



Centre for **Chronic Disease Control**

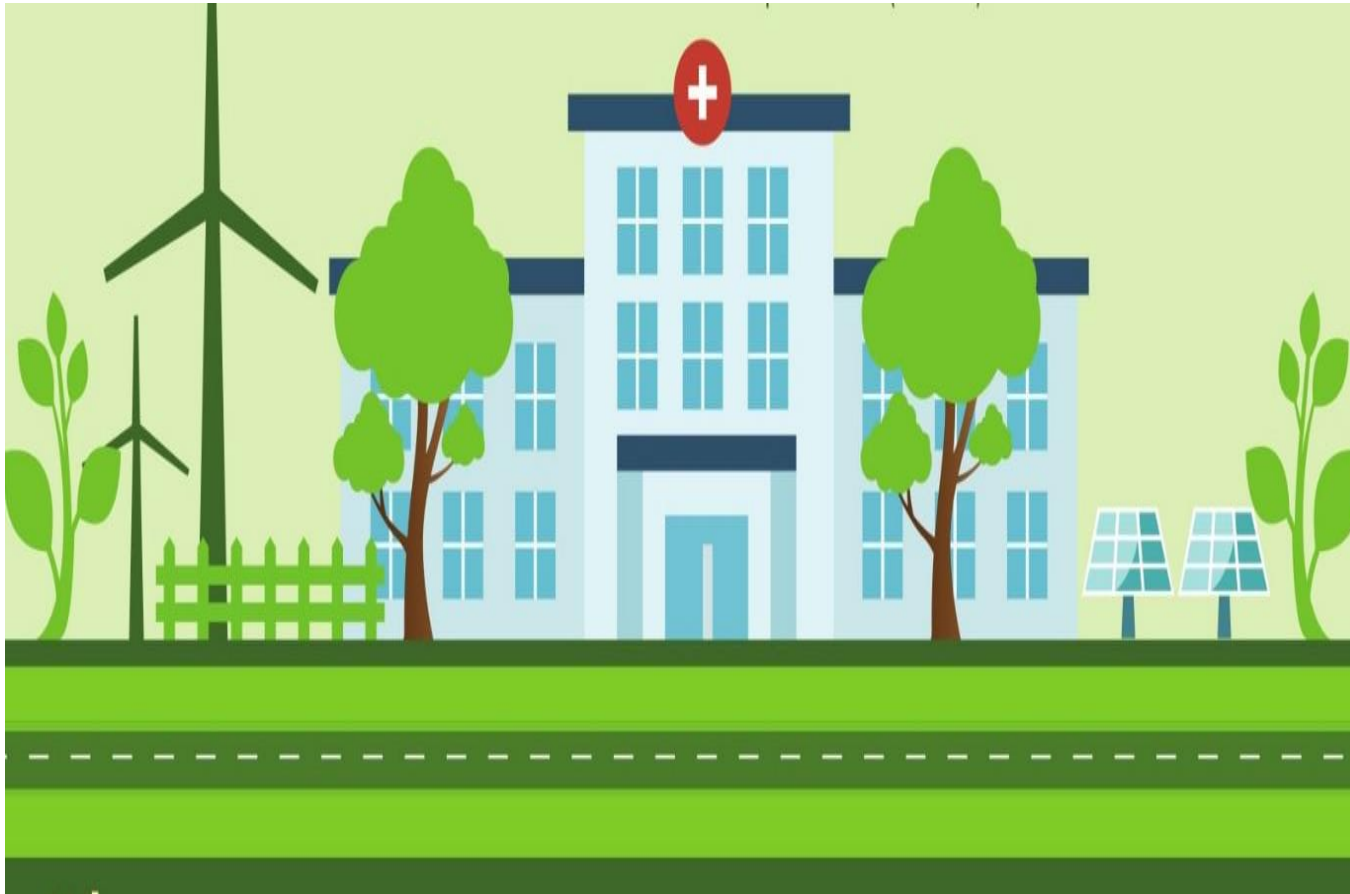


WHO Collaborating Centre for
Surveillance, Capacity building
and Translational Research in
Cardio-Metabolic Diseases



