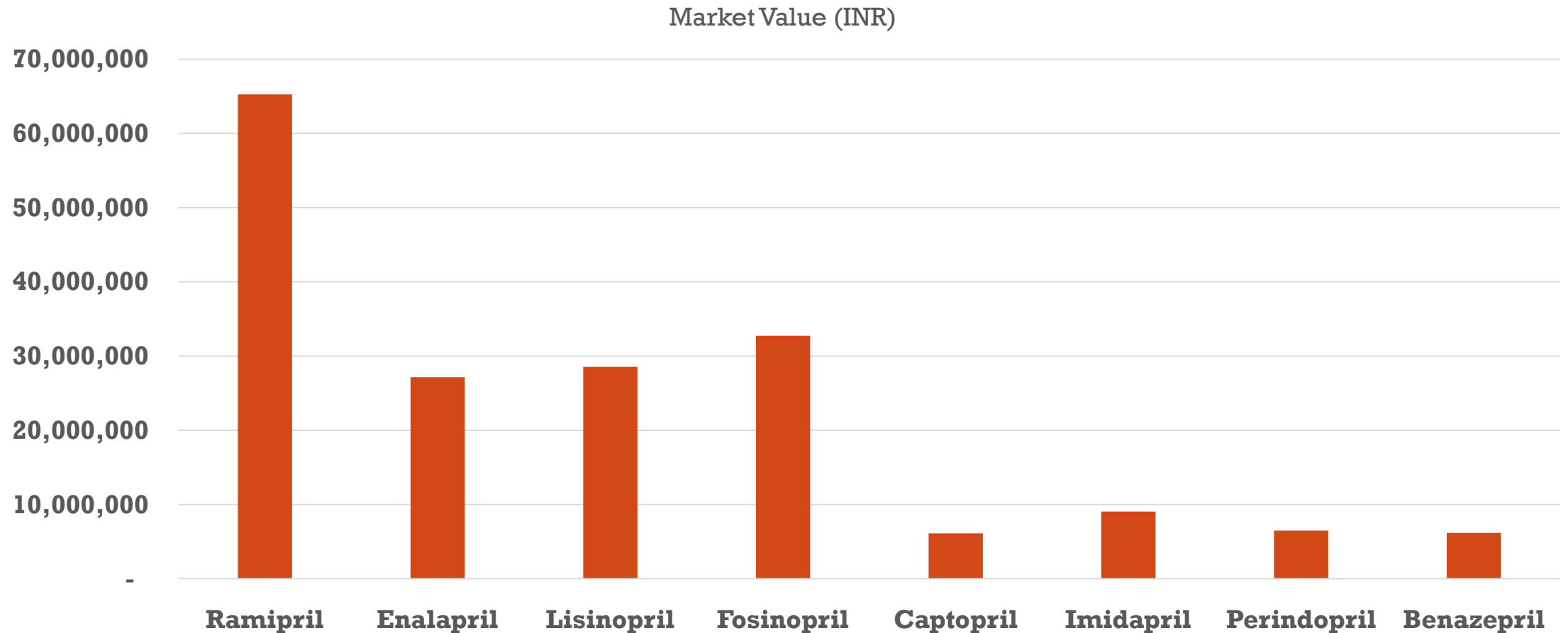
COMPARISON OF MARKET VOLUME OF INDIVIDUAL ACEI MOLECULES



The investigation revealed that the most prescribe molecule of ACE Inhibitor was Ramipril followed by Enalapril, Lisinopril, Fosinopril and Captopril.



