

Action Plan on Climate Change and Human Health



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Part A

Climate and Health Profile of UT of Chandigarh

1. CLIMATE AND HEALTH PROFILE

The Union Territory of Chandigarh is located in the foothills of the Shivalik hill ranges in the north, which form a part of the fragile Himalayan ecosystem. It is occupied by Kandi (Bhabhar) in the north east and Sirowal (Tarai) and alluvial plains in the remaining part. The subsurface formation comprises of beds of boulders, pebbles, gravel, sand, silt, clays and some kankar. The area is drained by two seasonal rivulets viz. Sukhna Choe in the east and Patiala-Ki-Rao Choe in the west. The central part forms a surface water divide and has two minor streams. The stream passing through the central part is called N-Choe and the other is Choe Nala which initiates at Sector 29

Climate profile

Chandigarh falls under Koeppen's CWG category i.e., it has cold dry winter, hot summer and sub-tropical monsoon. Evaporation usually exceeds precipitation and the weather is generally dry.

The area experiences four seasons: (i) Summer or hot season (mid-March to Mid-June) (ii) Rainy season (late-June to mid-September); (iii) Post monsoon autumn/transition season (mid-September to mid-November); (iv) Winter (mid-November to mid-March). The dry spell of summer is long but with the occasional drizzles or thunder storms. May and June are the hottest months of the year with the mean daily maximum & minimum temperatures being about 37 degrees C & 25 degrees C, respectively. Maximum temperatures can rise up to 44 degrees C. Southwest monsoons with high intensity showers commence in late June. The weather at this time is hot and humid. The variation in annual rainfall on year-to-year basis is appreciable i.e. 700 mm to 1200 mm. The 20 year average rainfall for Chandigarh is 1100.7 mm. January is the coldest month with mean maximum and minimum temperatures being around 23 degrees C and 3.6 degrees C respectively. Winds are generally light and blow from northwest to southeast direction with exception of easterly to southeasterly winds that blow on some days during the summer season.

▪ Status of ambient air quality

There are three real time ambient air quality monitoring stations installed by Chandigarh Pollution Control Committee at sector 25, 22 and 53 to monitor the ambient air pollutants in the city. Additionally, there are five manual monitoring stations installed in different locations of the city, as shown in Fig. 6. As per the orders of Hon'ble National Green Tribunal (NGT), Air Quality Monitoring Committee (AQMC) has been constituted in Chandigarh to monitor the air quality management under National Clean Air Programme.

Air quality of Chandigarh During Diwali: The status of air quality during Diwali period is determined by multiple factors viz., additional local emissions from fire crackers, transport of stubble burning emissions (for Chandigarh), local weather as well as large scale circulations, etc. Air quality is expected to deteriorate on the following days of Diwali due to emissions from fire crackers the previous night. Concentration of particulate matter (PM_{2.5} and PM₁₀) depends on the magnitude of emissions on the night of Diwali and the static stability of the boundary layer, mixing layer height and surface wind speed on the following day. Weather plays an important role in controlling air quality through wet scavenging (rainfall) or dispersion (due to high

winds) or convection (due to high solar radiation) causing year to year variability during the Diwali period. The following figures illustrate the variation of PM_{2.5}, PM₁₀ and NO_x in Chandigarh during the Diwali period (5 days before and 5 days after Diwali) for the last 3 years in comparison with that of 2021. The PM₁₀ and PM_{2.5} concentration in Chandigarh during the Diwali period of 2021 was lower as compared to the years 2019 and 2020 due to aggressive campaigning by the administration for Green Diwali in the city. In the year 2020 Chandigarh witnessed rainfall during the Diwali period and hence the concentration levels remained low (Figure 10). The concentration in the year 2019 was observed higher than the year 2020 and 2021. However, the PM₁₀ and PM_{2.5} concentrations in all the years i.e. 2019, 2020 and 2021 was above the NAAQS five days pre and post to Diwali day. As opposed to the previous years the PM concentration did not peak this year. The hourly concentration of PM however was observed to increase from 10 pm in the night of the Diwali day and it peaked at 12 am (110 µg/m³) and then further decreased. The air quality index (AQI) on Diwali day and post Diwali day remained in the moderate category. This observed decreasing trend of pollutant concentrations (PM₁₀, PM_{2.5} and NO_x) on Diwali over the years can be attributed to aggressive campaigning by the administration for Green Diwali, increasing awareness is done amongst people through FM radio, newspaper advertisements, newsletters by eco-clubs and schools organized by Environment Department, Chandigarh.

Table 1: Annual Pollutant Levels in Chandigarh for the year 2017-2019.

Pollutant	2017	2018	2019
PM 2.5	63.8	49.8	63.2
PM10	108.8	102	96.6
NO2	16.2	16.2	18.6

Source: WHO air pollution data

Status of AQI, Chandigarh: As per CPCB bulletin on status of category-wise numbers of AQI in Chandigarh during 2020 and 2021, out of 365 AQI numbers reported in 2020, 121 were in Good category, 149 were in Satisfactory category, 92 were in Moderate category and remaining 3 were in Poor category (Table 4). In 2021, out of 365 AQI numbers reported in 2021, 81 were in Good category, 128 were in Satisfactory category, 151 were in Moderate category and remaining 5 were in Poor category. The analysis of AQI values in Chandigarh during both the years indicates that 24% (average for both years) AQI value are falling in Good category, 39% are in Satisfactory category, 35% are in Moderate category and 1% are in Poor category indicating minor breathing discomfort to sensitive people.

Table 2: Status of AQI, Chandigarh

AQI Category(Range)	2020	2021
Good (0-50)	121	81
Satisfactory (51-100)	149	128
Moderate (101-200)	92	151
Poor (201-300)	3	5
Very Poor (301-400)	0	0
Severe (401-500)	0	0
Total no. of Days	365	365

Source: CPCB, 2021, Prominent parameter- PM_{2.5}

▪ Extreme heat

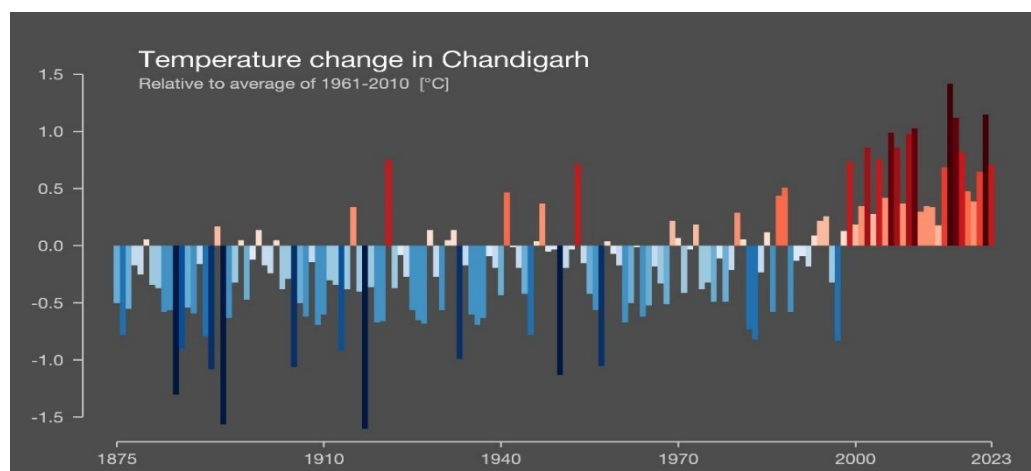
Exposure to extreme heat can lead to various heat-related illnesses (HRI), from mild (prickly heat) to fatal (heatstroke) manifestations. It also increases cardiovascular, respiratory, renal, and all-cause mortality along with increases in ambulance calls and admissions.

In Chandigarh, May and June are the hottest months of the year with the mean daily maximum and minimum temperatures being about 37°C and 25°C respectively. Maximum temperatures can rise to 44°C. Chandigarh witnessed heat waves for 38 days.

Based on the quantification of the IMD's gridded daily data for maximum and minimum temperature, increase in hot days and extreme hot days is apparent. (Figure 2 and 3). The hot days and extreme hot days have been quantified based on the exceedance of the 90th and 99th percentile threshold of Tmax respectively for climate baseline of 1982-2011. Similarly, warm nights and extreme warm nights are quantified by 90 and 99 percentile for Tmin.

