Reviving the domestic API industry

In context of the recent coronavirus outbreak

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pwc

Executive Summary (1/2)

- In context of the recent coronavirus outbreak, PwC has undertaken an independent study to understand challenges faced by the Indian active pharmaceutical ingredient (API) industry and interventions required to revive the industry.
- Dependence on China for APIs has been an ongoing concern for the industry and the outbreak of coronavirus (COVID-19) in China may disrupt India's pharmaceutical industry by impacting the supply of essential APIs.
- The percentage of API imports from China has spiked from ~1% in 1991 to ~70% in 2019 and in recent past the actual market price of some of the APIs which are imported from China have gone up steeply.
- In current context, if the situation aggravates, it can potentially lead to price volatility, impact on exports for most Pharma companies and ultimately making essential medicines unaffordable and inaccessible to people.
- Our analysis based on 68 critical APIs captured from 19 leading pharmaceutical companies shows that :
  - 50% of the critical APIs are being imported and almost all the imports are from China.
  - Domestically produced APIs cover approximately 50% of the total quantity. However key starting materials (KSMs) for most APIs are still sourced from China.
- The Chinese API industry has an inherent advantage because of economies of scale and the support from Chinese government in form of financial incentives, infrastructure and regulatory policies.
  - Lower capex requirements due to large Special Economic Zones (10–15x the size of Indian SEZs)
  - Lower borrowing costs: 5–7% vs. 11–14% in India
  - Lower logistics costs: 1% of total costs in China vs. 3% for India
  - Lower conversion costs as labour and electricity costs in China are relatively cheaper (average ~11 US cents/kwh vs. 19 US cents/kwh in India)
- Indian API manufacturers lost competitive edge to manufacture lower end of the spectrum for APIs and fermentation technology to countries like China, majorly on account of factors like :
  - Stricter implementation of pollution control norms, leading to higher costs of manufacturing APIs in India
  - Issues in interpretation of the Drug Price Control Order (DPCO), 2013
  - No financial incentives like lower tax, cheaper utilities and land subsidy to lower capex requirement
  - Lack of large scale mega parks to manufacture bulk drug
  - Collapse of the fermentation industry in India.

Executive Summary (2/2)

India needs a holistic and conducive ecosystem to capitalise the full potential of its API manufacturing capabilities which can include some immediate-term interventions and few longer-term ones:

- Immediate:
  - Provide faster environment clearance: Approval process could be bought down to 2 months from current timeline of 4-6 months. Give total category capacity where additional clearance is not required as long as pollution load is not exceed. Deep sea discharge norms to be in line with global best practices
  - Encourage manufacturing by giving fiscal stimulus:

    <u>API/Intermediates</u>

    - Provide 12% subsidy on the overall production value of these APIs/ Intermediates with a criteria of minimum threshold on investment value (~100 cr) in any greenfield or brownfield project and a minimum threshold on production value (~250 cr) by 3rd year of operation

    <u>Fermentation Products</u>

    - Provide 30% subsidy on overall production value with minimum threshold on both investment and production value. Additional subsidies can also be considered, in-line with fiscal incentives provided under electronics policy like wage reimbursement, capital subsidy and electricity at Rs 2/kWh
  - Accommodative pricing policy: Formulations under schedule I of the DPCO 2013 which are priced under Rs 5/ unit could be excluded for the price control. Immediate upward revision of price cap for impacted NLEM formulation because of significant API price increase
  - Financial Incentives: Cost of electricity and water to be cut by 50% for 5 years, Land to be provided at concessional rate and provided infrastructure status to the industry
- Longer term :
  - Develop 2-3 large clusters and provide plug-and-play infrastructural support in dedicated zones for manufacturing APIs
  - Encourage Industry academia initiatives
  - Facilitate alternate source of import by providing additional incentives

