



MARKET STUDY ON ANTI-POLLUTION MASKS IN DELHI AND NCR REGION

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TABLE OF CONTENTS

1. RESEARCH OBJECTIVES AND SCOPE _____	6
1.1. RESEARCH OBJECTIVE _____	6
1.2. RESEARCH SCOPE _____	6
2. RESEARCH METHODOLOGY _____	7
2.1. SURVEY _____	7
2.1.1. LIMITATIONS _____	7
2.2. COMPETITIVE ASSESSMENT _____	7
2.2.1. RESEARCH PROCESS _____	7
2.2.2. MARKET SIZE ESTIMATION _____	9
3. MARKET INSIGHTS _____	10
3.1. INTRODUCTION _____	10
3.2. MARKET DYNAMICS _____	10
3.2.1. DRIVERS _____	10
3.2.1.1. RISE IN POLLUTION LEVELS IN THE NATIONAL CAPITAL _____	10
3.2.1.2. RISE IN HEALTH AWARENESS LEVELS _____	12
3.2.1.3. INCREASE IN GOVERNMENT INITIATIVES _____	12
3.2.1.4. EFFECTS OF POLLUTION ON PRODUCTIVITY _____	12
3.2.2. CHALLENGES _____	14
3.2.2.1. SOCIAL STIGMA ASSOCIATED WITH WEARING POLLUTION MASKS _____	14
3.2.2.2. LACK OF AWARENESS REGARDING TYPES OF POLLUTION MASKS _____	14
3.2.2.3. HIGH PRICE OF POLLUTION MASKS _____	14
3.2.3. TRENDS _____	14
3.2.3.1. TECHNOLOGICAL ADVANCEMENTS PERTAINING TO POLLUTION MASKS _____	14
3.2.3.2. GROWING TREND REGARDING DESIGNER POLLUTION MASKS _____	15
4. ANTI-POLLUTION MASKS MARKET SIZE IN DELHI AND NCR REGION _____	16

4.1. INTRODUCTION	16
5. COMPETITIVE ASSESSMENT	17
5.1. MARKET SHARE ANALYSIS	17
5.2. PRODUCT ANALYSIS	17
6. CURRENT AND HISTORICAL MEASURES TO CURB POLLUTION IN DELHI	23
6.1. RECENT INITIATIVES	23
6.1.1. ODD EVEN SCHEME	23
6.1.2. JUDICIARY DIRECTIVES	23
6.1.3. RESTRICTION ON INDUSTRIAL ACTIVITIES	23
6.1.4. INCREASE IN THE NUMBER OF PUBLIC TRANSPORT AVAILABILITY	23
6.2. HISTORICAL MEASURES	23
7. APPENDIX	25
7.1. QUESTIONNAIRE	25
7.2. INDUSTRY QUOTES	28
8. REFERENCES: -	29

LIST OF TABLES

TABLE 1	DEEP DIVE ASSESSMENT OF KEY PRODUCTS AND THEIR FEATURES	17
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LIST OF FIGURES

FIGURE 1 SURVEY METHODOLOGY	7
FIGURE 2 COMPETITIVE ASSESSMENT METHODOLOGY	8
FIGURE 3 MARKET SIZE ESTIMATION	8
FIGURE 4 INTERVIEW PROCESS	9
FIGURE 5 AIR QUALITY IN DELHI (2012-2018)	10
FIGURE 6 LOSS IN LIFE EXPECTANCY ON ACCOUNT OF AIR POLLUTION (IN MONTHS)	12
FIGURE 7 DELHI AND NCR ANTI-POLLUTION MASKS MARKET SIZE, 2018–2023 (INR CRORES).....	16
FIGURE 8 DELHI AND NCR ANTI-POLLUTION MASKS MARKET SHARE ANALYSIS, BY KEY PLAYERS, 2018	17

ACRONYMS

Acronym	Description
AQI	Air Quality Index
CNG	Compressed Natural Gas
DTC	Delhi Transport Corporation
NCR	National Capital Region
NGT	National Green Tribunal
PM	particulate matter
PUC	Pollution Under Control

1. RESEARCH OBJECTIVES AND SCOPE

1.1. RESEARCH OBJECTIVE

The goal of this engagement would be to provide comparative study on anti-pollution masks in Delhi and NCR region. Deeper understanding of different products available in the market and understand the need gap analysis.

1.2. RESEARCH SCOPE

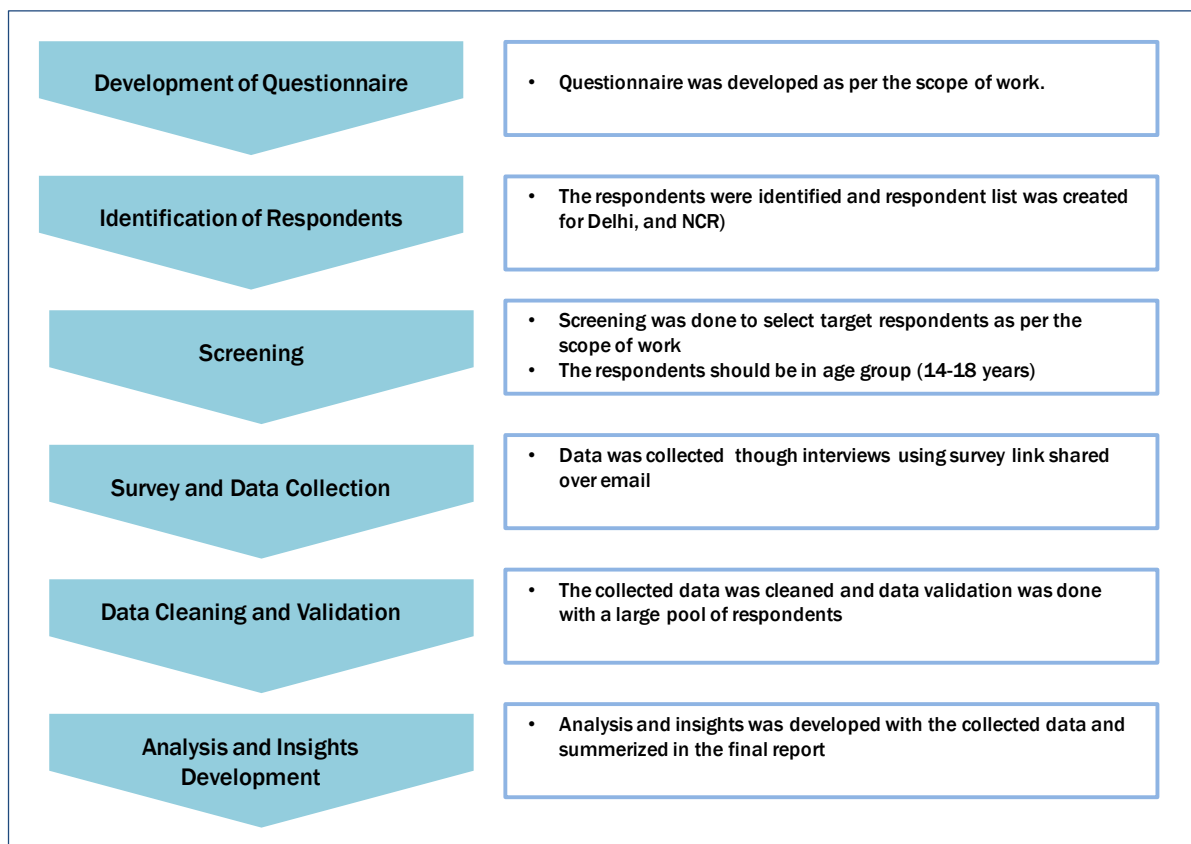
- Target Region - Delhi
- Preparation of questionnaire and conduct survey to understand need and usage of anti-pollution masks in Delhi (Sample Size = 100)
- Provide subsequent analysis based on survey response
- To determine addressable market for anti-pollution masks in Delhi (Forecast up to next five years)
- Market insights and trends (Including key growth drivers, trends and challenges)
- Competitive Assessment
 - Deep dive assessment of key products (N95, Surgical Masks, Nasofilters and others)
 - Product features and comparative analysis
- Current and historical measures to curb pollution in Delhi