COMPARISON OF MARKET VALUE OF INDIVIDUAL ACEI MOLECULES

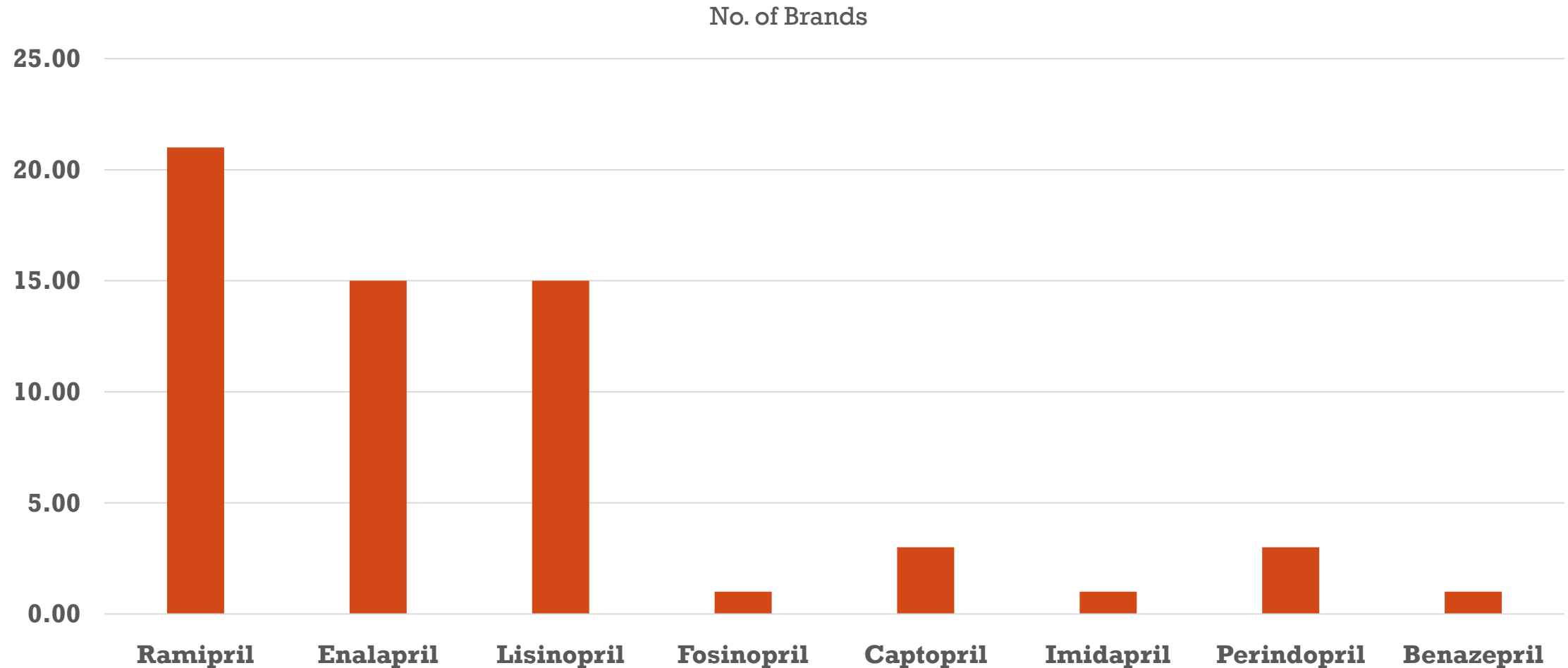


Even though the market volume indicates the highly prescribed molecules, however the market value shows a different picture due to variation in the Selling prices of these molecules. This variation in the Prices may be because different molecules shows different efficacy at different dosage and therefore its quantity in the formulation effects the price of the final product.

Ramipril appeared to occupy major value share followed by Fosinopril, Lisinopril and Enalapril.



COMPARISON OF NUMBER OF BRANDS UNDER ACEI MOLECULES



The number of brands present in the market was found to be in direct proportion to the Market Volume occupied by the Molecules.

