

# THE LANCET

## Healthy Longevity

### Supplementary appendix

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## **Supplementary materials**

*Sex differences in functional limitations and the role of socioeconomic factors: a multi-cohort analysis*

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**Figure S1. Flowchart of sample selection in ELSA.**

ELSA (2002-2019)  
 Follow-up mean duration = 9.1y, median = 10y, range: 0 to 17y

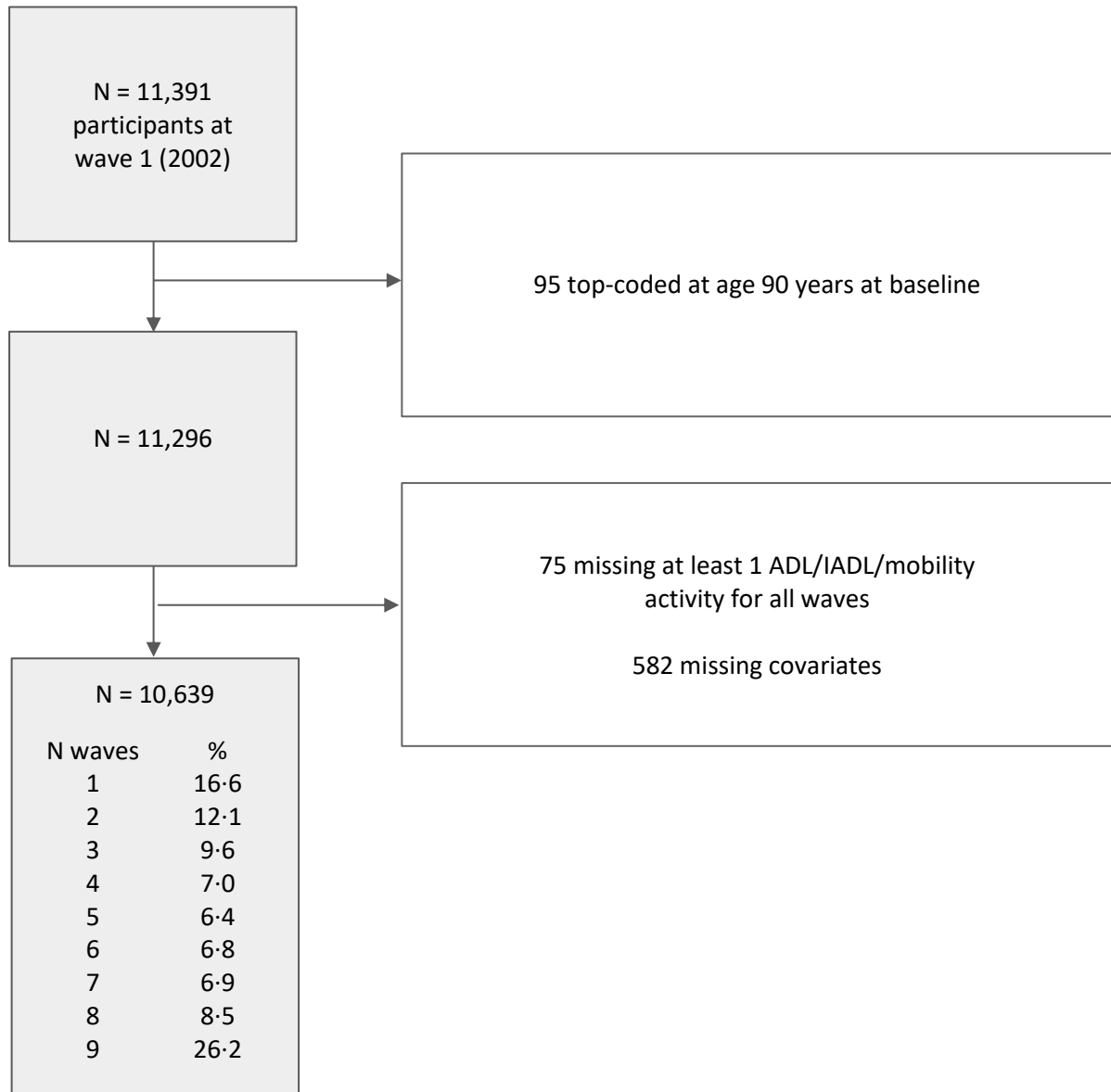


Figure S2. Flowchart of sample selection in TILDA.