Accreditation Standards for Green Healthcare Facilities

21st Dec 2020



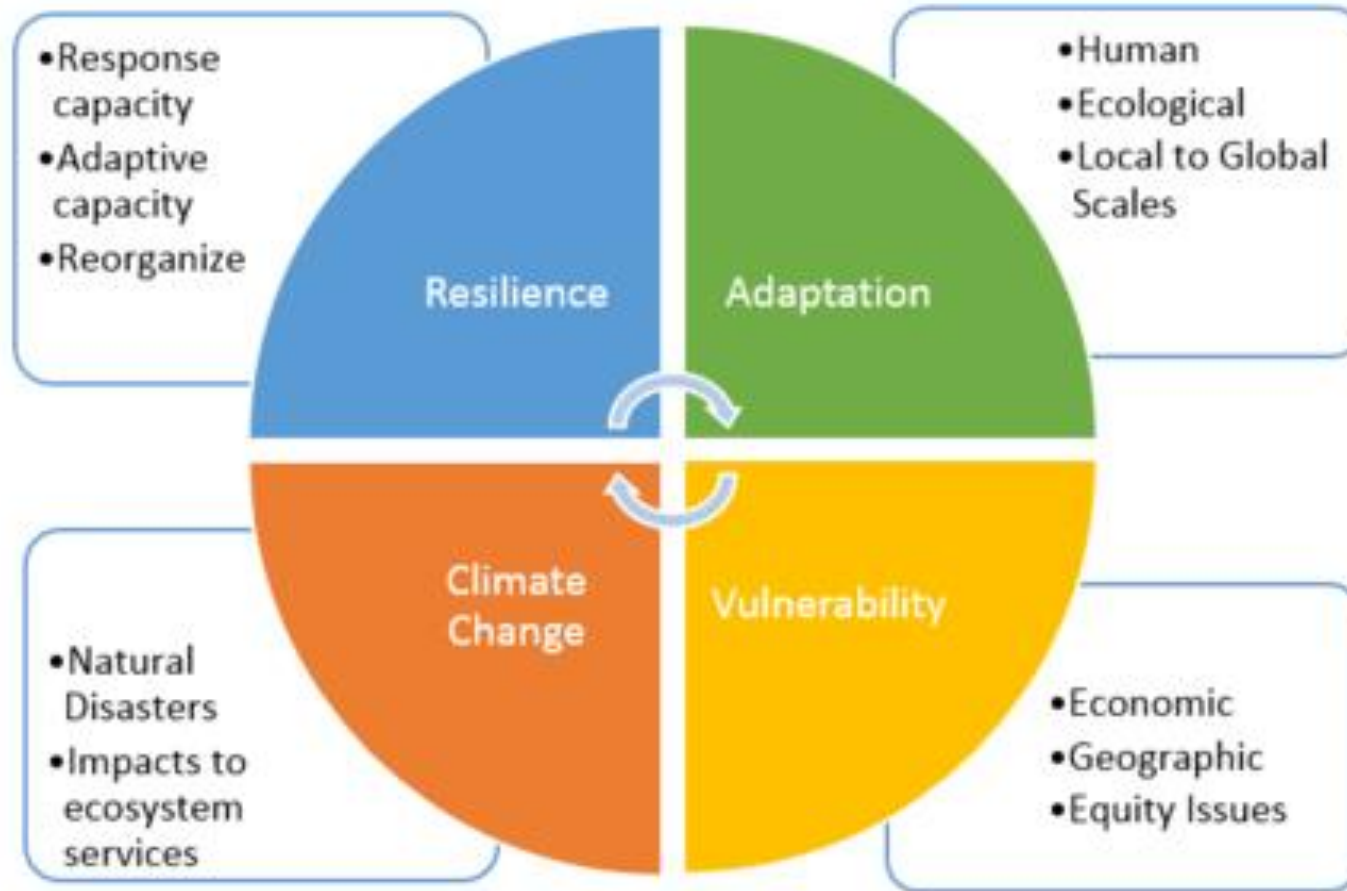
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Centre for Chronic Disease Control

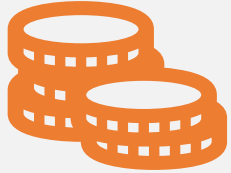
Climate Resilience & Adaptation



Vulnerability of the hospitals

- Amplification in the number of extreme events impacts the coping capacity of the hospitals.
- Heat Waves: impair functionality of hospitals including medical equipment and storage of medicines; affect thermal comfort of hospital buildings for patients and staff
- Floods: impacts on physical infrastructures supporting health services; Increase in water borne diseases
- Air Pollution: 1.2 million deaths in India in 2017; Increase in hospital admissions for cardiovascular and respiratory ailments
- Infectious/Vector borne disease: Spread of vector borne diseases poses additional challenge for the hospitals and health system

Impacts of climate change on hospitals



Financial

- Financial burden on hospitals, substantial economic strain on local, national, and global economies
- The increasing demand of resources during climate stress can have an overwhelming impact on the hospital and the region's economy.



