

Table S1. Interactions between Leukocyte Telomere Length (kb pairs) and Age, Sex, Race/Ethnicity, and Education (n=3,091)

	All-Cause Mortality	Cardiovascular Mortality	Cancer Mortality	Other Disease Mortality
	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
Model 1				
Telomere Length*	1.49 (0.32, 6.95)	3.92 (0.19, 80.38)	4.98 (0.36, 68.67)	0.57 (0.05, 7.15)
Age	0.98 (0.78, 1.23)	1.41 (1.00, 1.99)	1.22 (0.78, 1.91)	1.09 (0.90, 1.31)
Telomere Length x Age	0.99 (0.97, 1.01)	0.98 (0.94, 1.02)	0.98 (0.94, 1.01)	1.00 (0.97, 1.04)
Model 2				
Telomere Length	0.98 (0.70, 1.20)	1.15 (0.67, 1.96)	1.03 (0.69, 1.54)	0.73 (0.50, 1.07)
Female	0.74 (0.08, 6.42)	1.80 (0.04, 87.66)	1.84 (0.05, 64.07)	0.50 (0.02, 14.46)
Telomere Length x Female	1.03 (0.71, 1.50)	0.83 (0.41, 1.70)	0.83 (0.44, 1.58)	1.07 (0.58, 1.97)
Model 3				
Telomere Length	0.96 (0.74, 1.25)	1.15 (0.78, 1.69)	1.02 (0.67, 1.54)	0.78 (0.54, 1.14)
African-American	6.46 (0.52, 80.66)	41.32 (1.46, 1169.54)	34.10 (0.39, 2960.51)	8.48 (0.20, 362.28)
Mexican-American	0.52 (0.02, 12.89)	2.64 (0.04, 189.55)	1.23 (0.00, 438.59)	0.26 (0.00, 32.19)
Telomere Length x African-American	0.73 (0.47, 1.14)	0.52 (0.29, 0.96)	0.54 (0.24, 1.18)	0.72 (0.37, 1.42)
Telomere Length x Mexican-American	1.11 (0.61, 2.00)	0.79 (0.36, 1.75)	0.89 (0.32, 2.48)	1.24 (0.52, 2.92)
Model 4				
Telomere Length	0.92 (0.72, 1.17)	1.01 (0.62, 1.66)	0.78 (0.46, 1.33)	0.69 (0.45, 1.06)
Less Than High School	1.00 (0.11, 9.11)	1.19 (0.05, 30.26)	0.10 (0.00, 9.94)	0.33 (0.02, 4.85)
Telomere Length x Less Than High School	1.05 (0.71, 1.53)	1.09 (0.61, 1.95)	1.78 (0.78, 4.07)	1.37 (0.82, 2.29)

Notes: kb pairs = kilobase pairs; CI = Confidence Interval; HR = hazard ratio. Models include controls for age, age squared, sex, education, smoking, body mass index, cardiovascular disease, diabetes, hypertension, and high cholesterol.

*The continuous measure of telomere length was multiplied by -1 to reflect increased risk of mortality associated with shorter telomere length.

Table S2. Association Between Leukocyte Telomere Length (T/S Ratio) and Mortality, By Age

