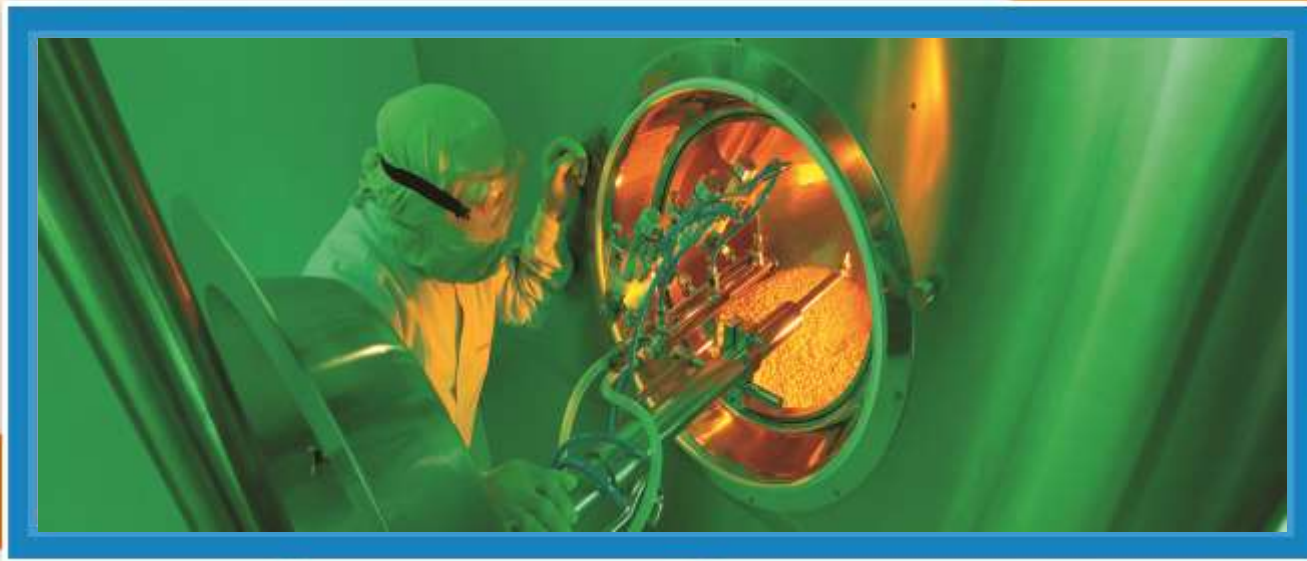


PHARMACEUTICALS



MARCH 2017

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CONTENTS

- ❖ [Executive Summary.....3](#)
- ❖ [Advantage India.....4](#)
- ❖ [Market Overview and Trends.....6](#)
- ❖ [Porter's Five Forces Analysis.....19](#)
- ❖ [Strategies Adopted.....21](#)
- ❖ [Growth Drivers.....24](#)
- ❖ [Opportunities.....38](#)
- ❖ [Success Stories..... 41](#)
- ❖ [Useful Information..... 50](#)



EXECUTIVE SUMMARY

Leading pharma producer

- Indian pharmaceutical sector accounts for about 2.4 per cent of the global pharmaceutical industry in value terms and 10 per cent in volume terms

One of the highest exports

- India accounts for 20 per cent of global exports in generics. In FY16, India exported pharmaceutical products worth USD16.89 billion, with the number expected to reach USD40 billion by 2020

Among fastest growing industries

- The country's pharmaceutical industry is expected to expand at a CAGR of 12.89 per cent over 2015–20 to reach USD55 billion

Rapidly growing healthcare sector

- Indian healthcare sector, one of the fastest growing sectors, is expected to advance at a CAGR of 17 per cent to reach USD250 billion over 2008–20

Growing generics market

- The generics market stood at USD26.1 billion in 2016 from USD21 billion in 2015. India's generics market has immense potential for growth

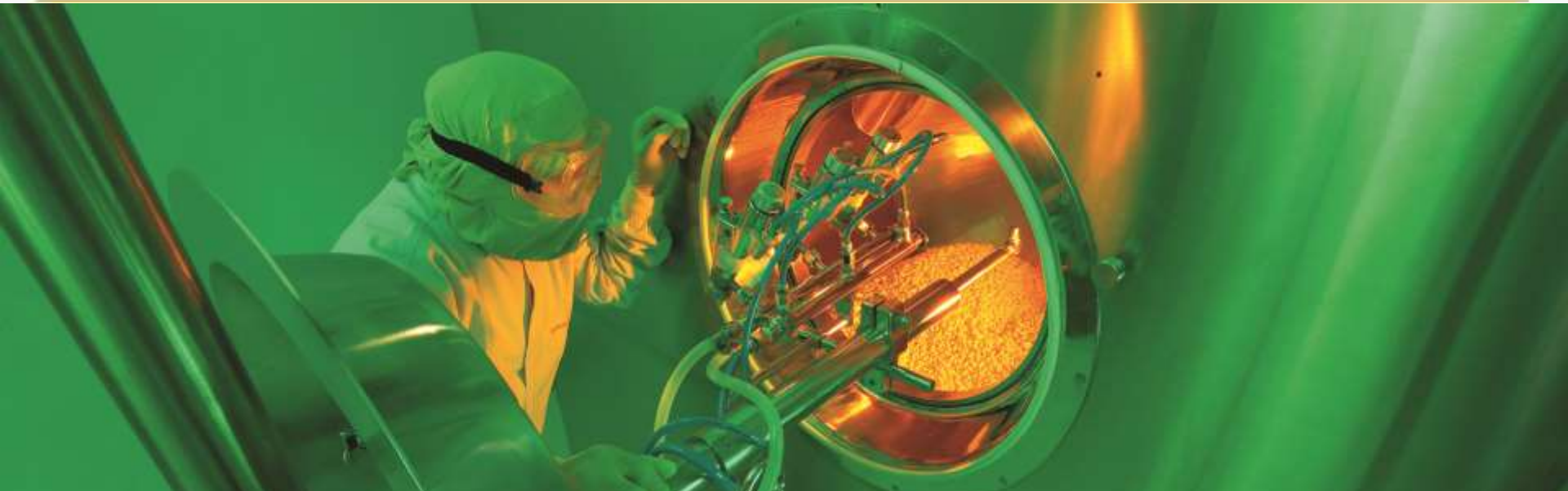
Ranked 4th in terms of attracting FDI

- Pharmaceutical sector in India attracted 4.48 per cent of the total FDIs into India from April 2000 to December 2016
- Cumulative FDI inflows worth USD14.53 billion were made during April 2000 to December 2016

Source: India Biz, PWC, Department of Industrial Policy and Promotion, Deloitte, PharmaBiz, Frost and Sullivan Report on Indian Pharmaceutical Market, McKinsey, TechSci Research

Notes: API - Active Pharmaceutical Ingredient, USFDA - United States Food and Drug Administration, CAGR - Compound Annual Growth Rate

PHARMACEUTICALS



ADVANTAGE INDIA

2016

Market size:
USD36.7 billion

Cost efficiency

- Low cost of production and R&D boosts efficiency of Indian pharma companies
- India's cost of production is approximately 60 per cent lower than that of the US & almost half of that of Europe
- Due to lower cost of treatment, India is emerging as a leading destination for medical tourism
- As of February 2017, India's ability to manufacture high quality, low priced medicines, presents a huge business opportunity for the domestic industry.

Economic drivers

- Economic prosperity to improve drug affordability
- Increasing penetration of health insurance
- With increasing penetration of chemists, especially in rural India, OTC drugs will be readily available

2020F

Market size:
USD55 billion

Advantage India

Diversified portfolio

- Accounts for over 10 per cent of the global pharmaceutical production
- Over 60,000 generic brands across 60 therapeutic categories. Manufactures more than 500 different APIs
- 35.7 per cent of all drug master filings from India is registered in the USA in 2015

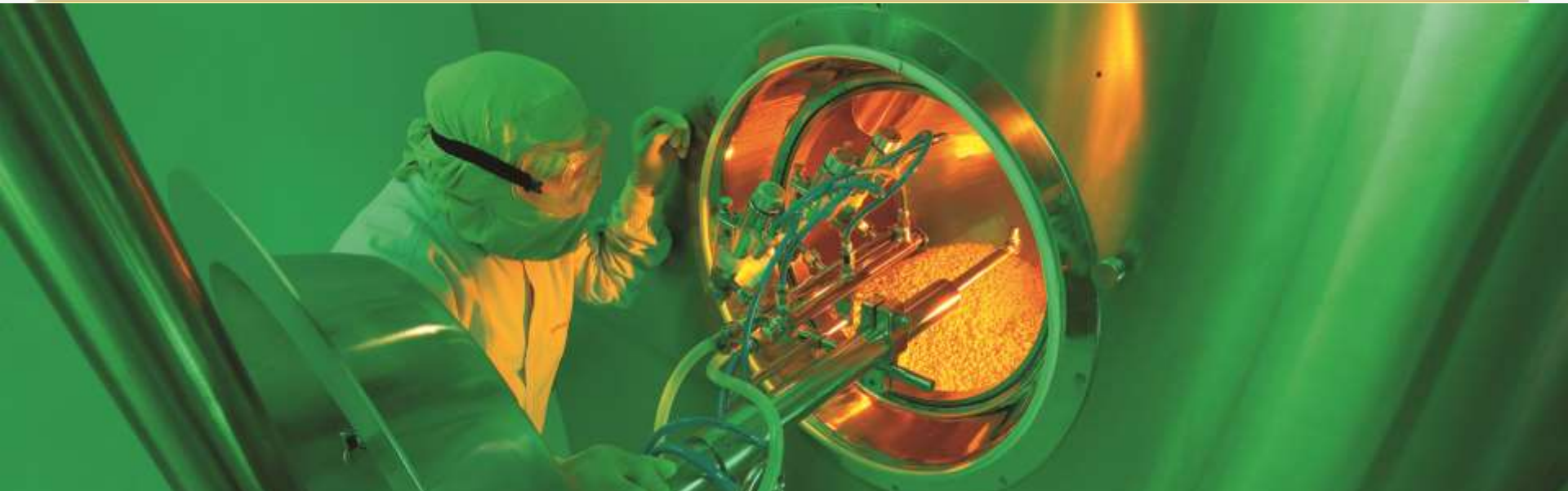
Policy support

- Government unveiled 'Pharma Vision 2020' aimed at making India a global leader in end-to-end drug manufacture
- Reduced approval time for new facilities to boost investments
- In this sector, 100 per cent FDI is allowed under automatic route

Source: PwC, McKinsey, Pharmaceuticals Exports Promotion Council of India, TechSci Research

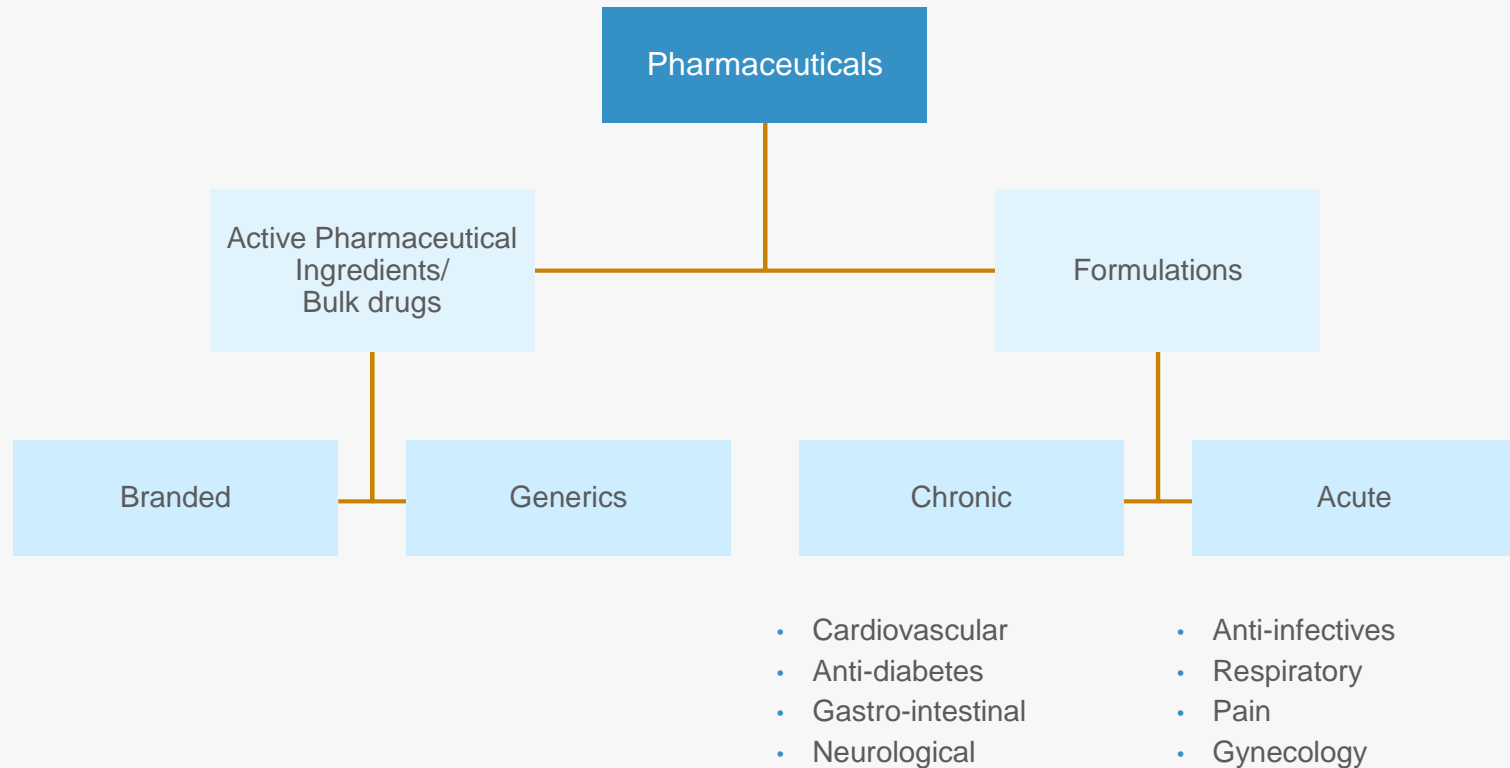
Notes: 2020 revenue forecasts are estimates of McKinsey, API - Active Pharmaceutical Ingredients, F - Forecast, OTC - Over-The-Counter