Social

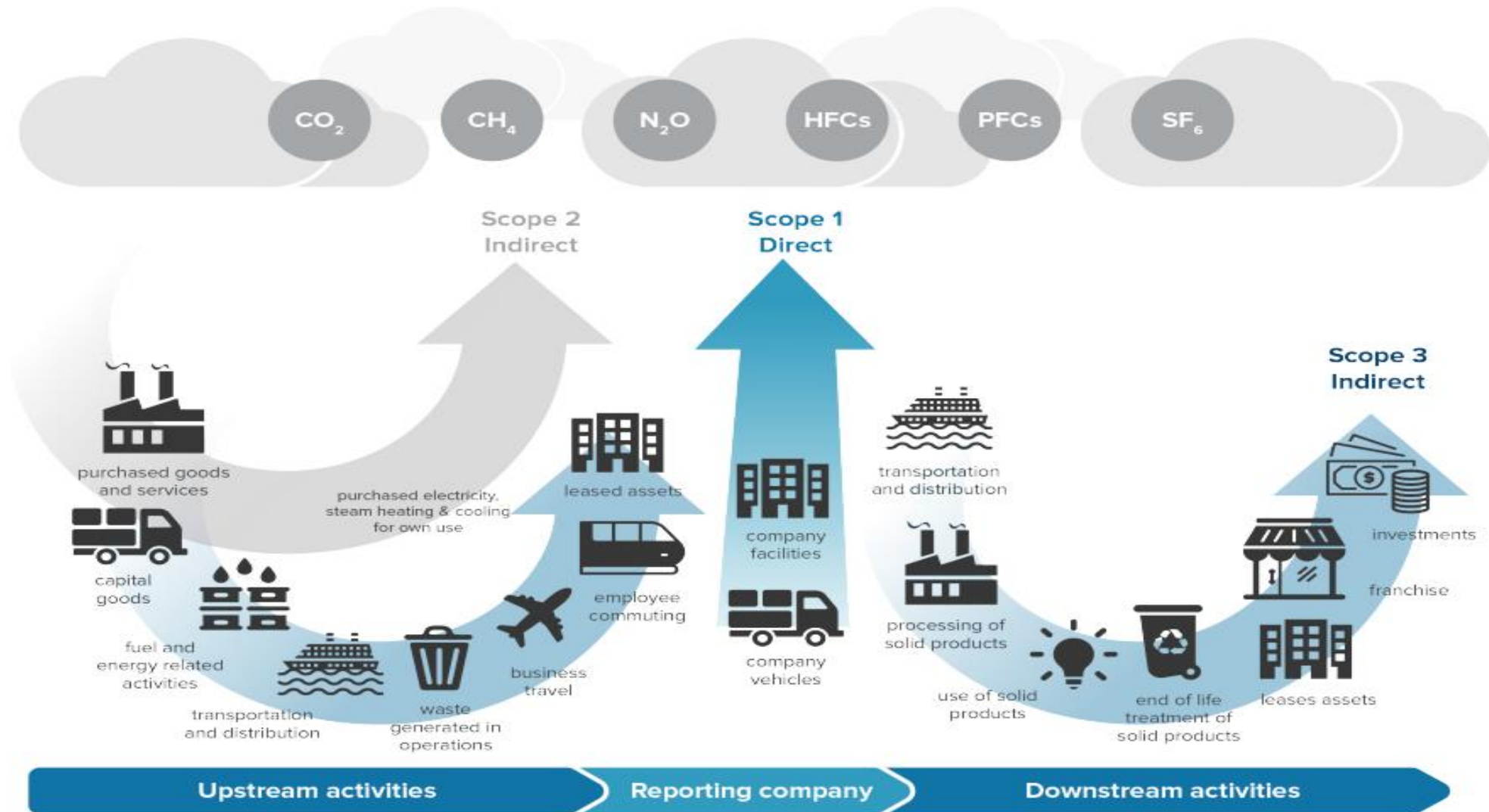
- Loss of confidence/morale in the affected community
- affect the long-term recovery and sense of well-being of the community.



