COVID-19 in South Asian communities

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Non-communicable disease in South Asian populations
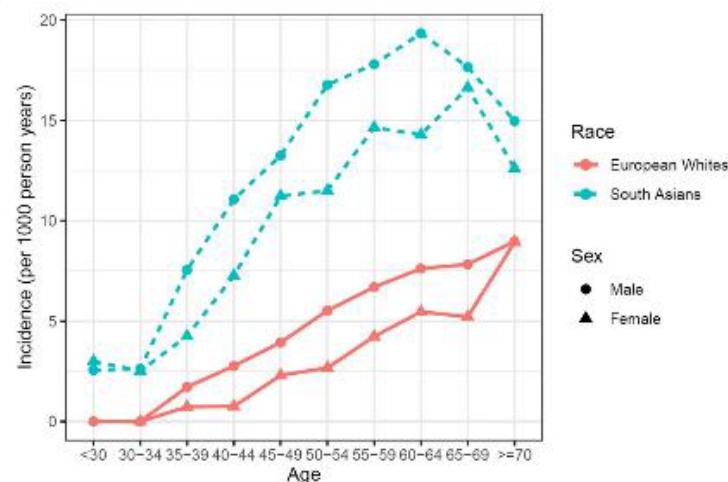
T2D incidence: South Asians vs Europeans

Group Aims

Aetiology: What are the behavioural, environmental and molecular factors that drive chronic disease in Asian populations?

Translation: How can we deliver 'Personal' and 'Population' based approaches for health promotion in Asian settings?

A.

	Race
	European Whites
	South Asians

	Sex
	Male
	Female

B.

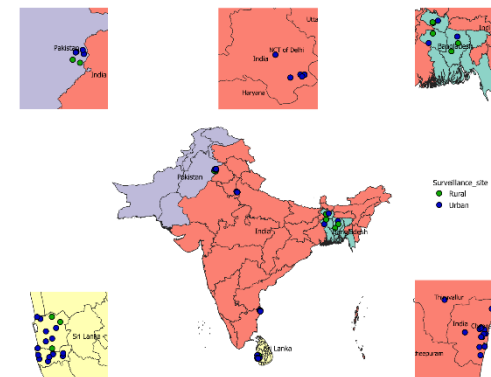| Model	RR (95%CI) of T2D in South Asians vs Europeans	P=
Age, sex	2.62 (2.33 to 2.96)	6.1E-56
+ BMI, WHR	2.66 (2.34 to 3.01)	4.6E-53
+ Glycaemic traits	2.23 (1.93 to 2.58)	6.6E-28
+ Physical activity	2.19 (1.90 to 2.57)	2.4E-26
+ Amino acids	2.21 (1.90 to 2.57)	8.4E-25
+ Genetic risk score	2.11 (1.80 to 2.47)	9.9E-21

Global Health Research Unit Surveillance study

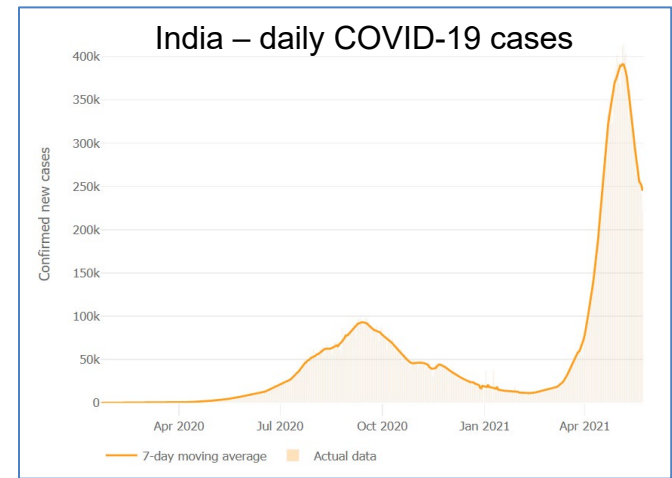**150,000 South Asians with rich phenotypes and samples**

