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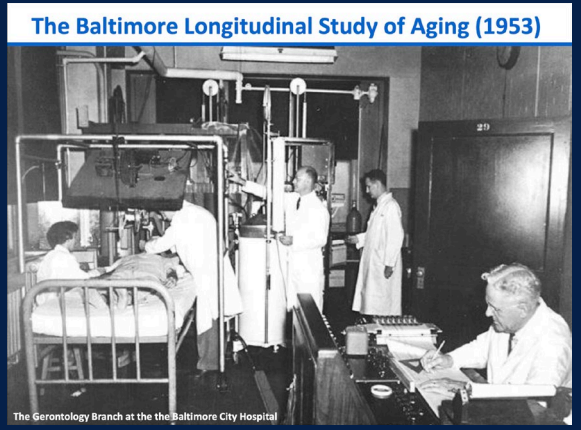
Clin-STAR Annual Meeting –
Secondary Data Panel *11/18/2025*

The Baltimore Longitudinal Study of Aging (BLSA)

Scott R. Bauer, MD, ScM
Associate Professor, Departments of Medicine, Urology, Epidemiology & Biostatistics, UCSF

Scott.Bauer@ucsf.edu
@ScottBauerMD

What is the BLSA?



- Established in 1958 as a continuous enrollment "life-long" cohort to study normative aging
- Overhauled in 2003 by Dr. Luigi Ferrucci with a new paradigm to identify multifactorial sources of aging processes, including frailty, loss of mobility and cognitive impairment
- Expanded in 2008 and 2011 to target enrollment of exceptionally healthy adults over age 70 to promote research on healthy aging

Adapted from Dr. Eleanor Simonsick

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nature aging

ARTICLES

https://doi.org/10.1038/s43587-022-00243-7

Check for updates

OPEN

Longitudinal phenotypic aging metrics in the Baltimore Longitudinal Study of Aging

Pei-Lun Kuo[1], Jennifer A. Schrack[2], Morgan E. Levine[3], Michelle D. Shardell[4], Eleanor M. Simonsick[1], Chee W. Chia[5], Ann Zenobia Moore[1], Toshiko Tanaka[1], Yang An[6], Ajoy Karikkineth[5], Majd AlGhatrif[7], Palchamy Elango[1], Linda M. Zukley[8], Josephine M. Egan[5], Rafael de Cabo[1], Susan M. Resnick[6] and Luigi Ferrucci[1]

Journal of the American Heart Association

ORIGINAL RESEARCH

Sex Differences in Longitudinal Determinants of Carotid Intima Medial Thickening With Aging in a Community-Dwelling Population: The Baltimore Longitudinal Study on Aging

Ajoy C. Karikkineth, MD*; Majd AlGhatrif, MD, MA*; Matt T. Oberdier, PhD; Chris Morrell, PhD; Elango Palchamy, PhD; James B. Strait, MD; Luigi Ferrucci, MD; Edward G. Lakatta, MD*

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Journals of Gerontology: Biological Sciences
cite as: J Gerontol A Biol Sci Med Sci, 2021, Vol. 76, No. 3, 426–433
doi:10.1093/gerona/glaa201
Advance Access publication August 14, 2020

OXFORD

Original Article

Association of Mitochondrial Function, Substrate Utilization, and Anaerobic Metabolism With Age-Related Perceived Fatigability

Fangyu Liu, MHS,[1,2,*] Amal A. Wanigatunga, PhD, MPH,[1,2,•] Marta Zampino, MD,[3,•] Nicolas D. Knuth, PhD,[4] Eleanor M. Simonsick, PhD,[3] Jennifer A. Schrack, PhD,[1,2,•] and Luigi Ferrucci, MD, PhD[3,•]

DOI: 10.1111/jgs.17369

CLINICAL INVESTIGATION

Journal of the American Geriatrics Society

Functional decline among older cancer survivors in the Baltimore longitudinal study of aging

Arfan Siddique MPH[1] | Eleanor M. Simonsick PhD[2] | Lisa Gallicchio PhD[1]

Received: 7 April 2021 | Revised: 24 June 2021 | Accepted: 12 September 2021
DOI: 10.1111/acel.13487

SHORT TAKE

Aging Cell WILEY

Mitochondrial DNA copy number and heteroplasmy load correlate with skeletal muscle oxidative capacity by P31 MR spectroscopy

Qu Tian[1] | Ann Zenobia Moore[1] | Richard Oppong[1] | Jun Ding[1] | Marta Zampino[1] | Kenneth W. Fishbein[2] | Richard G. Spencer[2] | Luigi Ferrucci[1]

JAMA Network Open.