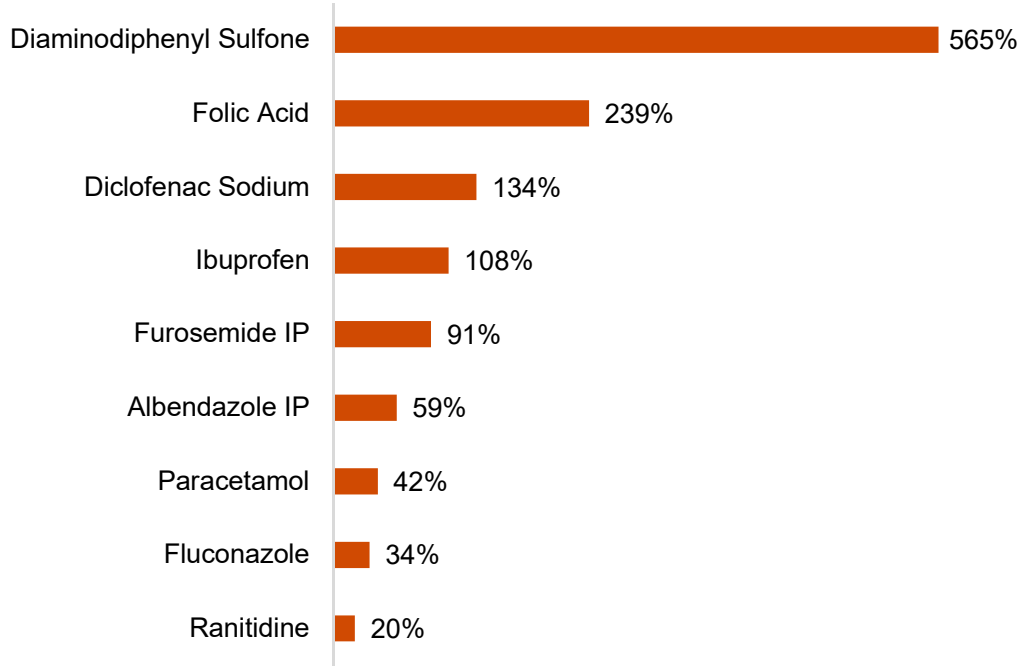
Setting the context

Dependence on China for APIs has been an ongoing concern for the industry

Background

- API is an important segment of the Indian pharma industry, contributing to around 35% of the market.
- On an average, the contribution of API to the overall cost is approximately 40%, but in certain cases, it may go up to 70–80% depending on the prevailing API prices.
- Due to the competitive pricing offered by Chinese suppliers, in the last few years, the Indian API industry has been dependent on China for imports of APIs and advanced API intermediates.
- It is significant to note that the percentage of API imports from China has spiked from around 1% in 1991 to around 70% in 2019, primarily backed by large-scale manufacturing incentives and state-driven subsidies offered in China to promote exports.
- In the recent past, the actual market price of some of the APIs which are imported from China have gone up steeply, thereby raising the input cost.

Select examples of price increase of APIs in percentage (2013–2019)



The recent outbreak of coronavirus (COVID-19) in China may disrupt the supply of essential APIs for the Indian pharma market and may impact price volatility

Source: PwC paper on Impact of rising API price on IPM

Taking stock of the current situation

Key highlights

01 50% of the APIs are being imported and almost all the imports are from China.

02 For 8 out of 68 APIs, the Indian pharma industry is completely dependent on imports from China: penicillin G, levodopa, streptomycin, meropenem, carbidopa, vancomycin, gentamycin and progesterone.

03 Domestically produced APIs account for 50% of the total quantity; however, KSMs for some key APIs like caffeine, chloramphenicol, azithromycin, sulfadoxine, ciprofloxacin, metformin, ciprofloxacin, levofloxacin, ofloxacin, ampicillin, amoxicillin and cephalosporins are sourced from China.

04 5 out of the top 10 APIs, namely penicillin G, amoxicillin, citric acid, potassium clavulanate and tetracycline are at the risk of getting out of stock; 3 of them highly dependent on China.

Source: IPA member companies, Indian Drug Manufacturers' Association (IDMA)

Sourcing and inventory details of key APIs (quantity in lakh kg)

Name of APIs	Quantity imported	Quantity domestic	Quantity from traders	Total quantity	Stock in hand	Approximate duration of stocks (in months)
Penicillin G	28.8	-	-	28.8	2.4	0.8 – 1
Paracetamol	0.6	15.3	0.8	16.6	4.0	~3
Amoxicillin	0.2	6.4	<0.1	6.6	1.2	2.2
Ciprofloxacin	<0.1	6.2	-	6.3	0.9	>3
Mannitol	-	-	3.0	3.0	0.8	>3
Citric Acid	-	2.3	<0.1	2.3	1.5	1.5
Potassium Clavulanate	2.0	-	0.2	2.2	0.4	2.5
Azithromycin	1.3	0.3	0.5	2.1	0.3	>3
Metronidazole	0.8	0.5	<0.1	1.3	0.6	>3
Tetracycline	0.9	0.3	<0.1	1.2	0.1	1.0 – 1.1
Others	1.0	6.8	0.9	8.6	3.9	
	35.6	**38.0**	**5.4**	**79.0**	**16.2**	