COVID-19
and study activity

India – daily COVID-19 cases

Lockdown 1

Wave 2

Study recruitment

Bangladesh   North India   Pakistan   South India   Sri Lanka
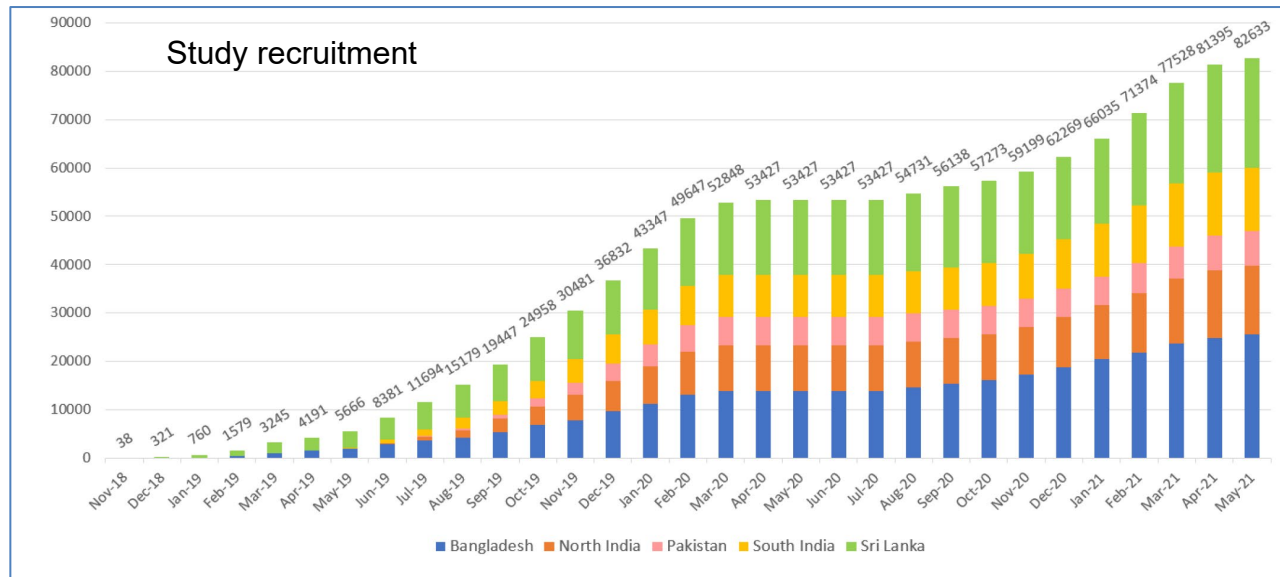
Pre-COVID

Phase 1

Phase 2

Phase 1

wellcome

GAD2

PHQ2

Unemployed (%)   Work hours   Income (USD)