Original Investigation | Ophthalmology

Association of Vision Impairment With Cognitive Decline Across Multiple Domains in Older Adults

Varshini Varadaraj, MD, MPH; Beatriz Munoz, MS; Jennifer A. Deal, PhD; Yang An, MS; Marilyn S. Albert, PhD; Susan M. Resnick, PhD; Luigi Ferrucci, MD, PhD; Bonnielin K. Swenor, PhD, MPH

The Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet is associated with physical function and grip strength in older men and women

Sameera A Talegawkar,[1] Yichen Jin,[1] Eleanor M Simonsick,[2] Katherine L Tucker,[3,4] Luigi Ferrucci,[2] and Toshiko Tanaka[2]

Received: 21 June 2021 | Revised: 18 November 2021 | Accepted: 5 January 2022
DOI: 10.1111/acel.13552

RESEARCH ARTICLE

Aging Cell WILEY

Muscle mitochondrial energetics predicts mobility decline in well-functioning older adults: The baltimore longitudinal study of aging

Qu Tian[1] | Brendan A. Mitchell[1] | Marta Zampino[1] | Kenneth W. Fishbein[2] | Richard G. Spencer[2] | Luigi Ferrucci[1]

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Journals of Gerontology: Medical Sciences
cite as: J Gerontol A Biol Sci Med Sci, 2021, Vol. 76, No. 8, 1504–1511
doi:10.1093/gerona/glaa294
Advance Access publication November 24, 2020

OXFORD

Research Article

Association Between Brain Volumes and Patterns of Physical Activity in Community-Dwelling Older Adults

Amal A. Wanigatunga, PhD, MPH,[1,2,*,•] Hang Wang, PhD, MHS,[2] Yang An, MS,[3] Eleanor M. Simonsick, PhD,[3] Qu Tian, PhD, MS,[3] Christos Davatzikos, PhD,[4] Jacek K. Urbanek, PhD,[5] Vadim Zipunnikov, PhD,[6] Adam P. Spira, PhD,[2,7] Luigi Ferrucci, MD, PhD,[3,•] Susan M. Resnick, PhD,[3] and Jennifer A. Schrack, PhD[1,2,•]

The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences, 2024, 79(6), 1–9
https://doi.org/10.1093/gerona/glae008
Advance access publication 9 January 2024
Special Issue: Urinary Incontinence and Voiding Dysfunction: Research Article

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OXFORD

Associations of Lower Extremity Muscle Strength, Area, and Specific Force With Lower Urinary Tract Symptoms in Older Men: The Baltimore Longitudinal Study of Aging

Marvin E. Langston, MPH, PhD,[1] Peggy M. Cawthon, PhD, MPH,[2,3] Kaiwei Lu, MS,[4] Rebecca Scherzer, PhD,[4,5] John C. Newman, MD, PhD,[6] Kenneth Covinsky, MD,[4,5] Luigi Ferrucci, MD, PhD,[7] Eleanor M. Simonsick, PhD,[7] and Scott R. Bauer, MD, ScM[5,8]

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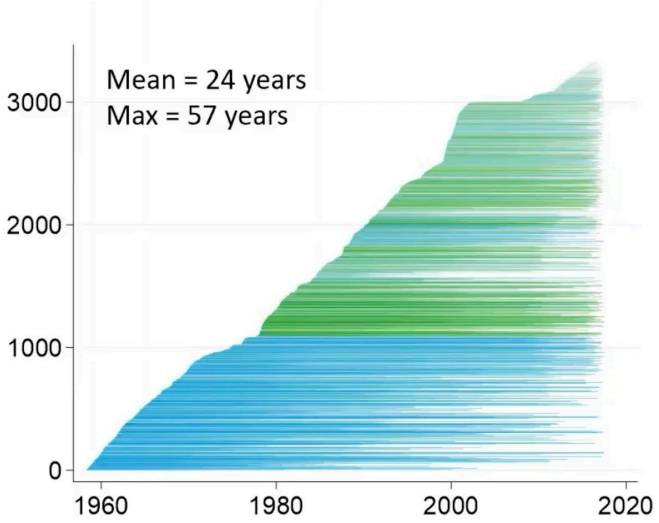
BLSA Sample

Legacy

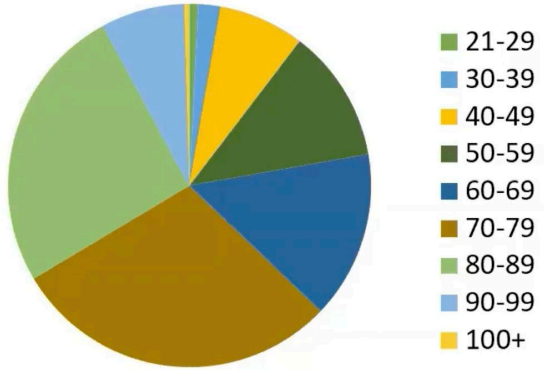
> 1,400 Women with > 8,000 visits
> 2,000 Men with > 16,000 visits



Current

Census:
~ 1100 participants ~ 50% women ~ 30% black
Visit schedule:
21-59: 4 years, 60-79: 2 years, 80+: yearly
Visit length: 2-4 resident days

