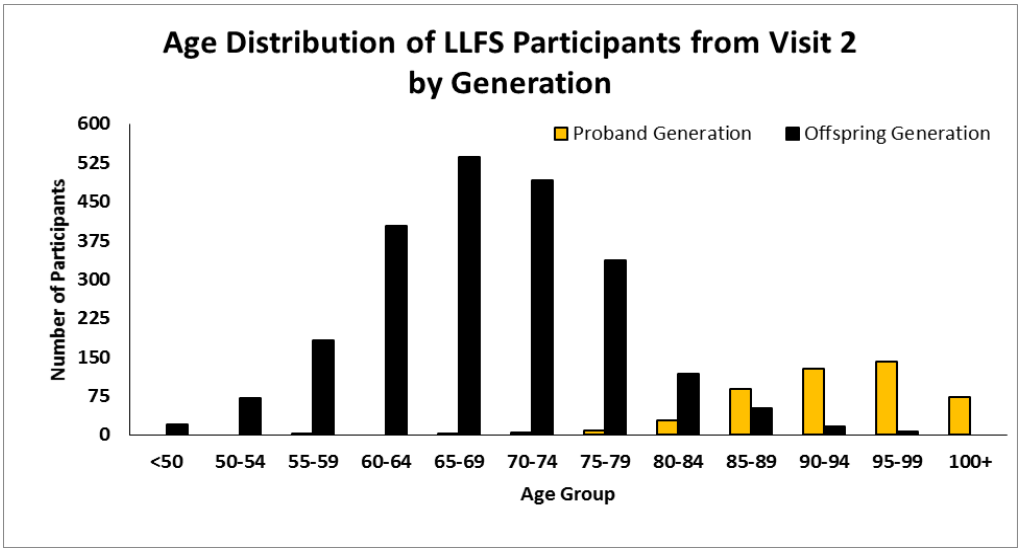
NEWSLETTER

In Person Study Visit 2 Coming to a Close at End of October, 2017

We are very grateful for your continued participation in the Long Life Family Study and with your help we are **nearing the end** of the Visit 2 phase of our study. For those of you who have completed a second home visit, we have enjoyed seeing you in person again! **Study wide we have seen over 2800 participants for Visit 2!** The graph below shows the age distribution of Visit 2 participants by generation. We are still trying to reach some of you before Visit 2 ends so that we can continue to gain a better understanding of the mechanisms behind achieving a long and healthy life. We look forward to connecting with you. After Visit 2 ends, everyone in the LLFS will continue to be contacted once per year for our usual surveillance follow-up call. We are also writing more grants so we will keep you posted!



LLFS Investigators are very active presenting and publishing important findings at national and international meetings. Since our last newsletter in June 2016 we have published 10 manuscripts and have two more in press. Two interesting research areas are featured on the reverse side of this newsletter. We will share more research findings in the next update.

The University of Pittsburgh team has conducted 665 Visit 2's. We have enjoyed traversing the United States to see you as well as talk with you on the phone. We appreciate you welcoming us and sharing your family's stories! Please continue to keep us posted on how you and your family members are doing. Also, let us know if your address or phone number changes. **Contact Dr. Nancy Glynn, Program Director, University of Pittsburgh Field Center, at 412.383.1309 or toll-free 1-800-552-8140 or epidnwg@pitt.edu.**

The LLFS is funded by the National Institute on Aging of the National Institutes of Health.

Identification of Biomarker Signatures of Aging

In a study published in Aging Cell in January 2017 and led by Dr. Paola Sebastiani of the Boston field center, we analyzed 19 biomarkers in blood samples obtained from LLFS participants. These biomarkers are measurable substances in the blood that can indicate underlying disease processes such as cardiovascular disease and type 2 diabetes. We found 26 different patterns of these biomarkers that were common among participants. We then analyzed whether these patterns were associated with survival, disease, and physical function change over follow-up. One group of participants had a biomarker pattern that was related to lower risk of disease and better survival and physical function. We believe this pattern of blood biomarkers is associated with more successful aging. Other patterns were associated with less successful aging over the follow-up, as indicated by higher risk of frailty, disease, and death. Since change in one biomarker may be caused by several different conditions, these patterns of biomarkers, referred to as biomarker signatures, may be better at distinguishing between underlying disease and aging processes. Additional research is needed to investigate additional biomarkers and to learn how these signatures relate to health outcomes.

Full paper published by: Sebastiani P, Thyagarajan B, Sun F, Schupf N, Newman A, Montano M, Perls T. Biomarker signatures of aging. Aging Cell (2017) 16, pp329–338

What do we know about the Grandchildren in the Long Life Family Study?

The families included in the Long Life Family Study are all characterized by long-lived sibships. This is the positive starting point. In a series of studies, we have shown that also the children of the first long-lived generation have better survival, and in addition, they are healthier than average, and so are their spouses.[1] This made us wonder whether the clustering of good health continues into the grandchildren's generation.

In the Danish part of the Long Life Family Study, in our small country with less than 5.7 million people, we are fortunate to have access to church books and population registers which enable us to study hundreds of such longevity-enriched families, i.e., families with long-lived sibships. By scrutinizing the old church books we were able to identify about 659 families with a total of nearly 4,000 siblings who were characterized by a very long life span. Through interviews we succeeded in identifying approximately 5,000 children of these siblings and through population registers more than 10,000 grandchildren of these long-lived sibships.

Our preliminary findings (unpublished data) are very encouraging: The study of the grandchildren suggests that they have substantially reduced infant mortality, i.e. mortality in the first year of life. This advantage continues throughout childhood and adolescence, and we have been able, in these preliminary analyses, to demonstrate that the grandchildren of the long-lived sibships have less than average hospitalization from birth to age 15 years.

We are eager to try to figure out how this advantage arises. Which diseases are "missing" in the grandchildren? The mechanism is not known; however, these preliminary findings suggest that not only do the children of the long-lived siblings also live longer, but their grandchildren seem, on average, to be blessed with a better health than others at their age.

[1]Pedersen JK, Elo IT, Schupf N, Perls TT, Stallard E, Yashin AI, Christensen K. J Gerontol A Biol Sci Med Sci. 2017 Jan; 72(1): 109–114.