

Data recording guide: A meta-analysis of associations between stress and telomeric measures

This guide is to be used in conjunction with the template spreadsheet in which the data will be recorded. The fields listed in the table below each correspond to columns in the template spreadsheet. Each row of data entered should represent an effect, rather than a study. For example, one row may represent the unadjusted effect of Poverty Income Ratio on leukocyte telomere length in women. A different row should be used to record the unadjusted effect of Poverty Income Ratio on leukocyte telomere length in men.

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
EffectNumber	The numbers in this column should be unique to the effect and increasing in sequential order (i.e. 1, 2, 3, 4, 5). This will be used to identify specific effects from within studies (labelled by StudyID, as below).	<ul style="list-style-type: none"> • 1 • 2 • 3
StudyID	<ul style="list-style-type: none"> • The study ID should be comprised of the surname of the lead author of the study, and the year of publication. Where the same lead author published more than one included paper in the same year, a letter should be appended to the date to allow differentiation (e.g. carroll2013a & carroll2013b) <p>These entries should be entirely in lowercase to prevent confusion.</p>	<ul style="list-style-type: none"> • carroll2013a • carroll2013b • damjanovic2007
Author	This should be the surname of the lead author on the study. Again, These entries should be entirely in lowercase.	<ul style="list-style-type: none"> • carroll • damjanovic
Year	This should be the year of publication.	<ul style="list-style-type: none"> • 2013 • 2007
Species	This should be the Latin name of the study species in which the effects of stress on telomeres were tested. These entries should also be entirely in lowercase to prevent confusion.	<ul style="list-style-type: none"> • <i>homo sapiens</i> • <i>sturnus vulgaris</i>
AdversityMeasure	This should give details of the specific measures of stress/adversity used, as described by the study authors. This entry will be used later on to classify stresses into types for analysis.	<ul style="list-style-type: none"> • Enhancing Recovery in Coronary Heart Disease Patients (ENRICH) Social Support Inventory (ESSI). • Malaria infection status.

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
AgeAtAdversity	<p>This should be a qualitative entry describing the period during which the study subjects experienced the stress in question, as described by the study authors.</p> <p>If the stress was experienced during gestation, or incubation, the period should be classed directly as “embryonic”.</p> <p>If the age at adversity isn’t reported, this column should say “unreported”.</p>	<ul style="list-style-type: none"> • 20–50 years old [mean =38±6.5 years] • 2-12 days • embryonic • unreported
AveAgeAdversity	<p>This should be either the mean age of the study subjects when the stress was experienced, or the median of the age bracket in which the study subjects sat when the stress was experienced. To account for the shorter-lived study species, the unit should be days.</p> <p>In the case of our example subjects, 20–50 years old [mean =38±6.5 years], the mean age of 38 years would be converted to 13870 days, using the Google unit converter.</p> <p>In the case of 2-12 day old subjects, the median of 7 days would be recorded.</p> <p>For entries classed as “embryonic” in the “AgeAtAdversity” column, this column should read “embryonic”.</p>	<ul style="list-style-type: none"> • 13870 • 7 • embryonic
AgeAtMaturity	<p>The species-typical age at sexual maturity (in days) should be extracted from the AnAge database at http://genomics.senescence.info/species/</p> <p>When the ages differ for males and females, either:</p> <ol style="list-style-type: none"> 1. The age appropriate to the sex should be extracted – i.e. if the effects is for males only, the typical age at maturity for males should be recorded; or 2. The average of the male and female ages at maturity should be taken. <p>For <i>Homo sapiens</i>, if the effect pertained to both sexes the entry would be 4927.5 days – the average between the male</p>	<ul style="list-style-type: none"> • 4927.5 • 365