PHARMACEUTICALS



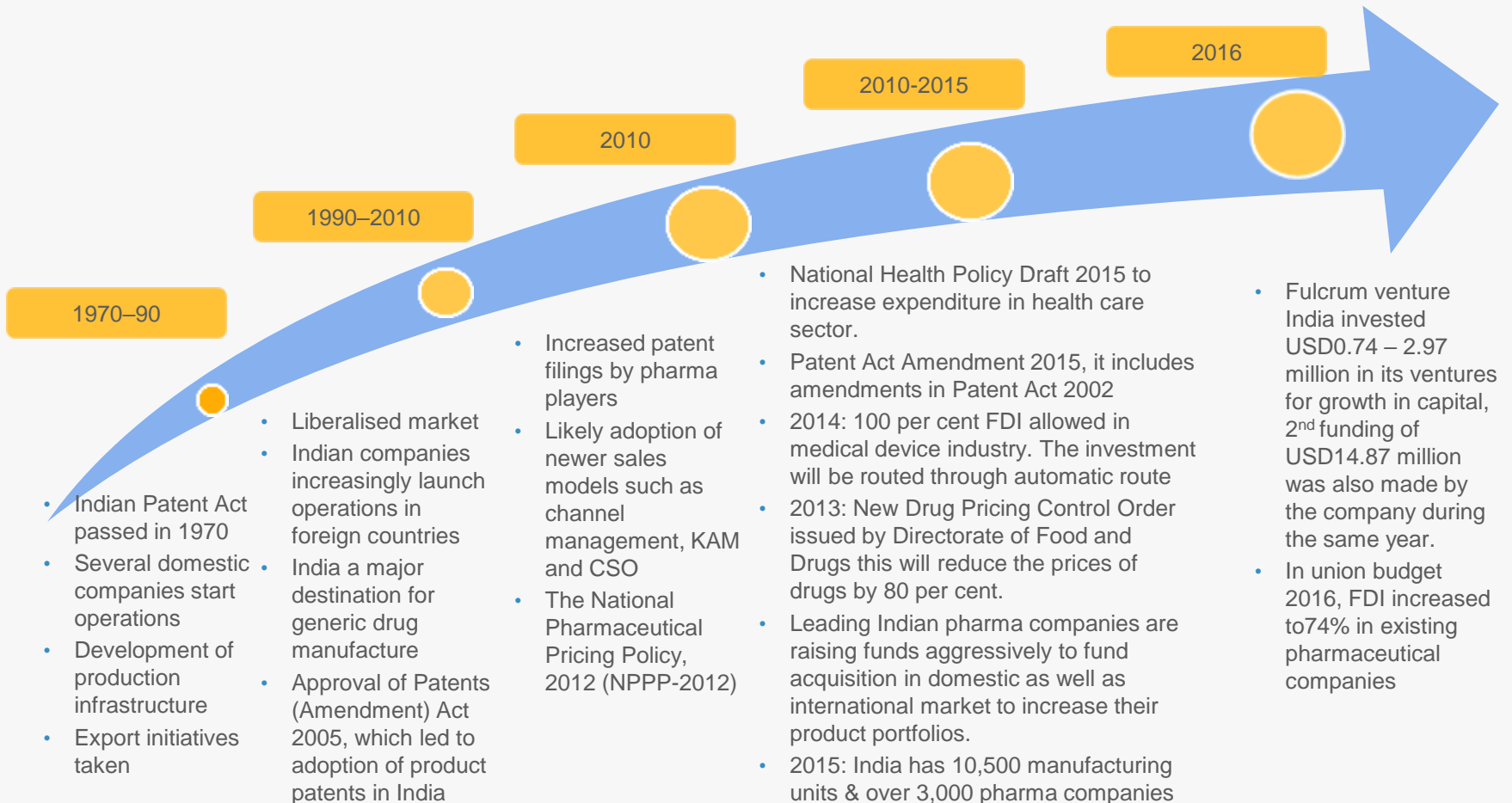
MARKET OVERVIEW AND TRENDS

STRUCTURE OF PHARMA SECTOR IN INDIA



Source: Dun & Bradstreet, TechSci Research

EVOLUTION OF INDIAN PHARMACEUTICAL SECTOR



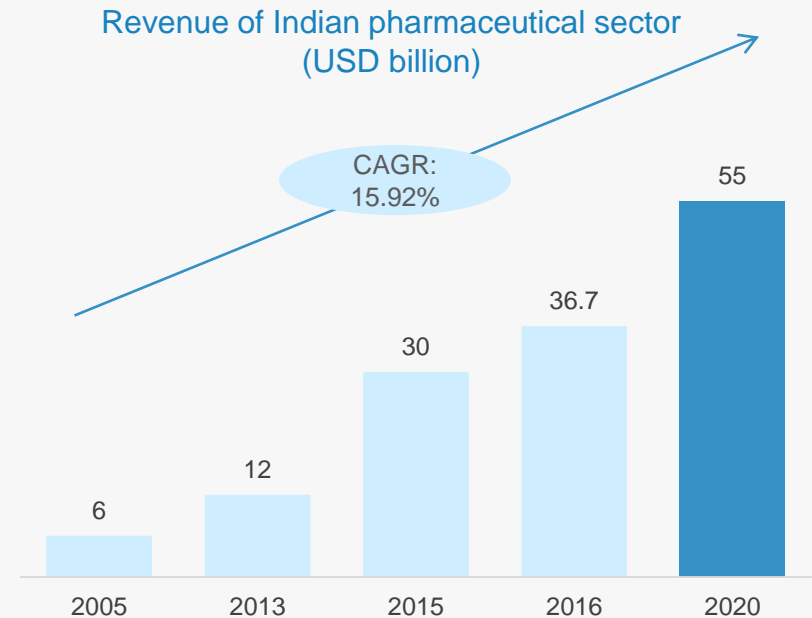
API IS THE LARGEST SEGMENT OF THE INDIAN PHARMACEUTICALS SECTOR



Source: BMI, Datamonitor, Kemwell Biopharma, Chemical Pharmaceutical Generic Association, ICRA Report estimates, TechSci Research, pharmanewspwire.com
Note: OTC - Over The Counter

INDIAN PHARMA SECTOR REVENUES TRENDING NORTH

- * The Indian pharmaceuticals market witnessed growth at a CAGR of 17.90 per cent, during 2005-16, with the market increasing from USD6 billion in 2005 to USD36.7 billion in 2016.
- * By 2020, India is likely to be among the top three pharmaceutical markets by incremental growth and sixth largest market globally in absolute size
- * India's cost of production is significantly lower than that of the US and almost half of that of Europe. It gives a competitive edge to India over others.
- * Increase in the size of middle class households coupled with the improvement in medical infrastructure and increase in the penetration of health insurance in the country will also influence in the growth of pharmaceuticals sector.



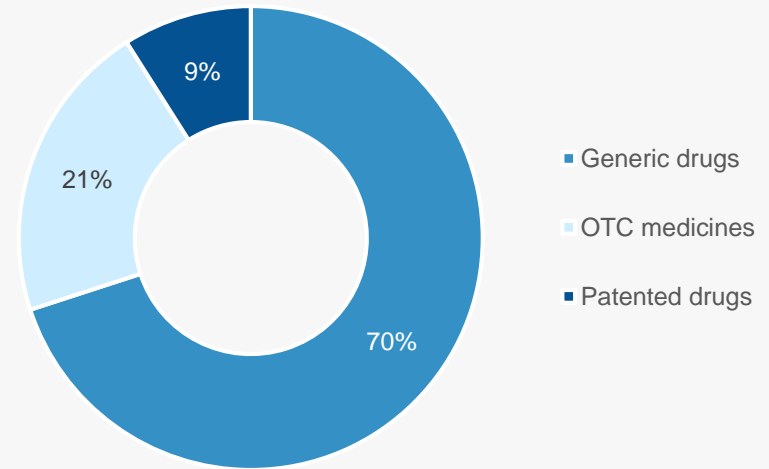
Source: Department of Pharmaceuticals, PwC, McKinsey, TechSci Research

Notes: F - Forecast, CAGR - Compound Annual Growth Rate

GENERIC DRUGS FORM THE LARGEST SEGMENT OF INDIAN PHARMA MARKET

- * With 70 per cent of market share (in terms of revenues), generic drugs form the largest segment of the Indian pharmaceutical sector
- * India supplies 20 per cent of global generic medicines market exports, in terms of volume, making the country the largest provider of generic medicines globally and expected to expand even further in coming years
- * Over the Counter (OTC) medicines and patented drugs constitute 21 per cent and 9 per cent, respectively, of total market revenues of USD20 billion

Revenue share of Indian pharmaceutical sub-segments in 2015 (%)

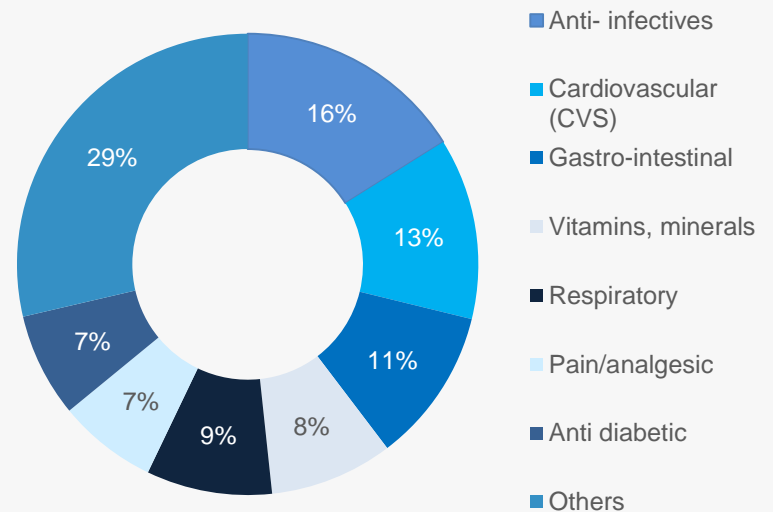


Source: Business Monitor International, FCCI Indian Pharma Summit 2014-15, TechSci Research

ANTI-INFECTIVE DRUGS LEAD THE PHARMA MARKET

- * Anti-infective drugs command the largest share (16 per cent) in the Indian pharma market
- * The cardiovascular segment represents 13 per cent of the market share; its contribution is likely to rise due to the growing number of cardiac cases in India
- * Gastro-intestinal contributes around 11 per cent of the total value of pharma industry in India. With increasing number of research in gastroenterology, segment is going to grow at significant pace in coming years
- * Top five segments contribute nearly 57 per cent to the total drugs consumption

Indian pharmaceutical market segments by value (FY15)

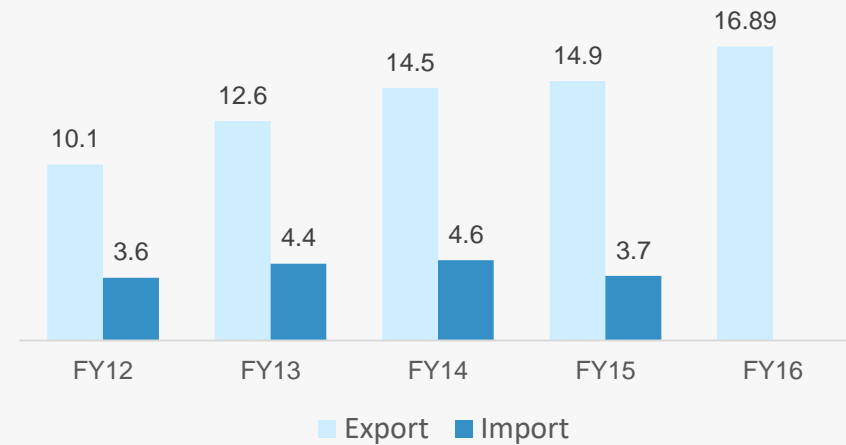


Source: All Indian Origin Chemists & Distributors, Department of Pharmaceuticals, TechSci Research

PHARMA EXPORT TO CONTINUE WITNESSING HIGH GROWTH

- * Indian pharma companies are capitalising on export opportunities in regulated and semi-regulated markets
- * In FY16, India exported pharmaceutical products worth USD16.89 billion, with the number expected to reach USD40 billion by 2020
- * Department of Pharmaceuticals targets to export USD18.02 billion worth of pharmaceuticals in 2016. Indian drugs are exported to more than 200 countries in the world, with the US as the key market
- * India is the world's largest provider of generic medicines; the country's generic drugs account for 20 per cent of global generic drug exports (in terms of volumes)

Trade data of Indian pharma sector (USD billion)

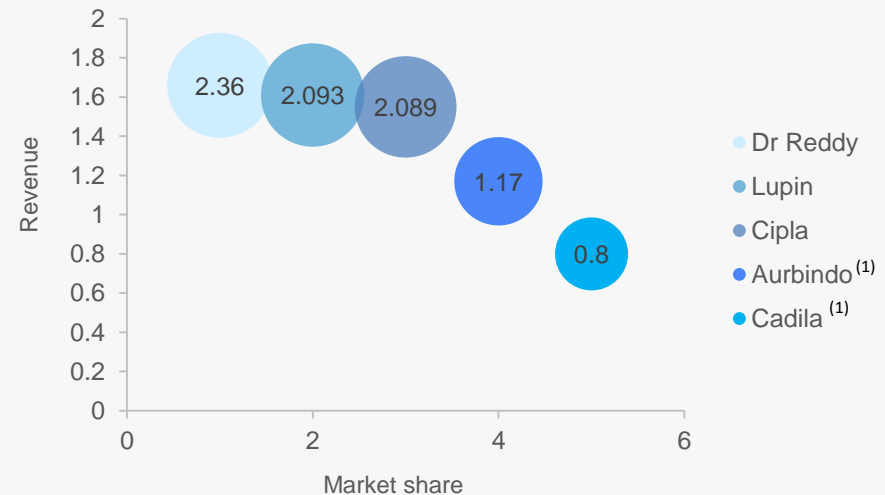


Source: Department of Commerce India, Department of Pharmaceuticals, India Business News, BMI, TechSci Research
Notes: CAGR - Compound Annual Growth Rate,
*Import - From April 2014 to Dec 2014
* Export - From April 2014 to Dec 2014