Note: Data is for the period April 2019 to January 2020

Source: IPA member companies

Top 10 APIs dependent on imports from China (quantity in lakh kg)

Name of APIs	Total Quantity	Stock in Hand	Approx Months of Stocks	%age Imported from China
Penicillin G	28.8	2.4	0.8 – 1.0	100%
Levodopa	0.1	0.1	>3	100%
Streptomycin	0.1	0.1	>3	100%
Meropenem	0.1	0.1	2.0 – 2.2	100%
Carbidopa	<0.1	<0.1	>3	100%
Gentamycin	<0.1	<0.1	>3	100%
Progesterone	<0.1	<0.1	>3	100%
Vancomycin	<0.1	<0.1	>3	100%
Tetracycline	1.2	0.1	1.0 – 1.1	77%
Potassium Clavulanate	2.3	0.4	1.5 – 1.6	69%
Others	19	6.7		7%

Note: Data is for the period April 2019 to January 2020

Source: IPA member companies

Challenges faced by the Indian API industry

Indian API manufacturers lost competitive edge to manufacture lower end of the spectrum of APIs and fermentation technologies

01 **Stricter implementation of pollution control norms:**

This is leading to higher costs of manufacturing APIs in India. Under the current norms, companies have to go through a fresh approval process every time they want to make a change in the product mix, a process that can take as long as 4 months. For increase in production or addition of equipment, it could be 8 months or even more.

02 **Interpretation of the DPCO 2013**

In order to cope up with decisions related to scheduled vs non-scheduled formulations, new drugs, demand notices for overcharging etc. Indian pharma companies were forced to evolve business strategies to move up the value chain and focus on commercially attractive segments like finished formulations and complex-to-manufacture APIs. And, local formulation players thus started sourcing raw materials and simple APIs from cost-competitive locations like China which has also led to increased dependence on single source and huge fluctuations in the API prices.

03 **No tax incentives, higher utilities and borrowing cost**

Non availability of Tax Incentives to boost API parks, higher borrowing and utilities cost (eg. Electricity, water, steam) and low import duties has lead to cheaper imports from giant plants in China, which enjoyed economies of scale .

04 **Lack of mega bulk drug park**

Lack of large sized clusters for bulk drug manufacturing having common facilities for pollution control, effluent treatment, and single environmental clearance which leads to higher capex requirement

05 **Issues faced by fermentation industry**

Initially huge capacity was created by both public and private sector to cater to growing demand. However, because of the cheap rates, substantial quantity was being imported from China which forced local manufacturers to shut down operations as it was commercially unviable for them

China being the sole manufacturer of penicillin, has started manufacturing intermediates from penicillin G like 6APA.7ADCA,7ACCA and therefore has strategically priced penicillin, which makes even the production of intermediates uneconomical in India.

Source: PwC paper on Impact of rising API price on IPM, Industry sources

Inherent advantage of the Chinese API industry

Economies of scale and government support in form of infrastructure and subsides are the key drivers

15%
Y-o-Y growth of industry

20%
Global API Output by volume

2000+
API Molecules

5x
Increase in number of manufacturers in 5 years

Economies of scale leading to lower set-up & Production costs (15–20% lower cost)

- **10–15x large SEZ** in size that of Indian SEZs
- **Logistics costs: 1% of total costs in China vs. 3% for India**
- Over 1000 API manufacturers vs. 300-400 in India

Supportive R&D Ecosystem
USD 1.6 B Invested by the government

Creation of a research ecosystem:

- "Thousand Talents Plan", attracted over 50,000 PhDs through generous funding support (up to USD 75,000/year)
- Strong industry and academia partnerships

Financial assistance, ~13% tax incentives and soft loans

- **Borrowing costs: 5–7% vs. 11–14% in India**
- **~13% tax incentives** for the export of APIs
- **Exemption from various taxes** and low to **no import duties**