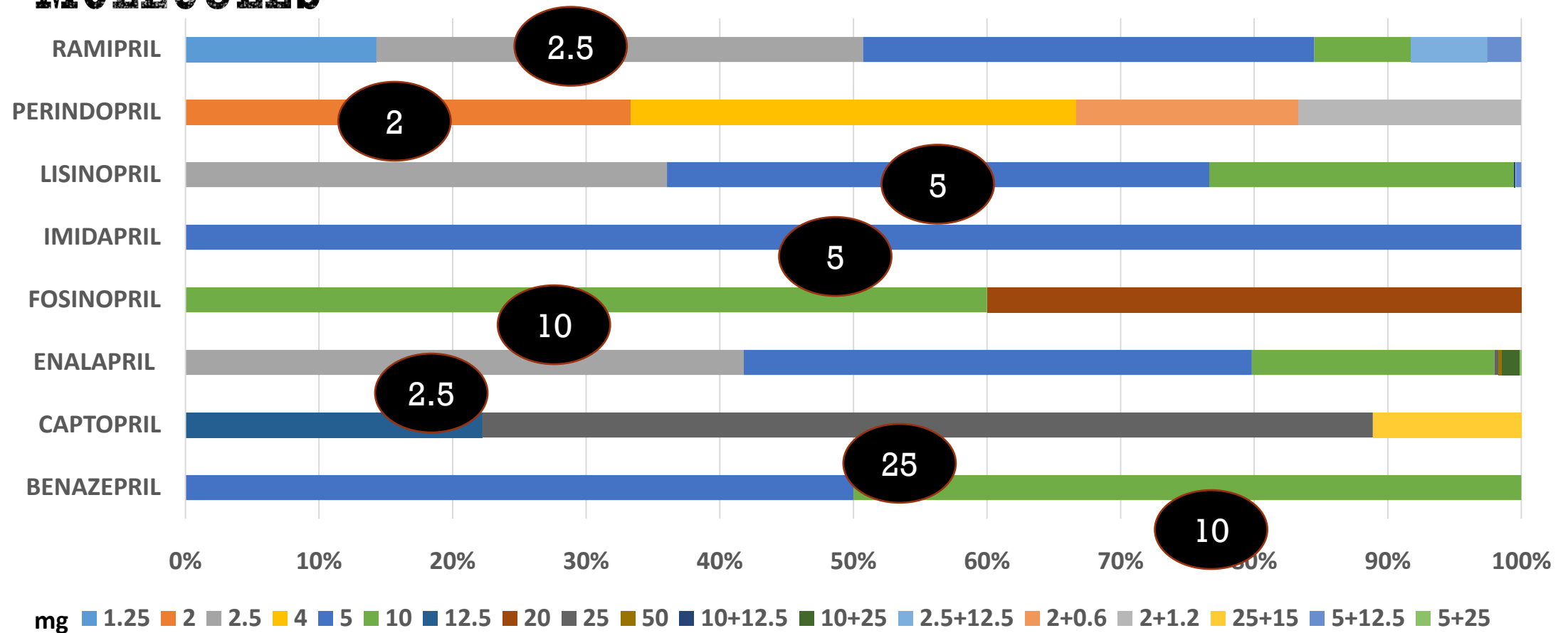


COMPARISON OF MARKET VOLUME, VALUE AND NUMBER OF BRANDS OF INDIVIDUAL ACEI MOLECULES

- In terms of Sales Volume, the sale of Ramipril is Highest, followed by Enalapril and Lisinopril.
- However, in terms of Market value, Fosinopril ranks second after Ramipril, followed by Lisinopril and Enalapril.
- This indicated that even though the sales of Fosinopril is Low, the revenue generated by it is much higher.
- It was also found that the entire market share of Fosinopril market was occupied by Hytrol of Sun Pharma.



DISTRIBUTION OF DIFFERENT STRENGTHS OF ACEI MOLECULES



The above graph shows the prescription share occupied by different dose strengths within individual molecule.

The highly prescribed strengths for individual molecules is 2.5mg Ramipril, 2mg Perindopril, 5mg Lisinopril, 5mg Imidapril, 10mg Fosinopril, 2.5mg Enalapril, 25mg Captopril and 10mg Benazepril.