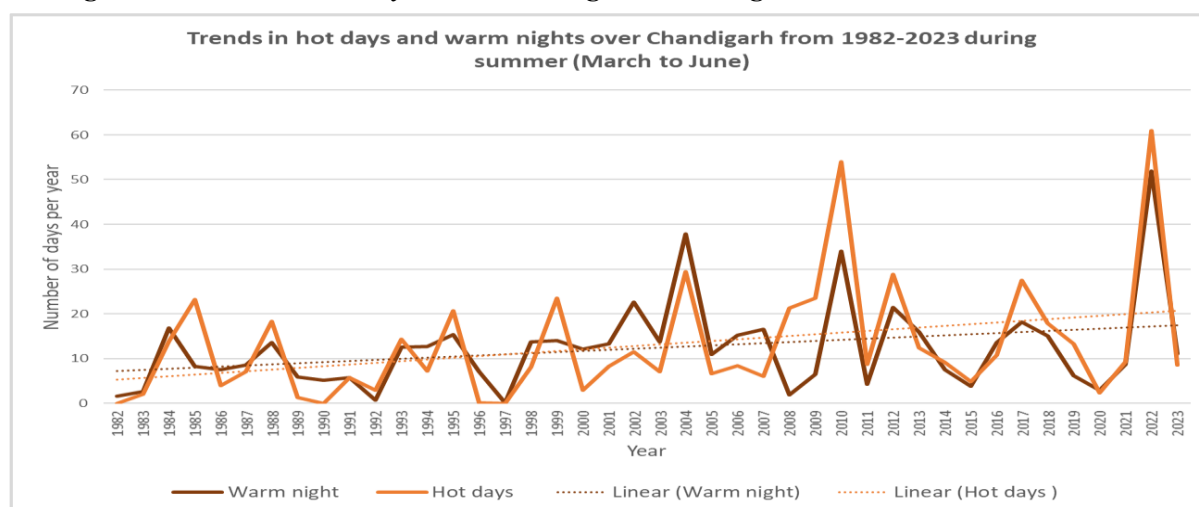
This suggests a significant trend of increased exposure to extreme heat for the population in line with the trends observed all over the country especially in plain regions.

Figure 1: Annual average temperature change observed in Chandigarh, 1875-2023.



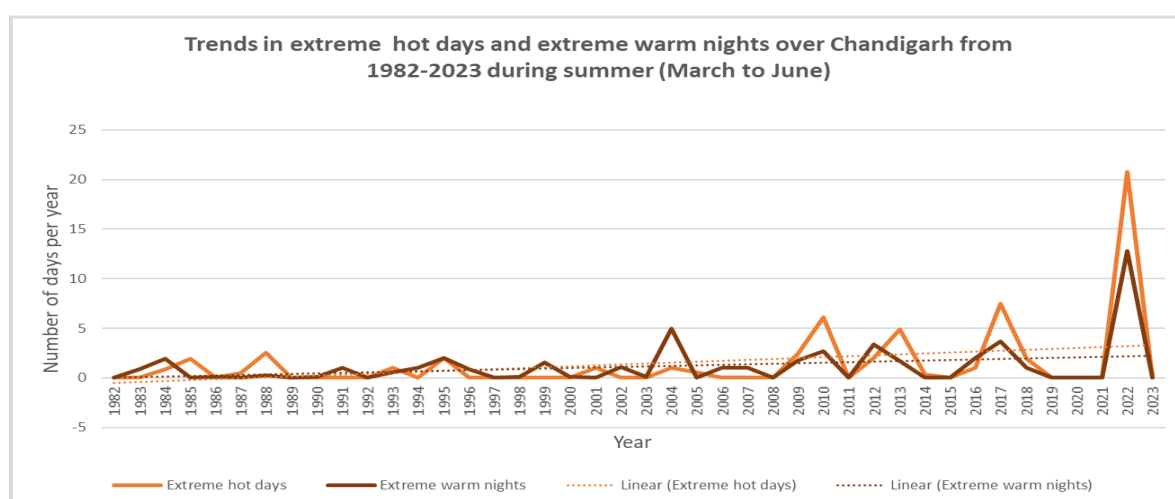
Source: Warming stripes by Ed Hawkins

Figure: 2 Trends in hot days and warm nights, Chandigarh, 1982-2023



Source: CEEW analysis based on IMD gridded data

Figure: 3: Trends in extreme hot days and extreme warm nights, Chandigarh, 1982-2023



Source: CEEW analysis based on IMD gridded data

Climate Sensitive Illnesses in Chandigarh

There is enough evidence on health-related problems arising from environmental factors such as air and water pollution, floods and droughts, improper sanitation, VBDs, improper waste management, etc. (MoHFW, 2018). A study conducted by Joseph and Xavier in the year 2018 determined that in Chandigarh, prevalence of *Entamoeba histolytica* parasite is influenced by rainfall characteristics (Boyard-Micheau, Joseph and Xavier Rodó, 2018). The increase in humidity over the region especially during the summer season contributes to more rainfall and is associated with an increase of parasites *Entamoeba Histolytica* and *Giardia Lamblia*, leading to food-borne diseases.

- **Air- borne diseases**

Air borne diseases are communicable diseases spread through pathogens in the environment. The droplets of pathogens spread through an infected individual, from coughing or sneezing, find its way in the air and on surfaces and infect individuals who come in contact with the contaminated air and/or surface. Influenza is a type of air-borne disease which is seasonal in nature largely dictated by temperature and humidity that directly impacts the respiratory system and is not particularly prevalent in Chandigarh UT. However, as seen in the table below between 2011-2015 cases related to Avian Influenza led to five and seven deaths in 2013 and 2015 respectively. Seasonal Influenza has been prevalent in the U.T from 2017-2020, with the highest number of cases being 63 in 2017 leading to six deaths followed by 54 cases and three deaths in 2019 and 28 cases and two deaths in 2020.

Table 3: Number of total reported cases of common air-borne diseases in Chandigarh (U.T.)

Year	No. of Infections (Avian Influenza)	No of Deaths (Avian Influenza)	Number of Infections (Seasonal Influenza)	No of Deaths (Seasonal Influenza)
2011	0	0	-	-
2012	1	0	-	-
2013	37	5	-	-
2014	1	0	-	-
2015	22	7	-	-
2016	0	0	0	0
2017	0	0	63	6
2018	0	0	4	2
2019	0	0	54	3
2020	0	0	28	2
2021	0		0	

Source: Anti Malaria Officer-Cum-Nodal Officer (IDSP), NVBDCP, U.T. Chandigarh

• Air pollution and health

Air pollution can be through ambient (outdoor) air pollution or household (indoor) air pollution. Chandigarh's ambient air quality is better than that of most other cities in India. The overall SO_x and NO_x levels and the suspended particulate matter (SPM) levels are within permissible limits however the levels show site-specific and seasonal variations showing the effects of different anthropogenic activities on air quality. Studies have shown decreased air quality in December during crop burning season, higher NO_x levels linked to higher vehicular density, and variations in levels at the industrial and commercial sites (Khairwal R., 2020). Therefore, the main causes of air pollution in the UT that led to deteriorating air quality in the environment include crop/agricultural waste burning pollen, and vehicular congestion. The main diseases linked to air pollution in Chandigarh UT include asthma, chronic obstructive pulmonary disease (COPD), pneumonia, and acute respiratory infections (ARI). The limited data on diseases associated with air pollution is given in the table below:

Table 4: Number of total reported cases of common air pollution linked diseases in Chandigarh

Air pollution linked Diseases	2015	2016	2017	2018	2019	2020	2021
Acute Respiratory Infections (ARI)* (As per Form of IDSP)					186913	107149	
Pneumonia (As per P-Form)					4900	2996	
COPD				3297			
Asthma				31036			

*Data TBD for all years (numbers based on limited information)

● **Food and Water-borne diseases and health**

The various food and water-borne diseases are associated with contaminated food and poor water quality. The population may be exposed to infectious food and/ or through the fecal-oral route due to lack of proper water treatment. In Chandigarh (UT), the water supply is supplied through central piped water supply system, however, improved water is still lacking in slum and informal settlements. The common food and water borne diseases include cholera, typhoid, hepatitis-A, hepatitis-E, and acute diarrheal diseases. The total number of reported cases of common water-borne diseases is given in the table below. As can be seen, there is a significant reduction in typhoid, hepatitis A, and hepatitis E cases in 2020 as compared to 2019 and deaths related to water-borne diseases since 2016 have been negligible.

Table 5: Number of total reported cases of common water-borne diseases in Chandigarh (U.T.)

Diseases	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
People infected with Cholera (As per IDSP L form)	-	24	1	12	66	67	12	18	2	0	39
Number of deaths (cholera)	16	24	1	12	0	-	-	-	-	-	
People infected with Typhoid	651	834	697	382	430	341	389	371	415	168	82
Number of deaths (Typhoid)	-	-	-	-	-	0	0	0	0	0	0
People infected with Hepatitis-A	31	80	48	79	148	154	197	141	180	81	103
Number of deaths Hepatitis A	0	0	0	0	0	0	0	0	0	0	0
People infected with Hepatitis-E	28	23	37	32	30	149	457	325	101	51	14
Number of deaths (Hepatitis-E)	0	0	0	0	0	0	0	0	0	-	0
People infected with Acute Diarrhoeal Disease									48,254	23,799	

Source: ENVIS Chandigarh (2019) and Assistant Director Malaria, U.T. Chandigarh

Prominent causes of food and water borne diseases in Chandigarh UT include:

- Mixing of sewerage contents in old pipes with drinking water lines. Also, overcrowding due to migratory population can further contribute to overloading sewerage system and creation of illegal connection causing mixing of sewerage contents.
- Unhygienic, illegal factories for food preparations in informal slum areas, unhygienic working conditions, lack of personal hygiene of food handlers, and lack of improved sanitation are key causes of food borne diseases.

