Department of Biotechnology (DBT) Consortium for COVID-19 Research

Objectives:

- Epidemiology of SARS-CoV-2 infection – acute & post-acute phases
- Development & validation of in-vitro diagnostics (molecular & serological)
- Evaluate immune response to understand natural infection & inform vaccine development
- Development of therapeutics (mAbs)
- Seroepidemiology

Research institutes (Delhi NCR)

- Translational Health Science & Technology Institute, Faridabad
- National Institute of Immunology, New Delhi
- International Centre for Genetic Engineering and Biotechnology, New Delhi
- Regional Center for Biotechnology

Hospital partners (Delhi NCR)

- ESIC medical college hospital, Faridabad
- Loknayak hospital, New Delhi
- Civil hospitals, Gurugram & Palwal
- Al-Falah medical college hospital, Dhouj
- Medanta hospital Gurugram
- SGT Medical college, Gurugram
- SHKM medical college, Nalhar

DBT COVID-19 Research Consortium Cohort Profile

Prospective observational cohort

Date of enrolment with positive RT-PCR

Day 0 → Day 10-28 → 6-10 weeks → 6 months → 12 months

Clinical data: Demographics, contact history, symptomatology, comorbidities, drug, exposure & travel history, hospitalization & treatment history, *(expanded national questionnaire)*

Clinical outcomes

Blood (10 mL*) (Serum, plasma)

Blood (25 mL) (Serum, plasma & PBMCs)

NP/OP

Inclusion criteria:

Testing centres: Suspected COVID 19 infection tested positive with RT-PCR (national guidelines)

Dedicated COVID 19 hospitals: admitted with COVID 19 infection within 5 days of positive RT-PCR (national guidelines)

Written informed consent

Clinical data collection (by study nurses):

At enrolment: By interview & review of medical records

Follow-up: Telephonic interviews

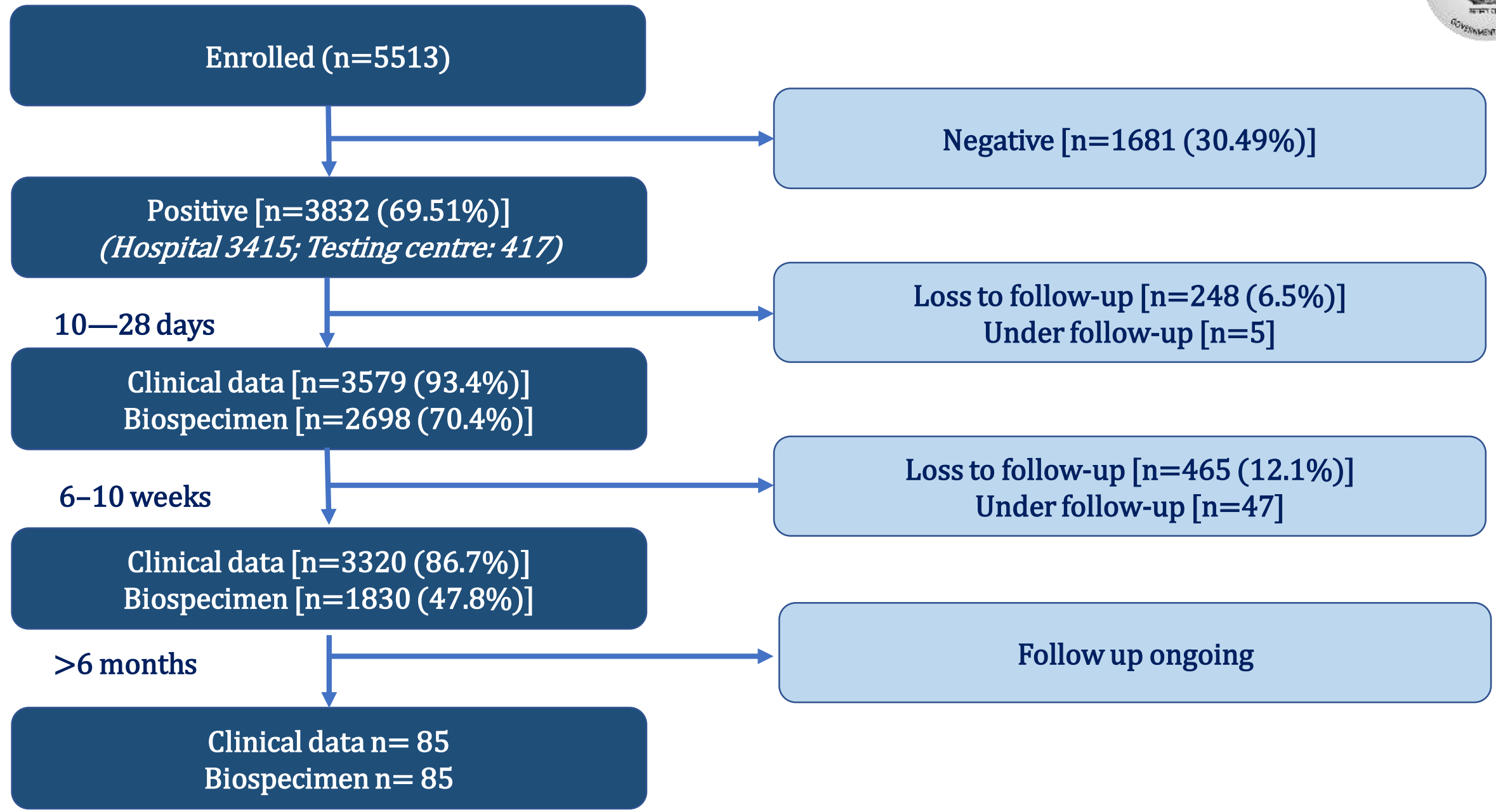
Electronic data capture, RedCap, external monitoring

