Wealth at the End of Life: Evidence on Estate Planning and Bequests

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Preliminary

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Introduction

- **Retirement-savings puzzle:** Retired households decumulate wealth at a much lower rate than that implied by the basic life cycle model (De Nardi et al., 2016 ARE).
  - **Precautionary Saving** Yaari (1965 JPE), De Nardi et al. (2010 JPE).
  - **Bequest Motive** Laitner and Ohlsson (2001 JPubE), Kopczuk and Lupton (2007 RES), Ameriks et al. (2011 JOF).

Introduction

- Van Ooijen et al. (2015 DE) and Suari-Andreu et al. (2016) document that the retirement-savings puzzle holds in the Netherlands.
- Out of pocket medical expenditures are not an issue due to extensive coverage of both curative care and long term care (Van Ooijen et al., 2016).
- Van Ooijen et al. (2015 DE), also show that average and median wealth do not significantly decline at the very last stages of life, and not even for the long-lived.

Introduction

- This evidence suggests the potential relevance of the bequest motive in explaining the savings of retirees in the Dutch context.
- We contribute to the literature by empirically studying the presence of a bequest motive using administrative micro data for the Netherlands.
- In this paper we build on and expand the work by Kopczuk (2007 QJE).

Kopczuk (2007)

- Kopczuk uses US data on estate tax returns (filed in 1977) to regress wealth at time of death on length of terminal illness. Controls for:
  - Age
  - Lifetime Income
  - Gender
  - Marital Status
- Length of terminal illness is defined as:
  - **Quick** Instantaneous death.
  - **Medium** Days or weeks.
  - **Long** Months or years.
- Lifetime income is proxied by previous individual income (in 1969 and 1974).

Kopczuk (2007)

- Kopczuk only observes individuals above the minimum estate tax threshold (360k 2007 $), thus must use truncated regression techniques.
- Most of the analysis is based on married males, since a lot of income observations are missing for singles and married females.
- He finds that married male taxpayers who die instantaneously have about 18% more wealth than those who suffered from a lengthy illness.
- Based on supplementary data he claims that this finding cannot be explained by
  - Medical Expenditures
  - Income Shocks

Kopczuk (2007)

- Instead, Kopczuk comes up with the following explanation for the empirical findings:

$$\text{TERMINAL ILLNESS} \Rightarrow \text{ESTATE PLANNING} \Rightarrow \text{EARLY BEQUESTS}$$

- This mechanism reflects the presence of an underlying bequest motive for saving.

- Given a bequest motive, individuals may engage in early bequests due to tax reasons and/or to exert control over how a bequest is spent/invested (Kopczuk, 2010 NBER; McGarry, 2013 AER).

Our contribution

- We expand Kopczuk's work in five main different directions:
  - We observe the whole net worth distribution and thus we are able to apply quantile regression.
  - We can generate a more refined measure for length of terminal illness.
  - We can generate a better proxy for lifetime income.
  - The Dutch institutional context prevents any issue caused by medical expenditures and/or income shocks.
  - We can connect every individual in our sample with his/her children.

Data - Sources and Sample Selection

- We use Dutch administrative data coming from different sources (all provided to us by Statistics Netherlands):
  - Death Register
  - Tax Register
  - Hospital Discharge Register
  - Municipal Administration Records
- We observe 10 thousand individual deaths occurred in the Netherlands between 2006 and 2010.

Data - Wealth at the End of Life

- Through the tax register we obtain data on assets and liabilities given on the 31^{st} of December of the year previous to death.
- By subtracting liabilities from assets we obtain net worth. We focus on net financial wealth (NFW). These data are given at the household level.
- Splitting the sample into gender-marital status groups, we see that all distributions are skewed as expected.