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	<p>(5,110 days) and female (4,745 days) ages at maturity. http://genomics.senescence.info/species/entry.php?species=Homo_sapiens</p> <p>For <i>Sturnus vulgaris</i>, if the effect pertained to both sexes, the entry would be 365 days – because both sexes are recorded as being mature at 365 days. http://genomics.senescence.info/species/entry.php?species=Sturnus_vulgaris</p>	
LifeStage	<p>Where the value in the “AveAgeAdversity” column is greater than the value in the “AgeAtMaturity” column, “adult” should be entered in this column.</p> <p>Where the value in the “AveAgeAdversity” column is less than the value in the “AgeAtMaturity” column, and is not “embryonic”, “juvenile” should be entered in this column.</p> <p>For entries classed as “embryonic” in the “AgeAtAdversity” and “AveAgeAdversity” columns, this column should read “embryonic”.</p> <p>If the life stage at which the stress/adversity was experienced is “unreported” in the “AgeAtAdversity” field), an “NA” should be entered in this column.</p>	<ul style="list-style-type: none"> • adult • juvenile • embryonic • NA
MaxLifespan	<p>The species-typical maximum recorded lifespan should be extracted from the AnAge database at http://genomics.senescence.info/species/, and recorded in days.</p> <p>As with the “AveAgeAdversity”, field years can be converted to days using the Google unit converter.</p>	<ul style="list-style-type: none"> • For <i>Homo sapiens</i>, this would be 44712.5 days (122.5 years) http://genomics.senescence.info/species/entry.php?species=Homo_sapiens • For <i>Sturnus vulgaris</i>, this would be 8358.5 days (22.9 years) http://genomics.senescence.info/species/entry.php?species=Sturnus_vulgaris
LengthExposure	<p>This should be the length of exposure to the stress in question, again in days. If it is not reported, a note should be made to indicate that it is “unreported”. Where the length of exposure is simply an age bracket, the median of that age range should be recorded, unless an average</p>	<ul style="list-style-type: none"> • 45 • unreported

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	<p>length of exposure is reported, in which case that should be noted.</p> <p>As with the “AveAgeAdversity” and “MaxLifespan” fields, years can be converted to days using the Google unit converter.</p>	
Population	<p>These notes should give a reasonably detailed description of the study population, as described by the authors. These notes will be used to help identify overlaps in study population, and specialist populations.</p>	<ul style="list-style-type: none"> • 963 men and women, aged 45-84, from the multi-ethnic study of atherosclerosis (MESA): 18.7% White, 53% Hispanics, and 28.5% African American. • 207 offspring from 76 broods (hatched in 1988-2002), produced by 33 females and 47 males belonging to the cohorts hatched in 1984-1998 (including both immigrants and philopatric individuals).
SpecialistPopulation	<p>If the effect is based on subjects from a specialist population, such as a clinical group, a genetically modified organism, or an acutely infected group, this should be noted with a “1” in this column. If not, an “NA” should be entered.</p>	<ul style="list-style-type: none"> • 1 • NA
Overlaps	<p>This column should contain a “1” if the effect comes from a study population that is known to overlap with other populations for which distinct effects are recorded in our data set.</p> <p>If there is no known overlap, an “NA” should be entered.</p> <p>If the effect is a direct replication (the independent variable and the study population are the same), then it should be excluded from the main data set and recorded in the systematic search record under “Papers from which we extracted data (If not, reason for exclusion)”.</p>	<ul style="list-style-type: none"> • 1 • NA
OverlapStudyID	<p>For effects containing a “1” in the “Overlaps” column, this column should contain the StudyID for the paper reporting effects from an overlapping population.</p>	<ul style="list-style-type: none"> • Epel2004 • Nettle2015

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
AgeAtFirstTL	<p>This should record the age (in days) at which the first telomere measurement was taken.</p> <p>This should be either the mean age of the study subjects when the tissue sample was taken, or the median of the age bracket in which the study subjects sat when the tissue sample was taken. The unit should be days.</p> <p>If only one telomere measurement was taken, the age at which it was taken should be recorded in the “AgeAtLastTL” column (below), and this column should contain an “NA”.</p> <p>If the age at which the telomere measurements were taken is “unreported”, is should be noted here.</p>	<ul style="list-style-type: none"> • If the subjects were reported as being 20–50 years old [mean =38±6.5 years], the mean age of 38 years would be converted to 13870 days, using the Google unit converter. • If the subjects were 2-12 days old subjects, the median of 7 days would be recorded. • NA • unreported
AgeAtLastTL	<p>This should record the age (in days) at which the last telomere measurement was taken, using the same rules as in “AgeAtFirstTL”, above.</p> <p>If only one telomere measure was taken, the age at that measurement should be recorded here.</p> <p>If the age at which the telomeres were measured is “unreported”, is should be noted here.</p>	<ul style="list-style-type: none"> • 24 • 14656 • unreported
Females	<p>The number of female participants in the sample relating to the effect that is being recorded, should be recorded in this column.</p> <p>If the effect was for male participants only, this column should contain an “NA”.</p> <p>If the number of female participants was not reported, this column should read “unreported”.</p>	<ul style="list-style-type: none"> • 15 • unreported • NA
Males	<p>The number of male participants in the sample relating to the effect that is being recorded, should be recorded in this column.</p> <p>If the effect was for male participants only, this column should contain an “NA”.</p>	<ul style="list-style-type: none"> • 23 • unreported • NA