COMPETITIVE MARKET; TOP FOUR FIRMS ACCOUNT FOR OVER 20 PER CENT MARKET SHARE

- * Dr Reddy's accounted for the largest share in the Indian pharma market, with sales of USD2.36 billion during March 2016
- * Lupin had the 2nd largest share in the Indian pharma market with sales of USD2.09 billion in FY16
- * Cipla, with a revenue base of USD2.089 billion for March 2016 sales, ranked third in the market
- * Aurobindo ranked fourth in the market, with a revenue base of USD 1.17 billion for March 2015 sales
- * While these top four companies garnering 20 per cent market share, top 10 companies accounted for nearly 39 per cent of the market share in 2015

Market share, revenue, growth rates of leading companies (%), FY16



Note: The bubbles denote MAT March 2014 sales in USD million

Source: All Indian Origin Chemists & Distributors, Equity Master, BMI, TechSci Research

Notes: Market share is in terms of revenue,

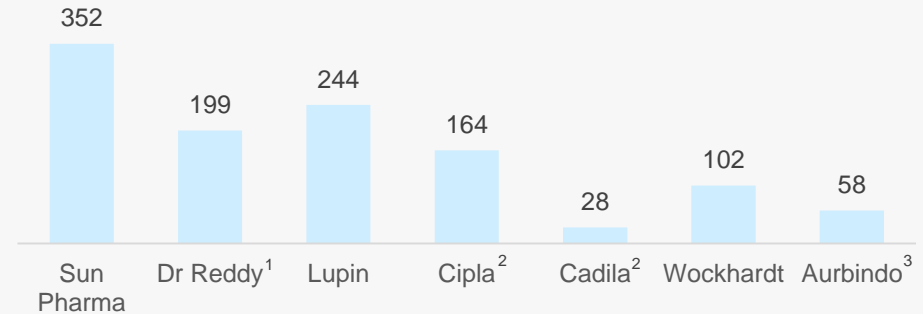
⁽¹⁾ Data is for March 2015

Market share is being calculated on the basis of FY15 revenue

PHARMA GIANTS RAISE THEIR R&D SPENDING

- * In FY16, highest expenditure on research and development has been done by Sun Pharma, followed by Dr. Reddy
- * Sun Pharma's R&D spending is 9.1 per cent of the total sales in the March quarter of FY16, which grew at a rate of 23 per cent YoY, in comparison with March quarter of FY15.
- * In FY17, Lupin's R&D spending is expected to be 12-15 per cent of sales, growing from 12 per cent in FY16

R&D spending by top six pharma giant FY16
(USD million)



Source: Company websites TechSci Research

Notes: R&D - Research and Development

¹ - Data is up to Dec 2015,

² - Data is up to September 2015,

³ - Data is for FY15

NOTABLE TRENDS IN THE INDIAN PHARMACEUTICALS SECTOR ... (1/2)

Research and development

- Indian pharma companies spend 8-11 per cent of their total turnover on R&D
- Expenditure on R&D is likely to increase due to the introduction of product patents; companies need to develop new drugs to boost sales

Export revenue

- India's pharmaceutical export market is thriving due to strong presence in the generics space
- Pharmaceuticals Exports Promotion Council expects pharma exports exceeded USD15 billion in 2015 and reached USD16.89 billion in 2016

Joint Ventures

- Multinational companies are collaborating with Indian pharma firms to develop new drugs\
- Cipla formed an exclusive partnership with Serum Institute of India to sell vaccines in South Africa
- Six leading pharmaceutical companies have formed an alliance 'LAZOR' to share their best practices, so as to improve efficiency and reduce operating costs

Expansion by Indian players abroad

- Cipla, the largest supplier of anti-malarial drugs to Africa, sets up a USD32 billion plant in Africa for the production of anti-retroviral and anti-malarial drugs

Source: TechSci Research
Note: R&D - Research and Development

NOTABLE TRENDS IN THE INDIAN PHARMACEUTICALS SECTOR ... (2/2)

PPP in R&D

- Indian Government invited multi-billion dollar investment with 50 per cent public funding through its public private partnership (PPP)
- As on January 2016, the total project cost of healthcare infrastructure project is USD151.91 million and there are five healthcare projects under PPP. Green Field Super Specialty Hospital (Bathinda), Green Field Super Specialty Hospital (Mohali), Indira Gandhi Government Medical College Complex (Maharashtra), Nephrology and Dialysis unit at Coronation Hospital (Uttarakhand), Nephrology Dialysis unit at Base Hospital (Uttarakhand)

Draft Patents (Amendment) Rules, 2015

- The time limit given for submitting the application for grant has been reduced to 4 months from 12 months, providing an extension of 2 months
- Necessary permissions to be taken from the concerned authority before the grant of patents

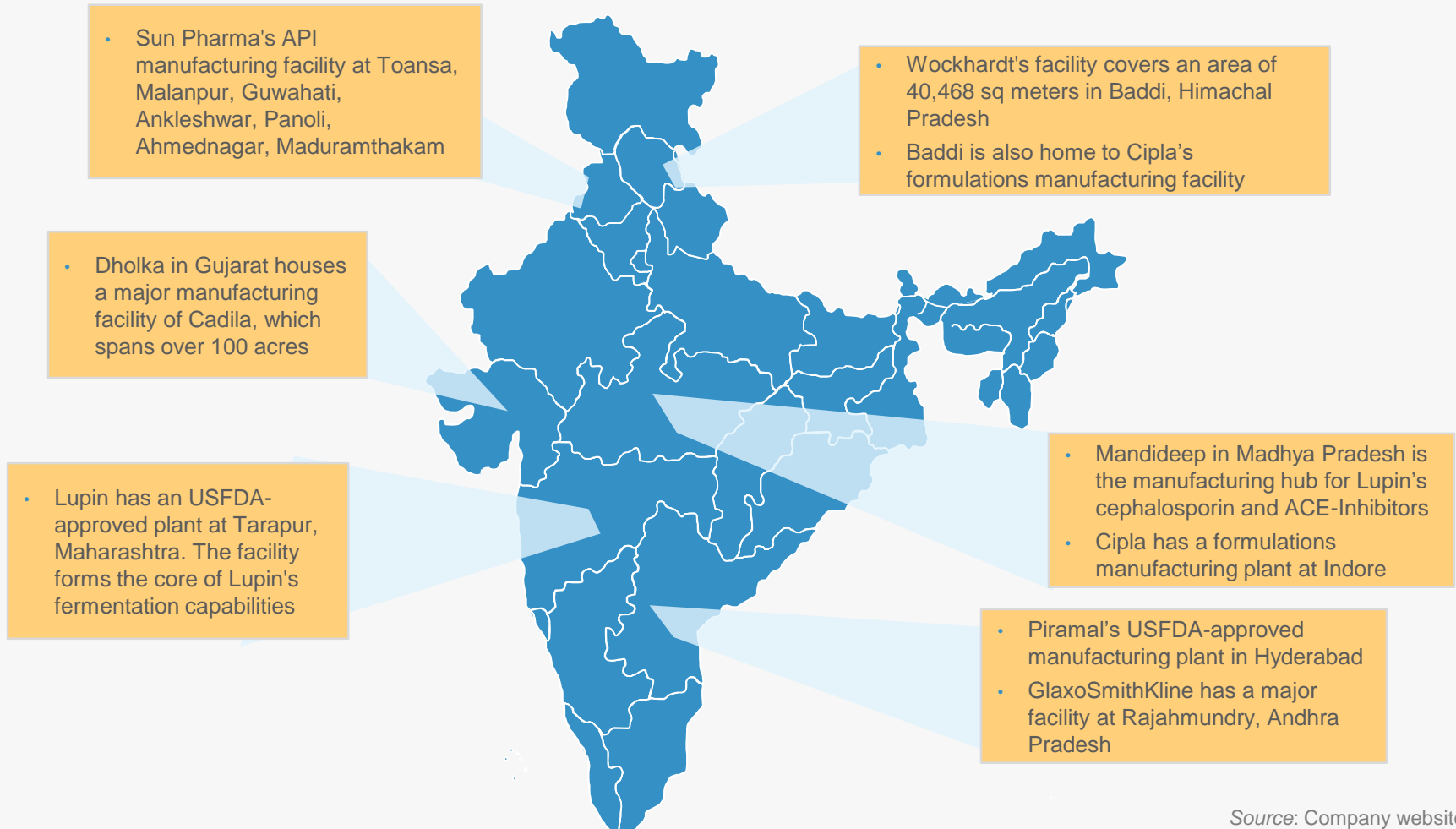
Product Patents

- The introduction of product patents in India in 2005 gave a boost to the discovery of new drugs
- India reiterated its commitment to IP protection following the introduction of product patents
- In December 2016, Suven Life Sciences was granted product patent for the treatment of neurodegenerative diseases

Less time for approval

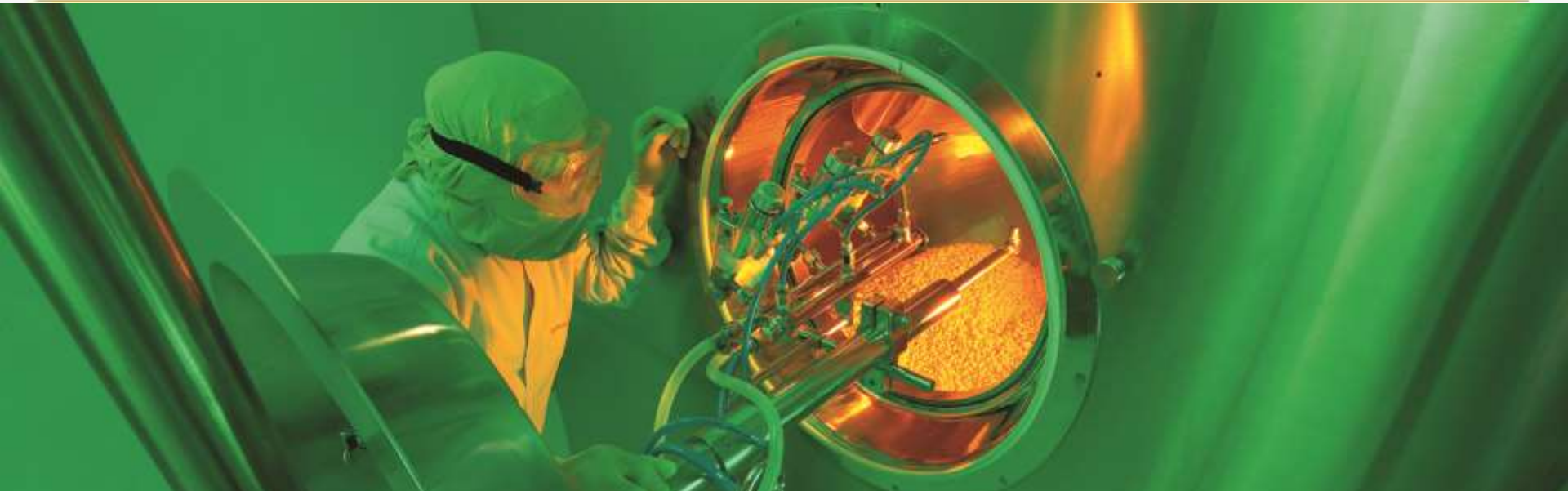
- In order to compete with global players in pharmaceutical industries, approval process of drugs have been simplified by the authorities and approval time for new facilities has been drastically reduced

STATES HOSTING KEY PHARMACEUTICAL VENTURES



Source: Company websites

PHARMACEUTICALS



PORTERS FIVE FORCES ANALYSIS

PORTER'S FIVE FORCES ANALYSIS

Competitive Rivalry

- Growth opportunities for pharma companies are expected to grow in next few years, with many drugs going off-patent in the US and other countries, thus increasing competition
- Indian pharma companies will face competition from big pharma companies, backed by huge financial muscle

Threat of New Entrants

- Strict government regulations thwart entry of new players
- Difficult to survive because of high gestation period

Substitute Products

- Threat to substitute products is low; however, homeopathy and Ayurvedic medicines can act as substitute

Bargaining Power of Suppliers

- Difficult-to-manufacture APIs such as steroids, sex hormones and peptides give bargaining power to suppliers. However, generic APIs do not have much of that power

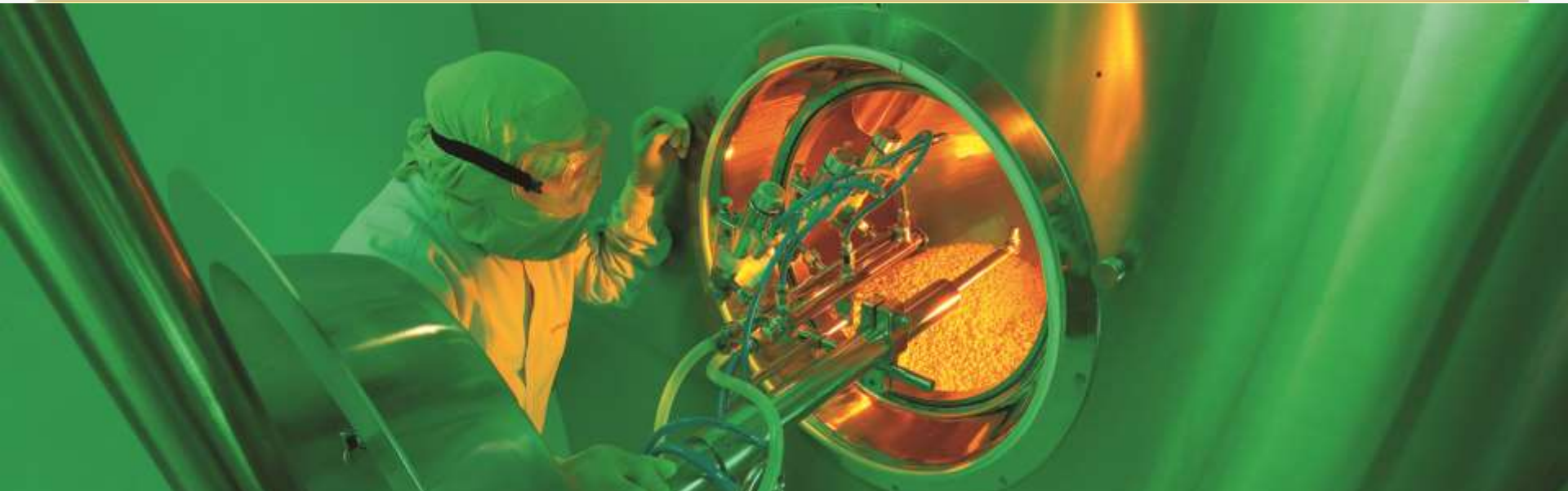
Bargaining Power of Customers

- Generic drugs offer a cost-effective alternative to drugs innovators and significant savings to customers
- Biosimilars offer significant cost saving for insurance companies in India



Source: TechSci Research

PHARMACEUTICALS



STRATEGIES ADOPTED

STRATEGIES ADOPTED

Cost leadership

- Players in the sector are trying to achieve cost leadership in various ways. For example, Sun Pharma is trying to achieve the same by
 - Vertical Integration: Complex API, which require special skills & technology, are developed & scaled up for both API & dosage forms

Differentiation

- Players in the sector are trying to differentiate themselves by investing heavily on R&D efforts. For example,
 - In 2015, Lupin opened a R & D centre for inhalation products in Florida, US
 - Sun Pharma is trying to develop technically complex APIs, such as steroids, sex hormones, peptides, carbohydrates & taxanes, which require special skills & technology
 - Dr Reddy's is investing in technology platforms. It acquired OctoPlus N.V, a Netherlands-based company, to get access to the Poly Lactic-Co-Glycolic Acid (PLGA) technology for the formulation of complex injectables
 - In January 2017, Piramal Enterprises acquired a portfolio of anti-spasticity and pain management drugs from US based drug maker – Mallinckrodt, for USD 203 million.

