PARTICIPANT INFORMATION SHEET

For Interview and Study Site Visit

You are invited to participate in a research study. This information sheet provides you with information about the study. The Principal Investigator (the person in charge of this research) or his/her representative will also describe this study to you and answer all of your questions. Read the information below and ask questions about anything you don't understand before deciding whether or not to take part.

1. Protocol title

This study is known as the "Singapore Population Health Studies (SPHS) – Multi-Ethnic Cohort Phase 3 (MEC3)". NUS-IRB Reference Code: LH-19-004

2. Principal Investigator and co-investigator(s)

Principal Investigator (PI): Associate Professor Sim Xueling[1]
Co-investigators: Professor Rob van Dam[1], Associate Professor Mary Chong Foong Fong[1], Dr Pipin Kojodjojo[2], Saumya Shekhar Jamuar[3], Yasmin Bylstra[3], Nellie Chai[3] and Sylvia Kam Pei-Rong[4].

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[4] SingHealth Duke-NUS Genomic Medicine Centre (SDGMC), 10 Hospital Boulevard, #19-01 SingHealth Tower, Singapore 168582

3. Whom should I call if I have any questions or problems?

Please contact the SPHS operations team at **6478 9608** [Mondays to Fridays from 8.30am to 5.30pm, except public holidays] or email sphs@nus.edu.sg for all study-related matters and in the event of study-related injuries.

This study has undergone an ethics review by the National University of Singapore Institutional Review Board (NUS-IRB). For an independent opinion regarding the ethics of this study and the rights of participants, or if you have complaints about the study, you may contact a staff member of the NUS-IRB at telephone (+65) 6516 1234 [Mondays to Thursdays from 8.30am to 6pm, and Fridays from 8.30am to 5.30pm, except public holidays] or email irb@nus.edu.sg.

4. What is the nature and purpose of this biomedical research?

This study is investigational in nature and we hope to discover new information which may contribute to scientific and public health knowledge. The data collection and procedures are only being performed for the purposes of the study and are not part of any standard care or treatment.

The purposes of the Multi-Ethnic Cohort study are:

1) To follow-up on each participant every 3 to 5 years for at least 20 years to find out about how socio-economic, environmental and lifestyle factors, with and without the influence from genetic and biological factors, can affect well-being, transmission of infectious diseases and the development of common chronic diseases in Singapore. This will help us understand how we can change these factors to prevent the disease or keep it from spreading or getting worse.
2) To study the differences in genes, biological processes, environment and lifestyle amongst different individuals and predict the effectiveness of different prevention or treatment methods for a health condition in different groups of people.
3) To evaluate the effectiveness of health programmes and health treatments, and to predict the economic burden of diseases to the individual and the country.

5. Who can participate in the research? What is the expected duration of my participation? What is the duration of this research?

We would like to invite those who meet these criteria:
1) Aged 21 or older;
2) Singapore Citizen or Permanent Resident; and
3) Belong to Chinese, Malay or Indian ethnic group.

The following persons will be excluded from this study:
1) Those who refuse audio-recording of the consent taking and face-to-face interview.
2) Those who refuse to provide their NRIC numbers for the purpose of this study.
3) Those who are not willing to provide access to their data held by other organisations for the purposes of this research study.
4) Those who have a severe mental condition and are thus unable to give consent independently.

Participants who think they might be pregnant or are currently pregnant may begin their participation 3 months after giving birth.

Participants will be invited to a follow-up visit every 3 to 5 years. Consent will be obtained at each follow-up visit. We will also ask for your consent to contact and invite you to participate in future public health-related research.

6. What is the approximate number of participants involved?

We aim to recruit 30,000 participants to this study.

7. What will be done if I take part in this research study?

This research study consists of an interview, a study site visit, and linkage to records. The different parts of the research study are described below.