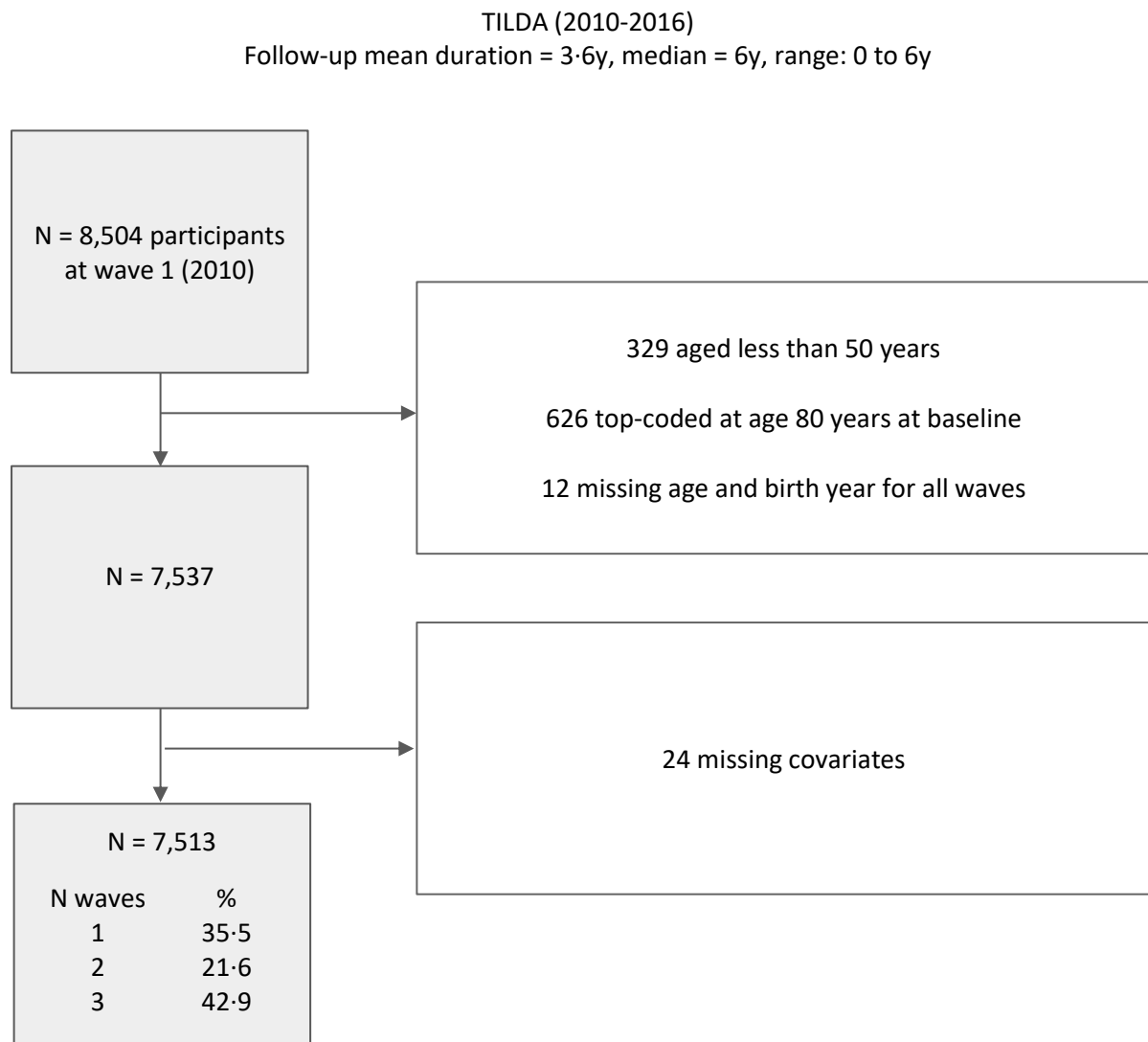


Figure S3. Flowchart of sample selection in SHARE.