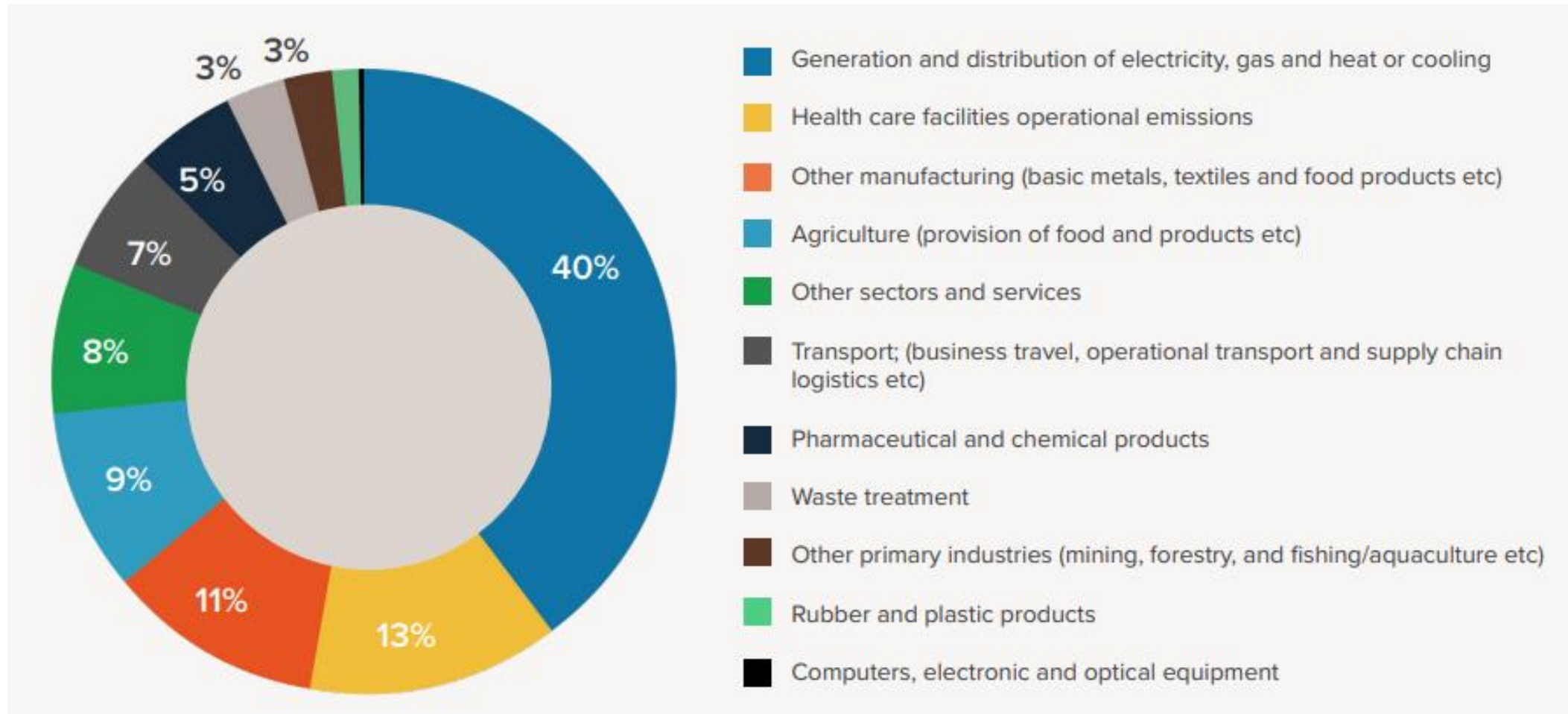
Healthcare

- lapses in the medical care being given to the victims
- delay in preventive medicine and public health response.

Healthcare's Climate Activity



Global Health Care Emissions Split by Production Sector



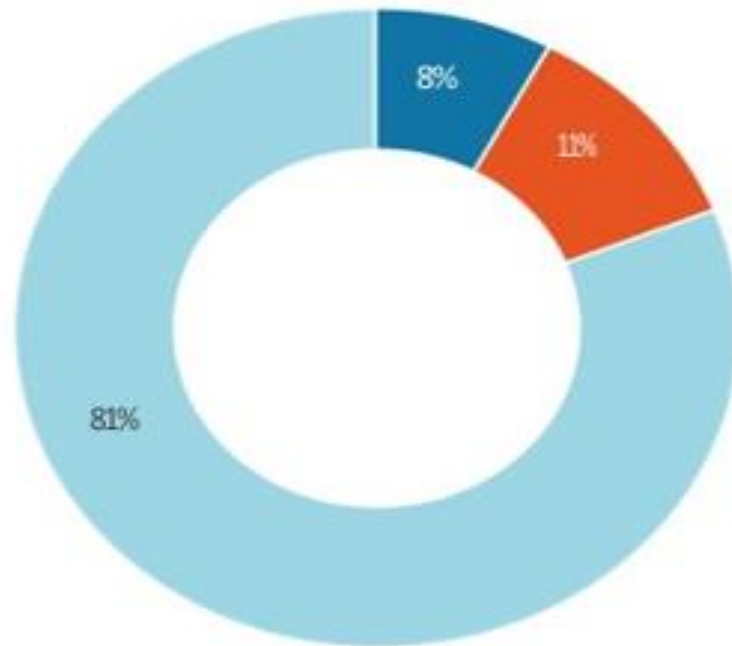
Healthcare's Climate Footprint

- Provides a global estimate of health care's greenhouse gas emissions, as well as provide 43 country estimates broken down by Scopes 1, 2, and 3.
- Examines how energy, food, anesthetic gases, and transportation contribute to health care's global climate footprint.
- Identifies opportunities for further research and methodological development that would support the sector in its efforts to understand and address its climate footprint.
- Outlines a series of international, national and subnational policy recommendations for health care climate action.



India's Footprint

India



Scope 1 Scope 2 Scope 3

India health care	Value	Unit
Climate footprint	39	MtCO ₂ e
Emissions per capita	0.03	tCO ₂ e/capita
Emissions as % of national footprint	1.5	%
Expenditure per capita	57	USD
Expenditure as percentage of GDP	3.6	%
% of footprint generated domestically	80.1	%
Health sector footprint equivalence to coal power plant emissions ²²	10	coal-fired power plants in one year

Framework of Accreditation Standards

Sl. No.	Name of Chapter	No. of Standards	No. of Criteria
1	Governance and Leadership (GAL)	3	7
2	Site Selection (SS)	5	15
3	Indoor Air Quality (IAQ)	4	14
4	Energy and Ambience (EA)	4	18
5	Water Use (WU)	5	19
6	Bio-Medical Waste Management (BMWM)	4	21
7	Green Housekeeping (GHK)	6	20
8	Procurement of Materials and Resources (PMR)	2	9
	Total	33	123



Green Building Principles for Healthcare

- Site Selection
 - Mitigate Flooding
 - Heat waves
 - Vector borne control
 - Land slides

Site Selection: Standards

- Healthcare Facility (HCF) should first look at National and regional norms for Site Selection.
- HCFs shall ensure conservation and preservation of available natural resources and resilience to flooding and other impacts of climate change.
- HCFs shall have a plan & monitoring mechanism during construction to reduce noise pollution, air pollution, soil erosion and airborne dust generation
- HCFs shall adhere to applicable statutory norms to ensure patient, visitor and staff safety in all areas.