Interview
First, a trained interviewer appointed by NUS will contact you to arrange an interview about your socio-demographic background, health and medical history, medications, physical activity, sleep quality, use of tobacco and alcohol, quality of life and mental health. If you are 65 years old or older, you will also be interviewed about your activities of daily living and physical functioning. The interview may be conducted at your home or another venue of your choice, or at the study site at NUS. In some cases, participants may be selected for interviews over the phone or video call instead of in-person interviews.

The interview will take about 1hr to 1hr 45min to complete. If there are any questions that you are uncomfortable with during the interview, feel free to discuss options with the interviewer. The interview will be audio-recorded for quality control and training purposes, and the audio file will be stored for at least 2 years. We may contact you later to verify certain information collected for this study.

Study Site Visit

This study includes a study site visit. The interviewer can arrange an appointment for you to attend the study site visit at NUS (Tahir Foundation Building/MD1, 12 Science Drive 2, #11-03, S117549). The study site visit involves 2 sessions which will take about 4.5hrs in total. The first session will take about 2.5hr and may include the following procedures:
1) Measurement of your weight, height, and waist and hip circumferences;
2) Measurement of your blood pressure;
3) Measurement of the strength of your hand grip;
4) Obtaining a blood sample, preferably fasting, from your arm

   (i) up to 10mls (or about 1 tablespoon) for creatinine, glucose,cholesterol and liver function (bilirubin, ALT, AST, GGT) tests to be performed by our research laboratory in SSHSPH
   (ii) up to 20mls (or about 2 tablespoons) to be stored for future Public Health Research*
5) Obtaining a urine sample to
   (i) Test for albumin and creatinine (this requires about 20mls of urine)
   (ii) Store up to 6mls (about half a tablespoon) for future Public Health Research*
6) Recording the rhythm of your heart (electrocardiogram or ECG). You will be asked to remove your top and sticky pads called electrodes will be stuck to your chest, arms and legs during this test;
7) Testing your eyesight or vision;
8) Taking a photo of your retina (back of your eyeball)
9) Assessing your walking and balancing; and/or
10) Assessing the function of your lungs.

**See Section 17 on future Public Health Research.*

During your visit, the staff will screen you for your eligibility to proceed with the procedures of Session 2. If eligible, the staff will arrange for you to continue with Session 2 on the same day. It will take about 2hr and includes the following procedures:

1) An online nutrition survey. A brief report summarising and providing recommendations on your diet will be emailed to you if you have provided an email address to us;
2) A computer-based assessment of your cognitive functions (basic mental processes); and
3) Obtaining 2.5ml (less than 1 teaspoon) of blood sample (fasting not needed) from your arm to be stored for future Public Health Research*;
4) An ultrasound scan of the arteries on both sides of the neck;
5) A full body scan to measure your bone density, and fat and lean mass. You will be asked to change into an examination gown and then lie down on the scanning table; and
6) Wearing a physical activity tracker on the wrist constantly for the next 7 days (including during sleep and shower) and return it via the pre-paid envelope given to you.

The surveys and blood taking may be done within the first session if you are eligible and willing and time permits.

If you consent to donate a blood sample, we would prefer that you fast for 10-12hr prior to the appointment time for the blood tests. If you have any concerns about fasting affecting your medical conditions or medication, please consult your doctor before fasting. If you chose not to fast, do inform the registration desk on the day of your visit.

Within 8 weeks of the study site visit, you will be provided with a report of the results of your visit. The results may include:

1) blood pressure;
2) body mass index (BMI);
3) blood creatinine, glucose, cholesterol, bilirubin, ALT, AST and GGT levels;
4) albumin:creatinine ratio
5) vision;
6) ECG; and/or
7) Bone density results.

The tests are conducted primarily to obtain data from the general population for public health research and may not meet clinical testing standards required for making clinical diagnoses. The report should therefore not be used for the clinical management of one's health.

Apart from the report described above, we will <u>not</u> be reporting back results of additional measurements and analyses done using your stored data and samples. Specifically, we will <u>not</u> be reporting back results of genetic analyses or results of future analyses of your data or samples, unless these results are of serious health or reproductive importance. These measurements and analyses will be performed for the purpose of research and may not meet clinical testing standards for making clinical diagnoses. However, if we were to re-contact you for a research study in the future because a test result makes you a suitable participant for that research study, you will receive information about the result at the point of contact.