Liberal policies and cheaper utilities

- **Electricity costs half** compared to India
- **Steam 40-50% cheaper** from India
- Relatively **liberal pollution norms**

Source: Industry sources

Key APIs & Intermediates from China having high demand in India

API & Intermediates Imported more frequently from China & lack manufacturing capability in India

Name of API	Intermediates
Ascorbic Acid	Atorvastatin
Aspartame	Ciprofloxacin
Rifampicin	Cephalosporins
Doxycycline	Chloroquine
Tazobactum acid	Gabapentin
Steroids	Montelukast
Antipyretic	Telmisartan
Analgesics	Olmesartan
Amino acids	

Approx. API/Intermediates Imports from China by Value

Name of API	Value in USD (mn)
Paracetamol	116
Metformin	63
Ranitidine	12
Amoxicillin	104
Ciprofloxacin	59
Cefixime	16
Acetyl salicylic a.	5
Ascorbic acid	13
Ofloxacin	23
Ibuprofen	16
Ampicillin	92
Metronidazole	14

Import of Penicillin G
(Essential API for manufacturing several antibiotics from China)

Penicillin G	6000 ton

Source: Zhanwang Pharma, IDMA

High dependence on single source can have a cascading effect in such events

High Dependence on China

Chinese APIs account for ~70% of all imported APIs in volume terms

Supply disruption and Cost trends in China

Prices of most commonly used APIs have shot up anywhere between 50% and 200%. This is due to increasing wages and other costs in China and scenarios like Corona outbreak and impurity related issues

Rise in Formulation Prices and Drop in Margins

Prices of drugs shoot up to meet with high API costs

Increasing healthcare costs and decrease in Capex

Cost of treatment for patient shoots up
Pharma firms drop capex

- Drug Shortages
- High cost
- Job Cuts
- Increased healthcare burden
- Shutdown of companies

Source: PwC Analysis, Industry Sources

Recommendations to revive the Indian API Industry

India needs a holistic and conducive ecosystem to capitalise the full potential of its API manufacturing capabilities.

Favorable policies and financial & regulatory ecosystem are likely to enable the API industry to ensure health security in India by becoming self reliant.

Recommendations

Immediate

- Faster environment clearance
- Encourage manufacturing of key APIs/Intermediates and Fermentation products by giving fiscal stimulus
- Accommodative pricing policy under DPCO 13
- Financial incentives

Long Term

- Develop large clusters and provide plug-and-play infrastructural support in dedicated zones for manufacturing APIs
- Industry academia initiatives
- Facilitate alternate source of import

Source: Industry sources, IPA paper, Katoch committee report

Recommendations (Immediate) 1/2

1. Faster environment clearance

- The approval process could be brought down to 2 months as such delays in approval process adversely impact industry competitiveness both domestically and in export markets.
- Change in the product mix (API and intermediates) should be freely permitted if the chemical effluents approved to be processed in effluent treatment plants are all covered. Environmental clearances should be given for categories (broader baskets) and not for individual drugs
- There should be no restrictions on quantity produced as long as the overall pollution load is not breached
- Deep sea discharge norms for fermentation products to rationalized as per the global best practices

2. Encourage manufacturing by giving fiscal stimulus

For API and Intermediates

- Incentivise production of key identified APIs and intermediates where dependence on China is very high.
- Provide 12% subsidy on the overall production value of these APIs/ Intermediates with a criteria of minimum threshold on investment value (~100 cr) in any greenfield or brownfield project and a minimum threshold on production value (~250 cr) by 3rd year of operation
- Tariff on currently imported products to ensure viability of greenfield projects.

For Fermentation Products

- India has completely lost its relevance in fermentation products to China because of cheaper imports. Moreover, setting-up a fermentation plant also requires a very high capital investments and hence needs special attention
- Provide 30% subsidy on overall production value with minimum threshold on both investment and production value
- Provide few other subsidies in-line with fiscal incentives provided under electronics policy like wage reimbursement, capital subsidy and electricity at Rs 2/kWh

Source: Industry sources, IPA paper, Katoch committee report, Electronics Policy

Recommendations (Immediate) 2/2

3. Accommodative pricing policy under DPCO 2013

- While some of the policy changes may take time, we need to increase demand for domestic API by incentivizing formulation manufacturers
- The formulations under scheduled I to the DPCO 2013, which are priced under INR 5 per unit could be excluded from price control
- Upward revision on price cap for all the impacted formulations where API prices have increased substantially. Recently, there was an upward revision on price cap for 21 such formulations using Para 19

4. Financial incentives

- Industry to be provided infrastructure status to enable ease of financing.
- Cost of electricity and water to be cut by 50% for 5 years.

