



Understanding the Patterns and Determinants of Health in South Asians People: South Asia BioBank

PIS:

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TIMELINE: May 2018 – September 2021

PARTNERS:

- Imperial College London
- Non-Communicable Disease Control, Directorate General of Health Services (DGHS)
- National Institute of Cardiovascular Diseases (NICVD)
- Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM)
- Bangladesh University of Health Science (BUHS)
- BRAC

DONOR: National Institute for Health Research (NIHR)

Cardiovascular diseases (CVD) and Type 2 diabetes mellitus (T2DM) are leading cause of mortality and morbidity in South Asia. The burden of T2DM and CVD are high in South Asia, one of the most populous and the most densely populated regions of the world. The prevalence of T2DM in South Asia has risen more rapidly than in other large geographical regions, and it is projected that South Asia will account for 40% of the global CVD burden by 2020. In addition, T2DM and CVD

develop at an earlier age in South Asians than in their European counterparts. Identification of the primary risk factors for T2DM and CVD is central to the development of effective approaches for the prevention and treatment. However, there is a paucity of epidemiological data from South Asia, and current evidence on the drivers of T2DM and CVD is predominantly from cross-sectional. The few available longitudinal studies were carried out among South Asians residing in Western countries, and therefore, are limited by small sample size and incomplete phenotypic characterisation. To better understand the wide range of exposures that contribute to the development of T2DM, CVD and other chronic diseases in South Asians, a large-scale population-based study that collects information on demographic, lifestyle, clinical, environmental and genomic variables is needed. To address this important need, we have established a unique population-based study focused on the South Asian population: the South Asia Biobank (SAB). The SAB was launched in 2018 as a partnership between collaborating centres in Bangladesh, India, Pakistan, Sri Lanka and the UK. The Bangladesh component of SAB is being implemented by the Center for Non-communicable Diseases and Nutrition (CNCDN) of BRAC James P Grant School of Public Health in collaboration with the Non-Communicable Disease Control Programme of the Directorate General of Health Services of the Government of the People's Republic of Bangladesh (NCDC); Global Health Research Unit of Imperial College London; BRAC; Bangladesh Institute of Research and Rehabilitation for Diabetes, Endocrine and Metabolic Disorders (BIRDEM); National Institute of Cardiovascular Diseases (NICVD); and Bangladesh University of Health Sciences (BUHS). The financial support for SAB came

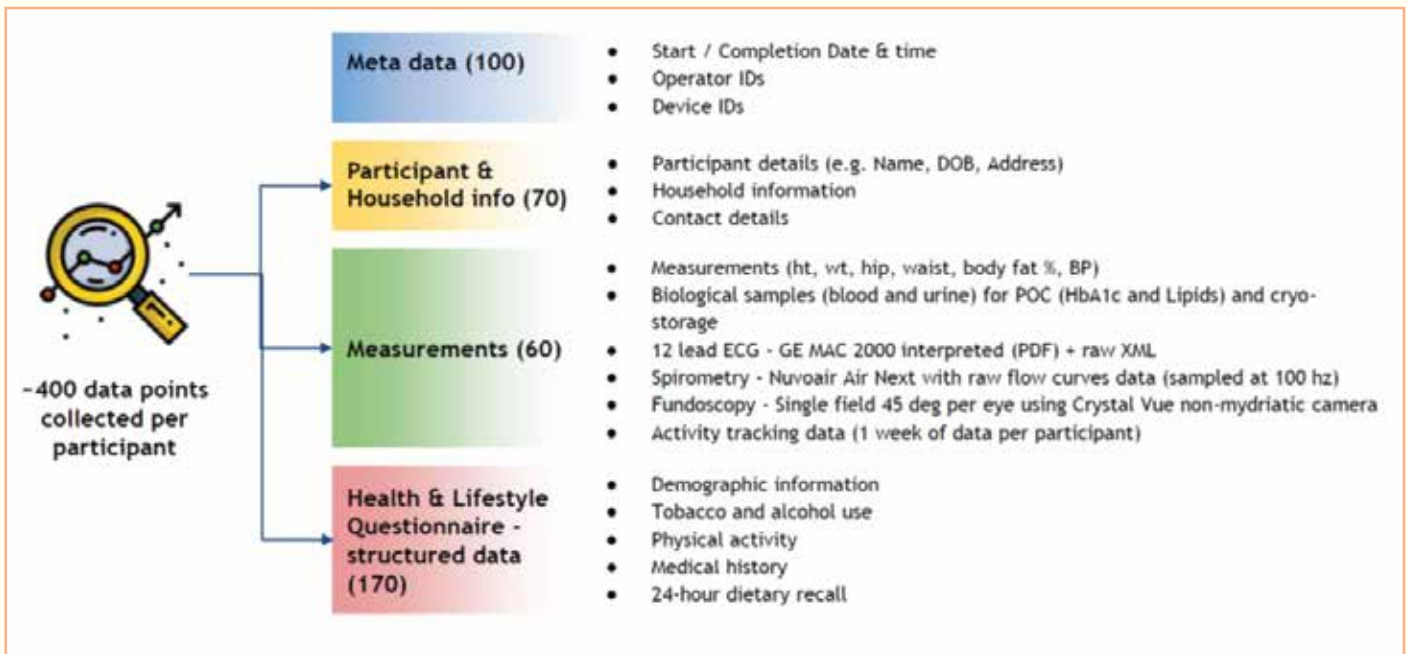


Figure 1: Types of data being collected from each participant

from the National Institute for Health Research, UK and Wellcome Trust. The partners of the project from the other South Asian countries are Max Super Speciality Hospital, Services Institute of Medical Science, Madras Diabetic Research Foundation, Punjab Institute of Cardiology, University of Kelaniya, University of Colombo, and Nanyang Technological University