Focus on new markets

- Certain players in the sector are focussing on entering new markets with new opportunities. For example, Lupin is making inroads into new markets such as Latin America, Russia and other East European countries
- Sun Pharma decided to focus on specialty and chronic therapies such as neurology, oncology, dermatology segments
- In January 2017, a subsidiary of Biocon in Malaysia received an order to supply insulin worth USD 68.42 million

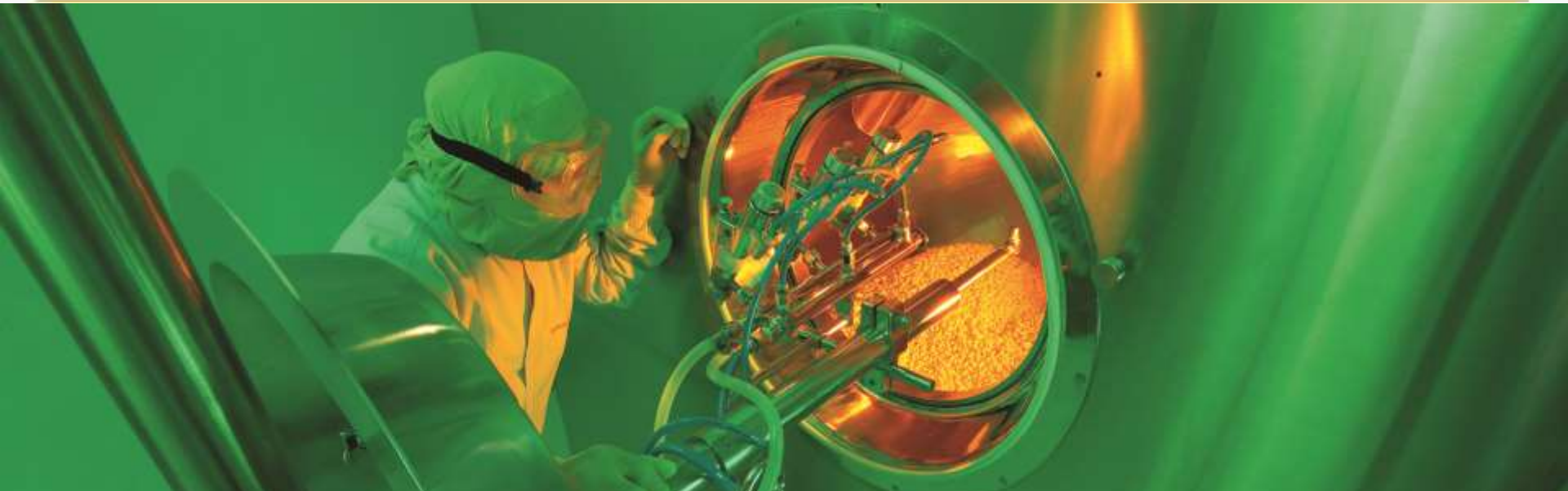
LEVERS FOR SUCCESS



Source: TechSci Research

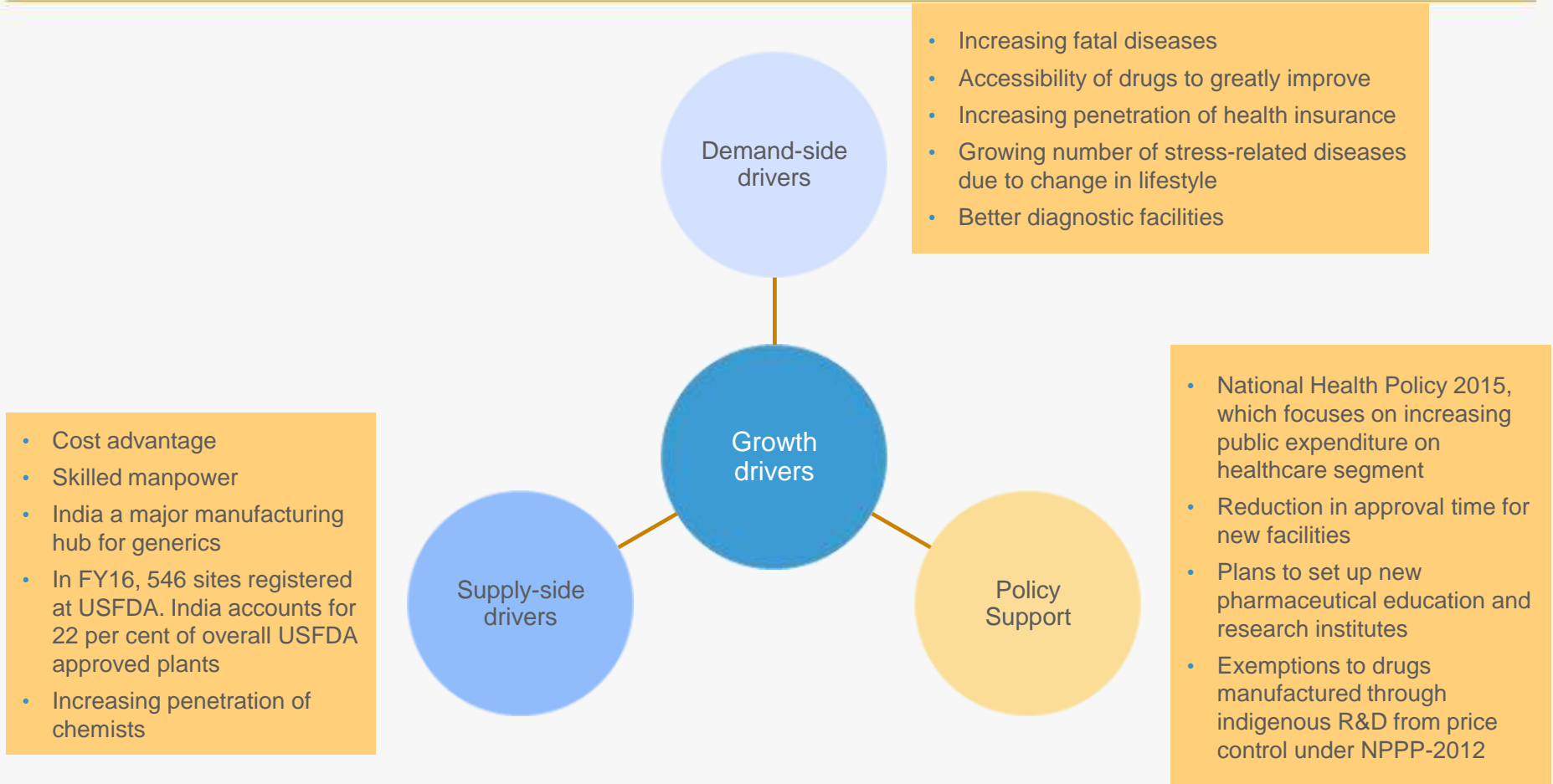
Notes: R&D – Research and Development, JV – Joint Venture, M&A – Mergers and Acquisitions

PHARMACEUTICALS



GROWTH DRIVERS

SECTOR DRIVEN BY CONFLUENCE OF DEMAND, CAPABILITIES AND POLICY



Source: Pharmaceutical Export Promotion Council

Notes: BPL - Below Poverty Line, USFDA - United States Food and Drug Administration, NPPP-2012--The National Pharmaceutical Pricing Policy, 2012

SUPPLY-SIDE DRIVERS OF INDIAN PHARMA SECTOR

Launch of patented drugs

- Following the introduction of product patents, several multinational companies are expected to launch patented drugs in India
- Growth in the number of lifestyle diseases in India could boost the sale of drugs in this segment
- High Court allowing to export patent drugs, to foreign players in the Indian market.

Medical infrastructure

- Pharma companies have increased spending to tap rural markets and develop better medical infrastructure
- Hospitals' market size is expected to increase by USD200 billion by 2024
- In October 2016, the government gave a nod to set up the country's 1st medical devices manufacturing park in Chennai

Scope in generics market

- India's generic drugs account for 20 per cent of global exports in terms of volume, making the country the largest provider of generic medicines globally
- India's generics drug market accounts for around 70 per cent of the India pharmaceutical industry and it is expected to reach USD27.9 billion by 2020

Over-The-Counter (OTC) drugs

- India's OTC drugs market is expected to rise at a CAGR of 16.3 per cent to USD6.6 billion over 2008–16
- Increased penetration of chemists, especially in rural regions, would increase the availability of OTC drugs in the country

Patent expiry

- The total sales value of the drugs with expiring patent in 2015 is USD66 billion and drugs with expiry protection in 2014 valued around USD34 billion
- The newly available market will be filled by generics, which would provide great opportunity to Indian companies

COST EFFICIENCY AND COMPETENCY CONTINUE TO BE INDIA'S FORTE

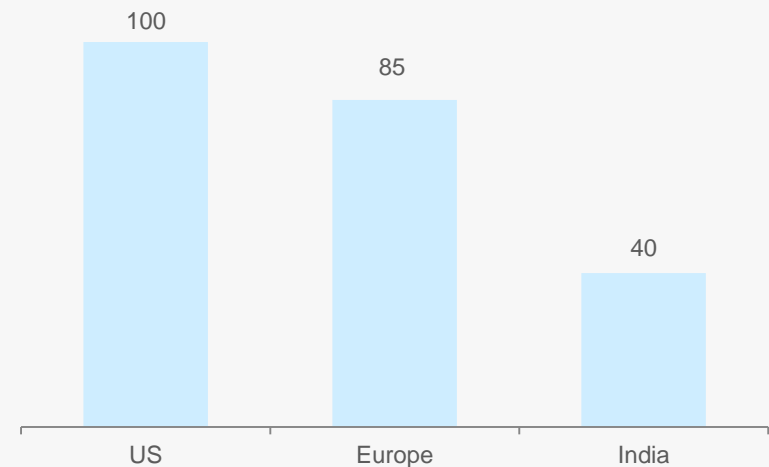
Cost efficiency

- * India's cost of production is nearly 60 per cent lower than that of the US and almost half of that of Europe
 - * Labour costs are 50–55 per cent cheaper than in Western countries
 - * The cost of setting up a production plant in India is 40 per cent lower than in Western countries
- * Cost-efficiency continues to create opportunities for Indian companies in emerging markets and Africa

Competency

- * India has a skilled workforce as well as high managerial and technical competence in comparison to its peers in Asia
- * India has the second largest number of USFDA-approved manufacturing plants outside the US
- * India has 2,633 FDA-approved drug products
- * India has over 546 USFDA-approved company sites, the highest number outside the US

Relative cost of production with US
Cost, 2015



Source: Frost and Sullivan Report on Indian Generic Pharmaceuticals Market, BMI, Financial Express, TechSci Research
Note: USFDA - United States Food and Drug Administration

DEMAND DRIVERS OF INDIAN PHARMA SECTOR

Accessibility

- Over USD200 billion to be spent on medical infrastructure in the next decade
- New business models expected to penetrate tier-2 and tier-3 cities
- Over 160,000 hospital beds expected to be added each year in the next decade
- India's generic drugs account for 20 per cent of global exports in terms of volume, making the country the largest provider of generic medicines globally

Acceptability

- Rising levels of education to increase acceptability of pharmaceuticals
- Patients to show greater propensity to self-medicate, boosting the OTC market
- Acceptance of biologics and preventive medicines to rise
- A skilled workforce as well as high managerial and technical competence
- Surge in medical tourism due to increased patient inflow from other countries

Demand drivers

Affordability

- Rising income could drive 73 million households to the middle class over the next 10 years
- Over 650 million people expected to be covered by health insurance by 2020
- Government-sponsored programmes set to provide health benefits to over 380 million BPL people by 2017
- By 2017, the government plans to provide free generic medicines to half the population at an estimated cost of USD5.4 billion

Epidemiological factors

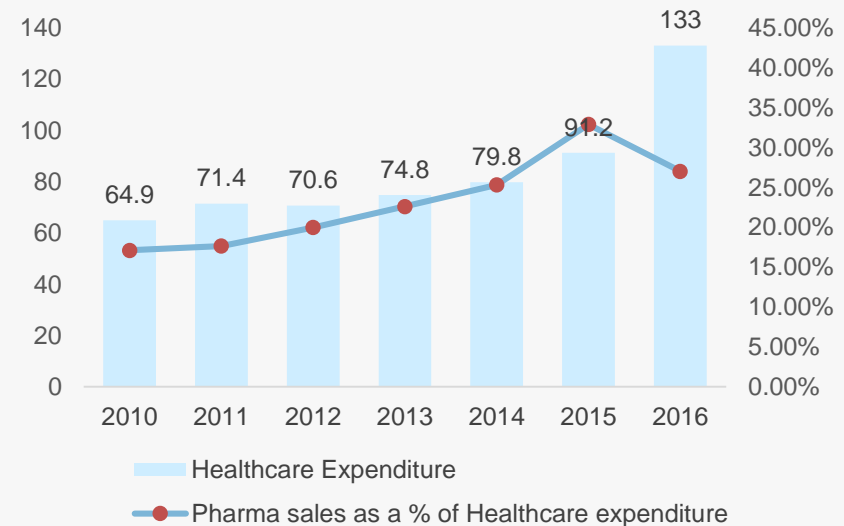
- Patient pool expected to increase over 20 per cent in the next 10 years, mainly due to rise in population
- New diseases and lifestyle changes to boost demand
- Increasing prevalence of lifestyle diseases

Source: ICRA Report on Indian Pharmaceutical Sector, Pharmaceutical Industry: Developments in India- Deloitte, Mckinsey Pharma Report 2020, TechSci Research
Note: RSBY - Rashtriya Swasthya Bima Yojna

ANTICIPATED STEEP GROWTH IN EXPENDITURE ON PHARMACEUTICALS

- * During 2010-16, total healthcare spending is expected to increase at a CAGR of 12.70 per cent to USD133 billion in 2016.
- * Moreover, pharmaceutical sales, as a percentage of total healthcare expenditure, are likely to reach 27 per cent by 2016 from 32.88 per cent in 2015 owing to increased healthcare expenditure on research and development of patented drugs

Pharma sales as a per cent of total health care spending

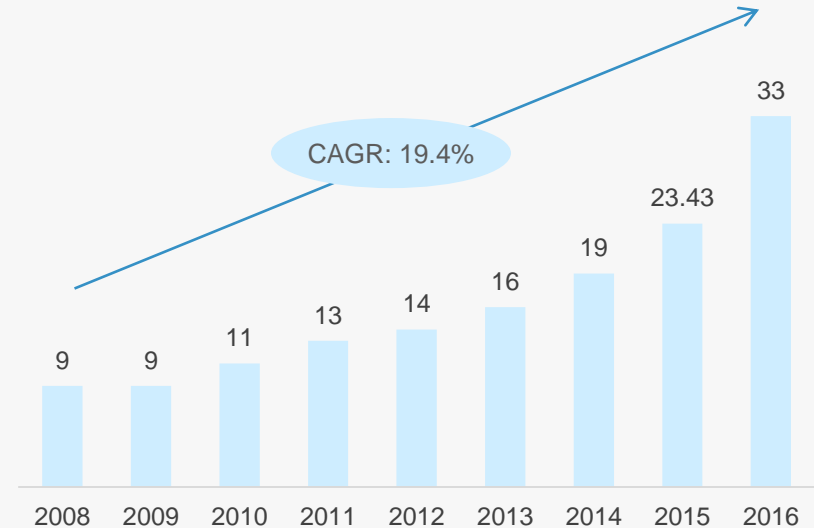


Source: Deloitte, BMI, PWC, TechSci Research
Notes: CAGR - Compound Annual Growth Rate

GROWING PER CAPITA SALES OF PHARMACEUTICALS

- * Growing per capita sales of pharmaceuticals in India offers ample opportunities for players in this market
- * Per capita sales of pharmaceuticals is expected to expand at a CAGR of 19.4 per cent to USD33 by 2016
- * Economic prosperity would improve affordability for generic drugs in the market and improve per capita sales of pharmaceuticals in India

Per capita sales of pharmaceuticals (USD)



Source: BMI, TechSci Research
Notes: CAGR - Compound Annual Growth Rate

FAVOURABLE POLICY MEASURES SUPPORT GROWTH

Reduction in approval time for new facilities

- Steps taken to reduce approval time for new facilities
- NOC for export licence issued in two weeks compared to 12 weeks earlier

Collaborations

- MoUs with USFDA, WHO, Health Canada, etc. to boost growth in the Indian Pharma sector by benefiting from their expertise. In 2015, NIPER (Mohali) signed MoUs with pharmaceutical industry leaders Bharat Biotech, Dr Reddy, Cadila Healthcare, Sun Pharma & Panacea Biotech.
- In 2016, Strides Arcolab & US-based Gilead Sciences Inc. entered into a licensing agreement for manufacturing & distributing Gilead Sciences' cost-efficient TenofovirAlafenamide (TAF) product in order to treat HIV patients in developing economies

Support for technology upgrades and FDIs

- Zero duty for technology upgrades in the pharmaceutical sector through the Export Promotion Capital Goods (EPCG) Scheme
- Government is planning to relax FDI norms in the pharmaceutical sector

Industry infrastructure

- Under the Union Budget 2015-16, government has announced to set up 3 new National Institute of Pharmaceuticals Education & Research in Maharashtra, Rajasthan & Chhattisgarh & government is also planning to set up 1 institute of Science & Education Research in Nagaland & Orissa each. In 2016, the government has planned to set up 6 pharma parks at an investment of about USD27 million

Pharma Vision 2020

- Pharma Vision 2020 by the government's Department of Pharmaceuticals aims to make India a major hub for end-to-end drug discovery

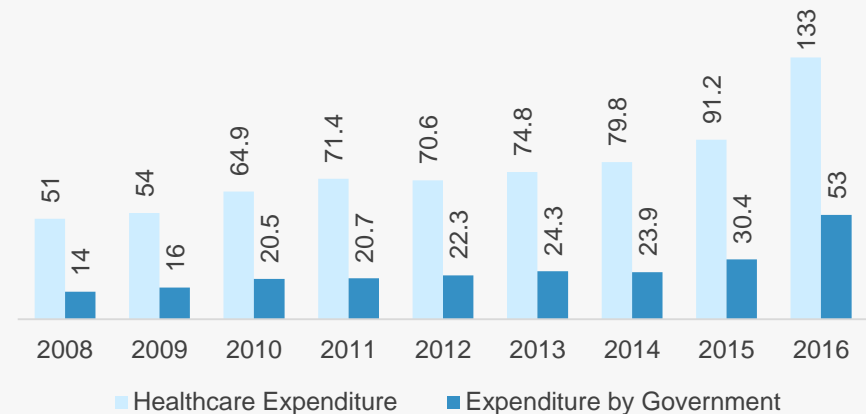
Exceptions

- Full exemption from excise duty is being provided for HIV/AIDS drugs & diagnostic kits supplied under National AIDS Control Programme funded by the Global Fund to fight AIDS, TB & Malaria (GFATM)
- The customs duties on the said drugs are also being exempted

GOVERNMENT EXPENDITURE IN THE PHARMA SECTOR ON AN UPTREND

- * Government expenditure on health in the country increased from USD14 billion in 2008 to USD53 billion in 2016
- * The expenditure is expected to expand at a CAGR of 18.1 per cent over 2008–16 to USD53 billion
- * Under Union Budget 2017-18, new 5000 postgraduate seats were announced by the government, in medicine, to ensure availability of specialist doctors.
- * Medical technology park in Vishakhapatnam, Andhra Pradesh has already been set up with an investment of USD183.31 million. States like Himachal Pradesh, Gujarat, Telangana & Maharashtra are showing interest for making investments in these parks.

Rising share of government expenditure
(USD billion)

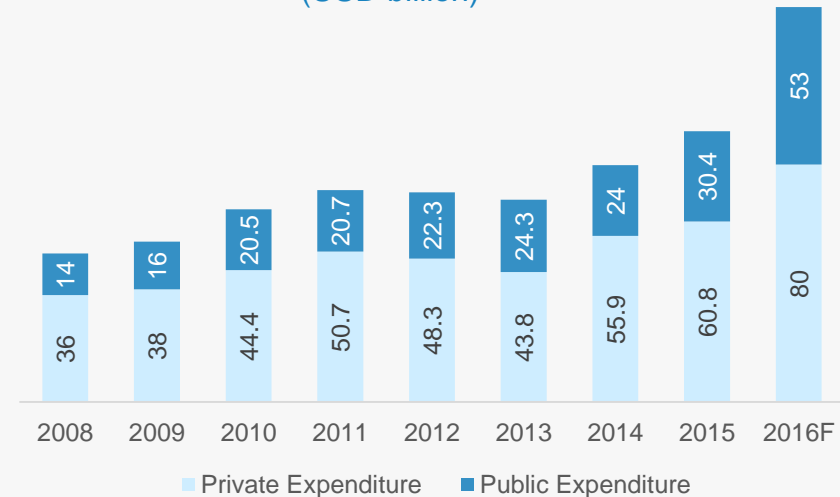


Source: Business Monitor International, Union Budget 2015-16,
TechSci Research
Notes: CAGR - Compound Annual Growth Rate

RISING EXPENDITURE SHARE BY PRIVATE SECTOR

- * The share of private sector spending increased from USD36 billion in 2008 to USD60.8 billion in 2015
- * Supported by favourable government policies, the private sector's share is expected to reach USD80 billion by 2016
- * With increasing urbanisation and problems related to modern-day living in urban settings, currently, about 50 per cent of spending on in-patient beds is for lifestyle diseases; this has increased the demand for specialised care
- * To standardise the quality of service delivery, control cost and enhance patient engagement, healthcare providers are focusing on the technological aspect of healthcare delivery
- * Digital Health Knowledge Resources, Electronic Medical Record, Mobile Healthcare, Electronic Health Record, Hospital Information System and PRACTO are some of the technologies gaining wide acceptance in the sector
- * A new trend is emerging as luxury offerings in healthcare sector. More than essential requirements, healthcare providers are making offerings of luxurious services. For example: pick and drop services for patient by private helicopters and luxurious arrangements for visitors to patient in hospital

Public and private expenditure on healthcare (USD billion)

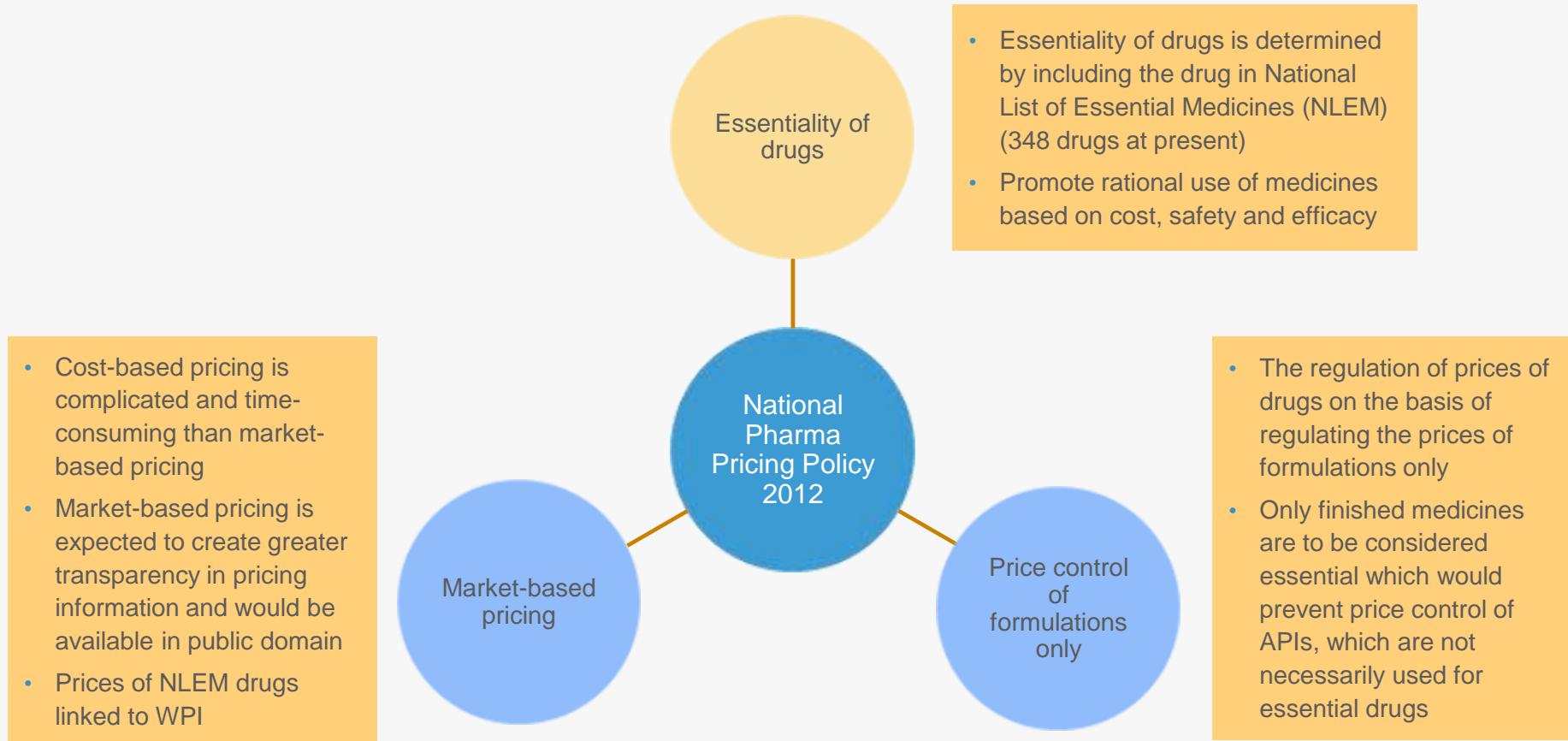


Source: Business Monitor International, TechSci Research

HEALTH INSURANCE PENETRATION EXPECTED TO SURGE

- * Increasing penetration of health insurance is likely to be driven by government-sponsored initiatives such as RSBY and ESIC
- * Government-sponsored programmes expected to provide coverage to nearly 380 million people by 2020
- * Private insurance coverage would increase nearly 15 per cent annually till 2020
- * In FY15, 27 per cent of the total population has been covered under government sponsored health insurance schemes
- * From March to November 2015, gross direct premium income for health insurance segment reached USD2.58 billion. Private sector accounted for 36.3 percent of the total gross direct premium income (March to November 2015)
- * Increase in private sector insurance would play an important role in affordability for high cost

NATIONAL PHARMA POLICY TO BRING GREATER TRANSPARENCY



Source: National Pharmaceuticals Pricing Policy 2012

INVESTMENTS, JVs INFUSING SUPERIOR CAPABILITIES IN INDIAN FIRMS ... (1/2)

- Pharma, healthcare and biotech have witnessed significant increases in M&A activities over the years; over the last three years, pharmaceuticals segment has accounted for more than 70 per cent of M&A deals
- In February 2017, Piramal announced that the company will acquire specialty products segments of UK's Mallinckrodt for USD 170 million