Kusuma et al. SSM. 2021
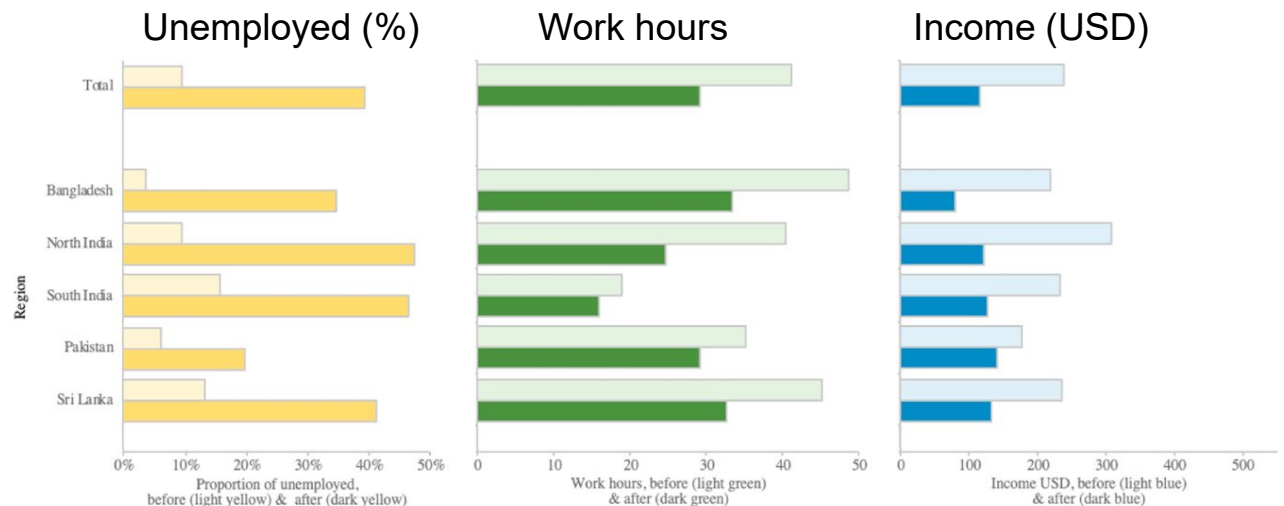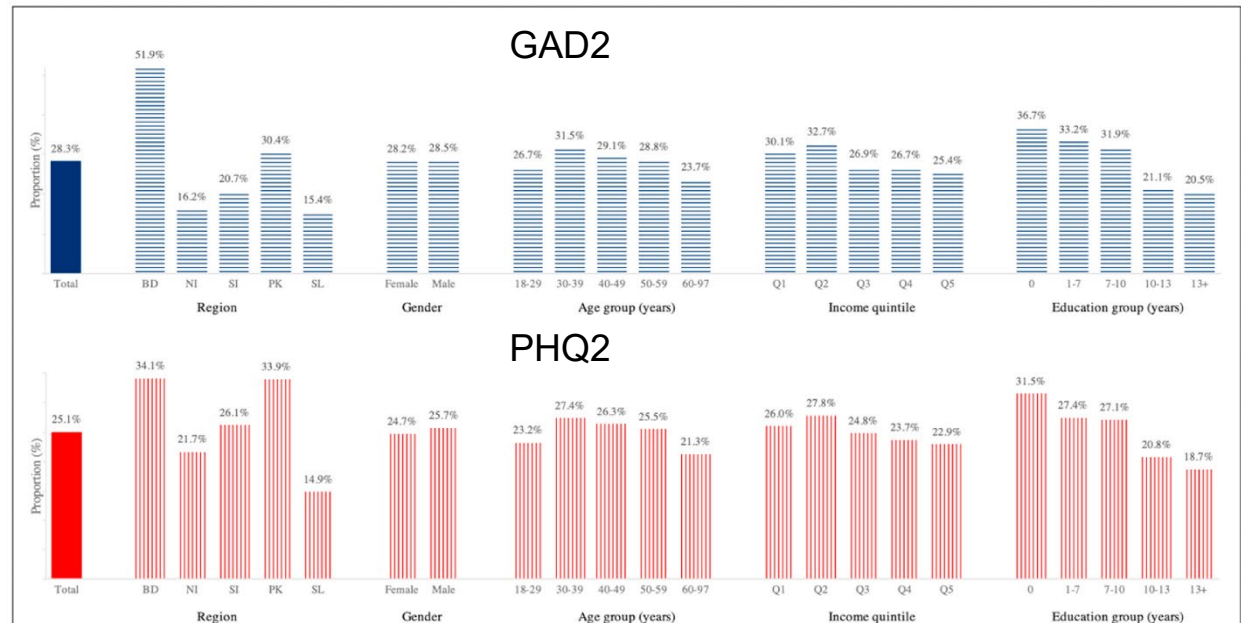
Impact of COVID-19 in South Asians

DAILY CONFIRMED NEW CASES (7-DAY MOVING AVERAGE)

Outbreak evolution for the current most affected countries
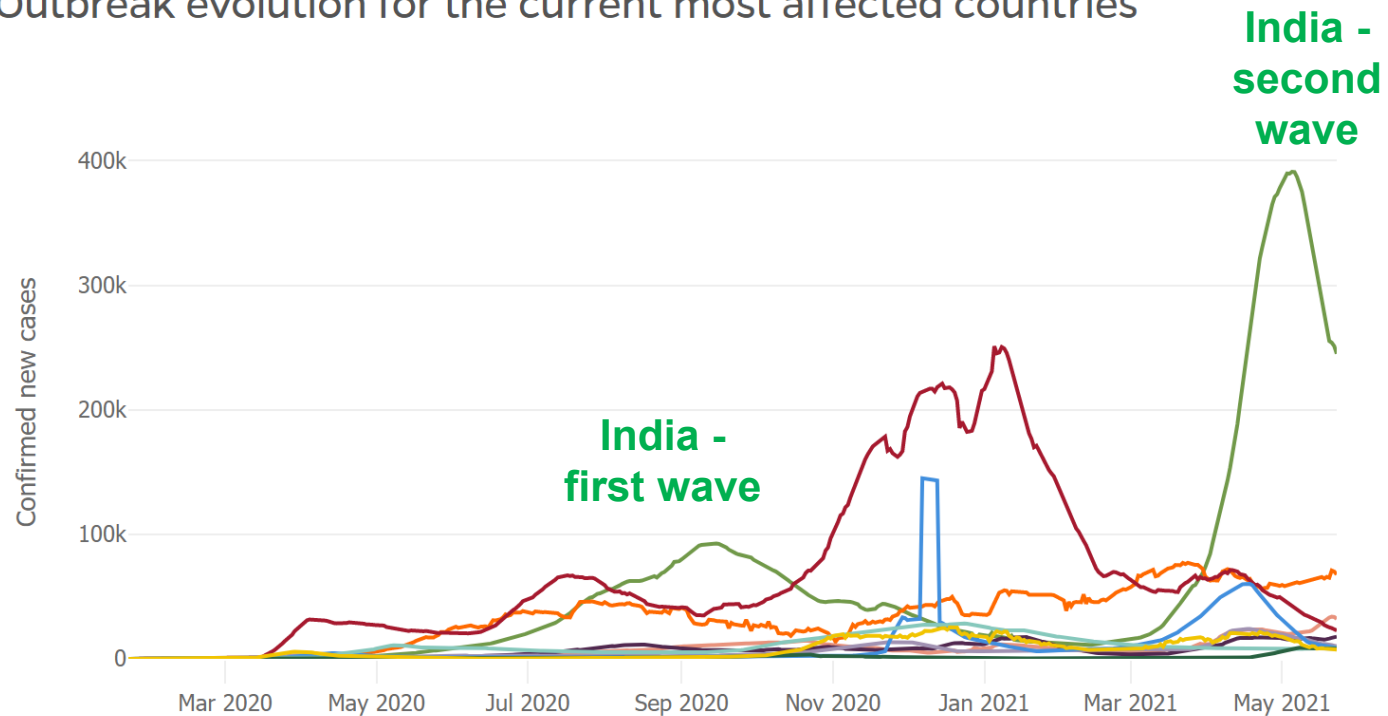
UK Biobank: South Asians are at increased risk of COVID-19

