

Study on Market Potential of Oncology in India

By

Sohan Chaudhary

*Dissertation submitted for the partial fulfillment of the
MBA Pharmaceutical Management*

Academic year, 2018-2020



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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled A study on market potential of oncology in india and submitted by Sohan Chaudhary Enrollment No. 0153 under the supervision of Mr. Rahul Sharma for award of MBA in Pharmaceutical Management at University carried out during the period from 03 March, 2020 to 03 May, 2020 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Sohan Chaudhary

Signature

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-Sohan Chaudhary

Introduction

Cancer involves an inadequately controlled division and multiplication of cells that can infiltrate adjacent tissues and, in many types, form distant secondary lesions. The factors that permit metastatic tumor cells to survive

The concept of cancer has evolved through ages from that of a single disease to one of many diseases with many causes. Most prevalent are the carcinomas of the stomach, lungs, breast, cervix, colon, rectum, prostate and liver.

Chief among carcinogens are irritants such as fumes of tobacco & certain metals, ionizing and ultraviolet radiation, Specific chemical compounds, some helminthic parasites and possibly viruses.

Everyone is constantly bombarded by carcinogens of various potencies, but cancer develops in minority of people. A few uncommon neoplasms, clearly are genetically determined, but the degree of resistance to carcinogens also appears to have a genetic basis.

A correct cancer diagnosis is needed for proper and effective treatment because every cancer type requires a typical treatment regimen that encompasses one or more modalities such as surgery, radiotherapy, and chemotherapy. Identifying the goals of treatment and is an important first step, and health services should be integrated and people-centred. The primary target is generally to treat cancer or to increase life.

Prolonging the patient's quality of life is also an important target. This can be completed by supportive & physical care and psychosocial support.

The main classes of cancer treatment are surgery, systemic therapies (chemotherapy, hormonal therapy and biological agents) and radiotherapy, which can be given alone or in combination and either with curative or palliative purpose.

The development of new operational services delivering these therapies is associated with increasingly high costs, therefore making realistic projections is critical to maximize infrastructure, equipment, financial and human resources at a population level.

Taking radiotherapy, the information available has been generated mainly in developed countries; the estimates of service demand are based on expert's opinion, rate of utilization, or on what should be prescribed according to clinical guidelines. However, patterns of cancer incidence, stage at diagnosis and access to treatment in developing countries are distinct, thus indications for surgery, systemic therapies and radiotherapy may vary considerably.

Types of Cancer

Carcinoma-The most common type of cancer which are formed by epithelial cells, the cells which covers the inside and outside surfaces of the body. There are many types of epithelial cells and carcinomas that begin in different epithelial cell types they have different names.

- Adenocarcinoma is a type of cancer that form in the epithelial cells which produces fluid or mucus. Mostly breast, prostate and colon are adenocarcinomas.
- Basal cell carcinoma is a type of cancer that forms in the basal or lower (base) layer of the epidermis, that is person's outer layer of skin.
- Squamous cell carcinoma is a type of cancer that forms in squamous cells that lie just beneath the outer of surface of the skin. Squamous cells line many other organs which include stomach, intestines, lungs, kidney, bladder.
- Transitional cell carcinoma is a type of cancer that forms in a type of epithelial tissue which is a transitional epithelium or urothelium. This tissue is made up of many layers of epithelial cells which can get bigger or smaller and found in the linings of the ureters, bladder and some part of the kidneys (renal pelvis), and some other organs.

Sarcoma- Is a type of cancers that form in bone and soft tissues and also including muscle, fat, lymph vessels, blood vessels, and fibrous tissue (such as tendons and ligaments). Examples are Osteosarcoma (bone) and Kaposi sarcoma (soft tissue).

Leukaemia- Cancer of blood-forming tissue of the bone marrow is known as leukaemia.

Lymphoma- Lymphoma is a type of cancer that begins in lymphocytes (T cells or B cells). These are disease-fighting white blood cells which is a part of the immune system. In lymphoma, the abnormal lymphocytes build up in lymph vessels and lymph node or in other organs of the body.

There are two main types of lymphoma:

Hodgkin lymphoma – People with this disease have abnormal lymphocytes which is known as Reed-Sternberg cells and these cells usually form from B cells.

Non-Hodgkin lymphoma – Is a large group of cancers that starts in lymphocytes. This cancer can grow quickly or slowly or can form from B cells or T cells.

Multiple Myeloma- Is a type of cancer that begins in plasma cells, an another type of immune cell. The abnormal plasma cells known as myeloma cells, build up in the bone marrow and form tumors in bone throughout the body.

Melanoma-Is cancer that begins in cells that become melanocytes, these are specialized cells that make melanin (the pigment that gives skin its color). Most of the melanomas are form on the skin but melanomas can also form in other pigmented tissues, such as eyes

The global cancer therapy market was valued at USD 136,254.35 million in 2018 and is estimated to be valued USD 220,701.26 million in 2024 and witnessing a CAGR of 8.37%. Certain factors which are driving the market growth include increasing Patient Assistance Programs (PAPs), increasing government initiatives for cancer awareness, cancer worldwide, , rising prevalence, and strong R&D initiatives from key players.

Treatment for Cancer have been advanced and at a accelerated pace in recent years with offering of notable improvements in clinical benefit, as well as increased specificity through selection according to biomarkers, through engineered cell or gene therapies. Global spending on cancer therapies and supportive care drugs now exceeds and reached \$133 billion and as the value of these medicines is recognized and a greater share of drug budgets is allocated to these products. Over the next five years this amount is projected to reach \$180—200 billion.

Key drivers of change in the oncology market-

- By 2030 it is predicted that there will be 41 mega-cities, with more than 10 million inhabitants. 3 Urbanization is leading to changes in lifestyle, predisposing populations to the emergence of cancer (e.g. activity, diet etc.).
- **Increased Cancer incidence-** Circulation of pollution is being attributed to an increasing proportion of lung cancer cases and it is widely recognized that further decreases in ozone levels are likely to result in increase in the number of cancer cases globally.
- **Increased pharma R&D cost-** Circulating pollution is being attributed to an increasing proportion of lung cancer cases, and it is widely recognized that further decreases in ozone levels are likely to result in an increase in the number of cancer cases globally.
- **Healthcare Budget pressure-** Rising spending on healthcare will place ever increasing pressure on public budgets. Without action, healthcare expenditure in OECD countries is forecast to double as a share of GDP by 2060, which is considered unsustainable.

Literature Review

Cancer is a process whereby a loss of control of normal cell division and multiplication produces a tumor that can invade adjacent tissues and metastasis, i.e implant cancerous cells at a site that is non contiguous to their origin , where abnormal multiplication continues.

When Cancer originates in connective tissues, in (bone or a muscle), it is called Sarcoma. When it originates in epithelial tissues (lining tissues and organs such as the breast, lungs or stomach), It is called Carcinoma.