National COVID bioresource

NP swabs for antigen immunoassays

Serum for antibody & PBMCs for immunological characterization

Current status of the cohort *(11 Apr'20 - 6 Feb'21)*



Clinical characteristics & predictors of severe COVID-19

Baseline characteristics
N= 3832

	Median (IQR)/ n(%)
Age (y)	45 (30-57)
Male	**2606 (68%)**
Symptomatic	**3284 (86%)**
H/o primary contact	583 (15%)
H/o secondary contact	70 (1.8%)
Diabetes	**746 (19%)**
Heart Disease	165 (4.3%)
Hypertension	**748 (20%)**
Liver Disease	47 (1.2%)
Smoking	301 (7.9%)
Thyroid disorders	144 (3.8%)

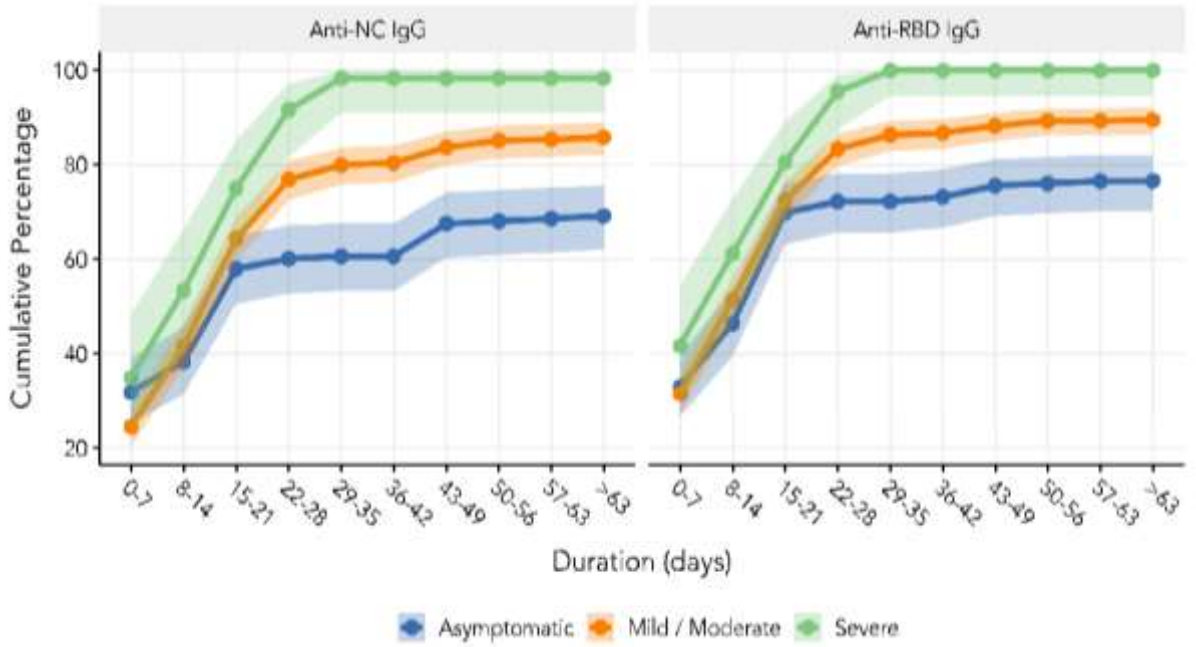
Outcomes of acute COVID-19

Asymptomatic 14%; Mild/ Moderate 63%; Severe 23%
Oxygen supplementation: 386; Ventilator support: 12; ICU care: 68;
Deceased: 72
Duration of hospitalization [Median(IQR)]: 9(6-12) days

Independent predictors of severity:

Age (y) (aOR: 1.02; 95%CI: 1.01, 1.03); Diabetes (aOR: 1.37; 95%CI: 1.03, 1.81)

Cumulative seropositivity for anti-N & anti-RBD IgG for varying severity



Overall seroconversion rate: 85.3%

22.3% asymptomatic participants with no seroconversion

Thiruvengadam et al., medRxiv/doi: 10.1101/2021.02.04.21251140

Profile of symptoms at 6 – 10 week from onset of acute COVID-19 illness (N=3320)

	Proportion with symptoms(n (%))	Duration of symptoms (days)
Cough	50 (1.5%)	4 (1, 8)
Fatigue	48 (1.5%)	3.0 (0.0, 7.0)
Fever	47 (1.4%)	4.0 (2.0, 5.0)
Breathlessness	34 (1.0%)	3.0 (1.0, 9.0)
Body ache	20 (0.6%)	**7 (2, 15)**
