

Citation:

de Groot CP, Enzi G, Matthys C, Moreiras O, Roszkowski W, Schroll M. Ten-year changes in anthropometric characteristics of elderly Europeans. *J Nutr Health Aging*. 2002;6(1):4-8.

PubMed ID: [11813073](#)

Study Design:

Prospective Cohort Study

Class:

B - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:

 NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To assess longitudinal (10-y) changes in height, body weight and circumferences in elderly Europeans.

Inclusion Criteria:

- Elderly men and women born between 1913 and 1918.
- Nine European research towns: Hamme/Belgium (H/B), Roskilde/Denmark (R/DK), Haguenau/France (H/F), Romans/France (R/F), Padua/Italy (P/I), Culemborg/the Netherlands (C/NL), Vila Franca de Xira/Portugal (V/P), Betanzos/Spain (B/E), Yverdon/Switzerland (Y/CH).

Exclusion Criteria:

None specifically mentioned.

Description of Study Protocol:**Recruitment**

Using standardized methodologies, data were collected from a random stratified sample of elderly men and women born between 1913 and 1918 including a total of 662 subjects in 1999.

Design: Prospective cohort study

In 1999 data were collected from SENECA's final participants. Measurements carried out in 1988/1989 in a random sample of elderly men and women born between 1913 and 1918 were repeated in 1993 (follow-up) and in 1999 (finale) in nine European research towns: Hamme/Belgium (H/B), Roskilde/Denmark (R/DK), Haguenau/France (H/F), Romans/France

(R/F), Padua/Italy (P/I), Culemborg/the Netherlands (C/NL), Vila Franca de Xira/Portugal (V/P), Betanzos/Spain (B/E), Yverdon/Switzerland (Y/CH).

Blinding used (if applicable): not applicable

Intervention (if applicable): not applicable

Statistical Analysis

- Changes over time are presented as means and percentiles.
- The significance of changes within subjects was tested using Student's T test ($\alpha=0.01$).
- For all towns, sex-specific descriptions are given as means and SD's.
- Cox proportional hazards (survival) analysis was used to explore associations between body weight change between the baseline and follow-up study and subsequent mortality.

Data Collection Summary:

Timing of Measurements

- 1988/1989
- Repeated in 1993 (follow-up)
- 1999 (final)

Dependent Variables

- Survival time

Independent Variables

- Height
- Body weight and BMI
- Change in body weight
- Mid upper arm circumference and waist circumference

Description of Actual Data Sample:

Initial N: 2040 subjects

Attrition (final N):

- Baseline anthropometric data collected from 1958 examinees: 927 men and 929 women.
- In the end, measurements were repeated in 662 subjects: 292 men and 370 women

Age: 81 - 86 y

Ethnicity: European

Other relevant demographics:

Anthropometrics

Location:

European research towns: Hamme/Belgium (H/B), Roskilde/Denmark (R/DK), Haguenau/France (H/F), Romans/France (R/F), Padua/Italy (P/I), Culemborg/the Netherlands (C/NL), Vila Franca de Xira/Portugal (V/P), Betanzos/Spain (B/E), Yverdon/Switzerland (Y/CH).

Summary of Results:

Key Findings

- Height decreased over time in both men (from 6 towns) and women (from 7 towns). Only in the samples from Betanzos/E and Vila Franca de Xira/P (men and women) and from Padua/I (men) were there no significant changes. Overall height declined by 1.6 cm in men ($p < 0.0001$) and 1.8 cm in women ($p < 0.0001$).
- Overall, the distributions of body weight change were wide with median values close to zero. Clear negative changes ($p < 0.01$) were observed in Betanzos/E (median change in men: -5.1 kg; median change in women: -2.3 kg) and Roskilde/DK (P50 in women; -2.9 kg). While average weight changes were in general modest (-1.2 kg in men and -1.7 kg in women), 23% of men and 27% of women lost at least 5 kg of their initial body weight. Another 13% of both men and women gained a minimum of 5 kilograms.
- Based on crude-unadjusted relative risk estimates derived from Cox's Model, body weight loss (≥ 5 kg) over the first four years of follow-up might be predictive for subsequent survival but more so in men (RR 2.2; $p < 0.0001$) than in women (RR 1.3, $p = 0.35$).
- Since stature decreased over time, body mass index may not be a useful index in the present study. For this reason, changes are not described. BMI was low in 4% of men and in 7% of women, whereas 20% of both men and women had a high BMI ($> 30 \text{ kg/m}^2$).
- Mid-upper arm circumference decreased over time in Haguenau/F (-1.8 cm in men and -2.1 cm in women), Betanzos/E (-2.0 cm in women), Yverdon/CH (-1.1 cm in men, -1.0 cm in women), and Roskilde/DK (-1.3 cm in men). At other sites, median values varied around zero, resulting in an average change of -0.7 cm ($p < 0.0001$) in both men and women. In contrast to the mid-upper arm circumference, waist circumference changed towards higher values in the French, Italian and Dutch towns, with overall increments of 2.9 cm in men and 3.9 cm in women ($p < 0.0001$).

Author Conclusion:

- Whilst small-to-modest average changes in height, body weight and circumferences emerged over SENECA's 10-year follow-up period, considerable gains and losses of body weight had occurred in a significant proportion of the SENECA populations, whereby early weight loss might be predictive of subsequent survival.
- The present study shows a decline in stature in both men and women, while weight changed in approximately 40% of the examinees.
- Further analyses should concentrate on possible determinants and implications of the observed changes in body weight and concurrently in waist circumference.

Reviewer Comments:

Large sample size with 10 year follow-up period, so considerable information is available on their height, weight, body mass index, change in body weight and body circumferences.

Authors note that though SENECA's core protocol called for a randomly selected sample of people born in the 1913-1918 time period, the initial response reached only 50% and healthier and better educated subjects participated in the 1988/1989 study.

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions

1.	Was the research question clearly stated?	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	Was the selection of study subjects/patients free from bias?	???
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	???
2.2.	Were criteria applied equally to all study groups?	???
2.3.	Were health, demographics, and other characteristics of subjects described?	No
2.4.	Were the subjects/patients a representative sample of the relevant population?	???
3.	Were study groups comparable?	???
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	Yes
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	???
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	???
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A

3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	Was method of handling withdrawals described?	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	Was blinding used to prevent introduction of bias?	Yes
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	Yes
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were intervening factors described?	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A

6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	Were outcomes clearly defined and the measurements valid and reliable?	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	No
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	Was the statistical analysis appropriate for the study design and type of outcome indicators?	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	???
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	N/A
9.	Are conclusions supported by results with biases and limitations taken into consideration?	Yes
9.1.	Is there a discussion of findings?	Yes

9.2.	Are biases and study limitations identified and discussed?	Yes
10.	Is bias due to study's funding or sponsorship unlikely?	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes

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