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	If the numbers of female participants was not reported, this column should read "unreported".	
Sex	This column should state whether the effect in question pertains to male subjects, female subjects, or both. If the numbers of males and females included in the analysis were not reported, then "unreported" should be entered into this column.	<ul style="list-style-type: none"> • male • female • both • unreported
n	This column should be used to record the total sample size for the association in question.	<ul style="list-style-type: none"> • 73
Tissue	<p>This should be a record of the type of tissue in which telomere length was tested. If more than one tissue was tested in a study, the effects for each tissue should be recorded in their own rows.</p> <p>If the tissue used for the analysis is unclear, or is not reported, "unreported" should be entered into this column.</p> <p>To avoid confusion with the typology of acronyms, these should always be in lowercase without spaces.</p>	<ul style="list-style-type: none"> • monocytes • pbmcs • tcells • liver • rbcs • wbc • fin • buccal • unreported
Technique	<p>This column should note the primary technique used to generate the dependent measure. Where combinations are reported (e.g. qPCR & southern blot, with southern blot being used for the reference gene), the technique used to measure the telomeres of interest should be recorded (in this example, qPCR).</p> <p>If the technique used is unclear, or is not reported, "unreported" should be entered into this column.</p> <p>To avoid confusion with the typology of acronyms, these should always be in lowercase without spaces.</p>	<ul style="list-style-type: none"> • qpcr • southernblot • qfish • unreported
Experimental	If the effect is from a study in which stressors are experimentally applied, or reduced, there should be "1" in this column.	<ul style="list-style-type: none"> • 1 • NA

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	If the effect is from a cross-sectional/correlational analysis, this column should contain an "NA".	
Longitudinal	If the effect is longitudinal with respect to telomere measurement (telomeres are measured at multiple time points), there should be a "1" in this column. If the study is cross-sectional, this column should contain an "NA".	<ul style="list-style-type: none"> • 1 • NA
InduceOrReduce	Where effects were coded as being experimental (above), this column should note whether the effect resulted from an attempt to induce stress, or reduce it. Where the study design is cross-sectional or longitudinal, an "NA" should be entered in this column.	<ul style="list-style-type: none"> • induce • reduce • NA
ReportedSignificant	This column should contain a "1" if the authors reported the effect as being significant. An "NA" should be entered if they reported a null effect.	<ul style="list-style-type: none"> • 1 • NA
PredictedDirection	This column should note the predicted direction of the association between stress exposure and the telomeric measure. To code this ask yourself, if increasing stress exposure leads to shorter telomeres, what is the predicted direction of the effect? For example, for associations between stress exposure and telomere length, a negative association would be predicted. For associations between stress exposure and telomere attrition, a positive association would be predicted. This column should indicate our prediction about the direction of the effect, not that of the study authors. The note will allow us to adjust the directions of recorded associations, so that the forest plots make intuitive sense.	<ul style="list-style-type: none"> • positive • negative
IV	This column should be used to note the independent variable or, if groups were compared, the comparison groups.	<ul style="list-style-type: none"> • Years of caregiving • Caregivers.Controls

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
DV	This column should be used to record the dependent variable used in the analysis – the telomeric measure.	<ul style="list-style-type: none"> • MonocyteTL(mTRF) • Age-adjustedLTL(base pairs) • log10-transformed % change in T/S ratio • Natural log transformed LTL(T/S ratio)
Adjusted	This column should contain a “1” if the recorded effect was from an adjusted model, and an “NA” if it was not. If this is unclear, “unreported” should be entered.	<ul style="list-style-type: none"> • 1 • NA • unreported
Effect	<p>This column should state which of the convertible effect types is being recorded. These are:</p> <ul style="list-style-type: none"> • correlation coefficients (correlationcoefficient) • standardised betas (beta) • F-ratios from ANOVAs comparing two groups (fanova) • T-statistics (ttest) • Cohen’s D statistics, or standardized mean differences (dcohen) • means and standard errors (meansse) • means and standard deviations (meanssd) <p>To avoid confusion, these should always be in lowercase without spaces.</p>	<ul style="list-style-type: none"> • correlationcoefficient • beta • fanova • ttest • dcohen • meansse • meanssd
EffectConcordant	If the effect (see above) is labelled using the same terminology as used by the authors of the papers, place a “1” in this column. If not, enter an “NA”. For example, if the authors have reported a standardized mean difference, and the effect has been labelled “dcohen”, enter an “NA”.	<ul style="list-style-type: none"> • 1 • NA
F	<p>Where the effect is “fanova”, this column should contain the F-ratio.</p> <p>If the effect being recorded is not of the “fanova” type, the cell should contain an “NA”.</p>	<ul style="list-style-type: none"> • 4.07 • NA
df2F	Where the effect is “fanova”, this column should contain the second value for degrees of freedom in the model. The first degrees of freedom value will not be	<ul style="list-style-type: none"> • 66 • NA