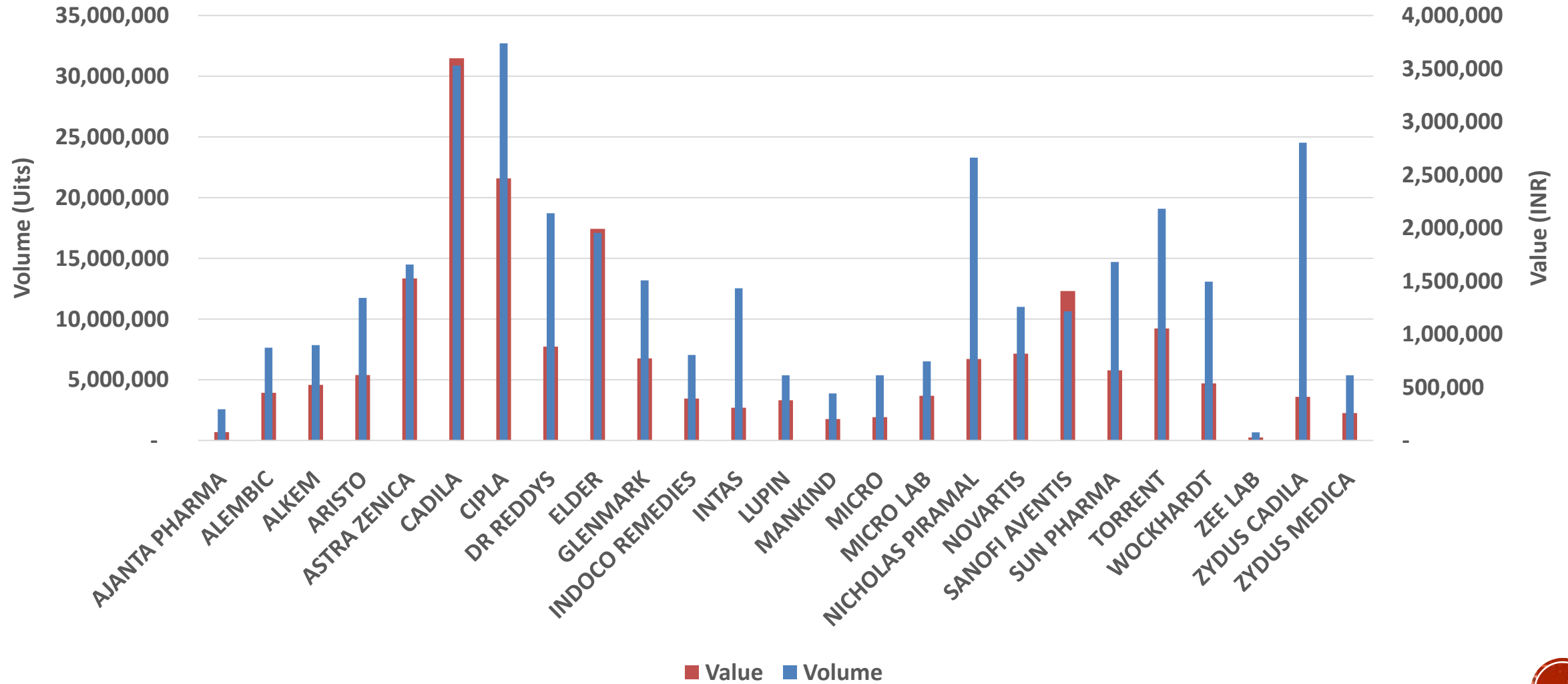


ACE INHIBITOR MARKET OVERVIEW WITH TOP SELLING BRANDS



It was observed that the top 5 brands of Ramipril and Lisinopril occupy about 43% and 73% share of the respective Market. The competition among brands for other molecules was quite defined with limited brands occupying a significant market share.