Age at last visit



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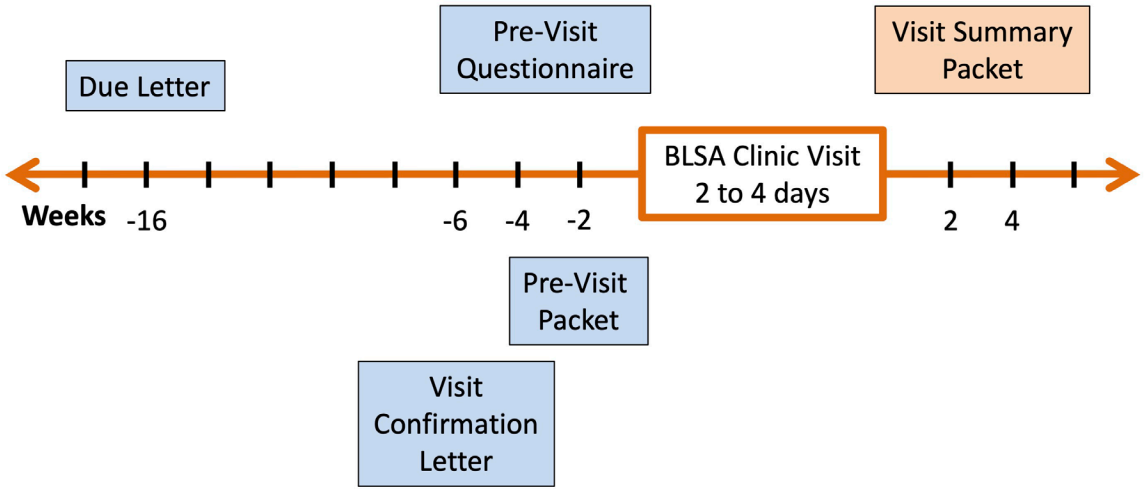
Participant Visit Timeline

Visit frequency: age <60 every 4 years, age 60-79 biannually; age ≥80 annually



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Core and Core+ Measures*

CORE

Physical Examination + EKG
Medical Interview
Medications
Vitals and Anthropometry
General Interview
Clinical Labs
Core Cognitive Battery
Physical Performance Testing
Strength

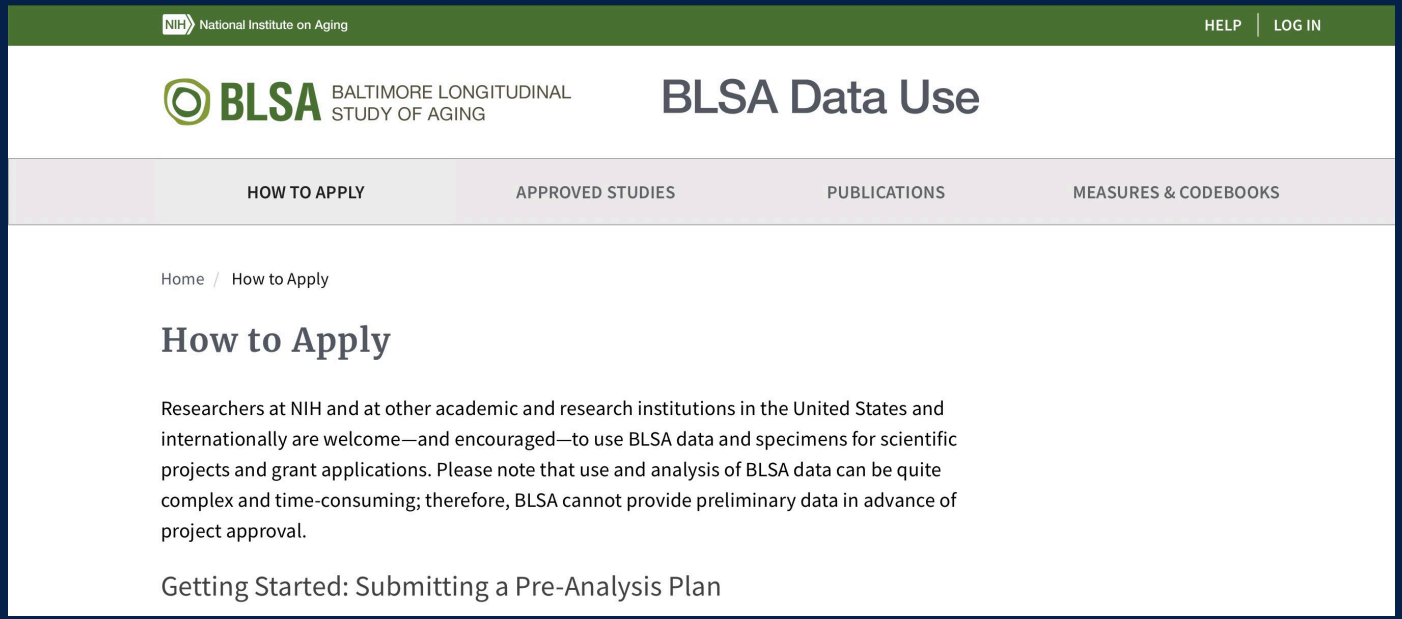
***All eligible participants every visit**

