

Chapter 3

Recruitment of Control Spouses

PURPOSE/OVERVIEW

While we will learn a lot in the study of ES individuals themselves, there is potentially even more we can learn from the study of their descendants. To the extent that there are genetic and familial protective factors for ES, the descendants of ES individuals should be enriched with these factors. To identify such factors, we need to compare these ES subjects with another group of subjects who are NOT selected for their longevity – a control group. Factors or relationships among variables whose prevalence or magnitude differs between cases (long-lived subjects) and controls (subjects not selected for their longevity) may be those enabling people to live long lives. The control subjects will be drawn as a convenience sample of the spouses of family members in both the proband and the offspring generation. These subjects will themselves come from families with variable familial longevity. Spouses will be invited to undergo the identical assessment as longevous family members. In general, they will be seen at the same time as their spouse in the home or in the clinic. One additional questionnaire will be administered to the control spouses of offspring only *at the end of standard assessment protocol*. This is a modified TS1/FLoSS Instrument – we will collect information (not on the identity but) on the control’s family members (including sibs, parents and grandparents on both the maternal and paternal sides), their vital status, ages, and dates of birth and death. This information will be used to calculate a family longevity selection score (FLoSS). In contrast to the proband family screening, the information will NOT be used to screen the eligibility of the controls, but may be used as data at analysis time to optimize certain statistical contrasts.

SELECTION OF CONTROL INDIVIDUALS

The following protocol has been established for recruitment of controls:

- Initially, invite all spouses of the offspring generation who are willing to participate (shooting for an average of one per family).
- Invite the spouse of the proband or his/her siblings. We will only select spouses that are the biological mother/father of the offspring. This information will be ascertained using the screening form described below.
- There are no selection criteria for spouses (i.e., FLoSS will not be calculated before enrollment).
- Spouses will be administered a modified version of the Family Member Telephone Screener to assess their willingness and feasibility of conducting the in-person visit (See detailed instructions for administering TS1a-c below).
- Spouses will undergo the complete protocol as the Proband and his/her enrolled family members.
- Spouses of the offspring generation only will also be administered at the in-person visit a modified version of the FLoSS Instrument for the purposes of obtaining information to calculate a FLoSS. (See detailed instructions for administering the FLoSS-Ic below).

Note: This score will not be exactly comparable to the score for the family. It would be used to rank the controls for analysis (not enrollment purposes) and will inquire about siblings, parents and both maternal and paternal grandparents.

LLFS TELEPHONE SCREENER – CONTROL SUBJECTS (TS1a-c):

Background and Purpose: At this time, you will be contacting an interested spouse of someone in the proband generation or an offspring or niece/nephew of the Proband who has been identified on the TS1a, and provided verbal consent to be contacted as documented on the TS2. The purpose of this form is to document

verbal consent from this individual to participate in the Study, conduct a basic check of their health status to determine study eligibility, and confirm their willingness to participate. Once this has been accomplished, eligible spouses will be invited to participate in an in-person visit, and an enrollment visit should be scheduled, generally, at the same time as the family member to whom they are married.

Detailed Instructions:

Confidentiality: Information obtained through these screening interviews is to be kept separate from all other study data, as a subject's a written consent form has not yet been signed.

Interviewer Note: This interview entails calling a spouse of an enrolled family member, who has been identified and consented to be contacted by the previously screened family member.

Interviewer Script: *Hi, my name is [insert your name here] and I am calling from [insert your institution here] about the Long Life Family Study. We are attempting to learn why some families have more relatives living to a very old age than some other families. Your [husband / wife] [Insert spouse's name] told us that they spoke with you and that you are interested in learning more about participating in this study. Your [husband / wife] belongs to family we believe has had the good fortune have many members living long and health lives. Because your [husband / wife] is participating in this important international study of longevity, we would like to invite you to participate as well. In addition to our university, this study is being conducted at two other American universities [insert names here], as well as at the University of Southern Denmark. Our goal is to find out what families with histories of long-lived individuals have in common. By participating in this study with your family members, you may have an opportunity to help improve the health of future generations.*

If you choose to participate in our study, we would arrange to see you in person. For now, we have some questions we would like to ask you. You do not have to answer any questions that you do not want to. All information that I receive from you, including your name and any other identifying information, will be strictly confidential and kept under lock and key. Your participation is voluntary; you do not have to answer these questions. This will take approximately 15 minutes. Is it okay to speak with you now?