Source: Industry sources, IPA paper, Katoch committee report

Recommendations (Long Term)

1. **Develop large clusters and provide plug-and-play infrastructural support in dedicated zones for manufacturing APIs**

- Constructing 2-3 large sized dedicated zones and leasing them to private players for operating manufacturing plants.
- Setting up common utilities such as solvent recovery and distillation plants, power and steam units, effluent treatment plants, common logistics centers, regulatory infrastructure and warehousing to make smaller units economically viable in these zones.
- Following support can be looked at to encourage investments in mega parks
    - Stamp duty waiver
    - 50% subsidy on water and electricity for 5 years
    - SGST reimbursement – 75% for 5 years
    - 50% subsidy on the expenses incurred for quality certification / patent registration
    - Waiver on development charges, currently it is 9% of property cost
- Evaluate strategic locations for these mega parks, eg Union territories, where center can play a larger role to control cost like cost of land, utilities, etc

2. **Industry academia initiative**

- Facilitate collaborations with institutions like NIPER, CSIR labs and universities to improve process technologies (e.g., yield improvement, etc)

3. **Facilitate alternate sources of Import**

- For APIs and intermediates of high strategic importance that cannot be manufactured domestically, due to lack of either raw materials or concerns relating to environmental hazards, the government needs to adopt alternative sources.
- Initiatives to promote imports of intermediates and APIs from multiple sources to reduce monopoly in imports. 10% of additional subsidy can be provided if the imports are from sources other than China

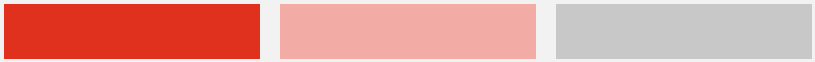
Source: Industry sources, IPA paper, Katoch committee report

Conclusion

- The Indian API industry has been struggling for a long time because of high dependence on China, which accounts for almost 100% of the total imports. Because of this, API prices have been very volatile and we have seen prices of APIs going up by more than 100% in recent past.
- High dependence on a single source can have significant adverse impact in emergency-like situations. In context of the recent coronavirus outbreak, it has the potential of disrupting supplies of essential medicines, resulting in price volatility and ultimately leading to a situation where medicines are not available to patients.
- It is time we revive our domestic API industry, which has been deeply affected because of certain policies like stricter implementation of pollution control norms, implementation of the DPCO 2013, lower import duties and complete collapse of the indigenous fermentation industry.
- India needs a holistic and conducive ecosystem to rebuild its API manufacturing capabilities, which would require favourable policies from the government and a supportive financial ecosystem to boost private and foreign investment.
- In the immediate term, suggested changes around pricing policy, along with some financial incentives and faster approvals on environmental clearances can give required boost to the API industry. In the slightly longer term, the government may look at the Chinese model and work on developing clusters for API and fermentation along with looking for ways to encourage alternate sources.

Appendix

Supply Risk Assessment - API of key therapy areas



Therapy wise Risk Assessment	Zhejiang	Hubei	Jiangsu	Guangdong	Beijing	Tianjin	Shandong	Shanghai	Chongqing	Jiangxi	Henan	Hebei
Anti-Infective												
Pain/Analgesic												
Anti inflammatory (Corticosteroid)												
Respiratory												
Oncology												
CVS												
Neuro/CNS												
Hematology												
Diabetology												
Gastroenterology												
Vitamin & Minerals												
Dermatology												
Hormone												

	Zhejiang	Hubei	Jiangsu	Guangdong	Beijing	Tianjin	Shandong	Shanghai	Chongqing	Jiangxi	Henan	Hebei
FDA Approved API Manufacturing site (380)	69	25	60	14	12	10	39	16	10	8	8	15
FDA Approved FDF Manufacturing site (300)	19	12	44	38	9	9	18	19	3	7	4	4

