



Gender Differences and Time Trends in the Trajectories of Disability in Germany

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Limitations of Earlier Studies

Many population-based longitudinal studies on health and disability do not fully take advantage of the information available.

- 1. They use two points in time**
- 2. Study single transitions**
- 3. Use a dichotomous measurement of disability**

Very few look at course types or disability trajectories that have

- 1. more than two points in time and**
- 2. more than two levels of disability**

(e.g. Deeg 2005; Nusselder, Looman & Mackenbach 2006)



Aims of this Study

- (1) Identify different course types of disability,**
- (2) Assess their relative frequency**
- (3) Analyze their association with subsequent deaths**
- (4) Explore time trends in disability**

BY GENDER



Method: Step 1

Separate linear regressions in order to assess four aspects for each individual:

1. The **level of disability** is defined as the **intercept** of a linear regression
2. The **slope of the model** is used to indicate the **direction of the change**:
 - a positive slope indicates deterioration;
 - a negative slope indicates an improvement in disability.
3. The **concavity/convexity of the time trend** is measured by adding a quadratic term to the equation and by measuring the **distance between the quadratic regression curve and the straight linear regression line**:
 - a positive difference indicates a convex shape,
 - a negative one indicates a concave shape.
4. The **variability** of the trajectory is measured by the **root mean square error of the quadratic function**.



Method: Step 2

The four aspects are the input variables for a cluster analysis

In order to assure that each of the four aspects influences the cluster analysis equally, we **standardize** them, using their mean and standard deviation. We perform a hierarchical agglomerative complete linkage cluster analysis based on Euclidian distances.

The number of clusters is decided on the basis of the Calinski-Harabasz pseudo-F statistic.

We keep the **stable disability trajectories** separate (stable healthy, stable moderate disability, stable severe disability).



Data:GSOEP

In the years 1984 to 1987, 1992 and 1995 to 2001

The following question was asked in the German Socio-Economic-Panel

“Not regarding occasional illnesses, is the fulfilment of everyday activities, e.g. in the household, your job or education hindered by your condition of health, and, if so, to what extent?”

- Not at all
- slightly
- to a great extent

Gender Differences in Disability Trajectories: a) 1995 to 2001
b) mortality follow-up
of survivors 2002-2005