The latter is by far more common. Invasive tumors occur in all complex species and probably antedate the advent of vertebrates.

The concept of autonomy suggests that once a cell has become truly cancerous, it is beyond bodily control.

The fact that Cancer once established can enter a stage of remission- sometimes permanently argues that the body can rally to retard or even reverse previously uncontrolled cell proliferation.

The extent to which the incidence of cancer is increasing is a complicated issue. It is predominantly an illness of middle age and with the exception of few norms such as leukaemia, its relatively rare in children. Although a shift in the Age distribution of a population affects the actual incidence of cancer, Statistics have shown the art factual increases.

These are due to vast improvements in the diagnostic techniques of endoscopy, imaging, and biochemistry that can now be used to detect many asymptomatic cancers and pathological techniques that facilitate the differentiation of neoplastic from inflammatory lesions, primary from secondary neoplasms, and so forth .

For the incidence of a disease to be considered meaningfully, It must be presented in age-specific terms. As the average age of population increases and the proportion of an age group in which various cancers most commonly occur become larger, an increase in the number of cases is expected. This increase can however tend to blur the more important question of whether the incidence of that disease is increasing in a specific age group. Suspicion of potential carcinogenesis has also fallen synthetic food additives, such as dyes and flavouring agents, and contaminants, such as pesticides & fertilizers, either from direct spraying or from absorption of affected groundwater.

The available treatments are by far generally drastic & poorly selective of the foci of the disease and, in many circumstances not curative.

Earlier diagnosis improves the cure rate of many but not all cancers.

Therefore Public education about the signs of Cancer and further improvements in the sensitivity of diagnostic methods should be sought. However, until our understanding of the fundamental biology of cancer improves, preventive measures, such as minimizing exposure to known carcinogens, will exert by far the greatest benefit to public health.

Source: cancerindia.org.in/common-cancers/

Indian oncology Market-India has around 1.8 million people suffering from different type of cancer, with patients of breast, cervical and oral cancers are topping in the list. Even every 13th new cancer patient in the world is an Indian. Official data shows that there are only about 1600 trained oncologists in the country and the ratio of oncologists to cancer patients is about 1:2,cancer . Cancer ranks as the 6th leading cause of death in India. The Cancer mortality rate in India is very high at 68% of the annual incidence. Ratio indicates that the 30% of the patient survive 5 years or longer after diagnosis.

Cancer rates are increasing in a very fast manner in developing countries With rising incomes and better access to childhood vaccinations, people are living longer in developed countries. The major health risks worldwide are basically averaged to tobacco use and household air pollution. Due to inadequate regulatory intervention and effective health policies in developing countries, people are developing cancer at young age, in greater numbers.

The last few decades have seen considerable efforts made in the treatment and prevention of cancer around the world, but it still looms large over our lives, especially in India for a multitude of reasons. The incidence of cancer has reached high in number with India being the third country after China and the USA with the maximum number of cancer cases. Ignorance about the disease, its symptoms and a delay in visiting medical experts for a proper diagnosis has increased the prevalence of this illness which is anticipated to grow by 30 percent in coming 5 years. The Indian Council of Medical Research (ICMR) has predicted that by the year of 2020 India will witness more than 17.3 lakhs new cases of cancer and even more than 8.8 lakh Indians would die because of it. Unfortunately, a majority of the patients visit hospitals for diagnosis or treatment in the advanced stages of the illness. The need of the hour is therefore heavy investments in prevention techniques, cancer awareness, vaccinations and screening, along with a focus on clinical data research and studies for developing better cancer fighting techniques.

Market Drivers-

The market driver of the cancer treatment market in India is generally three-fold: There have been improvements in health-care access and delivery have been small so far, and public health improvement in India has been less of a political priority than in other countries at a similar developmental stage. This has been possible due to the initiation of government to improve the access to diagnosis and treatment of cancer by focusing in various areas such as

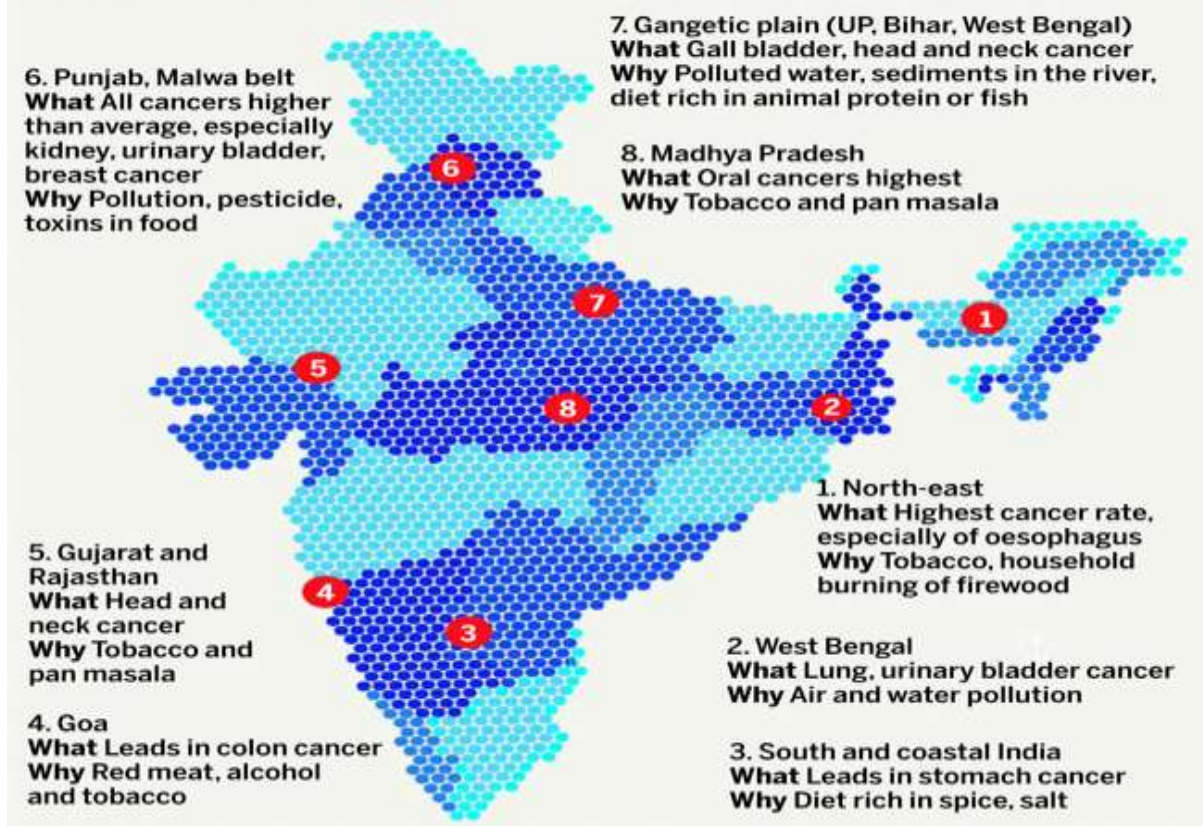
awareness, monitoring research, building skills of the staffs, providing capital grants to backward districts within the country to promote health in such regions. The comprehensive plan has been led out in the 12th plan of Government of India as a part of Cancer specific initiatives. The adoption of the technology by the private and public health institutions are increasing where, level of technology used in cancer treatment is advanced with 90% of installations being of moderate to high technology levels. According to Frost and Sullivan, Oncology will be a key area of growth in India's healthcare sector. As there will be more emphasis on health coverage both by central and state governments, spending on coverage of medicines for oncology will see substantial rise in 3-5 years.

