



# Why Patients go for Aclasta reinfusion?

Are they really satisfied with Aclasta or are they compelled to take it?

**Prepared by**

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# **Internship Report**

On

## **Why Patients go for Aclasta reinfusion?**

Are they really satisfied with Aclasta or are they compelled to take it?

### **Submitted to**

Syeda Shaharbanu Shahbazi

Senior Lecturer

BRAC Business School

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### **Date of Submission**

4<sup>th</sup> July, 2012

(i) **Letter of Transmittal**

Date: 5<sup>th</sup> July, 2012

To  
Ms. Syeda Shaharbanu Shahbazi  
Senior Lecturer  
BRAC Business School, BRAC University  
Dhaka, Bangladesh

**Subject: Request for accepting the Internship Report**

Dear Miss,

With due respect I would like to inform you that I have completed my internship program in Novartis (Bangladesh) Limited and now as per requirement, I am submitting my Internship report to you.

I would like to express my gratitude in allowing me to undertake this responsibility in preparing this paper and would be extremely delighted, honored if you accept my report and recognize the hard work and determination I have put together in the preparation and completion of this report.

Thanking you.

Sincerely and Regards,

Mousumi Rahaman  
Student ID# 08104129

-----  
Signature

## (ii) Acknowledgement

First of all, I would like to thank my on-site supervisor **Dr. Tanvir Mobarak Ali, Director, Medical & DRA, Novartis (Bangladesh) Limited** for providing me the opportunity to work on this project that I have selected and for his invaluable guidelines, suggestions and advices whenever needed.

Secondly, I would like to express my gratitude to **Dr. Farzana, Medical advisor, Novartis (Bangladesh) Limited** for helping me and working with me in most of the projects. I would also like to take this opportunity to thank **Mr. Taufiqur Rahman, Marketing Executive and Ms. Irin Habib, Marketing Officer, Novartis (Bangladesh) Limited** for providing me with all the necessary information available. I am also grateful to the team members I have worked with.

Finally and more importantly, I would like to thank my academic supervisor **Ms. Syeda Shaharbanu Shahbazi, Senior Lecturer, BRAC Business School**, BRAC University for guiding me through all the way by being flexible and also by being there whenever needed. Without her advice and help, finishing this project effectively would have been impossible.

### **iii) Executive Summary**

Novartis International AG is a well known multinational company who is ranking number two in sales among the worldwide Pharmaceutical industry. Now, in the current year 2012, prediction goes that it is going to top Pfizer and take the top rank in global Pharmaceuticals. Novartis (Bangladesh) Limited had started its operation officially in 1997 but the local competition is so enormous that they are not in the top ten rank in Bangladesh. Their slogan is “Care and cure” and by that, they are emphasizing more on the welfare, benefits and safety of the people.

Aclasta is one of the special products of Novartis which is prescribed to cure osteoporosis. Osteoporosis is basically a bone loss disease where bone becomes weak and causes fractures afterwards. It is the first original medicine which contains Zoledronic Acid and is known as a revolutionary medical discovery for osteoporosis because of it's once a year treatment. The infusion of the drug is pretty expensive but it's effective as well.

Among all the projects, Aclasta has been chosen for preparing the internship report because the organization allowed me to disclose the results of this report. One of the answers of research questions that the organization was looking for was whether the patients who are taking Aclasta reinfusion are finding the drug effective or not. They wanted to know the exact reason that whether the patients are taking the reinfusion because they are really satisfied with the outcomes or they are being compelled to take it by the doctors. Due to prices and other factors, Patients may not like to the infusion further. So the research has been done to find out the answer of those questions.

For this, a questionnaire has been made and through telephone survey, patients had been asked by the team to give a feedback to those questions. After getting their answers, all the data has been sorted out and through SPSS, analysis has been done. Under one major hypothesis, 17 sub hypotheses has been made and then it was compared with other variables to find out associations and difference. Many methods have been used such as, Chi-Square test, regression, cross tabulations etc. Then after the analysis; the result has been interpreted and it was concluded with some findings and recommendations. Finally, the answer that has been found is that the patients are satisfied with Aclasta reinfusion so they are taking it; they are not being compelled to take it.

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## CHAPTER ONE

### PART ONE: HISTORICAL BACKGROUND & FOUNDATION

#### **1.1.1 Historical Overview**

Pharmaceutical Industry is one of the highly sophisticated industries in Bangladesh which has been uncovered to rapid change and made a revolution in Bangladesh by maintaining high technology and a world class standard in quality. These industries have a major commitment to the society than any other industries as it is involved with the manufacturing of life saving drugs.

Novartis (Bangladesh) Limited is one of the leading global pharmaceutical companies in Bangladesh. Novartis International AG, a Swiss company is the parent of Novartis (Bangladesh) Ltd. This company came into existence in 1997. Previously this company was known as Ciba-Geigy (Bangladesh) Ltd. with the global merger between Ciba-Geigy and Sandoz in 1997, Novartis Bangladesh was formed. Novartis International AG is the mother company of Novartis (Bangladesh) Limited. It is now positioned as the fifth largest among all the pharmaceutical companies in the world.

Novartis has been operating in Bangladesh since 1968. At that time, it was only a trading house. It started doing health care business in Bangladesh since 1973 again in the form of trading. In 1979, company decided to invest in developing its own crop protection formulation plant in Chittagong. Novartis (Bangladesh) Limited registered with the joint Stock company as Ciba-Geigy (Bangladesh) Limited in 1973 a joint venture agreement between Ciba-Geigy AG, Switzerland (60%) and Bangladesh Chemical Industries Corporation (40%). The partnership with BCIC was further strengthened in 1989 with the setting up of a pharmaceutical plant in Tongi. Proportion of partnership remains same. The pharmaceutical plant has the success of developing innovative analytical methods, which have been incorporated in the Novartis Generics global manufacturing processes. The plant is an approved global supply point for solid dosage forms of Novartis Generics. Products manufactured from this plant are exported to Asia Pacific, European and Latin American countries. The Bangladesh Novartis is limited to the business of research pharmaceuticals brand.



Pharmaceutical industry not only meets the maximum demand of our country but also export these products to other countries. Bangladesh is the only country, which is self reliant in medicine in this part of the world beside India, which exports pharmaceutical raw materials too.

### 1.1.2 Novartis principles

Several product categories. Various brands

I provide effective and quality product; Innovative new products

Innovation is the heart of our research strategy

I am committed to focus on research and development

I span the country covering thousands of medicine outlets

To provide a broad portfolio of innovative, effective and safe products and services to patients through healthcare professionals around the world

Our purpose is to improve lives; to extend lives; to save lives.

### 1.1.3 Corporate Purpose

Novartis corporate purpose is to discover, develop and successfully promote innovative products to cure diseases, to ease sufferings and to enhance the quality of life. They want to create and successfully commercialize leading products to treat patients, to prevent disease and to restore the life of people. The company also wants to provide a broad portfolio of innovative, effective and safe products and services to patients through healthcare professionals around the world. It tries to meet the essential needs of people everywhere.

Their long-term success requires a total commitment to exceptional standards of performance and productivity, working together effectively and a willingness to embrace new ideas and learn continuously. They believe that success requires the highest standards of corporate behavior towards their employees, consumers and in the society they live. This is Novartis road to retain

sustainability, profitable growth and long-term value creation for their shareholders and employees.

#### **1.1.4 Vision**

To be a global leader in the discovery, development and commercialization of pharmaceuticals

#### **1.1.5 Mission Statement**

I, Novartis Bangladesh, guided by our Aspirations believe in ensuring our long term existence by being profitable and sustainable with our commitment to providing value adding innovative products and services to satisfy the needs of our customers in the sectors of:

- Pharmaceuticals
- Sandoz
- Animal Health

#### **1.1.6 Goal**

They aim to harness the latest advances in biomedical research and technology to develop new therapies with the potential to benefit millions of patients throughout the world.

### **PART TWO: NOVARTIS-AT A GLANCE**

#### **1.2.1 Glimpse of Global Novartis**

Basle, the Chemical Capital of Switzerland is famous for its four-way culture for placing the border of four countries and for its four large chemical companies because of its geographic position, Basel had a great opportunity to prosper.

First there are three companies: Geigy which history goes back to the middle of the 18th century, Ciba, born at around 1860 and Sandoz which was set-up in 1886. The three most famous chemical companies are:

**Ciba:** Chemical industries of Basel

**Geigy:** Named after the owner J. R. Geigy

**Sandoz:** Health care specialist

In 1970 Ciba and Geigy merged. The newly created Ciba-Geigy Ltd. and Sandoz continued to follow separate ways for two and a half decades.

On March 7, 1996, It has been formally announced that, Sandoz and Ciba, two proud Swiss based companies with almost three hundred years of tradition, agreed to integrate to become one. The creation of Novartis was at that time one of the largest corporate merger in the history. Ciba-Geigy Ltd. and Sandoz both have a colorful and rich history spanning more than hundred years. Preceding the merger, there are months of top-secret negotiations and meetings of the minds on a bold strategic move.

Novartis is the world leader in research and development of products to protect and improve health and ill being. The very name derived from the Latin novae artes, meaning new skills reflects its commitment to focus on research and development to bring innovative new products to the society. Novartis wants to have a positive impact on people's lives and to discover, develop and successfully market innovative products to cure disease and enhance the quality of life.

With the approval of the EU and US Federal Trade Commission, Novartis finally came into existence on December 20, 1996, clearing all the regulatory hurdles of the merger.

Headquartered in Basel, Switzerland, Novartis innovates for the benefits of its customers. It operates through 360 affiliates in **140 countries** and offers its products through its Pharmaceuticals, Generics, consumer Health, CIBA Vision, Animal Health and Business Development & Licensing Unit.

## 1.2.2 Brief Profile of Novartis

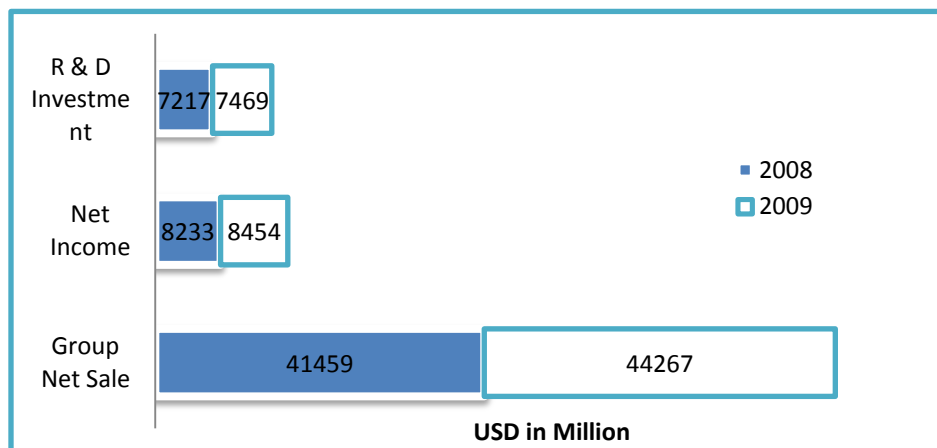


Type	Public	
Industry	Pharmaceutical Industry	
Business Segments	<ul style="list-style-type: none"> <li>▪ Pharmaceuticals,</li> <li>▪ OTC Drugs,</li> <li>▪ Vaccines &amp; Diagnostics,</li> <li>▪ Generics,</li> <li>▪ Animal-Health Medicines,</li> <li>▪ Contact Lenses &amp; Lens Care Products</li> </ul>	
Founded	1996 (from Merger)	
Headquarter	Basel, Switzerland	
Number of Countries Operating in	140 Countries	
Key People	Chairman, Board of Directors	Dr. Daniel Vasella
	Chief Executive Officer	Joseph Jimenez
	Chief Financial Officer	Jon Symonds
	Division Head, Pharmaceutical	David Epstein
	MD, Global Head, Novartis Institute for BioMedical Research	Dr. Mark Fishman
	Division Head, Generics	Jeff George
	Division Head, Consumer Health	George Gunn
	MD, Division Head, Vaccines & Diagnostics	Dr. Andrin Oswald
	Global Head, Human Resources	Jurgen Brokatzky-Geiger
	General Counsel	Dr. Felix Ehrat
	Corporate Secretary	Dr. Charlotte Pamer-Wieser
	Chief Compliance Officer	Dr. Peter Kornicker
	Healthcare Revenue	<b>US \$ 44.27 Billion (2011 - Jan 25, 2012)</b>
Consolidated Revenue	US \$ 44.27 Billion (2009)	
Operating Income	US \$ 10,998 Million (2011 - Jan 25, 2012)	
Net Income	US \$ 9,245 Million (2011 - Jan 25, 2012)	
Earning Per Share	US \$ 3.83 (2011 - Jan 25, 2012)	
Total Assets	US \$ 95.51 Billion (2009)	
Shareholder's Equity	US \$ 57.46 Billion (2009)	
R&D Expenditure	US \$ 7.47 Billion (2009)	
Associates	1,20 ,000 Associates	
Net Sales	US \$ 58,566 Million (2011 - Jan 25, 2012)	
Subsidiaries	Sandoz, Ciba Vision	
Official Website and Information Source	<a href="http://www.novartis.com">www.novartis.com</a>	

### 1.2.3 Global Financial Performance

At present, Novartis holds the 4<sup>th</sup> place in the top 50 pharmaceutical companies all over the world with USD 44.3 billion revenue, USD 10.3 billion net income and USD 7.5 billion Investment in R&D. On the basis of financial performance Johnson & Johnson holds the leading position succeeded by Pfizer, Roche, and GlaxoSmithKline. In addition, Novartis also holds 184<sup>th</sup> position in ‘Fortune 500 Company’ ranking. The following chart (1.2.3) shows the position of Novartis from the global perspective:

**Chart 1.2.3: Global Financial Performance of Novartis**



(Source: Med News, September 2010, Volume 29, Number 9)

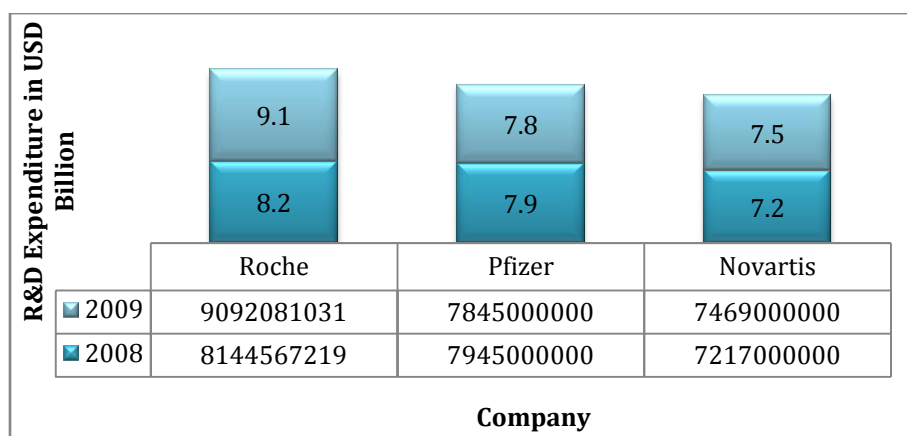
### 1.2.4 Top 3 R&D Based Companies & Novartis Position

Evaluate Pharma’s World Preview 2018 reveals that It is being forecasted that Novartis is going to be the biggest seller of drugs by 2018, it is also expected to be spending the most on developing them, . The Swiss pharma giant is investing \$10.1billion on pharmaceutical R&D by 2018 when most other major companies are cutting back. Novartis spent \$135bn on research in 2011, equivalent to 18.8% of worldwide prescription drug sales.

(Source: <http://www.epvantage.com/Universal/View.aspx?type=Story&id=302035&isEPVantage=yes>)

On the basis of research and development expense, Novartis holds the 3<sup>rd</sup> position globally. Roche holds the leading position while Pfizer is on the second place. The following chart shows the R&D expenditure of these top three companies in 2008 and 2009:

**Chart 1.2.4: Top 3 R&D Based Company's R&D Expenditure**



Source: Med News, September 2010, Volume 29, Number 9

### 1.2.5 Best-Selling Rx Products of Novartis

Globally the 10 best-selling Rx products of Novartis of 2009 and 2008 are as follows:

**Table 1.2.5: Best-Selling Rx Products of Novartis**

Product	Sales ( US \$ Million)	
	2009	2008
Diovan, Diovan HCT	6013	5740
Gleevec/ Glivec	3944	3670
Zometa	1469	1382
Femara	1266	1129
Lucentis	1232	886
Sandostatin	1155	1123
Exelon, Exelon Patch	954	815
Neoral, Sandimmun	919	956
Volteren group	797	814
Exforge	671	406

Source: Med News, September 2010, Volume 29, Number 9

## Novartis (2010)

Headcount	119,418	
Year Established	1996	
Pharma Revenues	\$44,420	16%
Total Revenues	\$50,324	14%
Net Income	\$9,969	18%
R&D Budget	\$8,080	11%

**Table 1.2.5.1: Top-Selling Drug of Novartis in 2010**

Drug	Indication	\$	(+/- %)
Diovan	hypertension	\$6,053	1%
Gleevec	chronic myeloid leukemia	\$4,265	8%
Lucentis	age-related macular degeneration	\$1,533	24%
Zometa	bone metastasis	\$1,511	3%
Femara	breast cancer	\$1,376	9%
Sandostatin Group	acromegaly	\$1,291	12%
Exelon	Alzheimer's disease	\$1,003	5%
Exforge	hypertension	\$904	35%
Neoral	immunosuppression	\$871	-5%
Voltaren	inflammation/pain	\$791	-1%
Exjade	iron chelation	\$762	17%
Comtan	Parkinson's disease	\$600	8%
Reclast	osteoporosis	\$579	23%

*Source: Med News, September 2010*

## PART THREE: CODE OF CONDUCT

### 1.3.1 Code of Conduct

Novartis adopted its first global Code of Conduct in 1999. In order to reflect the signing of the Global Compact in 2000, an amendment became necessary. The revised version of the Code of Conduct was distributed in 2001 to all Novartis Group company employees worldwide and translated into local languages. Compliance with our Code of Conduct, which is a part of the employment terms of all Novartis employees, is closely monitored. For this Novartis have

established a worldwide network of over 45 Compliance Officers who advise on compliance. The Code of Conduct is an expression of the professionalism Novartis strive for throughout our businesses, and of the professionalism I expect of our associates.

As an ethically, socially and ecologically responsible organization, Novartis places a premium on dealing fairly with employees, commercial partners, government authorities and the public. Success in its business ventures depends upon maintaining the trust of these essential stakeholders.