Source: Industry sources

Stocking details of top APIs

- **Number of APIs analysed:** 68
- **Number of pharma companies covered:** 19
- **Top 10 APIs constitute 90% of the total quantity of APIs**
- **Approximately 50% of APIs are imported**

Name of API	Quantity imported (in lakh kg)	Quantity purchased domestically (in lakh kg)	Quantity from traders (in lakh kg)	Total quantity (in lakh kg)	Stock in hand (in lakh kg)
Penicillin G	28.8	-	-	28.8	2.4
Paracetamol	0.6	15.3	0.8	16.6	4.0
Amoxicillin	0.2	6.4	<0.1	6.6	1.2
Ciprofloxacin	<0.1	6.2	-	6.3	0.9
Mannitol	-	-	3.0	3.0	0.8
Citric Acid	-	2.3	<0.1	2.3	1.5
Potassium clavulanate	2.0	-	0.2	2.2	0.4
Azithromycin	1.3	0.3	0.5	2.1	0.3
Metronidazole	0.8	0.5	<0.1	1.3	0.6
Tetracycline	0.9	0.3	<0.1	1.2	0.1
Others	1.0	6.8	0.9	8.6	3.9
	35.6	**38**	**5.4**	**79**	**16.2**

Note: Data is for the period of April 2019–January 2020

Source: IPA member companies

Top APIs imported from China

- **Imports from China comprise approximately 45% of the total quantity and more than 95% of the total imported quantity**
- **For 8 out of 68 APIs, India relies solely on imports from China. They are penicillin G, levodopa, streptomycin, meropenem, carbidopa, vancomycin, gentamycin and progesterone.**

Name of API	Quantity imported from China (in lakh kg)	Quantity imported from other countries (in lakh kg)	Total quantity (in lakh kg)	Total percentage imported from China	Stock in hand (in lakh kg)
Penicillin G	28.8	-	28.8	100%	2.4
Potassium Clavulanate	1.6	0.5	2.3	69%	0.4
Azithromycin	1.3	<0.1	2.1	62%	0.3
Tetracycline	0.9	-	1.2	77%	0.1
Metronidazole	0.8	<0.1	1.3	60%	0.6
Paracetamol	0.5	<0.1	16.6	3%	4.0
Acyclovir	0.2	-	0.3	66%	0.3
Amoxicillin	0.2	<0.1	6.6	3%	1.2
Levofloxacin	0.1	-	0.9	15%	0.1
Levodopa	0.1	-	0.1	100%	0.1
Others	0.5	<0.1	19	3%	6.7
	35	**0.6**	**79**	**45%**	**16.2**

Note: Data is for the period of April 2019–January 2020

Source: IPA member companies

Top APIs manufactured domestically

- **APIs manufactured domestically constitute approximately 50% of the total quantity.**
- **However, KSMs for these APIs may not be produced domestically.**

Name of API	Quantity produced domestically (in lakh kg)	Quantity imported from China (in lakh kg)	Total quantity (in lakh kg)	Percentage manufactured domestically	Stock in hand (in lakh kg)
Paracetamol	15.3	0.5	16.6	92%	4.0
Amoxicillin	6.4	0.2	6.6	97%	1.2
Ciprofloxacin	6.2	0.1	6.3	99%	1.0
Citric Acid	2.3	0.0	2.3	100%	1.5
Erythromycin	1.0	0.0	1.0	100%	0.1
Ceftriaxone sodium	0.9	0.0	1.0	98%	0.1
Levofloxacin	0.6	0.1	0.9	67%	0.1
Telmisartan	0.5	0.0	0.5	100%	0.3
Metronidazole	0.5	0.8	1.3	38%	0.6
Diclofenac sodium	0.5	0.0	0.5	100%	1.1
Others	3.7	33.3	42.1	9%	6.2
	38	**35**	**79.1**	**50%**	

Note: Data is for the period of April 2019–January 2020

Source: IPA member companies

List of major intermediates imported from China

S. no.	Name of intermediate	Name of API synthesised
1	Cyanoacetic Acid	Caffeine
2	L-aminodiol	Chloramphenicol
3	Azithromycin amine	Azithromycin
4	MCPSA and DCMP	Sulfadoxine
5	Cyclopropylamine	Ciprofloxacin
6	DCDA	Metformin
7	DCFA – 2, 4-Dichloro-5-flourobenzoyl chloride	Ciprofloxacin
8	2, 3, 4, 5–tetrafluoro benzoyl chloride	Levofloxacin ester Ofloxacin ester
9	L-Alaninol	Levofloxacin ester
10	DL-Alaninol	Ofloxacin ester
11	6 APA	Ampicillin and Amoxicillin
12	7 ACA	Cephalosporins