Market by therapeutic modalities-

- Cytotoxic Chemotherapy
- Hormonal Chemotherapy
- Immunological Chemotherapy
- Targeted Cancer Therapy
- Supportive Care Therapy

Geographical distribution of Cancer in India

GEOGRAPHY OF CANCER



Source: cancerindia.org.in/common-cancers

Incidences of Cancer in India

Incidence rates (new cases per 100 000 people per year), age-standardized to a common world.

population, for the seven most common cancers.

There are estimated cancer cases in India are 2.5 Million, While New Cancer Cases Registering are 7 Lakhs are Every year.

Deaths in groups between (30-69) are 71 % of total cancer related deaths in India

The Major 50 % Deaths in India in Men are Caners of Oral Cavity and Lungs and Cervix & Breast Cancer cases in Women. New cases registered: 1,23,000.

The Top Five Cancers that accounts for 47.2 % deaths in India in men are Lip, oral cavity, Stomach, colorectum, Pharynx, and in Women are Breast, cervix colorectum, Ovary, Lip and Oral Cavity.

Source: cancerindia.org.in/common-cancers

Emerging trends in cancer in India are:

- There is an increase in cases of lung Cancer in men, and there is an increase in Colon, Ovary & uterus cancer in women.

The number of oral cancers was more than twice the number of lung cancers in individuals aged 30-69 years, indicating that the range of fatal cancers caused by tobacco in India differs substantially from that in high-income countries.

Cancer strikes more Women than Men, but more Men die of Cancer than Women.

Cancer Statistics of India

- One woman dies of cervical cancer every 8 minutes in India .
- For every 2 women newly diagnosed with breast cancer, one woman dies of it in India .
- As many as 2,500 persons die every day due to tobacco-related diseases in India .
- Smoking accounts for 1 in 5 deaths among men and 1 in 20 deaths among women, accounting for an estimated 9,30,000 deaths in 2010.

Cervical cancer is the second most common cancer in India in women accounting for 22.86% of all cancer cases in women and 12% of all cancer cases in both men and women.

Report says that Over 39 % of All cancer cases in India are registered in Haryana.

Highest numbers of cancer cases recorded from Indian states were from Haryana at 39.6 per cent followed by Delhi at 27.3 and Uttar Pradesh at 12.7 per cent.

Approximately 17.3 lakh new cancer cases are being estimated by the year 2020 in India, therefore with the present trends Haryana might have around 6.5 lakh cancer cases by then.

Breast cancer has a majority share of cancer cases and is the leading cause for deaths in women suffering with non-communicable disease. According to an Indian Council of Medical Research (ICMR) report, breast cancer shares 10% of all cases.

Types of Most common Cancers in India

- Breast cancer

- Cervical cancer
- Oral cancer
- Colorectal cancer
- Lung cancer

Causes

Causes of Breast Cancer

- Obesity
- Older age
- Personal records of breast cancers in a single breast
- Family records of breast cancers in near loved ones along with your mom, sister, or daughter - specifically if they developed the ailment at a young age
- Inherited genetic mutations, such as BRCA1 and BRCA2
- Radiation publicity on your chest as a baby or younger adult
- Starting your menstrual cycle earlier than the age of 12
- Starting menopause at an older age
- Giving birth for the first time after the age of 35
- By no means pregnancy
- Taking hormone therapy that combines oestrogen and progesterone
- Taking alcohol

Causes of Lung Cancer

- Smoking: Tobacco.
- Second-hand Smoke: Smoke from other people's cigarettes, pipes, or cigars also causes lung cancer.
- Radon gas Exposure:
- Coming in Contact with asbestos and other harmful chemicals: The other main causes of lung cancer are breathing industrial chemicals such as asbestos, arsenic and polycyclic hydrocarbons.

Causes of Colorectal Cancer

- Stress
- Unhealthy Eating habit
- Genetics
- Inflammatory Bowel disease

Causes of Cervical Cancer

- Papilloma Virus: most Cases of Cervical Cancer are recorded due to infection to Human Papilloma Virus.
- Smoke.
- Food & eating habits.
- Consuming Oral Contraceptives

Source: cancerindia.org.in/common-cancers

Prevention

Cervical Cancer

Primary Prevention: It is designed to prevent the disease from occurring in the first place.

- Adopt **safe sex practices** (avoid multiple sexual partners).
- Use of male condoms as **barrier contraceptives** to reduce the risk of HPV infection.
- Timely treatment of **reproductive tract infections**.
- There is evidence that **circumcision** for men may reduce the incidence of infection among sexual partners.
- **HPV vaccination:** Prophylactic vaccines for cervical cancer target HPV 16 and 18, the most common oncogenic types of HPV responsible for cervical cancer. HPV vaccination

is not effective against all oncogenic HPV types. Currently two vaccines, licensed globally are available in India; a quadrivalent vaccine (against HPV genotypes 6, 11, 16, 18) and a bivalent vaccine (against HPV genotypes 16, 18). to the HPV infection are likely to benefit more from the vaccine.

Indian Academy of Pediatrics (IAP) recommendations on HPV vaccination:

- Only 2 doses of either of the two HPV vaccines for adolescent/pre-adolescent girls aged 9-14 years
- For girls 15 years and older, and immune-compromised individuals 3 doses are recommended
- For two-dose schedule, the minimum interval between doses should be 6 months.
- For 3 dose schedule, the doses can be administered at 0, 1-2 (depending on brands) and 6 months

Breast Cancer

1. Prevention By Genetic Testing

If you have a history of breast cancer in the family (either mother, sister or daughter with breast cancer), you can have genetic testing for the presence of BRCA1 and BRCA2 gene mutations. However, having a copy of mutated gene does not mean that you will certainly get breast cancer. If the genetic tests are positive, you may require genetic counseling and advice by your attending surgeon.

2. Prevention by changing lifestyle-related risk factors

- maintaining correct body weight
- exercising regularly
- avoiding smoke and excessive alcohol
- breastfeeding

- avoiding unnecessary radiation exposure.

Source: cancerindia.org.in/common-cancers/

Lung Cancer

Prevention of Lung Cancer

There is no proven way to completely prevent lung cancer, but there are steps to lower the risk of getting lung cancer. You can help lower your risk of getting lung cancer in the following ways:

1. Not Smoking: The best way to prevent lung cancer is to not smoke. People who have never smoked have the lowest risk of lung cancer.