Clean water and improved sanitation are closely related to better health outcomes. A combination of strategies employed by the Chandigarh administration has curtailed water and food borne diseases including:

Provision of 24/7 quality water supply, removal of blockages in drainage system. Improved infrastructure separating water and sewage pipes.

- Training of healthcare staff, food handlers, and integrating water borne illness in health programs and policies.
- Data maintenance and joint surveillance with citizens and coordination body.
- Building partnerships with citizens, businesses, government through proper communication channels - phone, in-person, IEC awareness raising activities.
- Prohibiting open defecation.

- **Vector borne diseases (VBDs)**

Vector borne diseases are also closely linked to climate change effects. With increasing global warming, the rise in temperature combined with higher precipitation and humidity increases the duration of warm season provides ideal conditions for vector breeding. For Chandigarh in particular, according to the recent SAPCC 2021 the following may be the causes of different VBDs in the UT:

1. Increased construction activities (Malaria & Dengue);
2. Multiple breeding points/leakages (Malaria & Dengue);

The data below provides VBDs most prevalent in Chandigarh UT from 2011-2021. As per the total number of reported cases, dengue is the most prevalent VBD in Chandigarh.

Table 6: Number of total reported cases of common vector borne diseases in Chandigarh (U.T.)

Diseases	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Malaria	446	204	152	109	152	157	114	44	22	7	6
Dengue	73	351	107	13	966	1246*	1951*	301	286	265	1596
Chikungunya	0	0	0	0	1	272	54	4	0	0	7

Source: (ENVIS Chandigarh, 2019) and Assistant Director Malaria, U.T. Chandigarh

Further, a vulnerability assessment conducted by Chandigarh Administration showcases that children and elderly are more vulnerable compared to adult population for VBDs. In the year 2019, out of the total 22 malaria cases 4 cases were of <5 years and out of the total 286 dengue cases, 9 cases were of <5 years, 8 for <60 years of age. While in 2020, out of the total 7 malaria cases 1 case was of <5 years and out of the total 265 dengue cases, 8 cases were of <5 years, seven for <60 years of age and 1 case of a pregnant woman (Chandigarh Administration, 2021).

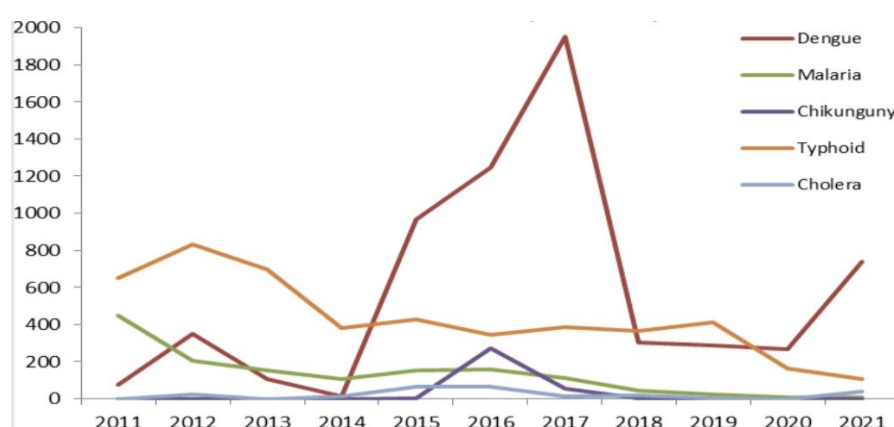
Over the last five years, there is a significant decrease in number of cases of vector borne diseases in Chandigarh UT due to consistent efforts in the field and strategies adopted for controlling VBDs. These include the following:

- House to house field survey and micro-planning of spray and fogging operations;
- Mapping of permanent breeding points;
- Disease surveillance: filling dengue cards, case detection and field action etc.;
- Hands on training of MPWs (Regular & Contractual) and health care providers;
- Stepping up Intersectoral coordination and strengthening of IEC activities: involvement of public health wing, education department, RWAs, village *Panchyats*, NGOs etc.;

- WhatsApp linkages and 24 x 7 Dengue Helpline;
- Screening of plasma donors for malaria in all blood banks.
- Quality control for malaria diagnosis.
- Screening of Pregnant Women for malaria;
- Public procurement of requisite insecticides/ larvicides and replacement of chemicals used for spray to prevent resistance from similar chemicals.

In conclusion, the data presented from IDSP on VBDs and food and water borne diseases is given below from 2011-21.

Figure 4: Trends of vector borne diseases in Chandigarh (2011-2020)



• Non- communicable diseases (NCD)

India is a fast-developing nation with an increasing socio-economic development, urbanization, the changing demographic structure and associated lifestyles which has now made NCDs a growing burden. Malnourishment is seen as a key risk factor for NCDs (Global Panel on Agriculture and Food Systems for Nutrition, 2016) and improving nutritional status can help overcome their increasing burden.

The nutritional status for adults residing in Chandigarh is given in the table below. The 2019-21 shows a marginal drop in underweight population compared to 2015-16 among both men and women between the age of 15 and 49 years. However, obesity has risen to 44% in women (up by 2.5%) and 34.4% in men (up by 2.4%).

Diabetes, cardiovascular and cancer data is given in the table below. The NFHS-4 data for 2015-16 shows that women are more vulnerable to diabetes than men with 2.3% cases in women as opposed to only 1.6% in men however, the reverse is true for cardio-vascular conditions with 1.8% cases in men and only 0.6% in women.

Table 7: Nutritional status of adults (age 15-49 years)

Indicators	2015-16 (%)		2019-21 (%)	
	Women	Men	Women	Men
Body Mass Index (BMI) is below normal (BMI<18.5kg/m ²)	13.3	21.7	13	15.1

Overweight or obese (BMI \geq 25.0 kg/m ²)	41.5	32	44	34.4
High risk waist-to-hip ratio (\geq 0.85)	NA		60.7	66.9

Source: National Family Health Survey (NFHS-5), 2019-21

Table 8: Diabetes and cardio-vascular and data for 2015-16

Indicators	2015-16 (%)	
	Women	Men
Diabetes (%)	2.3	1.6
Cardio-vascular disease (%)	0.6	1.8

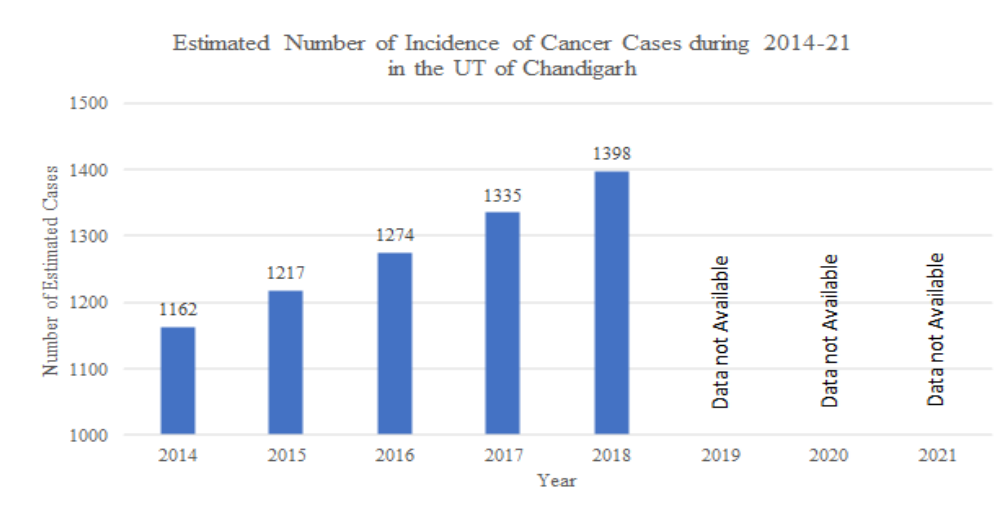
Source: NFHS-4

Blood sugar levels of adult men and women residing in Chandigarh are given below. The NFHS-5 data for 2019-21 shows that women have a higher percentage of blood sugar levels or a higher percentage of women are taking medicine for blood sugar, i.e., 19% as compared to men which is at 16.6%. However, for hypertension, 25% cases in women as opposed to 30.6% in men higher than the national average of 21.3% and 24% respectively.

Table 9: Blood sugar level among adults (age 15 years and above)

Indicators	2019-21 (%)	
	Women	Men
Blood sugar level - high or very high (>140 mg/dl) or taking medicine to control blood sugar level	19	16.6
Elevated blood pressure (Systolic \geq 140 mm of Hg and/or Diastolic \geq 90 mm of Hg) or taking medicine to control blood pressure	25	30.6

Source: NFHS-5



- **Health Index and Burden of diseases in Chandigarh**

Health index is a key indicator related to health and healthcare system of an area. Traditionally, the health index is expressed as an index of life expectancy at birth using a minimum value of 20 years and a maximum value of 85 years.

