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# A rapid assessment of the impact of coronavirus disease (COVID- 19) pandemic on health care & service delivery for noncommunicable diseases in India



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## ABSTRACT

**Background and aim:** The coronavirus disease (COVID-19) pandemic had disrupted the availability, access and utilisation of routine health care services. The present study aimed to assess the impact of COVID-19 pandemic restrictions on India's Non communicable Disease (NCD) health care service delivery.

**Methods:** The study included existing hospitals in disease registry network of the Indian Council of Medical Research-National Centre for Disease Informatics and Research (ICMR-NCDIR), Bengaluru. The study participants comprised site investigators who were clinicians from many specialities, including general medicine, surgery, cancer, neurology, cardiology, and endocrinology. A standardised questionnaire was prepared to collect data on NCD health care services at the respective hospitals over three months from March to May 2020.

**Results:** Out of 153 hospitals approached for the study, 106 (70%) agreed to participate. Of these, 16 hospitals fully converted for COVID-19 care were excluded from the study. Thus, data from 90 hospitals were included in the final analysis. There had been a total disruption of NCD-related healthcare services during the three months in 44% of the hospitals. In April 2020, the outpatient attendance for over one-third of the hospitals was reduced by more than 75%. Admissions for planned surgeries for cancer treatment were reduced by more than 75% for about 40% of the hospitals. Preventive activities and population-based screening for diabetes, hypertension and cancer appear to have been adversely affected, with about one-third of the hospitals reporting total disruption in April and May 2020. As many as 60% of the institutions reported adequate availability of doctors. Over 91% of the institutions had preparedness/action plans to ensure the continuity of NCD services.

**Conclusion:** The study shows that despite adequate human and material resources, NCD outpatient services, elective surgeries and population-based screening were severely affected. Most institutions were prepared to overcome the pandemic-imposed disruption and ensure a continuum of care for NCDs'.

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## 1. Introduction

Non communicable diseases (NCDs) are a significant cause of disability and account for 66% of the deaths in India [1]. Since the emergence of COVID -19 in December 2019, there has been an unprecedented global effort to control the resulting pandemic. The

World Health Organization (WHO) identified the SARS-CoV-2 coronavirus (COVID-19) as a public health emergency on January 30, 2020 and declared it a pandemic on March 11, 2020. The first COVID-19 infection case in India was reported on January 27, 2020 in Kerala. As of early August 2022, over 500 million cases and 6 million deaths due to COVID-19 have been reported worldwide, and more than 44 million cases and 0.5 million deaths were estimated to occur in India [2].

COVID-19 causes higher mortality in the elderly and those with underlying NCDs' [3,4]. After hypertension, diabetes is the second most common co-morbidity among COVID-19 patients and was seen in 30% of patients who died due to the disease [5]. Associated

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co-morbidities in a diabetic patient, including cardiovascular disease, obesity and chronic kidney disease, lead to increased disease fatality. In diabetic patients, hyperglycemia might modulate immune, coagulatory and inflammatory responses resulting in increased mortality [6]. Severe COVID-19 infection also contributes to hyperglycemia through damaging pancreatic  $\beta$ -cells and increasing target tissue resistance to insulin [7].

The pandemic had disrupted the availability, access and utilisation of routine health care services. In response to the rising number of cases, the country went into a complete twenty-one day nationwide lockdown on March 24, 2020. Different phases of lockdowns and uplifting of restrictions have followed since then. The instructions to restrict elective surgeries and regular outpatient department services during the lockdown and its delayed opening had left many patients with unattended medical attention. Even with the easing of lockdown restrictions and resumption of everyday activities, the health-seeking behaviour, availability and utilisation of health services were affected [8].

Concerning NCDs, many patients are likely to have faced challenges due to restricted access to health care and mobility during this unprecedented time. A WHO survey conducted in 163 countries observed that NCD services got disrupted in 122 countries, which increased as the pandemic progressed [9]. A systematic review of the impact of COVID-19 on routine diabetic care at the global level showed that many new cases and complications in known diabetics went undiagnosed [9]. Studies from India, limited to single facilities or communities, have confirmed the impact of COVID-19 on specific NCDs [10–13]. Most studies assessed NCD service disruption from a client's perspective. However, there appears to be a gap in understanding the disruption of NCD care from a broader perspective of health care facilities. Thus, this survey was conducted to understand the pattern and magnitude of disruption of health care services for NCDs' during the pandemic in multiple hospitals throughout the country.