2. Quitting Smoking.

3. Avoid second hand smoke.

4. Lower your exposure to radon.

5. Lower exposure to workplace risk factors.

The following help in reducing the risk of cancer in general, not specifically for lung cancer:

- Diet rich in fruits and vegetables
- Regular physical activity

Statistics of disease pattern in India for Oncology

Population in 2012: 1258.3m

People newly diagnosed with cancer (excluding NMSC) / yr: 1,014,900

Age-standardised rate, incidence per 100,000 people/yr: 94.0

Risk of getting cancer before age 75: 10.1%

People dying from cancer /yr:682,800

Data from **Source:** IARC GlobalCan (2012)

Cervical cancer is less common in Muslim than in Hindu women.

(The study also shows mortality deaths were higher in Hindu women than in Muslim women and experts feel this is because of circumcision among Muslim men, which reduces the sexual transmission of human papillomavirus. “Studies have proved that circumcision reduces the risk of transfer of HIV virus,”)

Cervical cancer is the third largest cause of cancer mortality in India accounting for nearly 10% of all cancer related deaths in the country.

When broken down by cancer type we see that globally breast cancer is the most prevalent form, followed by colon & rectum, and prostate cancer. Across most countries these are the top three cancer forms, however they tend to vary in their ranking across the world

Survival rate

The relative five year survival averages to 48.7%.

Length of survival depends on the cancer stage at the time of diagnosis.

The survival chance of a person becomes better if the cervical cancer is diagnosed and treated at earlier stages. Therefore it is important to avail of cervical cancer screening.

Breast cancer

It is the most common cancer in women in India and accounts for 27% of all cancers in women.

The incidence rates in India begin to rise in the early thirties and peak at ages 50-64 years .

Overall, 1 in 28 women is likely to develop breast cancer during her lifetime.

In urban areas, 1 in 22 women develops breast cancer during her lifetime as compared to rural areas where 1 in 60 women develops breast cancer in her lifetime.

For more information, refer to this document (Source: National Cancer Registry Programme).

Oral Cancer

Oral cancer is the most common cancer in India amongst men (11.28% of all cancers), fifth most frequently occurring cancer amongst women (4.3% of all cancers) and the third most frequently occurring cancer in India amongst both men and women.

New cases registered: 77,003

Deaths: 52,067

Around 80% of oral cancers are directly attributable to tobacco use.

The mean age of oral cancer is 50 years.

The rates for oral cancer among males are significantly higher than females and these rates increase with age.

Survival rate (5-year).

Patients with early stage oral cancer: 82%

Patients with advanced stages: 27%

Anastrozole				
Brand Name	Lead Manufacturer	Dose	MRP	Form
Altroz	Alkem	1mg	810	Tablet
Altrol	Taj Pharma	1mg	722.82	Tablet
Anabrez	Sun Pharma	1mg	263.75	Tablet
Brand Name	Lead Manufacturer	Dose	MRP	Form
Trozet	Dabur	2.5mg	428.96	Tablet
Oreta	Dr Reddy's	2.5mg	378	Tablet
Luprolide	Lupin	3.75mg	4000	Injection
Fempro	Cipla	2.5mg	60	Tablet

Molecules available for breast cancer treatment in India-

Bevacizumab				
Brand Name	Lead	Dose	MRP	Form
	Manufacturer			
Bevatas	Intas Pharmaceutical	100mg	₹ 25,990.00	Injection
Bevazza	Lupin Ltd	100mg	₹ 21,993.00	Injection
Zybev	Zydus Cadila	100mg	₹ 27,000.00	Injection
Advamab	Alkem Laboratories	100mg	₹ 27,428.00	Injection

Objectives

- To study the Market Potential of Oncology drugs in India.
- To study the domestic oncology market.
- To find out the geographic wise cancer pattern in India.
- To identify current trends in growth of Oncology drugs in India.

Rationale

Cancer mortality cases are increasing year by year in India, thereby creating a challenge for health services in India to combat with it. India lags behind in providing better infrastructure and health services to cancer patients. The disparity in availability of oncology therapies becomes more severe over a 10-year period (2006-2016), with not even one-third of the 270-odd oncology-molecules being available in India, a country with over 10 million cancer patients, According to a data by QuintilesIMS, a technology-driven healthcare service provider shows.

Figure 1 Top 10 Therapeutic Categories Based Upon Their Market Share.

S.No.	MOLECULE	THERAPEUTIC CATEGORY	TSA MAT VALUE 2018(in Cr.)	TSA MAT VALUE 2019(in Cr.)	MARKET SHARE
1	TRASTUZUMAB L1X10	ALL OTHER ANTINEOPLASTICS	126.0	150.7	6.0%
2	PACLITAXEL L1C8	VINCA ALKALOIDS AND OTHER PLANT PRODUCTS	149.4	133.4	5.3%
3	GEFITINIB L1X15	ALL OTHER ANTINEOPLASTICS	163.1	129.3	5.2%
4	IMATINIB MESYLATE L1X16	ALL OTHER ANTINEOPLASTICS	134.2	119.6	4.8%
5	ERLOTINIB L1X30	ALL OTHER ANTINEOPLASTICS	102.3	111.4	4.5%
6	RITUXIMAB L1X9	ALL OTHER ANTINEOPLASTICS	97.1	110.1	4.4%
7	MYCOPHENOLATE MOFETIL L4A6	IMMUNOSUPPRESSIVE AGENTS	105.2	98.2	3.9%
8	FILGRASTIM L3A2	IMMUNOSTIMULATING AGENTS EXCLUDING INTERFERONS	128.0	95.0	3.8%
9	LENALIDOMIDE L1X48	ALL OTHER ANTINEOPLASTICS	61.8	85.8	3.4%
10	ABIRATERONE ACETATE L1X43	ALL OTHER ANTINEOPLASTICS	44.2	81.1	3.2%

Figure 2 Top 10 Brands in Anti-Cancer Segment based on their market share.

S.NO	BRAND	SUBGROUP	TSA MAT Value May 2018 (in Cr.)	TSA MAT Value May 2019 (in Cr.)	Growth (in %)	MARKET SHARE
1.	GEFTINAT	GEFITINIB L1X15	146.5	118.5	-19.1	4.7%
2.	ERLONAT	ERLOTINIB L1X30	94.9	101.4	6.8	4.1%
3.	VEENAT	IMATINIB MESYLATE L1X16	103.7	88.6	-14.6	3.6%
4.	LENALID	LENALIDOMIDE L1X48	40.9	76.9	87.8	3.1%
5.	VIVITRA	TRASTUZUMAB L1X10	67.2	63.3	-5.8	2.5%
6.	FOLITRAX	METHOTREXATE	42.2	47.4	12.5	1.9%

		L1B1				
7.	SORAFENAT	SORAFENIB L1X40	43.3	46.2	6.7	1.8%
8.	CANMAB	TRASTUZUMAB L1X10	29.4	43.0	46.2	1.7%
9.	REDITUX	RITUXIMAB L1X9	49.9	39.2	-21.3	1.6%
10.	ABIRAPRO	ABIRATERONE ACETATE L1X43	21.5	38.9	80.7	1.6%

Figure 3Top 10 Companies in Anti-cancer Segment based on their Market Share.

