

Additional File 2: Sensitivity analyses on imputed dataset

Table A2-1. Characteristics of care recipients and caregivers in the harmonized dataset across seven countries, stratified by complete cases vs. cases with missing values ^a

	Overall (N=3442)	Has Missing (N=124, 3.6%)	Complete Case (N=3318, 96.4%)	P value
Care recipient characteristics				
Gender, n (%)				.04*
Males	1406 (40.8%)	62 (50.0%)	1344 (40.5%)	
Females	2036 (59.2%)	62 (50.0%)	1974 (59.5%)	
Age groups, n (%)				<.001*
<65	350 (10.2%)	22 (18.0%)	328 (9.9%)	
65-74	981 (28.5%)	52 (42.6%)	929 (28.0%)	
75-84	1555 (45.2%)	41 (33.6%)	1514 (45.6%)	
≥85	554 (16.1%)	7 (5.7%)	547 (16.5%)	
Years of education, n (%)				.06
≤12 years	2777 (83.0%)	19 (67.9%)	2758 (83.1%)	
>12 years	569 (17.0%)	9 (32.1%)	560 (16.9%)	
Baseline number of comorbidities, mean (SD)	1.73 (1.43)	2.20 (2.06)	1.72 (1.41)	.04*
Baseline MMSE total score, mean (SD)	18.7 (6.72)	22.8 (6.92)	18.6 (6.66)	<.001*
Caregiver characteristics				
Gender, n (%)				.18
Males	1156 (33.6%)	33 (27.5%)	1123 (33.8%)	
Females	2282 (66.4%)	87 (72.5%)	2195 (66.2%)	
Age groups, n (%)				.51
<65	1757 (51.1%)	67 (55.8%)	1690 (50.9%)	
65-74	853 (24.8%)	27 (22.5%)	826 (24.9%)	
75-84	728 (21.2%)	25 (20.8%)	703 (21.2%)	
≥85	100 (2.9%)	1 (0.8%)	99 (3.0%)	
Lives with the care recipient, n (%)				.57
Yes	2548 (74.0%)	95 (76.6%)	2453 (73.9%)	
No	894 (26.0%)	29 (23.4%)	865 (26.1%)	
Relation to the care recipient, n (%)				.01*
Spouse	1783 (51.8%)	67 (54.9%)	1716 (51.7%)	
Child	1202 (34.9%)	30 (24.6%)	1172 (35.3%)	
Other	455 (13.2%)	25 (20.5%)	430 (13.0%)	
Number of other caregivers involved in care, n (%)				.43

0	1707 (49.6%)	61 (50.4%)	1646 (49.6%)	
1	1028 (29.9%)	42 (34.7%)	986 (29.7%)	
2	405 (11.8%)	9 (7.4%)	396 (11.9%)	
3	175 (5.1%)	4 (3.3%)	171 (5.2%)	
≥ 4	124 (3.6%)	5 (4.1%)	119 (3.6%)	
Having paid work, n (%)				.86
No	2303 (67.0%)	79 (65.8%)	2224 (67.0%)	
Yes	1135 (33.0%)	41 (34.2%)	1094 (33.0%)	
Country, n (%)				<.001*
France	417 (12.1%)	2 (1.6%)	415 (12.5%)	
Germany	555 (16.1%)	11 (8.9%)	544 (16.4%)	
Italy	195 (5.7%)	2 (1.6%)	193 (5.8%)	
Japan	555 (16.1%)	2 (1.6%)	553 (16.7%)	
Spain	378 (11.0%)	10 (8.1%)	368 (11.1%)	
United Kingdom	527 (15.3%)	6 (4.8%)	521 (15.7%)	
US	815 (23.7%)	91 (73.4%)	724 (21.8%)	
Caregiving costs and burden				
Monthly informal care costs (in USD)	1694 (2204)	1480 (1962)	1804 (2311)	<.001*
Having monthly informal care costs				0.37
Yes	3206 (93.3%)	109 (90.8%)	3097 (93.3%)	
No	232 (6.7%)	11 (9.2%)	221 (6.7%)	
ZBI	28.2 (15.9)	21.6 (13.6)	28.3 (15.9)	0.02*

^a Information about race and ethnicity was not provided by GERAS-EU, GERAS-II, and GERAS-JP studies, and therefore was not reported for the merged dataset.

* indicates statistically significant ($P < .05$). P values were calculated using the chi-square test or Fisher's exact test for categorical variables and the t test for continuous variables.