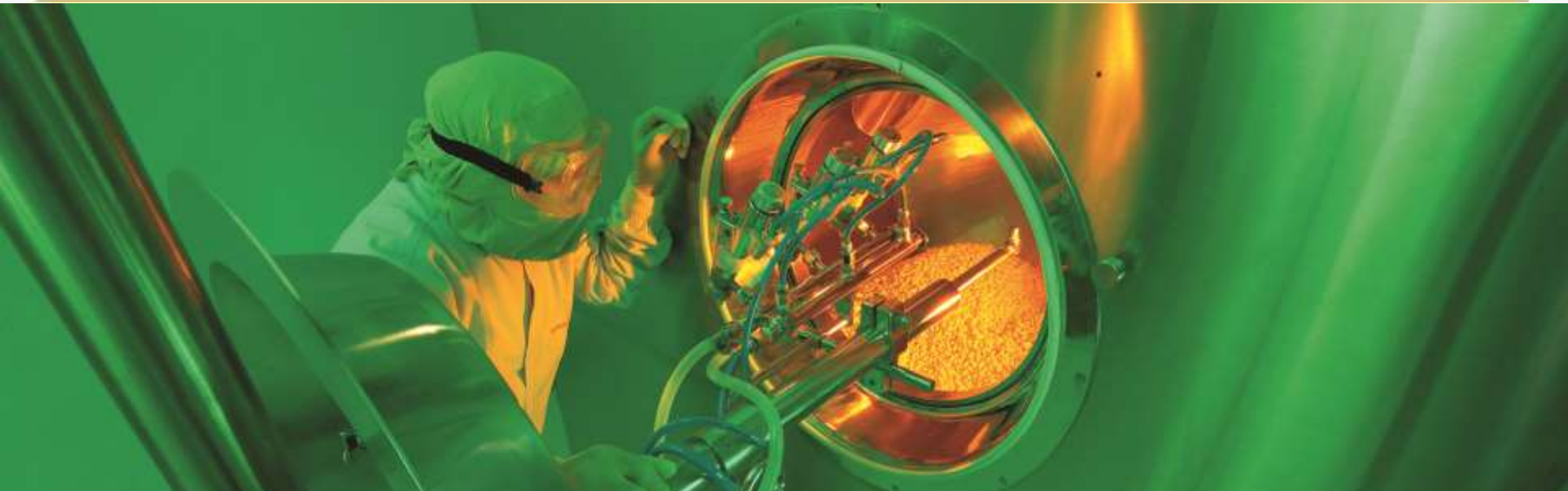
| Date announced | Indian company | Foreign company | Value (USD million) | Type |
|-----------------|-------------------------------|--|---------------------|----------------------|
| February 2017 | Piramal | Mallinckrodt | 170 | Specialty products |
| July 2016 | Continental Hospitals Limited | HH Healthcare Berhad | 192.84 | 73.4% Stake |
| February 2016 | Cipla | InvaGen Pharmaceuticals Inc. and Exelan Pharmaceuticals Inc. | 550 | 100% Stake |
| November 2015 | Famy Care Ltd | Mylan Inc – Mylan Laboratories Limited | 750 | 100% Stake |
| October 2015 | Nitin Lifesciences | Recipharm | 109.8 | 75% stakes in equity |
| July 2015 | Lupin | Temmler | Not disclosed | Acquisition |
| May 2015 | Cadila Healthcare | Claris Lifesciences | 556.8 | To be acquired |
| July 2015 | Lupin | Gavis & Novel Laboratories | 880 | Acquisition |
| April 2014 | Sun Pharma | Ranbaxy | 320 | Acquisition |
| November, 2014 | Curatio Healthcare | Sequoia Capital | 15.8 | Acquisition |
| July, 2013 | Cipla | Cipla Medpro | 512 | Acquisition |
| January, 2013 | GlaxoSmithkLine Consumer | GlaxoSmithkLine Plc. | 1,088 | Acquisition |
| September, 2011 | Natco Pharma | Litha | NA | JV |
| May, 2010 | Glenmark | Sanofi | 615 | JV |
| March, 2011 | Dr Reddy's | Iso Ray | NA | Licensing rights |
| April, 2011 | Sun Pharma | Merck | NA | Marketing |
| September, 2010 | Piramal | Abbot | 3,720 | Business buyout |
| December, 2012 | Shantha Biotech | Sanofi Aventis | 783 | Acquisition |

INVESTMENTS, JVs INFUSING SUPERIOR CAPABILITIES IN INDIAN FIRMS ... (2/2)

| Date announced | Indian company | Foreign company | Value (USD million) | Type |
|-----------------|-------------------------|-----------------------------------|---------------------|-----------------------------------|
| December, 2014 | Panacea Biotec Ltd | Apotex Inc | NA | JV |
| August, 2012 | Strides Arcolab Ltd | Gilead Sciences Inc | NA | Licensing agreement |
| July, 2011 | Ranbaxy | Gilead Sciences Inc | NA | Licensing agreement |
| August, 2013 | Jubilant Biosys | Endo Pharmaceuticals | NA | Drug development |
| October, 2012 | Piramal Healthcare Ltd | Fujifilm Diosynth Biotechnologies | NA | Drug development |
| March, 2009 | Biocon | Bristol-Myers Squibb | NA | Exclusive marketing |
| March, 2013 | Unichem Laboratories | Mylan | 30 | Acquisition |
| October, 2012 | SMS Pharmaceuticals | Mylan | 33 | Acquisition of manufacturing unit |
| March, 2012 | Biocon | Abbott Laboratories | NA | Contract research |
| September, 2012 | Agila Specialties | Mylan, A Canonsburg | 1,850 | Acquisition |
| February, 2012 | Jubilant Biosys | Mnemosyne Pharmaceuticals Inc | NA | Drug development |
| January, 2011 | Zydus Cadila Healthcare | Bayer | NA | Marketing arrangement |
| December, 2012 | Claris Lifesciences | Otsuka Pharmaceutical | 250 | JV |
| November, 2012 | Zydus Cadila Healthcare | Abbot Laboratories | NA | Licensing agreement |
| July, 2011 | Lupin | Eli Lilly | NA | Marketing arrangement |

Source: ICRA Research on Indian Pharmaceutical Sector, India Ratings Research Outlook on Indian Pharmaceutical, BMI, TechSci Research
Notes: JV - Joint Venture, ADC - Antibody Drug Conjugates

PHARMACEUTICALS



OPPORTUNITIES

OPPORTUNITIES ABOUND IN CLINICAL TRIALS AND HIGH-END DRUGS

Clinical trials market

- India is among the leaders in the clinical trial market
- Due to a genetically diverse population and availability of skilled doctors, India has the potential to attract huge investments to its clinical trial market
- From 2009 to 2015, 3043 clinical trial has been carried out in India

High-end drugs

- Due to increasing population and income levels, demand for high-end drugs is expected to rise
- Demand for high-end drugs could reached USD7.5 billion in 2015
- Growing demand could open up the market for production of high-end drugs in India

Penetration in rural market

- With 70 per cent of India's population residing in rural areas, pharma companies have immense opportunities to tap this market
- Demand for generic medicines in rural markets has seen a sharp growth. Various companies are investing in the distribution network in rural areas

CRAMS

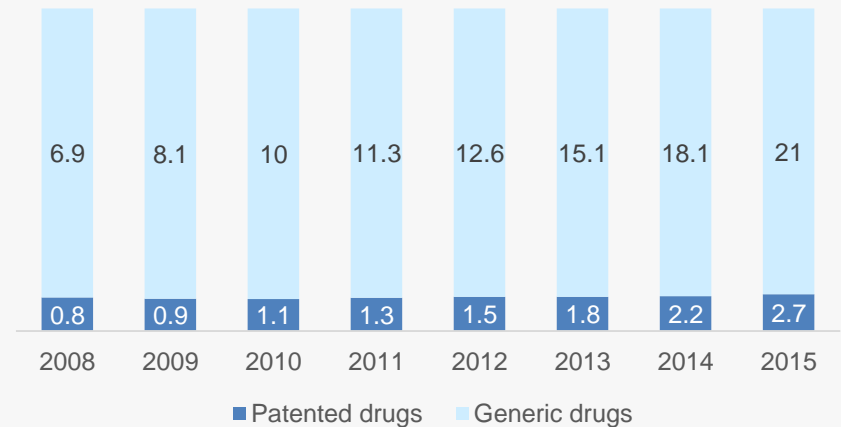
- The Contract Research and Manufacturing Services industry (CRAMS) – estimated at USD8 billion in 2015, up from USD3.8 billion in 2012 has a huge potential for investments
- The market has more than 1,000 players

Source: BMI, TechSci Research

DRUG SALES TO MORE THAN DOUBLE BY 2015 ACROSS SEGMENTS

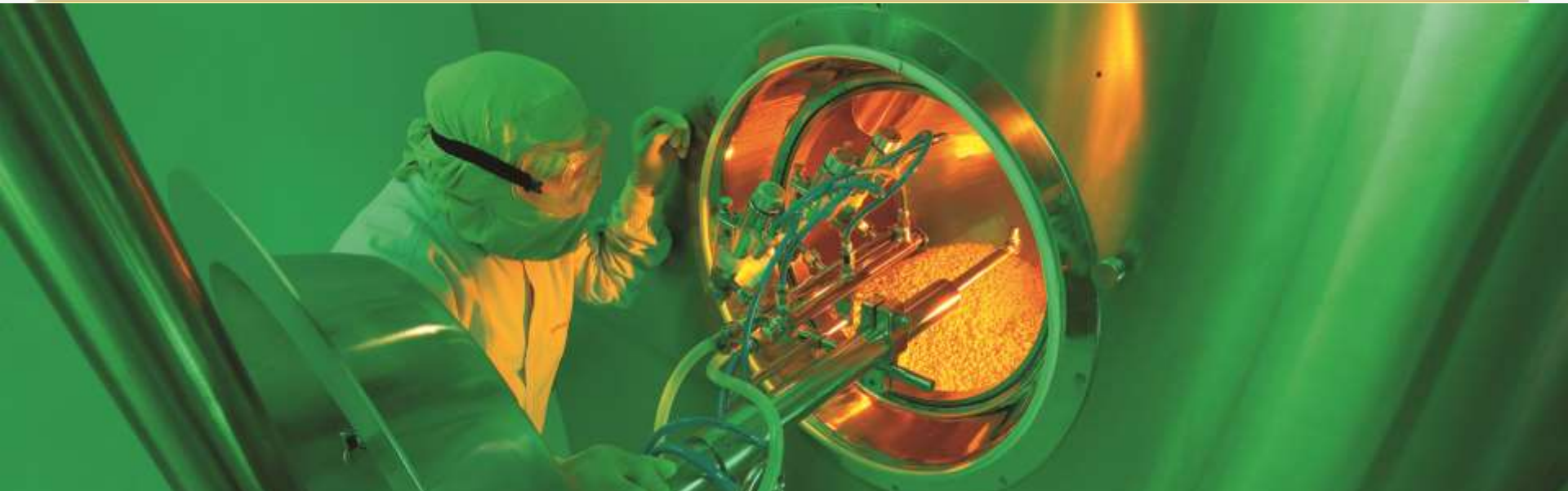
- * The share of generic drugs is expected to continue increasing; it could represent about 85 per cent of the prescription drug market by 2016
- * Domestic generic drug market is expected to reach USD27.9 billion in 2020
- * Due to their competence in generic drugs, growth in this market offers a great opportunity for Indian firms
- * Generic drug market is expected to grow in the next few years, with many drugs going off-patent in the US and other countries
- * Domestic generic drug market has reached USD26.1 billion in 2016

Share of patented and generic drugs in prescribed drug market (USD billion)



Source: BMI, TechSci Research
Note: F - Forecast

PHARMACEUTICALS

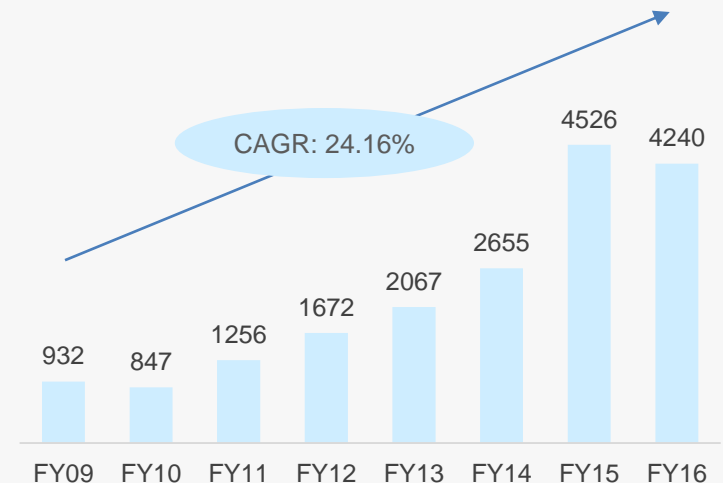


SUCCESS STORIES

SUN PHARMA: LEVERAGING ITS GENERICS MARKET CAPABILITIES ... (1/2)