In India, NITI Aayog along with the Ministry of Health and Family Welfare (MoHFW) and the World Bank in 2017 initiated an Annual Health Index for tracking the overall performance of current year and incremental performance to determine progress on health outcomes and health systems and develop a healthy competition and encourage cross-learning among all States and Union Territories (UTs).

The framework criteria of NITI Aayog's Health Index are a weighted composite score incorporating about 24 indicators which cover key aspects of health performance. The health performance criteria are modified to include selected indicators grouped under the following domains of: (a) Health Outcomes; (b) Governance and Information; and (c) Key Inputs and Processes. The Health Index covers some targets and indicators under the aforementioned SDG 3 including Neonatal Mortality Rate (NMR), Under-five Mortality Rate (UMR), Maternal Mortality Ratio (MMR), institutional deliveries (proxy to skilled birth attendance) and total case notification of Tuberculosis (proxy to Tuberculosis incidence per 100,000 population).

In the fourth edition of the health index released, Chandigarh as compared to the other six UTs ranked 2nd in its overall performance after Dadra and Nagar Haveli and Daman and Diu (DH&DD) followed by Lakshadweep, Puducherry, Delhi, Jammu & Kashmir, and Andaman & Nicobar. In the health outcomes domain Chandigarh ranked the highest with health outcome index score of 78.49. The health index data for Chandigarh is summarized in the table below. The National Health Mission Department in the Chandigarh Administration (NHMCHD) has determined the overall birth rate and death rate at 13.3 and 4.3 respectively that is 2018, birth rate for Chandigarh, UT was 13.3 births per 1000 inhabitants and death rate of 4.3 deaths per 1000 inhabitants and the infant mortality rate (IMR) was 13 deaths per 1000 live births (National Health Mission, 2022).

Table 10: Health Index and data indicators on health outcomes and health systems in Chandigarh

Indicator		2018-19	2019-20	Increment
Overall Health Index Reference Year (2019-20) (Source: NITI Aayog's Health Index report)				
Score: 62.53; Rank 2				
Incremental Index Base Year (2018-19) to Reference Year (2019-20) (Source: NITI Aayog's Health Index report)				
Score: -10.85; Rank 7				
HEALTH OUTCOMES DOMAIN (Source: National Family Health Survey; NFHS-5, 2019-21)				
1.1.1	NMR (per 1000 live births)		NA	
1.1.2	U5MR (per 1000 live births) @		NA	
1.1.3	Sex Ratio at Birth	920	950	
1.2.1	Modern Contraceptive Prevalence (%)		55.6	
1.2.2	Full immunization coverage (%)	93.83	77.58	-16.24
1.2.3.a	First trimester ANC registration (%)	80.57	73.19	-7.37
	Proportion of pregnant women received 4 or more			

1.2.3.b	ANCs (HMIS)		100	9.17
1.2.4	Institutional deliveries (%)	100	100	0
1.2.5	Total Case Notification of TB (%)	100	100	0
1.2.6	TB Treatment Success Rate (%)	88.2	87.77	-0.43
1.2.7	PLHIV on ART (%)			
GOVERNANCE AND INFORMATION DOMAIN				
2.2.1	Average occupancy: State level 3 Key posts (inmonths)	11.95	12.01	0.06
2.2.2	Average occupancy: CMOs (in months)	11.95	9.01	-2.94
2.2.3	Fund transfer (no. of days) @			
KEY INPUTS AND PROCESSES				
3.1.1	Shortfall: ANMs at SCs (%)	0	N/A	N/A
3.1.1	Shortfall: Staff Nurses at PHCs, UPHCs, CHCsand UHCs (%)	55.9	50.61	-5.29
3.1.1	Shortfall: MOs at PHCs and UPHCs (%)	0	0	0
3.1.1	Shortfall: Specialists at DH (%)	7.5	7.5	0
3.1.2	Staff covered under a functional HRMIS (%)	55.35	100	44.65
3.1.3.a	Functional FRUs (%)	100	100	0
3.1.3.b	DH with Kayakalp score of >70% (%)	0	0	0
3.1.3.b	SDH/CHCs with Kayakalp score of >70% (%)	0	100	100
3.1.3.b.	PHCs with Kayakalp score of >70% (%)	0	0	0

	Indicator	2018-19	2019-20	Increment
3.1.3.b.	UPHCs with Kayakalp score of >70% (%)	100	N/A	N/A
3.1.4.	SCs functional as HWCs (%)	50	N/A	N/A
3.1.4.	PHCs functional as HWCs (%)	0	0	0
3.1.4.	UPHCs functional as HWCs (%)	100	N/A	N/A
3.1.5	DHs with functional CCU (%)	100	N/A	-100
3.1.6.a.	Level of registration of births (%)	100	100	0
3.1.6.b	Level of death registration (%)	100	100	0
3.1.7	IDSP reporting of P Form (%)	95	91	-4
3.1.7	IDSP reporting of L Form (%)	95	89	-6
3.1.8.a	Proportion of DH-SDHs with accreditation certificates (State Report)		0	0
3.1.8.a	Proportion of CHCs with accreditation certificates (State Report)		0	0
3.1.8.a	Proportion of PHCs with accreditation certificates (State Report)		0	0
3.1.8.b	Proportion of DHs certified under LaQshya - Labour Room (MoHFW)		100	100
3.1.8.b	Proportion of DHs certified under LaQshya - Maternity OT (MoHFW)		100	100

@Negative indicator where higher number means lower performance [Source: NITI Aayog's State Health Index Round IV 2019-20]

*Source: Registrar Birth and Death, U.T Chandigarh.

2. NPCCHH PROGRAMME, GOALS, AND OBJECTIVES

SAPCCHH: Vision, Goal & Objectives

Vision: Strengthening of healthcare services for all the citizens of the state especially vulnerable like children, women, elderly, tribal and marginalized population against climate sensitive illnesses.

Goal: To Reduce morbidity, mortality, injuries and health vulnerability due to climate variability and extreme weathers

Objective: To strengthen health care services against adverse impact of climate change on health.

Specific Objectives

Objective 1:

To create awareness among general population (vulnerable community), health-care providers and Policy makers regarding impacts of climate change on human health.

Objective 2:

To strengthen capacity of healthcare system to reduce illnesses/ diseases due to variability in climate.

Objective 3:

To strengthen health preparedness and response by performing situational analysis at state/ district/below district levels.

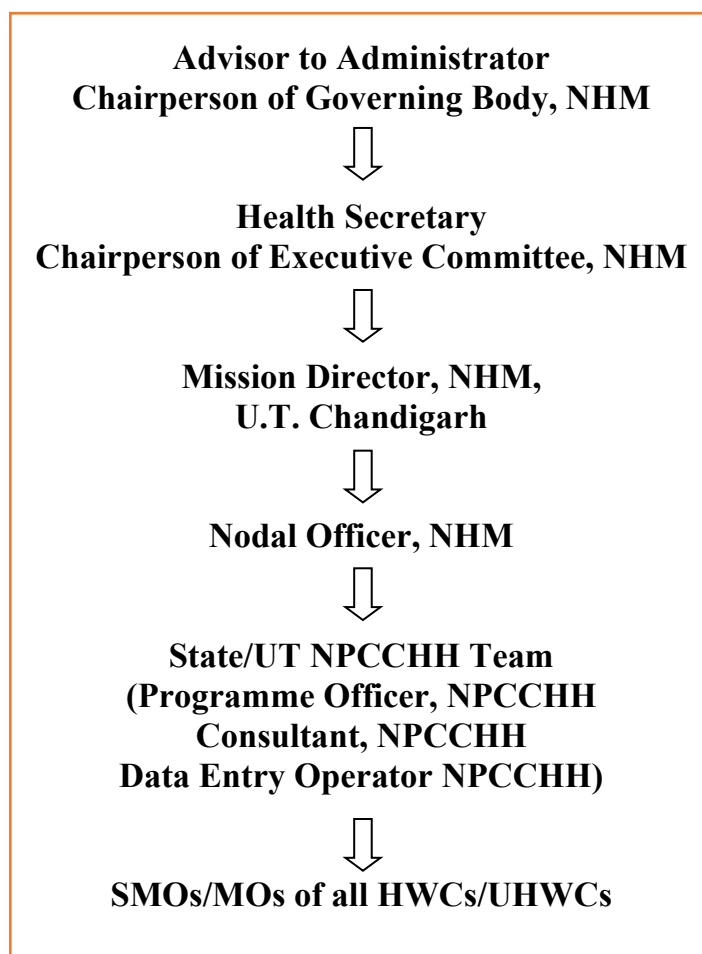
Objective 4:

To develop partnerships and create synchrony/ synergy with other missions and ensure that health is adequately represented in the climate change agenda in the **Chandigarh** in coordination with the Ministry of Health & Family Welfare.