Time Trends in Disability Trajectories by Gender
1984 to 1987 vs.
1995 to 1998



Disability Trajectories

Frequency and Association with Subsequent Death by Gender

**Germany 1995-2001 with a
Mortality follow-up 2002-2005
Ages 50+**



Data

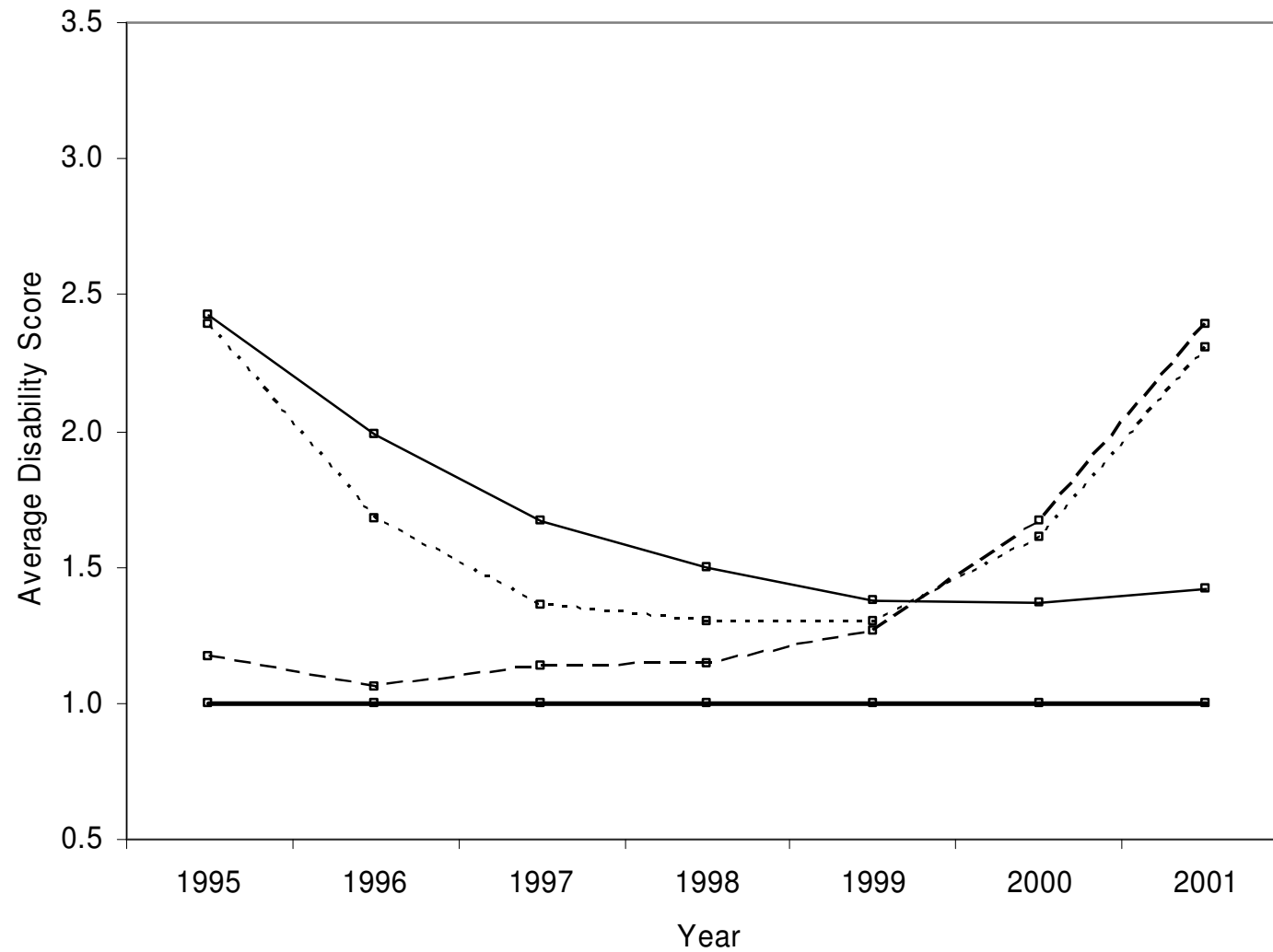
Year	Attrition ^a	Deaths ^a / Deaths with full information on disability ^b	Persons alive 1995-2001 with full information on disability
<hr/>			
Trajectories 1995-2001			
1995		1/	2639
1996	72	93/	2639
1997	92	87/	2639
1998	131	86/	2639
1999	121	86/60	2639
2000	92	75/54	2639
2001	84	69/51	2639
total	592	497/165	2639
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2002 -2005 follow-up of survivors			
2002	66	55	
2003	64	53	
2004	88	61	
2005	96	61	
total	314	230	

a) all cases; b) all cases with complete health information; health information does not exist for the follow-up



Survivors Aged 50+ Germany 1995-2001

Healthy Trajectories (24%)