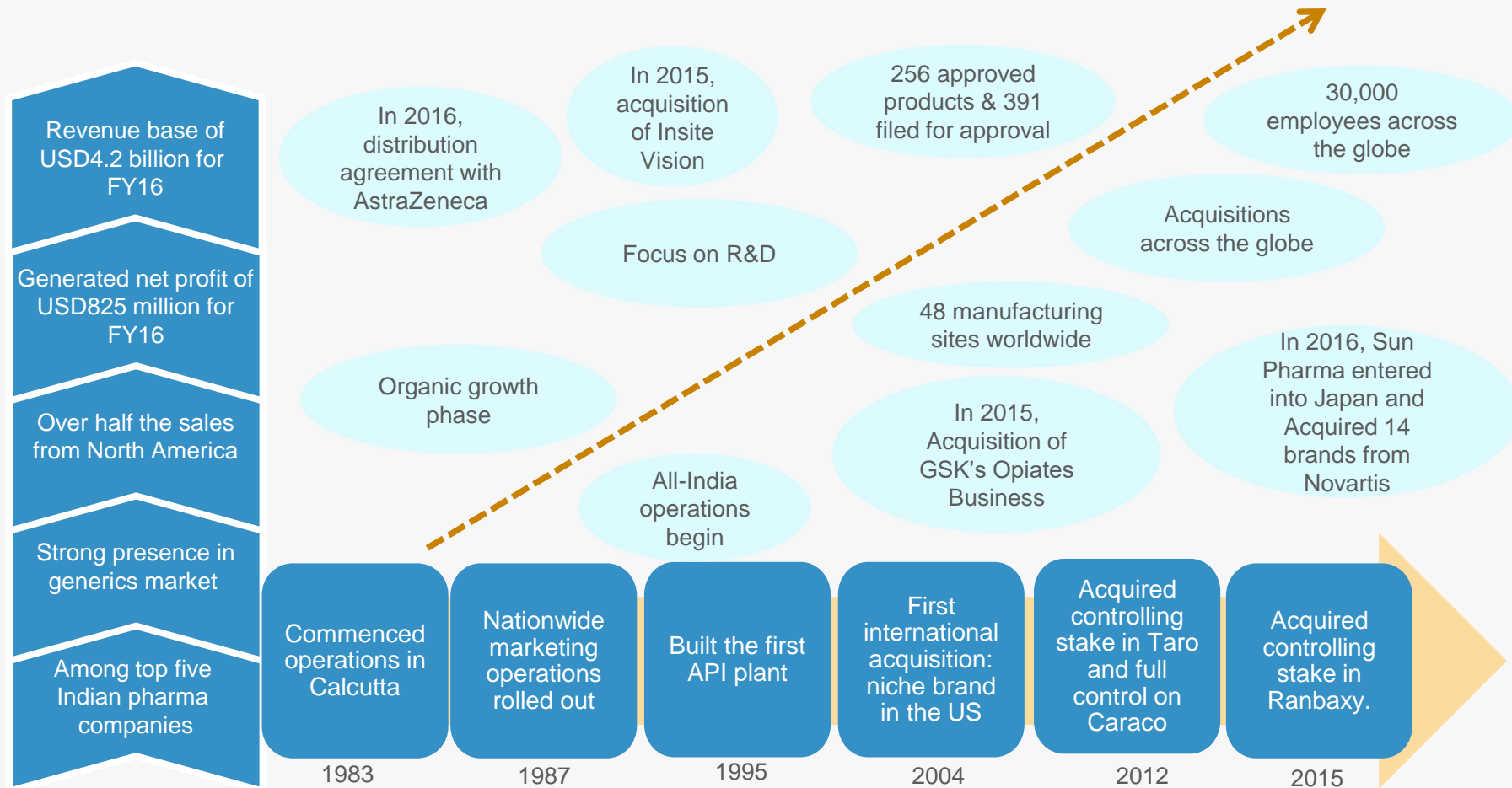
- * Sun Pharma was set up in 1983, with a compact manufacturing facility for tablets and capsules
- * It set up its first API plant at Panoli in 1995
- * It has 48 manufacturing facilities across five continents and employs more than 30,000 people as on FY16
- * Nearly 74 per cent of its sales came from international markets in 2016
- * Revenues of Sun Pharma increased from USD932 million in FY09 to USD 4.2 billion in FY16, witnessing growth at a CAGR of 24.16 per cent over FY09-16
- * In March 2015, Sun Pharma completed the acquisition of Ranbaxy Laboratories Ltd to become the fifth largest global specialty pharma company, No 1 pharma company in India, and ensure a strong positioning in emerging markets
- * The company reported net profit of USD 335.8 million for the period July 2016 - September 2016
- * As of October 2016, the company acquired 100 per cent equity in the US-based eye care specialist 'Ocular Technologies Sarl' for USD 40 million

Sun Pharma net sales (USD million)



Source: Sun Pharma website, TechSci Research
CAGR - Compound Annual Growth Rate

SUN PHARMA: LEVERAGING ITS GENERICS MARKET CAPABILITIES ... (2/2)

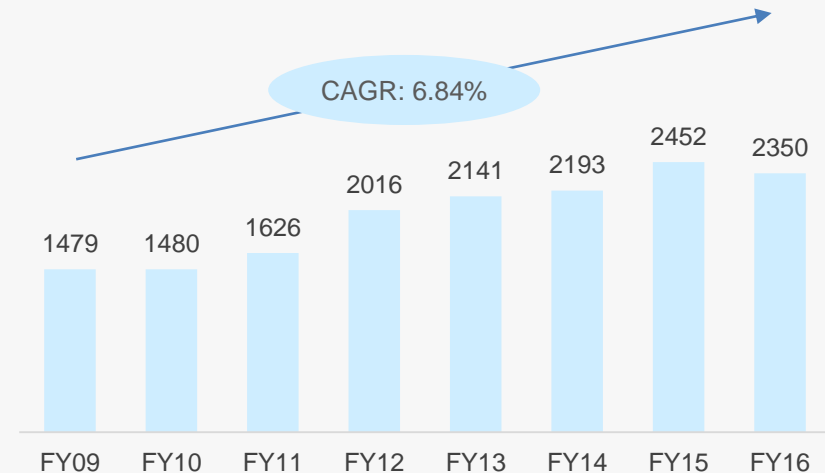


Source: Sun Pharma website

DR REDDY'S: PROVIDING AFFORDABLE AND INNOVATIVE HEALTHCARE ... (1/2)

- * Dr Reddy's began as an API manufacturer in 1984, producing high-quality APIs for the Indian domestic market
- * It has presence in almost all therapeutic segments
- * It has an integrated business model in three segments: Pharmaceutical Services & Active Ingredients (PSAI), Global generics and Proprietary products
- * Dr Reddy's has access to numerous emerging markets through partnerships with GlaxoSmithKline (GSK)
- * Its product offering spans the entire value chain, from process development of APIs to submission of the finished dosage dossier to regulatory agencies
- * The company's revenues increased from USD1.5 billion in FY09 to USD2.4 billion in FY16, at a CAGR of 6.84 per cent over FY09-16
- * Global generics comprised over 81 per cent of its revenue mix in FY15
- * Dr Reddy's is investing heavily on R&D to differentiate itself in the market. In FY15 - 16 Dr Reddy's spent around 13.8 per cent of sales on R&D

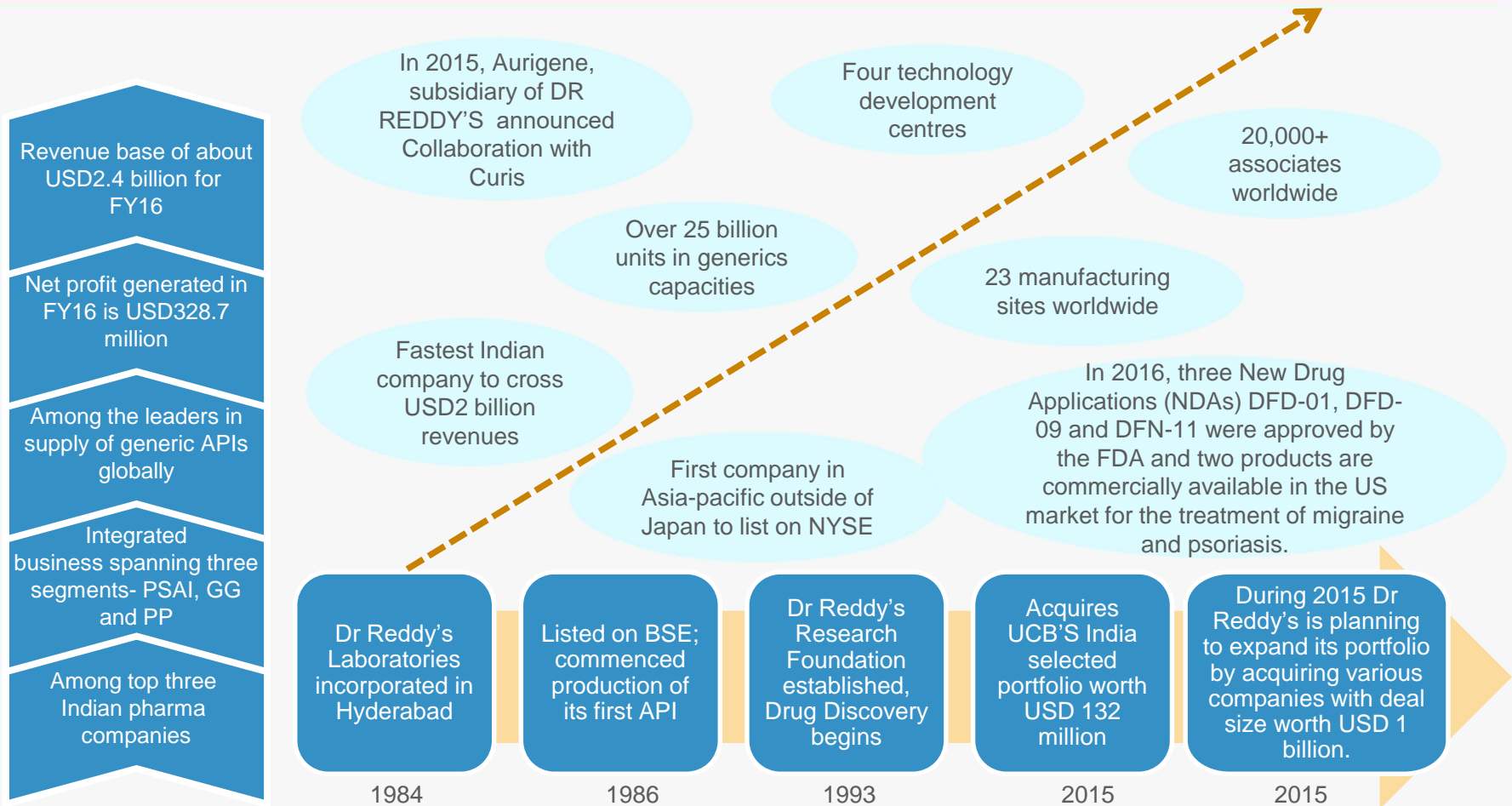
Dr Reddy's net sales (USD million)



Source: Dr Reddy's website,
Notes: FY16* (April to September 2015)
CAGR - Compound Annual Growth Rate,
R&D - Research and Development

PHARMACEUTICALS

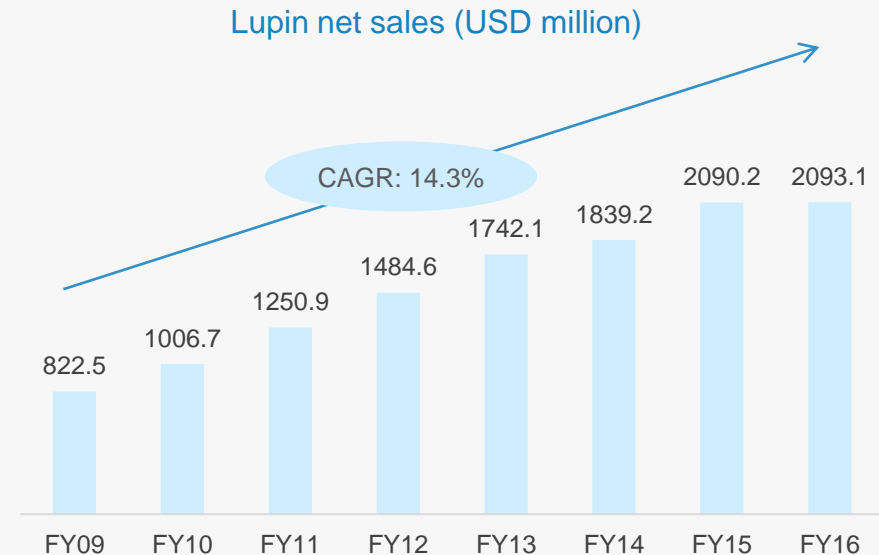
DR REDDY'S: PROVIDING AFFORDABLE AND INNOVATIVE HEALTHCARE ... (2/2)



Source: Dr Reddy's website, Annual Report
Notes: PSAI - Pharmaceutical Services and Active Ingredients, GG - Global Generics, PP - Proprietary Products, JV - Joint Venture

LUPIN: ON A HIGH GROWTH PATH ... (1/2)

- * Lupin is a renowned pharma player producing a wide range of quality, affordable generic and branded formulations and APIs
- * It is one of the world's largest manufacturers of TB drugs & has significant market share in the cardiovascular, diabetology, asthma, paediatrics, CNS, Anti-infectives & NSAIDs therapy segments
- * Lupin is the 7th largest generic pharmaceutical company globally in terms of market capitalization
- * Its revenues increased from USD822.5 million in FY09 to USD2.1 billion in FY16, witnessing growth at a CAGR of 14.3 per cent over FY09-16
- * Advanced market formulations comprised nearly 46 per cent of its revenues in FY16
- * Specialty generic player across the globe, including emerging markets
- * Lupin is third largest drug manufacturer in India by sales
- * In 2016, Lupin received USFDA nod for its generic version of Diclofenac capsules that are used for treating acute pain & osteoarthritis
- * In February 2017, Lupin has received the final approval from USFDA to market potassium sulfate, sodium sulfate & magnesium sulfate oral solutions, which are used to treat a form of cancer.

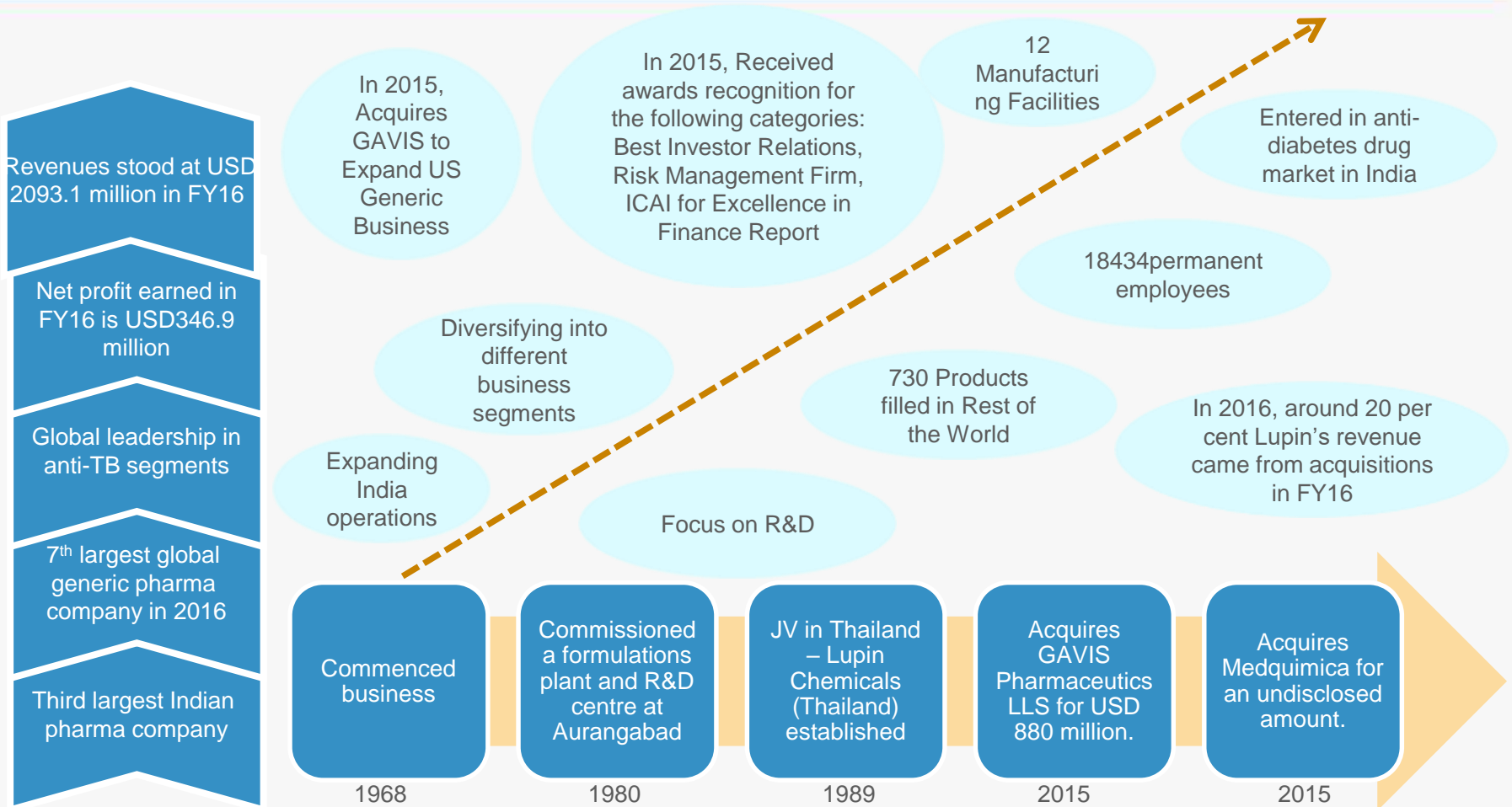


Source: Lupin website

Notes: CAGR - Compound Annual Growth Rate,
API - Active Pharmaceutical Ingredient, CNS - Central Nervous System,
NSAIDS - Non-Steroidal Anti-inflammatory Drugs, TB - Tuberculosis