S.No.	CORPORATE	MAT VALUE (in Cr.) MAY 18	MAT VALUE (in Cr.) MAY 19	GROWTH (%)	MARKET SHARE
1	NATCO PHARMA LTD	478.7	510.7	6.7	20.5%
2	ZYDUS + BIOCHEM	344.3	332.0	-3.6	13.3%
3	DR. REDDYS LABORATORIES LTD	353.2	213.9	-39.4	8.6%
4	INTAS PHARMACEUTICALS LTD	145.1	181.9	25.4	7.3%
5	PFIZER + WYETH	54.9	107.1	94.9	4.3%
6	PANACEA BIOTEC LTD	120.2	102.3	-14.9	4.1%
7	EMCURE + ZUVENTUS	130.7	92.7	-29.1	3.7%
8	SUN + RANBAXY	60.4	92.1	52.5	3.7%
9	FRESENIUS KABI INDIA PVT LTD	106.2	89.7	-15.5	3.6%
10	HETERO HEALTHCARE LTD	25.8	89.3	246.3	3.6%
	Grand Total	2389.6	2496.2	4.5	100.0%

Figure 4List of Top 18 Potential Molecules based upon Competition.

S. N o.	Molecule	No. of Brands	MAT Value(in Cr.) May 2018	MAT Value(in Cr.) May 2019	Gr. %	MAT unit (in Th.) 2017	MAT unit(in Th.) 2018	Gr. %
1	SORAFENIB	3	56.0	53.7	-4.1	128.9	91.5	-29.0
2	REGORAFENIB	2	16.7	45.5	172.4	4.6	14.5	212.3
3	ANTITHYMOCYTE IMMUNOGLOBULINS	3	17.0	29.6	74.6	16.1	22.4	38.9
4	TRIPTORELIN	3	18.5	23.0	24.5	94.0	117.9	25.4
5	PALBOCICLIB	1	0.3	21.6	8178.6	0.08	3.2	8730.6
6	CRIZOTINIB	1	6.9	19.3	178.9	0.9	2.8	196.8
7	CETUXIMAB	1	4.4	17.0	286.7	2.9	11.4	293.6
8	FOSFESTROL	2	17.1	16.9	-1.2	846.1	804.8	-4.9
9	PAZOPANIB	1	4.3	16.9	292.7	3.8	13.0	242.3

10	SUNITINIB	2	6.4	16.3	154.7	2.4	7.1	193.4
11	INTERFERONS BETA	3	4.6	14.5	217.2	3.0	4.3	44.8
12	POMALIDOMIDE	5	0.0	13.3	#DIV/0!	0.0	15.1	#DIV/0!
13	PEGYLATED INTERFERON ALPHA 2B	4	15.6	12.4	-20.7	14.4	10.1	-30.3
14	NIMOTUZUMAB	2	10.2	9.7	-5.0	2.4	2.3	-5.3

		SUBSTITUTED								
S.No.		SUBGROUP		MAT Value MAY 18 (in Cr.)	MAT Value MAY 19 (in Cr.)	GR OW TH(%)	MAT UNIT(in Thousan ds) MAY 17	MAT UNIT(in Thousand s) MAY 18	GRO WTH (%)	
1.		GEFITINIB LIX15	Total	163.1	129.3	-20.7	394.0	317.2		-19.5
218		PENCICUMAB L1C8	Total	139.4	133.4	11.6	351.9	305.6	5116.7	1.3

	Total						
3.	IMATINIB MESYLATE L1X16 Total	134.2	119.6	-10.9	984.9	811.8	-17.6
4.	MYCOPHENOLATE MOFETIL L4A6 Total	105.2	98.2	-6.7	1867.0	1758.2	-5.8
5.	ERLOTINIB L1X30 Total	102.3	111.4	8.9	113.5	123.9	9.2
6.	DOCETAXEL L1C11 Total	70.9	45.0	-36.4	98.4	72.3	-26.5
7.	BORTEZOMIB L1X23 Total	64.8	50.5	-22.1	67.9	54.8	-19.3
8.	LENALIDOMIDE L1X48 Total	61.8	85.8	38.9	144.1	151.6	5.2
9.	METHOTREXATE L1B1 Total	58.5	59.8	2.1	8007.9	7923.1	-1.1
10.	SORAFENIB L1X40 Total	56.0	53.7	-4.1	128.9	91.5	-29.0
11.	CAPECITABINE L1B2 Total	53.7	42.7	-20.6	443.1	436.9	-1.4
12.	TEMOZOLOMIDE L1A24 Total	52.8	24.4	-53.7	94.6	48.5	-48.7
13.	TACROLIMUS L4A7 Total	51.1	55.4	8.3	1995.2	1964.1	-1.6
14.	GEMCITABINE L1B10 Total	40.0	40.8	2.0	169.1	179.7	6.3
15.	PEMETREXED L1B11 Total	36.5	51.4	40.8	48.0	64.7	34.7
16.	OXALIPLATIN L1X4 Total	34.7	27.3	-21.4	88.0	79.5	-9.6
17.	CARBOPLATIN L1X2 Total	34.6	36.5	5.5	327.3	361.6	10.5
18.	AZATHIOPRINE L4A3 Total	33.1	34.4	4.0	4426.3	4639.6	4.8
19.	CYCLOSPORIN L4A4 Total	33.0	41.2	24.8	1255.3	1608.2	28.1
20.	LETROZOLE L2B12 Total	30.1	67.0	122.4	2203.3	5411.0	145.6

Figure 5Top 20 Small Molecules (excluding biologics) based upon revenue.

Results and Findings-

1. Top 10 brands account for **27 %** of market share in oncology segment.
2. Top 10 companies contribute**72.70 %** of Total oncology market.

3. **Anti-Neoplastics, Vinca alkaloids and Plant products, and Immunosuppressive and Immunostimulating agents** contribute for 45 % of Revenue in Oncology market.
4. The main therapeutic categories which account for oncology sales are **Anti-Neoplastics, Vinca alkaloids and Plant products, and Immunosuppressive and Immunostimulating agents**.
5. **Haryana** records highest cases of Cancer in India.
6. **Small molecules** (Chemotherapeutic drugs) have high revenue, as compared to biologics(Monoclonal Antibodies)
7. Potential segment areas in cancer are **Lung Cancer, Oral Cavity, Cervix Cancer & Breast Cancer**.