	<u>Age 50-59 (n=900)</u>		<u>Age 60-74 (n=1,553)</u>		<u>Age 75+ (n=635)</u>	
	Deaths (n)	HR (95% CI)	Deaths (n)	HR (95% CI)	Deaths (n)	HR (95% CI)
All-Cause Mortality						
Telomere Length (kb pairs)*	95	0.92 (0.54, 1.57)	400	1.16 (0.79, 1.71)	375	1.26 (1.00, 1.59)
Telomere Length Quartiles (kb pairs)						
<5.15	15	0.77 (0.35, 1.71)	114	1.12 (0.70, 1.78)	155	1.63 (1.14, 2.33)
5.15-5.45	29	1.68 (0.92, 3.09)	110	1.11 (0.75, 1.64)	91	1.40 (0.80, 2.47)
5.46-5.82	22	0.88 (0.92, 1.60)	93	0.95 (0.66, 1.37)	93	1.78 (1.08, 2.96)
>5.82	29	1.00	83	1.00	36	1.00
Cardiovascular Mortality						
Telomere Length (kb pairs)*	<25	1.01 (0.29, 3.55)	117	0.72 (0.48, 1.07)	90	1.38 (0.80, 2.36)
Telomere Length Quartiles (kb pairs)						
<5.15	<5	0.25 (0.04, 1.74)	24	0.47 (0.23, 0.96)	33	3.33 (0.91, 12.24)
5.15-5.45	8	2.44 (0.69, 8.47)	38	1.02 (0.54, 1.92)	24	3.10 (0.81, 11.80)
5.46-5.82	5	0.67 (0.15, 2.96)	30	1.18 (0.61, 2.29)	27	5.20 (1.62, 16.72)
>5.82	7	1.00	25	1.00	6	1.00
Cancer Mortality						
Telomere Length (kb pairs)*	33	0.62 (0.25, 1.51)	110	1.42 (0.75, 2.66)	74	1.28 (0.86, 1.92)
Telomere Length Quartiles (kb pairs)						
<5.15	5	0.58 (0.13, 2.49)	35	1.42 (0.63, 3.18)	31	2.69 (0.74, 9.74)
5.15-5.45	10	1.21 (0.50, 2.89)	21	0.88 (0.39, 2.00)	18	2.43 (0.52, 11.25)
5.46-5.82	6	0.53 (0.17, 1.61)	30	1.11 (0.53, 2.32)	20	3.55 (0.83, 15.20)
>5.82	12	1.00	24	1.00	5	1.00
Other Disease Mortality						
Telomere Length (kb pairs)*	28	1.53 (0.62, 3.73)	129	1.57 (0.92, 2.68)	158	1.13 (0.67, 1.90)
Telomere Length Quartiles (kb pairs)						
<5.15	6	2.82 (0.75, 10.61)	43	1.46 (0.75, 2.83)	72	1.14 (0.64, 2.03)
5.15-5.45	7	2.19 (0.56, 8.50)	37	1.06 (0.50, 2.24)	36	0.93 (0.50, 1.77)
5.46-5.82	10	3.02 (1.01, 9.03)	22	0.51 (0.22, 1.21)	32	0.97 (0.53, 1.77)
>5.82	5	1.00	27	1.00	18	1.00

Notes: kb pairs = kilobase pairs; CI = Confidence Interval; HR = hazard ratio. Models include controls for age, age squared, sex, race/ethnicity, education, smoking, body mass index, cardiovascular disease, diabetes, hypertension, and high cholesterol. Cell sizes less than 5 were suppressed due to concerns about confidentiality.

*The continuous measure of telomere length was multiplied by -1 to reflect increased risk of mortality associated with shorter telomere length.

Table S3. Association Between Leukocyte Telomere Length (T/S Ratio) and Mortality, By Sex

	Female (n=1,483)		Male (n=1,605)	
	Deaths (n)	HR (95% CI)	Deaths (n)	HR (95% CI)
All-Cause Mortality				
Telomere Length (kb pairs)*	359	1.19 (0.90, 1.59)	511	1.08 (0.79, 1.48)
Telomere Length Quartiles (kb pairs)				
<5.15	113	1.47 (1.02, 2.10)	171	0.97 (0.65, 1.45)
5.15-5.45	79	1.12 (0.78, 1.63)	151	1.31 (0.93, 1.85)
5.46-5.82	102	1.21 (0.83, 1.75)	106	1.06 (0.76, 1.48)
>5.82	65	1.00	83	1.00
Cardiovascular Mortality				
Telomere Length (kb pairs)*	94	1.08 (0.67, 1.72)	136	0.87 (0.51, 1.49)
Telomere Length Quartiles (kb pairs)				
<5.15	21	0.94 (0.41, 2.19)	39	0.78 (0.34, 1.78)
5.15-5.45	24	1.35 (0.63, 2.90)	46	1.44 (0.67, 3.08)
5.46-5.82	32	1.60 (0.77, 3.32)	30	1.42 (0.61, 3.28)
>5.82	17	1.00	21	1.00
Cancer Mortality				
Telomere Length (kb pairs)*	81	1.20 (0.65, 2.25)	136	0.93 (0.64, 1.36)
Telomere Length Quartiles (kb pairs)				
<5.15	27	1.84 (0.90, 3.74)	44	0.81 (0.50, 1.32)
5.15-5.45	16	0.98 (0.50, 1.94)	33	1.14 (0.68, 1.89)
5.46-5.82	22	1.30 (0.66, 2.59)	34	0.90 (0.57, 1.45)
>5.82	16	1.00	25	1.00
Other Disease Mortality				
Telomere Length (kb pairs)*	132	1.25 (0.75, 2.06)	183	1.41 (0.91, 2.20)
Telomere Length Quartiles (kb pairs)				
<5.15	49	1.74 (0.94, 3.22)	72	1.19 (0.72, 1.98)
5.15-5.45	27	0.89 (0.49, 1.64)	53	1.31 (0.70, 2.44)
5.46-5.82	35	1.07 (0.61, 1.87)	29	0.92 (0.47, 1.76)
>5.82	21	1.00	29	1.00

Notes: kb pairs = kilobase pairs; CI = Confidence Interval; HR = hazard ratio. Models include controls for age, age squared, race/ethnicity, education, smoking, body mass index, cardiovascular disease, diabetes, hypertension, and high cholesterol.