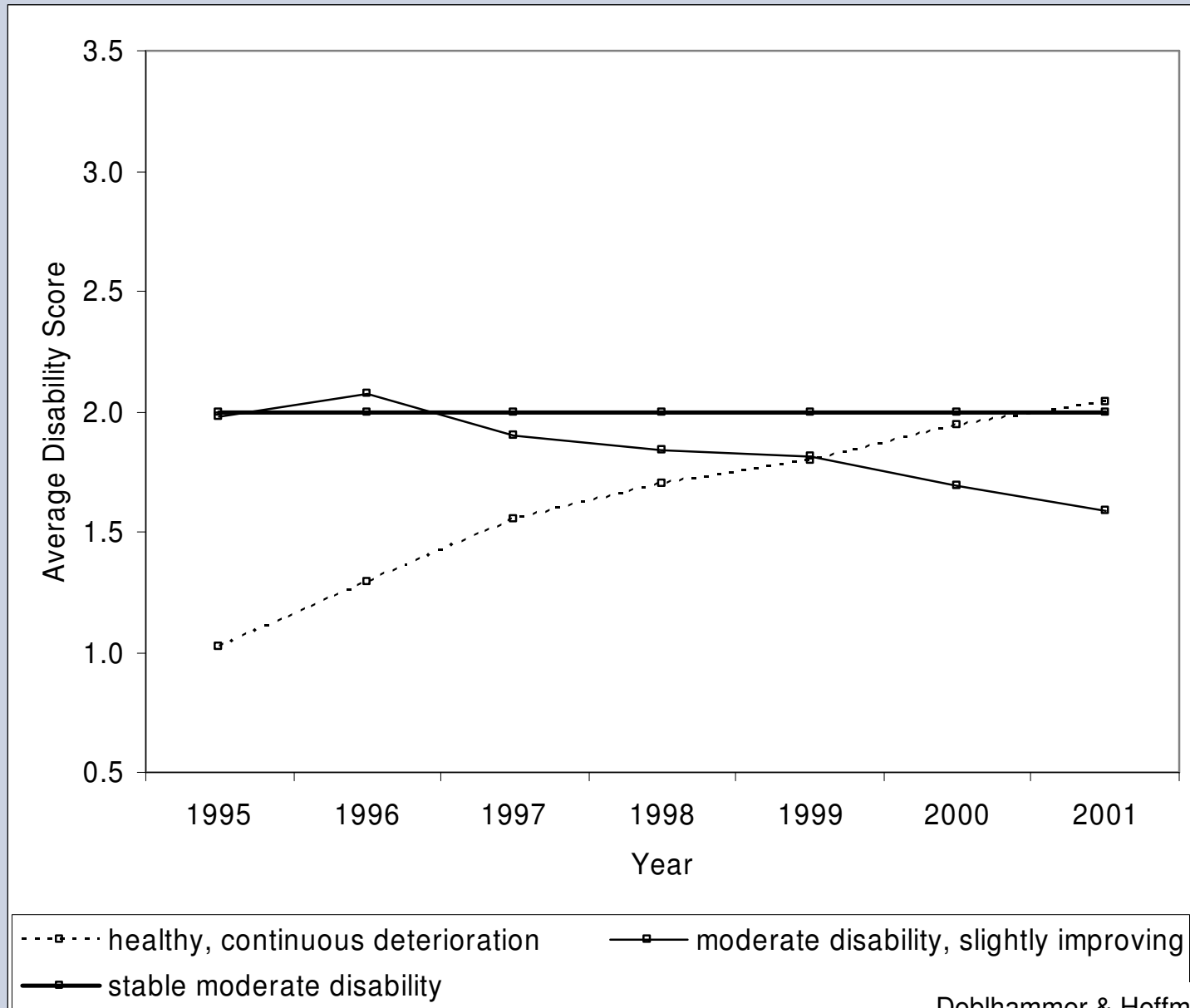


--□-- healthy, delayed severe deterioration —□— recovery from severe disability
-.-□-.- recovery, severe deterioration —□— stable healthy