2. RESEARCH METHODOLOGY

2.1. SURVEY

- ✓ To conduct survey among high school students with age group 14-18 years in different schools/colleges in Delhi and NCR
- ✓ The survey to be conducted with a sample size of 100 students using pollution masks (N95, N99, Nasofilters, and other). The sample size will be distributed evenly by type of pollution masks
- ✓ The questionnaire contains a mix of closed-ended and open-ended questions

FIGURE 1 SURVEY METHODOLOGY



2.1.1. LIMITATIONS

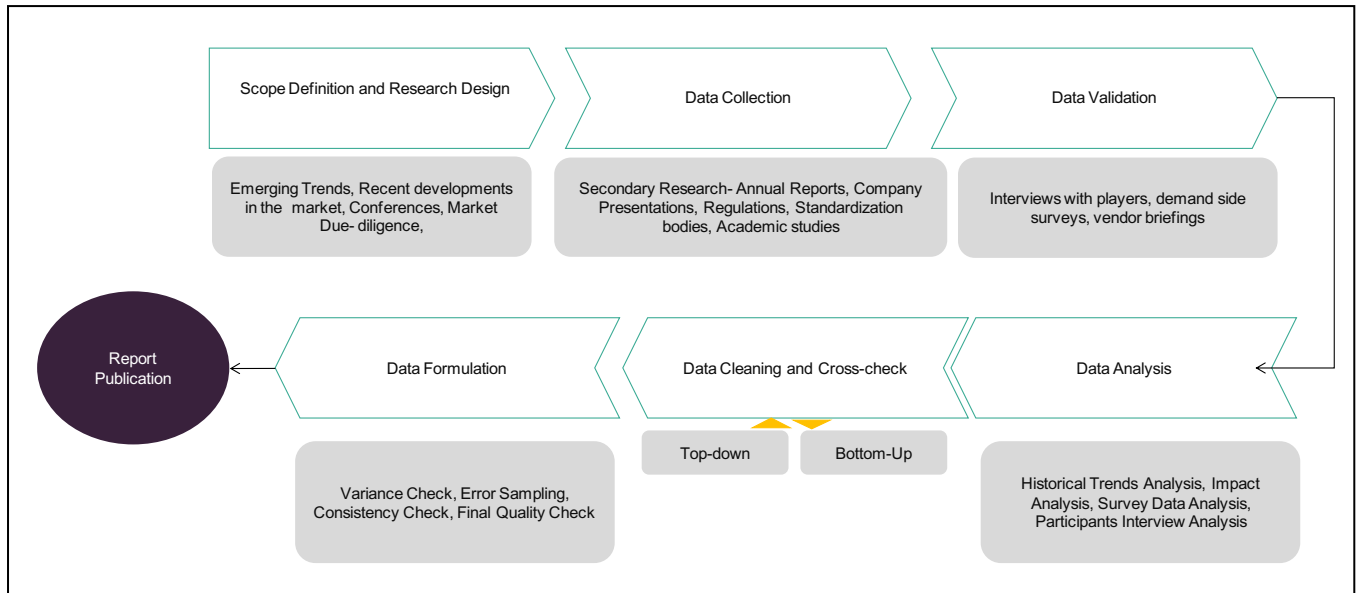
- ✓ The survey will be conducted in Delhi and National Capital Region. It is based on random sampling and the target group of the survey respondents is not defined. The questionnaire will be administered with the respondents who will volunteer and provide consent to our field researches
- ✓ The identity and contact details of the respondents will be revealed based on their consent

2.2. COMPETITIVE ASSESSMENT

2.2.1. RESEARCH PROCESS

- ✓ Our research methodology is governed by a six-step process: Scope Definition and Research Design, Data Collection, Data Validation, Data Analysis, Data Formulation, and Data Publication.

FIGURE 2 COMPETITIVE ASSESSMENT METHODOLOGY

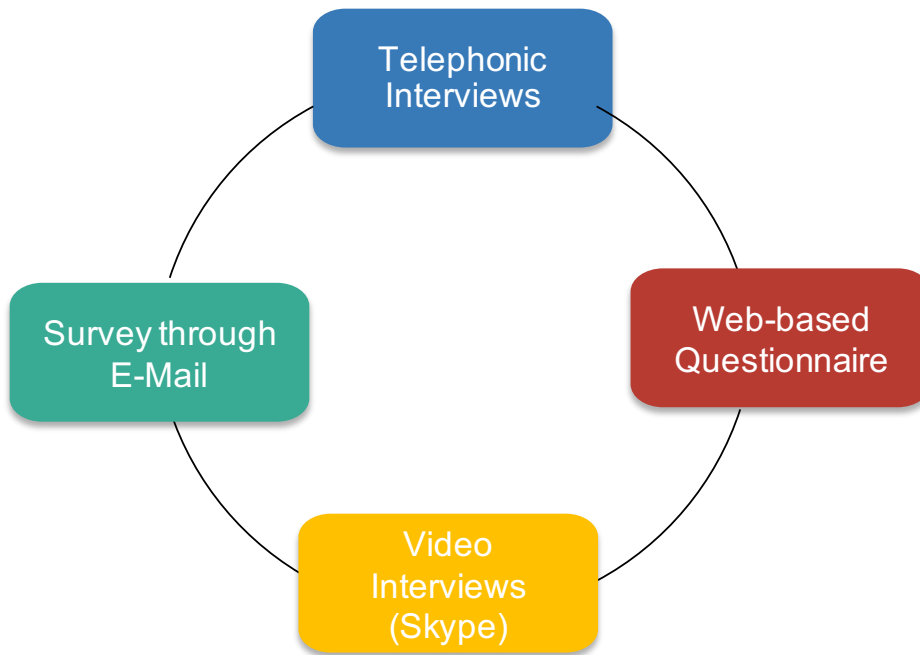


- ✓ The rigorous period of information will be gathered from both secondary and primary sources through several interviews with key industry participants from demand and supply side, channel players, regulators, and standardization bodies. Data gathered from these interviews and surveys will be further analysed and engineered to understand competitive landscape and estimate market sizes and forecasts.