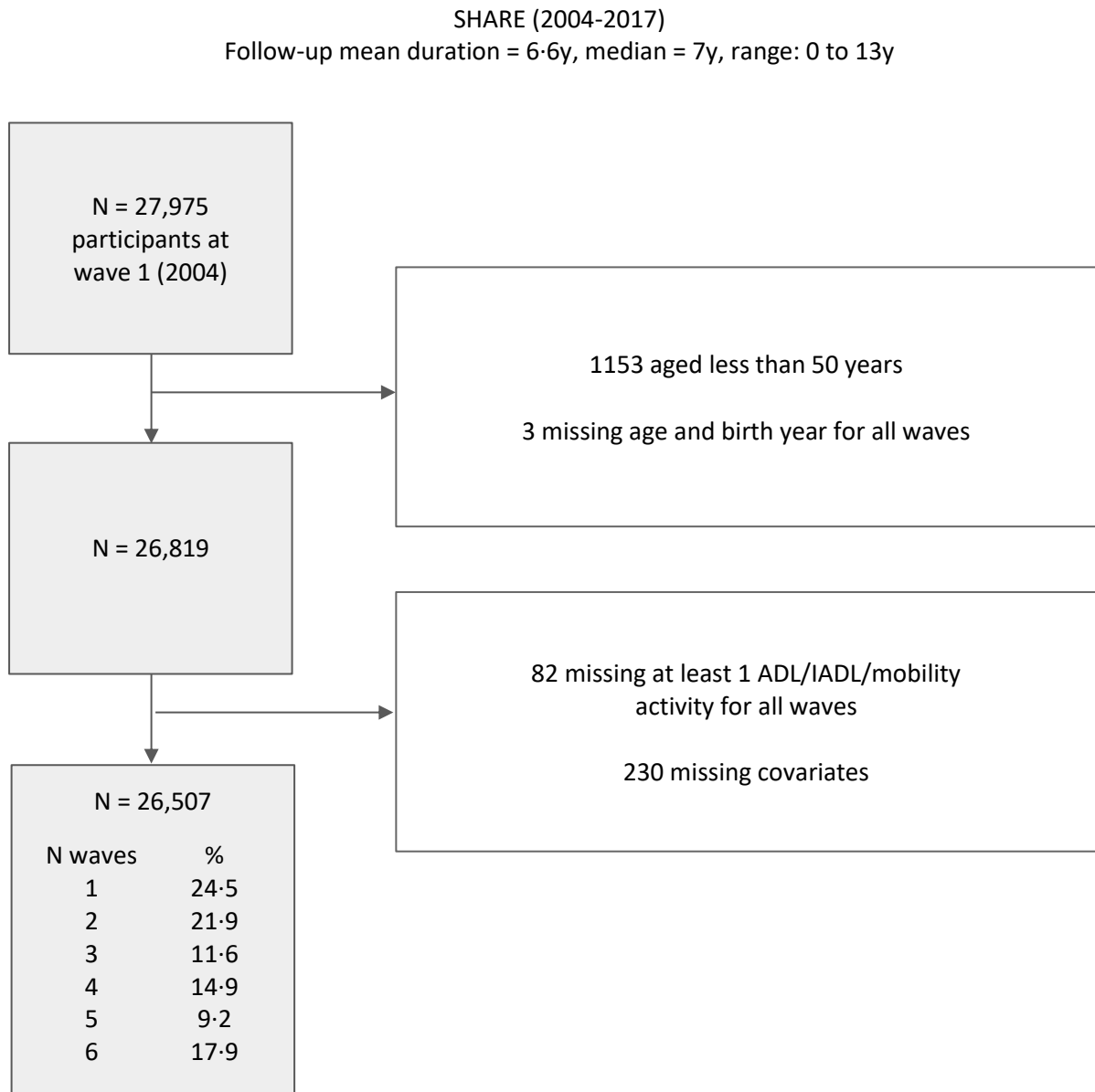


Figure S4. Flowchart of sample selection in HRS.