Sore throat	17 (0.5%)	1.5 (1.0, 6.2)
Vomiting	13 (0.4%)	3.50 (1.50, 6.25)
Abdominal pain	13 (0.4%)	10 (3, 14)
Diarrhea	13 (0.4%)	4.0 (2.8, 6.0)
Headache	10 (0.3%)	**10.0 (3.0, 14.0)**
Runny nose	11 (0.3%)	7 (6, 20)

Symptom	Proportion with symptoms(n (%))	Duration of symptoms (days)
Nausea	8 (0.2%)	2.50 (1.25, 3.75)
Loss of smell	7 (0.2%)	1.00 (1.00, 1.50)
Haemoptysis	2 (<0.1%)	-
Loss of taste	5 (0.2%)	10 (2, 15)
Any symptom	**165 (4.3%)**	-
Cluster of symptoms		
Respiratory	**88 (2.7 %)**	
Musculoskeletal	**60 (1.8%)**	
Gastrointestinal	**33 (1 %)**	

Persistent illness (4/165): 2 required oxygen supplementation for 2 weeks post discharge;
1 reported persistent cough for 5 weeks; 1 hemoptysis

48/165 participants needed medical care for symptoms

- 43/165 participants improved with outpatient care (respiratory symptoms- most common, followed by bodyache)
- 5/165 participants required inpatient care; 2 stroke, 1 cholelithiasis, 1 fatigue & dehydration, 1 hemoptysis

Profile of symptoms after 6 months from onset of acute COVID-19 illness

Initial data (N=85)

	Proportion with symptoms(n (%))	Duration of symptoms (days) Median (IQR)
Fatigue	5 (5.9%)	90 (80,120)
Cough	3 (3.5%)	3-5
Breathlessness	2 (2.4%)	60, 90
Sore throat	1 (1.2%)	10
Body ache	1 (1.2%)	60
Vomiting	1 (1.2%)	1
Abdominal pain	1 (1.2%)	2
Diarrhea	1 (1.2%)	2
Any symptom	**6* (7.1%)**	-
Cluster of symptoms		
Respiratory	4 (4.7 %)	
Musculoskeletal	2 (2.4 %)	
Gastrointestinal	2 (2.4%)	