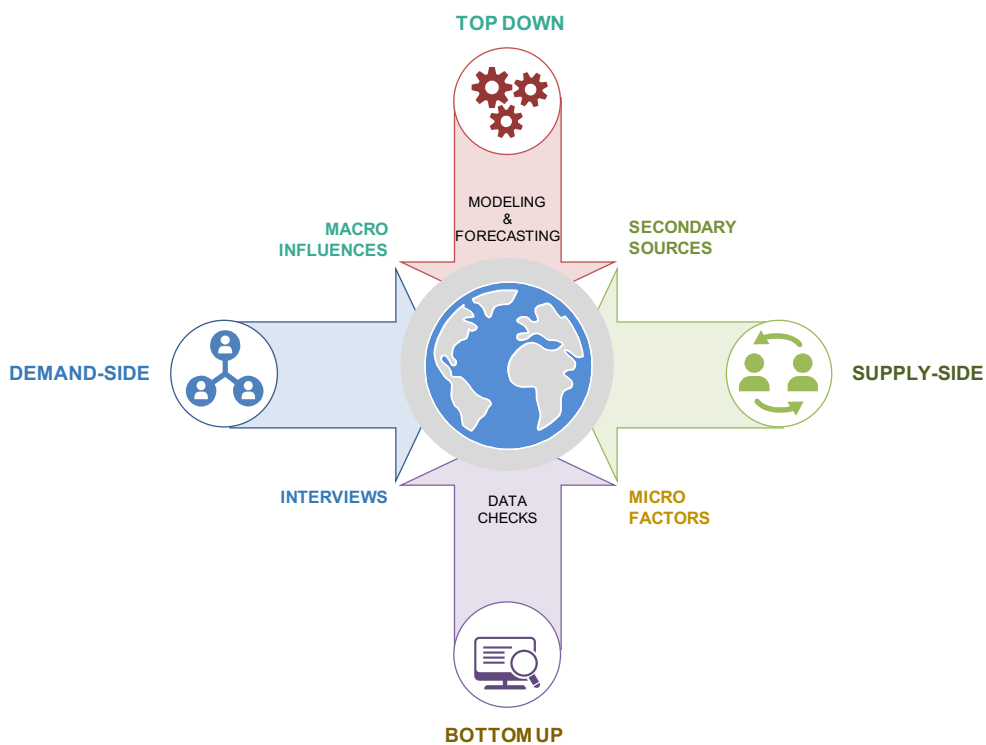
FIGURE 3 MARKET SIZE ESTIMATION

- ✓ In the primary research process for this research study, the industry experts such as Marketing Directors, Business Managers, Marketing Managers, and related key executives from various key companies and organizations throughout the value chain across the globe have been interviewed, to obtain and verify both qualitative and quantitative aspects of this research study.

FIGURE 4 INTERVIEW PROCESS



2.2.2. MARKET SIZE ESTIMATION

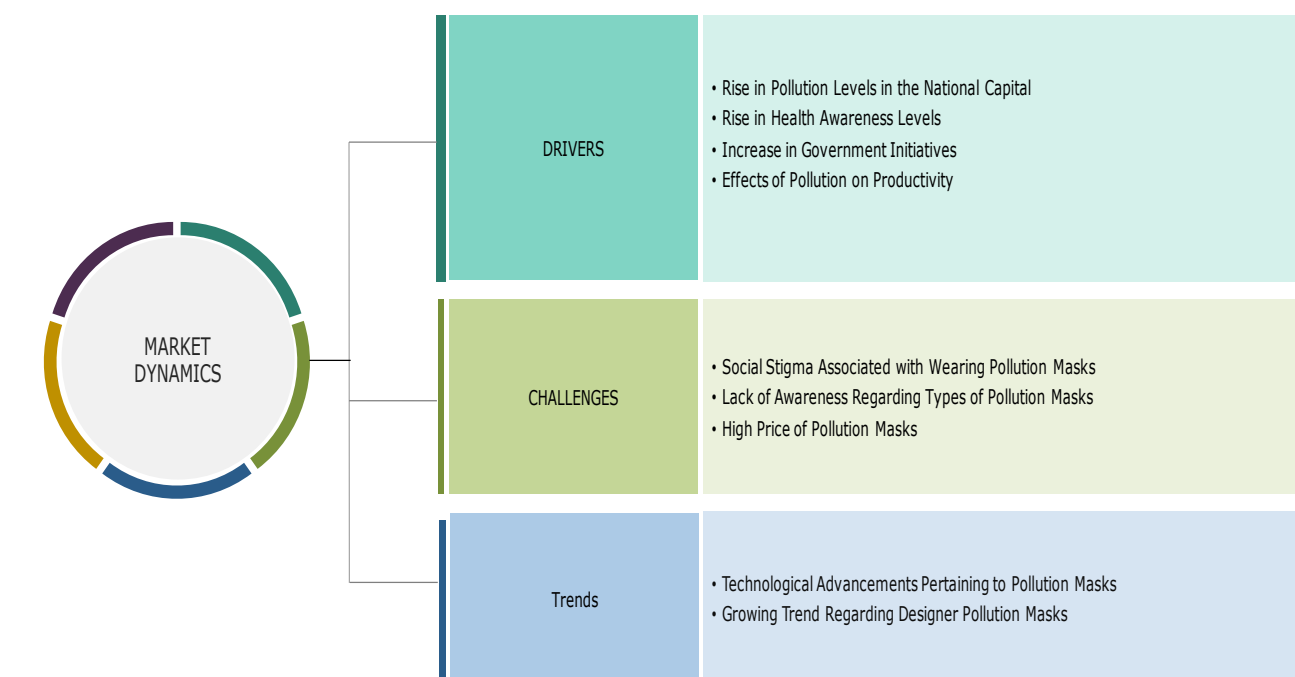


3. MARKET INSIGHTS

3.1. INTRODUCTION

The anti-pollution masks market in Delhi and NCR region was valued at INR 28.2 Crores in 2018 and is estimated to reach INR 64.9 Crores in 2023, growing at a CAGR of 18.1% during the forecast period. The growth of this market is mainly attributed to the rise in pollution levels in the national capital, rise in health awareness levels, increase in government initiatives, effects of pollution on productivity. However, the market is impeded by social stigma associated with wearing pollution masks, lack of awareness regarding types of pollution masks, high price of pollution masks.