PHARMACEUTICALS

LUPIN: ON A HIGH GROWTH PATH ... (2/2)

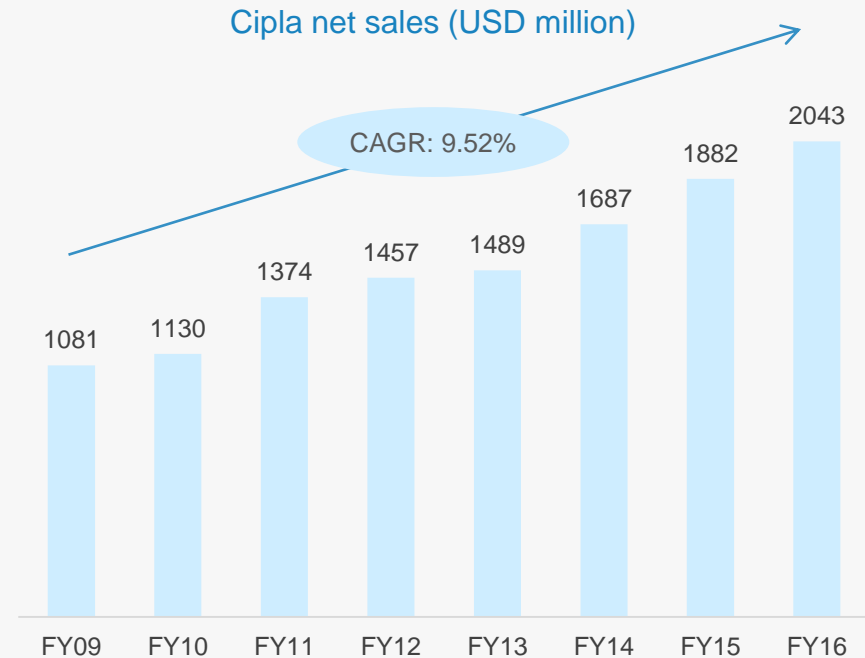


Source: Lupin website, Annual Report

Notes: ANDAS - Abbreviated New Drug Application, DMFs - Drug Master Files, * - As of Half Year Ended September 2015

CIPLA: MAKING HEALTHCARE ACCESSIBLE ... (1/2)

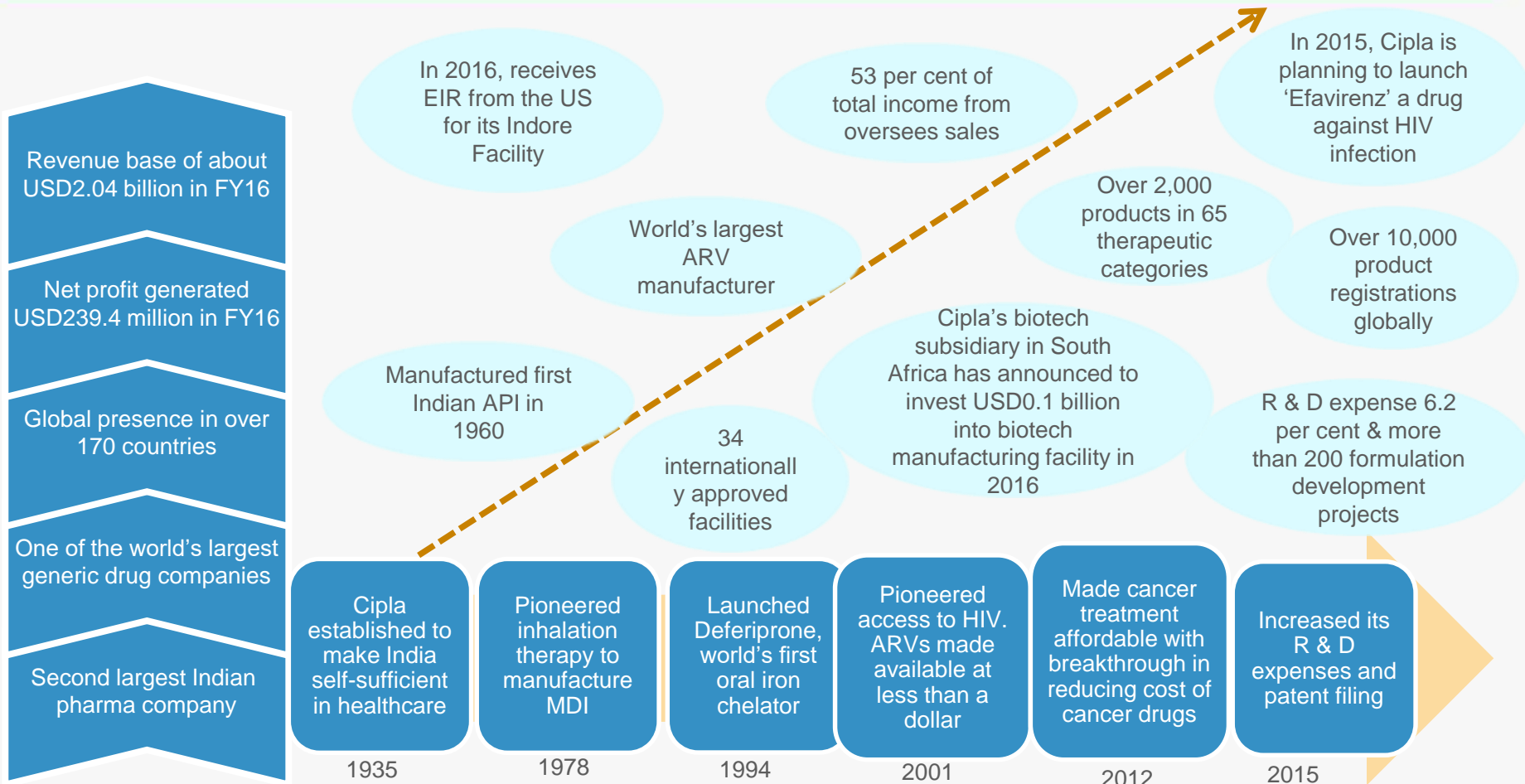
- * Established in 1935, Cipla has over 34 state-of-the-art manufacturing units. Cipla's R&D division focuses on new product development and new drug delivery systems across a range of therapies
- * It is one of the few companies producing medicines for rare diseases such as Idiopathic Pulmonary Fibrosis, Pulmonary Arterial Hypertension, Thalassaemia and Multiple Sclerosis
- * Cipla outperformed other global pharma majors by offering patented anti-AIDS drugs at affordable prices
- * It has presence in over 170 countries, with an employee strength of over 20,000; moreover, it is the 6th-largest player in South Africa
- * Its revenues increased from USD1.11 billion in FY09 to USD2.04 billion in FY16, at a CAGR of 9.52 per cent over FY09-16
- * It is the 1st company to develop drug for the treatment of H1N1 flu
- * Cipla has entered into an agreement to acquire 2 US based pharmaceutical companies InvaGen Pharmaceuticals Inc., & Exelan Pharmaceuticals Inc. for USD500 million



Source: Cipla website, Cipla brochure, Cipla corporate profile

Notes: CAGR - Compound Annual Growth Rate,
API - Active Pharmaceutical Ingredient, OTC - Over The Counter

CIPLA: MAKING HEALTHCARE ACCESSIBLE ... (2/2)

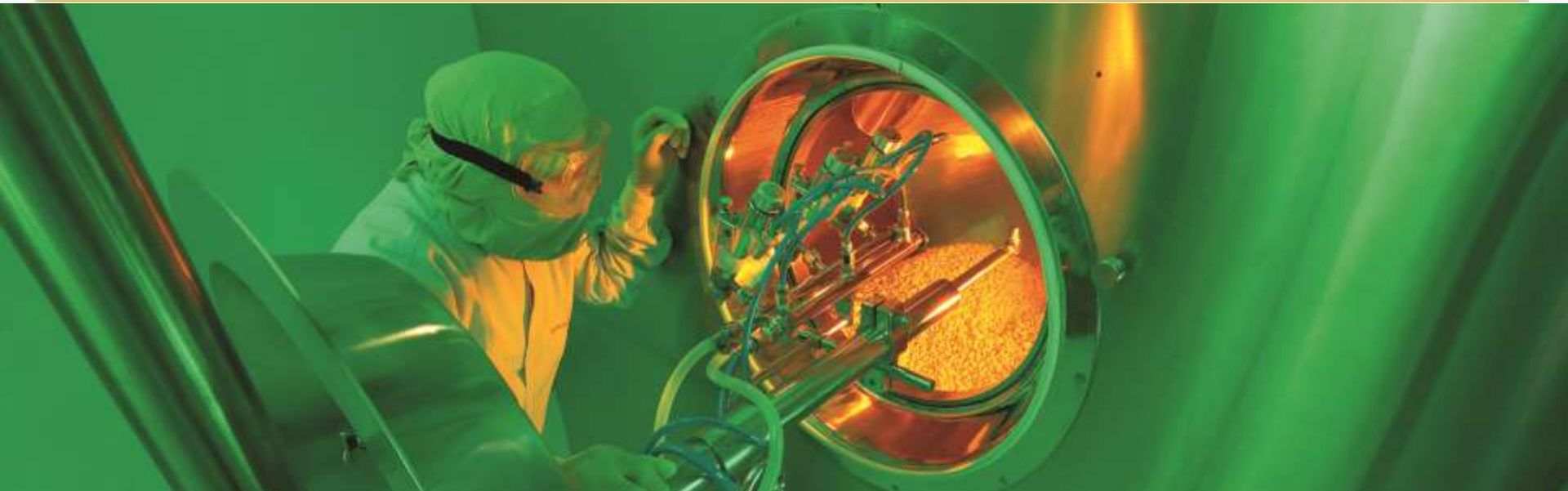


Source: Cipla website, Annual Report Note; FY16* (Up to September 2015)

Notes: MDI - Metered Dose Inhaler, ARV - Anti-retroviral

For updated information, please visit www.ibef.org 49

PHARMACEUTICALS



USEFUL INFORMATION

INDUSTRY ASSOCIATIONS ... (1/2)

The Indian Pharmaceutical Association

Kalina, Santacruz (E),
Mumbai – 400 098
Phone: 91-22-2667 1072
Fax: 91 22 2667 0744
E-mail: ipacentre@ipapharma.org
www.ipapharma.org

Indian Drug Manufacturers' Association

102-B, Poonam Chambers, Dr A.B. Road
Worli, Mumbai – 400 018
Phone: 91-22-2494 4624/2497 4308
Fax: 9122 24950723
E-mail: idma1@idmaindia.com
www.idma-assn.org

Organisation of Pharmaceutical Producers of India

Peninsula Chambers, Ground Floor,
Ganpatrao Kadam Marg, Lower Parel,
Mumbai – 400 013
Phone: 9122 24918123, 24912486, 66627007
Fax: 9122 24915168
E-mail: indiaoppi@vsnl.com
www.indiaoppi.com

INDUSTRY ASSOCIATIONS ... (2/2)

Bulk Drug Manufacturers Association

C-25, Industrial Estate, Sanath Nagar

Hyderabad – 500018

Phone: 91 40 23703910/23706718

Fax: 91 40 23704804

E-mail: info@bdmai.org

www.bdmai.org

- * **CRAMS:** Contract Research and Manufacturing Services
- * **API:** Active Pharmaceutical Ingredients
- * **FDI:** Foreign Direct Investment
- * **GOI:** Government of India
- * **INR:** Indian Rupee
- * **USD:** US Dollar
- * **BPL:** Below Poverty Line
- * **RSBY:** Rashtriya Swastha Bima Yojna
- * **ESIC:** Employees State Insurance Corporation
- * Wherever applicable, numbers have been rounded off to the nearest whole number

EXCHANGE RATES

Exchange rates (Fiscal Year)

| Year | INR equivalent of one USD |
|------------|---------------------------|
| 2004-05 | 44.81 |
| 2005-06 | 44.14 |
| 2006-07 | 45.14 |
| 2007-08 | 40.27 |
| 2008-09 | 46.14 |
| 2009-10 | 47.42 |
| 2010-11 | 45.62 |
| 2011-12 | 46.88 |
| 2012-13 | 54.31 |
| 2013-14 | 60.28 |
| 2014-15 | 61.06 |
| 2015-16 | 65.46 |
| 2016-2017E | 66.95 |

Exchange rates (Calendar Year)

| Year | INR equivalent of one USD |
|-----------------|---------------------------|
| 2005 | 43.98 |
| 2006 | 45.18 |
| 2007 | 41.34 |
| 2008 | 43.62 |
| 2009 | 48.42 |
| 2010 | 45.72 |
| 2011 | 46.85 |
| 2012 | 53.46 |
| 2013 | 58.44 |
| 2014 | 61.03 |
| 2015 | 64.15 |
| 2016 (Expected) | 67.22 |

Source: Reserve bank of India,
Average for the year

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