Data - Wealth at the End of Life

Table 1 NFW at the End of Life by Gender and Marital Status (1000 €)

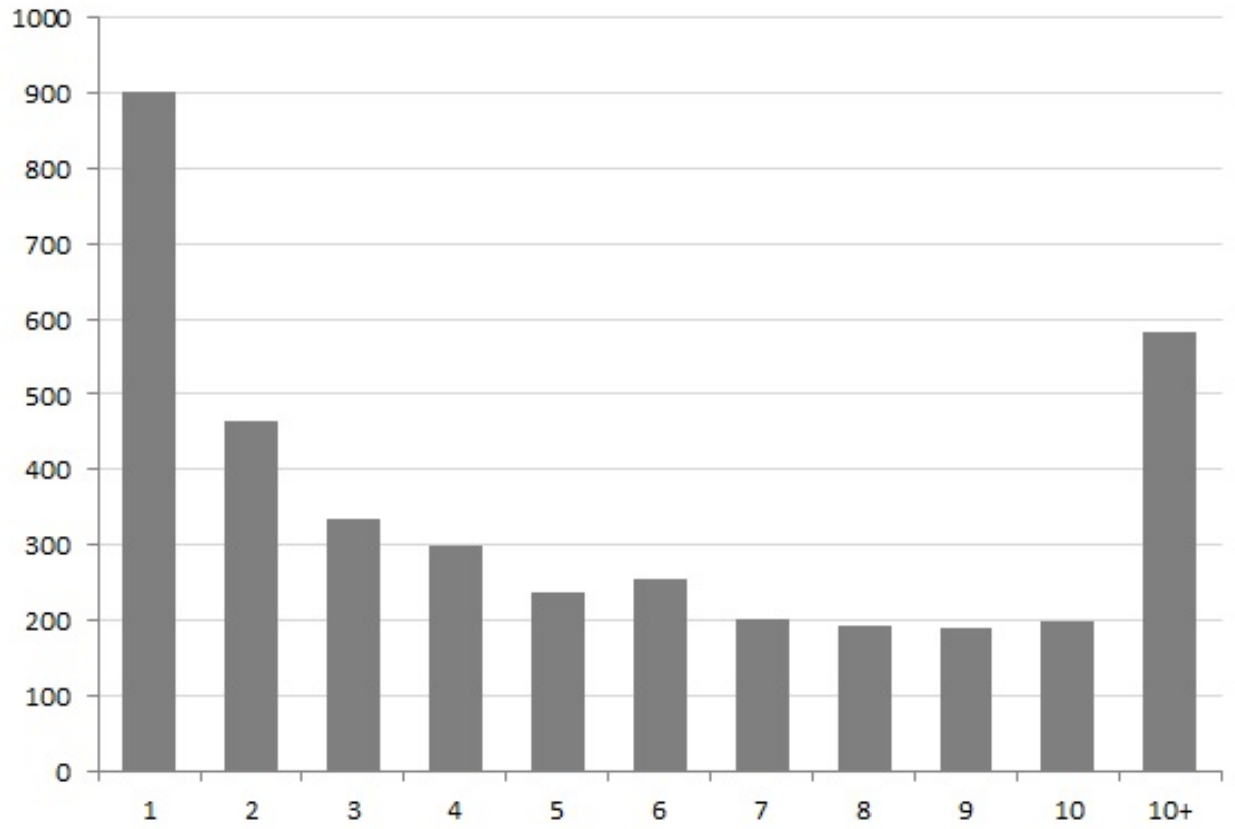
	Avg	p10	p25	p50	p75	p90	p99	Obs
Single Females	70	0	5	18	48	157	856	2658
Single Males	66	0	3	18	50	152	768	1402
Married Females	75	1	7	24	75	193	687	1718
Married Males	108	1	9	27	80	205	1026	3851
All	85	1	6	23	66	183	876	9629

Data - Length of Terminal Illness (LoTI)

- To generate our length of terminal illness measure we combine data from the death register and from the hospital discharge register.
- We classify underlying cause of death (COD) and hospital diagnosis according to 15 general categories given by ICD 10. COD
- We know thus whether someone dying due to a particular COD category had a hospital intake with a main diagnosis falling in that same category, as long as it happened after 1994.
- LoTI $=$ [31^{st} Dec year $(t-1)$] $-$ [date 1^{st} COD-related intake].