3.2. MARKET DYNAMICS

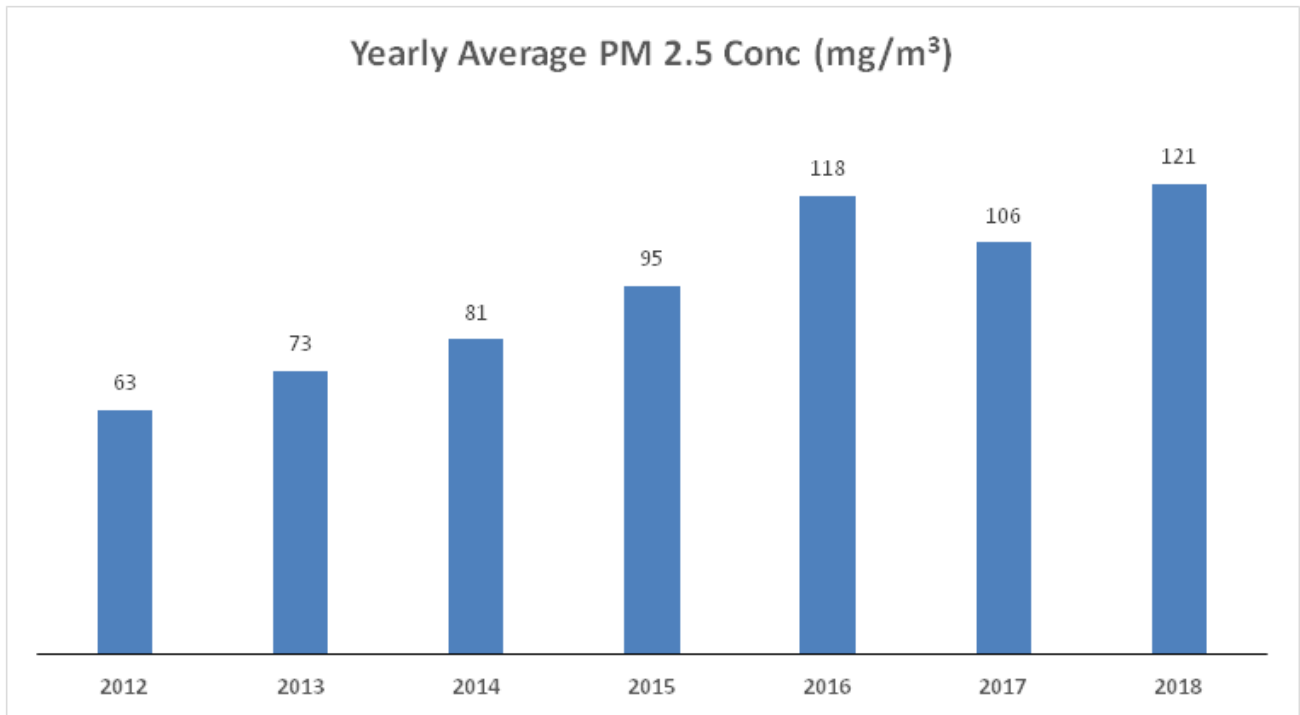


3.2.1. DRIVERS

3.2.1.1. RISE IN POLLUTION LEVELS IN THE NATIONAL CAPITAL

According to a survey by the WHO in 2015, the air quality in New Delhi has been ranked as the worst of any major city in the world, out of a total of 1,650 participating cities. One of the major reason behind the rising pollution levels in the national capital region is motor vehicle emissions. The fast-paced urbanization of the region has subsequently resulted in rapid growth in the number of motor vehicles. According to the National Transport Department, the number of registered vehicles in Delhi has reached around 7.6 million in 2018, registering a growth rate of 14% per annum since 1994. About two-third of the motor vehicles are two-wheelers. The pollution from these vehicles is a major source of air pollution in the region. This has led to the reaching of the air quality to extreme hazardous levels in worst days and hence acts as a driving force behind the increase in utilization of pollution masks in the region.

FIGURE 5 AIR QUALITY IN DELHI (2012-2018)



Source: CPCB

Another factor that plays a major role in the smog situation in Delhi is the stubble burning from adjoining states such as Punjab and Haryana. The practice of stubble burning in the states of Punjab, Haryana and Uttar Pradesh makes up much of the hazardous smog that envelops Delhi during winters. This results in the Air Quality Index (AQI) in the city reaching the severe to hazardous mark many a times, and further leading to the declaration of a public health emergency in November 2019. This leads to worsening of the air quality in the city and adjoining regions, prompting the surge in adoption of pollution masks by the population. Moreover, heavy metal rich firecrackers, usage of wood and crop burning, and the emissions from wet cooling towers are also the source of pollutants in the form of particulate matters contributing towards air pollution.

3.2.1.2. RISE IN HEALTH AWARENESS LEVELS

With the rise in pollution levels in the National Capital Region, the general population has been subjected to various health hazards. This has led to the adoption of various protective measures such as staying indoors with air purifiers, avoiding physical activity during severely polluted days, and reducing smoke production. One of the most effective and cost containment measure is the use of pollution masks to prevent health hazards.

The rise in pollution levels in the region has led to various ailments including the onset of allergies or aggravation in existing allergies, decrease in lung immunity, uncontrollable or chronic coughing, wheezing, and shortness of breath. Moreover, prevalence of current asthma (in the last 12 months) and physician-diagnosed asthma in Delhi is significantly higher than in other states. Besides these, non-respiratory effects have also been noticed to be more in Delhi than in other regions. Moreover, Delhi has significantly higher levels of chronic headache, eye irritation and skin irritation. With these health hazards reaching to an increasing population year on year, there has been a rise in public awareness regarding the smog situation in Delhi, and ways to curb the harmful effects on individual. This in turn, has led to an increase adoption of pollution masks, being an inexpensive tool to protect from particulate matter without hinderance in routine activities.

3.2.1.3. INCREASE IN GOVERNMENT INITIATIVES

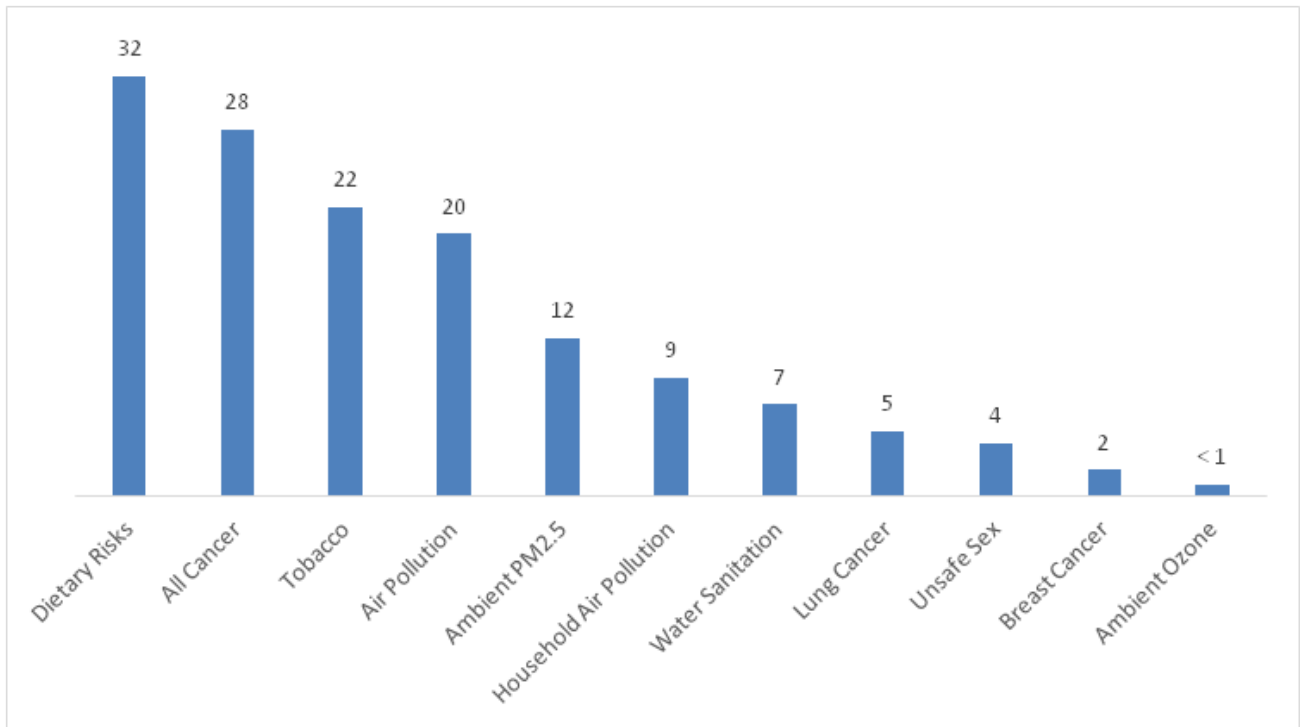
Delhi, the national capital region, has been receiving attention from the past few years pertaining to soaring air quality index (AQI) resulting in hazardous air quality. This has forced the Delhi government to take significant initiatives to prevent severe consequences caused due to particulate matter (PM). The rising pollution in the city have increased the need to use preventive measures to tackle hazardous air quality. One such initiative is to increase the awareness and adoptability of pollution masks.