Green Building Principles for Healthcare

- Indoor Air Quality
 - Not promoting diesel gen sets
 - Following protocols of Indoor monitoring in ICU/NICU/Emergency is essential

Indoor Air Quality : Standards

- The organization has a documented process for maintaining the indoor air quality standards according to National/ International Health Standards.
- Conduct indoor air quality testing on a monthly basis in critical zones to determine the level of pollutants.
- Ensure all occupied spaces including administrative and recreational areas have proper ventilation, thereby improving health and well-being of all patients, visitors and hospital staff.
- Avoid the use of fossil fuel in artificial power generation.

Green Building Principles for Healthcare

- Energy & Ambience
 - Maximize the access to daylight in patient and staff areas.
 - New electrical appliances shall have a minimum 3-star rating from Bureau of Energy Efficiency or equivalent recognized organization to minimize the energy input
 - Use of LED lamps
 - Task lights in non-frequent areas
 - Use of renewable energy as a back as well as to bridge energy in-efficiency
 - Energy decentralization is important for resilience and mitigation.

Energy & Ambience: Standards

- Requirements for new health facilities.
- Maximize the access to daylight in patient and staff areas.
- minimum 3-star rating from Bureau of Energy Efficiency or equivalent recognized organization to minimize the energy input
- Demonstrate that refrigerants used in Heating, Ventilation & Air-conditioning (HVAC) equipment are CFC (Chloro Fluoro Carbon) free, with a low Greenhouse Warming Potential (GWP) when available.
- Demonstrate that refrigerants used in cooling equipment have the lower GHP (greenhouse power)

Energy & Ambience

- Incorporate optimized energy consumption devices.
- Ensure the hospital has a strategy for optimization of energy usage and saving.
- Ensure regularly occupied spaces are adequately ventilated, thereby improving health and well-being of the occupants.

Green Building Principles for Healthcare

- Water Use
 - Hospital demonstrates that there are no drips, leaks and unnecessary flows in bathroom, laundry, kitchen, labs, green cover (garden/ plantation sites
 - Sub-metering to understand and evaluate water consumption
 - Rain water harvesting
 - Waste-water recycle plant; Grey water for flushing toilets

Water Use : Standards

- Hospital works on action items for new buildings and construction
- Enhance efficiency of plumbing fixtures by design
- Hospital treats waste water generated on-site, so as to avoid polluting the receiving streams by safe disposal
- Hospital demonstrates efficient management of water saving.
- Hospital use sub-metering to improve water performance of the hospitals, and thereby save potable water
- Eg: Use recycled grey water for irrigation and toilet flushing,
- Installation of water efficient faucets and toilet equipment

Green Building Principles for Healthcare

- Waste Management
 - Segregation of dry-wet-bio medical
 - Measuring waste generated and setting goals to reduce them
 - Setting up in-house waste management system in hospitals for manual composting of wet and/or dry waste
 - Compliance with national Bio-medical rule
 - Bio-medical waste management committee and training

Waste Management : Standards

- Implement National BMWM amendment, 2018
- Hospital demonstrates segregation of general waste generated at source
- Hospital demonstrates proper segregation of bio-medical waste at source of generation.
- Establishment of Bio-medical waste management system
- A documented policy exists to address health and safety needs of staff

Green Building Principles for Healthcare

- Green House Keeping & Procurement
 - Establishment of Sustainability Committee/Green team in the healthcare facility for procurement policies
 - Awareness & Capacity Building
 - Expectations and outcomes of management and senior leaders to create and maintain a culture of green healthcare
 - Leadership will influence climate financing and help build resilience.

Green House Keeping: Standards

- Hospital shall ensure use of certified low-VOC emitting and least toxic emitting chemicals and materials.
- Hospital shall have a protocol for procuring of Products, Materials and Equipment used for house-keeping (Environmental Friendly Preferable).
- Provide appropriate infection control parameters & systems in hospitals, thereby reducing the nosocomial infection.
- Organization shall have a process for housekeeping and cleaning agents with defined criteria considering performance/ people/ planet and pricing.

Procurement : Standards

- The organization shall have a process for the purchase and procurement of more sustainable materials.
- Use certified green building materials, products, and equipment, so as to reduce dependence on materials that have associated negative environmental impacts.

Green Building Principles for Healthcare

- Leadership
 - Establishment of Sustainability Committee/Green team in the healthcare facility for procurement policies
 - Awareness & Capacity Building
 - Expectations and outcomes of management and senior leaders to create and maintain a culture of green healthcare
 - Leadership will influence climate financing and help build resilience.