## 2. Methodology

**Study settings and participants:** The ICMR-National Centre for Disease Informatics and Research (NCDIR), Bengaluru, conducted the survey in its existing network of collaborating hospitals all over the country, which serve as sites for disease registry and other research activities. These hospitals are in the public and private sectors, ranging from general to super-speciality. A total of 153 hospitals were invited to participate in the survey. The respondents were Principal investigators of study sites of the registries and other ongoing hospital projects. They included clinicians from different specialities such as general medicine, surgery, oncology, neurology, cardiology and endocrinology.

**Data collection:** A standardised questionnaire was developed to collect data on delivering health care services for NCDs' at the respective hospitals. The questionnaire included a combination of close and open-ended questions. The survey questionnaire was securely hosted on a web portal for which login access was

provided to the participating hospitals.

### 2.1. Data variables

The participants responded to the survey questionnaire under the following categories.

- (i) General information- Type of hospital, organisation governance. These included
  - Medical-college hospital: Hospitals associated with or attached to a medical college
  - Super-Specialty hospital: A hospital primarily and exclusively engaged in the treatment of patients having a specific disease
  - Multi-speciality hospital: A hospital providing patients with treatment facilities for all branches of medicine and surgery
  - Regional Cancer Centre: Cancer hospitals and research institutes specifically dealing with cancer patients only.
- (ii) Disruption of health care services for diabetes, cardiovascular diseases (hypertension, coronary artery disease and stroke) and cancer. Total disruption comprised total suspension of services, while partial disruption referred to a decline in the availability of health care services, although services continued to be available on a lesser scale.
- (iii) The magnitude of disruption and types of affected services- Out Patient Department (OPD), In-patient, elective procedures, emergency services, intensive care, diagnostics
- (iv) Changes in patient attendance and admissions concerning NCDs' during March to May 2020, compared with the corresponding period in 2019
- (v) Availability of health resources: human resources (doctors and nurses), medicines and equipment)
- (vi) Preparedness and response plans for delivering NCD services

All respondents provided subjective responses to the survey questions in consultation with their concerned colleagues. The submitted information was not subjected to any additional verification.

The data were entered using Microsoft Excel and analysed using descriptive statistics.

**Ethics clearance:** The study was approved by the Institutional Ethics Committee of ICMR-NCDIR (NCDIR/IEC/3015/2020)

## 3. Results

Of the 153 study hospitals from the existing ICMR-NCDIR network, 106 (70%) agreed to respond to the survey questionnaire. The answers to the questions were obtained through an in-house consultative process at the participating hospital. Among the 106 hospitals, 16 were COVID -19 dedicated hospitals and were not providing care for other illnesses. Hence a total of 90 hospitals were included in the final analysis.

**Table 1**  
Profile of institutions and type of ownership (N = 90).

Hospitals	Government n(%)	Private n(%)	Charitable/NGO n(%)	Total n(%)
Medical college hospital	15 (17)	3 (3)	4 (4)	22 (24)
Super-speciality hospital	10 (11)	10 (11)	6 (7)	26 (29)
Multi-speciality hospital	6 (7)	11 (12)	2 (3)	19 (22)
Regional Cancer Centre	11 (12)	2 (3)	4 (4)	17 (19)
Others	4 (4)	1 (1)	1 (1)	6 (6)
N	46 (51)	27 (30)	17 (19)	90 (100.00)

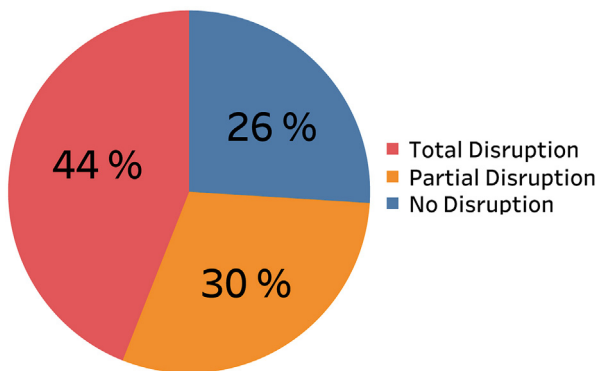


Fig. 1. Percentage of hospitals where NCD services were disrupted due to COVID 19 pandemic (N = 90).

### 3.1. Profile of participating institutions

The profile of institution types and governance is shown in Table 1. Over half (51%) of the institutions were government-owned, followed by private (30%). The proportion of super-speciality hospitals was 29%, followed by medical college hospitals (24%) and multispeciality hospitals (22%).

### 3.2. Disruption of NCD related healthcare services

Out of the ninety hospitals, nearly half (44%) reported a total disruption of NCD-related healthcare services during March–May 2020, followed by partial disruption in 30%, as shown in Fig. 1. The extent of disruption for different types of health services over the three months is shown in Fig. 2. Outpatient and inpatient services were entirely disrupted in over half of the participating hospitals in April 2020. Disturbance in population-based screening and NCD prevention-related activities was reported in about one third

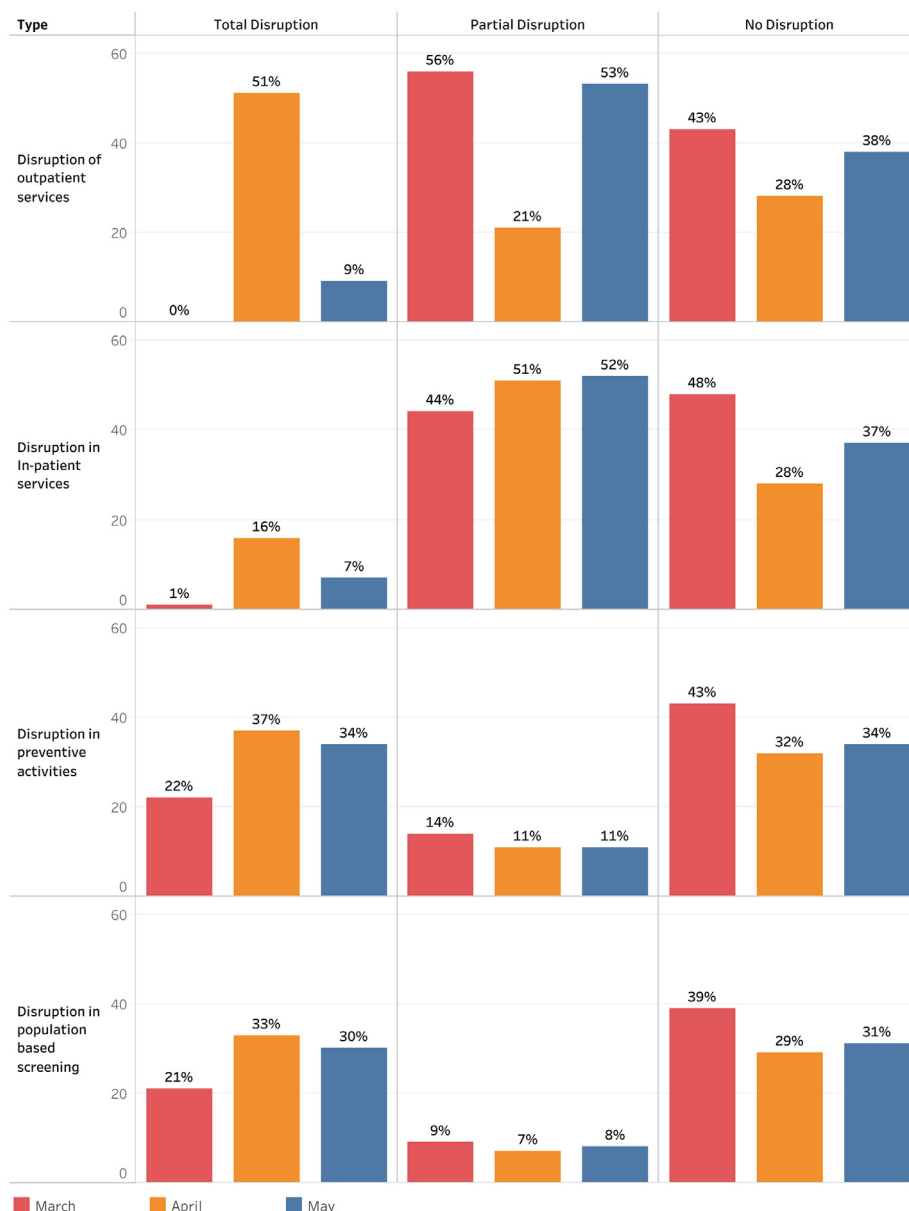


Fig. 2. Percentage disruption of healthcare services from March–May 2020 (N = 90) in hospitals which were not dedicated COVID 19 care centres.