In November 2019, 5 million pollution masks have been distributed by the Delhi government among the schools in the national capital region because of declaration of public health emergency. Further, in October 2019, the Delhi cabinet approved an expenditure of INR 35 lakhs for initiating pollution mass awareness campaigns across the national capital. The prime motive of the massive public awareness campaign initiated by the cabinet is to inform and educate the citizens about the benefits offered by the pollution masks and to participate in such mandatory measures. Such types of government initiatives and campaigns launched by the authorities is anticipated to enhance the awareness and adoptability of pollution masks among the general population, thereby increasing the demand for the same in the upcoming years.

3.2.1.4. EFFECTS OF POLLUTION ON PRODUCTIVITY

The soaring air pollution level is one of the major reason to affect the productivity of workers. Exposure to pollution during long commute hours is likely to impair regular productivity due to changes in lung functioning and cardiovascular activity. The worker's output is closely monitored daily, ensuring proper operations in an organization. Rising pollution levels increases restlessness among the workers, forcing them to take short breaks, thereby affecting organization's operations. Additionally, rising number of school leaves on account of the declaration of public healthcare emergency by the Delhi government is significantly hampering studies and physical activities.

FIGURE 6 LOSS IN LIFE EXPECTANCY ON ACCOUNT OF AIR POLLUTION (IN MONTHS)



Source: Health Effects Institute

Due to air pollution, the life expectancy is decreasing on account of inhalation of airborne particulate matter, further affecting the lungs and heart. The reducing life expectancy of people and associated diseases is the major factor contributing to lower productivity of workers and students. This has led to use of pollution masks amongst the workers and students, thereby bolstering the growth of Delhi and NCR anti-pollution masks market.

3.2.2. CHALLENGES

3.2.2.1. SOCIAL STIGMA ASSOCIATED WITH WEARING POLLUTION MASKS

Plummeting air quality to hazardous levels in Delhi have created a concern amongst residents to use precautionary measures to avoid increasing pollution. This has created a high demand for pollution masks on account of its health-related benefits. The social stigma associated with wearing pollution masks amongst residents, specially youth, is creating a hurdle in the adoption rate of pollution masks. The consciousness and reluctance among youth population for wearing pollution masks on account of public judgements have created a health concern. Further, the psychology of people pertaining to wearing masks have not changed over the years in spite of government initiatives and awareness programs. This has created a problem for the healthcare providers to control diseases such as asthma, cardiovascular problems, allergies, and cancers. The reluctance associated with wearing pollution masks among the youth, in the city is anticipated to create a major challenge for the market over the forecast period.

3.2.2.2. LACK OF AWARENESS REGARDING TYPES OF POLLUTION MASKS

Several government initiatives have been undertaken in Delhi to increase awareness and adoption of these masks. However, lack of awareness still remains amongst the residents pertaining to the use of specific mask types. Some residents of Delhi use ineffective masks for preventing air pollution which are typically inefficient to restrict particulate matters from the air. Cloth masks, surgical masks, and even handkerchiefs are being used by the residents, thereby causing serious harm to health. These are considered as a substitute available for the pollution masks which are easily available and affordable. Cloth masks are only effective to provide protection from harmful PM2.5 pollutants, offering a false sense of security to the wearer. Pollution masks such as N95 and N99 are efficient enough to restrict the particulate matter from hazardous air. Hence, the lack of awareness regarding specific pollution masks types is one of the major challenge in the market, further affecting the adoption rate of pollution masks in Delhi.

3.2.2.3. HIGH PRICE OF POLLUTION MASKS

High grade and medically certified pollution masks are recommended to be used against hazardous air pollution by the healthcare professionals. Residents with low income have difficulty to afford these masks, thereby adopting cloth and surgical masks which needs to be disposed off. Technologically advanced and certified pollution masks have a higher price tag as compared to regular surgical masks. For instance, in India, the price of N99 and N100 masks ranges between INR 180 to INR 2,000 which effectively works for approximately 6 months, if regularly used. On the other hand, P95 and R95 masks have a price tag of INR 10,900 which are needed to be frequently replaced. Therefore, the high price of efficient certified pollution masks is anticipated to restrict the adoption by the residents having low income levels, thereby creating a challenge for the market.

3.2.3. TRENDS

3.2.3.1. TECHNOLOGICAL ADVANCEMENTS PERTAINING TO POLLUTION MASKS

Companies dealing with pollution masks in India are shifting their focus to develop technologically advanced masks which could efficiently prevent the influx of particular matters, thereby providing better results. Technological advancements in the field of pollution masks has the potential to foster growth in the market on account of rising pollution levels in Delhi. Established companies along with start-ups are launching new and upgraded products amalgamating new technologies to meet the increasing demand. For instance, Honeywell provides N95 and KN95 pollution masks with 3-layer filtration technology which is efficient to block minute air particles, thereby offering filtration capacity ranging between 80% to 95%. Further, 3M offers N95, N99, and N100 based on low breathing resistance filter technology for consistent performance, providing prevention from

air particulates in hazardous air quality. Moreover, in November 2017, Nanoclean developed a cost-effective device, Nasofilters for reducing risk of respiratory diseases on account of air pollution. The Nasofilter is based on nanotechnology which sticks on the nasal orifice, thereby restricting the particulate matters. The successful incorporation of various technologies in preventive consumer products, including pollution masks offered by key market players and start-ups in India is likely to bolster the results, thereby positively affecting the market growth.

3.2.3.2. GROWING TREND REGARDING DESIGNER POLLUTION MASKS

The use of pollution mask across the city has steadily increased over the past few years. High quality masks with nanopore sized air filters are highly required to prevent the exposure of air particulates. Urban youth population have started to wear fashionable reusable masks having a carbon filter layer with an exhalation valve. With the growing penetration of designer products, there is a shift towards adoption of fashionable pollution masks.