RESEARCH APPROACH

SAB includes collection of rich demographic, lifestyle, clinical (Electrocardiogram, retinal imaging, spirometry), environmental, phenotypic data and biological samples from 150,000 South Asian participants (30,000 from Bangladesh). The specific objectives of SAB are as follows. i. Establish a network of non-communicable disease (NCD) surveillance sites in Bangladesh, India, Pakistan and Sri Lanka, using common protocols and platforms, in partnership with regional centres of excellence in South Asia. ii. Complete structured health assessments on a representative sample of 150,000 South Asians aged 18 years and above, residing at the surveillance sites. iii. Use the data to identify the genetic and environmental factors underlying non-communicable diseases in South Asians, and translate the findings into new approaches for maintenance of health and well-being. Accordingly, in Bangladesh, 30 surveillance sites across eight divisions of Bangladesh have been established and despite the ongoing COVID-19 pandemic, data and biosample collection have been completed for 27,152 participants from 28 surveillance sites. SAB is the first project to objectively measure physical activity using accelerometers among a nationally representative samples in Bangladesh. Figure 1 below gives a summary of data collection from each participant.

EVIDENCE GENERATED

The preliminary analysis of Bangladesh data confirmed high prevalence of hypertension and T2D in all divisions of Bangladesh. The prevalence of hypertension was 25 percent (27 percent in males and 22 percent in females) and the prevalence of diabetes was 13 percent (13 percent in females and 12 percent in males). Among the hypertensives, 23 percent were unaware of hypertension status, only 53 percent of those who were aware of hypertension status were taking antihypertensive medicines but 39 percent of those taking medicine had uncontrolled blood pressure. Among the diabetics, 30% were unaware of their status, 61 percent of those who were aware of diabetes were taking antidiabetic medications but 69 percent of those taking medicines had uncontrolled blood sugar. There is a high prevalence of behavioral risk factors e.g., tobacco consumption, physical inactivity, unhealthy diet consumption and these risk factors differed between hypertensives and non-hypertensives and diabetics and non-diabetics. The genetic, proteomic and metabolomic analysis of collected biosamples are yet to be started. This data and biosamples will enable a broad range of epidemiological research, including the development of prevention and treatment approaches, discovery of novel molecular biomarkers, risk stratification algorithms and innovative therapeutic approaches for better prevention of T2DM and CVD in South Asians.

POLICY INFLUENCE

Data from the preliminary analyses have already been shared through a dissemination event in Bangladesh. Moreover, in 2019, data from all South-Asian countries were shared in the South Asia Regional Conference of

International Epidemiological Association. Our findings called for the following policy actions:

- Given a high prevalence of the burden of behavioural risk factors, life style modification counselling and education should be prioritised through health system and through national campaign
 - Given a high number of undetected people with hypertension and diabetes population based screening is required
 - Given a high number of people with diabetes and hypertension had uncontrolled blood glucose and blood pressure, respectively, a total CVD risk-based approach and the national protocol for the management of diabetes and hypertension should be institutionalised and equal emphasis should be given on lifestyle modification advice and medication
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 - Kusuma D, Pradeepa R, Khawaja KI, Hasan M, Siddiqui S, Mahmood S, Ali Shah SM, De Silva CK, de Silva L, Gamage M, Loomba M, Rajakaruna VP, Hanif AA, Kamallesh RB, Kumarendran B, Loh M, Misra A, Tassawar A, Tyagi A, Waghdhare S, Burney S, Ahmad S, Mohan V, Sarker M, Goon IY, Kasturiratne A, Kooner JS, Katulanda P, Jha S, Anjana RM, Mridha MK, Sassi F, Chambers JC; NIHR Global Health Research Unit for Diabetes and Cardiovascular Disease in South Asia. Low uptake of COVID-19 prevention behaviours and high socioeconomic impact of lockdown measures in South Asia: Evidence from a large-scale multi-country surveillance programme. *SSM Popul Health.* 2021 Feb 13;13:100751. doi: 10.1016/j.ssmph.2021.100751. PMID: 33665333; PMCID: PMC7902538.

PUBLICATIONS

As data collection is still ongoing in all four South Asian countries under the study, we have published a method paper from this study. Moreover, we carried out a telephone survey among the study participants just after the COVID-19 pandemic. From the the telephone survey, we published a paper and reported the effect of COVID-19 on the burden of non-communicable diseases and changes in the access to health services for non-communicable diseases. Please find the links to the papers below: