COVID-19 in South Asian communities

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**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?

### T2D incidence: South Asians vs Europeans

<table>
<thead>
<tr>
<th>Model</th>
<th>RR (95% CI) of T2D in South Asians vs Europeans</th>
<th>P=</th>
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<tr>
<td>Age, sex</td>
<td>2.02 (2.33 to 2.80)</td>
<td>3.1E-55</td>
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<td>+ BMI, WHR</td>
<td>2.06 (2.34 to 3.01)</td>
<td>4.6E-53</td>
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<td>+ Glycaemic traits</td>
<td>2.23 (1.93 to 2.58)</td>
<td>6.0E-28</td>
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<td>+ Physical activity</td>
<td>2.19 (1.90 to 2.57)</td>
<td>2.4E-25</td>
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<td>+ Amino acids</td>
<td>2.21 (1.90 to 2.57)</td>
<td>8.4E-25</td>
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<td>+ Genetic risk score</td>
<td>2.11 (1.80 to 2.47)</td>
<td>9.9E-21</td>
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Global Health Research Unit Surveillance study
150,000 South Asians with rich phenotypes and samples
COVID-19 and study activity
Phase 1

June 2020
28,909 participants re-interviewed

1% reported symptoms suggestive of COVID-19

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

India - second wave

India - first wave
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.
### Factors associated with COVID-19-related death using OpenSAFELY

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

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

- **Sri Lanka**: 3,800 participants
- **Pakistan**: 600 participants
- **India South**: 500 participants
- **India North**: 3,700 participants
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
  – Primary determinants of the ‘excess risk’ in SA
# Timelines

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<td>- IRB approvals</td>
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<td>- Vaccine hesitancy in South Asians</td>
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Funding

- Medical Research Council (MRC)
- CHAN ZUCKERBERG INITIATIVE
- Department of BioTechnology, Government of India
The collaboration

Imperial College London

NIHR Global Health Research Unit on Diabetes and Cardiovascular Disease in South Asia

- Madras Diabetes Research Foundation India South
- Max Healthcare India North
- Services Institute of Medical Sciences Pakistan
- BRAC University Bangladesh
- University of Colombo Sri Lanka
- University of Kelaniya Sri Lanka

LOLIPPOP
The London Life Sciences Population Study

iHEALTH T2D