Objective 5:

To strengthen state research capacity to fill the evidence gap on climate change impact on human health

Organogram of National Programme for Climate Change and Human Health (U.T. Chandigarh)



Task Force has been compiled in 2019 in UT and includes representatives /nominated members from the following departments: (Annexure 1)

- Public Health Expert from State Health Department
- Director, ICMR or other Research Institute (nominated member from CSIR –Institute of microbial technology)
- Director, Meteorological department of State/UT (Scientist F as representative)
- Chairman, State Pollution Control Board (Scientist B as representative from CPCC)
- State disaster management authority (SDM East nominated)
- Environmental Engineer/ Scientist from MOEFCC (Scientist D as representative)
- Secretary, State Agriculture Ministry
- Secretary, State Ground Water Board (Scientist D, Sr. Hydrogeologist nominated)
- State Surveillance Officer (State Epidemiologist from IDSP is working as additional consultant for NPCCHH, Chandigarh.

PART B

Action Plans on Climate Sensitive Illnesses

1. HEALTH ACTION PLAN ON AIR POLLUTION RELATED DISEASES

▪ Awareness Generation

The department makes the people of the state aware of air pollution and its damages through various mass media channels including posters, hoardings, social media, print media, radio, and health talks during VHND and UHND days. Various IEC materials have also been prepared to ensure that the key message reaches the public properly. The summary of IEC and BCC activities conducted in the financial years 2021-22 is shown below.

Table 11: Awareness and Sensitization plan for Air pollution

Activities	Quantity	Responsibility	Timeline (year wise)
Posters	Posters per facility DH - 15 SDH - 5 UCHC 22 – 5 UCHC 22 – 5 HWCs – 33 Total Quantity- 63	SNO – Finalize Posters, Decide quantity facility wise IEC Consultant, NHM, Chd – Carry out translation into local language (Hindi, Punjabi, English), put up tender for printing and deliver posters to Store Keeper. Store Keeper – Distribute posters to all health facilities as per distribution plan provided by SNO	1 st Week of Sept. Completed within Sept. and printing and delivery by mid-Oct Health Facilities to pickup IEC material by last week of Oct.
Audio Video	Radio Jingles Video Clips/Advt.	SNO – Finalize, dissemination IEC Consultant, NHM, Chd – Put up tender for Audio Video Clip	Oct

▪ Capacity Building

The orientation training of the district nodal officers, officials of sentinel surveillance hospitals, and medical officers regarding respiratory illnesses / diseases with details of cardinal signs/diagnosis and management protocol and surveillance of respiratory illness due to Air Pollution have been completed.

Table 12: Training Calender under NPCCHH for Acute Respiratory Illnesses

Capacity Building	Participants	Responsibility	Timeline	Budget
NationalLevel	SNO – NPCCHH SNO – NPCCHH will act as ToTs for ARI	NCDC GOI	Oct	--

State Level	Nodal Officer – Sentinel hospital	Strengthening ARI surveillance	June/July 2024	Rs. 0.21 Lakhs
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▪ **Surveillance on Acute Respiratory Illness (ARI) in Context of Air Pollution**

The objective of ARI surveillance is to identify the trend of air pollution-related illness in the context of the outdoor air quality in an area to help minimize the impact of the air pollution through timely and appropriate intervention measures. The daily data is being collection on National Outdoor Air and Disease Surveillance (NOADS) application.

Table 13: ARI Surveillance Sentinel Hospitals and Nodal Officers at State Level

S.no.	Facility	Nodal Officers
1.	GMSH-16	Dr. Rajwinder Singh Toor (98155-15577)

Table 14: Five Year vision for the ARI surveillance and awareness in the State of Punjab (2022-2027)

Timeline	Sentinel Sites	Training, capacitybuilding	Alert Signals
2022- 2023	1	All MOs, Health Department Staff and Health Workers, to be covered	Establish link Between Chandigarh Pollution Board to send AQI alerts via newspapers, SMS alerts, Social Media
2023-2024	1	From all health facilities under Health Dtment	
2024-2025	1		
2025-2026	1		
2026-2027	1		

- **Community wise awareness activity will be carried every-year to ensure that message and precautions needed to be taken get instilled in the public deeply leading to more climate friendly lifestyle changes.**

▪ **Morbidity, Mortality and related statistics of air pollution**

(Report generation of ARI surveillance on prescribed format from designated SSH (from GMSH) has yet to start, this will be done within first quarter.

S.No.	Diseases As per (IDSP Portal)	2019	2020
1	ARI* (As per P-Form of IDSP)	186913	107149
2	Pneumonia (As per P-Form)	4900	2996

*These figures relate to presumptive diagnosis form filled and does not necessarily include illness attributed to air pollution

▪ **Roles and responsibilities:**

UT Climate Change & Human Health Cell:

1. To coordinate with the UT-level task force meetings to develop a HAP on air pollution and health as part of the State Action Plan on Climate Change and Human Health (SAPCCHH)
2. To undertake situational analysis of health impacts in the context of air pollution in the State

3. Identification and capacity building of human resources like Nodal officer-ARI surveillance, and others
4. IEC development, translation, and dissemination planning
5. Development and dissemination of health advisories
6. Surveillance establishment in the context of air pollution
7. Hospital preparedness related to air pollution diseases
8. Timely issue of warnings to hotspot areas, health professionals, and the vulnerable and general population
9. Overall periodic reviews, supervision, monitoring, and evaluation of the identified activities being carried out at all levels – State, Districts, Blocks, and Villages/wards

Medical officer at the Primary Health Centre/ Urban Healthcare Centre level:

The medical officer is responsible for implementing Comprehensive Primary Healthcare Services through a network of Health and Wellness Centres that are envisaged in the Ayushman Bharat to provide promotive, preventive, and curative services, etc. near the community through active participation of the whole team through the following actions:

1. Creating awareness at the healthcare facilities and the community level
2. Capacity building, developing village-level health adaptation plans related to air pollution
3. Management of outdoor cases of health problems, emergency services, and their referrals for cases in the context of air pollution

Community Health workers at the Village Level/ Ward Level-

- Village Health Sanitation Nutrition Committee
- MAS (Mahila Arogya Samiti) in Urban wards
- Community-level public awareness generation on the effects of air pollution, and ways to protect and prevent health problems
 1. **ASHAs** are community-level health workers acting as an important link between the community and the healthcare system. With their community outreach activities, the following may be done-
 - a. Awareness generation at the community level on the sources of air pollution, health problems, and ways to protect and prevent air pollution
 - b. Organise campaigns, particularly on health problems of women and children related to air pollution
 2. **AWWs** – (through CDPO): At the Anganwadi centers during immunization sessions, information may be given on the sources of air pollution in the household and outside, its health problems, particularly on women and children, and ways to address them.

2. HEALTH ACTION PLAN ON EXTREME HEAT

▪ Vulnerable populations

Chandigarh is vulnerable to heatwaves. Even though it may not be recognized as heat-prone “State” and consequently, may be lacking necessary prioritization for heat wave; the fact that both Punjab and Haryana States are heat-prone, UT of Chandigarh cannot be an exception.

Children below 5 years and elders above 65 years, Pregnant women, labourers and Outdoor workers, Industrial workers working at High Temperatures, Slum residents/Beggars/ Homeless, Alcoholics and Smokers. Persons suffering from chronic diseases like Cardiovascular, Renal, Skin, Liver, Diabetes, Obesity, debilitated/malnourished etc.

The informal labour in the UT is quite high as about 93% of the total casual workers lack a written job contract. This implies a large part of the population being exposed to higher temperatures while working in outdoor conditions. The population of the UT exposed to heat wave-like conditions would contribute to increasing the vulnerability of the population significantly (SAPCC, 2017).

Administration has undertaken the following steps during summer season

1. Provision of clean drinking water at strategic locations
2. Sheds to take rest during summer months during daytime
3. Preventive advisories for general public for heat related illness.
4. Sensitization of doctors for treating stroke, dehydration etc.

▪ IEC and Awareness Activities

The department makes the people of the state aware of heat waves and related illnesses through various mediums. This includes posters, hoardings, social media platforms, print and electronic media tools, radio, and health talks during VHND and UHND meetings. Various IEC materials have also been prepared to ensure that the key message reaches the public.

Awareness Activities

- Increase general awareness among all the relevant stakeholders including people especially vulnerable communities, health-care providers and policy makers regarding impacts of heat. (TIMELINE-March to July)
- Community participation through meetings with RWA, heat related illness education amongst school children. (TIMELINE -April to July)

IEC Dissemination Plan

IEC Content	Activity	Dissemination Plan for 5 years	Timeline
Pamphlet, poster, banner, Newspaper ad, School quiz/essay competition, Voice message/OBD calls etc.	a. Development of IEC tools and printing	2 Posters for Healthcare facilities in all districts	August to September
	a. Dissemination of IEC materials	Social Media (Facebook, Instagram, Twitter etc.)	October To February
		1 in all the Healthcare facilities	

Particulars	Timeline
Increase general awareness among all the relevant stakeholders including people especially vulnerable communities, health-care providers and policy makers regarding impacts of heat	March to July

Community participation through meetings with RWA, heat related illness education amongst school children	April to July
Sensitization of RWAs, Market associations and managers of apni mandis	March to July

▪ **Capacity Building**

The training of the medical officers regarding heat wave and their harmful impacts on human health, a management protocol, and surveillance is periodically organized.