Mark the "Yes" or "No" box to indicate whether or not the screener agrees to proceed with the interview at this time. If no, determine a day and time when the family member can be called again to complete the screening interview

Question 1: *"Do I have permission to ask you some questions about yourself"?* This interview should not be administered until the prospective participant has agreed to answer the questions. If they do not agree, inquire as to an alternative time to contact them; if they still do not agree, then terminate the interview by thanking them for speaking with you.

Contact Information:

Questions 2a-2d: *Verify the contact information of the control subject.* We would like to have two phone numbers, one for daytime and one for evening. This information is crucial because instructions for the preparation for the enrollment and assessment visit are sent to this address, and the phone number is used to remind participants of appointments. Check the accuracy of the address and phone number carefully.

Demographic Information:

Question 3-4: *Age and Date of Birth*. Ask the participant for his/her age and date of birth. Record the given age and date of birth on the form. Check to make sure that the two pieces of information are consistent (e.g., if birth date is 1920, then the person should be 86 years old). Be sure to record the date using the format provided in the example.

Question 5: *Gender*. This question is self-explanatory.

Assessment of Health Status: These are the main questions that determine personal eligibility of the spouse that is being screened. There are two ways in which a spouse can be deemed ineligible (1) if their health status is so poor that they would not be able to participate in or to complete the study assessments, or (2) if they do not have a clear understanding of the purpose of this study and thus appear to be too cognitively impaired to be able to participate in or to complete the study assessments.

Question 6: Read the question and the first 5 responses. Do not read the "Don't know" and "Refused" responses.

Question 7: The interviewer may not recognize certain medical problems. If you are unsure write the participant's verbatim response in the margin and do not mark an answer for this question and continue with the interview. Check with the administrative center and your site PI to see if the condition warrants exclusion. Complete the questionnaire and follow-up with the participant appropriately.

If the Spouse is definitely physically unable to participate in the study because of the presence of advanced cancer or a serious medical condition, then read *Script A – End Interview*:

"Thank you so much for this information. We greatly appreciate the time and interest you have shown in our study. The information you provided is very important and will help us discover how some people and their families live to a very old age." **END OF INTERVIEW**

If it is unclear whether or not the Spouse is physically able, check the option for "Maybe" and schedule a time to call back. The Spouse may either ask a family member to confirm that s/he is physically able to participate or the interviewer may have an opportunity to ask another family member during the second phone call.

If the Spouse is physically able, proceed to Q8.

Key Elements/Assessment of Understanding of LLFS: This section asks the participant to provide a brief statement of their understanding of the purpose of the LLFS, in order to determine their ability to provide informed consent.

Interviewer Script for Those Continuing: *Before we continue, I want to ask you what is your understanding of the purpose of the LONG LIFE Family Study?*

Question 8a-8b: **Write in the participant's response.** Any references to family, living long or research is fine. Interviewer then marks the appropriate box in Question 8b as to their judgment whether the potential participant comprehends the study. If the potential participant clearly does not comprehend the study, end the interview using the *Script B*.

Question 8c: Interviewer does not ask the next question but assesses the potential participant's ability to communicate. If the participant is hard of hearing or cannot talk clearly or does not seem to understand the questions the interviewer should mark "YES" and terminate the interview using **Script B**.