*None required outpatient or inpatient medical care

1/6* participants reported musculoskeletal symptoms persistent from 6-10 weeks

Deaths:

6/85 participants died between 10w & 6m from onset of illness

Median age: 64.5y;

All 6 had symptomatic acute COVID illness;

2 required oxygen & had respiratory symptoms during follow-up visit 6-10w from onset of illness

Evaluation of cause of deaths ongoing…

Fragile population cohort-1

Severe SARS-CoV-2 related disease in low and middle income country children aged 0-19 years: a multi-country observational study in a network of hospitals

Objectives:

Using hospital network surveillance systems to,

1. Describe clinical presentations, comorbidities, diagnostic & lab features, therapies, & *long-term outcomes*
2. Understand association between severity of SARS-CoV2 related disease & comorbidities in LMIC children

Prospective cohort design

Presentation to hospital

Child aged 0-19 years presenting to hospital with

1. any new illness since 1 January 2020 &
2. evidence of SARS-CoV2 exposure *(positive serology, positive RT-PCR, positive rapid test, or likely contact with a SARS-Cov2 positive person)*

↓

By 3 months follow up

Basic demographics [age, sex, geographic location], clinical presentation, past medical history, comorbidities, lab parameters, therapies
outcomes [hospital admission, intensive care support, *sequelae*]

Proposed sample size: 800 children from 4 countries; 200 from India

Current status: India – 14 enrolments; 6 followed up till 12w post discharge

Fragile population cohort-2

ORCHESTRA - A study on the epidemiology of Corona Virus Disease-19 (COVID-19) in pregnant women and neonates in India

Indo-EU collaborative effort through DBT India

Objectives:

- Estimate risk of adverse pregnancy outcomes (FGR, PTB, stillbirth, congenital anomalies) associated with antenatal SARS-CoV-2 infection
- Investigate vertical transmission of SARS-CoV-2
- Evaluate risk of all-cause morbidity, mortality, growth restriction up to 3 months of postnatal life

<14w GA	18-20w GA	26-28w GA	Delivery	3 months PP	Childhood: 2 year

Contact history, symptomatology, comorbidities, drug, exposure & travel history, hospitalization & treatment history *(expanded national questionnaire)*