CORE+

Gait Lab
Exercise Tolerance/Spirometry
Resting Metabolic Rate
Holter Monitor
Echocardiography/Cardiovascular
DXA and CT
Early Markers Battery
MRI , fMRI and MRS
Nerve Conduction/Sensitivity
Vision and Strip Meniscometry
Auditory and ~~Vestibular~~ Function
Ankle Proprioception
Research Labs and 24Hr Urine
Oral Glucose Tolerance Test
Saliva/Other Biospecimens
Taste Bud Photography
FFQ, Fatigability, Accelerometry
Personality

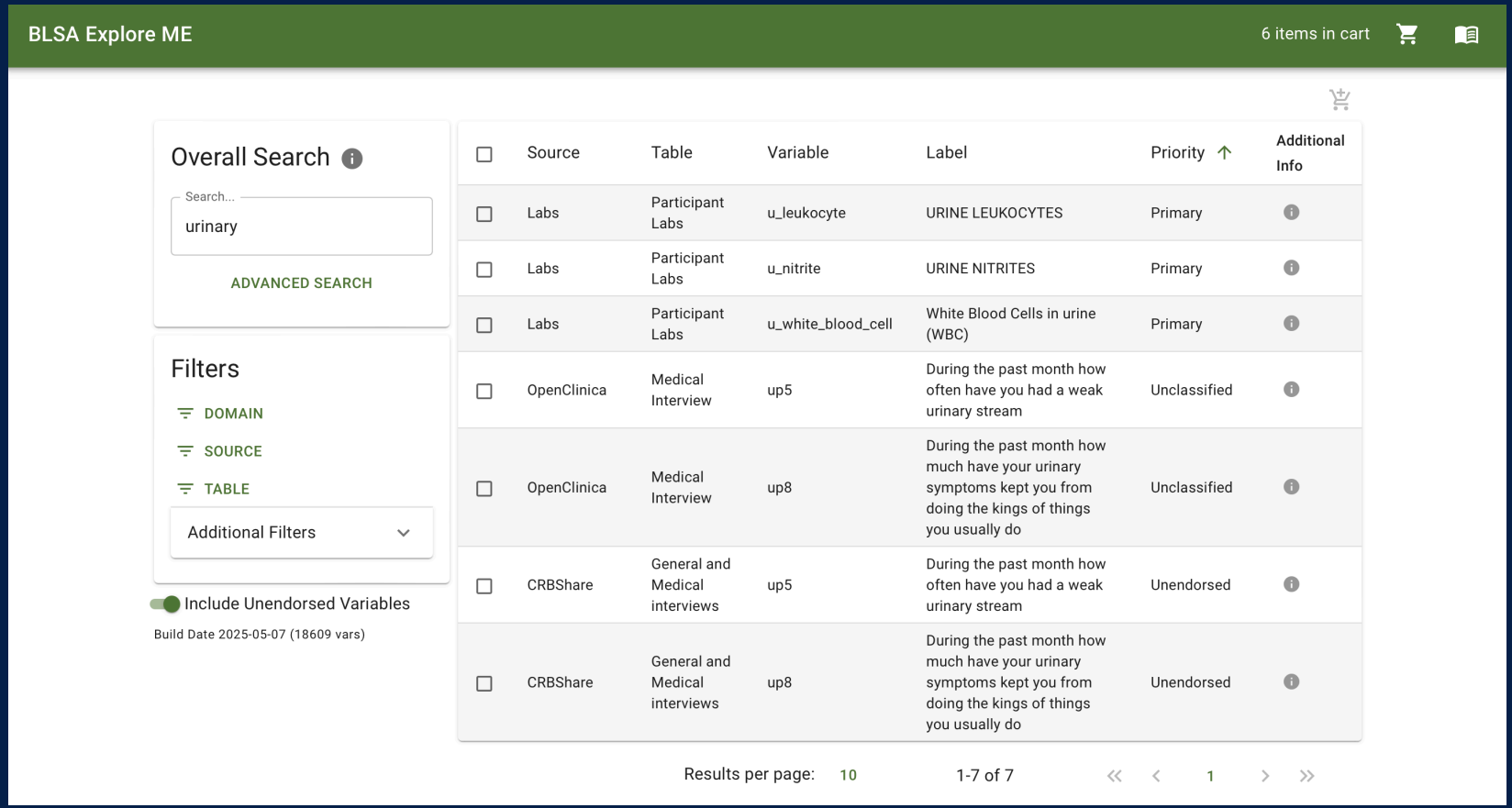
Adapted from Dr. Eleanor Simonsick

https://www.blsa.nih.gov/how-apply



Notice

This repository is under review for potential modification in compliance with Administration directives.