Code of Conduct is fundamental to the task of creating and Novartis considers this Code of Conduct to be essential in its relations with its employees. It shall form an integral part of the terms of employment of the companies of the Novartis Group. Novartis will insist on full compliance.

### **The standards are based on:**

- ▶ Support of and respect for the protection of internationally
- ▶ Proclaimed human rights
- ▶ Ethical and legal behavior
- ▶ Loyalty to Novartis
- ▶ Fair, courteous and respectful treatment of fellow employees
- ▶ Fair and appropriate consideration of the interests of other stakeholders (customers, other commercial partners, government authorities and the public) and of the environment
- ▶ Professionalism and good business practice
- ▶ Our commitment to the Global Compact

## **PART FOUR: NOVARTIS (BANGLADESH) LIMITED**

### **1.4 .1 Milestones of Novartis Bangladesh**

- 1973-Registered with a joint stock company as Ciba-Geigy (Bangladesh) Limited.
- 1979-Jont-venture agreement between Ciba-Geigy AG, Switzerland (60%) and Bangladesh Chemical Industries Corporation (40%)



- 1997-Ciba-Geigy become Novartis (Bangladesh) Limited
- A global merger of Ciba and Sandoz
- The Bangladesh Novartis has its chief manufacturing plant in Tongi. This very plant was inaugurated at Tongi in 1989. This plant not only meets the local market needs and demand, but exports product to countries in Asia pacific, Latin America, and Europe as well. Total export in 2001 was BDT 37.0 MIO.

### 1.4.2 Location

<p><b>Novartis (Bangladesh) Limited</b></p> <p><b><u>Head Office</u></b></p> <p>House 50, Road 2A Dhanmondi RA, Dhaka 1209 GPO Box 431 Dhaka 1000 Bangladesh Tel: + 880 2 861 5302-8</p>	<p><b>Novartis (Bangladesh) Limited</b></p> <p><b><u>Production Plant</u></b></p> <p>Squibb Road Cherag Ali Market Tongi I/A, Gazipur Bangladesh Tel: + 880 2 980 0561-4</p>
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### 1.4.3 Distribution Center

Starting out in Asia over 60 years ago, Zuellig Pharma has established itself as the leading healthcare distribution solution specialist in the region serving 15 countries and regions in Asia. Zuellig Pharma Bangladesh Limited was incorporated in June 2006 as it continued its expansion into South Asia establishing its Corporate Office in the Gulshan area of Dhaka. Zuellig Pharma operates as a distribution house for Novartis Bangladesh which has a countrywide distribution network having 13 branches. The branches are in the following cities in all over the country:

- ❖ Dhaka
- ❖ Chittagong
- ❖ Comilla
- ❖ Sylhet

- ❖ Mymensing
- ❖ Maizdee
- ❖ Khulna
- ❖ Barisal
- ❖ Rajshahi
- ❖ Rangpur
- ❖ Bogra
- ❖ Jessore

#### **1.4.4 Manufacturing Plant of Novartis (Bangladesh) Limited**

Manufacturing Plant of Novartis (Bangladesh) Limited has been inaugurated at Tongi in Gazipur zone in 1989. This particular production Plant meets the need of the local customers as well as exports to countries in Asia-Pacific, Latin America, and South Africa. This plant produces 200 million tablets per year to meet both the local and international need of the customers.

Recently Novartis has set up a new plant to meet the growing export demand in various countries including the whole Europe, according to the new target plan of 2002. Both the plants are expected to produce 400 millions of tablets, which is double the previous amount, to satisfy the customers demand delicately.

#### **1.4.5 Organizational Structure**

In terms of Novartis, they have one chairman and CEO leading the company worldwide. They have five Head leading five different Business Units. They have divided their worldwide business into different region and have different business groups to manage them. Apart from that no further information could be gathered about the organizational structure of Novartis.

Novartis Bangladesh, falls under the Southeast Asian region. It has one Chairman and one Managing Director (MD) under the board of the company. There exist one Chairman, one Managing Director (MD), three Alternative Directors and the Company Secretary as the Board Members. Two Directors from BCIC are also there in the Board.

The last Novartis MD was the first Bangladeshi Managing Director of the company who has become the MD of Novartis (Bangladesh) Limited, in July 2002. The company also has a CEC or Corporate Executive Committee consists of the Managing Director, three Alternative Directors.

## PART FIVE: MARKET SCENARIO OF NOVARTIS (BANGLADESH) LIMITED

### 1.5.1 Key Challenges

- Primary role is to discover, develop and successfully market innovative products to cure diseases, to ease suffering and to enhance the quality of life.
- To ensure that humanity continues to benefit from pharmaceutical innovation.
- To define an equitable way for sharing the economic burden of pharmaceutical development among the various segments of society.
- To ensure that research, development and application of pharmaceuticals are conducted in harmony with society's ethical and cultural standards.
- Other key challenges include the issues of marketing practices, animals used in research and development, and accountability for our suppliers and contractors.
- The latest challenge for Novartis (Bangladesh) Limited facing is about OTC. OTC is in loss for last one the Business Unit is in loss. By making the business unit again profitable is an extreme challenge for NBL.

### 1.5.2 Problem Faced by Novartis

- ◆ In case of cost curtail, it is not possible since all the raw materials are outsourced from outside Bangladesh, which are highly expensive. Thus prices of all the products are very high and Novartis faces a tremendous competition with the local companies regarding price set.
- ◆ Due to complex Government regulations and rules are imposed, the raw materials have to be stored in inventory for a long time which increases the price of the product naturally and helped other medicine to capture the market. Thus Novartis is left with a limited number of end users.

- ◆ Novartis cannot follow any Cost Leadership Strategy. For a company like Novartis, who has to spend so much on Fixed Overhead Cost and Variable Overhead Cost, it is impossible to be cost effective while producing.
- ◆ Novartis face a lot of problems while having any legal agreement, or signing any contract with the government bodies and authorities. But local companies do not have to face these hassles due to relaxed laws, rules-regulations and their continuous Rent Seeking Behavior in this arena.
- ◆ Lack of practice of patent law in Bangladesh, makes it all the more difficult for MNCs to exist and compete with the local companies who do not follow much of these laws.
- ◆ Keeping a high price in Primary Care product market (mainly in research related products) makes it harder to compete and survive in the local market.
- ◆ Doctors, the customer group, expects more frequent visit of the field force, which is difficult to maintain and continue.
- ◆ Hard to meet the demand of the local market for generics product in case of Primary Care and Generics product while competing with the local companies.
- ◆ After globally selling out some products, which are profit generating products for Bangladeshi market from OTC, this BU's sales drop down in Bangladesh. One of the major products of them was Ovaltin, which is sold to Nestle. Loss in OTC is a key problem from NBL.

### **1.5.3 SWOT Analysis**

This analysis will give a picture of the competitiveness of this company in comparison to that of its competitors.

#### **Strengths**

- ◆ Modern Technology and know-how
- ◆ It is a huge MNC providing quality product
- ◆ A widely recognized company with an attractive customer base
- ◆ A proven track record in defect-free manufacture
- ◆ Expertise in providing consistently good customer service

- ◆ Skills in producing innovative products
- ◆ Highly Efficient employees
- ◆ Job flexibility for employees thus company has a group of loyal employees.
- ◆ Proprietary technology and important trade mark
- ◆ Very attractive remuneration package as well as fringe benefits for employees
- ◆ Effective State-of-the-art plant and equipments
- ◆ Available Cash on hand
- ◆ An experienced and capable workforce
- ◆ Highly Experienced and efficient employees in key areas
- ◆ Motivated employees
- ◆ Managerial know-how
- ◆ Long term collective learning and know-how
- ◆ A strong balance sheet
- ◆ Company reputation
- ◆ A positive work climate and organization culture
- ◆ Novartis is the number 1 ethical pharmaceutical company worldwide.
- ◆ Novartis is in 2nd position among all the industries globally.

### **Weaknesses**

- ◆ Very expensive Raw Materials
- ◆ Low cost manufacturing know-how
- ◆ A company Intranet for accessing and exchanging information both internally which might create a problem in time of need.
- ◆ Countrywide distribution network is not as strong as competitors
- ◆ Losing Business Unit, OTC.

### **Opportunities**

- ◆ Serving additional customer group in the existing geographical market.
- ◆ Expanding into new geographic markets.

- ◆ Strength in export oriented products.
- ◆ Expanding the company's product line to meet a broader range of customer needs
- ◆ Transferring sector's skill or technological know-how to a new business or a new product.

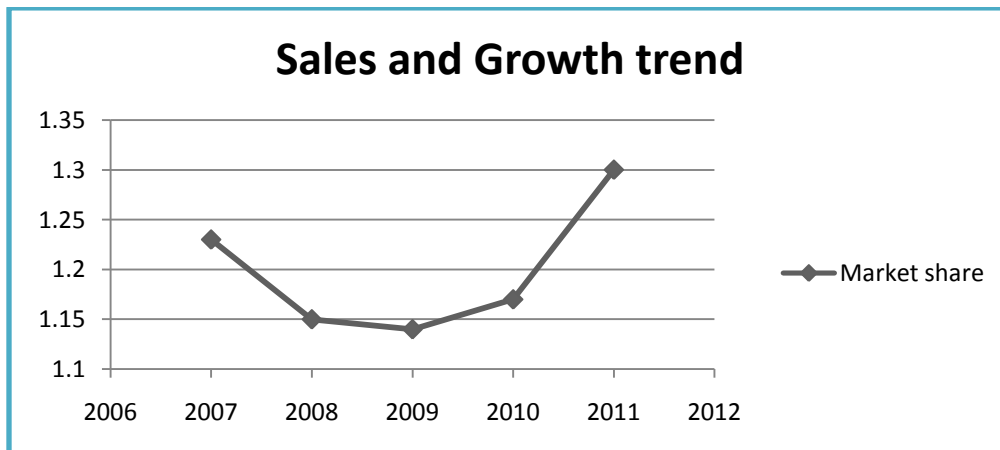
### Threats

- ◆ entry of the possible new competitors
- ◆ Growing bargaining power of suppliers.
- ◆ Adverse shift in foreign exchange rate
- ◆ expensive new regulatory obligations
- ◆ Pharmaceutical company in Bangladesh cannot have patent right of drugs because of the TRIPS agreement. Therefore Novartis will be facing threat to bring patented molecules of Novartis Pharmaceuticals.

### 1.5.4 Sales and Growth Movement

Novartis is getting benefitted from a regular growth in pharmaceutical market which is even unusual in the case of the market leader of the industry. The following chart (1.5.4) proves the fact where it shows the sales and growth trend of Novartis in Bangladesh market from 2007 to 2011. Novartis has shown tremendous growth from 2010 to 2011. Its growth has become double within a year.

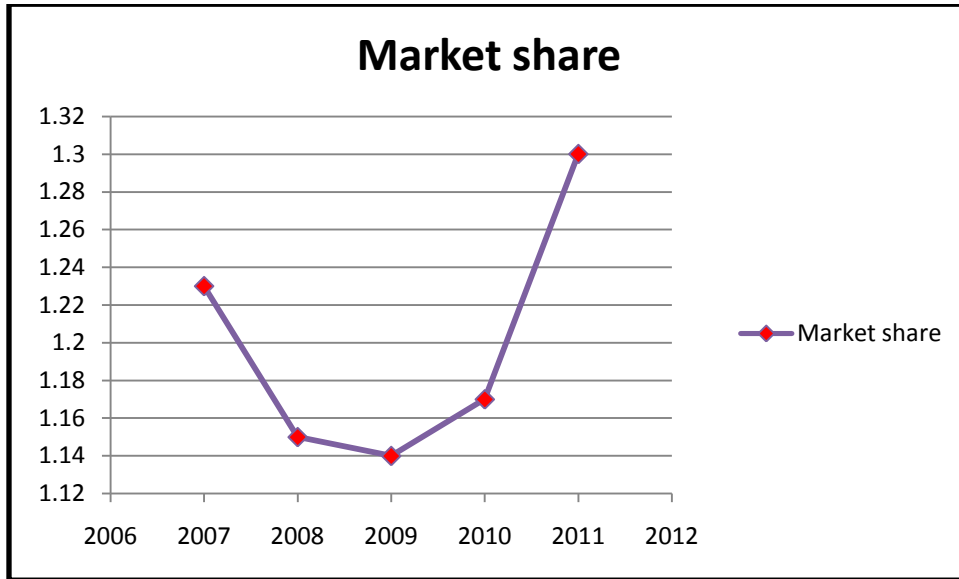
**Chart 1.5.4: Sales & Growth Trend of Novartis Bangladesh from 2007 to 2011**



### 1.5.5 Market Share

The pharmaceutical market of Bangladesh is dominated by local companies so global companies have to face certain obstacles in operating their business. In this situation, the market share of Novartis is still moving upward that is illustrated in the following chart (1.5.5).

**Chart 1.5.5: Market Share of Novartis Bangladesh from 2007 to 2011**

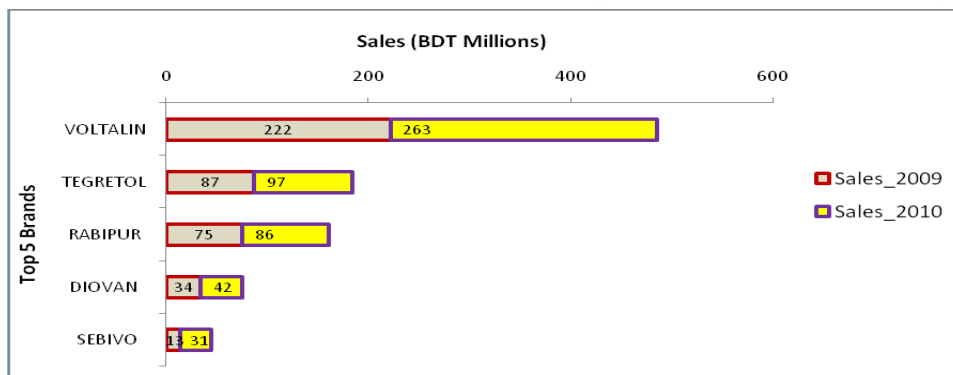


Source: Bangladesh Pharmaceutical Index, IMS, 2011 (Company Subscribed Software)

### 1.5.6 Top 5 Brands of Novartis in Bangladesh Market

The five best selling brands of Novartis this division are shown up here. The following chart (1.5.6) illustrates the sale of both 2009 and 2010.

**Chart 1.5.6: 2 Years Sales Trend of Top 5 Brands of Novartis Bangladesh**



Source: Bangladesh Pharmaceutical Index, IMS PLUS 2Q, 2010 (Company Subscribed Software)

## CHAPTER TWO: JOB OVERVIEW

### 2.1 Objective

To complete the BBA (Bachelors of Business Administration) program, it is mandatory to do internship in an organization or to submit a project report. Internship enables business students to furnish the practical and realistic ground of the work field. Internship phase is basically for three months but it can be extended if the organization and the student want. However, as per the rules, I have done my internship in Novartis (Bangladesh) Limited.

So my specific objective is to:

- ▶ Complete the BBA Program
- ▶ Boast a handy job experience
- ▶ Introduction with the corporate environment
- ▶ Observe and learn as much as possible from the senior associates.

### 2.2 Division where I have worked in:

Novartis has five different Business Units. Following Business Units are operating under Novartis Bangladesh:

- ▶ **Pharmaceutical Division** is headed by the Country Pharma Organization of Pharma Division. General medicine (Mass market products, Specialty products, Vaccine & Ophthalmic) & Oncology are two units of the division. This division completely works as a MNC
- ▶ Generics Business Units, **Sandoz**, headed by the BU Head of the business unit. OTC is currently under Sandoz. this division follows and works as local Pharmaceutical Company
- ▶ **Animal Health** Business Unit executed by BU head of Animal Health unit.

I have done my internship in **Novartis Pharmaceutical division**.



## 2.2.1 Overview: Novartis Pharmaceuticals

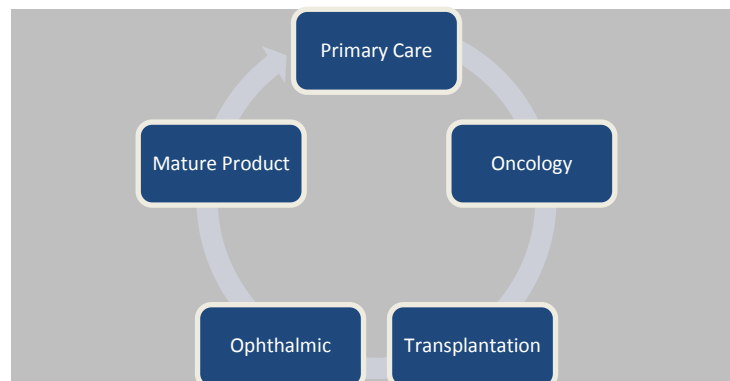
Novartis goal is to provide a broad portfolio of innovative, effective and safe products and services to patients through healthcare professionals around the world. At Novartis Pharmaceuticals innovation is the heart of their research strategy. They aim to harness the latest advances in biomedical research and technology to develop new therapies with the potential to benefit millions of patients throughout the world. Past sixth consecutive years, Novartis Pharmaceutical division has been achieving double-digit sales growth as net sales rise 11%, with the cardiovascular and oncology businesses being the main drivers.

In 2005-2006 Novartis introduced some global brands: Co-Diovan, Lescol XL, Voltalin Forte, & Trileptal. Now Diovan is the global number one antihypertensive. So, with this sort of introduction Novartis tried to be with its key commitments to the society. The post 2000 scenario of Novartis activities talks in favor of its dynamic attitude in terms of new introduction & line extension. Elidel, Zelnorm/Zelmac, new indications for Zometa, Diovan, Visudyne, Gleevec/Glivec are few examples of that.

From 2001 to 2006, Novartis achieved double digit market growth year even in a situation of highly competitive generic dominated market situation, where generic companies are of 15-25 times more Field Force strength & 5-10 times lower price.

Novartis Pharmaceuticals is comprised of five business units. They are:

**Figure 2.2.1.1: Five Business Units of Novartis Pharmaceutical Division**



## 2.2.2 Description of Various Departments

Novartis Bangladesh has a blend of simple and complicated departmental structure, which does not comply with the global Novartis. This customization has been done for the convenience of operation of this part of region; especially for a developing country where mass production and operational activities have not gone as far as developing nations.