Survivors Aged 50+ Germany 1995-2001

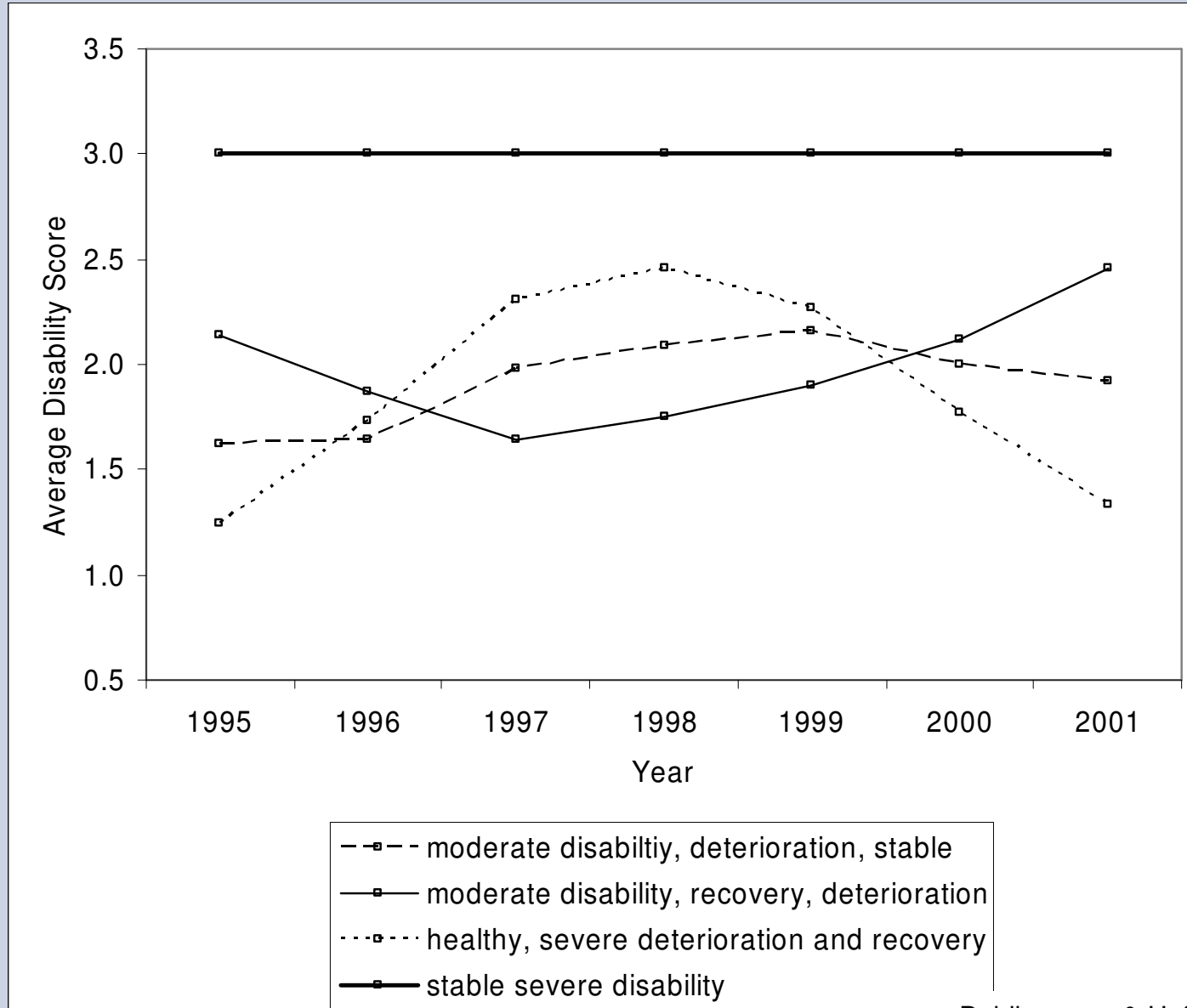
Moderate Disability Trajectories (38%)





Survivors Aged 50+ Germany 1995-2001

Severe Disability Trajectories (37%)





Survivors Aged 50+ Germany 1995-2001

% - Distribution of Trajectories by Age and Sex

Age	Males			Females			Significance Gender Difference
	Healthy	Moderate	Severe	Healthy	Moderate	Severe	
50-59	35	33	32	28	39	33	**
60-69	25	40	35	18	46	36	*
70-79	18	37	46	18	37	45	
80+	34	40	25	7	33	60	**