Annual training plan for Heat and Health under NPCCHH, Chandigarh

Training program for	Trainer	Topics	Timeline
Health facility level (Medical officers/Block Health Managers)	SNO-CC/Consultant	Heat Waves& it's impact on Health District-level preparedness & surveillance Specific roles & responsibilities of Medical officers in surveillance	February Refresher training/Review quarterly
Frontline workers (ANM, ASHA, JEEVIKA)	SNO-CC/Consultant	Heat waves& it's impact on Health Surveillance & reporting of probable cases	March Refresher training/Review quarterly
Panchayati Raj Institutions	SNO-CC/Consultant	Heat waves& it's impact on Health	March- April

▪ **Strengthening Health Sector Preparedness through surveillance**

- Plan has been designed as per the NCDC guidelines (NPCCHH: National Heat-related Illness Surveillance)
- As per the National action plan on Heat related illnesses, the following will be developed Case definitions, Reporting formats in health Facility, Death investigations form.
- Selection of reporting units: All designated health facilities in the UT will be engaged for reporting heat related cases from March to July.

Surveillance guidelines and reporting formats:

Digital HRI surveillance is conducted on Integrated Health Information Planform (IHIP) since March 1, 2023. Reporting is done at <https://ihip.mohfw.gov.in/>

National Action Plan on Heat Related Illnesses (<https://ncdc.mohfw.gov.in/wp-content/uploads/2024/05/1.Nation-Action-plan-on-Heat-Related-Illnesses.pdf>)

- Case definitions
- HRI reporting formats: health facility to state level (forms 1 to 4)
- Death investigation form for suspected heatstroke deaths

Reporting units: All health facilities in a district (PHC and above) should submit daily reports from March 1-July 31 regardless of observed temperatures and rainfall using their P-form level access to IHIP.

Surveillance training: included under capacity building section

Surveillance reporting and HRI monitoring:

- Daily monitoring of surveillance activity and health data monitoring should be done at district level in IHIP.
- Daily reporting will be monitored by the medical team in each institute
- Monthly review by the Medical Superintendent
- Quarterly review by the SNO, CC

▪ **Monitoring and evaluation**

The action plan be developed under the leadership of SNO-CC. Review of the health action plan will be conducted by the UT Task Force every year to evaluate the effectiveness of the proposed actions, target achieved and the progress

▪ **Location Specific Heat-Health Action Plans should include:**

Early warning system and inter-agency emergency response plan:

- Analysis of historic city level all-cause mortality with observed temperatures to establish health impact-based warning and response trigger (IMD, SDMA)
- Daily dissemination of forecast and observed temperature during summer to public and government agencies (IMD)
- Identification of roles and responsibilities of coordinating agencies with activity matrix and action checklists (Refer: Ahmedabad Heat Action Plan12)

▪ **Strengthening Health sector Preparedness Measures**

The department of Health & Family Welfare regularly is releasing an alert on heatwaves for taking precautionary measures by the citizen to prevent heat-related illnesses.

Season	Roles and responsibilities of SNO and DNO
During Pre-Heat Season (Annually from January through March)	<ul style="list-style-type: none"> Update surveillance protocols and programs, including tracking daily heat-related data Develop/revise and translate IEC in the local language Make a communication plan for the dissemination of heat-related alerts or education materials Check inventories of medical supplies in health centers Identify cooling centers and barriers to accessing cooling centers Capacity building of health care personnel to detect and treat heat-related illnesses Issue health advisory to healthcare personnel based on IMD seasonal prediction or warning Ensure inter-sectoral convergence and coordination for improving the architecture, design, energy-efficient cooling, and heating facility, and increase in plantation i.e. Climate Resilient Green Building Design.
During Heat Season (Annually from March through July)	<ul style="list-style-type: none"> Ensure real-time surveillance and monitoring system in case of an extreme event Prepare rapid response team Distribute “Dos and Don’ts” to the community Effectively send a “Don’t Panic!” message to the community Ensure access to Medical Helpline Ensure strict implementation of legislative/regulatory actions as per Occupational Health Standards. Coordination with the meteorological department for analyzing cases and death data with meteorological variables like maximum temperature and relative humidity
During Post-Heat Season (Annually from July through September)	<ul style="list-style-type: none"> Participate in the annual evaluation of heat action plan Review the revised heat action plan
Health Facility level	
<ul style="list-style-type: none"> HRI daily reporting IEC and awareness generation & dissemination Hospital level preparedness 	

Season	Roles and responsibilities of SNO and DNO
Frontline Health Care Worker	
<ul style="list-style-type: none"> • HRI surveillance • Generate awareness among the community • Timely referral of suspected cases to the nearest health facility 	

▪ Roles and responsibilities

<u>UT level</u>	<ul style="list-style-type: none"> • Disseminate early warning to block and health facility level • Ensure IEC dissemination to community level and facilitate community level IEC activities • Liaison with IMD to get daily observed temperature and relative humidity information • Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action • Conduct training for block health officers, medical officers, with relevant training manuals • Conduct sensitization of vulnerable groups: police officers, outdoor workers, women, children etc • Organize IEC campaigns at district level on observance of important environment-health days • Ensure daily reporting from health facilities and compile the data • Monitor, utilize surveillance data for necessary action • Coordinate with other agencies for response • Analyze daily health data with temperature and humidity levels to monitor trends and hotspots in district • Support timely suspected heatstroke death analysis and its reporting • Submit report of activities on heat-health under NPCCHH <p>Advocate for reduction in source of greenhouse gas emissions</p>
Block health officer	<ul style="list-style-type: none"> • Conduct community level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshop and training for vulnerable groups <p>Implement heat mitigation efforts</p>
Medical Officer	<ul style="list-style-type: none"> • Conduct health facility-based IEC activities • Support community level IEC activities • Be aware of AQI levels and health impact of air pollution <p>Ensure necessary health facility preparedness in early diagnosis and management of cases</p>
Panchayati Raj Institutions	<ul style="list-style-type: none"> • Conduct community level IEC activities

3. HEALTH ACTION PLAN ON VECTOR-BORNE DISEASE IN CONTEXT OF CLIMATE CHANGE

National Vector Borne Disease Control Programme (NVBDCP) is an umbrella programme for prevention & Control of 6 Vector borne Diseases, namely: Malaria, Dengue, Chikungunya, Japanese Encephalitis, Filariasis and Kala Azar

Causes of different Vector Borne diseases in the state:

1. Increased construction activities (Malaria & Dengue)
2. Multiple breeding points/leakages (Malaria & Dengue)
3. Increased usage of manmade containing by the residents.

Vulnerable groups

Migratory workers, construction workers and those with frequent cross border travel history.

Indicators for Vector Borne diseases:

Malaria: Chandigarh API has been <1 since 2014 & U.T has been placed in category 1 for malaria elimination by GOI. The target year given by for malaria elimination was by March 2020, However due to Covid pandemic the target could not be achieved. In the year 2020, 7 malaria cases have been detected as compared to 22 cases in the year 2019 (66.67% decrease)

Risk Mapping for Vector Borne diseases:

Hot spots/ High risk areas for VBD's are Manimajra, Maulijagan, Burail & few sectors within Chandigarh.

Resources required/ available to mitigate/reduce burden of Vector Borne diseases:

All the resources and machinery required for Vector Control are available with state for efficient vector control. Following are the measures which are being undertaken by NVBDCP, U.T, to control vector borne diseases in Chandigarh.

Actions for risk reduction that are agreed upon by stakeholders and the public

- **Joint operations** by M.C & Malaria wing have been planned for managing outdoor sources of water stagnation. This entails treatment of all the permanent breeding points of U.T, jointly.
- **Special strategies** are being devised by all stakeholders to prevent spread of VBD's in the high-risk areas.
- In the high-risk areas where Migratory Population is in large numbers **Intensive I.E.C activities** are being planned as well as the joined operations for source reduction will be carried out.

Operational Coordination (Stakeholders' role and involvement): Building partnerships by involving citizens, organizations, and businesses.

- **Public private mix** model has to be implemented in totality for expediting malaria elimination. IMA involvement is being sought for this purpose. This is essential to bring forth the latent malaria cases for remedial action and hasten elimination goal.
- **RWA involvement:** The cooperation of RWAs is a pre-requisite for controlling VBD like , Dengue
- **Builders associations:** The under construction sites are the main source of vector breeding as they contain containers used here always contain stagnant water. The proper mechanism of cleaning and scrub dry technique has to be demonstrated to the construction workers.