Novartis Bangladesh has four departments, which provide the company a common service and simultaneously work for all the Divisions and Business Units. These four departments separately do their respective jobs and activities for all the business units existing in Novartis Bangladesh.

These departments are:

- ☑ Human Resource Department
- ☑ Finance & Accounting Department
- ☑ IT or Information Technology Department
- ☑ Distribution Department

Apart from these four departments there are other Business Units of Novartis. They are:

- Portfolio Management Departments
- Medical & Drug Regulatory Affairs
- Sales Department
- Marketing Services Department
- Business Planning Analyst

The above five departments, Business Units and Divisions are also act as separate entity in the company, for which these four departments provides all kinds of operational activities and gives them continuous support in case of-

- ❏ Networking and System failure
- ❏ Employee lay off or Recruitment
- ❏ Sales and Promotional campaign

- ❑ Employee Training and Evaluation
- ❑ Balance sheet, Budget and Treasury
- ❑ Yearly funding and loans
- ❑ Keeping tracks of all kinds of legal and government regulations
- ❑ Signing and negotiating with the Government Bodies.

### ➤ **Portfolio Management Department**

Portfolio Management department is consisted of Head of portfolio Management and ten Portfolio Managers who look after different product categories of Pharmaceutical division. This department also has quite a few Regional Managers who report to the portfolio managers directly. Head of Portfolio Manager and other Portfolio Managers sit together and take decision on various issues regarding the marketing, promotion, post marketing activities and sales of different medicines innovated by Novartis. The Divisional Management Team and Marketing Managements Team and The Sales Team sit together and take the last time decisions on various issues related to the marketing of the products as well as they take part in strategic planning and marketing for the Pharma Division.

### ➤ **Sales Department**

Sales team is consisted of chiefly National Sales Manager, eight Regional Manager, eight Medical Information Officer and two Oncologists. Under the Sales Manager works a Sales Operational Executive. There are eight Regional Manager under the National Sales Manager who reports directly to the head of the Sales Manager. There is one Medical Information Officer under one Regional Manager and one Oncologist specialist for each Medical Information Officer. There are eight sales outlet in the Sales Department overall in the country in five districts in the country. They are: Dhaka and greater Dhaka, Chittagong, Sylhet, Khulna, Bogra. Sales Operational Executive gathers and stores operation data, procures stationeries, miscellaneous, organizes and arranges field force work as well as workers and finally assists Sales manager.

## ➤ **Marketing Services Department**

This is another important body of Novartis, which organizes all the events, seminars, scientific symposium and all sorts of meets and workshops for the company. This very department also takes part in the decision-making along with the division management team and marketing management team. Marketing Services Department consists of one Manager, Marketing services and three more staffs under him who help to complete the jobs on time. They keep track of all the expenses on a variety of staffs, elements and miscellaneous expenses carried out by the company. They have to keep continuous connection with all the existing departments of Novartis.

### **2.3 Department where I have worked in**

I have worked in **Compliance** department. The department consists of seven people. There is one Medical Director and DRA head, who manage this department. Under him, there was DRA Manager, DRA executive, adverse event Manager, Medical Advisor and clinical research manager, Head of Quality compliance, Medical scientific liaison and me as intern and research associate.

### **2.4 Job Specifications**

I have been appointed as Clinical Research Associate in Novartis (Bangladesh) Limited. I was in Pharma division and worked in compliance department. My on-site supervisor was Dr. Tanvir Mobarak Ali, Director, Medical & Drug Regulatory Authority (DRA) and I was the associate of Dr. Farzana Chowdhury, Manager, Clinical Research and Medical Officer.

During the internship phase, I was appointed with several projects. Summary of the specifications of those projects are given below:

#### **2.4.1 NP4 SOP 2012**

NP4 stands for Novartis Pharma Promotional Policies and Procedures and SOP stands for Standard Operating Procedure. NP4 is updated in every year. Novartis is basically a multi-national Pharmaceutical company who is operating in 140 Countries. So basically Novartis

(Bangladesh) Limited have to follow the global guidelines but also they need to deal with the Bangladesh Drug Regulatory Committee. In NP4 SOP, fundamentals that are usually being updated is-

- Rules and details of events, funding, venue, hospitality, international event
- Details of promotional gifts, courtesy gifts, samples
- Non-promotional interactions with Health care professionals
- Purpose of Consultants / Advisory Boards / Expert meeting, Studies in humans, Market Research, Investigator meetings, Disease awareness programs, Disease awareness programs
- GRANTS- Research / Educational grants, Educational grants relating to events, Image-building grants
- Interpretation and implementation of Promotional material
- Local guidelines of organizing Scientific meetings / seminar, Round Table Discussions/Conferences (RTD), Promotional Gifts, Courtesy Gifts, Compensation for healthcare professionals, sponsorship for HCP's, Participation of partners (accompanying person) for all kind of activities, workshops and congresses, Consultants / Advisory Boards / Expert meeting, Any types of studies/research programs involving humans (post-authorization, interventional and non-interventional), Market Research, Disease awareness programs, Patient compliance programs, Grants. I was responsible for finding out the gaps, analyzing and implementing the results through updating the SOP. Under the supervision, I have also prepared the clearance and approval forms.

#### **2.4.2 GALVUS:**

GALVUS is a special medicine which is only made by Novartis only for the diabetes patients. For the research in this product, Global team has specified a target of 510 outcomes of patients in Bangladesh. So per criteria, 57 famous, skilled, trained expert doctors been chosen from all over Bangladesh who is named as investigators for this purpose. Under their supervision, 510 patients are being chosen. The results are being updated through three visits and the duration of research is 6 months. All the outcomes that have been documented in that time are being sent to the manager for the last investigation in Bangladesh.

I was solely responsible for this project and in this project; I was in supervision of the manager. The report form for Galvus was called as “GUARD”.

Works that I had to do is,

- Finding out the deviation from the paper Case Report Form (CRF). If there is any, then send it to the manager for the clarifications.
- If there is no deviation, then documenting it to the main CRF
- After that, Main CRF is sent to the investigators for their last checking and to give their sign as approval.
- After they approve, distortion of the CRF pages are being made. White pages are being sent to data management which is in India, Blue pages are being archived and yellow pages are being sent to the investigators of Bangladesh.

#### **2.4.3 ACLASTA:**

Aclasta is a drug to treat osteoporosis. I had to interpret some research results of ACLASTA. I was in a team of three where I worked as interpreter. I have documented the case report form of the Aclasta patients. The report form for Aclasta was called as “AZURE”.

#### **2.4.4 VIRTUE**

Virtue is another project of GALVUS which will start from July 15, 2012. To successfully launch the project, I was responsible to monitor all the activities including going to field visit to meet with the investigators.

#### **2.4.5 DCF**

DCF stands for Data Clarification Form. This basically comes from the data management which is in India incase of deviations and confusions that has been found in the CRF's. I was responsible to clarify the questions of DCF, make a copy of that for sending it to the investigators for approval and then to launch the documents back to India. I have worked for the DCF of two products which is Galvus and Sebivo.

#### **2.4.6 HONORARIUM**

I was responsible to monitor the honorarium of investigators, data entries for giving the requisition for it along with tracking, archiving all the relevant documents.

#### **2.4.7 GCP WORKSHOP**

I was a part of the team who arranged GCP Workshop. GCP stands for Good Clinical practice. Speaker was an expert from India, Dr. Sonal Vora and it was held in Hotel Ruposhi Bangla. It was a day long session with 45 investigators of Bangladesh.

### **2.5 Relevancy of the work with academic Learning's:**

In the NP4 SOP project, I had to find the breach between the global guidelines and the actual activities that was happening. Afterward through the meeting, proposed results were given to the director and whilst he approved, I was responsible with the team to implement those results. This was a bit related to the course “Service Marketing” where I had to locate gaps and find out what can be executed accordingly. As a result that course helped me a lot to that project.

The course, “Programming language for Business (MSC 142)” was a major aid to successfully complete all the projects. For all types of documentation, using Microsoft excel was mandatory. Hence I worked as a research associate, creating database was obligatory. So this course helped a lot in my practical work.

Some of my projects included SPSS work. To interpret those SPSS results, the course; “Research methods in Business and management (BUS 302)” was simply a blessing because all the things that I have learned in this course were entirely related to my practical work. These are the courses which were fully related to my work.

Indirectly, some other academic courses were also relevant to my project. “Statistics for business and economics (ECO 202)” was one of them. Also from the course,

“Organizational behavior (MGT201)”, I was actually able to relate what was happening in the organization with my scholarly learning’s.

## 2.6 Knowledge that has been enhanced :

Some learning’s that I have been improved through my internship period is-

- ★ Proper Time Management
- ★ Maintaining Organizational Ethics
- ★ Knowing the Customs and Culture of the organizations
- ★ Advanced computer skills
- ★ Proper business etiquette
- ★ Proper Archiving
- ★ Planning events and work beforehand
- ★ Managing stressful situations
- ★ Work in dynamic situations
- ★ Activation and supervision of work
- ★ Handling projects
- ★ Communication with clients
- ★ Clerical works

By observing the senior colleagues, I have learned many things. It has enhanced and boosted up the confidence level. In this extensive training period, there were so many mistakes that I have done in the work and because of that, now I am able to do more error free work now on.

## 2.7 Challenges

Sometimes a little error can be a large mistake or loss for an MNC. There are some challenges that I have faced during my work in internship period-

- ✚ Less skilled in clerical work
- ✚ Misunderstanding in work
- ✚ Mistake in communications
- ✚ Error in follow up and documentation



- ✚ Unstable politics of Government
- ✚ Sudden Projects hampers existing project plans deadline
- ✚ Uncertainty about the upcoming

## **2.8 Project for the internship report**

For the internship report, I have chosen one of my projects named “Aclasta-AZURE”.

## **2.9 Reason Behind choosing ‘Aclasta’ project for the report**

Two most important projects for which I was responsible solely was NP4 SOP and GALVUS but both of the projects were confidential. Novartis (Bangladesh) Limited didn't allow me to disclose the works. As a result, I was unable to choose between these two.

Aclasta was one of my works that I have started in the beginning of my internship. At that time, I had to select one of my projects and give the topic name to the academic advisor. So I talked to my on-site supervisor and he suggested me to give my internship project in one of the segments of Aclasta. As it was a project of a team, I have got many help to gather the data. As company allowed me to disclose the work in this project and the topic was approved in the university, so I decided to submit the work on this project.

## CHAPTER THREE

### PART ONE: PHARMACEUTICAL INDUSTRY ANALYSIS

The pharmaceutical industry as a business sector is performing really well in Bangladesh. As shown in the Table (3.1.1) below, the value of this market is growing on a regular basis. In 2007, the total sales value was approximately 42 billion whereas in 2010 which increased by 60 billion (BDT). The following table (3.1.2) shows the sales as well as growth trend of the industry from 2007 to 2010.

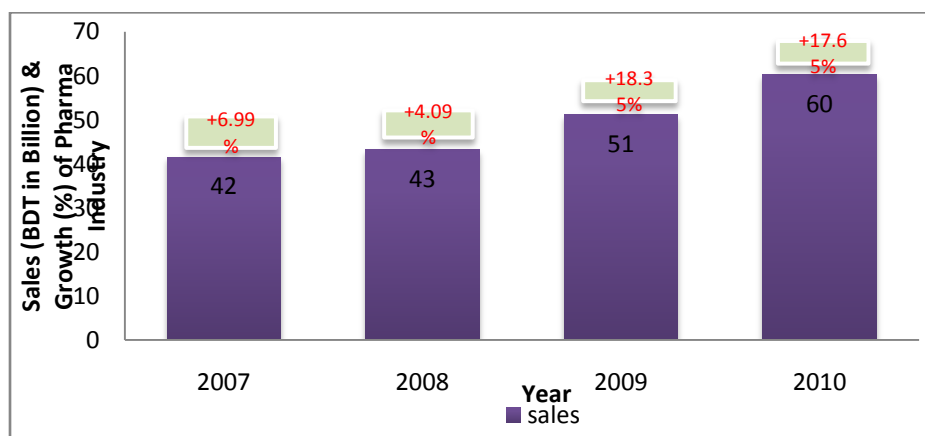
**Table 3.1.1: Industry Scenario from 2007 to 2010**

Year	Sales in Billion (BDT)	Growth (%)
2007	41	6.99
2008	43	4.09
2009	51	18.35
2010	60	17.65

*Source: Bangladesh Pharmaceutical Index, IMS PLUS 2Q, 2010 (Company Subscribed Software)*

It is found that the industry has 17.65% growth in the year 2010 and is now recognized to have great export potential. The total market size of Bangladesh pharmaceutical industry amounted Tk. 60 billion. Notably, within last four years, Bangladesh pharmaceutical industry has gone through with a continuous upward and downward pattern, as pointed out below:

**Chart 3.1.2: Sales and Growth Trend of Pharmaceutical Industry from 2007 to 2010**



*Source: Bangladesh Pharmaceutical Index, IMS PLUS 2Q, 2010 (Company Subscribed Software)*

## PART TWO: COMPETITIVE SCENARIO

SQUARE is leading the Pharmaceutical industry with 1378 Crore taka sales followed by Incepta Pharma with 650 Crore taka.. Among top 20 companies, POPULAR PHARMA has been showing tremendous growth of 54.53% last year. Top 10 companies have been observed to hold more than 67% market share of the industry.

The following Table (3.2.1) portrays the overall scenario of top 19 companies of the industry in 2011:

**Table 3.2.1: Top 19 Players of Industry in 2011**

### Top Pharmaceutical Company of Bangladesh: 2011

Rank	Total Market	Taka (Crore) 7,186	Share 100.00	Growth % 24.30
1	SQUARE	1,378	19.18	23.54
2	INCEPTA PHARMA	650	9.05	32.17
3	BEXIMCO	620	8.62	40.33
4	OPSONIN PHARMA	355	4.94	26.09
5	ESKAYEF	348	4.84	24.82
6	RENATA	340	4.73	29.63
7	ACME	319	4.44	17.34
8	A.C.I.	293	4.08	18.81
9	ARISTOPHARMA	286	3.99	21.63
10	DRUG INTERNATIONAL	270	3.75	18.18
11	SANOFI AVENTIS	185	2.57	8.77
12	GLAXOSMITHKLINE	140	1.95	10.84
13	ORION PHARMA LTD.	140	1.94	31.47
14	NOVO NORDISK	128	1.79	27.72
15	HEALTHCARE PHARMA	126	1.75	33.20
16	GENERAL	117	1.63	19.25
<b>17</b>	<b>SANDOZ</b>	<b>109</b>	<b>1.51</b>	<b>12.25</b>
18	POPULAR PHARMA	94	1.31	54.53
<b>19</b>	<b>NOVARTIS</b>	<b>94</b>	<b>1.30</b>	<b>46.01</b>

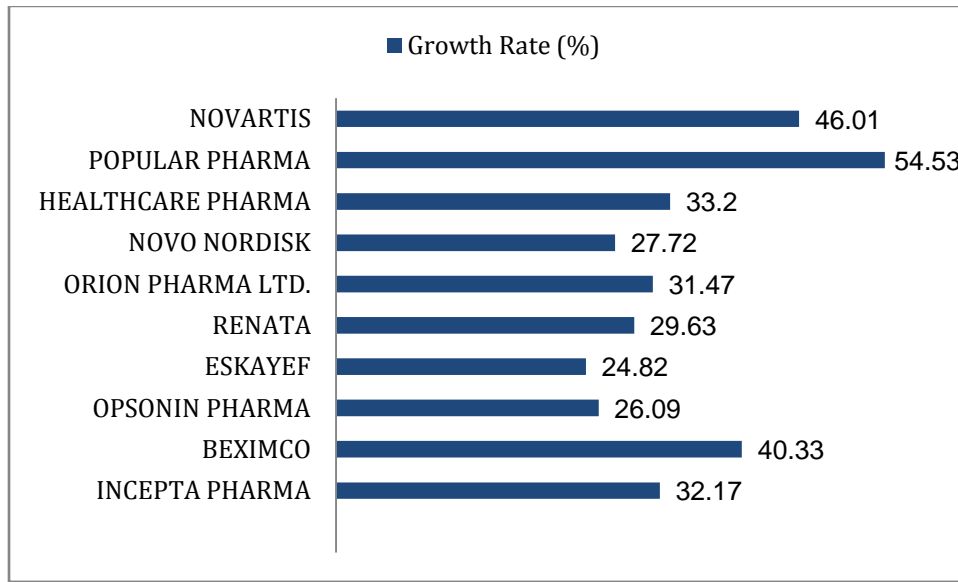
*Data Source: Bangladesh Pharmaceutical Index' 1st Q, 2011*

Being the leader, Square Pharma is having the major portion of the market that is 19.18% with a growth rate of 23.54%. On the contrary, POPULAR PHARMA, the 18<sup>th</sup> player of the industry has shown the highest growth rate which is more than twice than that of the industry at present

(industry growth is 24.30%). Novartis has shown remarkable growth rate of 46.01% (The second highest) though it is the 19 largest pharmaceutical company in Bangladesh.

The detail growth of top 10 companies in 2011 has been shown in chart 3.2.2 below:

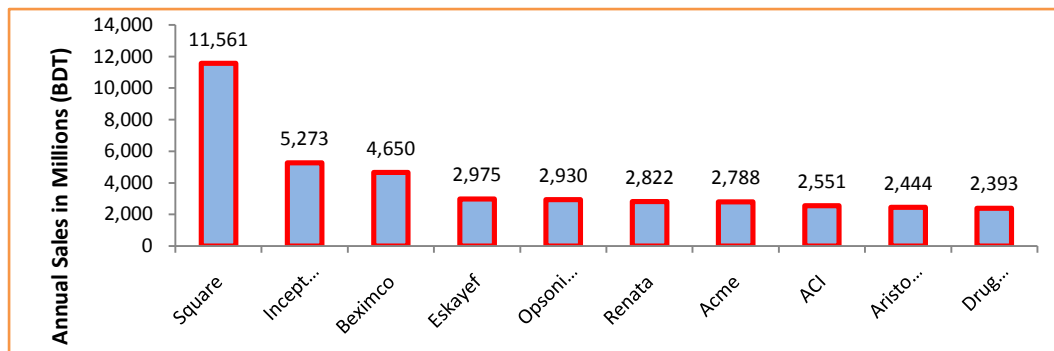
**Chart 3.2.2: Growth Trend of Top Players of 2011**



Source: Data Source: Bangladesh Pharmaceutical Index' 1st Q, 2011

The following figure 3.2.3 shows the annual sales of the top players in 2010. It is seen that for being in the leading position, again Square Pharma is dominating the sales thus the overall market share (chart 3.2.3).