Records linkage

Data from this research will be linked with additional data from your records held by health care providers, well-being and health promotion agencies, government organisations, and national electronic health records and registries, to fulfil the research aims of this study. These records may consist of past and future information relating to your health, health care, health services utilisation, participation in well-being and health promotion activities, socio-economic status, and birth, disease and death information. Data linkage helps to provide accurately recorded information that is not practical for you to remember or to provide via frequent surveys.

8 What are the proposed area(s) of research approved by the Institutional Review Board (IRB), where the IRB has waived the requirement that the removal of my tissue(s) be for therapeutic or diagnostic purpose?

There is none in this study.

9 Will there be reimbursement for participation?

You will be reimbursed for your time and effort when you have completed the following procedures:

Procedures	SGD$	Mode of reimbursement
Interview	15	Cash / PayNow/ Shopping vouchers
First session of the study site visit	30	Cash
Second session of the study site visit	20	Cash
Return of the wristband and physical activity tracker within 15 days of issuance and have 7 days (x 24hrs) of data collected	20	PayNow / Shopping vouchers

Once we have verified the data collected on the tracker, we will send the reimbursement through PayNow to your registered mobile number within 4 weeks. Alternatively, NTUC vouchers will be mailed to you in 3 months.

Reimbursement for interviews conducted over phone or video call will be sent within 4 weeks.

No pro-rated reimbursement will be provided if your participation is withdrawn before completing the procedure. Should we require you to revisit to complete a disrupted session, the reimbursement for the completion of that session will be doubled.

10 Do I have to incur any expenses if I participate in this research?

You do not need to pay for any tests or procedures conducted in this study.

11 What are the possible risks, discomforts or inconveniences to me if I participate in this research?

The risks of drawing blood include slight pain, bruising, and rarely, infection where the needle went in. We take every precaution to prevent infection. Some people feel dizzy when they have blood drawn, but this goes away when the person lies down. Appropriate first aid will be administered should any injury occur.

The full body scan involves a very low dose of radiation exposure, about the same as 3 days of exposure to natural background radiation. This test is done routinely in hospitals and research institutions. However, as all radiation doses carry a certain amount of risk to health, we will not perform this procedure if you are pregnant or suspect that you are pregnant.

Please inform the staff if you have any pre-existing disease or are healing from injury so that the staff will be able to assess if you may proceed with each procedure of the visit. This will not affect the reimbursement for your participation.

In addition, if you do not feel comfortable during the interview and/or the procedure, please inform us immediately so that we may assist you.

12 What benefits can I expect from participating in the research?

There is no direct benefit to you by participating in this study. The knowledge gained may benefit the public in the future. Observational studies on chronic disease development take many years to produce results. We will publish any significant study findings to share with the public, researchers and policy makers.

Donation of samples is voluntary. If you choose to donate any samples, you also agree to the renunciation of your right to the samples and any intellectual property rights that may be derived from the use of the samples.

13 Are there any alternative procedures or treatments available to me? What are the potential benefits and risks of such alternatives?

This is an observational study. There is no treatment involved in this study.

14 If I am injured as a result of participating in this research, what are the compensation and treatments available to me?

If you follow the directions of the PI in charge of this study and you are injured, the NUS will pay the medical expenses for the treatment of that injury. By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

15 How will my privacy and the confidentiality of my research records be protected?

<u>How NUS will manage your research data</u>
All research data collected will be kept in accordance to the NUS' Research Data Management Policy. Research data (without personal identifiers such as name, NRIC number and contact information) will be kept for a minimum of 30 years before being discarded.

Where any personal data is collected from you, we will keep the information confidential in accordance with the Human Biomedical Research Act (HBRA) and other applicable legal rules.