- **Involvement of Municipal councillors** is important so that the onus of responsibility regarding breeding in different area is thrust upon them. They will ensure that all the manmade containers are free from stagnation during peak season.

Mechanism of Generation of Alert system for the outbreak of Vector Borne diseases.

- **EWS generated on the basis of S & P forms** by IDSP can indicate a sudden spurt in fever cases and other symptoms can be due to vector borne diseases.
- **Action around the positive case** within 24 hrs will help to contain the Spread of VBD's in the area. This involves House to House survey around positive cases, Mass slides (around positive case of Malaria) contact slides around positive cases of malaria, vector control measures etc.

Activities conducted and proposed to integrate Vector Borne diseases in respective health programmes or policy.

1. EWS Detection by IDSP will serve as an indicator of early detection.
2. Private Sector reporting to be strengthened
3. Microscopy as a Gold standard for Malaria diagnosis will be promoted in private sector also.
4. Private Labs will be trained for early reporting for positives /suspect cases.
5. ANMs already trained in Malaria Slide Collection will be utilized in field to hasten malaria elimination.

New activities proposed for strengthening of surveillance related to Vector Borne illnesses include: -

- Training of School Medical Officers & School Health Incharges will be done so that for any fever case in school a slide of malaria is prepared. This is important for goal of malaria elimination.
- EWS Detection by IDSP will serve as an indicator of early detection.
- Private Sector reporting to be strengthened

▪ **Awareness**

To increase awareness amongst all the relevant stakeholders, including general people and vulnerable communities, healthcare providers, and policy makers regarding the impacts of vector-borne disease and ways to address them, the following is undertaken-

IEC Campaign: The districts are aimed to create awareness through Information Education and Communication Activities (IEC) through the development of locally and culturally more acceptable messages in posters, audio, video, organizing public health events, and issuing advisories. The content for the IEC for vector-borne disease will be provided by the UT NPCCHH division and NCVBDC. The UT will translate the content into the local or regional language and the role of the districts is to utilize these materials and disseminate them at all levels.

IEC dissemination plan: As per the schedule of NCVBDC & IDSP

▪ **Capacity Building**

Capacity Building: This will be done in a way that all NVBDCP staff are trained to handle climate related impact on VBDs in field. In UT, NVBDCP & IDSP are working in tandem since last few years. Consultant NPCCHH for Chandigarh (additional charge)) is also functioning as a Consultant VBD as well as State Epidemiologist, IDSP. The trainings to NVBDCP and IDSP Staff are being imparted by Consultant NPCCHH. **Henceforth all the personnel of NVBDCP will be sensitised for**

Climate Change & its relation to VBDs too during their sensitisation for VBDs. These trainings are planned from May to September month.

In schools, students who are part of ECO clubs will be ambassadors for spreading of Climate related messages and its impact on VBDs.

- **Special drives are planned during Anti Malaria month (June) & anti Dengue month (July).**
- **Strengthening of Existing Vector Control Interventions** like Anti-larval Activities, Source reduction activities and environmental management of sources will be done by NCVBDCP. **However, NPCCHH will lay Special emphasis will be laid on Cleaning drains, clearing vegetation from waterways etc.**
- **Special focus:** Chandigarh is criss crossed by **choe areas**. Administration will be involved in **channelization of choe water** where stagnation is encountered.
- **Intersectoral collaboration:** Active Cooperation from Public health wing of engineering department will be sought for source reduction. **Mapping of permanent breeding points & leakages** has already been done under NCVBDCP in UT and a list has been submitted to the department. NPCCHH will actively monitor this aspect in UT.

Awareness sessions and breeding control activities will be carried out as per the plan of NCVBDC with the NCVBDC budget.

1. Regular monitoring of climate factors and assessment of correlation with VBDs.
2. Establishment of a benchmark to generate Early warning signal
3. Mapping of potential vector breeding sites.
4. Regular adult vector monitoring (prevalence and density).

Environmental management and modification in rural areas through village Health, Sanitation & Nutrition Committee (VHSNC), MNREGA & Swachh Bharat Abhiyan and in rural areas by desilting, de-weeding, channelizing, larviciding, through Urban VBD scheme.

5. Biological control- Larvivorous fish.
6. Foci-based adult vector control interventions in and around 50 houses of the positive case- Space spray followed by IRS

Summary of Five-Year Health Action Plan for Vector Borne Disease

SN	Component	2022-23	2023-24	2024-25	2025-26	2026-27
1	Surveillance (NCVBDC/IDSP)	Throughout the year	Throughout the year	Throughout the year	Throughout the year	Throughout the year
2	Refresher Training of staff	As per the training schedule of NCVBDC	As per the training schedule of NCVBDC	As per the training schedule of NCVBDC	As per the training schedule of NCVBDC	As per the training schedule of NCVBDC
3	IEC BCC Activities	June to October	June to October	June to October	June to October	June to October
4	Health Advisory and Do's and Don'ts release	In the month on June and as per the needs				
5	Destruction of	As per the schedule of the NCVBDC. Actively from June to November				

	breeding sites	
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▪ **Roles and responsibilities**

UT Climate Change & Human Health Cell

1. Prepare advisory and disseminate to the district level.
2. Coordinate with other National health programmes like IDSP & NCVBDC for surveillance activities.
3. Coordinate with multisectoral task force members in developing the State Action plan for vector-borne diseases.
4. Capacity building of MOs in coordination with IDSP & NCVBDC.
5. IEC and awareness generation & dissemination planning in coordination with IDSP & NCVBDC.

4. HEALTH ADAPTATION PLAN FOR EXTREME WEATHER EVENTS

States and UTs may have recorded raised morbidity and mortality due to effect of extreme weather conditions viz frequent and severe episodes of heat waves, floods, droughts and fires as a direct impact of climate variability and affecting population at large.

Climate change can result in more hot days, resulting in more periods of 'drought', 'dust storms', or 'heavy rains (precipitation)', and even 'flooding'. The health gets directly affected due to injuries, hypothermia, hyperthermia, drowning and indirectly through population dislocation, crowding, poor living conditions, faeco-oral transmission of gastro-intestinal pathogens causing water and food borne illnesses, respiratory illness and other infectious diseases (e.g., leptospirosis, vector-borne disease, cholera and also mental illnesses). The reason primarily is due to contamination of water and sewage disposal.

Chandigarh is under seismic zone IV which makes it highly susceptible to Earthquake. Chandigarh district is also vulnerable towards other natural and manmade calamities like, Floods, Storms, Cold Wave, Fire, Accidents and Chemical and Biological threats.

Available evidence shows that there is high probability of increase in the frequency and intensity of climate related natural hazards due to climate change and hence increase in potential threat due to climate change related natural disasters in India, and Chandigarh is no exception to this.

▪ Awareness

The first step towards making hospitals safe is to create awareness among various stakeholders about the need to have safe hospitals, what it entails, and actions that can be undertaken. All awareness generation activities for hospital safety shall aim at sensitizing the key stakeholders and community on the need for disaster management in health facilities and to achieve the overall aim of protecting the lives of patients and health workers by ensuring the structural resilience of health facilities as well as improving the risk reduction capacity of health workers and institutions.

The key objectives of awareness generation activities shall be:

- a. Spreading awareness on protecting critical health facilities from disasters by including risk reduction in the design and construction of all new health facilities, and by reducing vulnerability in existing health facilities through structural and non-structural measures.
- b. Sensitizing the health workforce in hospitals as they are central to identifying potential health risks from hazards.

Administration has undertaken following steps during winter season:

1. Provision of *rain baseras* in strategic locations.
2. Preventive advisories for general public for cold related illness.
3. Sensitization of doctors for treating hypothermia etc.

▪ Dissemination Plan for IEC activities

IEC type	Material	Dissemination timeline	Dissemination mechanism
Advisory		Seasonal	Emails/WhatsApp from State Nodal for further instructions to health facilities
Early Warnings	Bulletins/ advisory by IMD (storm, cyclone), CWC (flood) sent by NPCCHH	Seasonal	Health Department, other Govt. offices, District Hospitals, public places & official websites, applications, Newspaper, Social Media
Posters	posters on various EWE and health impacts (English, Hindi, Punjabi)	Seasonal, as needed	Printing for UT-level dissemination at major public places, Health Facilities
Wall painting	Using available material	Painted in July-September	Selected schools, health facilities & important public places
Hoardings	Above mentioned IEC materials	Seasonal, as needed	To be displayed at selected places following discussions with Municipal Corporation and other relevant authorities
Audio-Visual	Video, GIF messages	Seasonal, as needed	Played seasonally and around relevant extreme weather events
Social media	Selected materials as mentioned above	Seasonal, As needed	Facebook and Twitter handle of state NPCCHH, NHM Official WhatsApp groups

Observance of important environment health days for Extreme weather events and health related

Day	Activities
October 13 International Day for Disaster Reduction	<ul style="list-style-type: none"> To educate people around the world on how they can lower the risks faced by natural disasters hence reducing the monetary loss and human lives Promoting awareness and enhancing knowledge and skills of all stakeholders and general people Mock drill and disaster response exercise