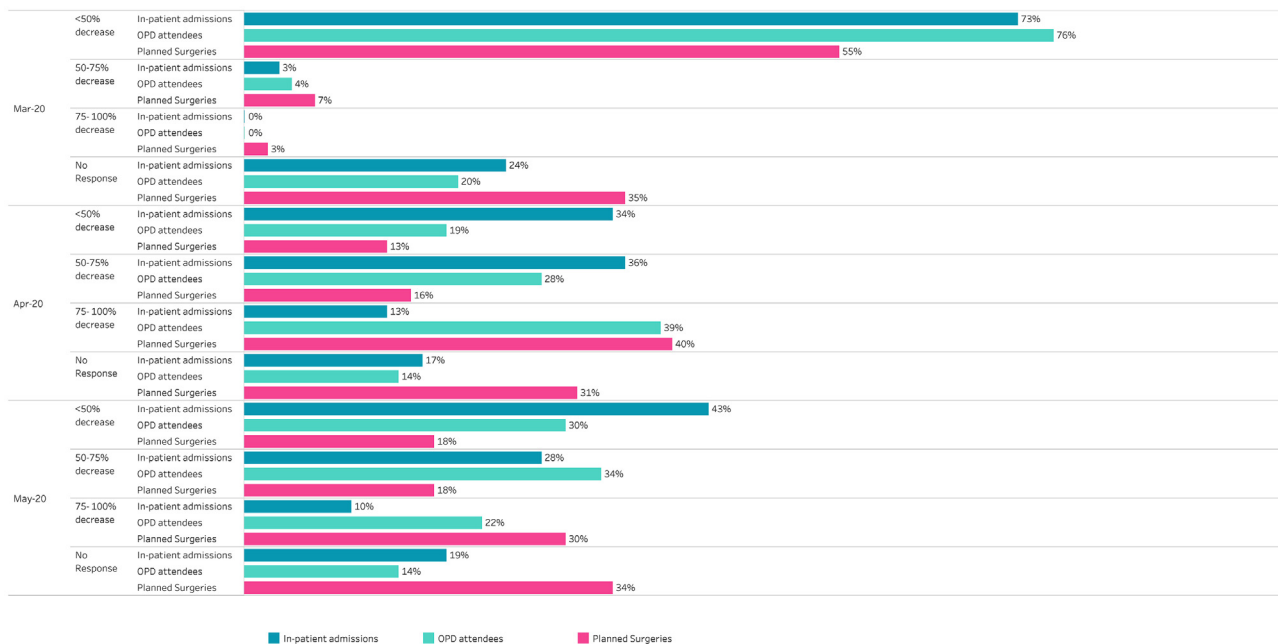


Fig. 3. Change in Patient load from March to May 2020, compared with the corresponding period in 2019.

Table 2 Proposed/adopted approaches to ensure continuity of services for NCDs'.

Sl. No.	Proposed/Adopted Approaches	n = 90 (%)
1	Continuation/resumption of routine OPD/Special clinics	80 (89)
2	Triaging patients and prioritising care based on the severity of the condition	72 (80)
3	Made contact with existing patients enrolled with the hospital to monitor health status and provide guidance	55 (61)
4	Telemedicine deployment to replace in-person consults	58 (64)
5	Prepared and shared counselling material with patients	70 (78)
6	Made home visits to patients by doctors/nurses/paramedical staff	6 (7)
7	Made contact with local health facilities to streamline patient care	46 (51)
8	Involved local NGOs/Civil society/self-help groups to extend healthcare services	33 (37)
9	Any Other	6 (7)
10	Did not propose/adopt any plan	16 (18%)

of the health facilities during April and May 2020. Partial disruption of in-patient admissions for elective surgeries/procedures and diagnostic procedures was seen in nearly half of the participating hospitals throughout the three months.