Leadership : Standards

- The management of the hospital is committed to implement the concept of green healthcare.
- The management is accountable for consistent compliance of applicable regulatory/ statutory/ legal requirements.
- The management receives reports on the compliance with the requirements of this standard on a scheduled basis.

Case Studies from India on Green HCFs

- **Solar Initiative at Bhagat Hospitals, Delhi**



- Sustainability Strategy Implemented
 - All the electrical appliances installed at the facility have a 4 or more-star rating according to Bureau of Energy Efficiency in India
 - All CFLs have been replaced by LEDs
 - The 50kW solar panel connected to the grid offsets up to 12% of the energy consumption of the hospital

A Water Conservation Initiative

- Conserving and Reducing Water Consumption Using a Decentralized Wastewater Recycling System by Aravind Eye Care Hospitals, Pondicherry
- Environmental benefit:
 - The hospital uses one borewell to pump 120 m³ of water every day of which 100m³ of water is recycled each day.
 - The recycled water is used for toilets and irrigation purposes
- Other benefits: Reduction of waste, both municipal and biomedical. The sludge which settles in the recycling unit is used as compost
- Financial benefits: The recycled water is used for irrigation and fertilization which in turn produces over **INR 4 lacs worth of food per year**

Safe Waste Management Initiative

- Improving the Management of Waste and Generating Revenue by Aravind Eye Care Hospitals, Pondicherry
- Financial gains of **INR 147,456 (US\$2,185)** was made in year 2016 through resale of plastic, paper and aluminum product gathered from recyclable waste
- Better occupational safety was provided to the hospital workers who handle biomedical waste
- Safe health care waste management techniques were implemented in all the units.
- This was possible through an enabling governance structure and emplacing systems for safe waste segregation, transportation, treatment using autoclave technology, and recycling

Safe Waste Management Initiative

- All wastes were segregated at source of generation as mentioned in the Bio-Medical Waste Management Rule (Government of India) by using different colored bins
- Reusable plastic sheets, paper, plastic bottles, aluminum, glass, blue plastic, bio-medical waste and other general waste were segregated separately at source
- The segregated hazardous waste is taken outside in a safe sealed bag and handled as per regulation
- The reusable plastic, paper and metals are segregated and shredded for sale
- More bins of the same color were introduced for collecting the common resalable waste
- The plastic, paper and aluminum materials are sold twice every month

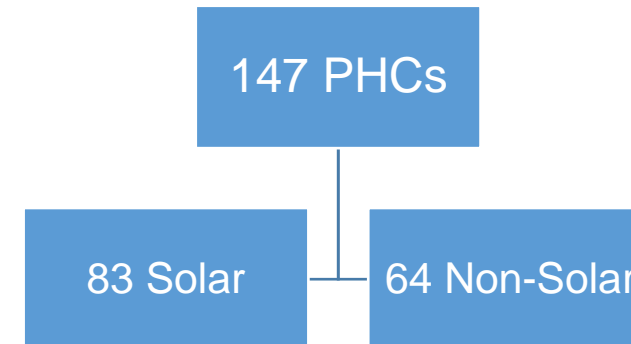
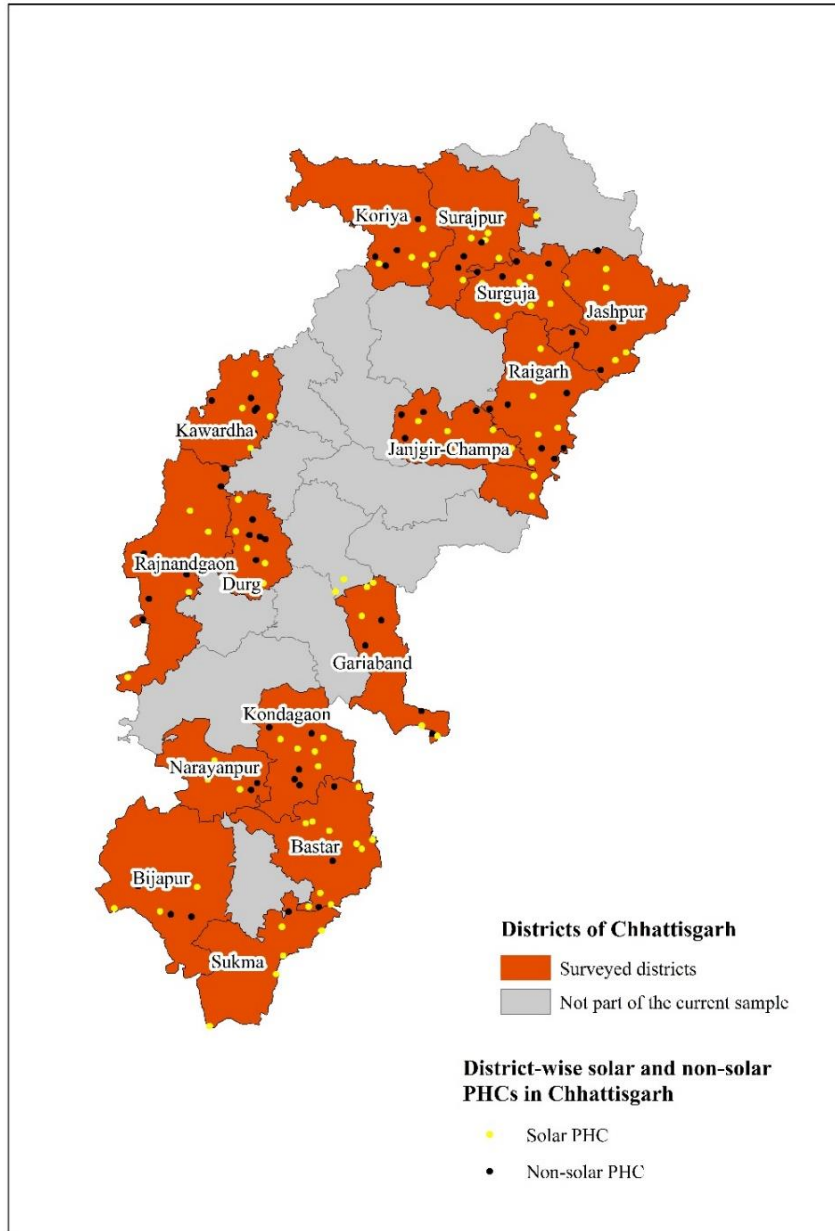
Waste Management Case Studies