Fig. 1 Risk ratios for associations between broad ethnicity groups (white British as the reference category) and SARS-CoV-2. Model 1: age, sex and assessment centre. Model 2: model 1 + country of birth. Model 3: model 2 + healthcare worker. Model 4: model 3 + social variables (urbanicity, number of people per household, highest education level, deprivation, tenure status, employment status, manual work). Model 5: model 4 + health status variables (self-rated health, number of chronic conditions and longstanding illness) + behavioural risk factors (smoking, alcohol consumption and BMI). Coefficients for the Chinese and other groups are not shown

Article

Factors associated with COVID-19-related death using OpenSAFELY

Elizabeth J. Williamson[1,6], Alex J. Walker[2,6], Krishnan Bhaskaran[1,6], Seb Bacon[2,6], Chris Bates[3,6], Caroline E. Morton[2], Helen J. Curtis[2], Amir Mehrkar[2], David Evans[2], Peter Inglesby[2], Jonathan Cockburn[3], Helen I. McDonald[1,4], Brian MacKenna[2], Laurie Tomlinson[1], Ian J. Douglas[1], Christopher T. Rentsch[1], Rohini Mathur[1], Angel Y. S. Wong[1], Richard Grieve[1], David Harrison[5], Harriet Forbes[1], Anna Schultze[1], Richard Croker[2], John Parry[3], Frank Hester[3], Sam Harper[3], Rafael Perera[2], Stephen J. W. Evans[1], Liam Smeeth[1,4,7] & Ben Goldacre[2,7 ✉]

COVID-19 mortality amongst >23M people using UK electronic medical records

	Age/sex adjusted	'Fully adjusted'
White	1.00 (ref)	1.00 (ref)
Mixed	1.62 (1.26–2.08)	1.43 (1.11–1.84)
South Asian	1.69 (1.54–1.84)	1.45 (1.32–1.58)
Black	1.88 (1.65–2.14)	1.48 (1.29–1.69)
Other	1.37 (1.13–1.65)	1.33 (1.10–1.61)

Potential limitations

- UK Biobank: 7,323 South Asians

- OpenSAFELY:
  - No biological samples
  - Incomplete baseline data

- Limited data for South Asia

Phase 2

Aims

- Determine the incidence of COVID-19 and its major complications in South Asian populations from India and the UK.

- Identify the primary risk factors predicting adverse COVID-19 outcomes in South Asians.

- Investigate whether known / novel risk factors account for differences in COVID-19 outcomes between South Asians and Europeans

Outcome variables

Primary COVID-19 endpoints:

i. Total: all with confirmed SARS-CoV2 infection

ii. Severe: COVID-19 (hospital admission or main / contributory cause for death)

iii. Prolonged: persistent symptoms after 6 weeks.