### 3.3. Magnitude of change in the utilisation of health care services

Compared with the same period (March–May 2019), the patient attendance and utilisation of different service types had reduced by varying extents, as seen in Fig. 3. In March 2020, in over two-thirds of the institutions, the decrease in outpatient and inpatient attendance was less than 50% compared to the previous year. However, in April 2020, the outpatient attendance for over one-third of the hospitals was reduced by 75–100%. Admissions for planned surgeries were reduced by 75–100% for about 40% of the hospitals in April 2020. The magnitude of change in patient attendance is presented in a Supplementary table.

### 3.4. Availability of health facility resources

As many as 60% of the institutions reported adequate availability of doctors. Over half (57%) of the institutions had sufficient nurses in attendance. Nearly three-fourths (76%) reported adequate availability of beds. A more significant proportion cited a good

availability of Personal Protective Equipment (PPE) (81%) and proper availability of medicine and equipment (91%).

### 3.5. Preparedness/action plans of the hospital to ensure continuity of NCD services

As many as 90% (84) of the institutions had preparedness/action plans to ensure the continuity of NCD services. The most typical approach was the continuation/resumption of routine OPD/special clinics. Other strategies included triaging and prioritising care, maintaining contact with patients, monitoring their health, and telemedicine, as shown in Table 2.

## 4. Discussion

The rapid assessment survey has provided broad information on the disruption of India's NCD-related health services from March to May 2020. Almost half of the respondents stated a disturbance in such services at their institutions. Interruption in health services has been reported in several countries since the pandemic's advent [5]. A study that involved 356 centres in 54 countries across six continents was undertaken to assess the impact of the pandemic on cancer care [14]. The study results indicate that 88.2% of the institutions had reduced cancer care service delivery. In India, while



some hospitals were converted into COVID-19 dedicated centres, suspension of outpatient services has been reported in many institutions, mainly due to lockdown restrictions and to avoid exposure of non-urgent cases to COVID-19 [15]. The present survey observed a partial disruption of elective surgeries and diagnostic procedures in almost half of the participating hospitals. Similarly, studies on the impact of the COVID-19 pandemic on breast cancer patients reported that diagnostic and surgical procedures had decreased dramatically [16,17]. Patients with cardiac disease have also been impacted due to the cancellation of elective invasive and non-invasive imaging techniques and percutaneous interventions [9].

The pandemic has posed a challenge to the health system and exposed gaps in the system. The maximum disruption was witnessed for April 2020, which coincides with the rising number of cases and lockdown restrictions. Such a scenario could be attributed to the reallocation of health staff for COVID-19 care and disruption in logistic supplies [16,18]. A study in a cohort of NCD patients in rural Andhra Pradesh observed that 14% had missed a follow-up visit during the lockdown period, and 13.4% faced challenges in procuring routine medication [19]. Besides outpatient services, inpatient care volume was reduced due to the cancellation of elective procedures in many health centres in the present study.

In the present survey, most respondents stated that their institution did not face any shortage of medicines and equipment. The primary concern appeared to be with the reduction in service delivery. Likewise, a survey on the disruption of cancer-related services reported that less than a quarter of the participating institutions were challenged with a shortage of human resources, equipment and medicines [14]. Nevertheless, deficiency in health resources is very likely to arise in an ongoing and long-lasting pandemic. Even high-income countries have experienced a shortage of resources during the pandemic peak [19,20]. Hence the decision-making authorities need to undertake optimal management of health care staff and plan for efficient use of resources.

There is increasing recognition regarding the use of virtual platforms to deliver health care. In the United States, a study on diabetic care during the COVID-19 pandemic demonstrated a decrease of 30% in clinic visits and a modest increase of 14% in telehealth use [21]. Teleconsultations use has surged following the issue of telemedicine practice guidelines by concerned authorities in India [22]. Even with the gradual return to routine life, the already overburdened health system will continue to face the challenge imposed by the backlog of NCD cases and complications arising from neglect during the pandemic. On a brighter note, 90% of the institutions had reportedly formulated NCD preparedness plans to ensure a continuum of care. The survey results would help the concerned stakeholders to explore strategies to ensure a continuum of care for patients with NCDs'.

## 5. Conclusion

The study shows that NCD out patient services, elective surgeries and population based screening were severely affected, despite adequate human and material resources. Most institutions were prepared to overcome the pandemic-imposed disruption and ensure a continuum of care for NCDs'.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.dsx.2022.102607>.

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