Table A2-2. Characteristics of care recipients and caregivers in the GERAS-US dataset, stratified by complete cases vs. cases with missing values

	Overall (N=815)	Has Missing (N=91, 11.2%)	Complete Case (N=724, 88.8%)	P value
Care recipient characteristics				
Gender, n (%)				0.17
Males	353 (43.3%)	46 (50.5%)	307 (42.4%)	
Females	462 (56.7%)	45 (49.5%)	417 (57.6%)	
Age groups, n (%)				0.68
<65	200 (24.5%)	20 (22.0%)	180 (24.9%)	
65-74	334 (41.0%)	42 (46.2%)	292 (40.3%)	
75-84	259 (31.8%)	28 (30.8%)	231 (31.9%)	
≥85	22 (2.7%)	1 (1.1%)	21 (2.9%)	
Years of education, n (%)				1.00
≤12 years	567 (78.2%)	1 (100%)	566 (78.2%)	
>12 years	158 (21.8%)	0 (0%)	158 (21.8%)	
Baseline number of comorbidities, mean (SD)	2.55 (1.75)	2.71 (2.39)	2.53 (1.71)	0.62
Baseline MMSE total score, mean (SD)	25.0 (3.08)	25.2 (4.28)	24.9 (2.90)	0.52
Caregiver characteristics				
Gender, n (%)				0.24
Males	254 (31.2%)	23 (25.3%)	231 (31.9%)	
Females	561 (68.8%)	68 (74.7%)	493 (68.1%)	
Age groups, n (%)				0.10
<65	526 (64.5%)	50 (54.9%)	476 (65.7%)	
65-74	187 (22.9%)	25 (27.5%)	162 (22.4%)	
75-84	94 (11.5%)	16 (17.6%)	78 (10.8%)	
≥85	8 (1.0%)	0 (0%)	8 (1.1%)	
Lives with the care recipient, n (%)				0.05
Yes	559 (68.6%)	71 (78.0%)	488 (67.4%)	
No	256 (31.4%)	20 (22.0%)	236 (32.6%)	
Relation to the care recipient, n (%)				0.002*
Spouse	301 (36.9%)	49 (53.8%)	252 (34.8%)	
Child	233 (28.6%)	20 (22.0%)	213 (29.4%)	
Other	281 (34.5%)	22 (24.2%)	259 (35.8%)	
Number of other caregivers involved in care, n (%)				0.53
0	407 (49.9%)	44 (48.4%)	363 (50.1%)	
1	293 (36.0%)	36 (39.6%)	257 (35.5%)	

2	78 (9.6%)	6 (6.6%)	72 (9.9%)	0.17
3	23 (2.8%)	2 (2.2%)	21 (2.9%)	
≥ 4	14 (1.7%)	3 (3.3%)	11 (1.5%)	
Having paid work, n (%)				
No	478 (58.7%)	60 (65.9%)	418 (57.7%)	
Yes	337 (41.3%)	31 (34.1%)	306 (42.3%)	
Caregiving costs and burden				
Monthly informal care costs (in USD)	2460 (2900)	1860 (2430)	2540 (2940)	0.02*
Having monthly informal care costs				0.90
Yes	768 (94.2%)	85 (93.4%)	683 (94.3%)	
No	47 (5.8%)	6 (6.6%)	41 (5.7%)	
ZBI	22.7 (15.4)	21.5 (13.8)	22.8 (15.4)	0.70

* indicates statistically significant ($P < .05$). P values were calculated using the chi-square test or Fisher's exact test for categorical variables and the t test for continuous variables.

Table A2-3. Informal care costs and caregiver burden, a caregiver-gender comparison ^a

	Male, mean (SD)	Female, mean (SD)	Mean difference (Female – Male)			
			Model 1: Unadjusted estimate (95% CI)	P value	Model 2: Adjusted estimate (95% CI) ^b	P value
Informal care costs (in USD)						
Complete cases (N=3318)	1480.1 (1962.3)	1804.0 (2311.1)	323.8 (175.1, 472.6)	<.001*	191.8 (27.4, 356.1)	.02*
Imputed data ^c (N=3442)	1475.0 (1951.4)	1809.9 (2321.0)	334.9 (188.8, 481.0)	<.001*	191.2 (29.5, 353.0)	.02*
Caregiver burden						
Complete cases (N=3318)	25.2 (14.5)	29.9 (16.4)	4.7 (3.5, 5.8)	<.001*	4.0 (2.6, 5.3)	<.001*
Imputed data ^c (N=3442)	25.0 (14.5)	29.5 (16.4)	4.5 (3.4, 5.6)	<.001*	3.9 (2.6, 5.2)	<.001*

^a The average mean effects of caregiver gender on informal care costs were estimated by two-part regression. The caregiver burden was measured by Zarit Burden Interview (ZBI) total score. The average mean effects of caregiver gender on caregiver burden were estimated by multiple linear regression.

^b Regression models were adjusted for patient characteristics (gender, age, and baseline MMSE and comorbidity scores), caregiver characteristics (age, employment status, living arrangement, relationship to the participant, presence of other caregivers), and country.

^c Multiple imputation by chained equations (MICE) was used to impute missing values, generating 30 imputed datasets. The regression analyses from the primary analyses were then repeated separately in each imputed dataset, and the results were combined using Rubin's rules.

* indicates statistically significant at $P < .025$ (.05/2) for the two primary analyses (complete cases) after Bonferroni correction for multiple comparisons, and at $P < .05$ for the sensitivity analyses (imputed data).