For the purpose of conducting the operations of this research study, only the SPHS operations team, SSHSPH IT unit and authorised third parties (e.g. providers of financial, mailing, messaging, telecommunications, IT services etc.) will have access to your personal data and this will not be released to the any other person, including the PI, co-investigators, and other members of the study team. To protect your confidentiality when analysing data, your research data will be coded (i.e. personal identifying information will be replaced with a code number). All personal data (name, NRIC number and contact information) will be kept separate from the research data. The link between your personal data and the code number will be kept confidential by the SPHS operations team and SSHSPH IT unit, both of whom are independent of any researcher. Only the SPHS operations team and SSHSPH IT unit are authorised to identify you via your name, NRIC number and contact information to send correspondences to you.

If you consent to donate your blood and/or urine, the samples obtained from you will be coded and stored indefinitely at SSHSPH's tissue repository or a tissue repository regulated under the HBRA, upon the completion of this study. Stored samples may be used in future Public Health Research, subject to an IRB's approval. These samples, through future tests, will generate additional research data which are also coded because the samples were coded.

<u>Data sharing</u>
NUS may share de-identified research data with other organisations, who may be local or overseas, to meet a specific objective of this research study or a future Public Health Research (see section 17). NUS will only share data with another organisation if it:

1) is subject to a set of privacy and data protection laws, regulations and policies as stringent as ours, if not more;
2) has appropriate security controls for data storage, access and use;
3) has the appropriate approvals to access and use the data, e.g. approval from an IRB and/or data access committee; and
4) agrees not to try and re-identify the data.

Risks
Your DNA profile is a set of genetic information that is unique to you. If you have made your DNA profile identifiable and publicly available by a test that you took in the past, there is a risk of re-identification of the genetic information that will be generated from your samples donated in this study. Your genetic information will be very similar to the genetic information of your close relatives. Hence, there is also a risk of re-identifying your genetic information in research databases if any of your close relatives have made their DNA profiles identifiable and publicly available.

We will not enter any research results into your health records. However, your knowledge of a potential health condition through your participation in this study may affect your chances of getting subsequent insurance coverage for that condition.

16 Will my participation in this research involve the use of any information that will identify me?

The SPHS operations team will need your identifying information in order to conduct future follow-ups and records linkage as described below.

Future follow-ups: We plan to conduct a follow-up survey with you in person every 3 to 5 years to learn of changes to your health, lifestyle and environment. One of our biggest challenges in research like this one is following up on our participants who have changed their addresses. We may apply to the relevant government organisation to request your most up-to-date address for us to contact you.

Records linkage (as explained in Section 7): Your consent recorded in this consent form, NRIC number and/or name will be provided to the other organisation to find your records held by them. NUS will only do this with organisations who will enter a legal agreement with NUS to protect the privacy of research participants and confidentiality of the research data. From these records, only the information relevant to the purposes of this study and public health research in Singapore will be retrieved and then combined with your donated data for research analysis. The SSHSPH IT unit will coordinate the records linkage process with the other organisation and no researchers will be involved in this process. The combined data will be coded (i.e. replace personal identifying information with code numbers) before it is stored in a secure database agreed by both NUS and the other organisation. Researchers will have to apply for IRB approval if they would like to use the coded combined data for their research.

17 Will any identifiable information obtained from me be used for future biomedical research?

If you consent to take part in this study, your name, NRIC number and contact information will be retained so that we can invite you for a follow-up in this study every 3 to 5 years and to perform records linkage (see section 7). The research data obtained from you at each visit will be linked to enable us to study how lifestyle changes affect health in each individual. The research data will be coded before it is used in analyses.

If you consent, we may reach out to you to inform you of news about our research studies or invite you to take part in other Public Health Research.

Public health is about assisting communities stay healthy through the prevention of disease and other health conditions, the progression of the disease or condition, and the promotion of health behaviours. Public health professionals conduct research to identify behavioural, social, environmental, biological and genetic factors which affect one's health or contribute to the spread of disease in a population, or which contribute to the differences in individuals' responses to a disease prevention or treatment method. By collecting and studying such health-related data, researchers can develop educational programs or

propose health policies to improve the health and quality of life of communities (collectively referred to as "Public Health Research").