Script B – End Interview: *"Thank you so much for this information. We greatly appreciate the time and interest you have shown in our study. The information you provided is very important and will help us discover how some people and their families live to a very old age." END OF INTERVIEW*

For Controls Residing within the 3 U.S. Field Center Catchment Areas, proceed with Q9a-9c:

Interviewer Script: *"Thank you for answering our questions. This information is very helpful. At this time we would like to invite you to participate in an in-person visit with your husband / wife so that we can gather more information about your health. This interview can be scheduled at your convenience either in your home or at our clinic. We can conduct this visit at the same time as we see your spouse. During the visit, a trained clinical staff member will obtain medical and personal information about you. You will be asked to answer questions related to your current and past medical history, medication use, daily living activities, physical activity as well as your health habits. You will also be asked questions such as how many years of education you have had and where you were born and your occupation. Other questionnaires will include paper and pencil tests of your ability to process and recall information and a mood/personality assessment. With your permission, we will obtain measurements of your weight, height, waist circumference, heart rate, blood pressure and lung function. You will also be asked to perform some simple physical tasks such as standing up from of a chair, gripping an object to measure hand strength and walking a short distance to assess your physical function. Additionally, you will be asked to perform a series of movements to test your balance. You will be asked if we can collect a small blood sample. This examination can be completed in approximately 3 hours. We will use all this information to determine the different ways in which families can achieve long lives and successful aging. You may refuse to participate in any portion of the study."*

Question 9a: In-Person Visit. If the Spouse answers "Yes" to **Q9a**, then proceed to **Q9b**. The option "No" should only be used if the Spouse clearly expresses that they are unwilling to participate in the study, including the blood draw. If so, then proceed to **Q9b**. If "Don't know" is marked, the Recruiter should call back the potential participant at a later time after materials have been sent and/or the Spouse had the chance to think about the study.

Question 9b: Location of In-Person Examination. Mark whether the Spouse prefers a home or clinic in-person examination. If Spouse chooses 'home' or 'clinic', proceed with scheduling the visit. Be sure to try to coordinate with the preferences and scheduling of their spouse's assessment visit.

Suggested Script for Scheduling/Confirming Appointment: *"We would like to see you and your husband/wife together. He/she is scheduled for _____. Are you available that day? (Work with subject to schedule a convenient time.) The visit will take under 3 hours to complete. We will be mailing to your home a reminder letter and instruction sheet, prior to the visit. Do you have any questions at this time? We will call you the day before your visit to confirm the date and time. The visit will take under three hours to complete. Do you have any questions at this time?"*

We are very excited about meeting you and your husband/wife in-person on _____ [day/date] at _____ o'clock. If you have any questions or something comes up and you need to reschedule, please call me at XXX-XXX-XXXX. Thank you and good-bye." END OF INTERVIEW

Question 9c: Refusal. Check the answer that best fits their reason for refusing participation and then end the Interview using the End Interview Script provided. If the Recruiter feels that the Spouse's concerns can be addressed, they should try to do so. If the Recruiter deems that the Spouse is unsure after further discussion they can check "Don't know" and probe for the reason that the person is unsure. It is up to the Recruiter to do his/her best to allay the fears/concerns of the potential participant by further explaining the study procedures and/or sending them more information (i.e., the Frequently Asked Questions) or directing them to the study website.

End Interview Script: *"Thank you so much for this information. We greatly appreciate the time and interest you have shown in our study. The information you provided is very important and will help us discover how some people and their families live to a very old age. If you decide at a later date that you would like to participate in this family study, please contact me at XXX-XXX-XXXX. Thank you and good-bye."* **END OF INTERVIEW**

For Controls Residing Outside the 3 U.S. Field Center Catchment Areas, proceed with Q10a-10c:

Interviewer Script: *"Thank you for answering our questions. This information is very helpful. At this time we do not have plans to conduct in-person visits in your area. However, if we do visit your area at a later time, we would like to invite you to participate in an in-person visit with your husband/wife so that we can gather more information about your health. This interview can be scheduled at your convenience either in your home or at our clinic. We can conduct this visit at the same time as we see your spouse. During the visit, a trained clinical staff member will obtain medical and personal information about you. You will be asked to answer questions related to your current and past medical history, medication use, daily living activities, physical activity as well as your health habits. You will also be asked questions such as how many years of education you have had and where you were born and your occupation. Other questionnaires will include paper and pencil tests of your ability to process and recall information and a mood/personality assessment. With your permission, we will obtain measurements of your weight, height, waist circumference, heart rate, blood pressure and lung function. You will also be asked to perform some simple physical tasks such as standing up from of a chair, gripping an object to measure hand strength and walking a short distance to assess your physical function. Additionally, you will be asked to perform a series of movements to test your balance. You will be asked if we can collect a small blood sample. This examination can be completed in approximately 3 hours. We will use all this information to determine the different ways in which families can achieve long lives and successful aging. You may refuse to participate in any portion of the study."*