Figure 6- Growth in Biosimilars

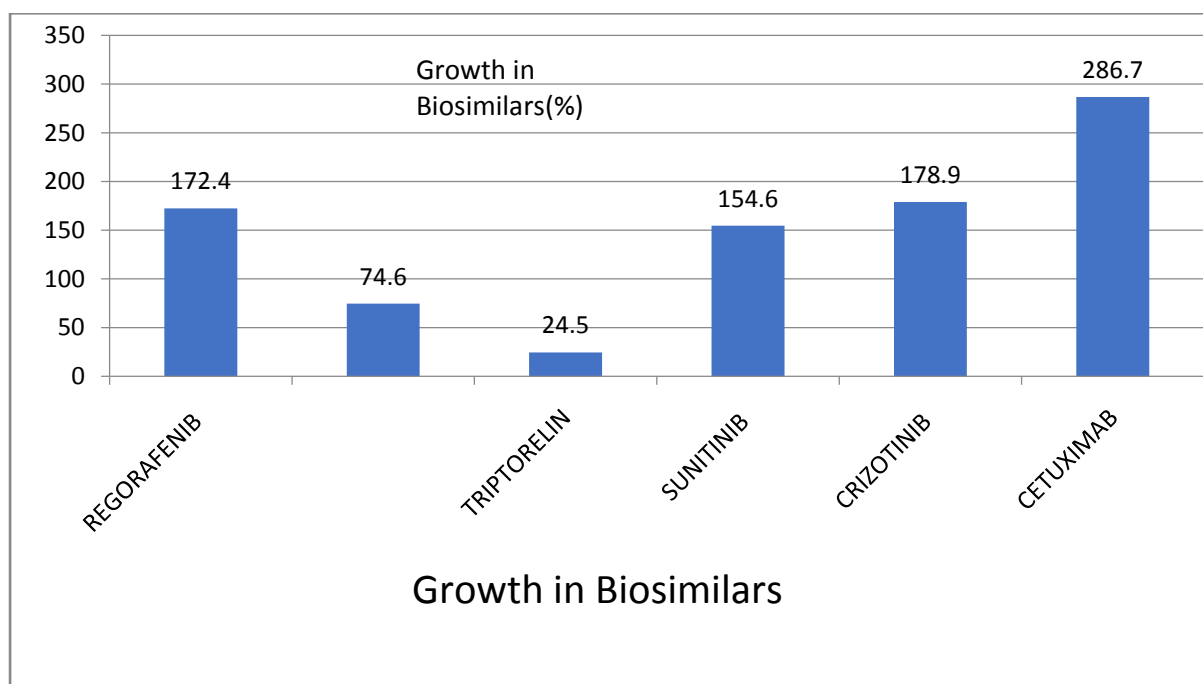


Figure 7 Growth of Chemotherapeutic Molecules

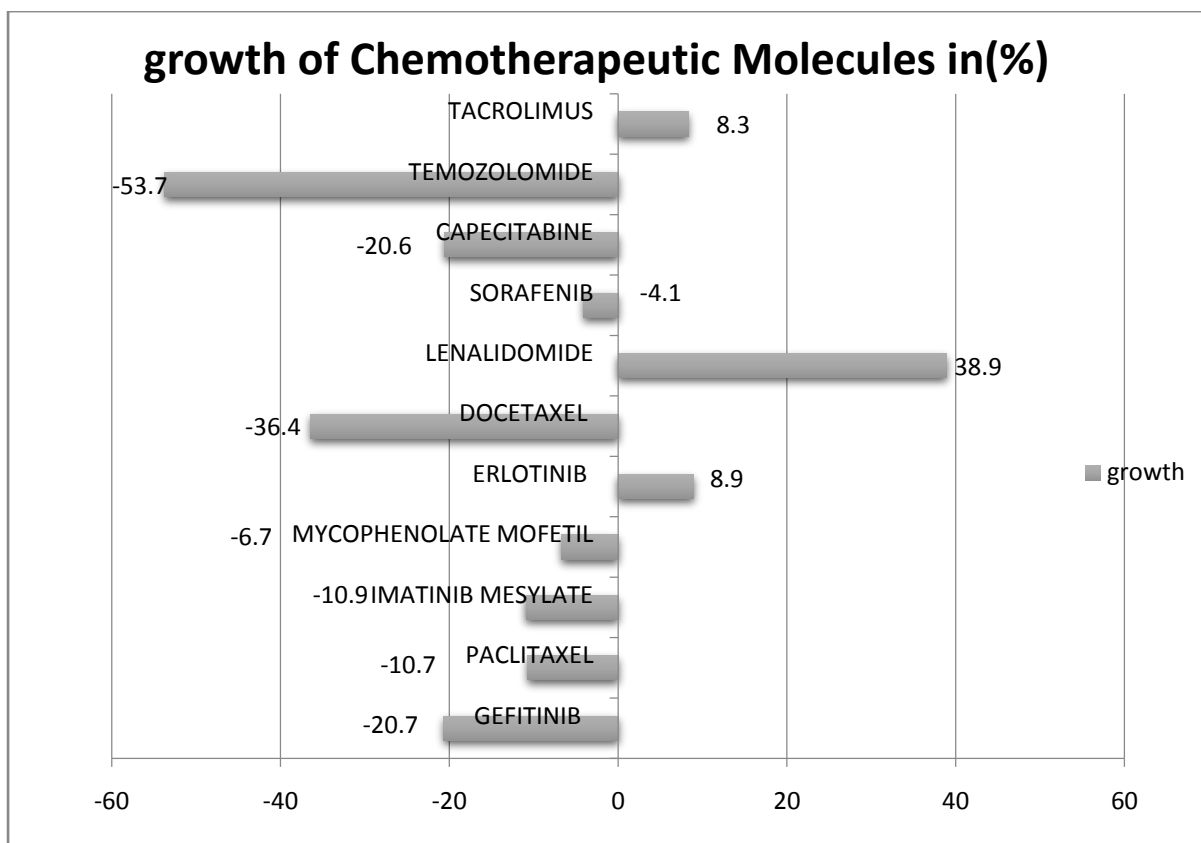


Figure 8- Methotrexate four Year Sales

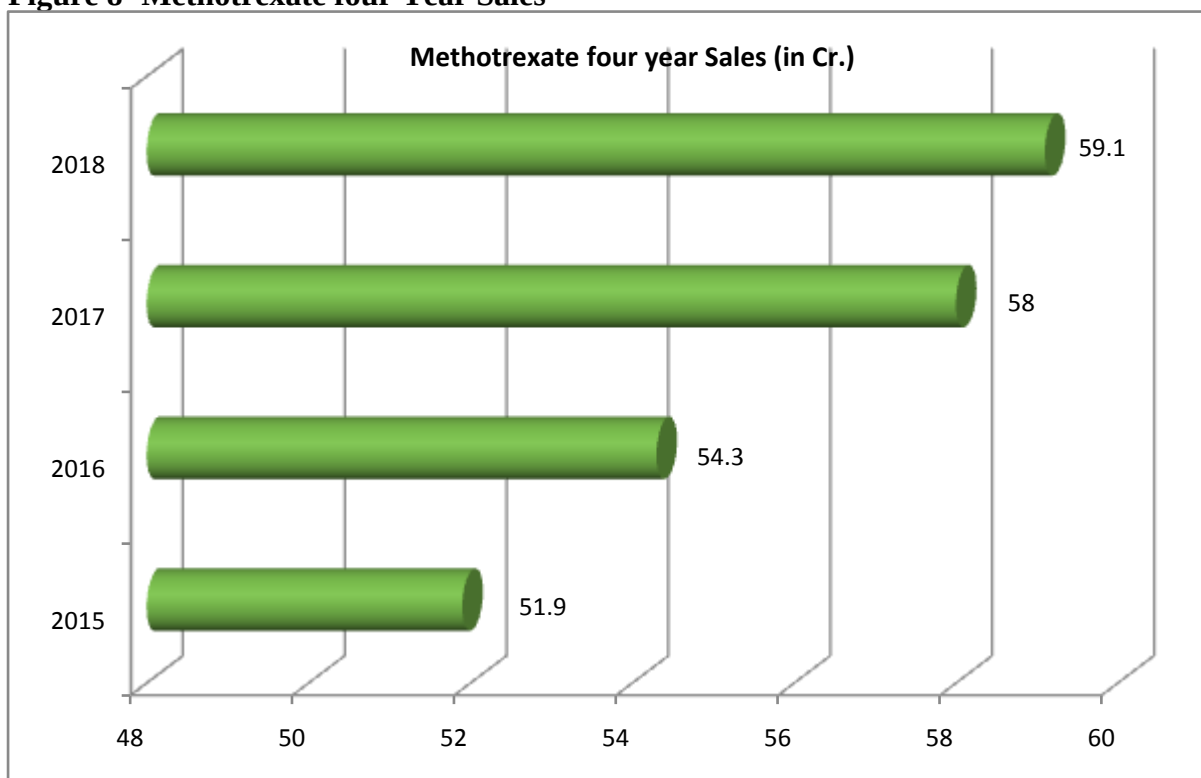