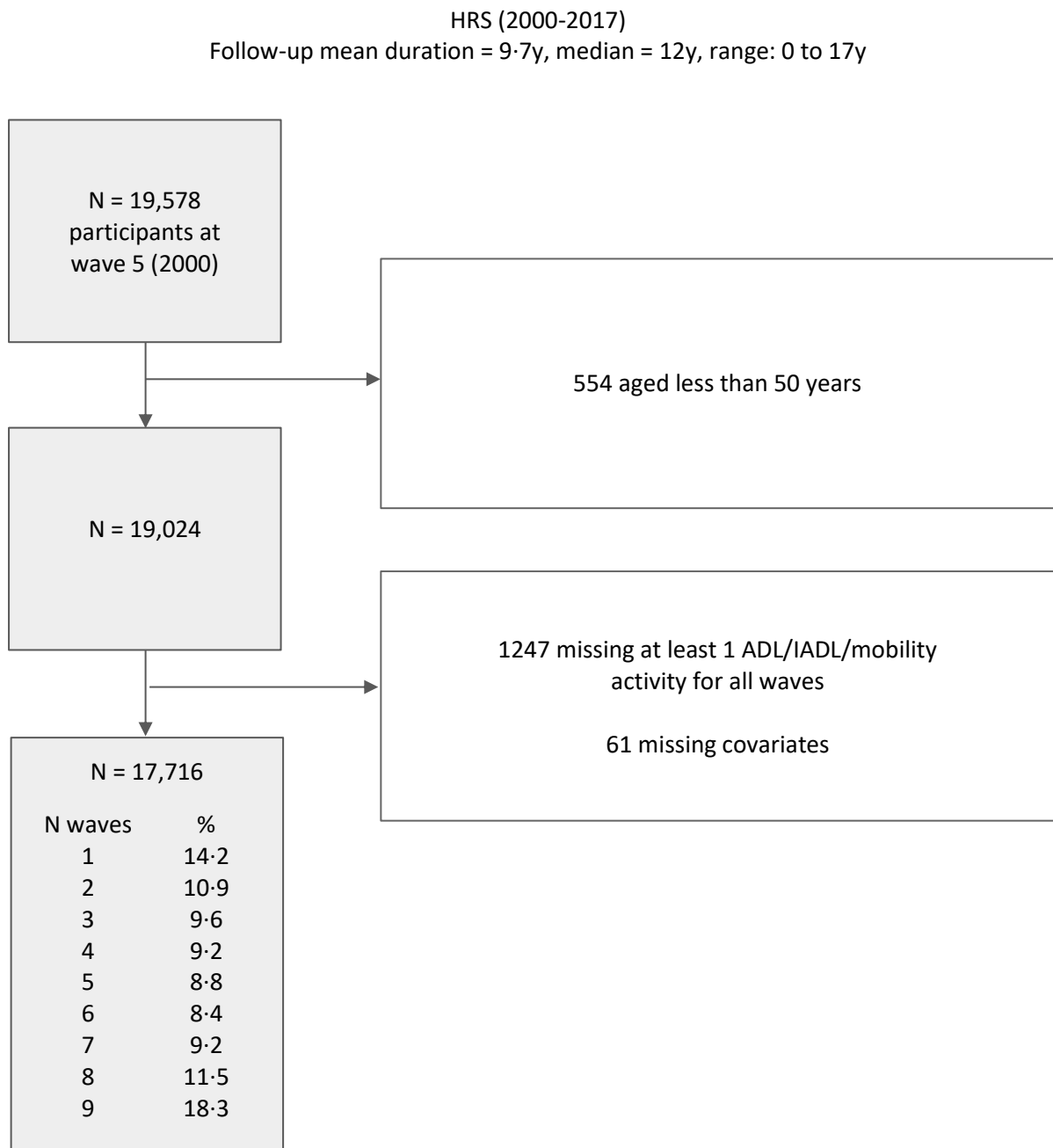
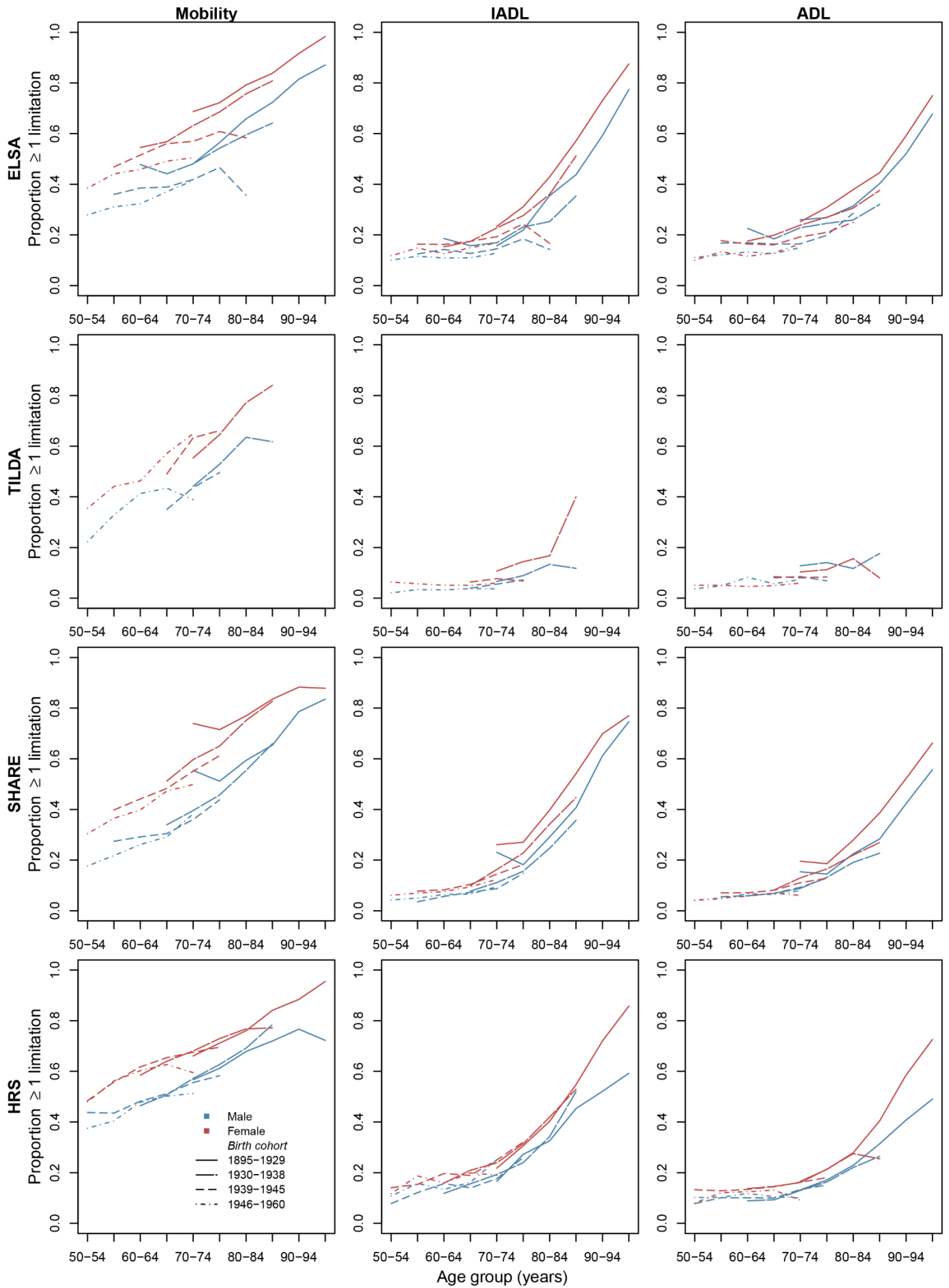