Data - Length of Terminal Illness (LoTI)

Figure 1 Histogram Length of Terminal Illness in Years



Note: Zeros are excluded from the figure. Their frequency is 5661.

LoTI

Data - Lifetime Income

- We observe yearly total income at the household level for the period between 2003 and the year previous to death.
- For every year we know which is the main source of income of the household.
- We generate a proxy for lifetime income by applying the following rule:
  - Main income source at $t-1$ is not pension income $\rightarrow$ take average of equivalized household income between 2003 and $t-1$.
  - Main income source at $t-1$ is pension income $\rightarrow$ take equivalized household income at $t-1$.

Methodology

- We estimate the following regression equation:

$$NFW_i = \beta_0 + \mathbf{D}_i'\boldsymbol{\beta}_1 + \mathbf{X}_{1i}'\boldsymbol{\beta}_2 + \mathbf{X}_{2i}'\boldsymbol{\beta}_3 + \mathbf{t}_i'\boldsymbol{\beta}_4 + \varepsilon_i.$$

- where $\mathbf{D}_i = (D_{1i},\ D_{2i},\ D_{3i},\ D_{4i})$, and:
  - D_{1i} is a dummy indicating that LoTI $= 0$, but with at least one COD-related hospital intake after the wealth measurement.
  - D_{2i} is a dummy indicating LoTI $= 0$ and $D_{1i} = 0$, but at least one non-COD-related hospital intake during the year t or $t-1$.
  - D_{3i} is a discrete LoTI indicator taking values from zero to ten.
  - D_{4i} is a dummy indicating LoTI > 10.

- $\mathbf{X}_{1i}$:= controls including age dummies, a proxy for lifetime income, and a delay-in-measurement variable.
- $\mathbf{X}_{2i}$:= children variables (presence, number, average age and lifetime income)
- $\mathbf{t}_i$:= year dummies

Methodology

- We run separate regressions for single females, single males, married females, and married males.
- We estimate the parameters by simultaneous quantile regression with bootstrapped standard errors.
- Quantile regression has three main advantages over OLS:
  - Deals with heteroskedasticity.
  - It is not sensitive to outliers.
  - It allows differentiating the effect according to wealth level.
- The third aspect is specially pertinent, since we expect estate planning to be particularly relevant among the rich.

Results

Table 3 OLS Results

	Single			
	Females		Males	
D_3	1510.49	2.17%	-1277.20	1.94%
	(1842.95)		(1612.09)	
D_4	-6508.44	9.36%	-23335.26	35.50%
	(10797.10)		(15286.12)	
R^2	0.11		0.09	
Obs.	2658		1402	

Note: Robust standard errors in parenthesis. ***1%, **5%, *10%.

Results

Table 3 OLS Results (continued)

	Married			
	Females		Males	
D_3	-1690.68	2.25%	-373.73	0.30%
	(1479.44)		(2807.67)	
D_4	-18073.52	24.14%	-30104.13*	27.90%
	(1479.44)		(17380.94)	
R^2	0.11		0.18	
Obs.	1718		3851	

Note: Robust standard errors in parenthesis. ***1%, **5%, *10%.

Results

Table 4 Quantile Regression Results: Married Males

	p25		p50		p75	
D_3	311.60	3.46%	-197.63	0.72%	-681.30	0.86%
	(194.40)		(286.55)		(829.05)	
D_4	-83.58	0.92%	-6597.67***	24.28%	-13297.71**	16.70%
	(1573.08)		(2199.64)		(6090.87)	
R^2	0.03		0.06		0.12	
Obs.	3851		3851		3851	

Note: Bootsrapped standard errors in parenthesis. ***1%, **5%, *10%.