Question 10a: In-Person Visit. If the Spouse answers "Yes" to **Q10a**, then proceed to End Interview script below **Q10a**. The option "No" should only be used if the Spouse clearly expresses that they are unwilling to participate in the study, including the blood draw. If so, then proceed to **Q10b**. If "Don't know" is marked, the Recruiter should call back the potential participant at a later time after materials have been sent and/or the Spouse had the chance to think about the study.

End Interview Script: *"Thank you so much for this information. We greatly appreciate the time and interest you have shown in our study. We will be in touch with you regarding participation if we are able to schedule a visit to your area. The information you provided is very important. Thank you and good-bye."* **END OF INTERVIEW**

Question 10b: Refusal. Check the answer that best fits their reason for refusing participation and then end the Interview using the End Interview Script provided. If the Recruiter feels that the Spouse's concerns can be addressed, they should try to do so. If the Recruiter deems that the Spouse is unsure after further discussion they can check "Don't know" and probe for the reason that the person is unsure. It is up to the

Recruiter to do his/her best to allay the fears/concerns of the potential participant by further explaining the study procedures and/or sending them more information (i.e., the Frequently Asked Questions) or directing them to the study website.

End Interview Script: *"Thank you so much for this information. We greatly appreciate the time and interest you have shown in our study. The information you provided is very important and will help us discover how some people and their families live to a very old age. If you decide at a later date that you would like to participate in this family study, please contact me at XXX-XXX-XXXX. Thank you and good-bye."* **END OF INTERVIEW**

CONTENT OF IN-PERSON VISIT

The content of the in-person visit is the same as for any other family member (Refer to Chapter 1 of the *LLFS MOP* for details), except for the addition of the FLoSS-Ic for the offspring generation only. This questionnaire, to establish a Family Longevity Selection Score for the control spouse of an offspring, will be interviewer administered at the time of the in-person visit. If the control spouse is too tired by the end of the full assessment protocol to do this additional interview, this information can be obtained at a later time with a telephone interview. Detailed instructions for the administration of this questionnaire are below.

LLFS FAMILY LONGEVITY SELECTION SCORE (FLoSS) – CONTROL SUBJECTS (FLoSS-Ic)

Instructions For Administration: This questionnaire is administered to enrolled spouse controls by the interviewer at the in-person visit. The questions included are designed to establish a Family Longevity Selection Score (FLoSS) for the control individual.

Detailed Instructions:

Interviewer Script: *Now I would like to ask you some questions about your family. Please feel free to tell me if you don't know the answer to a question, but please try to answer to the best of your knowledge. I am going to ask about your brothers and sisters, your biological parents, and your biological grandparents. We are using the word "biological" to describe individuals that are related to you by birth, meaning that they share a blood relationship with you. Please note that none of the study investigators will attempt to identify, or contact specific family members based on the relationship information you provide.*

Questions 1a: This question is self-explanatory. Read the script and fill-in the appropriate response.

Questions 1b: If brother or sister is deceased (i.e., "No" to Q1b), then answer Questions 1d-f. If "Yes" to Q1b, then go to Q1c. If "Don't know" to Q1b, then skip to Q2a.

Question 1c: **Current age in years.** Best guess for an age is better than unknown. Probe for the participant's best guess. If don't know, enter 999.

If brother or sister is deceased, ask Questions 1d-e.