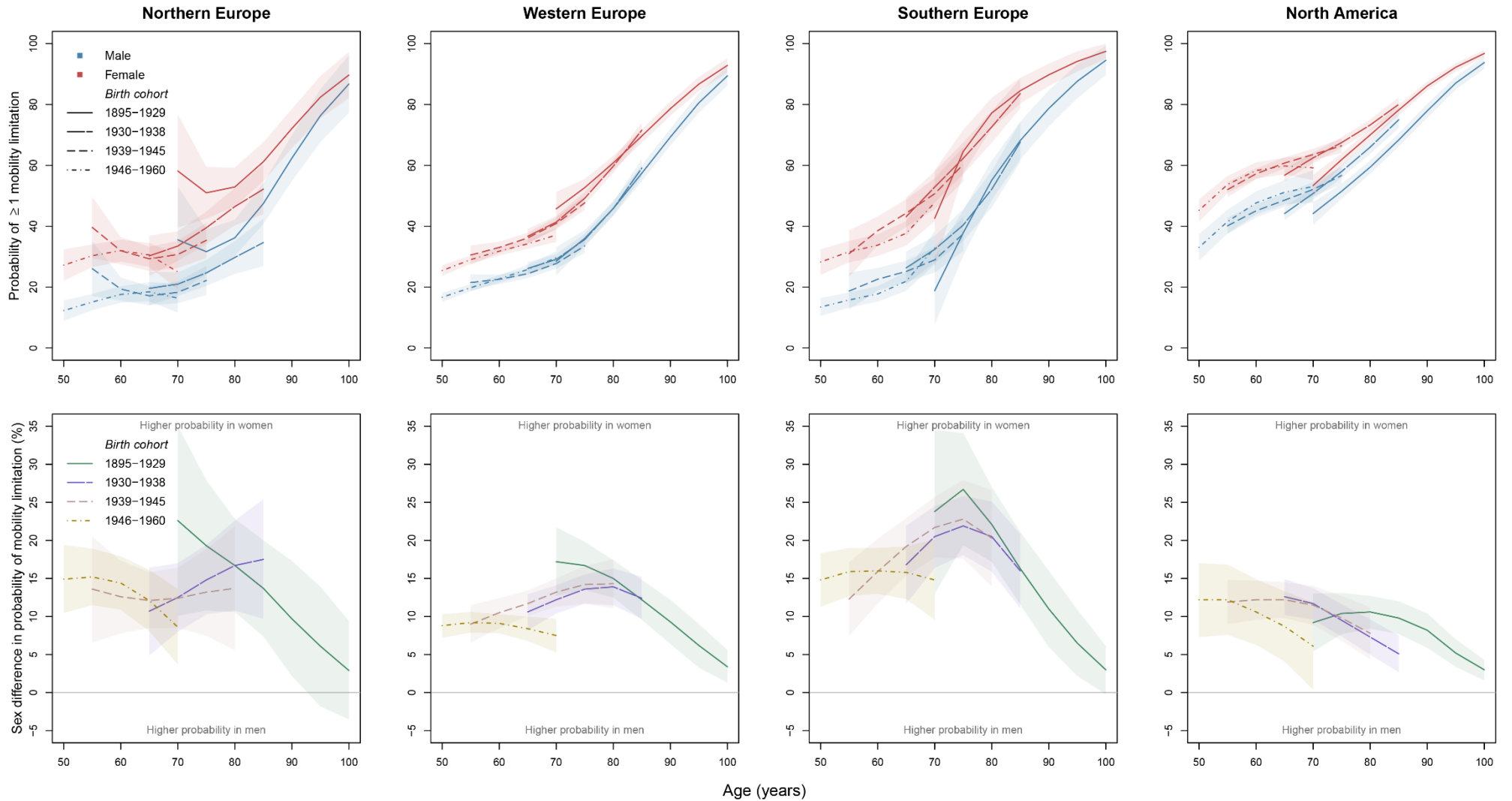