The youth population are embracing these mask types even donning the masks intended to prevent serious health reasons. The designer masks have a quirky appearance which has now become a fashion accessory amongst youth. With the fusion of fashionable design with the utilitarian feature of pollution masks, the new generation masks are capturing the market. This prevailing trend coupled with growing preference for designer masks is majorly seen in the urban cities including Delhi, thereby supporting the growth of the anti-pollution masks market.

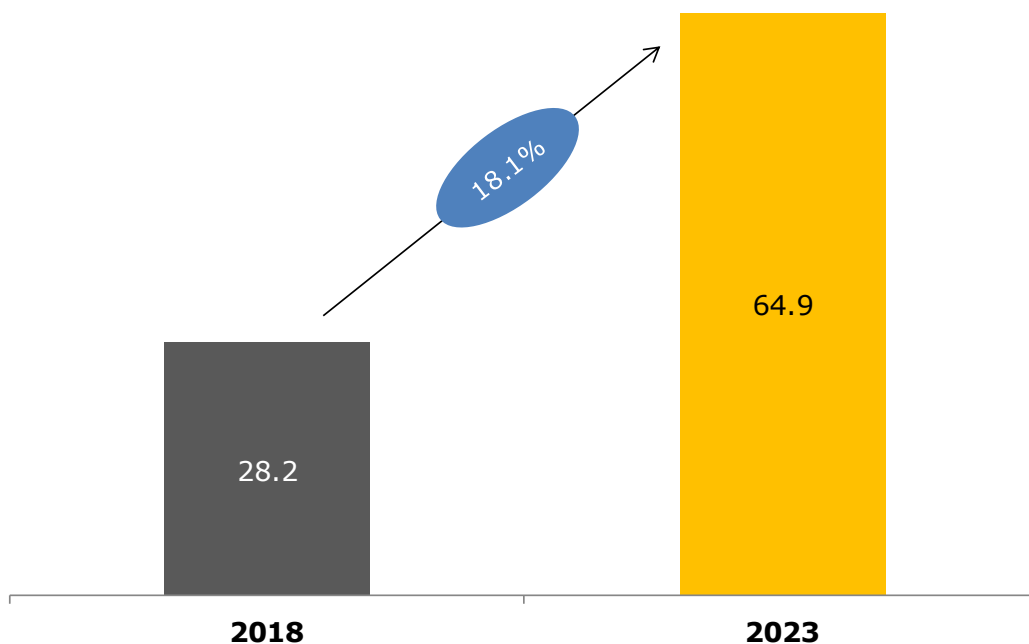
4. ANTI-POLLUTION MASKS MARKET SIZE IN DELHI AND NCR REGION

4.1. INTRODUCTION

The anti-pollution masks market in Delhi and NCR region is expected to register a significant growth rate of 18.1% during the forecast period. The market is valued at INR 28.2 crore in 2018 and is expected to reach INR 64.9 crore in 2023. Deteriorating air quality, presence of high concentration of pollutants in the air leads to high pollution levels in Delhi and NCR region, rapid urbanization, increasing demand, increasing government initiatives, and rising awareness are anticipated to fuel demand for pollution masks in Delhi in the coming years.

Increasing CO₂ emissions due to high industrial activities and expanding vehicle number, rising number of pollution masks sales through online channel and growing competition in the market are some of the other factors that are expected to boost the Delhi anti-pollution masks market in near future. 3M, Honeywell, Dettol, Xiaomi, Atlanta Healthcare, Prana Air, Vogmask, Crusaders India Pvt. Ltd, Repeller, Respokare, SmartAir, Respro (UK) Ltd, Totobobo, and Nanoclean Global Private Limited, are few of the key companies offering pollution masks in Delhi and NCR.

FIGURE 7 DELHI AND NCR ANTI-POLLUTION MASKS MARKET SIZE, 2018–2023 (INR CRORES)



Source: Company Websites, Analyst Reports, ASSOCHAM

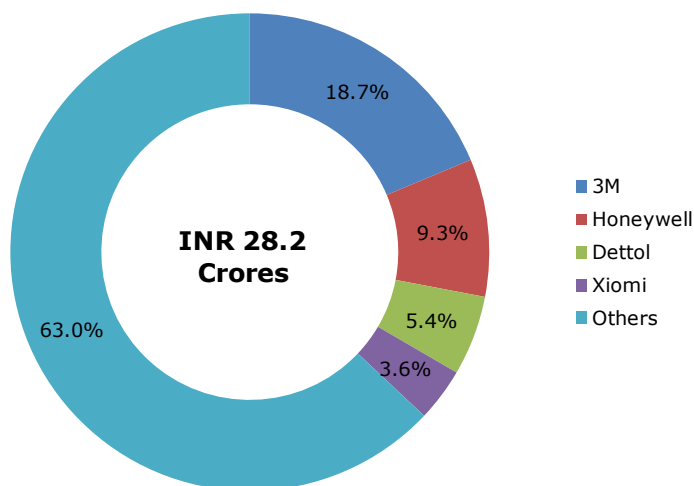
5. COMPETITIVE ASSESSMENT

5.1. MARKET SHARE ANALYSIS

The anti-pollution masks market in Delhi and NCR region is highly fragmented in nature with top four players, namely 3M, Honeywell, Dettol, and Xiomi, together accounted for the share of ~30% in 2018. These players are continuously focusing on innovating their mask features and strengthening their marketing activities in the market to increase their customer base and increase their market presence. Other manufacturers including Atlanta Healthcare, Prana Air, Vogmask, Crusaders India Pvt. Ltd, Repeller, Respokare, SmartAir, Respro (UK) Ltd, Totobobo, Nanoclean Global Private Limited, and a large number of local disposable masks manufacturers accounted for the largest share of more than 60.0% of the market in 2018.

The offline channel segment held the largest share in 2018. Widespread product availability at retail, supermarkets, hypermarkets, and chemist shops has driven this segment. Buyers can make informed choices based on information provided on the packaging and make instant purchases as per their requirement. Size, fit, and material are some of the criteria that consumers can decide on at offline stores. However, customers are shifting towards online channel, owing to lower price, better features comparison, increasing internet penetration in Delhi and NCR, and convenient purchasing options. Also, rising tendency of consumers to purchase original and branded products directly from company websites has rendered this segment highly lucrative.