Outcomes identification

- **WS1: Clinical follow-up**

  – Evaluate 30,000 South Asians for COVID-19

  – Three existing cohorts:

    - **LOLIPOP study** (UK; N=19,000)

    - **iHealth-T2D** (UK and South Asia; N=24,000)

    - **GHRU Surveillance study** (South Asia, N=53,000)

  – Questionnaire: adapted from WT/IHCC template

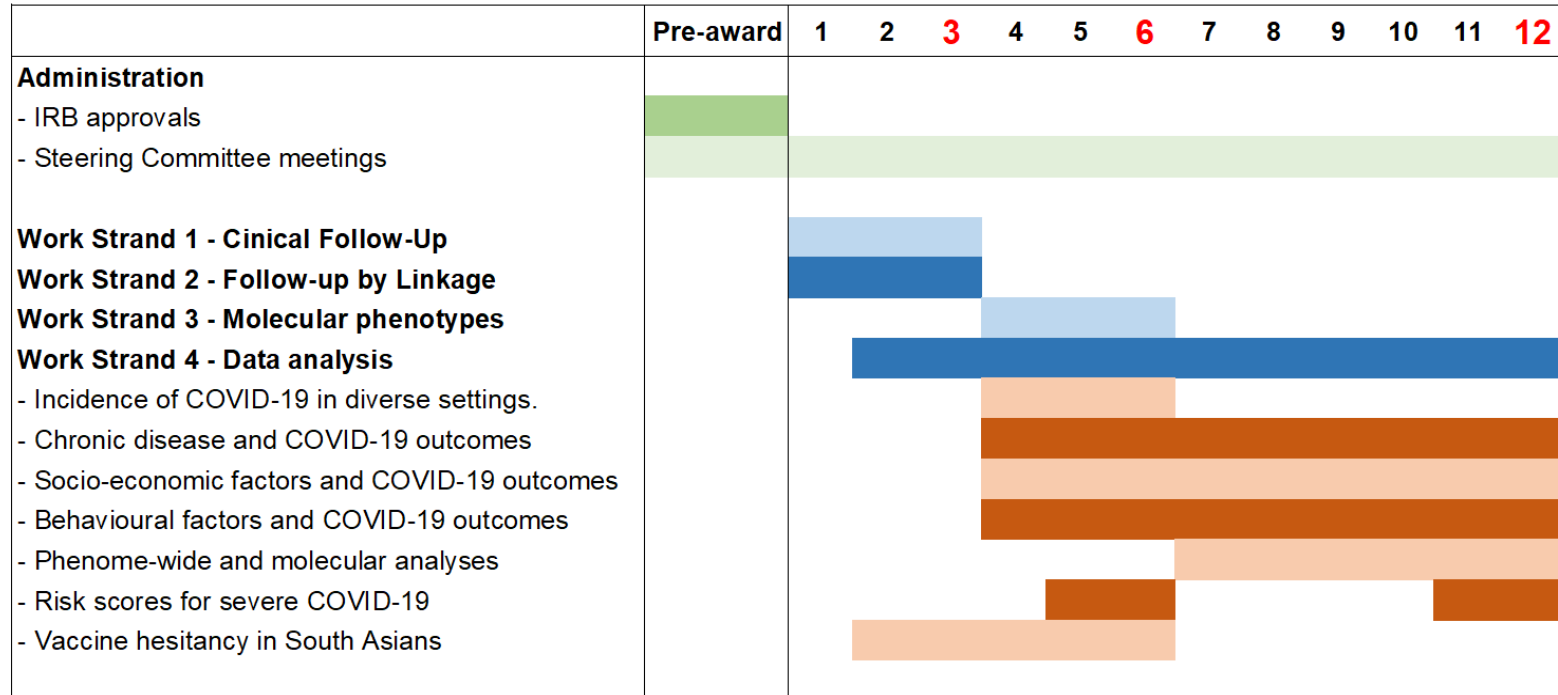 – Blood sample: COVID-19 serology

Progress on Clinical Follow-up
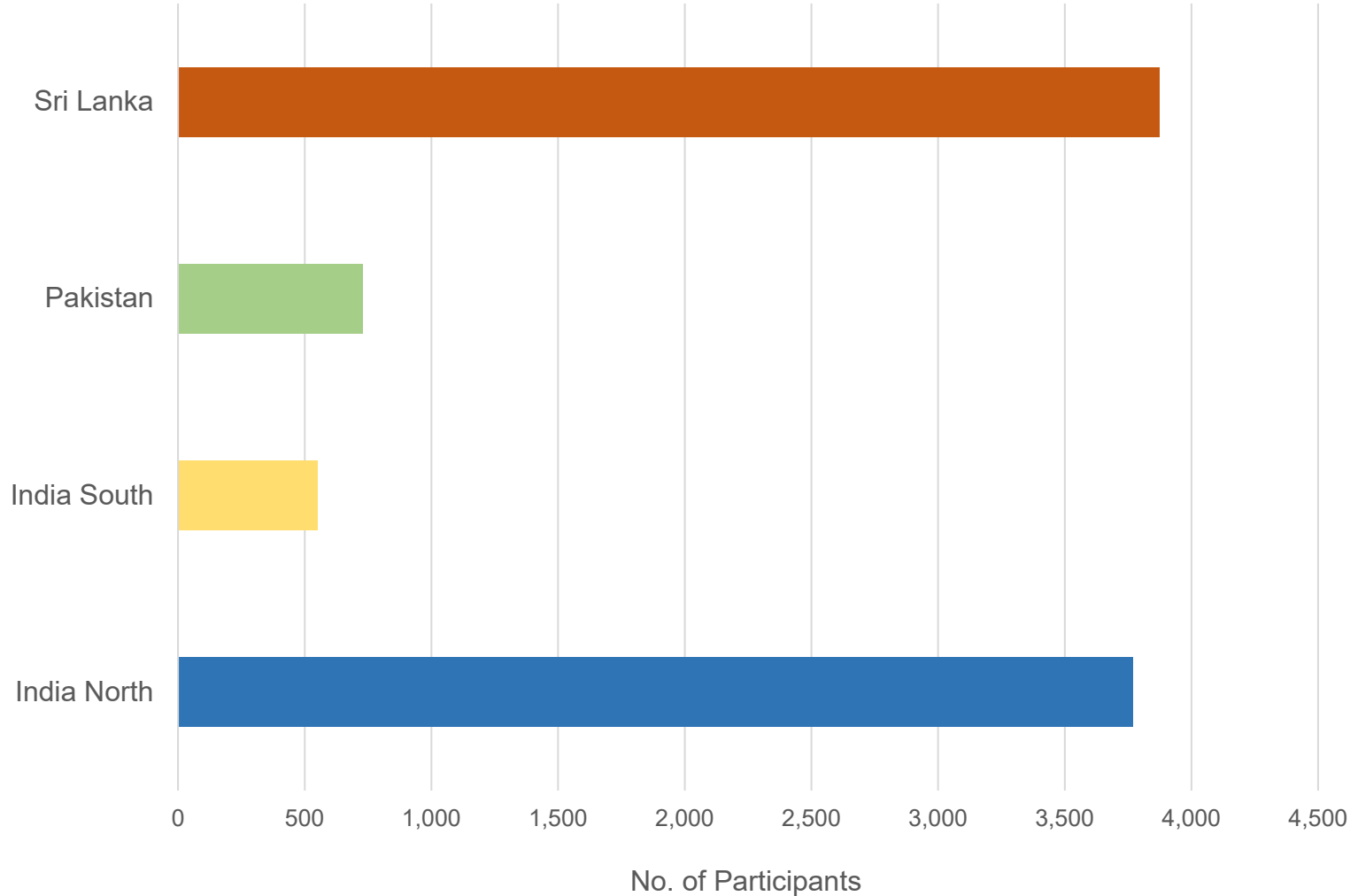
Analysis

- **WS2: Record linkage**
  - UK: NHS and mortality data
  - India: ICMR COVID-19 registry

- **WS3: Molecular phenotyping**
  - Collate existing molecular data
  - New GWAS on 2,500 COVID cases / controls

- **WS4: Analysis**
  - Incidence in UK and SA communities
  - Risk factors for COVID-19 outcomes: Environmental, behavioural & molecular factors.
  - Primary determinants of the 'excess risk' in SA

Timelines

	Pre-award	1	2	3	4	5	6	7	8	9	10	11	12
Administration													
- IRB approvals													
- Steering Committee meetings													
Work Strand 1 - Cinical Follow-Up													
Work Strand 2 - Follow-up by Linkage													
Work Strand 3 - Molecular phenotypes													
Work Strand 4 - Data analysis													
- Incidence of COVID-19 in diverse settings.													
- Chronic disease and COVID-19 outcomes													
- Socio-economic factors and COVID-19 outcomes													
- Behavioural factors and COVID-19 outcomes													
- Phenome-wide and molecular analyses													
- Risk scores for severe COVID-19													
- Vaccine hesitancy in South Asians													

Funding