Figure S5. Observed proportion  $\geq 1$  mobility, IADL, and ADL limitation in ELSA, TILDA, SHARE, and HRS.



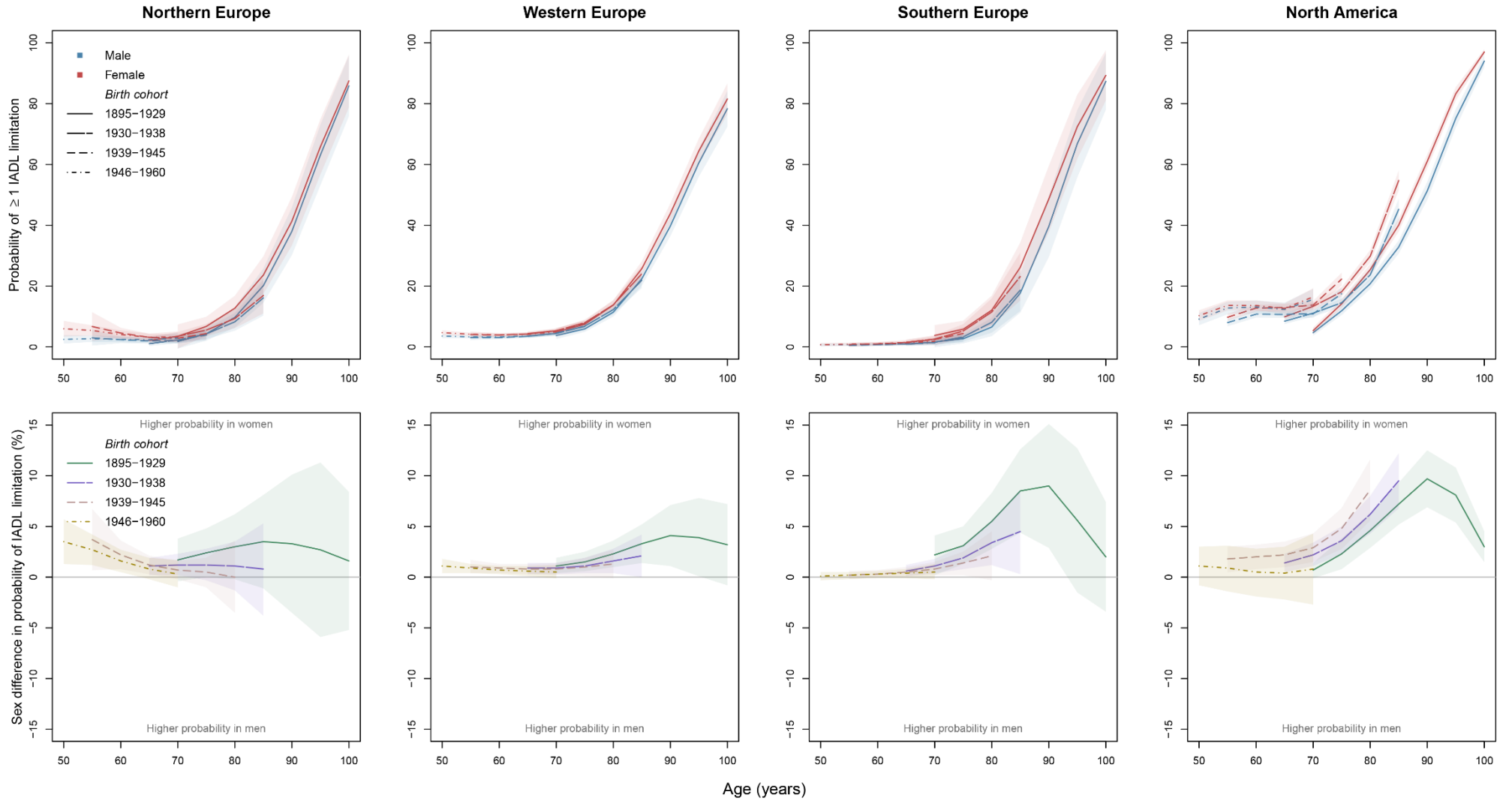


**Figure S6. Sex differences in probability of  $\geq 1$  mobility limitation by region.**



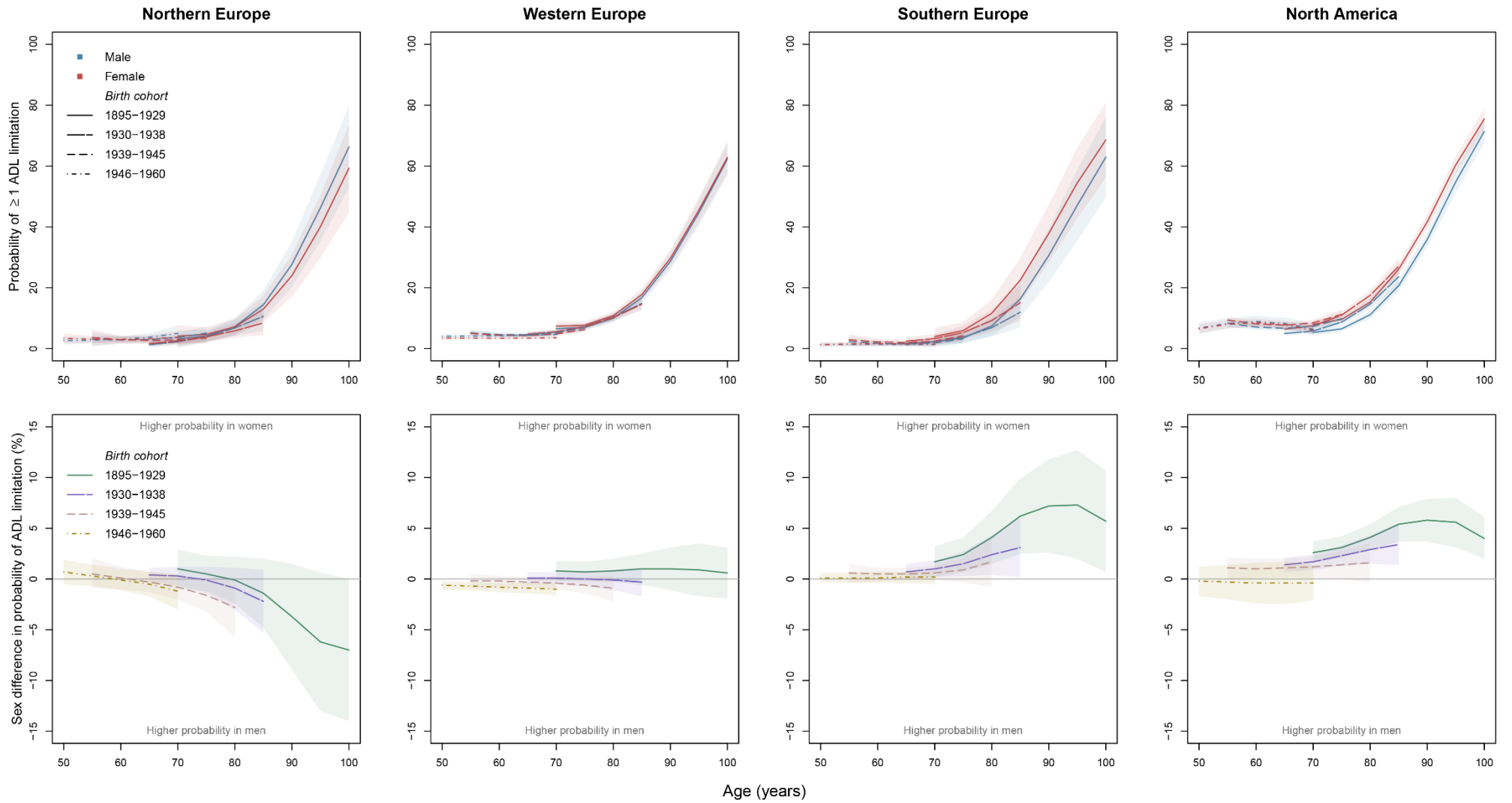
Top panel shows the probability of having  $\geq 1$  mobility limitation plotted by age for men and women in each birth cohort. Bottom panel shows the sex difference in probability of  $\geq 1$  mobility limitation: positive value indicates women have greater probability than men of  $\geq 1$  mobility limitation. Predicted probabilities based on models in each region adjusted for sex, age, birth cohort, and their interactions, marital status, education and labour force status, and plotted for reference categories for all covariates.