*The continuous measure of telomere length was multiplied by -1 to reflect increased risk of mortality associated with shorter telomere length.

Table S4. Association Between Leukocyte Telomere Length (T/S Ratio) and Mortality, By Race/Ethnicity

	White (n=1,885)		African-American (n=511)		Mexican-American (n=692)	
	Deaths (n)	HR (95% CI)	Deaths (n)	HR (95% CI)	Deaths (n)	HR (95% CI)
All-Cause Mortality						
Telomere Length (kb pairs)*	547	1.07 (0.84, 1.36)	159	1.98 (1.41, 2.77)	164	1.00 (0.61, 1.64)
Telomere Length Quartiles (kb pairs)						
<5.15	181	1.14 (0.86, 1.52)	47	2.14 (1.29, 3.55)	56	0.79 (0.38, 1.62)
5.15-5.45	152	1.17 (0.89, 1.53)	40	1.79 (1.21, 2.64)	38	0.75 (0.37, 1.51)
5.46-5.82	127	1.09 (0.83, 1.45)	42	1.57 (0.82, 2.99)	39	0.73 (0.39, 1.36)
>5.82	87	1.00	30	1.00	31	1.00
Cardiovascular Mortality						
Telomere Length (kb pairs)*	138	0.86 (0.59, 1.25)	44	1.98 (1.26, 3.12)	48	1.11 (0.54, 2.30)
Telomere Length Quartiles (kb pairs)						
<5.15	36	0.77 (0.42, 1.43)	10	2.15 (0.80, 5.78)	14	0.72 (0.31, 1.67)
5.15-5.45	42	1.23 (0.77, 1.96)	15	2.79 (1.04, 7.43)	13	0.89 (0.35, 2.28)
5.46-5.82	39	1.42 (0.83, 2.42)	14	2.74 (0.98, 7.66)	9	0.81 (0.27, 2.43)
>5.82	21	1.00	5	1.00	12	1.00
Cancer Mortality						
Telomere Length (kb pairs)*	146	0.98 (0.64, 1.49)	38	1.97 (0.90, 4.31)	33	1.41 (0.52, 3.84)
Telomere Length Quartiles (kb pairs)						
<5.15	49	1.10 (0.65, 1.87)	11	2.00 (0.76, 5.25)	11	1.38 (0.34, 5.57)
5.15-5.45	36	1.01 (0.64, 1.60)	8	1.51 (0.45, 5.06)	5	0.65 (0.14, 3.02)
5.46-5.82	35	1.02 (0.69, 1.49)	11	1.39 (0.58, 3.30)	10	0.94 (0.35, 2.53)
>5.82	26	1.00	8	1.00	7	1.00
Other Disease Mortality						
Telomere Length (kb pairs)*	197	1.24 (0.85, 1.80)	61	2.23 (1.10, 4.52)	57	1.11 (0.52, 2.39)
Telomere Length Quartiles (kb pairs)						
<5.15	77	1.32 (0.87, 2.03)	21	2.61 (0.99, 6.90)	23	1.54 (0.46, 5.20)
5.15-5.45	53	1.02 (0.59, 1.76)	13	1.52 (0.58, 3.95)	14	1.28 (0.53, 3.12)
5.46-5.82	37	0.91 (0.54, 1.54)	13	1.16 (0.47, 2.85)	14	1.91 (0.75, 4.90)
>5.82	30	1.00	14	1.00	6	1.00

Notes: kb pairs = kilobase pairs; CI = Confidence Interval; HR = hazard ratio. Models include controls for age, age squared, sex, education, smoking, body mass index, cardiovascular disease, diabetes, hypertension, and high cholesterol.

*The continuous measure of telomere length was multiplied by -1 to reflect increased risk of mortality associated with shorter telomere length.