Results

Table 4 Quantile Regression Results: Married Males (continued)

	p90		p95		p99	
D_3	419.34	0.20%	-3158.62	0.93%	-16690.98	1.62%
	(2317.02)		(4222.67)		(16004.23)	
D_4	-23568.35	11.49%	-53213.89**	15.74%	-255806.90***	24.94%
	(15330.59)		(23143.16)		(106332.30)	
R^2	0.16		0.20		0.40	
Obs.	3851		3851		3851	

Note: Bootsrapped standard errors in parenthesis. ***1%, **5%, *10%.

Results

Table 5 Quantile Regression Results: Married Males

		p95		p99	
D_4	Age<65	-59684.73*	17.65%	-544992.40**	53.12%
		(33814.12)		(242987.50)	
	65≤Age<80	-22179.25	6.56%	-368273.00**	35.89%
		(41379.24)		(158305.40)	
	Age≥80	-58896.59	17.42 %	-244818.30	23.86%
		(41959.99)		(162949.60)	
R^2		0.20		0.40	
Obs.		3851		3851	

Note: Bootsrapped standard errors in parenthesis. ***1%, **5%, *10%.

Results

Table 7 Quantile Regression Results: Married Males

		p95		p99	
D_4	1st Quartile	-27168.80	8.03%	-432580.60***	42.17%
		(49921.87)		(137177.40)	
	2nd Quartile	-65612.27	19.40%	-351079.00**	34.22%
		(49259.39)		(139443.60)	
	3rd Quartile	-121649.50***	35.98%	-500977.20***	48.83%
		(145580.10)		(136800.90)	
	4th Quartile	-23783.72	7.03%	-68097.18	6.63%
		(145580.10)		(126607.00)	
R^2		0.20		0.40	
Obs.		3851		3851	

Note: Bootsrapped standard errors in parenthesis. ***1%, **5%, *10%.

Conclusion

- We find a negative effect of length of terminal illness on net financial wealth at the end of life.
- However, it is only clearly significant for married males, and for illnesses above ten years long.
- Most single individuals in our sample are widowed or divorced, which implies they have already potentially been through an important shock to their wealth (Poterba et al. 2015, NBER; van Ooijen et al. 2015 DE).
- These results are compatible with Kopczuk's since he finds also a clear effect only for married males, and for illnesses longer than one month.

Conclusion

- Among married males at the top of the distribution, we find that the effect is stronger for those below 65.
- Additionally, the effect comes solely from those with children. Conditional on having children, it is stronger for those whose children are below the 75th percentile of the lifetime income distribution.
- Following Kopczuk, we interpret these result as early bequests that result from estate planning triggered by the onset of a terminal illness.
- We thus conclude that the bequest motive is a promising explanation for the fact that Dutch individuals do not withdraw their wealth during retirement.

THANKS FOR YOUR ATTENTION

Discussion and Future Work

- It could be that the effect we estimate is due to individuals increasing their consumption when faced with a terminal illness.
- Börsch-Supan and Stahl (1991 JPE), find that bad health decreases non-medical consumption. If that holds, our estimates are a lower bound.
- In 2010 there was an inheritance tax reform in the Netherlands. Having data after 2010 would allow to check whether the effect we find is due to tax evasion. Tax
- Running regressions at the child level can help distinguish the different types of bequest motive, study behavioural consequences of inheritance receipt, and its impact on wealth inequality (Boserup et al., 2016 AER; Elinder et al., 2016 IZA).