**Figure S7. Sex differences in probability of  $\geq 1$  IADL limitation by region.**



Top panel shows the probability of having  $\geq 1$  IADL limitation plotted by age for men and women in each birth cohort. Bottom panel shows the sex difference in probability of  $\geq 1$  IADL limitation: positive value indicates women have greater probability than men of  $\geq 1$  IADL limitation. Predicted probabilities based on models in each region adjusted for sex, age, birth cohort, and their interactions, marital status, education and labour force status, and plotted for reference categories for all covariates.

Figure S8. Sex differences in probability of  $\geq 1$  ADL limitation by region.



Top panel shows the probability of having  $\geq 1$  ADL limitation plotted by age for men and women in each birth cohort. Bottom panel shows the sex difference in probability of  $\geq 1$  ADL limitation: positive value indicates women have greater probability than men of  $\geq 1$  ADL limitation. Predicted probabilities based on models in each region adjusted for sex, age, birth cohort, and their interactions, marital status, education and labour force status, and plotted for reference categories for all covariates.

**Table S1. Countries in each included study.**

<b><i>Study</i></b>	<b><i>Region</i></b>	<b><i>Country</i></b>
<i>ELSA</i>	Western Europe	England
<i>TILDA</i>	Western Europe	Ireland
<i>SHARE</i>	Northern Europe	Denmark
		Sweden
	Western Europe	Austria
		Belgium
		France
		Germany
		Netherlands
		Switzerland
	Southern Europe	Greece
		Italy
Spain		
<i>HRS</i>	North America	United States

Abbreviations: ELSA: English Longitudinal Study of Ageing; TILDA: The Irish Longitudinal Study on Ageing; SHARE: Survey of Health, Ageing and Retirement in Europe; HRS: Health and Retirement Study

**Table S2. Waves and years included in analyses from ELSA, TILDA, SHARE, and HRS.**

<i>Year</i>	<i>ELSA</i>	<i>TILDA</i>	<i>SHARE</i>	<i>HRS</i>
2000				Wave 5
2001				
2002	Wave 1			Wave 6
2003				
2004	Wave 2		Wave 1	Wave 7
2005				
2006	Wave 3		Wave 2	Wave 8
2007				
2008	Wave 4			Wave 9
2009				
2010	Wave 5	Wave 1		Wave 10
2011			Wave 4	
2012	Wave 6			Wave 11
2013			Wave 5	
2014	Wave 7	Wave 3		Wave 12
2015			Wave 6	
2016	Wave 8	Wave 4		Wave 13
2017			Wave 7	
2018	Wave 9			
2019				

Abbreviations: ELSA: English Longitudinal Study of Ageing; TILDA: The Irish Longitudinal Study on Ageing; SHARE: Survey of Health, Ageing and Retirement in Europe; HRS: Health and Retirement Study

Wave 2 of TILDA and wave 3 of SHARE were included as no data on functional limitations was assessed at these waves. The baseline wave for HRS was wave 5 to allow for similar years of follow-up between studies.

**Table S3. Activities assessed for each functional measure.**

<i>Mobility activities</i>	<i>IADL</i>	<i>ADL</i>
Getting up from a chair	Managing money	Walking across the room
Climbing 1 flight of stairs	Taking medications	Dressing
Stooping, kneeling, or crouching	Grocery shopping	Bathing
Reaching/extending the arms	Preparing meals	Eating
Lifting/carrying weights over 10 lbs	Using the telephone	Getting in/out of bed
Walking 1 block/100 yds/100 m	House/garden work*	Using the toilet

\*For house/garden work, HRS participants were asked whether their health limited their ability to perform housework (yes/no).



**Table S4. Baseline distribution of self-reported chronic conditions in the pooled study population.**

	<b>Men</b>	<b>Women</b>	<b>P-value</b>
	<b>N = 27923</b>	<b>N = 34452</b>	
<b>High blood pressure, N (%)</b>			
No	17795 (63.7)	21054 (61.1)	
Yes	10128 (36.3)	13398 (38.9)	<i>&lt;0.0001</i>
<b>Diabetes, N (%)</b>			
No	24674 (88.4)	31140 (90.4)	
Yes	3249 (11.6)	3312 (9.6)	<i>&lt;0.0001</i>
<b>Cancer, N (%)</b>			
No	26042 (93.3)	31720 (92.1)	
Yes	1881 (6.7)	2732 (7.9)	<i>&lt;0.0001</i>
<b>Lung disease, N (%)</b>			
No	26162 (93.7)	32564 (94.5)	
Yes	1761 (6.3)	1888 (5.5)	<i>&lt;0.0001</i>
<b>Psychiatric illness, N (%)</b>			
No	26350 (94.4)	30874 (89.6)	
Yes	1573 (5.6)	3578 (10.4)	<i>&lt;0.0001</i>
<b>Arthritis, N (%)</b>			
No	20859 (74.7)	21504 (62.4)	
Yes	7064 (25.3)	12948 (37.6)	<i>&lt;0.0001</i>
<b>Cardiovascular disease,* N (%)</b>			
No	21640 (77.5)	28799 (83.6)	
Yes	6283 (22.5)	5653 (16.4)	<i>&lt;0.0001</i>

\*Heart attack and stroke.