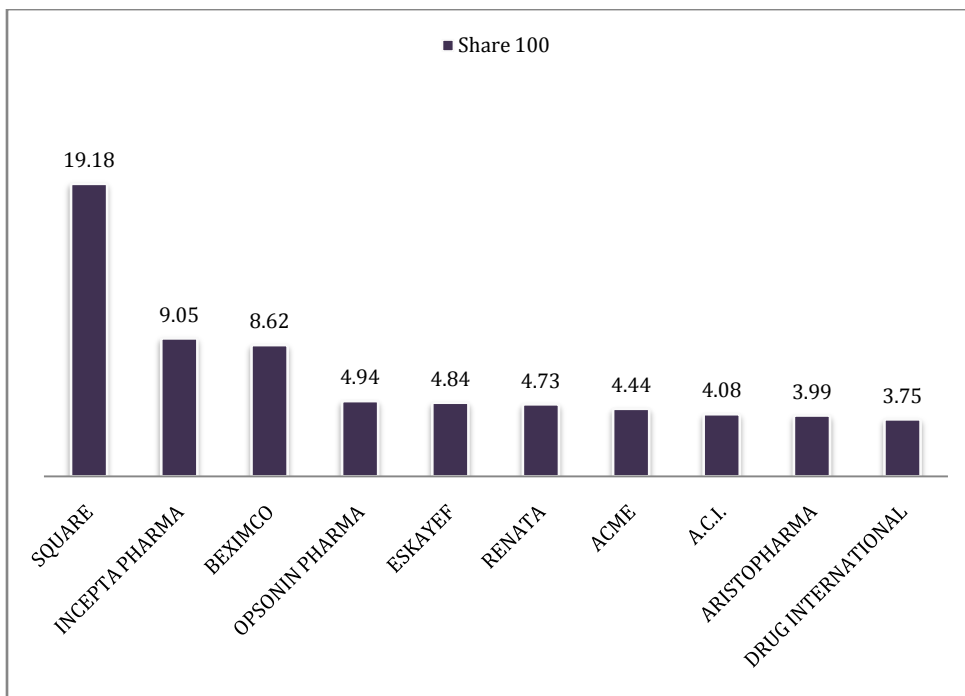
**Chart 3.2.3: Annual Sales of Top 10 Players in 2010**



Source: Bangladesh Pharmaceutical Index, IMS PLUS 2Q, 2010 (Company Subscribed Software)

The major contributing factors to drive the growth of the local companies of this industry are its generic dominated market, new launches and absence of the use of WTO agreement. Unlike foreign pharmaceutical markets, local market is much more generic oriented that is shown in the sales pattern of the top players. Basically these local companies maintain their market share and growth by dealing with generic products and new launches. Moreover, the absence of the use of WTO agreement is another contributing factor behind launching generics of the original brands.

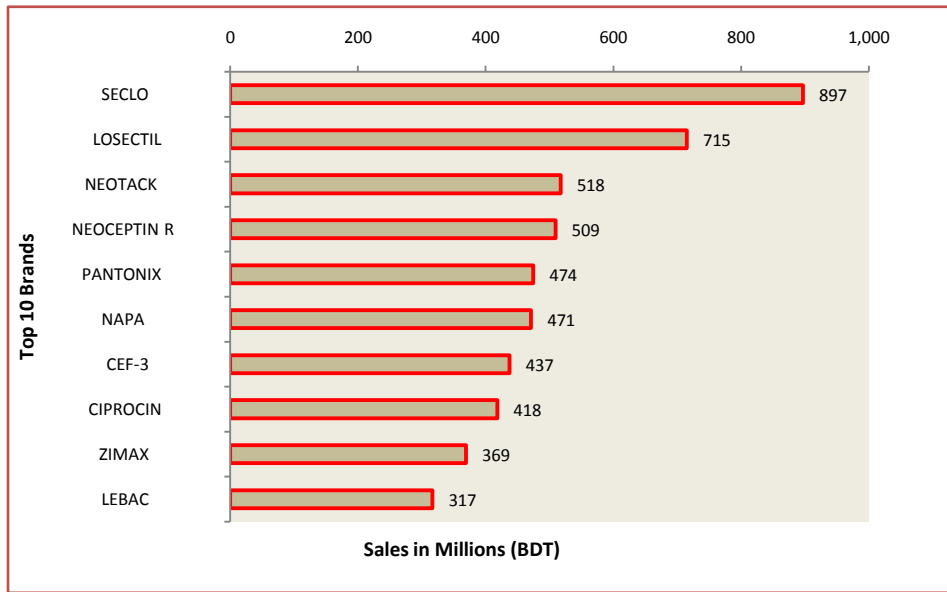
**Chart 3.2.4: Market Share of Top 10 Companies (Year 2011)**



*Source: Bangladesh Pharmaceutical Index, 2011*

Figure 3.2.4 gives an idea about Market Share of Top 10 Companies in 2011. SQUARE leading company of the industry has a remarkable market share gaining history. From 2006 to 2010, its market share has increased by 4.14%. Its primary concern like other top local companies is generic drugs and new launches.

**Chart 3.2.5: Top Selling Brands of the Industry (Year 2010)**



*Source: Bangladesh Pharmaceutical Index, IMS PLUS 2Q, 2010 (Company Subscribed Software)*

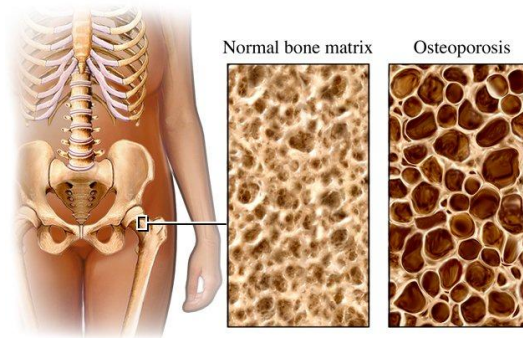
Figure 3.2.5 gives an idea about industry's top selling brands. It is seen that the top selling brand is Seclo which is a product of Square Pharmaceuticals succeeded by Losectil of Eskayef, Neotack of Square Pharma, Neoceptin of Beximco Pharma, Pantonix of Incepta Pharma, Napa of Beximco Pharma, Cef-3, Ciprocina, Zimax & Lebac of Square Pharmaceuticals Ltd.

However, industry's top 10 brands are having more than 50 billion taka sale with 79.82 % market share while the rest fall below. Among these 10 brands, about six brands are of Square Pharmaceuticals. Therefore, it can be said that maintaining the growth of these brands are crucial for Square as a little growth fluctuation of these top brands can lead to serious trouble for the company.

## PART THREE: INTRODUCTION OF **Aclasta**

Aclasta<sup>®</sup> is a prescription medicine used for the treatment of osteoporosis in postmenopausal women to reduce the incidence of hip, vertebral and non-vertebral fractures and to increase bone mineral density; treatment of osteoporosis in men; treatment of Paget's disease of bone; treatment and prevention of glucocorticoid-induced osteoporosis and for the prevention of clinical fractures in patients after hip fracture and prevention of postmenopausal osteoporosis.

Aclasta<sup>®</sup> is first introduced in Bangladesh by Novartis (Bangladesh) Ltd. in 2008. It was invented and produced in Switzerland. It is the first original medicine which contains Zoledronic Acid and is known as a revolutionary medical discovery for osteoporosis because of its once a year treatment. New bone is formed, replacing old bone to keep the body strong. In case of an osteoporosis patient, old bone breaks down faster than new bone can form. Bone loss speeds up around the time of menopause. Aclasta is a type of medicine called a bisphosphonate. It works to increase bone density because it's an intravenous treatment, Aclasta bypasses the digestive system, going to work to help protect from fracture for 12 full months.



Picture 3.3.1 Normal bone matrix and Osteoporosis

### **Year-long Protection**

- ☑ **One dose helps protect for a year**

With Aclasta<sup>®</sup>, a single yearly intravenous dose, along with daily calcium and vitamin D, helps increase bone density, protecting and strengthening the bones.

☑ **It goes to work to strengthen bones**

Aclasta<sup>®</sup> is an intravenous drug. So it bypasses the digestive system, goes directly to work to help protect the bones from fracture for a full 12 months.

☑ **Protects in more places**

Aclasta<sup>®</sup> is approved to help protect from fracture in hip, spine, and even other bones.

Here is a brief **profile of Aclasta<sup>®</sup>** in Bangladesh:



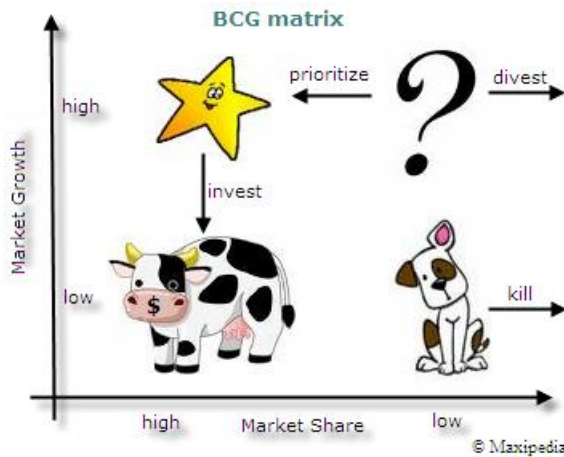
Type of Brand	Global
Type of Medicine	Bisphosphonate
Market	Osteoporosis
Number of Countries Marketed in	120
Introduced Year in Bangladesh	2008
Place of Invention	Switzerland
Place of Production	Switzerland
Form	Inject-able
Major Ingredient	Zoledronic Acid
Maximum Retail Price (BDT)	27,000
Position in Market	Leader
Position in BCG Matrix	Star
Competing Local Generic	Zolenic



## PORTFOLIO OF ACLASTA

As mentioned in the previous chapter, Aclasta is enjoying its leading position in the osteoporosis market of Bangladesh. As it has a high market share in a growing market like osteoporosis, its place in BCG Matrix is on **Star**.

Figure 3.2.1: BCG Matrix



### Features of BCG STAR Aclasta

- ★ Stars are defined by having high market share in a growing market. As Aclasta<sup>®</sup> has both of them; it can be called a star for Novartis.
- ★ Stars are the leaders in the business so is Aclasta<sup>®</sup>.
- ★ Being the market leaders, Stars still need a lot of promotion so is Aclasta<sup>®</sup>.
- ★ If market share is kept, Stars like Aclasta<sup>®</sup> are likely to grow into cash cows.



## **PART FOUR: PROBLEM DEFINITION**

### **3.4.1 Background of the Problem**

Aclasta is used to control osteoporosis (disease of bone loss). Patients were asked to take this infusion three times in three months (one time a month). Very recently the doses of infusion have been increases which amount to six times in six months on monthly basis. Many patients just take the first infusion and do not go for reinfusion. It's because either they forget about reinfusion or they become dissatisfied after the first infusion. To great extent high pricing of Aclasta also becomes the obstacle to refrain patients from taking it. I would like to peruse those reasons and the problems pertinent to reinfusion.

### **3.4.2 Statement of the Problem**

Here we want to see to the patients who have taken Aclasta reinfusion. We would like to observe the variables that actually have driven these patients to go for reinfusion. We will also oversee the reasons which deter the patients from taking reinfusion. The variables we have used here to determine the patients' satisfaction level are Doctor's visit, physical condition after first infusion, price of Aclasta, tendency towards substitutes, perceived benefit and many more.

### **3.4.3 Decision problem:**

Why patients go for Aclasta reinfusion?

### **3.4.4 Research Problem:**

To determine the reasons that drive patients to go for reinfusion. Is it that the patients are satisfied with the efficacy of Aclasta or whether the doctors are compelling them to take it so they are taking it?

# APPROACH TO THE PROBLEM

## 3.4.5 Research Framework



Figure 3.4.5: Research Framework of the Study

## **PART FIVE: RESEARCH DESIGN**

### **3.5.1 Type of Research Design**

For this research, I worked in team of three members. Here we have used both exploratory and conclusive research. First we formulated and defined the problem more elaborately and identified feasible courses of action. Then we developed the hypotheses which could be the potential responses of our sample group and formulated the rest part of research design. Now this was followed by the conclusive research which was the single cross-sectional research design, and we determined, evaluated and selected an appropriate course of action.

### **3.5.2 Information Needed**

There are two kinds of data; primary and secondary data namely. Primary data is originated by the data user for the specific purpose of addressing the research problem. Secondary data was collected for some other purpose other than the problem on hand and now which is made available for the use of all.

Here we have used both primary and secondary data. Primary data were about the background of the sample group of our research respondent: their physical condition after first infusion, doctor visit, feelings towards Aclasta, perceived benefit of Aclasta etc. As for secondary data, I consulted various online journals, website etc.

### **3.5.3 Data Collection**

To elicit the primary data, I have composed the survey result from the company where 120 patients were asked regarding their approach to reinfusion. In contrast, secondary data are collected from the company reports and Novartis featured articles of magazines.

### **3.5.4 Questionnaire Development**

A questionnaire with 13 (thirteen) questions are developed for obtaining qualitative as well as quantitative primary data in the telephone survey. Some questions are divided into some parts

within the questions. In the later part analysis, we have done 17 sub hypotheses under one main hypothesis. A sample questionnaire has been attached as **Appendix A**.

### **3.5.5 Methodology**

This study is to some extent Exploratory in nature in association with conclusive nature. Data used here is both Qualitative and Quantitative. Most of the data is qualitative. These data are collected from both primary and secondary sources. The method of primary data Collection is telephone survey and secondary data are collected from company reports, Medical Magazines and web-sites. In case of primary research, SPSS software has been used to conduct Chi-Squared test, linear regression, paired independent t test etc.

## **PART SIX: DATA ANALYSIS**

### **3.6 Primary data analysis**

Here we majorly will test if the Aclasta reinfusion takers are satisfied with Aclasta drug or they take it being complied. Alternatively those who don't take Aclasta reinfusion are actually not contended with Aclasta.

#### ***Major Hypothesis***

**H<sub>0</sub>:** There is no association between satisfaction of the patients and Aclasta reinfusion

**H<sub>1</sub>:** There is association between satisfaction of the patients and reinfusion

### **Chi-Squared Test of Independence of Categorical Variables**

#### ***Hypothesis 01***

**H<sub>0</sub>:** Impact of feeling well by taking Aclasta and perceived benefit out of Aclasta are independent of each other.

**H<sub>1</sub>:** Impact of feeling well influences the perceived benefit out of Aclasta or Perceived benefit depends on whether patients feel good or bad.

$H_0 = 0$

$H_1 \neq 0$

$H_0$  states that the variables are independent of each other.

**Q1. Feelings after taking Aclasta \* q7. Any perceived benefit you have found from Aclasta over competitors or substitutes (if you have switching experience)?**

(Cross tabulation)

			Q7. Any perceived benefit have you found from Aclasta over competitors or substitutes (if you have switching experience)?				Total
			yes	no	same	I don't know	
q1. Feelings after taking Aclasta	Feeling well	Count	73	0	3	11	87
		Expected Count	54.4	2.9	10.9	18.8	87.0
	Not feeling well	Count	2	4	12	15	33
		Expected Count	20.6	1.1	4.1	7.2	33.0
Total		Count	75	4	15	26	120
		Expected Count	75.0	4.0	15.0	26.0	120.0

Here 73 patients suggested that they are feeling well after taking Aclasta and also believe in perceived benefit out of Aclasta. The expected frequency for this is 54.4. 11 patients don't admit the perceived benefit of Aclasta over competitors even though they are feeling well after the Aclasta infusion. There are 2 patients who acknowledge the perceived benefit of Aclasta despite not feeling well after the infusion.

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	66.368 <sup>a</sup>	3	.000
Likelihood Ratio	72.279	3	.000
Linear-by-Linear Association	45.784	1	.000
N of Valid Cases	120		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is 1.10.

The value of Chi Square statistics is 66.368. The Chi Squared statistic has 3 degrees of freedom. Here P value equals .000. Here P value is less than .05. Hence we reject  $H_0$ . Hence we can demonstrate that condition of feeling well influences or reinforces the perceived benefit out of Aclasta.

**Hypothesis 02:**

**H<sub>0</sub>:** Choice of taking reinfusion is independent of willingness to attend Aclasta Patient Meeting.

**H<sub>1</sub>:** Choice of taking reinfusion leads patients to attend the Aclasta Patient Meeting.

**q2. I am taking Reinfusion \* q5.Are you interested to attend Aclasta Patient Meeting?  
(Cross tabulation)**

			Q5.Are you interested to attend coming Aclasta Patient Meeting?			Total	
			yes	no	may be		
q2. I am taking Reinfusion	Because I am happy with first Infusion	Count	24	11	5	40	
		Expected Count	17.3	13.3	9.3	40.0	
	Because doctor has prescribed	Count	13	4	7	24	
		Expected Count	10.4	8.0	5.6	24.0	
	Because of not much improvement of health I have gone for re-infusion	Count	1	8	6	15	
		Expected Count	6.5	5.0	3.5	15.0	
	Haven't gone for re-infusion	Count	14	17	10	41	
		Expected Count	17.8	13.7	9.6	41.0	
	Total		Count	52	40	28	120
			Expected Count	52.0	40.0	28.0	120.0

Here we can see that 24 patients are attending the Aclasta Patient Meeting as they are happy with the first Aclasta Infusion. 11 patients revealed that even though they are happy with the first infusion but they are not attending in the upcoming meeting. We can also see that 14 patients have not yet decided to go for reinfusion, still they are attending Patient meeting.

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.855 <sup>a</sup>	6	.007
Likelihood Ratio	20.407	6	.002
Linear-by-Linear Association	6.190	1	.013
N of Valid Cases	120		

a. 1 cells (8.3%) have expected count less than 5. The minimum expected count is 3.50.

The value of Chi Square Statistics is 17.855 containing 6 degrees of freedom. P value is .007 which is less than .05. Thus we can reject  $H_0$ . We can state that Choice of reinfusion influences patients' desire to attend Aclasta Patient Meeting.

### *Hypothesis 03:*

**$H_0$ :** The choice of being loyal or not with Aclasta and thoughts about discounting process are independent of each other.

**$H_1$ :** Choice of being loyal or not with Aclasta and thoughts about discounting process are not independent of each other.

That is the choice of whether to be loyal to Aclasta depends on whether you like the discounting procedure of Aclasta.

$$H_0 = 0$$

$$H_1 \neq 0$$

$H_0$  states that the variables are independent of each other.