** : $p \leq 0.05$

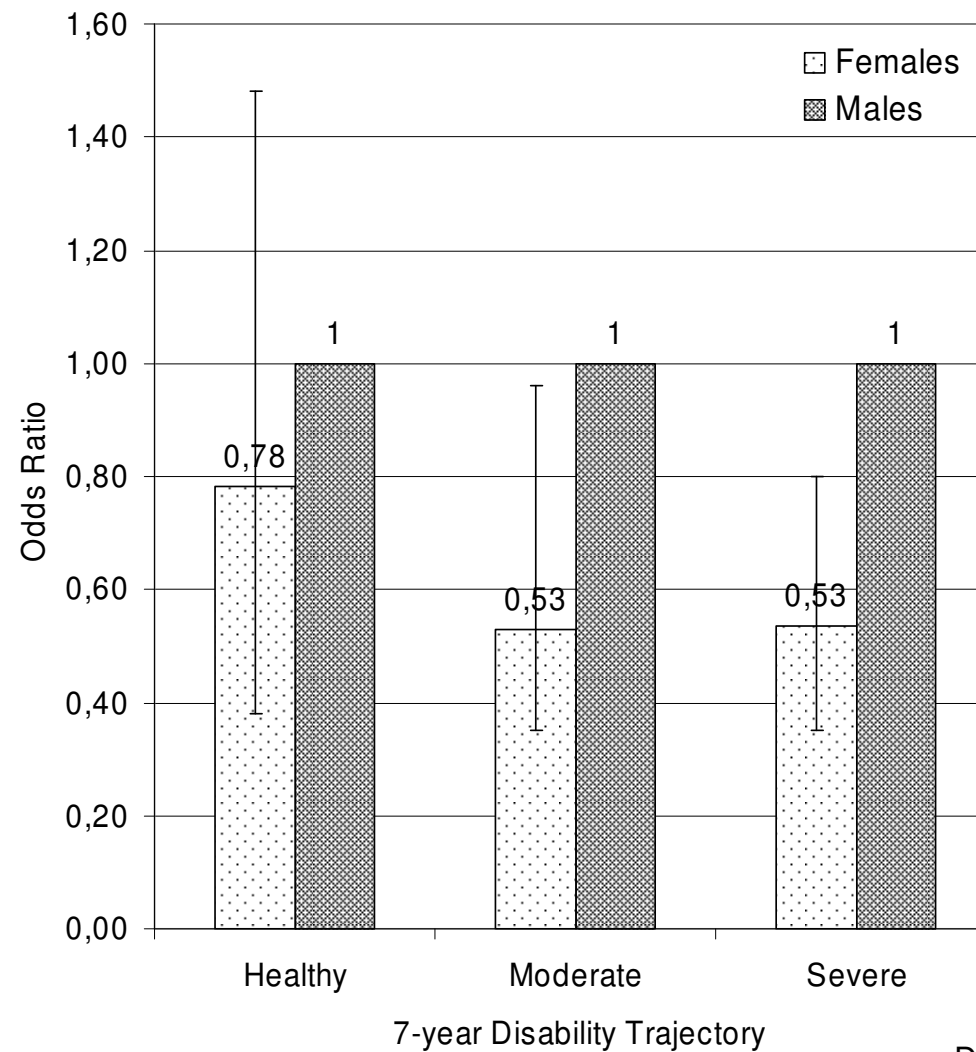
* : $p \leq 0.10$

Doblhammer & Hoffmann 2007



Mortality Risk by 7-year Disability Trajectory

Germany 2002-2005





Disability Trajectories

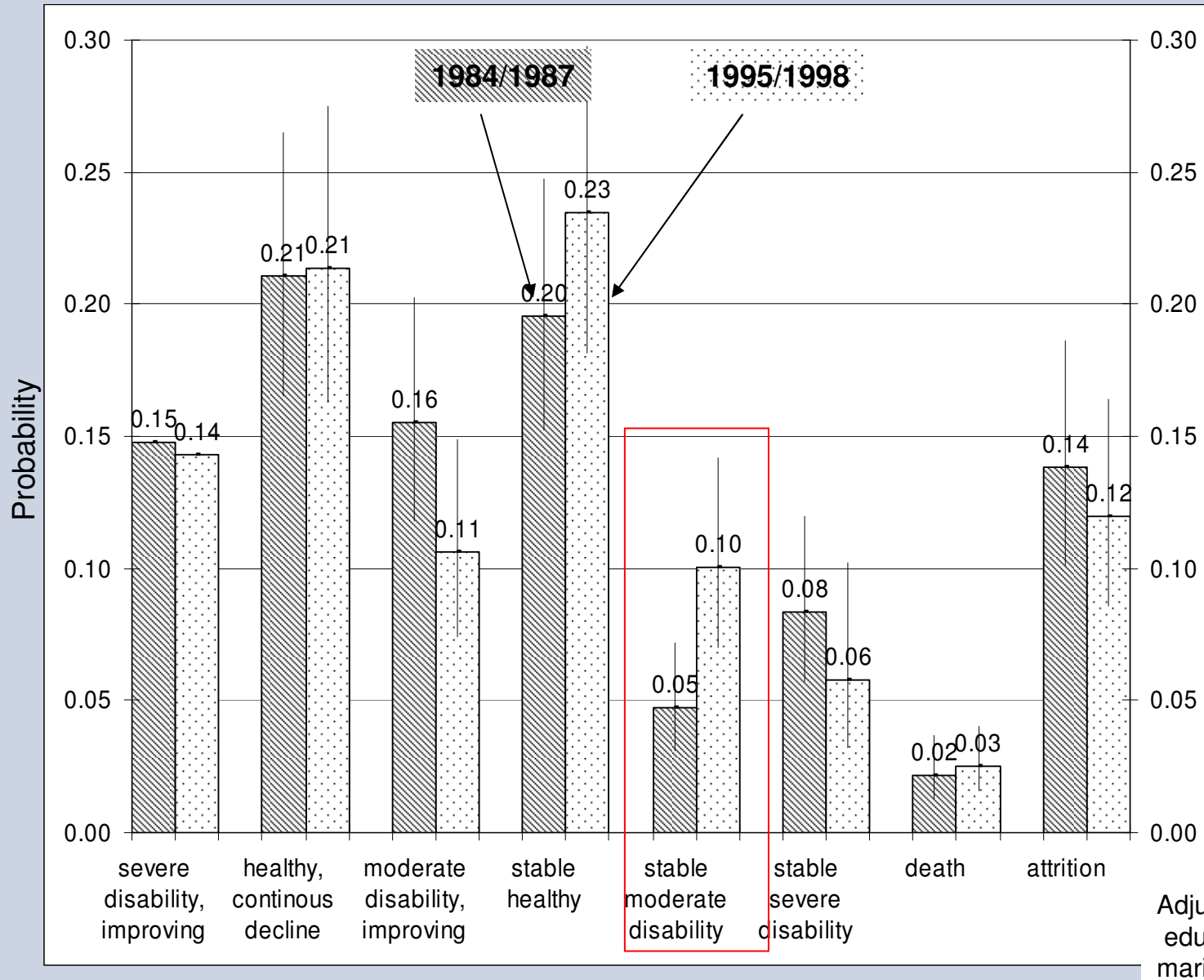
Time Trends by Gender

Germany 1984 - 1987 vs. 1995 - 1998

Ages 50+

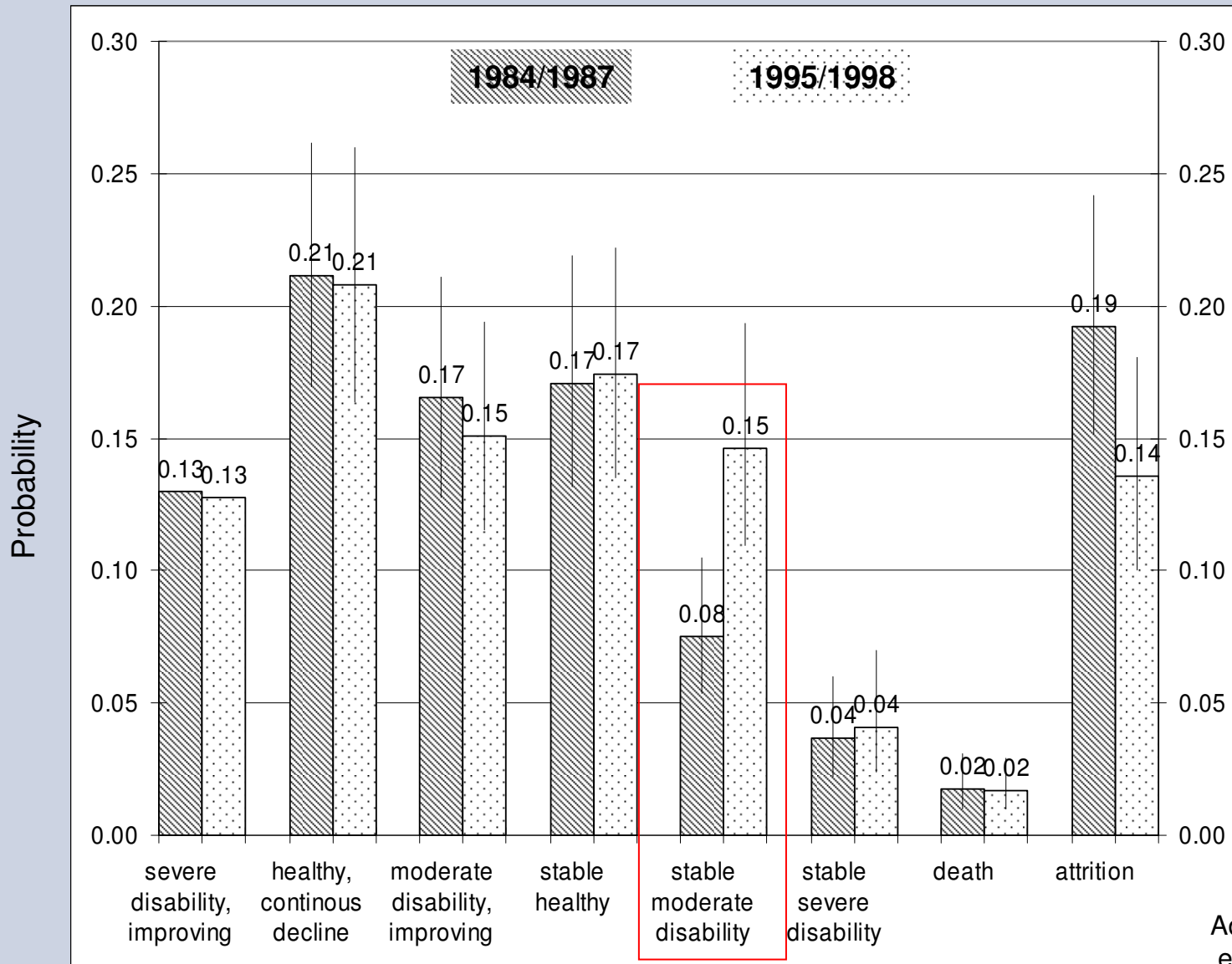


Males: Trends in German Disability Trajectories 1984/1987 and 1995/1998





Females: Trends in German Disability Trajectories 1984/1987 and 1995/1998



Adjusted for age, education & marital status



Conclusions

1. A significantly larger proportion of women follow disadvantaged disability trajectories in the youngest (50-59) and oldest age group (80+)

Earlier onset of disability
Selection

2. Both sexes have the same relative mortality disadvantage when they follow a severe disability trajectory instead of a moderate one.

Biological differences (Christensen et al. 2001)

Different health perception (Delbès & Gaymu 2002, Spiers et al. 2003

Idler 2003, Verbrugge 1989, Oakes & Rossi 2003, Luy & Di Giulio 2005)

Different chronic disease (Nusselder & Looman 2004)

3. Over time both sexes reveal a trend towards stable moderate disability



Thank you !