▪ Capacity Building

Training Programme	Trainer	Participants
Medical Officers (3 Days)	DNO	MO (DH, CHC, PHC)
Community Health Care Workers (HWC) (2 Days)	MO	Community Health Workers (MPHW, ASHA)
Panchayati Raj Institutions (1 Day)	MO, MLHP	Panchayati Raj Institutions, communities

▪ Roles and responsibilities

UT Climate Change & Human Health Cell

- Disseminate early warnings to the district level
- Finalization of IEC material and dissemination plan
- Formalize intersectoral coordination for disaster planning, management, and response with SDMA/IMD and other response departments
- Organize training of district-level officers
- Facilitate disaster vulnerability assessments
- Facilitate assessment and implementation of climate-resilient measures in health facilities

Health Facility level

- Conduct health facility-based IEC activities
- Support community-level IEC activities
- Preparation of Disaster Management Plans and hospital safety plan
- Assessment of health facilities in the context of climate change-extreme weather events
- Identifying structural changes/retrofitting measures at the facility level to equip the healthcare facility
- Ensuring routine monitoring and maintenance of support functions (Water quality, waste management)
- Health facility preparedness for seasonal events

Frontline Health Care Worker

- Generate awareness among the community
- Training of community members for preparedness and response due to disaster/extreme weather events

5. HEALTH ADAPTATION PLAN FOR GREEN AND CLIMATE RESILIENT HEALTHCARE

Building resilience and contributing to environmental sustainability are major components to strengthen the HCF to continue functioning with minimal negative environmental and health impacts. The National Programme on Climate Change and Human Health (NPCCHH) is engaging critically with strengthening the healthcare services and facilities to adapt to as well as mitigate the impacts of climate change. The key components recognized under the programme include –

- Energy efficiency
- Solarization
- Water Conservation
- Infrastructure development (retrofitting)

▪ Activity plan

Climate resilient healthcare infrastructure refers to the capacity of the healthcare facility to adapt, reorganize and evolve to be better prepared for future disasters and climate change impacts. Healthcare facilities need to take effective measures to withstand the impacts of increasing extreme weather events and other climate-related hazards such as higher temperatures, increasing precipitation over longer periods (causing increased flooding), intense but short-lived rainfall (causing flash flooding), decreasing precipitation (affecting places where rainwater harvesting contributes to the water supply systems of health care facilities), and higher winds and storms.

Roadmap to Green and Climate Resilient Health Infrastructure

Climate Resilient Infrastructure	Assessment Analysis and intervention identification	Action Planning Project, Policy, and Institutional Planning	Implementation of policy and programs
Situation analysis	Stakeholder input	Local ownership and validation	Capacity and advisory support
Stakeholder mapping and Authority Alignment	Data collection and analysis	Development of financial mechanisms or budgets	Monitoring and reporting
	Identification of effective interventions	Target setting and results framework	
Green Resilient Infrastructure	Green Resilient Infrastructure growth pathway analysis	Financial approval	Evaluation and learning
	Prioritization and costing of interventions		

▪ Situational Analysis

- Assessment of health infrastructure for Green and Climate Resilient (Energy Conservation, Water Conservation, and Green Resilient Infrastructure)
- Assess the possibilities of outbreak/ disaster around the health facilities
- Assess Manpower requirements for the outbreak/ disaster and plan deployment
- Assess the requirement of Equipment and Medicines

- Find an alternate place in case of non-functioning of Healthcare facilities or case of mass casualties.
- Assess the financial implication

▪ **Awareness & Capacity Building:**

Sensitization meetings/trainings on green resilient health infrastructure at the strategy level and tactical level through various talks, and meetings with higher authorities, Health Staff, Civil Engineers, and political leaders.

NPCCHH target for Green and Climate Resilient infrastructure

Activities	Indicator	Target (2024-25)	Achievement
Assessment of the healthcare facilities	% of HCF per district per year that have conducted the assessment	50%	Online assessment done for PHC/CHC/HWC
Green and Climate Resilient infrastructure measures e.g Energy efficiency Solarisation Water conservation	% of districts with at least one climate- resilient healthcare facility complying IPHS guideline per year	30%	Will be assessed after receiving checklist
	% of HCF have been replaced existing (Non-LED) lighting facilities with LED	20%	LED light installed in 100%HCF
	% HCF with installed solar panels	20%	66.67%
	% HCF with Rain Water Harvesting (RWH) system	10%	80%



Solar panels over Government Multispecialty Hospital, Sector 16, Chandigarh



Implementation Arrangement of Green Measures:

1. Green Measures in Health Care Facilities
 - a. LED Lights and energy efficient appliance in all Health Care facilities under Health Department
 - b. Energy audit will be conducted by Engineering Department, Chandigarh Administration
 - c. Water audit will be conducted by Engineering Department, Chandigarh Administration
 - d. Permission /NOC has been granted to CREST for installation of 270kWp SPV power plants at 16 nos. of different Health facilities under Health Department.
 - e. Installation of rain water harvesting system at GMSH-16.

2. TOTs will train MOs and Health workers to increase adoption of environment friendly energy consumption in the community in phased manner every year target will be increased by 10%.

LIST OF SPV POWER PLANTS INSTALLED AT GOVT. HOSPITALS IN CHANDIGARH

Sr.No.	Site Name	Capacity (in kWp)	Commissioning Date
1	Govt. Multi Specialty Hospital, Sector-16, Chandigarh.	70	04.07.2013
2	Govt. Medical College & Hospital, Sector- 32, Chandigarh.	100	24.07.2013
3	Two Wheeler Parking, Block-M, Govt. Medical College and Hospital, Sector-32, Chandigarh	450	08.09.2017
4	Govt. Civil Hospital, Sector-22, Chandigarh.	100	04.12.2017
5	Govt. Multi Speciality Hospital, Sec-16, Chandigarh	20	09.08.2018
6	Block-A, GMCH, Sector-32, Chandigarh	100	06.09.2019
7	Block-B, GMCH, Sector-32, Chandigarh	100	06.09.2019
8	Block-C, GMCH, Sector-32, Chandigarh	100	06.09.2019
9	Block-D, GMCH, Sector-32, Chandigarh	100	06.09.2019
10	Govt. Multi Specialty Hospital, Sector-16, Chandigarh. (Emergency Block)	55	21.12.2019
11	Govt. Multi Specialty Hospital, Sector-16, Chandigarh. (Nursing Hospital-I)	15	21.12.2019
12	Govt. Multi Specialty Hospital, Sector-16, Chandigarh. (Nursing Hospital-I)	20	21.12.2019
13	Govt. Multi Specialty Hospital, Sector-16, Chandigarh. (Administrative Block)	10	21.12.2019
14	Govt. Veterinary Hospital, Sector-22, Chandigarh	5	19.08.2020
15	GMCH South campus Hospital, Sector-48, Chandigarh	90	29.01.2021
Total		1335	

PART C

Budget

Actual and planned budget under NPCCHH for UT Chandigarh

Year	2022-23	2023-24	2024-25	2025-26	2026-27
Budget (in lac)	4.0	4.3	4.7	5.1	5.7

ANNEXURE 1: Multi-Disciplinary Task Force

Subject: Regarding constitution of Multi-Disciplinary Task Force for the National Programme for Climate Change & Human Health - NPCCHH.

Vide PUC received from Govt. of India regarding constitution of Task Force for the National Programme for Climate Change & Human Health- NPCCHH. Following are the nominations received from Health and Non Health Sectors required for the constitution of Task Force (Flag 'A'):

Sr. No.	Name	Designation & Department	Task Force Status
1.	Sh. Sudhanshu Gautam, HCS	Sub - Divisional Magistrate (E), Chandigarh	Member
2.	Dr. Vimal Kumar Hatwal	Scientist 'D', Ministry of Environment, Forest & Climate Change	Member
3.	Sh. Dinesh Tewari	Scientist 'D' (Sr. Hydrogeologist) Central Ground Water Board,	Member
4.	Dr. Manoj Kumar	Principal Scientist CSIR- Institute of Microbial Technology, Sector-39, Chd	Member
5.	Sh. Sushil Dogra	Scientist 'B' Chandigarh Pollution Control Committee	Member
6.	Sh. Surender Paul	Scientist 'F' Indian Meteorological Department	Member
7.	Dr. Upendrajeet Singh Gill	Public Health Expert-cum-State Nodal Officer for Climate Change & Human Health-cum-Assistant Director Malaria, NVBDCP -cum- State Surveillance Officer, IDSP	Nodal Officer
8.	Dr. Inderpal Singh	State Epidemiologist - IDSP	Member

Submitted for approval please.

EPI 5/12/19

Deep DEOST/12/19

ADP 05/12/19
ADM

The Task Force has been proposed on per the guidelines & consent of the septs. may kindly approve the same for conveying to G.O.I phase.
(Submitted for approval please)

Principal Secy IISCM.

11/06/2024 14:42

11/06/2024 14:42