**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
q9c. Discounting process/ procedure * q13.I have switched to another doctor, but still continuing with Aclasta reinfusion	120	100.0%	0	.0%	120	100.0%

**q9c. Discounting process/ procedure \* q13.I have switched to another doctor, but still  
continuing with Aclasta reinfusion**

**Cross tabulation**

		q13.I have switched to another doctor, but still continuing with Aclasta reinfusion		Total	
		True	False		
q9c. Discounting process/ procedure	Excellent	Count	4	1	5
		Expected Count	1.9	3.1	5.0
	Good	Count	20	18	38
		Expected Count	14.6	23.4	38.0
	Neutral	Count	19	29	48
		Expected Count	18.4	29.6	48.0
	bad	Count	3	23	26
		Expected Count	10.0	16.0	26.0
	Very bad	Count	0	3	3
		Expected Count	1.2	1.8	3.0
Total		Count	46	74	120
		Expected Count	46.0	74.0	120.0

Here we see that 4 patients who think discounting process of Aclasta is excellent also are loyal towards it despite switching a doctor. We also find here 1 patient won't be loyal even if he/she thinks that discounting process is excellent. 19 patients would be loyal to Aclasta although they think discounting procedure is not that good (neutral). The expected frequency for this cell under  $H_0$  is 18.4.

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.752 <sup>a</sup>	4	.002
Likelihood Ratio	19.143	4	.001
Linear-by-Linear Association	15.908	1	.000
N of Valid Cases	120		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.15.

The value of Chi-Squared statistic is 16.752. Here P value associated with Chi-square is .002. Here P value being less than .05, we can reject  $H_0$ . Hence patients who are happy with discounting process of Aclasta tend to be loyal towards it.

### Mann Whitney U Test

Now we want to test that people who think high pricing of Aclasta is justified also feel Aclasta is the most effective drug for osteoporosis.

#### *Hypothesis 04:*

$$H_0: \mu_{\text{Pricing}} \geq \mu_{\text{NoPricing}}$$

$$H_1: \mu_{\text{Pricing}} < \mu_{\text{NoPricing}}$$

The mean responses of the patients regarding 'High pricing is justified for Aclasta' is 1.88 (among agree, undecided and disagree) and the mean response for the reply of whether 'Aclasta is the most effective drug' is 1.48 (among agree, undecided and don't agree).

Descriptive statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
q8a.Aclasta is the most effective drug for osteoporosis	120	1.48	.698	1	3
q8d.High pricing is justified as Aclasta is brought from abroad and its effectiveness is quite high unless patents have other major health diseases	120	1.88	.812	1	3

### Mann-Whitney

### Ranks

Q8d.High pricing is justified for Aclasta as it's brought from Abroad.		N	Mean Rank	Sum of Ranks
q8a.Aclasta is the most effective drug for osteoporosis	agree	47	28.67	1347.50
	don't agree	33	57.35	1892.50
	Total:	80		

47 patients agreed with the fact that 'aclasata's high pricing is justified'. 33 patients don't agree with the high pricing of Aclasta.

### Test Statistics

	q8a.Aclasta is the most effective drug for osteoporosis
Mann-Whitney U	219.500
Wilcoxon W	1347.500
Z	-6.430
Asymp. Sig. (2-tailed)	.000

a. Grouping Variable: q8d.High pricing is justified as Aclasta is brought from abroad and its effectiveness is quite high unless patents have other major health diseases

The final section of the output gives the values of the Mann-Whitney U test (and several other tests as well.) The observed Mann-Whitney U value is given at the intersection of the row labeled Mann-Whitney U and the column labeled with the dependent variable (Aclasta is the most effective drug). Here Mann Whitney U value is 219.500. P value is given -- one on the row labeled Asymp Sig (2-Tailed). It is a two-tailed p value, but we have a one-tailed test. So we need to divide the two-tailed p value by 2 to get the one-tailed p value: here it is .000 which is less than .05. Hence we reject null hypothesis.

So patients who think high pricing of Aclasta is justified also feel it's the most effective drug.

**Hypothesis 05:**

$$H_0: \mu_{\text{Recall}} \geq \mu_{\text{NoRecall}}$$

$$H_1: \mu_{\text{Recall}} < \mu_{\text{NoRecall}}$$

Now we want to test that patients who can recall their reinfusion date, are also happy with the discounting process of Aclasta.

**Descriptive Statistics**

	N	Mean	Std. Deviation	Minimum	Maximum
q9c. Discounting process/ procedure	120	2.87	.888	1	5
Q10.Do you remember your reinfusion date?	120	1.50	.502	1	2

The mean response of discounting process is 2.87 (between excellent and very bad). More patients want additional discount than existing discount value and mean responses of 'who remember their reinfusion date' is .502.

From 120 patients, 60 patients remember their reinfusion date and another 60 patients don't remember their reinfusion date. Those who remember reinfusion date , their perceived mean rank of discounting procedure of Aclasta is 51.19 and those who don't remember their reinfusion date their perceived mean rank of Aclasta's discounting procedure is 69.81.

## Mann-Whitney Test

### Ranks

Q10.Do you remember your reinfusion date?		N	Mean Rank	Sum of Ranks
q9c. Discounting process/ procedure	yes	60	51.19	3071.50
	no	60	69.81	4188.50
	Total	120		

### Test Statistics

	q9c. Discounting process/ procedure
Mann-Whitney U	1241.500
Wilcoxon W	3071.500
Z	-3.100
Asymp. Sig. (2-tailed)	.002

a. Grouping Variable: q10.Do you remember your reinfusion date?

Here Mann Whitney U value is 1241.500. P value is given on the row labeled as Asymp. Sig (2-Tailed). It is a two-tailed p value, but we have a one-tailed test. So we need to divide the two-tailed p value by 2 to get the one-tailed p value: here it is .002 which is already less than .05. Hence we reject null hypothesis.

Thus we can manifest that patients who tend to remember their reinfusion date are happy with the discounting process of Aclasta.

## One way Anova of variances

Here we will test if the doctor's visit influences the continuation of Aclasta reinfusion.

Here,

**Hypothesis 06:**

$H_0: \mu_{\text{Less than 500}} = \mu_{500} = \mu_{\text{more than 500}}$

$H_1: \text{not } H_0$

$\mu$  represents mean possibility of taking Aclasta reinfusion.

### Descriptive

q4. Will you take reinfusion	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Less than 500	25	1.40	.500	.100	1.19	1.61	1	2
500	46	1.41	.498	.073	1.27	1.56	1	2
more than 500	49	1.33	.474	.068	1.19	1.46	1	2
Total	120	1.38	.486	.044	1.29	1.46	1	2

Here 25 patients who pay doctor's visit less than 500 BDT have the mean value of taking reinfusion is 1.40 (Between yes=1 and no=2). 49 patients pay more than 500 BDT and have mean possibility of continuing Aclasta of 1.38.

### Test of Homogeneity of Variances

q4. Will you take reinfusion

Levene Statistic	df1	df2	Sig.
1.712	2	117	.185

The Test of Homogeneity of Variances output tests  $H_0: \sigma^2_{\text{less than 500}} = \sigma^2_{500} = \sigma^2_{\text{more than 500}}$

Here, P value is .185 which is greater than .05. We fail to reject  $H_0$  implying that there is little evidence that the variances are not equal and the homogeneity of variance assumption may be reasonably satisfied.

## ANOVA

q4.Will you take reinfusion

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.197	2	.099	.413	.662
Within Groups	27.928	117	.239		
Total	28.125	119			

We would write the F ratio as: The one-way, between-subjects analysis of variance failed to reveal a reliable effect of Doctor's visit on Continuation of reinfusion,  $F(2, 117) = 0.413, p = .662, MS_{error} = 0.239, \alpha = .05$ .

The 2 is the between-groups degrees of freedom, 117 is the within-groups degrees of freedom, 0.413 is the F ratio from the F column, .662 is the value in the Sig. column (the p value), and 0.239 is the within-groups mean square estimate of variance. Here we fail to reject  $H_0$ . F ratio is statistically significant.

Let's look at multiple comparisons:

### Post Hoc Tests

Here, the mean difference between the Reinfusion continuation of the patients paying less than 500 BDT and patients paying 500 BDT and more than 500 BDT is consecutively -.013 and .073. The p value for comparing the possibility of Reinfusion continuation of people who pay less than 500 BDT with those who would be paying 500 BDT is 0.994, meaning that it is unlikely that these means are different. So we still can't reject null hypothesis. Here all the comparison P value (Sig.) is significantly more than .05. We can signify mean possibility of the patients for reinfusion is same regardless of Doctor's visit.

### Multiple Comparisons

q4. Will you take reinfusion						
(I) Doctor's visit	(J) Doctor's visit	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Less than 500	500	-.013	.121	.994	-.30	.28
	more than 500	.073	.120	.814	-.21	.36
500	Less than 500	.013	.121	.994	-.28	.30
	more than 500	.087	.100	.665	-.15	.32
more than 500	Less than 500	-.073	.120	.814	-.36	.21
	500	-.087	.100	.665	-.32	.15

### q4. Will you take reinfusion

Tukey HSD

Doctor's visit	N	Subset for alpha = 0.05
		1
more than 500	49	1.33
Less than 500	25	1.40
500	46	1.41
Sig.		.730

Means for groups in homogeneous subsets are displayed.

The means listed in each subset column are not statistically reliably different from each other. In this example, all four means are listed in a single subset column, so none of the means are reliably different from any of the other means. That is not to say that the means are not different from each other, but only that we failed to observe a difference between any of the means. This is consistent with the fact that we failed to reject the null hypothesis of the ANOVA.



## Linear Regression

### Descriptive Statistics

	Mean	Std. Deviation	N
q9b.Awareness of Aclasta	1.88	.795	120
q9a.Availability of stores	2.26	.903	120

### Correlations

		q9b.Awareness of Aclasta	q9a.Availability of stores
Pearson Correlation	q9b.Awareness of Aclasta	1.000	.678
	q9a.Availability of stores	.678	1.000
Sig. (1-tailed)	q9b.Awareness of Aclasta	-	.000
	q9a.Availability of stores	.000	-
N	q9b.Awareness of Aclasta	120	120
	q9a.Availability of stores	120	120

Here correlation between Awareness and itself is 1 and correlation between availability of stores and itself is 1.

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.678 <sup>a</sup>	.460	.455	.587

a. Predictors: (Constant), q9a.Availability of stores

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.534	1	34.534	100.392	.000 <sup>a</sup>
	Residual	40.591	118	.344		
	Total	75.125	119			

a. Predictors: (Constant), q9a.Availability of stores

b. Dependent Variable: q9b.Awareness of Aclasta

### Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.527	.145		3.644	.000
	q9a.Availability of stores	.597	.060	.678	10.020	.000

a. Dependent Variable: q9b.Awareness of Aclasta

Predicted value of "availability of stores" = .597 X value of awareness of Aclasta + .527. If we take the score 2 from the questionnaire of availability of stores it turns out 1.721, positive result. Hence patients who think availability of the Aclasta stores are excellent also think awareness campaign of Aclasta is excellent.

### Paired Samples t-Tests

#### *Hypothesis 07:*

$H_0: \mu_{\text{abstinence from Aclasta due to dissatisfaction with doctor}} = \mu_{\text{ignoring doctor's advice to go for reinfusion}}$

$H_1: \mu_{\text{abstinence from Aclasta due to dissatisfaction with doctor}} \neq \mu_{\text{ignoring doctor's advice to go for reinfusion}}$

$\mu$  is the mean number of responses of patients.

### Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	q11. I don't take Aclasta infusion/reinfusion as I am dissatisfied with my doctor	1.58	120	.496	.045
	q12. Being aware of Aclasta reinfusion I would/have gone for reinfusion ignoring my doctor's prescription	1.73	120	.448	.041

This gives the descriptive statistics for each of the two groups (as defined by the pair of variables.) In this example, there are 120 people who responded to the Dissatisfaction with Doctor Question (N), and they have, on average, 1.58 (among agree=1, and don't agree=2), with a standard deviation of .496. These same 120 people also responded to the 'Ignoring doctor's prescription' question (N), and they have, on average, 1.73 (between true and false), with a standard deviation of .448. The last column gives the standard error of the mean for each of the two variables.

		N	Correlation	Sig.	Mean	Std.error mean	SD
Pair 1	q11. I don't take Aclasta infusion/reinfusion as I am dissatisfied with my doctor & q12. Being aware of Aclasta reinfusion I would/have gone for reinfusion ignoring my doctor's prescription	120	.000	.992	-.150	.061	.669

Here  $r = .000$  and the  $p$  value is  $.992$  which is more than  $\alpha$ . So we fail to reject the null hypothesis. That is, there is insufficient evidence to conclude that the population correlation ( $\rho$ ) is different from 0.

Below the difference of the 2 means and std. deviation is consecutively  $-.150$  and  $.669$ .  $T$  value is  $-2.455$ .  $P$  value is  $.016$ . Here  $P$  value is less than  $\alpha$  hence we can reject the null hypothesis. We imply that there is sufficient evidence to conclude that the kind of responses to whether to abstain from reinfusion being dissatisfied with doctor and whether to take reinfusion ignoring doctor is different.

### Independent Samples t-Tests Single Value Groups

We will test here if the male and female pays doctor's visit in different proportions.

#### **Hypothesis 08:**

$$H_0: \mu_{\text{male}} = \mu_{\text{female}}$$

$$H_1: \mu_{\text{male}} \neq \mu_{\text{female}}$$

where  $\mu$  is the mean amount of doctors' visits.

#### **Group Statistics**

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Doctor's visit	male	45	2.13	.786	.117
	female	75	2.24	.750	.087

Here 45 male patients pay the mean of 2.13 for doctor's visit. And 75 female patients pay mean of 2.24 for doctor's visit.

Here is a column labeled "Sig." under the heading "Levene's Test for Equality of Variances". In this test, the significance ( $p$  value) of Levene's test is  $.932$ . Here the  $P$  value is more than  $\alpha$ . So we assume that the variances are equal. Calculated  $t$  value is  $.740$  (negative sign can be omitted here). 2 tailed  $p$  value associated with this test is  $.461$ . We fail to reject  $H_0$ . That implies

that we failed to observe a difference in the amount of doctor visits between the male and female patients.

**Independent Sample t test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
<b>Doctor's visit</b>	Equal variances assumed	.007	.932	-.740	118	.461	-.107	.144	-.392	.179
	Equal variances not assumed			-.732	89.375	.466	-.107	.146	-.396	.183

**Chi-Squared test**

**Hypothesis 09:**

H<sub>0</sub>: the reasons of taking reinfusion and choice of whether to take it are independent of each other.

H<sub>1</sub>: The reasons of taking reinfusion and choice of whether to take it are not independent. That is the reasons of taking reinfusion influences the decision of taking it.

**q2.I am taking Reinfusion \* q4.Will you take reinfusion (Cross tabulation)**

			q4.Will you take reinfusion		Total
			yes	no	
q2. I am taking Reinfusion	Because I am happy with first Infusion	Count	36	4	40
		% within q2.I am taking Reinfusion	90.0%	10.0%	100.0%
		% within q4.Will you take reinfusion	48.0%	8.9%	33.3%
		% of Total	30.0%	3.3%	33.3%
	Because doctor has prescribed	Count	18	6	24
		% within q2.I am taking Reinfusion	75.0%	25.0%	100.0%
		% within q4.Will you take reinfusion	24.0%	13.3%	20.0%
		% of Total	15.0%	5.0%	20.0%
	Because of not much improvement of health I have gone for re-infusion	Count	6	9	15
		% within q2.I am taking Reinfusion	40.0%	60.0%	100.0%
		% within q4.Will you take reinfusion	8.0%	20.0%	12.5%
		% of Total	5.0%	7.5%	12.5%
	Haven't gone for re-infusion	Count	15	26	41
		% within q2.I am taking Reinfusion	36.6%	63.4%	100.0%
		% within q4.Will you take reinfusion	20.0%	57.8%	34.2%
		% of Total	12.5%	21.7%	34.2%
Total	Count	75	45	120	
	% within q2.I am taking Reinfusion	62.5%	37.5%	100.0%	
	% within q4.Will you take reinfusion	100.0%	100.0%	100.0%	
	% of Total	62.5%	37.5%	100.0%	

Here patients who are happy with first Aclasta infusion, among them 90% are going for reinfusion. And those who are going for reinfusion, among them 48% are happy with the first

infusion. On total from both 'reinfusion takers non takers' category 33.3% have ticked they are happy with first infusion and overall Aclasta infusion.

Within 'I am going for reinfusion' group 75% of the patients mention that they abide by their doctor's prescriptions. And on total 20% of the patients have ticked the option 'As doctor has prescribed'. On total 62% patients who said that they will take reinfusion. Patients who haven't come across much improvement after first infusion, among them 40% are taking reinfusion.

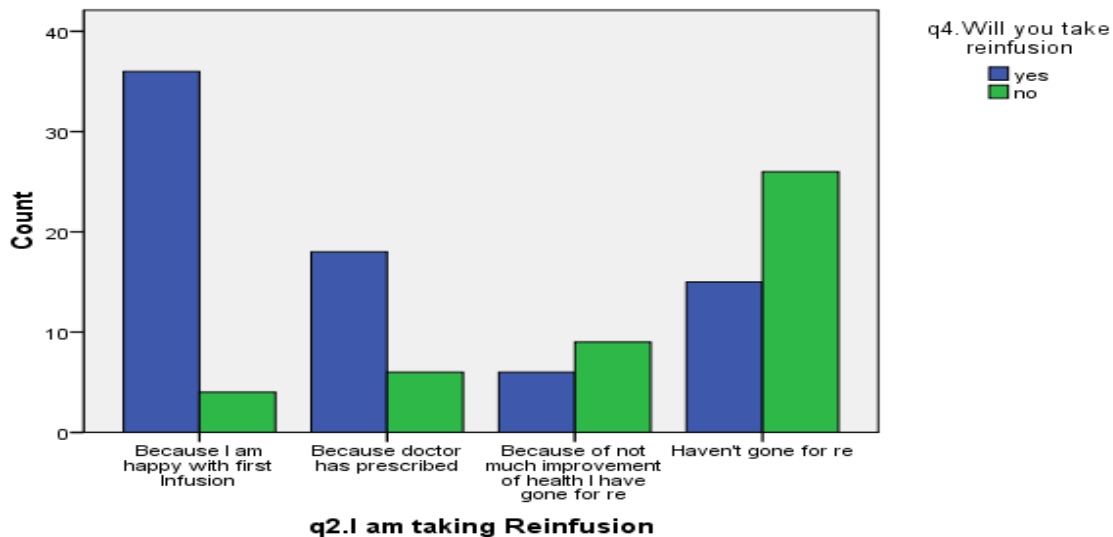
### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.495 <sup>a</sup>	3	.000
Likelihood Ratio	31.736	3	.000
Linear-by-Linear Association	27.979	1	.000
N of Valid Cases	120		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.63.