Figure 9- Four year Total Sales in Indian Oncology Market

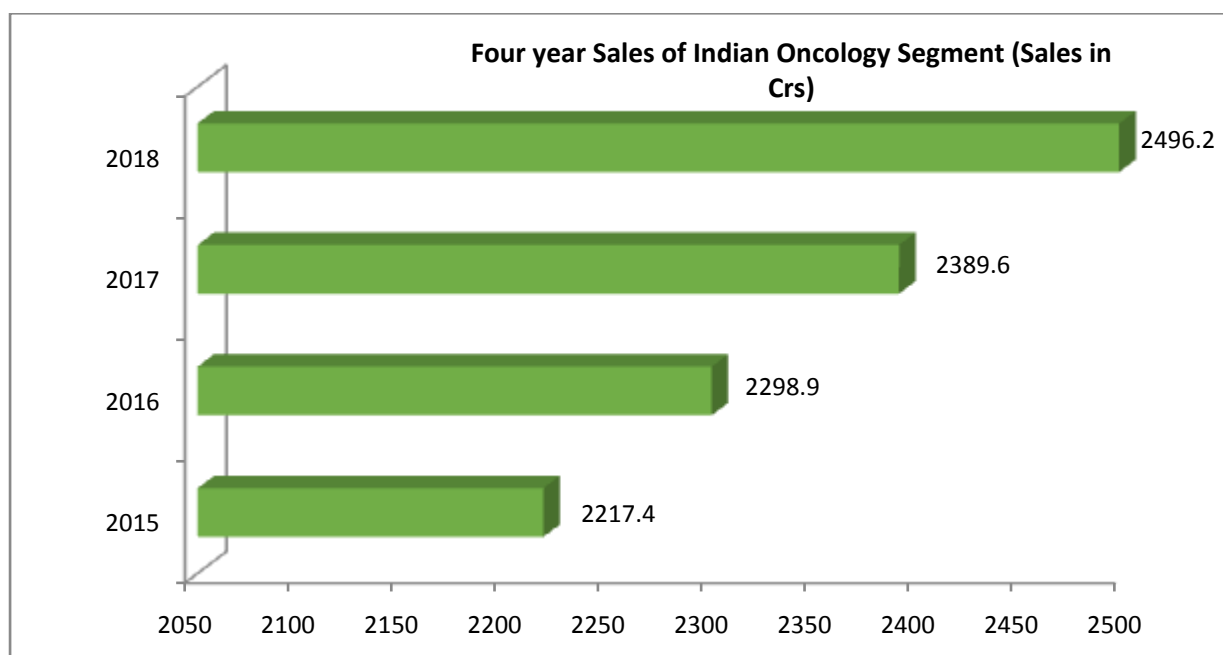


Figure 10- growth of Indian Oncology Market over Four years

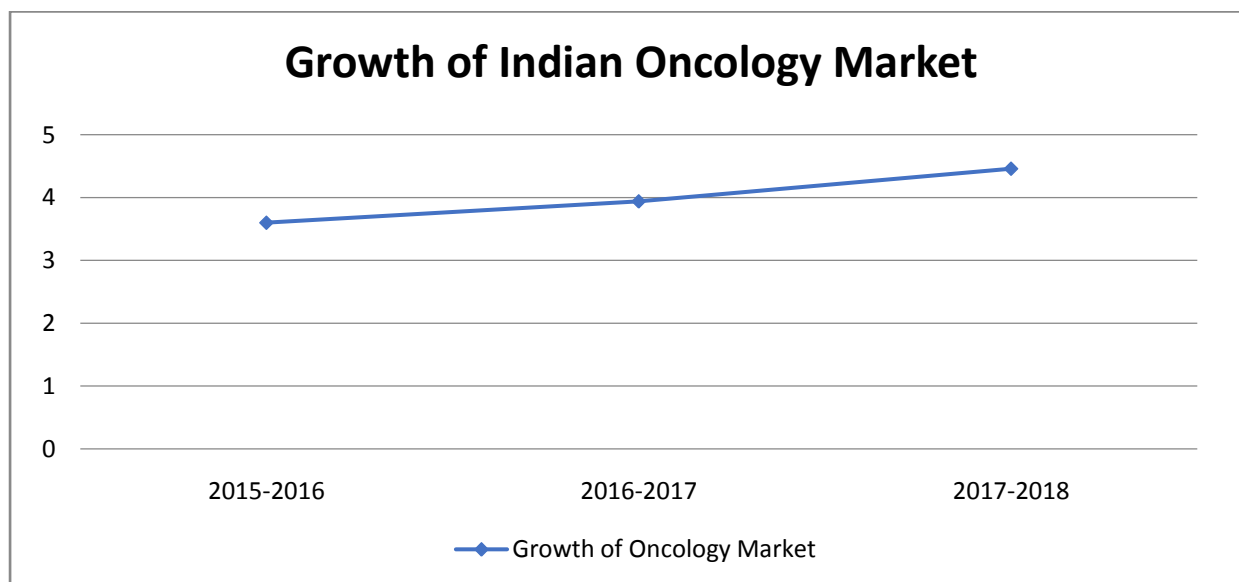


Figure 11- Market Share of top ten oncology companies in Indian Pharmaceutical Industry