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	<p>recorded because it should always be 1 when the effect is based on a comparison between two groups (in this case, stressed versus unstressed). Effects should not be included in our data set if they are comparing more than one group.</p> <p>If the effect being recorded is not of the "fanova" type, an "NA" should be entered.</p>	
t	<p>Where the effect is "ttest", this column should contain the T statistic.</p> <p>If the effect being recorded is not of the "ttest" type, an "NA" should be entered.</p>	<ul style="list-style-type: none"> • 2.47 • NA
dft	<p>Where the effect is "ttest", this column should contain the degrees of freedom of the T statistic.</p> <p>If the effect being recorded is not of the "ttest" type, an "NA" should be entered.</p>	<ul style="list-style-type: none"> • 40 • NA
d	<p>Where the effect is "dcohen", this column should contain the Cohen's D statistic, or standardized mean difference.</p> <p>If the effect being recorded is not of the "dcohen" type, an "NA" should be entered.</p>	<ul style="list-style-type: none"> • 0.68 • NA
MeanStressed	<p>Where the effect type is "meanssd" or "meansse", the mean telomeric outcome for the stressed group should be entered into this column.</p> <p>If the effect being recorded is not of the "meansse" or "meanssd" type, an "NA" should be entered.</p>	<ul style="list-style-type: none"> • 6.3 • NA
MeanUnstressed	<p>Where the effect type is "meanssd" or "meansse", the mean telomeric outcome for the less-stressed group should be entered into this column.</p> <p>If the effect being recorded is not of the "meansse" or "meanssd" type, an "NA" should be entered.</p>	<ul style="list-style-type: none"> • 6.5 • NA
SEStressed	<p>Where the effect type is "meansse", the standard error of the mean for the</p>	<ul style="list-style-type: none"> • 0.2 • NA

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	<p>stressed group should be entered into this column.</p> <p>If the effect being recorded is not of the “meansse” type, an “NA” should be entered.</p>	
SEUnstressed	<p>Where the effect type is “meansse”, the standard error of the mean for the less-stressed group should be entered into this column.</p> <p>If the effect being recorded is not of the “meansse” type, an “NA” should be entered.</p>	<ul style="list-style-type: none"> • 0.2 • NA
SDStressed	<p>Where the effect type is “meanssd”, the standard deviation for the stressed group should be entered into this column.</p> <p>If the effect being recorded is not of the “meanssd” type, an “NA” should be entered.</p>	<ul style="list-style-type: none"> • 0.517 • NA
SDUnstressed	<p>Where the effect type is “meanssd”, the standard deviation for the less-stressed group should be entered into this column.</p> <p>If the effect being recorded is not of the “meanssd” type, an “NA” should be entered.</p>	<ul style="list-style-type: none"> • 0.452 • NA
nStressed	<p>Where the effect type is “dcohen”, “meanssd” or “meansse”, the sample size for the stressed group should be recorded in this column.</p> <p>If the effect type is not “dcohen”, “meanssd” or “meansse”, an “NA” should be entered.</p>	<ul style="list-style-type: none"> • 12 • NA
nUnstressed	<p>Where the effect type is “dcohen”, “meanssd” or “meansse”, the sample size for the less-stressed group should be recorded in this column.</p> <p>If the effect type is not “dcohen”, “meanssd” or “meansse”, an “NA” should be entered.</p>	<ul style="list-style-type: none"> • 12 • NA
r	<p>Where the effect type is “correlationcoefficient”, the correlation</p>	<ul style="list-style-type: none"> • 0.41 • NA

FIELD NAME	INSTRUCTIONS	EXAMPLE ENTRIES
	<p>coefficient (r) should be recorded in this column.</p> <p>Where the effect type is not "correlationcoefficient", an "NA" should be entered.</p>	
B	<p>Where the effect type is "beta", the standardized beta value should be recorded in this column. Where the effect type is not "beta", an "NA" should be entered.</p> <p>Unstandardized betas should not be recorded.</p>	<ul style="list-style-type: none"> • -0.622 • NA
Notes	<p>This column should be used to write notes on concerns that are not captured in other columns.</p>	