When reading this table we are interested in the results for the Continuity correction. We can see here that Chi-square (3) = 29.495,  $P = 0.000$ . Hence reasons of taking Aclasta reinfusion strongly affect the decision of taking it. So we reject the null hypothesis.

Bar Chart



**Hypothesis 10:**

**H<sub>0</sub>:** Compliance with high pricing and choice of whether to take it are independent of each other.

**H<sub>1</sub>:** Compliance with high pricing and choice of whether to take it are not independent. That is positive or negative compliance with pricing influences the decision of taking it.

**q8d.High pricing is justified as Aclasta is brought from abroad and its effectiveness is quite high unless patents have other major health diseases \* q4.Will you take reinfusion**

(Cross tabulation)

			q4.Will you take reinfusion		Total
			yes	no	
q8d.High pricing is justified as Aclasta is brought from abroad and its effectiveness is quite high unless patents have other major health diseases	agree	Count	34	13	47
		% within q8d.High pricing is justified for Aclasta	72.3%	27.7%	100.0 %
		% within q4.Will you take reinfusion	45.3%	28.9%	39.2%
		% of Total	28.3%	10.8%	39.2%
	undecided	Count	25	15	40
		% within q8d.High pricing is justified for Aclasta	62.5%	37.5%	100.0 %
		% within q4.Will you take reinfusion	33.3%	33.3%	33.3%
		% of Total	20.8%	12.5%	33.3%
	don't agree	Count	16	17	33
		% within q8d.High pricing is justified for Aclasta	48.5%	51.5%	100.0 %
		% within q4.Will you take reinfusion	21.3%	37.8%	27.5%
		% of Total	13.3%	14.2%	27.5%
Total		Count	75	45	120
		% within q8d.High pricing is justified for Aclasta	62.5%	37.5%	100.0 %
		% within q4.Will you take reinfusion	100.0%	100.0%	100.0 %
		% of Total	62.5%	37.5%	100.0 %



Here 73.2% of patients within ‘high pricing: agree’ category will take reinfusion. And who will take reinfusion: among them 45.3% agree that the high pricing of Aclasta is justified. In total 62.5% patients in ‘Pricing category’ question have decided to take reinfusion. Those who don’t comply with the pricing of Aclasta, 48.5% of them are taking reinfusion.

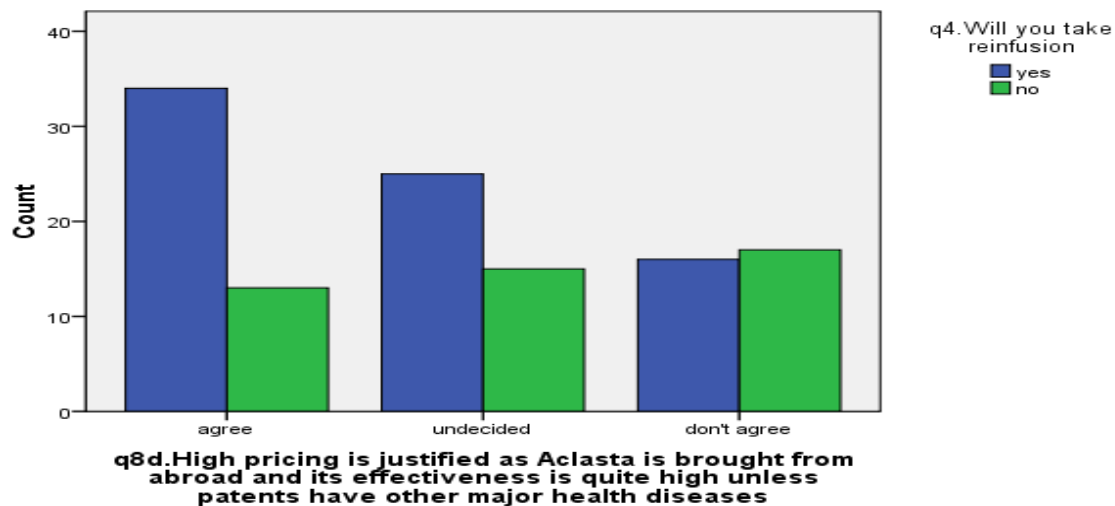
### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.708 <sup>a</sup>	2	.095
Likelihood Ratio	4.700	2	.095
Linear-by-Linear Association	4.620	1	.032
N of Valid Cases	120		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.38.

Here Chi-square statistic is 4.708. P= .095 which is more than .05. That means we can’t reject null hypothesis. Thus we can state that agreeable or negative compliance with the high pricing of Aclasta has no effect on the decision of the patients regarding reinfusion.

Bar Chart



## Sign Test and Wilcoxon Matched-Pairs Signed-Rank Test

### Hypothesis 11:

$H_0: \mu_{\text{money}} = \mu_{\text{discount}}$

$H_1: \mu_{\text{money}} \neq \mu_{\text{discount}}$

### Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
q8b. Money doesn't matter as long as the health is concerned	120	1.38	.674	1	3
q8c. Discount prompts us to buy Aclasta	120	1.32	.622	1	3

Here mean compliance rating of the patients to whom 'money doesn't matter as long as the Aclasta is effective' is 1.38. Mean compliance ranking of the patients to whom discount prompts them to buy Aclasta is 1.32.

### Wilcoxon Signed Ranks Test

#### Ranks

		N	Mean Rank	Sum of Ranks
q8c. Discount prompts us to buy Aclasta - q8b. Money doesn't matter as long as the health is concerned	Negative Ranks	22 <sup>a</sup>	20.20	444.50
	Positive Ranks	17 <sup>b</sup>	19.74	335.50
	Ties	81 <sup>c</sup>		
	Total	120		

a. q8c. Discount prompts us to buy Aclasta < q8b. Money doesn't matter as long as the health is concerned

b. q8c. Discount prompts us to buy Aclasta > q8b. Money doesn't matter as long as the health is concerned

c. q8c. Discount prompts us to buy Aclasta = q8b. Money doesn't matter as long as the health is concerned

Patients' compliance with discount has the less compliance likeability than the patients' compliance likeability with the money fact where observations amount to 22. It also gives the number of observations= 17 where patients pursuing discount have more compliance likeability than the patients who pursue healing in cost of any amount of money. 81 observations convey the same compliance rating in both category/group.

### Test Statistics

	q8c. Discount prompts us to buy Aclasta - q8b.Money doesn't matter as long as the health is concerned
Z	-.796 <sup>a</sup>
Asymp. Sig. (2-tailed)	.426

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

The P value associated with Wilcoxon test is .426.

### Frequencies

		N
q8c. Discount prompts us to buy Aclasta - q8b.Money doesn't matter as long as the health is concerned	Negative Differences	22
	Positive Differences	17
	Ties <sup>c</sup>	81
	Total	120

a. q8c. Discount prompts us to buy Aclasta < q8b.Money doesn't matter as long as the health is concerned

b. q8c. Discount prompts us to buy Aclasta > q8b.Money doesn't matter as long as the health is concerned

c. q8c. Discount prompts us to buy Aclasta = q8b.Money doesn't matter as long as the health is concerned

The output gives same outcome as in Wilcoxon test.

### Test Statistics

q8c. Discount prompts us to buy Aclasta - q8b.Money doesn't matter as long as the health is concerned	
Z	-.641
Asymp. Sig. (2-tailed)	.522

a. Sign Test

The final section of the output gives the values of the Sign test. The P value associated with Sign test and Wilcoxon test is consecutively .522 and .426. We can't reject null hypothesis as mean compliance rating for 'discount' and 'money justification for Health' is not same.

### Hypothesis 12:

**H<sub>0</sub>:**  $\mu_{\text{recalling}} = \mu_{\text{reinfusion decision}}$

**H<sub>1</sub>:**  $\mu_{\text{recalling}} \neq \mu_{\text{reinfusion decision}}$

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
q4.Will you take reinfusion	120	1.38	.486	1	2
q10.Do you remember your reinfusion date?	120	1.50	.502	1	2

Here we want to compare the mean acceptance rate of 'patients who will take reinfusion' with 'who remember their reinfusion date'. Here we can see that patients going to take Aclasta reinfusion imply mean acceptance rank of 1.38. And patients who remember their reinfusion date, their mean acceptance rank are 1.50.

P value associated with Wicoxon test is .001. Here we see 10 observations- where recall ability rank of reinfusion is less than reinfusion acceptance liability. And among 25 observations Remember ability overweighs the reinfusion acceptance rank. Among 85 observations remember ability and reinfusion acceptance rate/rank is same.

### Ranks

		N	Mean Rank	Sum of Ranks
Q10.Do you remember your reinfusion date? - q4.Will you take reinfusion	Negative Ranks	10 <sup>a</sup>	18.00	180.00
	Positive Ranks	25 <sup>b</sup>	18.00	450.00
	Ties	85 <sup>c</sup>		
	Total	120		

a. q10.Do you remember your reinfusion date? < q4.Will you take reinfusion

b. q10.Do you remember your reinfusion date? > q4.Will you take reinfusion

c. q10.Do you remember your reinfusion date? = q4.Will you take reinfusion

### Test Statistics<sup>b</sup>

	Q10.Do you remember your reinfusion date? - q4.Will you take reinfusion
Z	-2.535 <sup>a</sup>
Asymp. Sig. (2-tailed)	.011

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

### Sign

#### Frequencies

		N
q10.Do you remember your reinfusion date? - q4.Will you take reinfusion	Negative Differences <sup>a</sup>	10
	Positive Differences <sup>b</sup>	25
	Ties <sup>c</sup>	85
	Total	120

a. q10.Do you remember your reinfusion date? < q4.Will you take reinfusion

b. q10.Do you remember your reinfusion date? > q4.Will you take reinfusion

c. q10.Do you remember your reinfusion date? = q4.Will you take reinfusion

### Test Statistics

	q10. Do you remember your reinfusion date? - q4.Will you take reinfusion
Z	-2.366
Asymp. Sig. (2-tailed)	.018

a. Sign Test

In both Wilcoxon and Sign test P value is less than .05. Hence we reject null hypothesis. Hence mean recall ability rank is same as mean reinfusion acceptance rank.

### Chi-Squared Test of Independence of Categorical Variables

*Hypothesis 13:*

H<sub>0</sub>: Continuation with Aclasta in spite of switching doctor and response to effectiveness of Aclasta are independent.

H<sub>1</sub>: Continuation with Aclasta depends on the kind of response to effectiveness of Aclasta.

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
q8a.Aclasta is the most effective drug for osteoporosis * q13.I have switched to another doctor, but still continuing with Aclasta reinfusion	120	100.0%	0	.0%	120	100.0%

Here we can demonstrate that 41 patients agreed that Aclasta is the most effective drug and they will be loyal to Aclasta even after changing doctor.35 patients wont undertake the risk of continuing Aclasta after switching doctor, although they believe with the utmost effectiveness of Aclasta.

**q8a.Aclasta is the most effective drug for osteoporosis \* q13.I have switched to another doctor, but still continuing with Aclasta reinfusion**

**Cross tabulation**

			q13.I have switched to another doctor, but still continuing with Aclasta reinfusion		Total
			True	False	
q8a.Aclasta is the most effective drug for osteoporosis	agree	Count	41	35	76
		Expected Count	29.1	46.9	76.0
	undecided	Count	5	25	30
		Expected Count	11.5	18.5	30.0
	don't agree	Count	0	14	14
		Expected Count	5.4	8.6	14.0
Total		Count	46	74	120
		Expected Count	46.0	74.0	120.0

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.499 <sup>a</sup>	2	.000
Likelihood Ratio	27.844	2	.000
Linear-by-Linear Association	21.493	1	.000
N of Valid Cases	120		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.37.

Value of the Chi-squared statistic is 22.499. We reject null hypothesis as P value is less than .05. We can apprise that patients who believe in efficacy of Aclasta also tend to show loyalty toward Aclasta.

## Linear Regression

### Descriptive Statistics

	Mean	Std. Deviation	N
q4.Will you take reinfusion	1.38	.486	120
q1.Feelings after taking Aclasta	1.28	.448	120

Responses of the question 'will you take reinfusion' has a mean response of 1.38 (yes=1, n=2) and responses of 'feelings after taking Aclasta' has mean response of 1.28(1=feeling well, 2=not feeling well)

### Correlations

		q4.Will you take reinfusion	q1.Feelings after taking Aclasta
Pearson Correlation	q4.Will you take reinfusion	1.000	.448
	q1.Feelings after taking Aclasta	.448	1.000
Sig. (1-tailed)	q4.Will you take reinfusion	.	.000
	q1.Feelings after taking Aclasta	.000	.
N	q4.Will you take reinfusion	120	120
	q1.Feelings after taking Aclasta	120	120



### Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	q1.Feelings after taking Aclasta <sup>a</sup>	.	Enter

a. All requested variables entered.

b. Dependent Variable: q4.Will you take reinfusion

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.448 <sup>a</sup>	.201	.194	.436

a. Predictors: (Constant), q1.Feelings after taking Aclasta

20% of dependent variance is explained by the collection of independent variables.

### ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5.649	1	5.649	29.654	.000 <sup>a</sup>
Residual	22.476	118	.190		
Total	28.125	119			

a. Predictors: (Constant), q1.Feelings after taking Aclasta

b. Dependent Variable: q4.Will you take reinfusion

### ***Hypothesis 14:***

H<sub>0</sub>: Feeling after taking Aclasta has no impact on decision taking reinfusion

H<sub>1</sub>: Feeling after taking Aclasta has significant impact on decision of taking Aclasta.

The effect of 'feelings after Aclasta' (B= .486, P= .000) is significant and its coefficient is positive. So the greater positive the feeling is, the greater the possibility of going for reinfusion. Hence patients feeling well after taking Aclasta will intend to take reinfusion. If the patients are feeling well after taking Aclasta then they have the high chance of going for reinfusion. Considering the P value we find that the value is lower than .05. So we reject null hypothesis

implying that patients' health condition after taking Aclasta has significant effect on decision of taking reinfusion.

### Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.755	.121		6.268	.000
	q1.Feelings after taking Aclasta	.486	.089	.448	5.446	.000

a. Dependent Variable: q4.Will you take reinfusion

### Chi-squared test

#### Hypothesis 15:

**H<sub>0</sub>:** There is no association between the responses to the question 'reasons for abstinence from reinfusion' and decision of taking reinfusion.

**H<sub>1</sub>:** there is association between the responses to 'reasons for abstinence' and 'decision on taking reinfusion'.

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
q3.I won't go for re-infusion * q4.Will you take reinfusion	120	100.0%	0	.0%	120	100.0%

Those who chose that their probable abstinence from taking reinfusion would be high price, 76.4% of them are going for reinfusion. Those who have cured after the first infusion, among them 52% of patients are not taking reinfusion. Patients, who would only stop reinfusion if doctor suggests among them 66.7% of patients are taking reinfusion. On total 62.5% of patients is taking reinfusion. Fear of the side effects doesn't deter patients from taking reinfusion.

**q3.I won't go for re-infusion \* q4.Will you take reinfusion Crosstabulation**

			q4.Will you take reinfusion		Total
			yes	no	
q3.I won't go for re-infusion	Because price is so high that even after being satisfied can't take	Count % within q3.I won't go for re-infusion	16 76.2%	5 23.8%	21 100.0%
	I am feeling well, hence don't feel the necessity to take it	Count % within q3.I won't go for re-infusion	12 48.0%	13 52.0%	25 100.0%
	Doctor has not prescribed	Count % within q3.I won't go for re-infusion	16 66.7%	8 33.3%	24 100.0%
	I have switched to another substitute	Count % within q3.I won't go for re-infusion	1 14.3%	6 85.7%	7 100.0%
	I am dissatisfied after taking first Infusion	Count % within q3.I won't go for re-infusion	0 .0%	10 100.0%	10 100.0%
	forgot about the reinfusion date	Count % within q3.I won't go for re-infusion	16 84.2%	3 15.8%	19 100.0%
	scared of the side effects	Count % within q3.I won't go for re-infusion	14 100.0%	0 .0%	14 100.0%
Total		Count % within q3.I won't go for re-infusion	75 62.5%	45 37.5%	120 100.0%

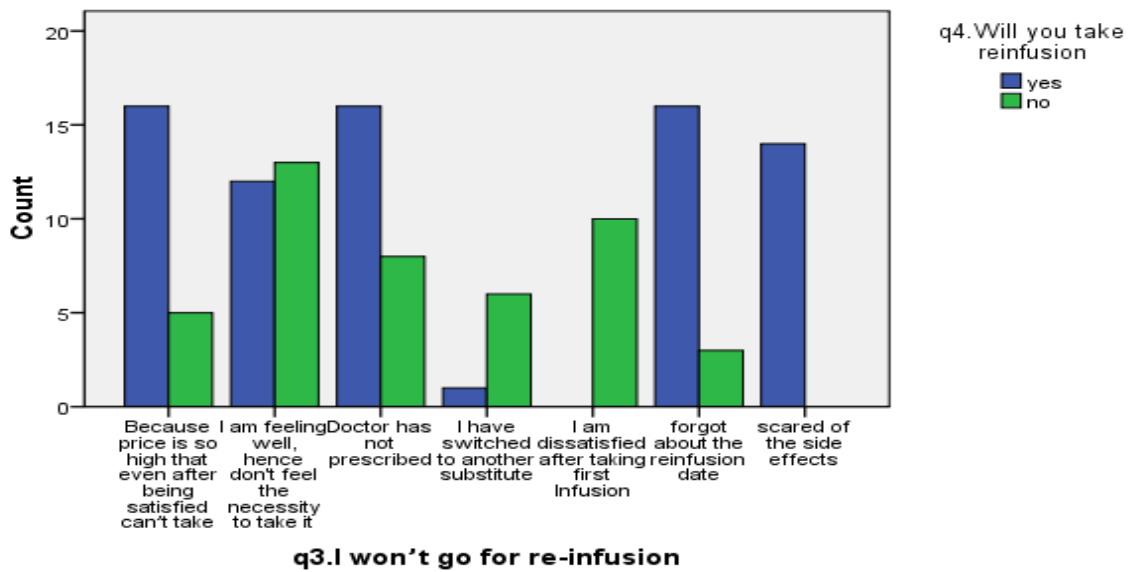
Here we see that P value is less than .05. Hence we can reject null hypothesis denoting that there is an association between the responses to 'reason for being abstinent from reinfusion' and 'decision of whether to take reinfusion'.