BLSA Explore ME
6 items in cart
Overall Search
Search...
urinary
ADVANCED SEARCH
Filters
DOMAIN
SOURCE
TABLE
Additional Filters
Include Unendorsed Variables
Build Date 2025-05-07 (18609 vars)
Source
Table
Variable
Label
Priority
Additional Info
Labs
Participant Labs
u_leukocyte
URINE LEUKOCYTES
Primary
Labs
Participant Labs
u_nitrite
URINE NITRITES
Primary
Labs
Participant Labs
u_white_blood_cell
White Blood Cells in urine (WBC)
Primary
OpenClinica
Medical Interview
up5
During the past month how often have you had a weak urinary stream
Unclassified
OpenClinica
Medical Interview
up8
During the past month how much have your urinary symptoms kept you from doing the kings of things you usually do
Unclassified
CRBShare
General and Medical interviews
up5
During the past month how often have you had a weak urinary stream
Unendorsed
CRBShare
General and Medical interviews
up8
During the past month how much have your urinary symptoms kept you from doing the kings of things you usually do
Unendorsed
Results per page: 10
1-7 of 7
1

INTERVIEW: URINARY PROBLEMS - 1 of 2

INTRODUCTION: "Now I would like to ask you some questions about urinary function."

		Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always	DK	Refused
1. During the last month or so, how often have you had a sensation of not emptying your bladder completely after you finished urinating?	**UP1**	○ **0**	○ **1**	○ **2**	○ **3**	○ **4**	○ **5**	○ **8**	○ **7**

INCONTINENCE

10. Many people complain that they accidentally leak urine. In the past week, did you leak even a small amount of urine?

Yes ○ **1** **UP10** No ○ **0** Don't know ○ **8** Refused ○ **7**

↓

Go to Question 11.

During the past week (7 days), how many times did you leak urine under the following conditions? ***Examiner Note: Enter 99 if all the time, 88 if don't know and 77 if refused.***

10a. With an activity like coughing, lifting, or exercise? ☐☐ **UP10A** *times in past week*

10b. When you had a sense of urgency and could not get to a toilet fast enough? ☐☐ **UP10B** *times in past week*

10c. Unrelated to an activity or urge to urinate? ☐☐ **UP10C** *times in past week*

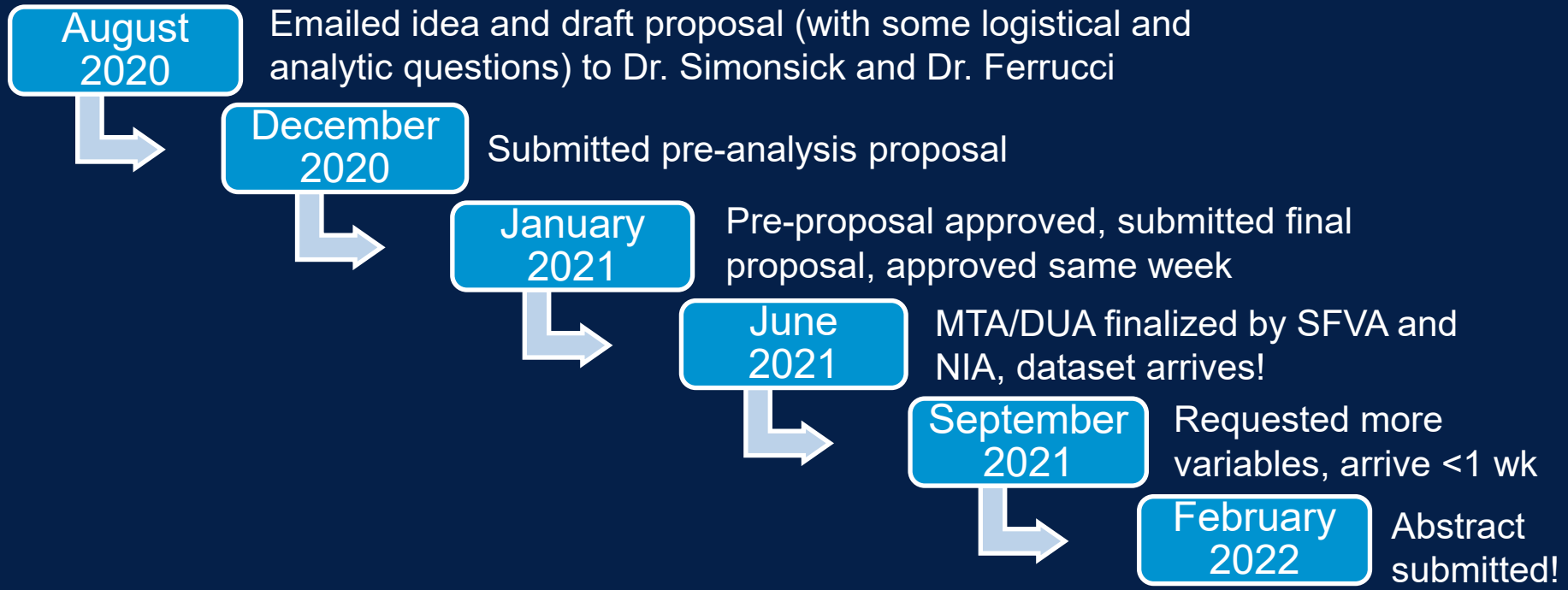
Go to Question 12.