Question 1d: **Age at time of death.** Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your brother/sister's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades, you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Question 1e: *Year of Birth.* This is a difficult question for many people. Often people will try to figure out year of birth by calculating backwards from the calendar year of the age at death. They often identify the calendar year of death of their sibling by relating age at death to important family events, like weddings or graduations. So for example, the individual may say that "sibling" died a year before their child's wedding, when "sibling" was XX years old and the wedding took place in year XXXX. There are many variations on this example. Record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense. If not, politely probe the subject for accurate information by providing examples of the discrepancy.

Question 1f: *Cause of death.* To appropriately calculate the Family Longevity Selection Score, we need to know whether the person died prematurely due to an accident, injury or war. Read the questions and the "Yes" and "No" responses. Do not read the "Don't know" and "Refused" responses.

Questions 2a-f to 10a-f: Complete these questions according to the number of siblings the Spouse control has in his/her family.

If Spouse has more than 10 biological siblings, please use additional forms to record this information for those brothers and sisters.

Interviewer Script: *Now I'm going to ask you some questions about your biological mother and your biological mother's parents (your maternal grandparents).*

Questions 11a: If biological mother is deceased (i.e., "Yes" to Q11a), then answer Questions 11b-d. If "No" to Q11a, then skip to Q11e-f. If the answer is "Don't know" to Q11a, then skip to Q12a.

Questions 11b: *Age at time of death.* Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your mother's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades, you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Questions 11c: *Year of Death.* We need to know about year of death as well as age at death, which is difficult for many people. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense. If not, politely probe the subject for accurate information by providing examples of the discrepancy.

Questions 11d: *Cause of death.* To appropriately calculate the Family Longevity Score, we need to know whether the person died prematurely due to external causes such as accident, injury or war. Read the questions and the "yes" and "no" responses. Do not read the "Don't know" and "Refused" responses. If death is a result of murder or suicide, answer "yes"; if death occurred during childbirth, answer "no".

If biological mother is still living, ask Questions 11e-f.

Questions 11e: *Current age in years.* Best guess for an age is better than unknown. Probe for the participant's best guess. If don't know, enter 999.

Questions 11f: *Year of Birth.* We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Interviewer Script: *Now I'd like to ask you about your biological mother's parents, that is, your maternal grandmother and grandfather. Remember: Please feel free to tell me if you don't know the answer to a question, but please try to give your best guess.*

Questions 12a: If biological maternal grandmother is deceased (i.e., "Yes" to Q12a), then answer Questions 12b-d). If "No" to Q12a, then skip to Q12e-f. If "Don't know" to Q12a, then skip to Q13a.

Questions 12b: ***Age at time of death.*** Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your maternal grandmother's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades, you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Questions 12c: ***Year of Death.*** We need to know about year of death as well as age at death, which is difficult for many people. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 12d: ***Cause of death.*** To appropriately calculate the Family Longevity Score, we need to know whether the person died prematurely due to external causes such as accident, injury or war. Read the questions and the "yes" and "no" responses. Do not read the "Don't know" and "Refused" responses. If death is a result of murder or suicide, answer "yes"; if death occurred during childbirth, answer "no".

If biological maternal grandmother is still living, ask Questions 12e-f.

Questions 12e: ***Current age in years.*** Best guess for an age is better than unknown. Probe for the participant's best guess. If don't know, enter 999.

Questions 12f: ***Year of Birth.*** We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 13a: If biological maternal grandfather is deceased (i.e., "Yes" to Q13a then answer Questions 13b-d). If "NO" to Q13a, then go to Q13e-f. If "Don't know" to Q13a then skip to Q14a.

Questions 13b: ***Age at time of death.*** Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your maternal grandfather's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades, you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Questions 13c: ***Year of Death.*** We need to know about year of death as well as age at death, which is difficult for many people. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 13d: ***Cause of death.*** To appropriately calculate the Family Longevity Score, we need to know whether the person died prematurely due to external causes such as accident, injury or war. Read the questions and the "yes" and "no" responses. Do not read the "Don't know" and "Refused" responses. If death is a result of murder or suicide, answer "yes"; if death occurred during childbirth, answer "no".

If biological maternal grandfather is still living, ask Questions 12e-f.

Questions 13e: **Current age in years.** Best guess for an age is better than unknown. Probe for the participant's best guess. If don't know, enter 999.