COMPANY MARKET SHARE BY VOLUME & VALUE

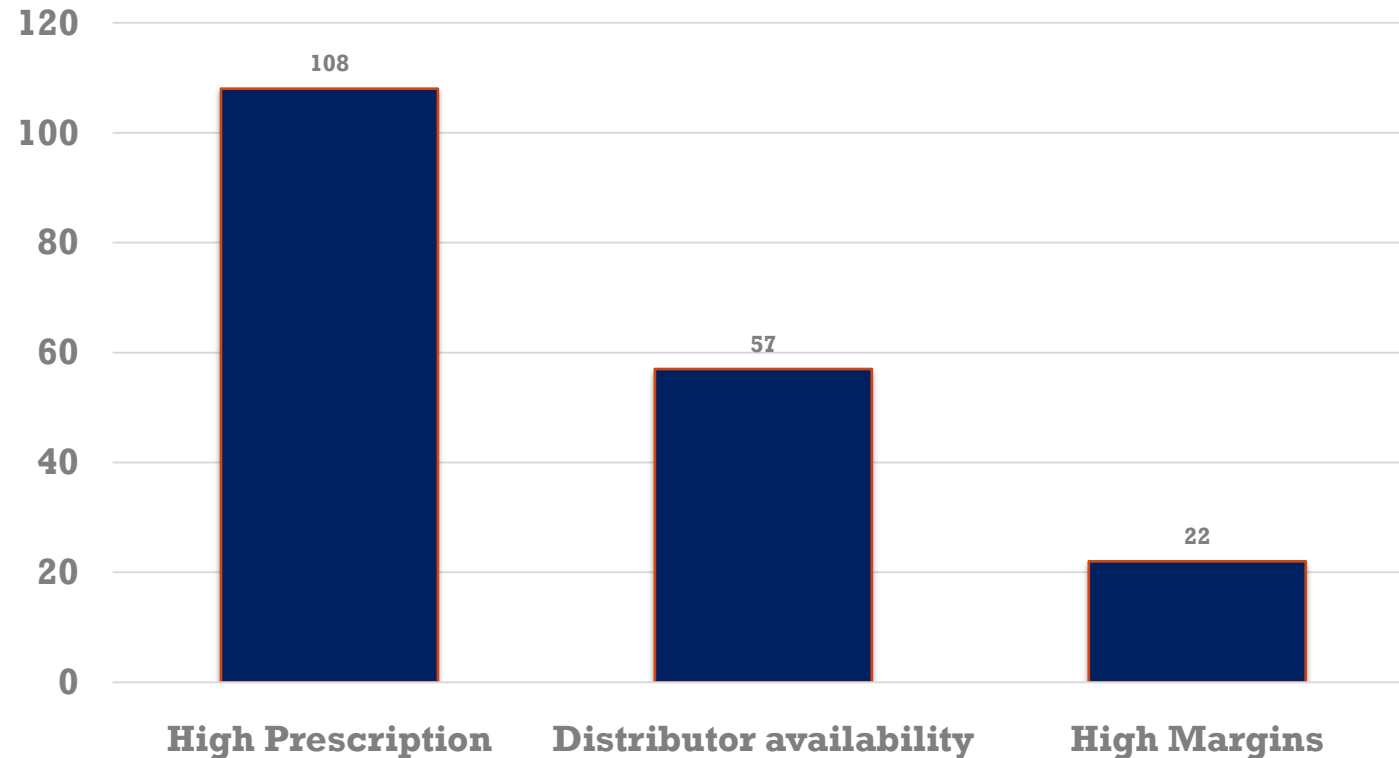


COMPANY MARKET SHARE BY VOLUME & VALUE

- Cipla leads the ACE Inhibitor market in terms of volume.
- Cadila follows Cipla in terms of Volume but accounts for Highest Market Value.
- Zydus Cadila has Low sales volume but corresponding Market Value is High.
- Sanofi Aventis has High sales volume but corresponding Market Value is Less.