Serological evaluation for exposure to SARS-CoV-2 infection

RT-PCR at delivery & when exposed/ symptomatic during antenatal period

Outcomes: GA at delivery, Birthweight

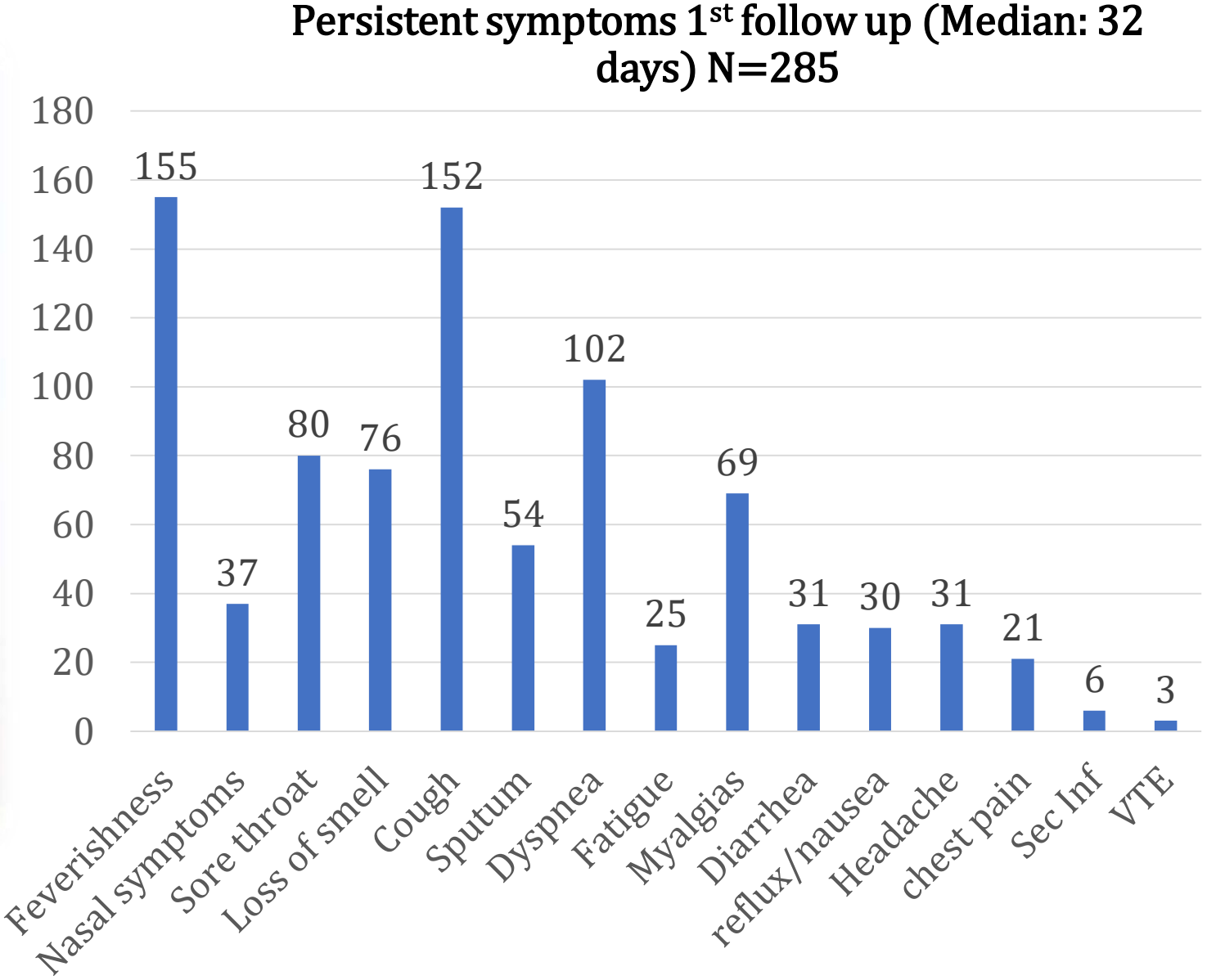
Anthropometry, morbidity & mortality

Anthropometry, morbidity & mortality, neurodevelopment

Current status: started July 20; 376 enrolled; 24 mothers tested positive by RT-PCR; no infant tested positive

All India Institute of Medical Sciences, New Delhi: Post COVID Clinic

- 285 recovered COVID-19 patients
- Mean Age 42.4 (SD:14.4) years
- Males 195 (68.4%) Females 90 (31.6%)
- Severity of disease
  - Mild: 20 (7.0%) Moderate: 218 (76.5%)
  - Severe/Critical: 47 (16.5%)
- Median follow-up duration:32d



Mohan et al., Dept of Pulmonary Medicine, AIIMS; (Personal communication)

Pulmonary function test evaluation at first follow up (N=285)

FVC % predicted	N (%)
Normal	155 (54.4%)
Mild restriction	57 (20%)
Moderate restriction	33 (11.6%)
Severe restriction	40 (14.0%)

6min walk test	N (%)
Not able to do	7 (2.4%)
>400m; no desaturation	197 (69.1%)
>400m; significant desaturation	32 (11.3%)
<400m; significant desaturation	49 (17.2%)

Mohan et al., Dept of Pulmonary Medicine, AIIMS (Personal communication)

Research questions moving forward…

1. What are the most common features of post COVID-19 condition in our population?
2. Is the duration of illness different for various symptom clusters?
3. What is the evaluation criteria for defining post COVID-19 condition?
4. What are the predictors of post COVID-19 condition?
5. Are fragile populations such as pregnant women, infants & children different in their Post COVID condition phenotype?
6. Can we harmonize data of cohorts being followed globally?