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.930 <sup>a</sup>	6	.000
Likelihood Ratio	48.237	6	.000
Linear-by-Linear Association	1.974	1	.160
N of Valid Cases	120		

a. 3 cells (21.4%) have expected count less than 5. The minimum expected count is 2.63.

### Bar Chart



### Hypothesis 16:

**H<sub>0</sub>:** People will not take reinfusion just because doctor has prescribed,  $\mu = 2$

**H<sub>1</sub>:** People will take reinfusion because doctor prescribed,  $\mu \neq 2$

## Statistics

q2.I am taking Reinfusion		
N	Valid	120
	Missing	0
Mean		2.48
Median		2.00
Mode		4
Std. Deviation		1.270
Minimum		1
Maximum		4

<b>Frequency</b>
------------------

### q2. I am taking Reinfusion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Because I am happy with first Infusion	40	33.3	33.3	33.3
	Because doctor has prescribed	24	20.0	20.0	53.3
	Because of not much improvement of health I have gone for re	15	12.5	12.5	65.8
	Haven't gone for re	41	34.2	34.2	100.0
	Total	120	100.0	100.0	

### One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
q2.I am taking Reinfusion	120	2.48	1.270	.116

### One-Sample Test

	Test Value = 2					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
q2.I am taking Reinfusion	4.097	119	.000	.475	.25	.70

So we can reject null hypothesis and adduce that patients tend to take reinfusion because of doctors' prescription.

#### *Hypothesis 17:*

**H<sub>0</sub>:** Response to Availability of stores has no impact on reinfusion decision

**H<sub>1</sub>:** Response to availability of stores has impact on decision of reinfusion because doctor prescribed,

Patients who ticked on 'Excellent' option regarding Availability of Aclasta stores, among them 62.5% of the patients have decided to go for reinfusion. 37.5% of patients are not taking reinfusion even though think availability of Aclasta stores is excellent. Patients who think availability of stores is good among them 79.6% of patients are taking reinfusion.

**q9a.Availability of stores \* q4.Will you take reinfusion Cross tabulation**

			q4.Will you take reinfusion		Total
			yes	no	
q9a.Availability of stores	Excellent	Count	15	9	24
		Expected Count	15.0	9.0	24.0
		% within q9a.Availability of stores	62.5%	37.5%	100.0%
	Good	Count	43	11	54
		Expected Count	33.8	20.2	54.0
		% within q9a.Availability of stores	79.6%	20.4%	100.0%
	Neutral	Count	15	14	29
		Expected Count	18.1	10.9	29.0
		% within q9a.Availability of stores	51.7%	48.3%	100.0%
	Bad	Count	2	11	13
		Expected Count	8.1	4.9	13.0
		% within q9a.Availability of stores	15.4%	84.6%	100.0%
Total	Count	75	45	120	
	Expected Count	75.0	45.0	120.0	
	% within q9a.Availability of stores	62.5%	37.5%	100.0%	

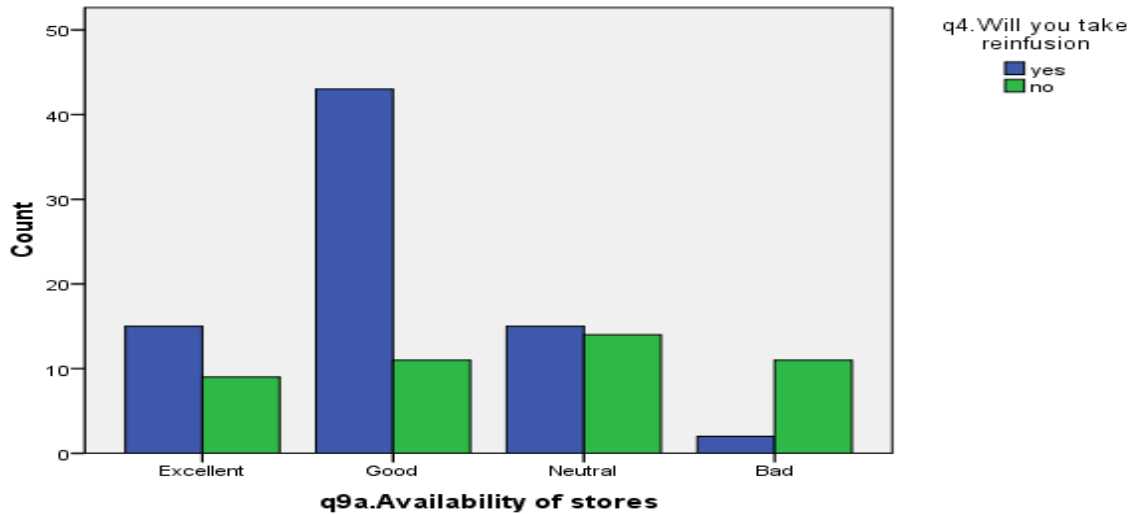
### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.510 <sup>a</sup>	3	.000
Likelihood Ratio	21.096	3	.000
Linear-by-Linear Association	10.312	1	.001
N of Valid Cases	120		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.88.

Here P value is less than .05. Hence we can reject null hypothesis and can denote that there is significant association between responses to ‘availability of the stores’ and ‘decision of whether to take reinfusion’. From the bar chart below we can exemplify that those who think availability of the stores is good, have the tendency of desire for taking reinfusion more than that of other feelings towards ‘availability of the stores’.

**Bar Chart**





## PART SEVEN: FINDINGS

### 7.1 Findings

So by the impression of all the statistical tests done above we can state that:

- Women tend to suffer from osteoporosis more than that of men. As a result, it has been seen that Most of the patients are female.
- Patients who believe in efficacy and feasibility of Aclasta they tend to take reinfusion more than that of who don't believe.
- Patients who think Aclasta as the most effective drug for osteoporosis they are prone to be more loyal towards Aclasta even if they switch to another doctor.
- Patients, who remember their reinfusion date, tend to go for reinfusion.
- We also observe that many patients who are not happy with the pricing of Aclasta, still goes for reinfusion. Patients who are okay with high pricing of Aclasta, majority of them are taking reinfusion. But there are some patients who despite being okay with high pricing, not going for reinfusion as they have cured after very first infusion.
- Patients who are happy with first infusion are the highest number of people to go for reinfusion. Significant numbers of patients are also taking reinfusion in accordance with doctors' prescription regardless of their physical condition after first infusion. There are 40% of patients within 'non improved health condition after first infusion' category, who go for reinfusion.
- Patients who remember their reinfusion date are also happy with the discounting process
- Doctor's visit amount has no impact on the decision made by patients regarding whether to go for reinfusion or not.
- Patients have the tendency of abiding by doctors' prescription.
- Even though the price is high, most patients will still go for reinfusion's who think high pricing is only the obstacle towards continuation. Patients who tend to forget their reinfusion date, most of them are prone to take reinfusion. Patients who would stop reinfusion when they will cure, among them majority is not going for reinfusion as they are absolutely fine after Aclasta infusion. Patients who are dissatisfied with Aclasta are not going for reinfusion.

- Patients' compliance rate with 'money doesn't matter until health is concerned' is more than that of 'Discount offer prompts them to buy Aclasta'.
- Compliance with high or low pricing has no effect on patients' decision making regarding reinfusion.
- Dissatisfaction with the doctor has no effect on building loyalty towards Aclasta ignoring doctor's prescription.
- Patients' loyalty towards continuation with Aclasta despite switching doctor some what depends on the kind of response or liking patients impose on Aclasta. There are some patients who are not appreciating the discounting process that much but still would be loyal because of Aclasta's high efficacy.
- The more the favorable responses towards 'availability of Aclasta stores' exist, the more there is tendency of the patients to take the decision of going for reinfusion.
- Health condition after first infusion determines the perceived benefit emitted from Aclasta. Improved condition after first infusion certainly strengthens the patients' positive notion and perceived benefit stemming from the Aclasta.

Hence by checking above findings we can say that the patients who take Aclasta reinfusion, most of them are influenced by the satisfaction with Aclasta. So we can reject null hypothesis stated at the very beginning of the Primary data Analysis and demonstrate that patients who go for reinfusion are actually satisfied with Aclasta.

**Note: Bar-diagrams of the findings are attached as Appendix 2.**

## **7.2 Recommendation:**

- Price is an ample obstacle to keep patients aloof from taking Aclasta even though these patients believe in Aclasta's efficacy to their utmost. Price can be lowered for the penniless patients through more lucrative discount schemes.

- Novartis can arrange discount offer for their enlisted patients who have already infused once. So that the patients would more likely to be induced to infuse Aclasta® for the next time as the medicine is to infuse once a year for three consecutive years.
- Repetitive programs of Aclasta® in different hospitals can reinforce the doctors to prescribe it more frequently.
- Patients have to be brought to hospital to get the Aclasta infusion which is quite ponderous for the aged patients. Hence arrangement of the infusion can be orchestrated at home of the patients just like home delivery.
- More awareness program highlighting Aclasta should be boosted and reinforced. They can also enroll in social event sponsorship and the like.

## **PART EIGHT: CONCLUSION**

Aclasta is undoubtedly the most effective drug for curing osteoporosis. This is the drug which comes from Abroad with intrinsic and chaste quality ensured. That's why the drug costs higher than other substitutes and competitors' products. But sometimes patients' age and having other lethal diseases may overshadow Aclasta's effectiveness. Novartis is boosting their campaign proclaiming Aclasta's value and its commitment to patients. Patients' health update (After taking Aclasta) is always gathered by the Call Center Service in Novartis drug. Sustaining agreeable rapport with patients- is the main motto for Novartis. Selling products to patients is not all for Novartis. Post purchase proclivity of the patients is also brought under custody. Patients' health condition, their appeal for discount is also overseen after Novartis sells the drug. Novartis also enlightens patients with education regarding their diseases, how Aclasta and other drugs work and also make them informed regarding the consequences beforehand. Novartis is not contented in merely healing patients, they are also working to allay the adverse side effects and ache; and trying to ascertain that patients feel snug and hazard free while taking Aclasta. Hence ultimate satisfaction of the patients is the most substantial and prior aim of Novartis.

## Reference

1. Belch, G. E. and Belch, M. A. 2009. Advertising and Promotion. 8<sup>th</sup> Ed. India: Pearson
2. Niles, Steven. 2010. Vision of Growth. Med Ad News, September, 98a.
3. Anonymous. 2010. Top 10 Pharma Companies. Med Ad News, September, 2.
4. IMS Plus 2Q, 2010. Bangladesh Pharmaceutical Index.
5. Bangladesh Pharmaceutical Index. 2011

## Appendix: 01

### QUESTIONNAIRE

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#### **Q1. Feelings after taking Aclasta-**

- Feeling Well
- Not feeling well

#### **Q2. I am taking Reinfusion-**

- Because I am happy with first Infusion
- Because doctor has prescribed
- Because of not much improvement of health I have gone for re-infusion
- Haven't gone for re-infusion

#### **Q3. I won't go for re-infusion-**

- Because price is so high that even after being satisfied can't take
- I am feeling well, hence don't feel the necessity to take it
- Doctor has not
- I have switched to another substitute
- I am dissatisfied after taking first Infusion
- Forgot about the reinfusion date
- scared of the side effects

#### **Q4. Will you take reinfusion-**

- Yes
- No

#### **Q5. Are you interested to attend Aclasta Patient Meeting?**

- Yes
- No
- May be
- 

#### **Q6. Gender- (To find out who takes more doctors' visit)**

- Male
- Female

#### **Q7. Any perceived benefit have you found from Aclasta over competitors or substitutes? (If you have switching experience)**

- Yes
- No

- Same
- I don't know

**Q8a. Aclasta is the most effective drug for osteoporosis**

**Q8b. Money doesn't matter as long as the health is concerned**

**Q8c. Discounts Prompts us to buy Aclasta**

**Q8d. High pricing is justified as Aclasta is brought from abroad and its effectiveness is quite high unless patents have other major health diseases**

- Agree
- Undecided
- Don't agree

**Q9a. Availability of stores**

- Excellent
- Good
- Neutral
- Bad

**Q9b. Awareness of Aclasta**

**Q9c. Discounting process/ procedure**

- Excellent
- Good
- Neutral
- Bad
- Very bad

**Q10. Do you remember your reinfusion date?**

**Q11. I don't take Aclasta infusion/reinfusion as I am dissatisfied with my doctor**

**Q12. Being aware of Aclasta reinfusion I would/have gone for reinfusion ignoring my doctor's prescription**

**Q13. I have switched to another doctor, but still continuing with Aclasta reinfusion**

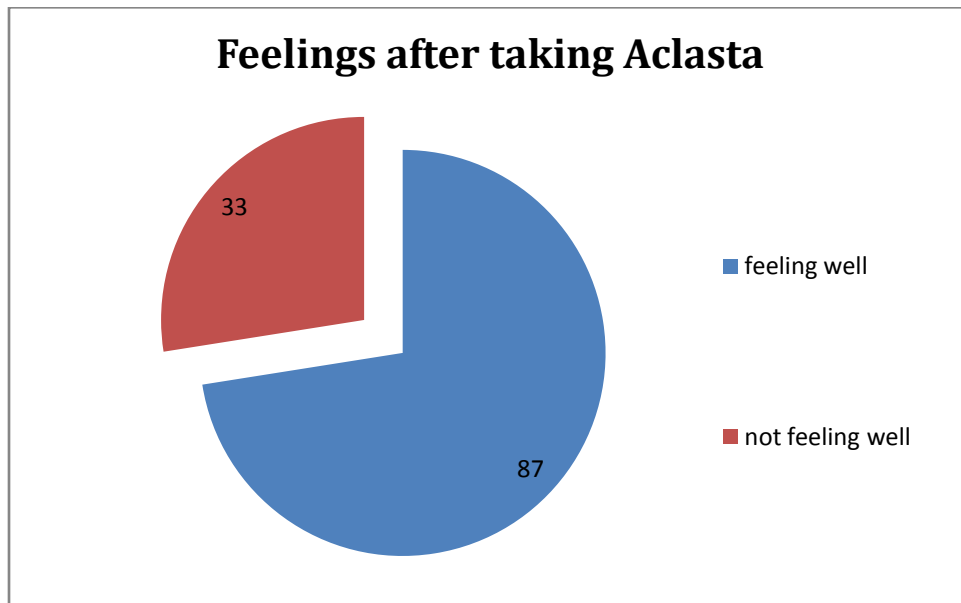
- True
- False

## Appendix: 02

### Findings:

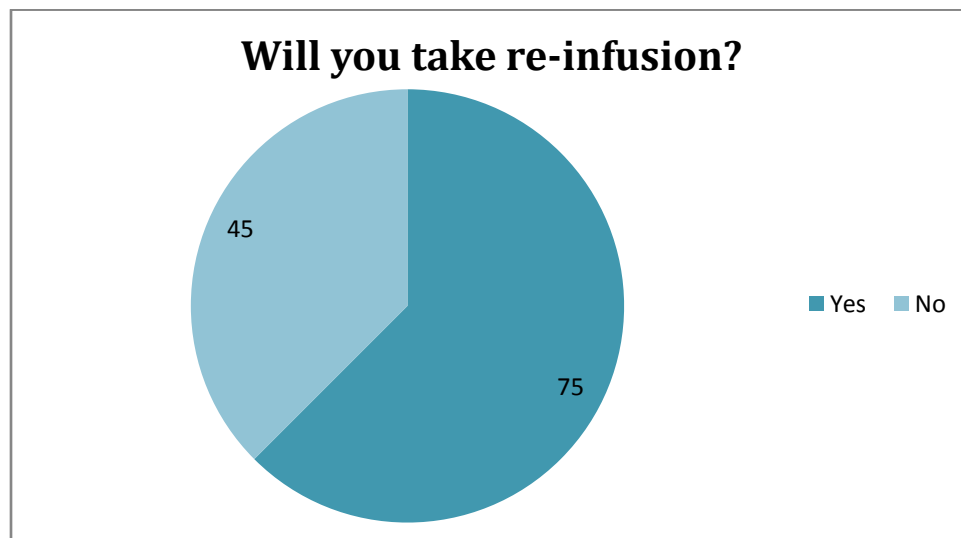
#### 1. Feelings after taking Aclasta-

- Feeling Well
- Not feeling well



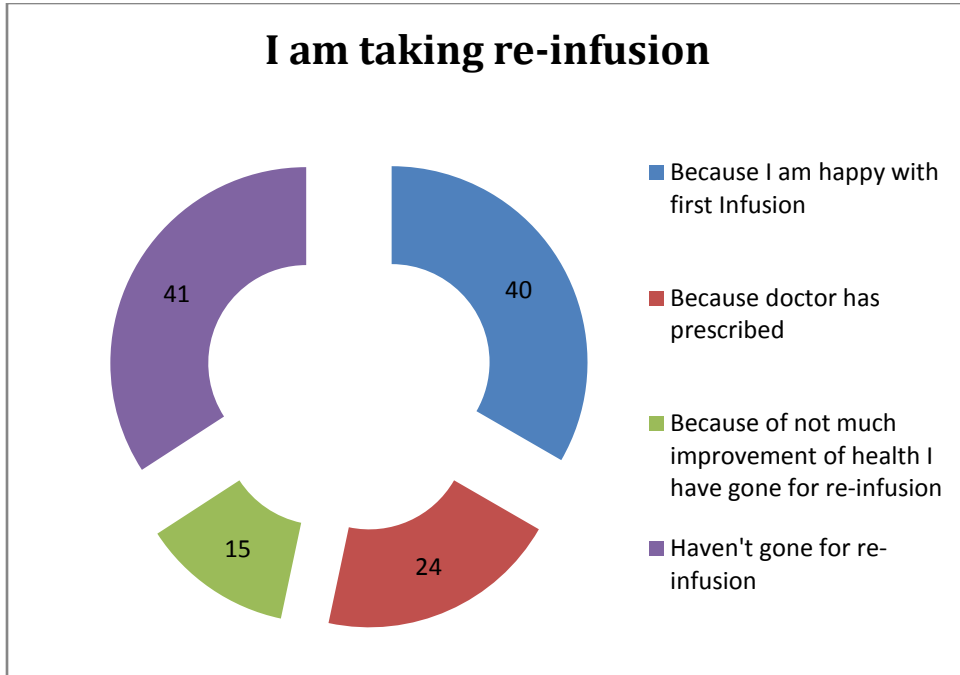
#### 2. Will you take reinfusion?