FIGURE 8 DELHI AND NCR ANTI-POLLUTION MASKS MARKET SHARE ANALYSIS, BY KEY PLAYERS, 2018



Source: Company Websites

5.2. PRODUCT ANALYSIS

TABLE 1 DEEP DIVE ASSESSMENT OF KEY PRODUCTS AND THEIR FEATURES

Company	Product	Filter Type	Protection Against	Price per piece	Key Features
3M	3M 9004IN Anti-Pollution and Dust Mask		0.3-micron sodium chloride particles	135	<p>The product is designed to protect from pollutants and dust. This is a lightweight mask and also known as 3M respirator.</p> <p>The mask incorporates 3M's proprietary technology – electrostatically charged microfiber filter media.</p> <p>The innovative features of the mask help it to meet respiratory protection and comfort needs. The product comes with adjustable nose clip that provides a custom fit and secure seal and reduces the potential for eyewear fogging</p>
	3M 9000ING Anti-Pollution and Dust Mask	-	0.3-micron sodium chloride particles	18	<p>The mask is lightweight, foldable and designed to protect from pollutants and dust.</p> <p>The mask incorporates 3M's proprietary technology – electrostatically charged microfiber filter media.</p> <p>Two strap design of the mask provides a secure fit. The masks are foldable and easy to carry as well</p>
	3M Aura 9300+ Series	-	-	249	<p>The mask comes with disposable respirator and provides comfort and style with compromising performance</p> <p>The respirator used is FFP3 approved</p> <p>The product protects against dusts and mists found in wide variety of industrial applications and other work situations requiring FFP3 protection</p>
	3M Particulate Respirator 8210	N95	Non-oil-based particles	93	<p>The mask is NIOSH approved for at least 95 percent filtration efficiency against certain non-oil-based particles</p>

					<p>Two-strap design with welded dual point attachment helps provide a secure seal</p> <p>The product is recommended to be used for personnel working in industries such as commercial buildings, construction, design & construction, food processing, food safety, general manufacturing, heavy infrastructure, mining, oil & gas, transportation</p>
	3M Particulate Respirator 8271/8577	P95	Oil and non-oil-based particles	420	<p>The product is NIOSH approved for at least 95% percent filtration efficiency against certain oil and non-oil-based particles.</p> <p>It comes with braided headbands that provide a comfortable and secure seal.</p>
Honeywell	Honeywell H801	N95	PM2.5, PM0.3	40	<p>The product is a NIOSH N95 Certified single use mask without valve, with a PU nose foam seal, designed to provide exceptional fit and comfort.</p> <p>The nose clip is metallic which is easy to shape around the nose</p>
	Honeywell H801V	N95	non-toxic and low toxicity solid aerosols	200	<p>The H801V is a NIOSH N95 Certified single use mask with valve, with an EVA nose foam seal, designed to provide exceptional fit and comfort.</p> <p>The product is easy to wear with safety spectacles, goggles, giving good vision and comfort</p>
Dettol	Dettol Anti-Pollution Mask N95 Siti Shield	N95	PM2.5 Fine Particles	249	<p>This N95 anti-pollution mask has European certification with three-layer filtration of PM2.5</p> <p>The product is tested by Nelson Laboratories and filters 99% of the bacteria.</p> <p>The mask has smart valve fitted on inside of the mask for seamless outflow of exhaled air and ultra-soft fabric comes with adjustable straps with soft nose pad.</p>

					The company claims masks' face-fit has been made with 3D scanning technique suited for Asian face.
Xiomi	Mi AirPOP PM2.5 Anti-Pollution Mask	N99	PM2.5 Fine Particles	249	<p>The product provides advanced four-layer filtration and has a protective layer that blocks dirt and dust.</p> <p>The company uses a 3D soft fit sponge technology to allow the mask to automatically mold to the sides of the nose, reducing pressure on the bridge and reducing leakage.</p> <p>The mask is ideal for the people who wear eyeglasses as the mask comes with a large vortex breathing valve that quickly discharges warm air and vapor.</p>
Atlanta Healthcare	Atlanta Healthcare N99 Cambridge Mask	N99	PM10, PM2.5, PM0.3	2199	<p>The product has primary filter layer for dust and PM10 along with a three-ply micro particulate filter and a military carbon filter with an activated carbon filter.</p> <p>The mask is treated with silver to protect from virus and bacteria.</p> <p>It has an adjustable nose clip that fits face and helps to prevent pollutants from leaking into mask.</p>
Prana Air	Prana Air Mask	N95	PM10, PM2.5, PM0.3	3000	<p>The mask has N95 filter and has a fan inside that gives proper airflow to breathe effortlessly.</p> <p>The mask has six layers of air purification, including two layers of activated carbon that prevents harmful gases, one layer of pre-white filter that stops all the particles larger than 0.10 microns, two layers of HEPA that stops PM2.5 and PM1 particles</p> <p>The product has a rechargeable battery that keeps the fan going for over 5 hours</p>
Vogmask	Vogmask Masks N99	N99	PM0.3	1800	The mask has N99 filter layer, a carbon filter, and an exhale valve.

					The product is available in different designs with either 1 or 2 valves.
Crusaders India Pvt. Ltd	Crusaders Mask	N99	-	1259	The mask has N99 filter with four layers of carbon filter. It offers great protection from air pollution and has a valve design.
Repeller	Repeller N99	N99	PM2.5 particles	499	The mask has adjustable straps and is washable The manufacturer claims to have full protection from pollution and if used 12 hours a day, can last for 2 months
Respokare	Respokare Anti-Pollution Mask	-	PM2.5 particles	399	The mask blocks 98.5% of PM2.5 particulate. It has an active respo layer as well, that neutralizes >90% of nitrogen dioxide, as well as other toxic gases. It is not washable; however, it lasts between 40 and 60 days depending on usage rate. There is an indicator that changes when the mask is useless.
SmartAir	SmartAir N99 Pollution Mask with Valve	N99	PM2.5 particles	499-849	The mask filters over 99% of PM2.5 air pollution
	SmartAir N95 Pollution Mask	N95	PM0.3 particles	290	These masks are designed to achieve a very close facial fit and provide very efficient filtration of airborne particles. The mask has been rated N95 by NIOSH.
	Activated Carbon Mask with Valve	-	PM2.5 particles	145-1200	This activated carbon mask conforms to the EN 149:2001 standard. It has an FFP2 rating, and protects against 94% of PM 2.5 particles
	Pollution Mask for Kids with Valve	N95	PM2.5 particles	225-995	The mask has attractive kid-friendly design with high-quality filter media which blocks PM2.5 particles and has filtration rate up to 95%

					The product has smooth and allergen-free inner layer
Respro (UK) Ltd	Respro RP00185 Techno Anti-Pollution Mask	Hepa-Type™ filter	Sub-micron particulate pollutants	2999	The mask has sporty look and adjustable nose fitting, and has dual valves. The product is well suited for outdoor activities, and the filter is removable and replaceable
Totobobo	Anti-Pollution Mask Totobobo	F94 filters	PM10 and PM2.5	5251	The mask has innovative design and gets molded to face using warm water for good fit. The mask part is transparent while filter is white, which indicates the time to replace filters
Nanoclean Global Private Limited	Nasofilters	-	PM2.5	10-15	The mask filters out Particulate Matter with 95% efficiency, protects from bacteria, dust and pollens. The product is made using nano technology which ensures that there is a minimal pressure drop while breathing, ensuring ease in breathing and no breathing discomfort Nasofilters are almost invisible from a distance which adds to the aesthetic value It is available in 3 sizes to satisfy needs of people of every age and nasal type It is a one time use biodegradable product, therefore no dangers of wearing unhygienic used masks
	Nasomask	-	PM2.5	90	The mask enables 99.63% filtration of particulate matters (PM) and have 3 layer filtration based on nanotechnology It is made of ultra-soft fabric and provides comfortable-fit The mask has self-adjusting straps with an adjusting nose clip

6. CURRENT AND HISTORICAL MEASURES TO CURB POLLUTION IN DELHI

6.1. RECENT INITIATIVES

6.1.1. ODD EVEN SCHEME

An initiative has been taken by the government of Delhi to curb the air pollution by applying an 'Odd-even scheme' on the 4-wheelers plying on the roads (with a few exemptions) in the months carrying the maximum risk of pollution. As per the rule, between 8am and 8pm private, non-commercial vehicles are allowed out on the roads on alternate days. Vehicles having registration number ending with an odd digit can run on the odd dates and vice-versa. The major aim of the scheme is to reduce the number of vehicles from the roads of Delhi.