Baltimore Longitudinal Study on Aging
Edited Master File
Final visit level file
Mean statistics

The MEANS Procedure

Variable	Label	N	N Miss	Minimum	Mean	Maximum
IDNo	BLSA ID	25664	0	11.0000000	2694.00	8224.00
Visit	Visit Number	25664	0	1.0000000	6.6896820	34.0000000
DOV	Date of visit	25664	0	-694.0000000	11605.90	22263.00
Age	Age at time of visit	25664	0	17.0000000	63.2004754	103.0000000
TypeVisit	Type of Visit, 1=Clinical, 2=Home, 3=Phone	25664	0	1.0000000	1.0300031	3.0000000
WtKg	ANTH: Weight (kg)	25395	269	32.4000000	76.2169679	192.1000000
HtCm	ANTH: Height in cm	25380	284	107.5000000	170.7236722	200.5000000
BMI	ANTH: Body Mass Index	25375	289	13.2900000	26.0530518	64.2300000
Waist	ANTH: Waist circumference in cm	20991	4673	21.2000000	89.2635320	352.4000000
WaistEditFlag	ANTH: Waist circumference edit flag	20991	4673	0	0.000428755	1.0000000
NMissSF	SF12: Number of missing components in SF12	7224	18440	0	5.0022148	35.0000000
SF12_PCScore	SF12: Physical health composite score	6045	19619	14.5000000	50.7354012	66.3000000
SF12_MCScore	SF12: Mental health composite score	6045	19619	15.2000000	55.2274773	69.8000000
SFHealth	SF12: SF-12 self-rated health	6220	19444	1.0000000	2.1083601	8.0000000
GRMUL	GRIP: Hand grip muscles left (Kg)	11200	14464	0	34.7655357	260.0000000
GRMUR	GRIP: Hand grip muscles right (Kg)	11219	14445	0	36.8770835	332.0000000
GripDate	GRIP: Grip Strength Date Completed	11390	14274	-144.0000000	13249.14	22264.00
SPPB_CS	PERF: repeat chair stand score for SPPB	5707	19957	0	3.3539513	4.0000000
CS5Pace	PERF: chair stands per second for 5 stands	5707	19957	0	0.4941090	5.7100000
CS10Pace	PERF: chair stands per second for 10 stands	5659	20005	0	0.4653402	1.3900000
SPPB_SB	PERF: standing balance score for SPPB	5733	19931	0	3.6834118	4.0000000
STSTime	PERF: semi-tandem stand time in seconds	5752	19912	0	28.2308936	30.0000000
FTSTime	PERF: full-tandem time in seconds	5754	19910	0	25.0433264	30.0000000
SLSTime	PERF: single leg stand time in seconds	5749	19915	0	17.5319534	30.0000000
TotsbTime	PERF: total standing balance time in seconds	5747	19917	0	70.8010440	90.0000000

