VALIDITY OF DATA COLLECTED FROM AN INTERNET-BASED COHORT STUDY

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BACKGROUND

- The Assessment Towards Tobacco Economical and Medical Prospective Trial (ATTEMPT) is an ongoing prospective multinational observational Internet-based cohort study. It is designed to examine the natural course of successive smoking cessation attempts, their impact on health and economic outcomes, and the influence of weight (measured and perceived) on the quit rates.

- Smoking habits may influence patterns of fat distribution. Central adiposity — which reflects visceral fat deposition — seems to be a better indicator of the adverse metabolic consequences of obesity than overall adiposity. Therefore, the variation of weight and waist circumference following quit attempts and smoking cessation were monitored throughout the study.

OBJECTIVE

- The objective of this analysis of the ATTEMPT cohort was to evaluate the validity of weight and waist circumference measurements self-reported via the Internet in comparison with the measurements recorded by trained health data collectors via in-home assessments.

METHODS

Subject recruitment

- Subject recruitment occurred through an established Internet panel of individuals who agreed to participate in web-based research.
- Inclusion criteria:
  - ≥5 cigarettes/day
  - Willing to quit smoking within the next 3 months
  - Aged 35–65 years.
- Exclusion criteria:
  - No access to the Internet
  - Weight >135 kg (maximum capacity of the scale being 150 kg).

Self-report

- Standardized digital body-weight scales and a tape measure were mailed to all subjects after they completed the baseline questionnaire.
- A video clip on how to measure waist circumference was inserted in the newsletter posted online shortly before the questionnaire was administered.
- Weight and waist circumference were reported by subjects via a web-based questionnaire every 3 months.

In-home assessment

- Subjects consented to in-home visits when they completed the baseline questionnaire.
- At the Month 6 assessment, a random sample of subjects from the USA, UK, and France were requested to perform an in-home assessment.
- In-home assessments were conducted by trained health data collectors using the weight scales and tape measures received by subjects after the Month 6 online self-assessment.

RESULTS

- In total, 4030 subjects from the USA, UK, and France completed the interactive web-based questionnaire at baseline.

Subjects who underwent an in-home visit

	USA	UK	France
Consented for in-home visit at baseline [% (n)]	78% (1147)	71% (907)	68% (874)
Selected at Month 6 for in-home visit (n)	562	475	546
Not approached for in-home visit (n)[a]	157	235	275
Approached for in-home visit (n)	405	240	271
Could not be reached or scheduled within time limit (%)	37%	3%	29%
Refused at the time of scheduling (%)	7%	8%	7%
Cancelled appointment (%)	7%	3%	1%
Completed in-home assessment [% (n)]	49% (200)	85% (204)	62% (169)
Mean ±SD No. of days between in-home and self-reported assessments	28 ±14	63 ±10	68 ±14

[a]Those who were pending contact at time quota met or those out of geographic cluster for European in-home assessments.

Demographics of subjects who underwent in-home visits

	USA	UK	France
In-home assessment			
Sample size (n)	200	204	169
Gender (% male)	54.5	51.5	59.2
Mean age (years)	49.9	45.9	45.6
Remaining cohort			
Sample size (n)	848	457	623
Gender (% male)	52.6	55.6	61.8
Mean age (years)	48.9	45.6	45.2

- No statistically significant differences (defined as p<0.05 using t-test for age and χ^2 test for gender) were found between the in-home sample and the remaining web-assessment subjects in terms of age and gender in the three countries.
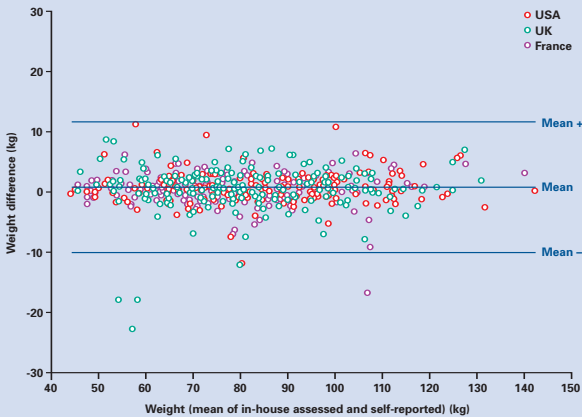
Body weight