- **Dr RN Cooper Hospital –Waste and Energy**
 - Entire dry food waste to on-site vermicomposting
 - Manure generated is used for the campus plantations (2700 trees)
 - Reducing the waste load at the landfill site
 - Solar panels for water heating
- **Lokmanya Tilak Municipal General Hospital- Waste**
 - Wet and dry food waste management through bacterial composting within their campus
 - Use manure for campus plantations (plans to develop organic kitchen garden for canteen consumption).

Powering primary healthcare through solar in India

Lessons from Chhattisgarh

- **Hypothesis:** Improved electricity access can lead to better health service delivery
- Two stage stratified random sampling for selecting the primary health centers
- Matched them with controls i.e. PHCs without solar



Powering primary healthcare through solar in India

Lessons from Chhattisgarh



- Chhattisgarh Renewable Energy Development Agency (CREDA)
- 2 kWh Off-grid Solar PV systems
- 4 Hours of back-up, depending on load
- 570 Primary Health Centres (PHCs) since 2012
- At present, the no of solarized PHCs are over 900.



Higher service provision in health facilities with solar

70% of health facilities with solar provided 24 x 7 services compared to 48% of those without solar

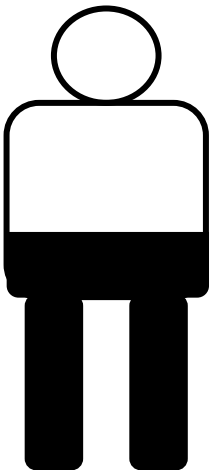
Out-patients treated per PHC per month

With Solar



630

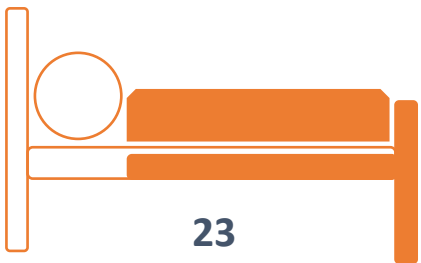
Without Solar



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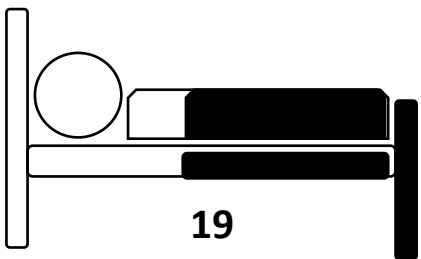
In-patients treated per PHC per month

With Solar



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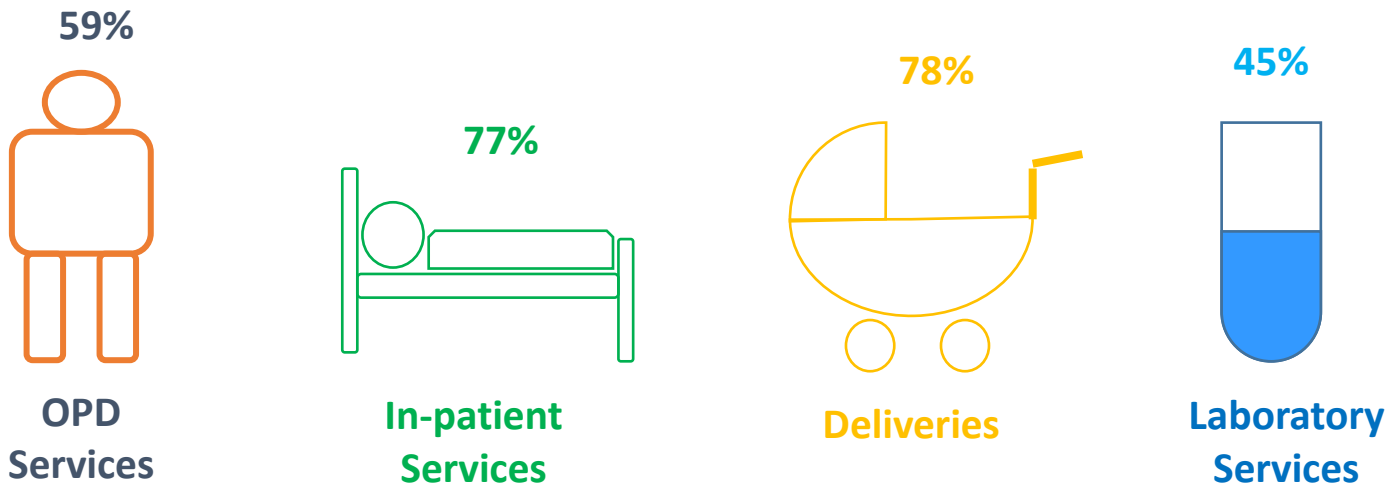
Without Solar