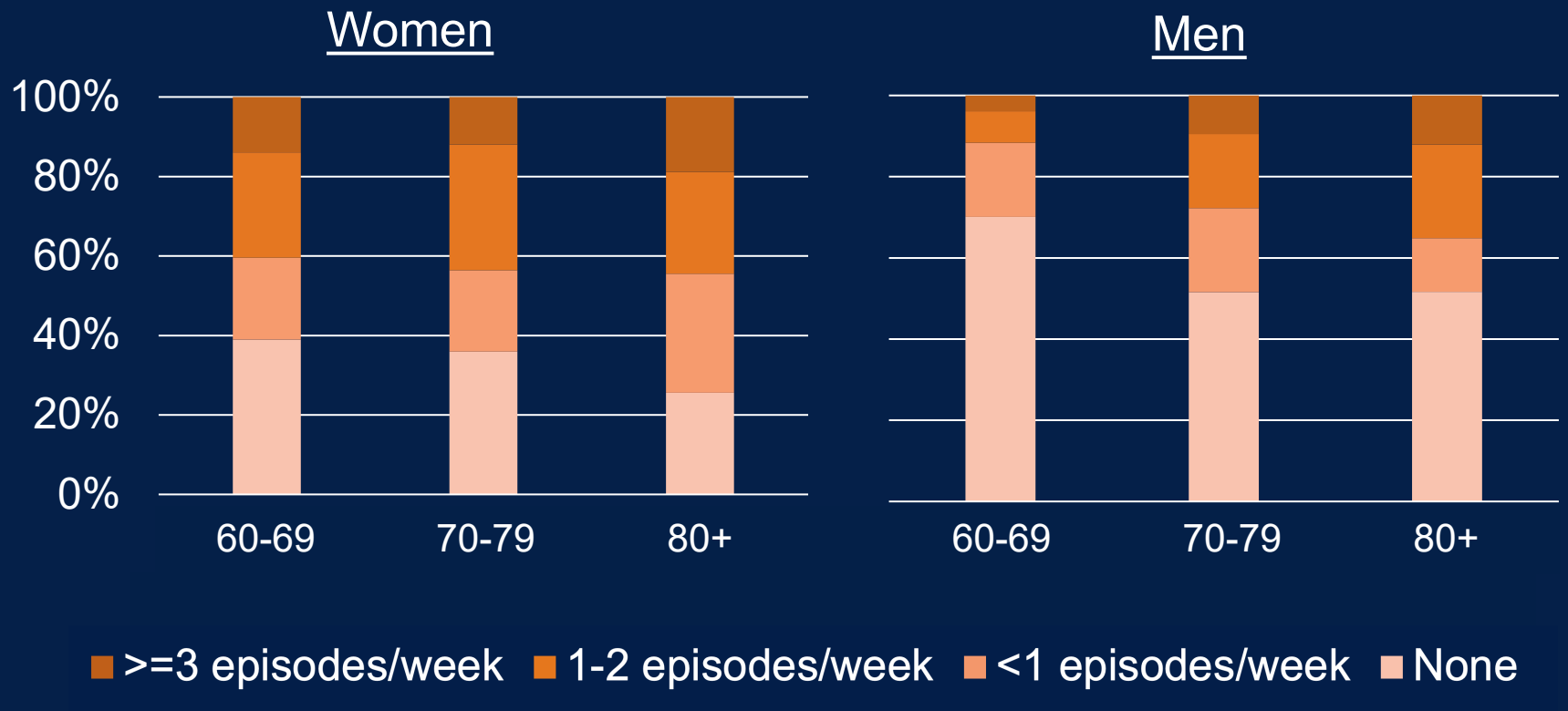
Timeline


August 2020
Emailed idea and draft proposal (with some logistical and analytic questions) to Dr. Simonsick and Dr. Ferrucci
December 2020
Submitted pre-analysis proposal
January 2021
Pre-proposal approved, submitted final proposal, approved same week
June 2021
MTA/DUA finalized by SFVA and NIA, dataset arrives!
September 2021
Requested more variables, arrive <1 wk
February 2022
Abstract submitted!

So. Many. Questions.

- Can you please confirm that MUSCLE_Area is specifically thigh muscle area? I'm assuming so based on the master data dictionary you sent that says this variable is from the dataset named "BLSA_CT_THIGH_NEW”
- I don't see any leg strength data and I'm not 100% certain which variables to use for maximum quadriceps strength. I think what we want is max_bio_qrc30 and max_bio_qlc30 (from "BLSA_BIODEXA_NEW").
- What is the difference between MDHX and SMDHX variables? The label for SMDHX says "To date summary" so I'm assuming those are time-updated and MDHX is not? And what are the value labels for SMDHX (range 1-4)?
- What are the value labels for smokehx (range 0-3) or smoke_edited? And which smoking variable should we use?
- I forgot to include these variables in our original request (if possible to add!): COG04, COG05, COG06, COG19