REASONS FOR AVAILABILITY OF BRANDS PRESENT IN THE MARKET

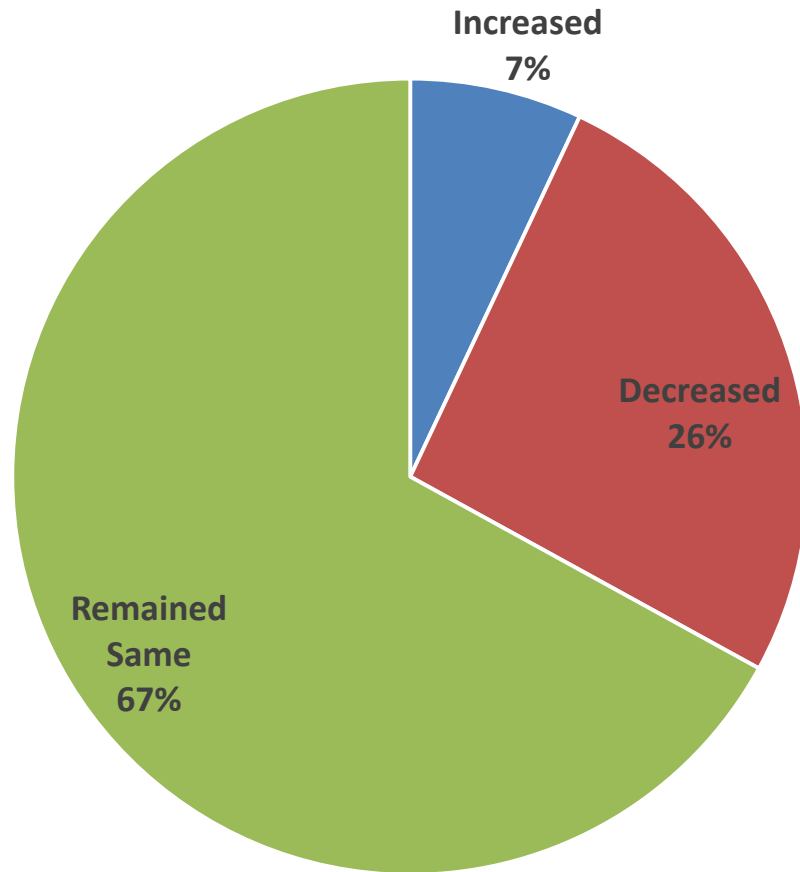


Around 108 of the primary participants said that High prescription was the reason for them to keep availability of the brands that were occupying the market.

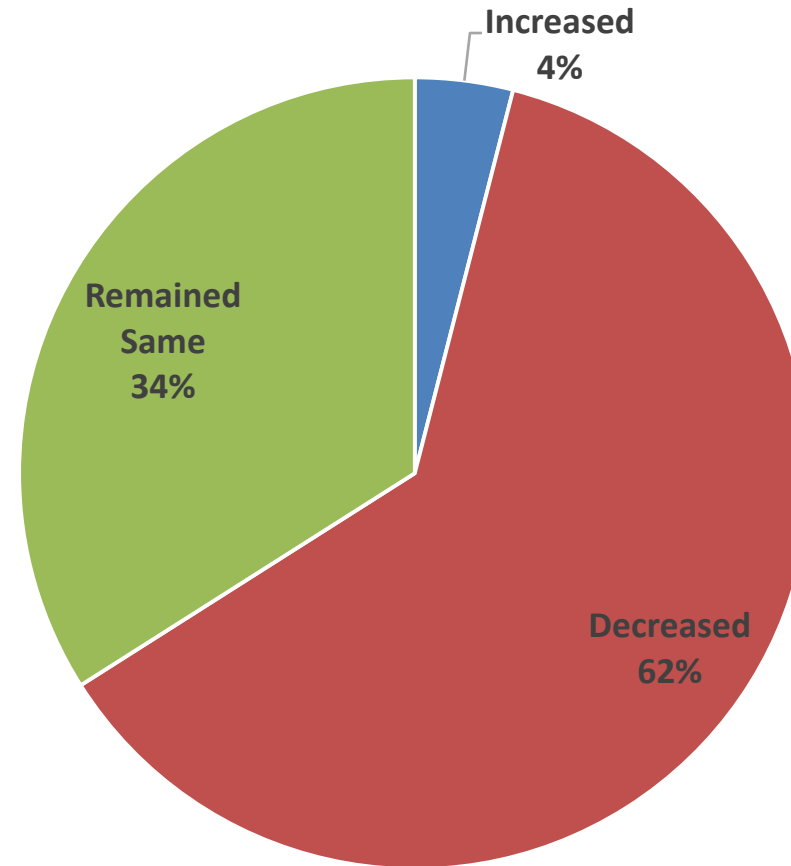


TRENDS OBSERVED IN THE PRESCRIPTION FREQUENCY AND SELLING PRICES

Prescription Frequency



Average Selling Price (INR)



About 67% of Primary participants said that they did not observe any changes in the prescription frequency of ACE Inhibitors at their stores.

About 62% of the participants said that they have observed decline in the Selling prices.