Table S5. Association Between Leukocyte Telomere Length (T/S Ratio) and Mortality, By Education

	<u>Less than High School (n=1,163)</u>		<u>High School+ (n=1,925)</u>	
	Deaths (n)	HR (95% CI)	Deaths (n)	HR (95% CI)
All-Cause Mortality				
Telomere Length (kb pairs)*	404	1.00 (0.72, 1.41)	466	1.21 (0.96, 1.53)
Telomere Length Quartiles (kb pairs)				
<5.15	127	0.87 (0.53, 1.42)	157	1.39 (1.11, 1.74)
5.15-5.45	106	1.01 (0.71, 1.43)	124	1.30 (0.99, 1.71)
5.46-5.82	99	0.91 (0.63, 1.33)	109	1.25 (0.94, 1.67)
>5.82	72	1.00	76	1.00
Cardiovascular Mortality				
Telomere Length (kb pairs)*	125	1.00 (0.64, 1.57)	105	0.91 (0.57, 1.44)
Telomere Length Quartiles (kb pairs)				
<5.15	32	0.78 (0.36, 1.67)	28	0.88 (0.40, 1.91)
5.15-5.45	38	1.51 (0.83, 2.76)	32	1.19 (0.68, 2.10)
5.46-5.82	35	1.47 (0.71, 3.03)	27	1.43 (0.76, 2.72)
>5.82	20	1.00	18	1.00
Cancer Mortality				
Telomere Length (kb pairs)*	89	0.80 (0.44, 1.44)	128	1.24 (0.75, 2.07)
Telomere Length Quartiles (kb pairs)				
<5.15	30	0.92 (0.36, 2.35)	41	1.40 (0.86, 2.28)
5.15-5.45	13	0.58 (0.25, 1.34)	36	1.46 (0.94, 2.27)
5.46-5.82	25	0.68 (0.35, 1.30)	31	1.40 (0.86, 2.28)
>5.82	21	1.00	20	1.00
Other Disease Mortality				
Telomere Length (kb pairs)*	148	1.15 (0.74, 1.78)	167	1.40 (0.92, 2.13)
Telomere Length Quartiles (kb pairs)				
<5.15	53	0.98 (0.52, 1.83)	68	1.67 (1.08, 2.57)
5.15-5.45	40	0.88 (0.46, 1.65)	40	1.19 (0.71, 1.99)
5.46-5.82	32	0.88 (0.48, 1.61)	32	1.00 (0.56, 1.78)
>5.82	23	1.00	27	1.00

Notes: kb pairs = kilobase pairs; CI = Confidence Interval; HR = hazard ratio. Models include controls for age, age squared, sex, race/ethnicity, smoking, body mass index, cardiovascular disease, diabetes, hypertension, and high cholesterol.

*The continuous measure of telomere length was multiplied by -1 to reflect increased risk of mortality associated with shorter telomere length.

eAppendix: ICD-10 codes for cause-specific mortality variables

Deaths due to cardiovascular disease:

Major cardiovascular diseases (I00-I78)
Diseases of heart (I00-I09,I11,I13,I20-I51)
Acute rheumatic fever and chronic rheumatic heart diseases (I00-I09)
Hypertensive heart disease (I11)
Hypertensive heart and renal disease (I13)
Ischemic heart diseases (I20-I25)
Acute myocardial infarction (I21-I22)
Other acute ischemic heart diseases (I24)
Other forms of chronic ischemic heart disease (I20,I25)
Atherosclerotic cardiovascular disease, so described (I25.0)
All other forms of chronic ischemic heart disease (I20,I25.1-I25.9)
Other heart diseases (I26-I51)
Acute and subacute endocarditis (I33)
Diseases of pericardium and acute myocarditis (I30-I31,I40)
Heart failure (I50)
All other forms of heart disease (I26-I28,I34-I38,I42-I49,I51)

Deaths due to cancer:

Malignant neoplasms (C00-C97)
Malignant neoplasms of lip, oral cavity and pharynx (C00-C14)
Malignant neoplasm of esophagus (C15)
Malignant neoplasm of stomach (C16)
Malignant neoplasms of colon, rectum and anus (C18-C21)
Malignant neoplasms of liver and intrahepatic bile ducts (C22)
Malignant neoplasm of pancreas (C25)
Malignant neoplasm of larynx (C32)
Malignant neoplasms of trachea, bronchus and lung (C33-C34)
Malignant melanoma of skin (C43)
Malignant neoplasm of breast (C50)
Malignant neoplasm of cervix uteri (C53)
Malignant neoplasms of corpus uteri and uterus, part unspecified (C54-C55)
Malignant neoplasm of ovary (C56)
Malignant neoplasm of prostate (C61)
Malignant neoplasms of kidney and renal pelvis (C64-C65)
Malignant neoplasm of bladder (C67)
Malignant neoplasms of meninges, brain and other parts of central nervous system (C70-C72)
Malignant neoplasms of lymphoid, hematopoietic and related tissue (C81-C96)
Hodgkin's disease (C81)
Non-Hodgkin's lymphoma (C82-C85)
Leukemia (C91-C95)
Multiple myeloma and immunoproliferative neoplasms (C88,C90)
Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue (C96)