Prevalence of Urinary Incontinence in BLSA by sex/age



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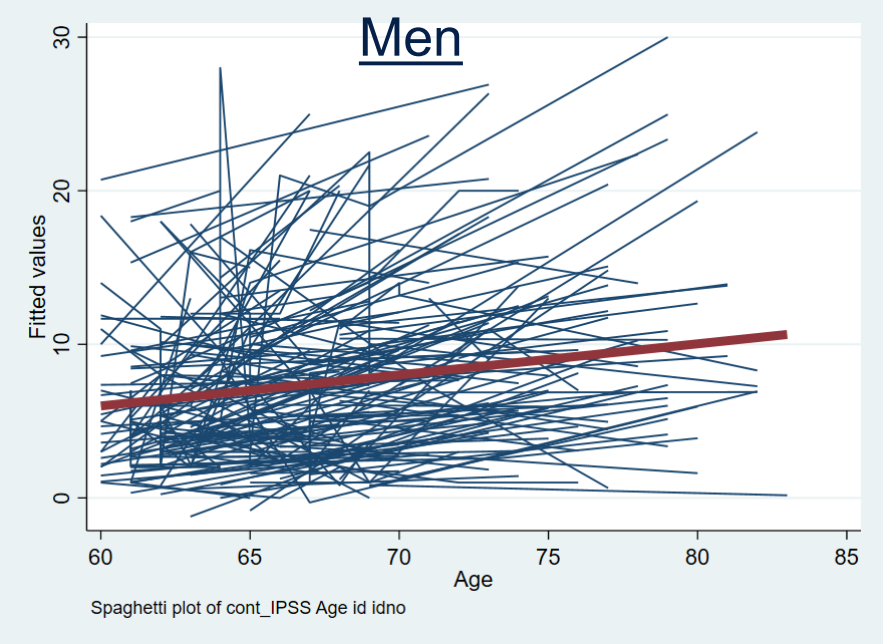
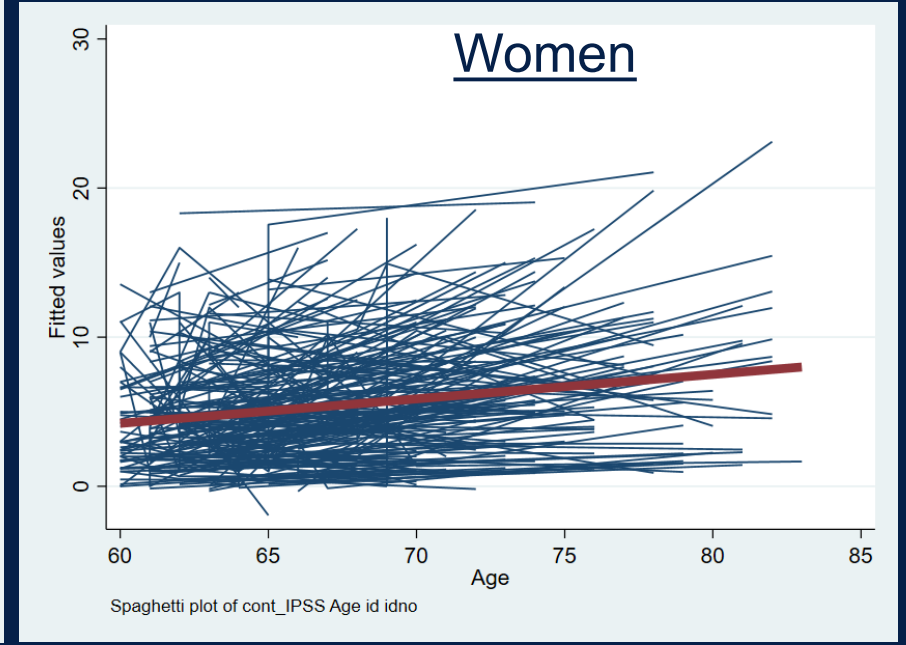
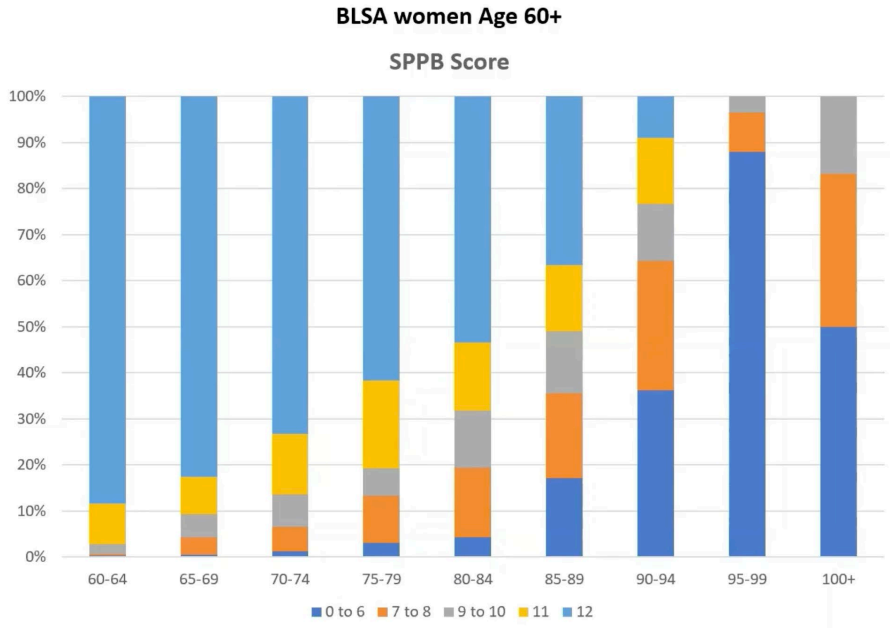
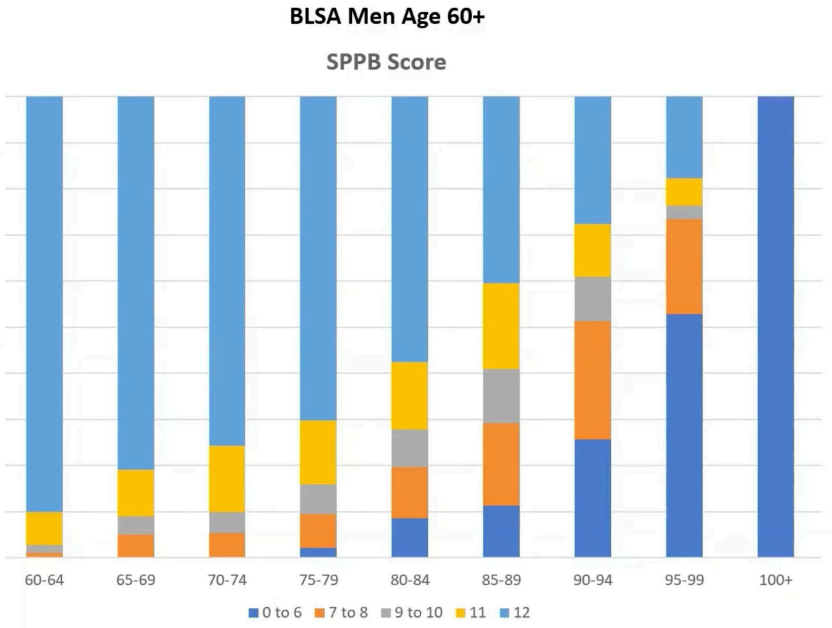
Trajectories of AUASI score in BLSA









Adapted from Dr. Eleanor Simonsick

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