- Yes
- No

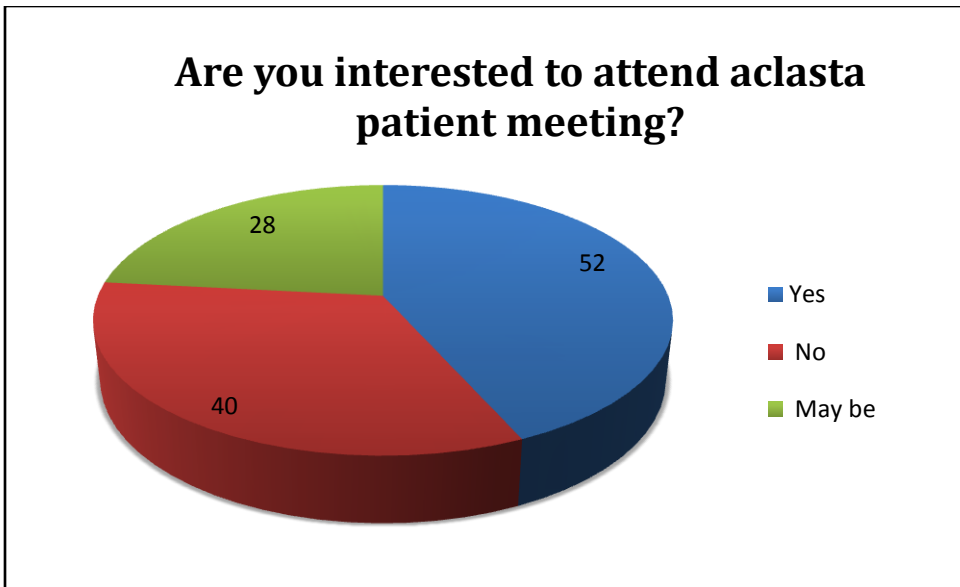


### 3. I am taking Reinfusion-

- Because I am happy with first Infusion
- Because doctor has prescribed
- Because of not much improvement of health I have gone for re-infusion
- Haven't gone for re-infusion

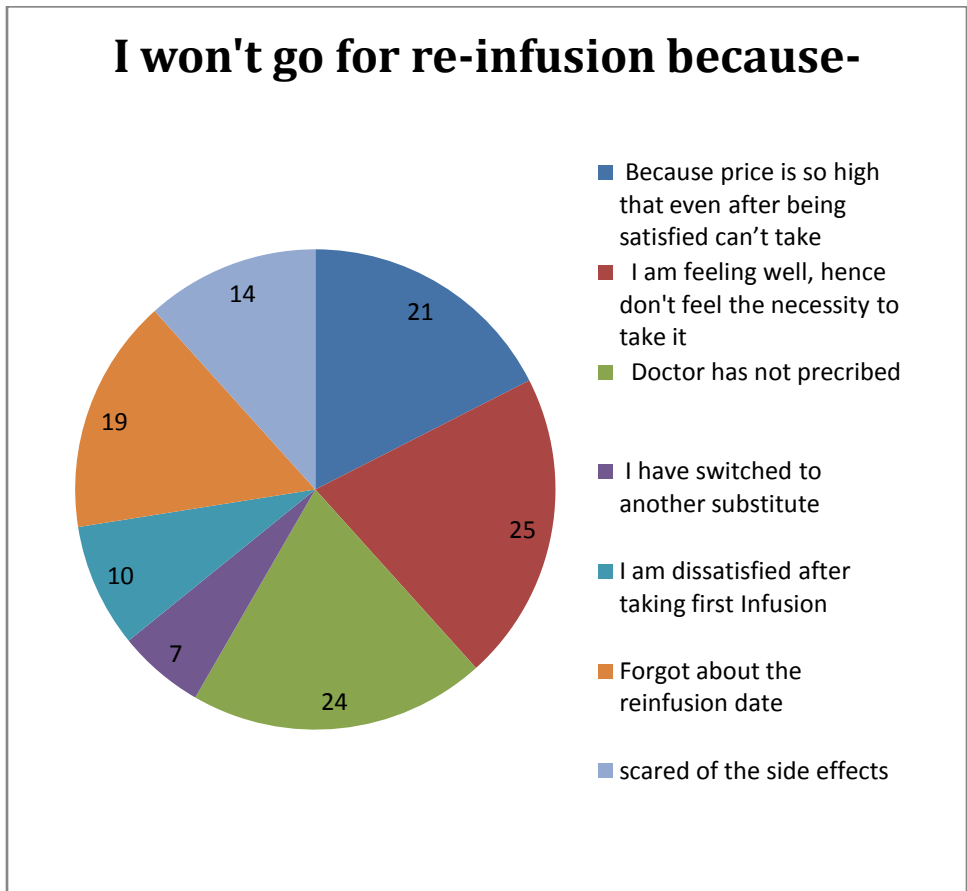


### Q5.Are you interested to attend Aclasta Patient Meeting?



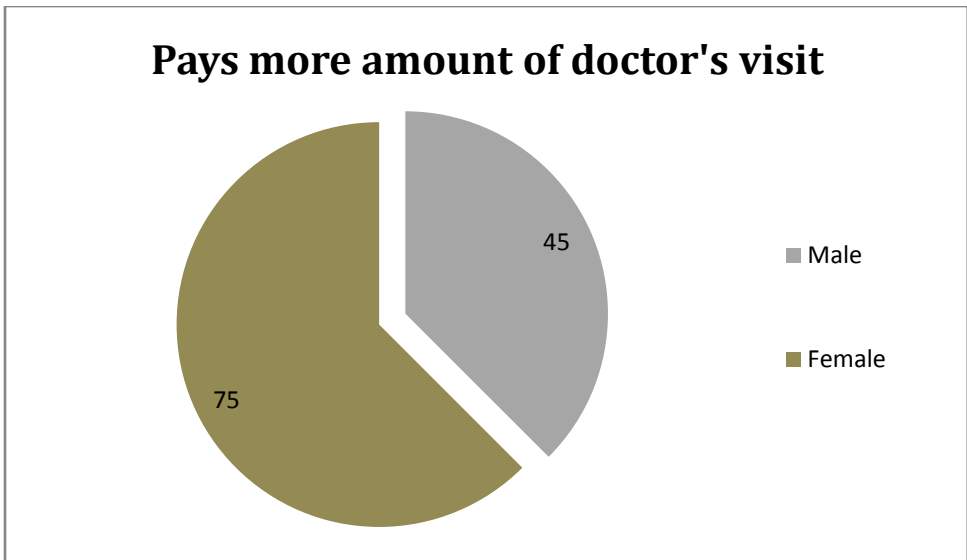


### I won't go for re-infusion-



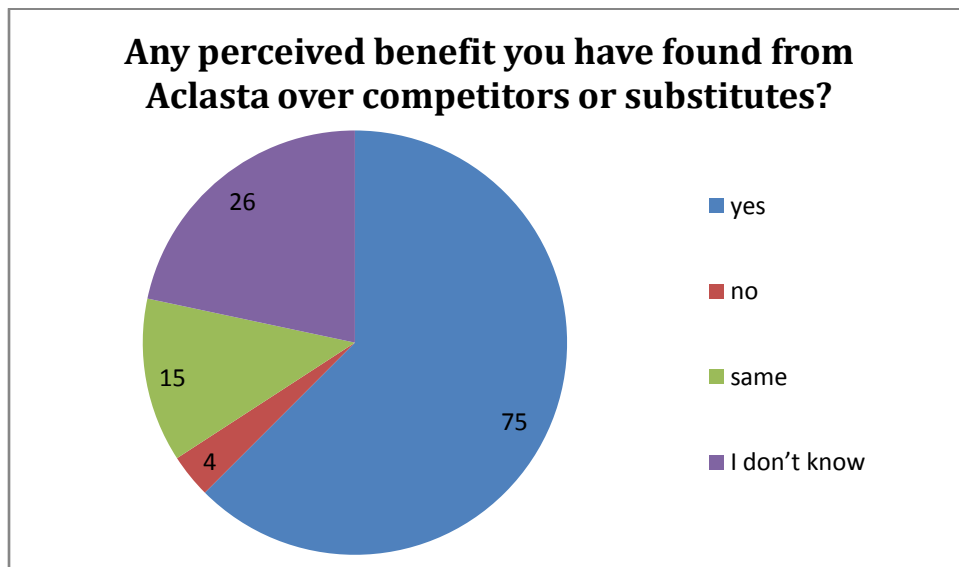
### Pays doctors visit-

- Male
- Female



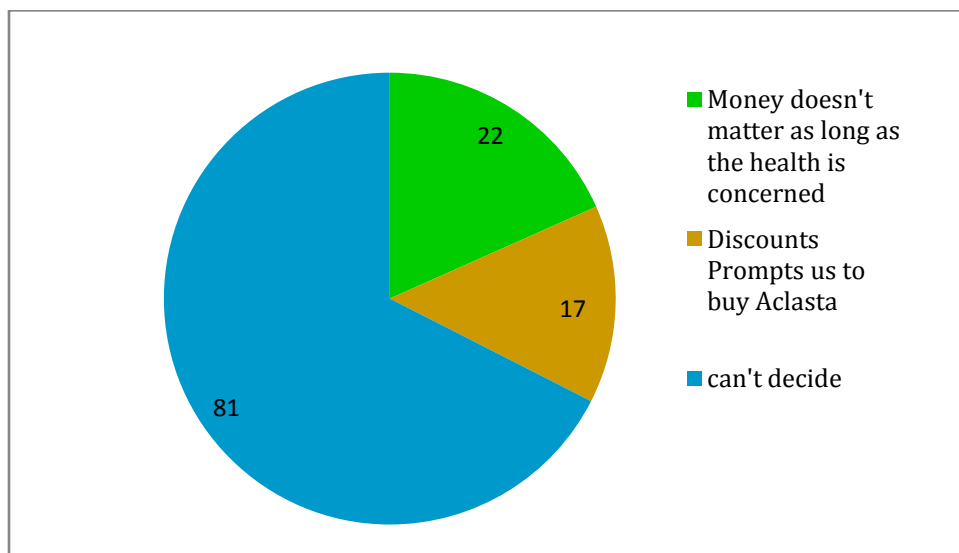
**Any perceived benefit have you found from Aclasta over competitors or substitutes?  
(If you have switching experience)**

- Yes
- No
- Same
- I don't know

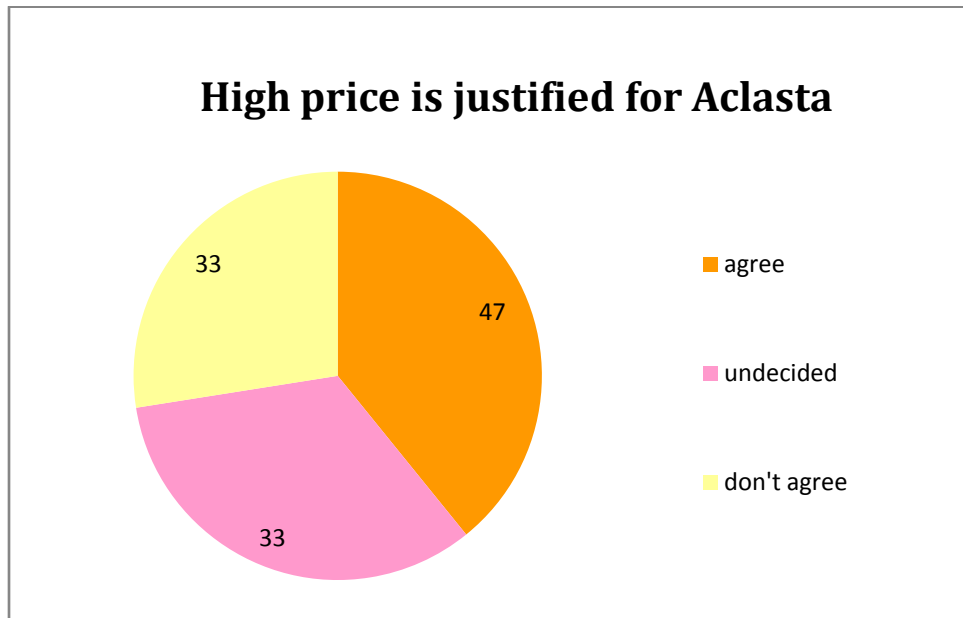


**a. Money doesn't matter as long as the health is concerned**

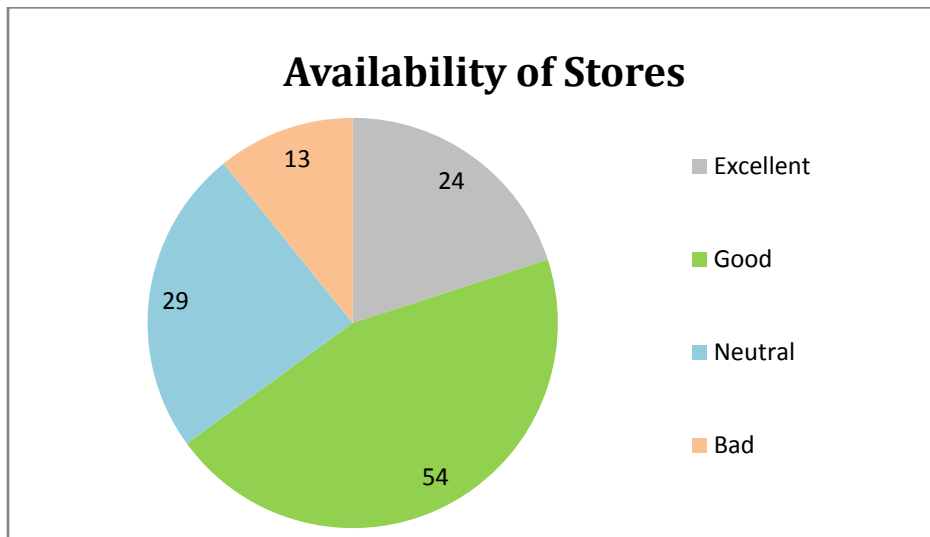
**b. Discounts Prompts us to buy Aclasta**



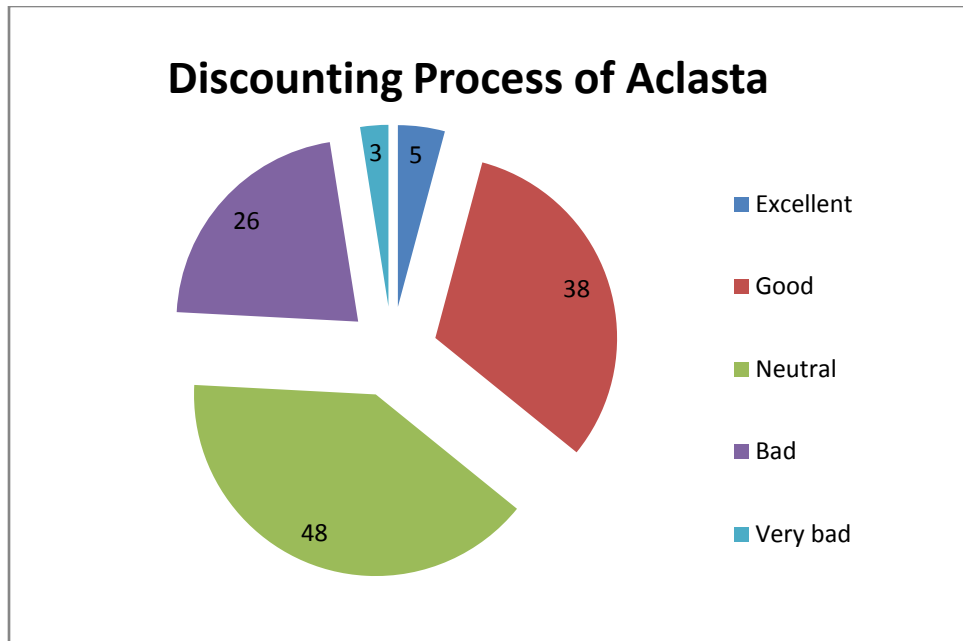
**High pricing is justified as Aclasta is brought from abroad and its effectiveness is quite high unless patents have other major health diseases**



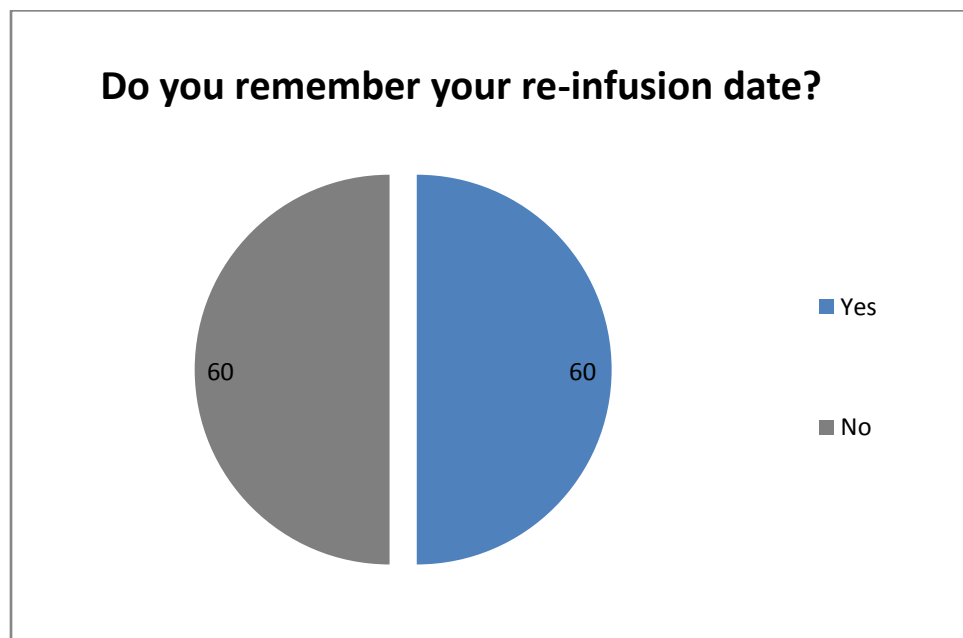
**Availability of stores**



### Discounting process/ procedure



### Do you remember your reinfusion date?



**I have switched to another doctor, but still continuing with Aclasta reinfusion**

- True
- False