19

Perceptions of health staff in PHCs (1/2)

Proportion of PHCs reporting service improvement due to solar



Green HCFs Standards Available in India

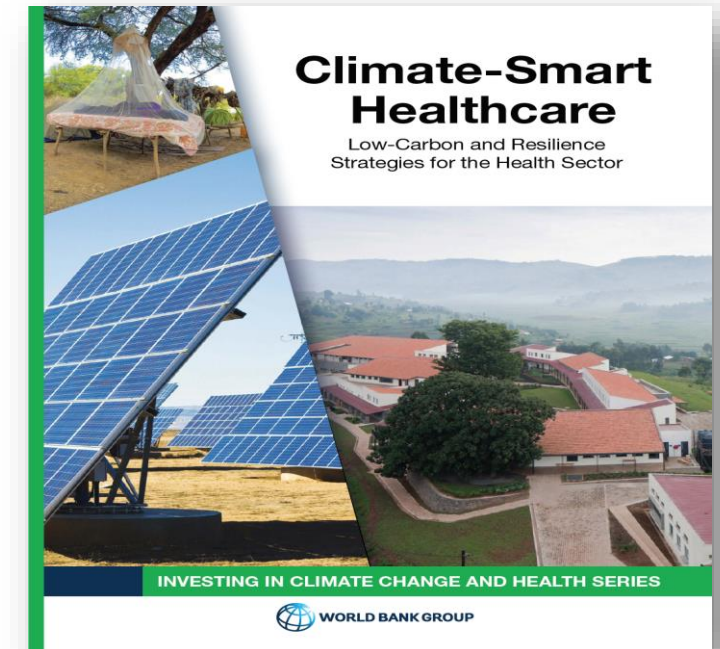
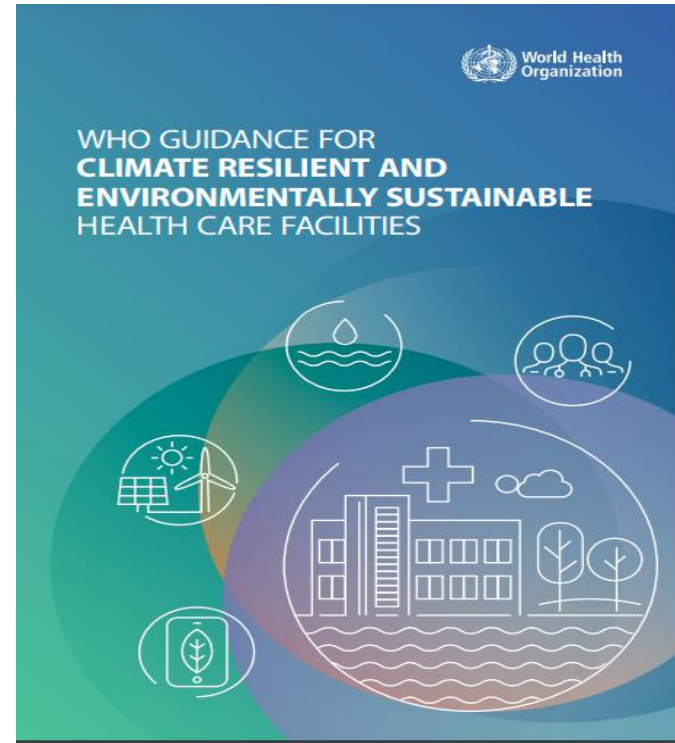
- Global Accreditation standards
- National Accreditation Standards
- Hospital relevant standards and recommendation
- Complete NGHS Standard with QAI



Climate-Smart Health Care

Brings mitigation and resilience together under one framework.

- *Reduce health care's carbon footprint
- *Build climate resilience
- *Improve Access to Health Care
- *Aligns health care with the Paris Agreement



Strengthen Green Buildings Standards

- Absence of Green building Standards in most accreditation bodies
- Welcoming move: IPHS guideline and NAPCCHH
- Presence of established standards will open up the stigma on Green building as an expensive concept
- Private sector initiative will be key in normalizing climate resilience in healthcare