A study conducted by the CPCB in 2016, to assess the effect of the scheme on the air quality of Delhi. The study revealed that during the odd-even period, there was a marked increase in the pollutants concentration as compared to 'pre – odd even period', for instance, a 13 – 39% rise in PM₁₀ concentration, 52 – 70% rise in PM_{2.5}, and 37 – 80% rise in NO₂ concentration. Other pollutants were also found to be increasing. No definite reason could be determined for this; however, unclear trend and wide fluctuations of air pollutants were attributed to the meteorological factors and emissions from pollution sources other than transportation. Moreover, the government has continued to implement the odd even scheme till date, as one of the prominent measure to curb air pollution in the city.

6.1.2. JUDICIARY DIRECTIVES

Since 2015, various Pollution Control Boards in the states of Uttar Pradesh, Haryana, Delhi, and the Jhalana Institutional Area in Rajasthan, have been issued a number of directions of the Air (Prevention and Control of Pollution) Act, 1981 regarding prevention, control or abatement of air pollution and improvement of ambient air quality in Delhi and National Capital Region (NCR). These directives included various issues such as control of vehicular emission, control of road dust, air pollution from biomass burning, industrial air pollution, and construction and demolition activities.

6.1.3. RESTRICTION ON INDUSTRIAL ACTIVITIES

In November 2019, the National Green Tribunal (NGT) directed the Delhi government and civic bodies, through its many directions, to curb air pollution in Delhi, including a ban on industrial activities and entry of trucks. It further stated that there should be no construction activity to be carried out on structures until further orders. Moreover, all industrial activities in Delhi-NCR causing emissions were restricted from carrying on their functioning till the end of the month.

6.1.4. INCREASE IN THE NUMBER OF PUBLIC TRANSPORT AVAILABILITY

In line with its strategy to keep the air pollution levels in the city under control, the Delhi Metro announced the undertaking of over 180 additional trips and four times increase in the current parking rates to restrict the usage of private vehicles on the road, in light of the hazardous pollution levels in the city. Moreover, the Delhi Transport Corporation (DTC) was been directed to hire 500 buses on a short-term basis and the DMRC was asked to procure 300 buses to handle the surge in customers due to implementation of odd-even scheme.

6.2. HISTORICAL MEASURES

Other key measures to keep a check on the overall air pollution levels in the region are: -

- Setting up of a control room in CPCB to facilitate review of air pollution levels in Delhi and the NCR region
- Imposition of 'Green Tax', and prohibition on entry of overloaded and non-destined trucks in Delhi
- Initiation of a project on National Air Quality Index (AQI) to strengthen air quality information dissemination system for larger public awareness and their participation on air quality management
- Stringent provision for ash content in coal for thermal power plants
- Construction of Eastern and Western Expressways for by-passing non-destined traffic to Delhi
- Revision of rules for handling and management of municipal waste.
- Ban on burning of leaves/ biomass in Delhi.
- Introduction of fuel quality index (Bharat Stage – I, II, III, and IV)
- Introduction of pollution under control (PUC) certificate with three months validity
- Introduction of compressed natural gas (CNG) for commercial vehicles phased out from 1998
- The reduction of Benzene (cancer causing agent) in gasoline from 5% in 1996 to 1% in 2000
- Reduction of Sulphur content in diesel from 0.5% in 1996 to 0.05% in 2000

7. APPENDIX

7.1. QUESTIONNAIRE

Screener questions

Q. 1. Name

Q. 2. School/College

Q. 3. Contact Details

Q. 4. Place

Q. 5. How old are you?

- <14 years (terminate)
- 14-16 years
- 16-18 years
- >18 years

Q. 6. Have you heard about pollution masks?

- Yes
- No (terminate)

Q. 7. Where are you currently located?

Q. 8. Have you ever used pollution masks?

- Yes
- No (terminate)

Questionnaire – Pollution masks in Delhi

Q. 9. How will you rate air quality at your current location?

- Very poor
- Poor
- Average
- Good
- Very good

Q. 10. Do you feel there is need for pollution masks in your locality? If yes, what percentage of population is using it?

- <10%
- 10%-20%
- 20%-30%
- 30%-40%
- >40%

Q. 11. Have you ever used/currently using any pollution mask? If yes, please mention the type.

- N95
- N99
- Nasofilter
- Other

Q. 12. What criteria/features do you give/will give importance to in selecting a pollution mask? Please rate these parameters on the level of importance.

[5 = Most important; 1 = Least important]

Features	1	2	3	4	5
Design					
Appearance					
Cost					
Comfort					
Durability					
Fitting					
Brand					

Q. 13. Typically, where do you purchase pollution masks?

- Online
- Chemist shop
- Supermarket
- Any other? Please Mention:

Q. 14. Would you prefer to extend the usage of the air pollution mask, beyond the severe pollution days in Delhi?

- Yes
- No

Q. 15. How would you rate the overall satisfaction for the current pollution mask you are using? Please rate below criteria/features on the level of satisfaction.

[5 = Very Satisfied; 1 = Dissatisfied]

Features	1	2	3	4	5
Filtration Technology					
Aesthetics (Look Wise)					
No Work Hinderance					
Ease of Breathing					
Comfort while (travelling, sleeping, playing)					

Q. 16. What challenges are you facing/have faced while using a pollution mask? Please rate these challenges on the level of importance.

[5 = Most important; 1 = Least important]

Challenges	1	2	3	4	5
Fitting problem					
Poor quality					
Breathing problem					
Social stigma					
High cost					

Q. 17. As per your experience, any feature you would like to add in your existing pollution mask?

7.2. INDUSTRY QUOTES

“As per our search data trends, we have seen a 70-140% increase this year over the last two years combined in searches for air-purification options like masks, air purifiers or plants.”

Director, category management, Amazon India

“We have seen a significant rise in the growth of air-pollution masks and are looking to serve 5x the number of customers this year over the last two years combined.”

Product Manager, Leading Mask Manufacturer

8. REFERENCES: -

- World Health Organization
- Ministry of Road Transport and Highways
- Central Pollution Control Board, New Delhi
- The Health Effects Institute
- Company Websites
- Annual Report & SEC Filings
- The Associated Chambers of Commerce and Industry of India (ASSOCHAM)
- National Green Tribunal (NGT)
- Delhi Transport Corporation (DTC)