The data collected through this study will be useful for education and research not only in public health, but also a variety of human sciences. For this reason, some of the collected data, which may include genetic data, will be shared in public scientific databases as 'open data' for educators and other researchers to access. Datasets that will be made publicly available will be de-identified. There is a risk of re-identification of your genetic information in some of the datasets if you have ever made your DNA profile and identity publicly available.

18 What will happen to the samples taken from me upon completion of the research?

If you consent, the samples obtained from you will be stored at a HBRA-regulated tissue repository for use in future Public Health Research or for the purpose of improving the processes of such research. The samples will not be used for purposes not related to future Public Health Research.

Blood and urine contain markers that tell us about certain conditions of the body, e.g. cholesterol and glucose levels. Blood can also be a source of DNA and other genetic materials for the study of genes and their functions and how these are regulated in the body. Therefore, such samples are useful for studying the biological and genetic factors that may explain health statuses and the differences amongst individuals. If you agree only to provide samples for this study but not future research, we will only collect the amount required for this study and discard any remaining samples at the end of this study.

Your donated samples may contribute to research discoveries that enable commercial companies and non-commercial institutions, in Singapore or overseas, to develop new treatments or diagnostic tests. NUS may collaborate with these organisations and require them to cover the costs of processing, storage, packaging and delivery of the samples, but NUS will not sell your samples to anyone for profit. The commercial development of those products may bring profits to the companies and some of the profits may be paid back to the researchers and the organisations involved in that research. While the commercial development of the research may benefit future populations, there will not be any direct benefits, financial or otherwise, to you.

19 Will the identifiable information obtained from me in the course of tissue donation be used for future research?

If you consent to donate samples for future Public Health Research, your samples will only be provided for research in the coded form. These research studies will be subject to an IRB's approval. Your samples will be used together with samples from many other participants from Singapore and/or other countries in Public Health Research studies.

20 Will my blood be used in restricted human biomedical research?

Your samples will not be used in research that is classified as "restricted" under the HBRA (e.g. research involving human eggs) or research involving human-animal combinations.

21 Will my tissue(s) be exported overseas or removed from Singapore?

The stored samples may be used for future Public Health Research in Singapore or overseas. NUS may require these researchers to cover the costs of processing, storage, packaging and delivery of the samples, but NUS will not sell your samples to anyone for profit.

22 Will I be re-identified in the event of incidental finding(s) arising during the biomedical research?

It is possible that during the research we may find you have pre-existing medical issues that are unrelated to our research. These are called "incidental findings". "Incidental findings" are findings that have potential health or reproductive importance to participants like you and are discovered in the course of conducting the study, but are unrelated to the purposes, objectives or variables of the study. You will be asked to

indicate whether you wish to be re-identified and notified in the event of an important incidental finding that is related to you. The discovery of an incidental finding, at the discretion of the University, will be communicated to you for the purpose of seeking medical advice or treatment. In the event that you have indicated not to be re-identified and notified, but the University has determined that the incidental finding is of clinical significance, you may still be contacted to decide if you wish to be notified of the incidental finding at that time.

However, NUS will not cover the costs of medical consultations and any ensuing treatment. We will not share any information with your doctor without your consent.

23 Under what circumstances will I be re-contacted for further consent?

The SPHS operations team will contact you in the event of any new information that may be relevant to your willingness to continue in this study.

24 Can I withdraw my consent to the research at any time?

You can withdraw from the study at any time without giving any reasons, by informing the SPHS operations team verbally or in writing. Please note that the withdrawal of consent does not affect the research information obtained before the consent is withdrawn and such information may still be retained and used for research. If you had donated samples, we can discard only the unused portions of the samples that can be traced back to you. There will be no penalties or damages imposed on you should you withdraw your consent to participate in this study.