ANTI-HYPERTENSIVE MARKET LANDSCAPE

	β-Blockers	Calcium Channel Blocker	Angiotensin Receptor Blockers	Diuretics	Angiotensin Converting Enzyme Inhibitor
Avg. weekly sales (strips)	3 (5.1%)	12 (20%)	14 (24%)	22 (37%)	8 (13.5%)
Highly prescribed brands	Ciplar	Acord	Cortel	Hydrazide	Tanatril
	Bisocar	Dicard	Arbitel	Frusenex	Hopecard
	Betaloc	Renidil	Cresar	Acezid	Enam



OTHER QUALITATIVE DATA REVEALED THAT

- Brand substitution in Pharmacies = 24%
 - Which signifies that the market share is not only influenced by prescribers but also other factors at the Pharmacy.
- Prescription of ACEI with Hypoglycemic agents = 2 prescriptions/week
 - This indicates that 25% of ACEI are prescribed in Diabetic patients. Therefore, combination products can become a feasible option for manufacturers.
- Prescription of other Anti-Hypertensive with Hypoglycemic agents = 11 prescriptions/week=21.56% of Anti-hypertensive Market



MARKET DRIVERS & CHALLENGES

- Increasing Hypertensive population due to Life style changes.
- Increasing concomitant diseases with hypertension, like Diabetes and kidney disorders
- Aging population
- First choice of treatment for low Hypertension.

CHALLENGES

- Expiring Patents
- Increasing Market of ARB due to less side effects compared to ACEI



STRATEGIES USED BY COMPANIES

- Increased sales force and detailing activity.
- Combination with other ACEI or other Anti-Hypertensive drugs.
- Formulation modification (bid or tid to qd)
- Making product availability
- **Market penetration strategy:**
 - Market share growth- Red ocean strategy
 - Customer loyalty improvement-migrate existing customer, add value to existing brand
 - Customer value improvement- increase customer profitability by decreasing cost to serve
increase prescription frequency



DISCUSSION

- The market value of ACE Inhibitors in Hyderabad was estimated to be 185,931,386 at market volume of 37,561,896.
- The anti-hypertensive market was found to comprise of 5% β -Blockers, 20% Calcium channel blockers, 24% ARB, 37% Diuretics and 13.5% ACE Inhibitors.
- The ACE Inhibitor market was divided into Ramipril (33%), Lisinopril (19%), Enalapril (18%), Imidapril (11%), Captopril (7%), Fosinopril (4%), Perindopril (4%), Benazepril (3%).
- Cipla was found to be leading the ACEI Market in Volume while Cadila lead in Value.
- High prescription was a leading factor in availability of specific Brands in the market.
- According to the primary participants, the rate of prescription has remained the same over the past while the average selling price has decreased. This may be because of high competition among products.
- Brand substitution was seen due to factors such availability at time of dispensing and sales force influence.
- ACE Inhibitors were prescribed mostly in cases of concomitant disorders and therefor combination could be a feasible option for Companies



CONCLUSION

- The ACE Inhibitors occupy about 14% of Anti-hypertensive market in Hyderabad but their market has been drastically influenced by steadily increasing market of ARBs.
- Ramipril is highly prescribed but its market is also highly fragmented due to large number of competitors.
- For New entrants, the market appears to be highly challenging due to established customer loyalty by Older brands.
- The Market penetration strategies could be applied in order to maximize Market share.
- Sales force plays a major role in the prescription generation in such competitive markets.
- Combination drugs were found to occupy only a minor portion of the market. This count may increase over the period due to changes in therapy and formulation developments.



SUGGESTIONS

- The report gives an insight of how the market is moving and this would facilitate the companies in deciding the right product which would be more profitable.
- The company can choose to come up with a highly prescribed molecule with highly prescribed strength and compete in the market using red ocean strategy.
- The company can also choose to enter into a monopolistic market and try to grab the market share of the existing player.
- Combination therapy is used in most of the patients therefore combination drugs can also be a feasible market.



LIMITATIONS

- Low sample size
- Study was conducted only in one city.
- Study depicts only the current data and not the forecast.
- Some of the respondents did not answer 100% of the questionnaire.
- Time duration for interview was also shortened due to the working hours of the participants.



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THANK YOU