**Table S5. Sex differences in probability of mobility limitations by severity of limitations.**

	Percent sex difference (95% CI) in probability of number of mobility limitations		
	At age 65	At age 75	At age 85
<b>1 limitation</b>			
1895-1929	No data	3.8 (3.3, 4.2)	-0.6 (-1.0, -0.3)
1930-1938	3.8 (3.4, 4.2)	3.2 (2.9, 3.5)	-1.0 (-1.3, -0.7)
1939-1945	3.9 (3.5, 4.3)	3.4 (3.0, 3.8)	No data
1946-1960	3.0 (2.6, 3.4)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.0016</i>	<i>0.083</i>	<i>0.023</i>
<b>2 limitations</b>			
1895-1929	No data	3.9 (3.5, 4.4)	1.8 (1.6, 2.0)
1930-1938	3.7 (3.4, 4.1)	3.6 (3.3, 3.9)	1.7 (1.5, 1.9)
1939-1945	4.0 (3.6, 4.3)	3.7 (3.3, 4.1)	No data
1946-1960	3.1 (2.7, 3.4)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.0018</i>	<i>0.46</i>	<i>0.51</i>
<b>≥3 limitations</b>			
1895-1929	No data	6.6 (5.8, 7.4)	10.7 (9.4, 12.0)
1930-1938	3.8 (3.3, 4.2)	6.9 (6.2, 7.5)	10.3 (8.9, 11.8)
1939-1945	4.3 (3.9, 4.8)	6.8 (6.0, 7.6)	No data
1946-1960	3.2 (2.8, 3.7)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.00080</i>	<i>0.85</i>	<i>0.67</i>

Estimates extracted at age 65, 75, and 85 with age analysed as a continuous term; analyses further adjusted for sex, birth cohort, and their interactions, marital status, study, region, education, and labour force status. Positive value indicates women have greater probability than men of having given number of limitations.

**Table S6. Sex differences in probability of instrumental activity of daily living (IADL) limitations by severity of limitations.**

	Percent sex difference (95% CI) in probability of number of IADL limitations		
	At age 65	At age 75	At age 85
<b>1 limitation</b>			
1895-1929	No data	1.1 (0.7, 1.4)	1.6 (1.1, 2.0)
1930-1938	0.5 (0.4, 0.7)	1.1 (0.8, 1.4)	1.1 (0.7, 1.6)
1939-1945	0.7 (0.4, 0.9)	1.1 (0.7, 1.6)	No data
1946-1960	0.6 (0.3, 0.8)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.63</i>	<i>0.97</i>	<i>0.098</i>
<b>2 limitations</b>			
1895-1929	No data	0.3 (0.2, 0.4)	0.8 (0.6, 1.1)
1930-1938	0.2 (0.1, 0.2)	0.3 (0.2, 0.4)	0.8 (0.5, 1.2)
1939-1945	0.2 (0.1, 0.3)	0.3 (0.2, 0.5)	No data
1946-1960	0.2 (0.1, 0.2)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.57</i>	<i>0.97</i>	<i>0.99</i>
<b>≥3 limitations</b>			
1895-1929	No data	0.3 (0.2, 0.4)	1.9 (1.4, 2.5)
1930-1938	0.1 (0.1, 0.2)	0.3 (0.2, 0.4)	1.8 (1.2, 2.5)
1939-1945	0.2 (0.1, 0.2)	0.3 (0.2, 0.5)	No data
1946-1960	0.1 (0.1, 0.2)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.39</i>	<i>0.78</i>	<i>0.74</i>

Estimates extracted at age 65, 75, and 85 with age analysed as a continuous term; analyses further adjusted for sex, birth cohort, and their interactions, marital status, study, region, education, and labour force status. Positive value indicates women have greater probability than men of having given number of limitations.

**Table S7. Sex differences in probability of activity of daily living (ADL) limitations by severity of limitations.**

	Percent sex difference (95% CI) in probability of number of ADL limitations		
	At age 65	At age 75	At age 85
<b>1 limitation</b>			
1895-1929	No data	0.8 (0.5, 1.0)	0.9 (0.6, 1.3)
1930-1938	0.3 (0.2, 0.5)	0.5 (0.2, 0.7)	0.4 (0.1, 0.8)
1939-1945	0.1 (-0.1, 0.3)	0.1 (-0.2, 0.4)	No data
1946-1960	-0.3 (-0.5, -0.1)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.00020</i>	<i>0.010</i>	<i>0.035</i>
<b>2 limitations</b>			
1895-1929	No data	0.3 (0.2, 0.4)	0.5 (0.3, 0.7)
1930-1938	0.1 (0.1, 0.2)	0.2 (0.1, 0.3)	0.2 (0.0, 0.4)
1939-1945	0.0 (-0.0, 0.1)	0.0 (-0.1, 0.1)	No data
1946-1960	-0.1 (-0.2, -0.0)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.00020</i>	<i>0.0076</i>	<i>0.037</i>
<b>≥3 limitations</b>			
1895-1929	No data	0.3 (0.2, 0.4)	1.0 (0.6, 1.3)
1930-1938	0.1 (0.1, 0.2)	0.2 (0.1, 0.3)	0.4 (0.1, 0.8)
1939-1945	0.0 (-0.0, 0.1)	0.0 (-0.1, 0.2)	No data
1946-1960	-0.1 (-0.2, -0.0)	No data	No data
<i>P sex difference by birth cohort</i>	<i>0.00020</i>	<i>0.012</i>	<i>0.028</i>

Estimates extracted at age 65, 75, and 85 with age analysed as a continuous term; analyses further adjusted for sex, birth cohort, and their interactions, marital status, study, region, education, and labour force status. Positive value indicates women have greater probability than men of having given number of limitations.