COVID-19 in South Asian communities

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Non-communicable disease in South Asian populations

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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</thead>
<tbody>
<tr>
<td>Age, sex</td>
<td>2.62 (2.33 to 2.90)</td>
<td>1.1E-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>6.6E-23</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
June 2020
28,909 participants re-interviewed

1% reported symptoms suggestive of COVID-19
Impact of COVID-19 in South Asians

DAILY CONFIRMED NEW CASES (7-DAY MOVING AVERAGE)
Outbreak evolution for the current most affected countries

India - first wave
India - second wave

Click any country below to hide/show from the graph:
- India
- Brazil
- Argentina
- United States
- Colombia
- Iran
- Turkey
- Russia
- Nepal
- Germany
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.
COVID-19 mortality amongst >23M people using UK electronic medical records

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<th>Ethnicity</th>
<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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<tr>
<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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<tr>
<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: WT/IHCC template
      – Blood sample: COVID-19 serology (Roche N&S?)

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

• 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

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<th>Administration</th>
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<td>- IRB approvals</td>
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<td>- Steering Committee meetings</td>
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| Work Strand 1 - Clinical Follow-Up |
| Work Strand 2 - Follow-up by Linkage |
| Work Strand 3 - Molecular phenotypes |
| Work Strand 4 - Data analysis       |
| - 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  |

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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

LOLIPOP
The London Life Sciences Population Study

iHEALTH T2D