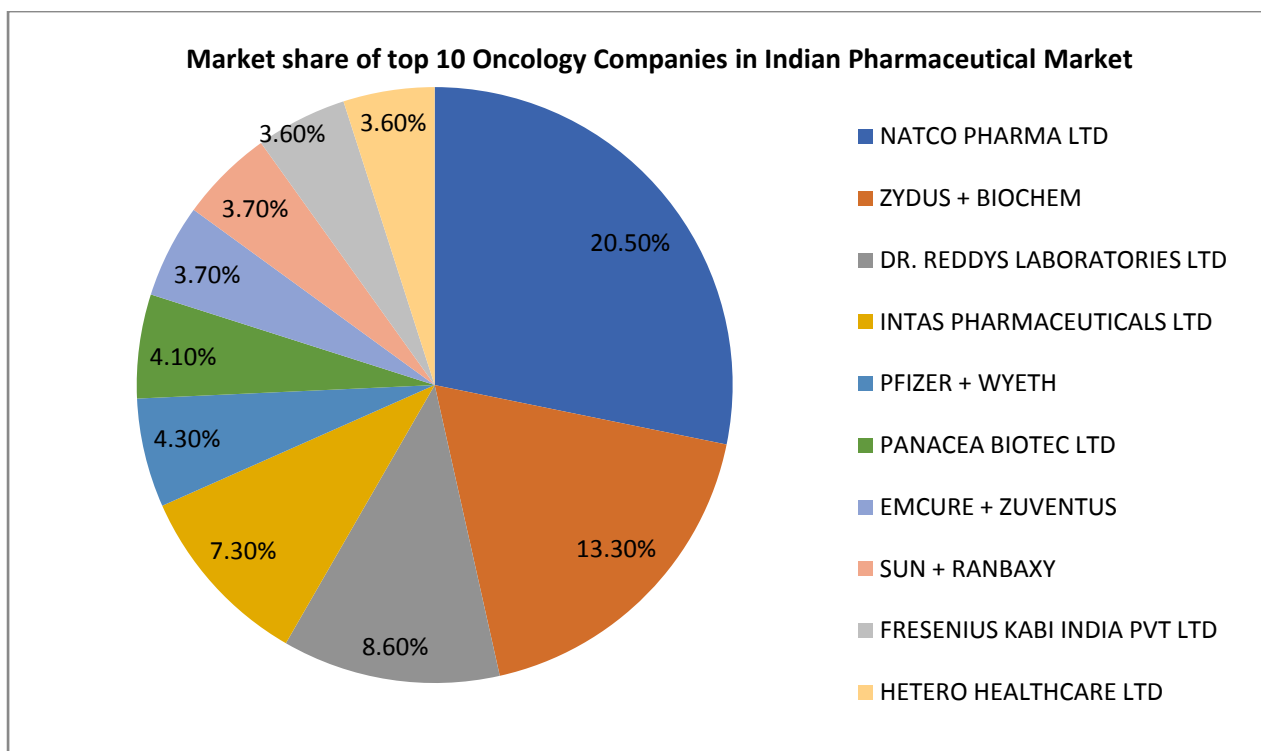
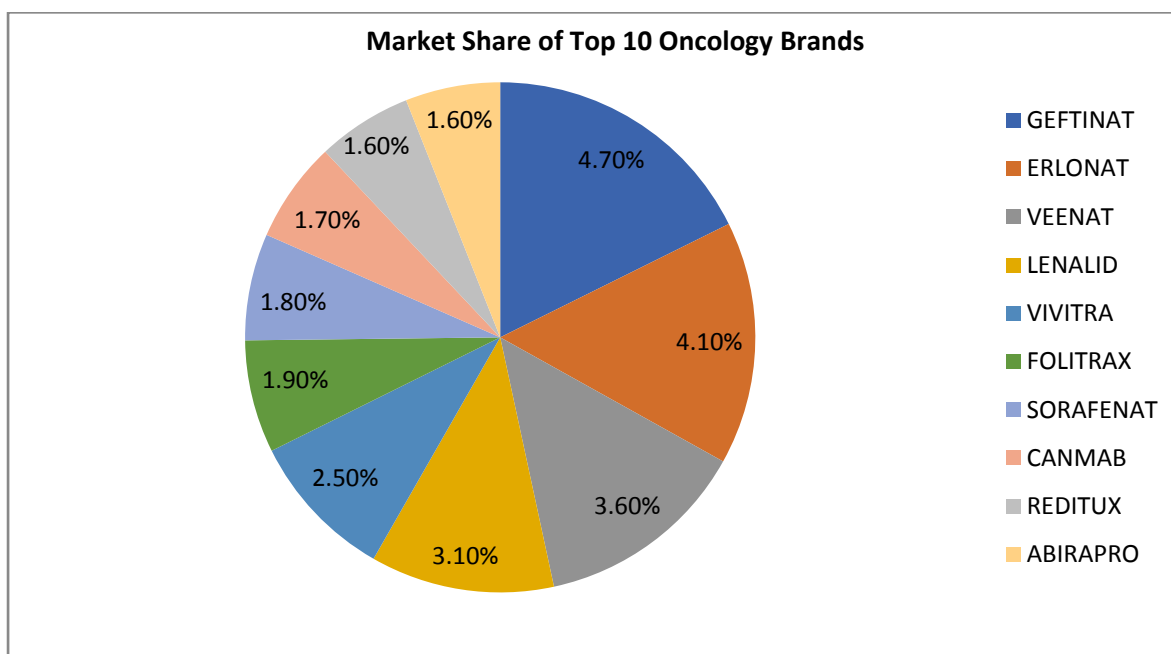


Figure 12- Market Share of top 10 Oncology Brands



Conclusion

Oncology is the growing market in Indian Pharmaceutical Industry despite Its low growth rate indicating higher costs of medicines is incurred for patients.

The growth in Oncology has shifted from Chemotherapeutic drugs to Monoclonal Antibodies(MAB)as Sales of MABs is growing at much faster rate than the Chemotherapeutic drugs.

Value Growth of Oncology Market for a year from 2018 to 2019 - **4.5 %**.

Total Units Sold in May 2018- **33,689 (in Thousand)**.

Total Units Sold in May 2019- **30,135 (in Thousand)**.

Unit Growth of Oncology Market- **11.79 %**.

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