S. no.	Name of intermediate	Name of API synthesised
13	(S,S)-2, 8 Diazabicyclo [4, 3, 0] Nonane	Moxifloxacin
14	4-Cyanopyridine	Ethionamide Protionamide
15	4-Amino-5-(aminomethyl)-2-methyl pyrimidine	Vitamin B1 Hcl
16	4-Methyl-5-ethoxyloxazole	Vitamin B6 Hcl
17	2-isopropyl-4, 7-dihydro-(1,3)-dioxepin	Vitamin B6 Hcl
18	2–mercaptothiazoline	Cysteamine Hcl
19	3-Cyanopyridine	Niacin
20	Beta Picoline	Niacin
21	Ethyl 3-(N,N dimethyl amino) acrylate	Ciprofloxacin

Source: IDMA

Price increase of select APIs in past 2 months – since the outbreak of Coronavirus

S. no.	Name of API	Price Increase
1	ORNIDAZOLE	66%
2	MEGLUMINE	50%
3	METHYLCOBALAMIN	50%
4	CIPROFLOXACIN	37%
5	DICLOFENAC SODIUM	22%
6	LOSARTAN K	18%
7	ATORVASTATIN	17%
8	LORATIDINE	15%
9	PANTOPRAZOLE	13%
10	CLOTRIMAZOLE	13%
11	TELMISARTAN	10%
12	METHYL PREDNISOLONE	6%
13	SILVER SULPHADIAZINE	5%

Source: Industry Sources

Key fermentation based API impacted due no domestic production base

Sl. No.	Name of Bulk Drug	Producers	Production Commenced	Present Status
1	Penicillin G/V	Alembic, Sarabhai, IDPL,JK Torrent, Ranbaxy, Standard	In early 60's	Plant stopped
2	Streptomycine	Alembic, Sarabhai, IDPL	In early 60's	Plant stopped
3	Tetracycline	Sarabhai, IDPL, Pfizer	In early 80's	Plant stopped
4	Oxytetracycline	Sarabhai, IDPL, Pfizer	In early 80's	Plant stopped
5	Kanamycin	Alembic	In early 70's	Plant stopped
6	Erythromycin	Alembic, Themis, IDPL, Standard	In early 80's	Partially in operation for captive production for safety.
7	Rifamycin	Themis^, Lupin^^, San-doz^^	Late 80's	Closed^,Captive^^
8	Gentamycin	HAL, Themis	Late 80's	Closed
9	Sisomycin	Themis	Late 80's	Closed
10	Vitamin B12	Themis, Alembic, MSD	Early 70's	Closed

Source: Ministry of Health - India

Key fiscal incentives under Electronics Policy (2014 – 2020)

Incentives	Description
STAMP DUTY, TRANSFER DUTY AND REGISTRATION FEE	100% reimbursement of Stamp Duty, Transfer Duty, and Registration Fee paid on sale/lease deeds on the first transaction, and 50% thereof on the second transaction
VAT/CST	100% tax reimbursement for a period of 10 years, subject to a maximum of 100% of fixed capital investment other than land
ELECTRICITY DUTY	100% exemption for 5 years from commencement of commercial operations (CoCO) for new electronic hardware units
POWER SUBSIDY	50% to micro, 40% to small, 25% to medium, and 10% to large-scale industry, limited to ₹50 lakh for a period of 5 years from date of CoCO
CAPITAL SUBSIDY	10% of total investment upto ₹5 crore (investment as defined in Indian Companies Act 1956)
INTEREST SUBSIDY	5% for a period of 7 years, subject to a maximum of ₹1 crore per annum per unit
LAND COST	25% rebate on land cost limited to ₹10 lakh per acre
INVESTMENT SUBSIDY	20% limited to ₹20 lakh for MSME, and additional 5% investment subsidy, for women/SC/ST Entrepreneurs

Source: Department of Industries – Government of Andhra Pradesh

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