All other and unspecified malignant neoplasms (C17,C23-C24,C26-C31,C37-C41, C44-C49,C51-C52,C57-C60,C62-C63,C66,C68-C69,C73-C80,C97)
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)

Deaths due to other diseases:

Salmonella infections (A01-A02)
Shigellosis and amebiasis (A03,A06)
Certain other intestinal infections (A04,A07-A09)
Tuberculosis (A16-A19)
Respiratory tuberculosis (A16)
Other tuberculosis (A17-A19)
Whooping cough (A37)
Scarlet fever and erysipelas (A38,A46)
Meningococcal infection (A39)
Septicemia (A40-A41)
Syphilis (A50-A53)
Acute poliomyelitis (A80)
Arthropod-borne viral encephalitis (A83-A84,A85.2)
Measles (B05)
Viral hepatitis (B15-B19)
Human immunodeficiency virus (HIV) disease (B20-B24)
Malaria (B50-B54)
Other and unspec. Infectious and parasitic diseases and their sequelae (A00, A05,A20-A36,A42-A44,A48-A49,A54-A79,A81-A82,A85.0-A85.1, A85.8,A86-B04,B06-B09,B25-B49,B55-B99)
Anemias (D50-D64)
Diabetes mellitus (E10-E14)
Nutritional deficiencies (E40-E64)
Malnutrition (E40-E46)
Other nutritional deficiencies (E50-E64)
Meningitis (G00,G03)
Parkinson's disease (G20-G21)
Alzheimer's disease (G30)
Essential (primary) hypertension and hypertensive renal disease (I10,I12)
Cerebrovascular diseases (I60-I69)
Atherosclerosis (I70)
Other diseases of circulatory system (I71-I78)
Aortic aneurysm and dissection (I71)
Other diseases of arteries, arterioles and capillaries (I72-I78)
Other disorders of circulatory system (I80-I99)
Influenza and pneumonia (J10-J18)
Influenza (J10-J11)
Pneumonia (J12-J18)
Other acute lower respiratory infections (J20-J22)
Acute bronchitis and bronchiolitis (J20-J21)
Unspecified acute lower respiratory infection (J22)

Chronic lower respiratory diseases (J40-J47)
Bronchitis, chronic and unspecified (J40-J42)
Emphysema (J43)
Asthma (J45-J46)
Other chronic lower respiratory diseases (J44,J47)
Pneumoconioses and chemical effects (J60-J66,J68)
Pneumonitis due to solids and liquids (J69)
Other diseases of respiratory system (J00-J06,J30-J39,J67,J70-J98)
Peptic ulcer (K25-K28)
Diseases of appendix (K35-K38)
Hernia (K40-K46)
Chronic liver disease and cirrhosis (K70,K73-K74)
Alcoholic liver disease (K70)
Other chronic liver disease and cirrhosis (K73-K74)
Cholelithiasis and other disorders of gallbladder (K80-K82)
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)
Acute and rapidly progressive nephritic and nephrotic syndrome (N00-N01,N04)
Chronic glomerulonephritis, nephritis and nephropathy not specified as acute or chronic, and renal sclerosis unspecified (N02-N03,N05-N07,N26)
Renal failure (N17-N19)
Other disorders of kidney (N25,N27)
Infections of kidney (N10-N12,N13.6,N15.1)
Hyperplasia of prostate (N40)
Inflammatory diseases of female pelvic organs (N70-N76)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)
All other diseases (Residual) (D65-E07,E15-E34,E65-F99,G04-G12,G23-G25,G31-H93,K00-K22,K29-K31,K50-K66,K71-K72,K75-K76,K83-M99, N13.0-N13.5,N13.7-N13.9,N14,N15.0,N15.8-N15.9,N20-N23,N28-N39,N41-N64,N80-N98)

Source:

http://www.cdc.gov/nchs/data/datalinkage/nh99_04_frequencies_of_select_variables_public_2010.pdf