	USA	UK	France
Male (n)	108	105	100
Mean ±SD in-home assessed weight (kg)	92.6 ±17.4	86.6 ±16.8	82.6 ±17.2
Mean ±SD difference[a] in weight (kg)	0.5 ±4.7	0.3 ±3.8	0.7 ±2.7*
Correlation (Pearson's)	0.96	0.97	0.99
Female (n)	91	97	69
Mean ±SD in-home assessed weight (kg)	75.2 ±18.0	76.2 ±17.6	69.2 ±14.4
Mean ±SD difference[a] in weight (kg)	0.6 ±7.8	1.8 ±7.8*	0.6 ±2.8
Correlation (Pearson's)	0.90	0.90	0.98

[a]Difference = In-home assessment value – Self-reported value.
*p<0.05 from paired t-test.

Bland and Altman graph[1] for weight

Four respondents (weight difference = -51, -41, 47, and 69 kg) are not displayed in the graph.
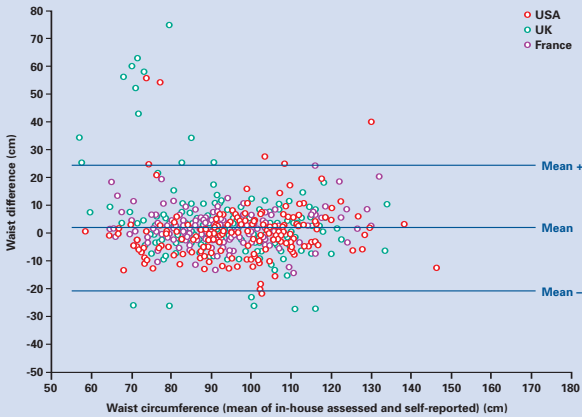
Waist circumference

	USA	UK	France
Male (n)	95	97	88
Mean ±SD in-home assessed waist circumference (cm)	103.0 ±13.2	97.3 ±12.9	96.4 ±15.1
Mean ±SD difference[a] in waist circumference (cm)	0.8 ±8.7	2.0 ±12.2	0.7 ±6.5
Correlation (Pearson's)	0.79	0.68	0.90
Female (n)	80	85	59
Mean ±SD in-home assessed weight (kg)	91.0 ±18.2	91.8 ±14.9	87.4 ±14.4
Mean ±SD difference[a] in weight (kg)	−1.5 ±11.8	3.1 ±17.7	1.8 ±6.2*
Correlation (Pearson's)	0.78	0.53	0.91

[a]Difference = In-home assessment value – Self-reported value.
*p<0.05 from paired t-test.

Bland and Altman graph[1] for waist circumference

CONCLUSIONS

- A large proportion of subjects agreed to in-home assessments.
- No selection bias was observed in the subgroup of subjects completing in-home visits in terms of age and gender.
- Self-reported weight was well correlated (0.3–1.8 kg under-reported on average; correlation coefficients ≥0.90) with the measurements assessed during the in-home visits.
- The correlation observed in the waist circumference measurement was acceptable in France and the USA, but was less consistent in the UK. The larger variation in waist circumference might be related to the difficulty in performing the measure.
- Some variation between online and in-home assessments may be expected, given the time delay between these two assessments and changes in smoking status that may influence weight and waist circumference variations during that time.
- These results suggest that this type of health data collected via the Internet can be reliable.
- The Internet therefore seems to be a fast and reliable tool for large-scale prospective cohort studies.

Reference
1. Bland JM, Altman DG. Measuring agreement in method comparison studies. Stat Methods Med Res 1999;8:135–160.