Questions 13f: **Year of Birth.** We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Interviewer Script: *Finally, I'm going to ask you some questions about your biological father and your biological father's parents (your paternal grandparents).*

Questions 14a: If biological father is deceased (i.e., "Yes" to Q14a), then answer Questions 14b-d. If "No" to Q14a, then go to Q14e-f. If "Don't know" to Q14a, then skip to Q15a.

Questions 14b: **Age at time of death.** Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your father's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades, you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Questions 14c: **Year of Death.** We need to know about year of death as well as age at death, which is difficult for many people. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 14d: **Cause of death.** To appropriately calculate the Family Longevity Score, we need to know whether the person died prematurely due to external causes such as accident, injury or war. Read the questions and the "yes" and "no" responses. Do not read the "Don't know" and "Refused" responses. If death is a result of murder or suicide, answer "yes"; if death occurred during childbirth, answer "no".

If biological father is still living, ask Questions 14e-f:

Questions 14e: **Current age in years.** Best guess for an age is better than unknown. Probe for the participant's best guess. If don't know, enter 999.

Questions 14f: **Year of Birth.** We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Interviewer Script: *Now I'd like to ask you about your biological father's parents, that is, your paternal grandmother and grandfather. Remember: Please feel free to tell me if you don't know the answer to a question, but please try to give your best guess.*

Questions 15a: If biological paternal grandmother is deceased (i.e., "Yes" to Q15a then answer Questions 15b-d). If "NO" to Q15a, then go to Q15e-f. If "Don't know" to Q15a then skip to Q16a.

Questions 15b: **Age at time of death.** Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your paternal grandfather's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades,

you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Questions 15c: *Year of Birth*. We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 15d: *Cause of death*. To appropriately calculate the Family Longevity Score, we need to know whether the person died prematurely due to external causes such as accident, injury or war. Read the questions and the "yes" and "no" responses. Do not read the "Don't know" and "Refused" responses. If death is a result of murder or suicide, answer "yes"; if death occurred during childbirth, answer "no".

If biological paternal grandfather is still living, ask Questions 15e-f.

Questions 15e: *Current age in years*. Best guess for an age is better than unknown. Probe for the participant's best guess

Questions 15f: *Year of Birth*. We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 16a: If biological paternal grandfather is deceased (i.e., "Yes" to Q16a), then answer Questions 16b-d). If "No" to Q16a, then go to Q16e-f. If "Don't know" to Q16a, then skip to Q17a.

Questions 16b: *Age at time of death*. Best guess for an age is better than unknown. Probe for the participant's best guess. You may offer a choice of decades such as "would you say that your (Spouse's) paternal grandfather's age of death was in their 40's, 50's, 60's, 70's, 80's, 90's. If you probe with a choice of decades, you must cover a full range, otherwise the limited range will produce bias. If the participant absolutely will not give a guess then enter 999 for the age.

Questions 16c: *Year of Birth*. We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Questions 16d: *Cause of death*. To appropriately calculate the Family Longevity Score, we need to know whether the person died prematurely due to external causes such as accident, injury or war. Read the questions and the "yes" and "no" responses. Do not read the "Don't know" and "Refused" responses. If death is a result of murder or suicide, answer "yes"; if death occurred during childbirth, answer "no".

If biological maternal grandfather is still living, ask Questions 12e-f.

Questions 16e: *Current age in years*. Best guess for an age is better than unknown. Probe for the participant's best guess

Questions 16f: *Year of Birth*. We need to know about year of birth. As above, use strategies to help individuals recall this information and record all this verbatim, exactly as given, and then do the calculations as quickly as possible to make sure that the result of the calculations makes sense.

Study Documents Referred to in this Chapter:

- Family Longevity Selection Score Instrument - Proband (FLoSS-I)
- Family Member Telephone Screener (TS1a)
- Relative Contact Information Worksheet (TS2)
- Control Subject Telephone Screener (TS1a-c)
- Family Longevity Selection Score Instrument – Controls (FLoSS-Ic)