Data - Length of Terminal Illness (LoTI)

Table A1 Cause of Death Categories ICD10

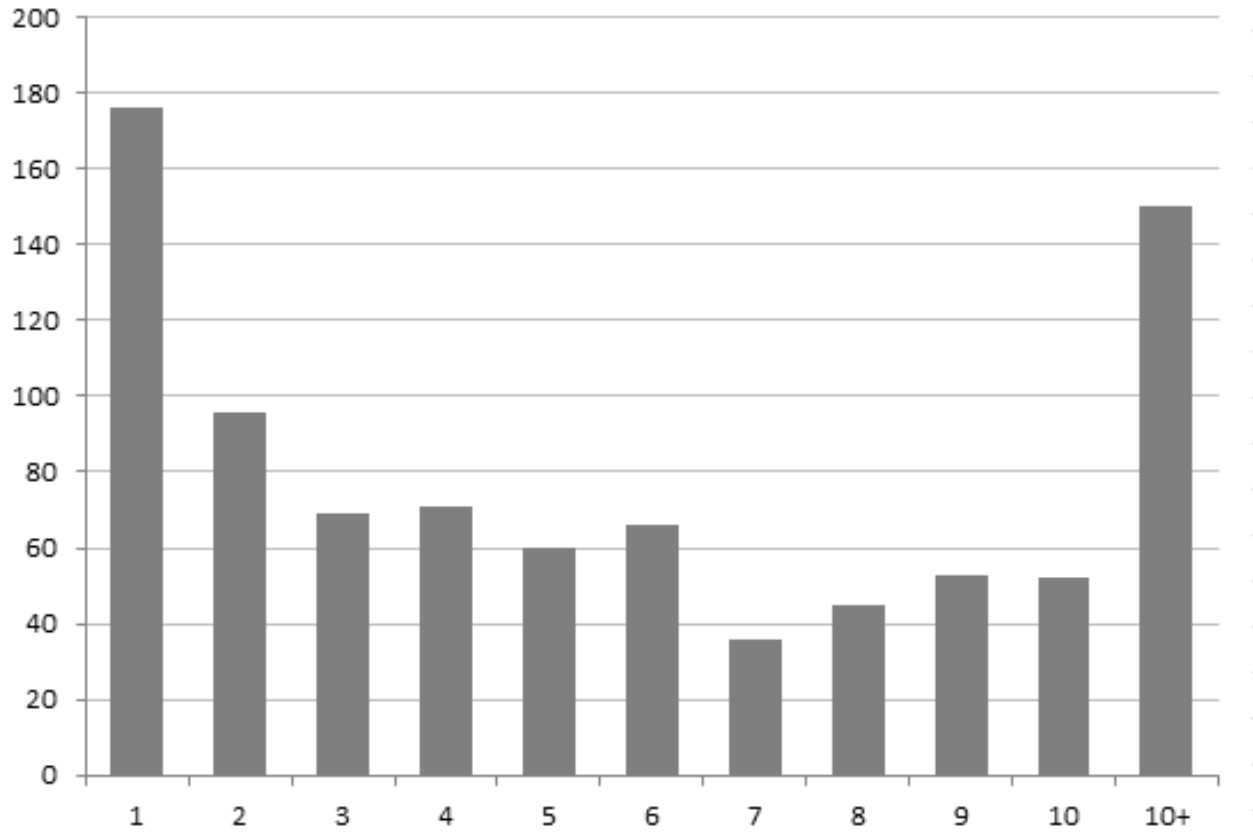
Category	Frequency	Percentage
Infectious diseases	129	1.3%
Neoplasms	3430	35.7%
Blood diseases	24	0.3%
Endocrine, nutritional and metabolic diseases	276	2.9%
Mental and behavioural disorders	423	4.4%
Diseases of the nervous system	272	2.8%
Diseases of the circulatory system	2816	29.3%
Diseases of the respiratory system	916	9.5%
Diseases of the digestive system	370	3.9%
Diseases of the skin	25	0.3%
Diseases of the musculoskeletal system	55	0.6%
Diseases of the genitourinary system	231	2.4%
Congenital malformations	6	0.1%
Ill-defined conditions	328	3.4%
External causes of morbidity and mortality	318	3.3%

COD

Data - Length of Terminal Illness (LoTI)

Figure A1 Histogram Length of Terminal Illness in Years

- Single Females -



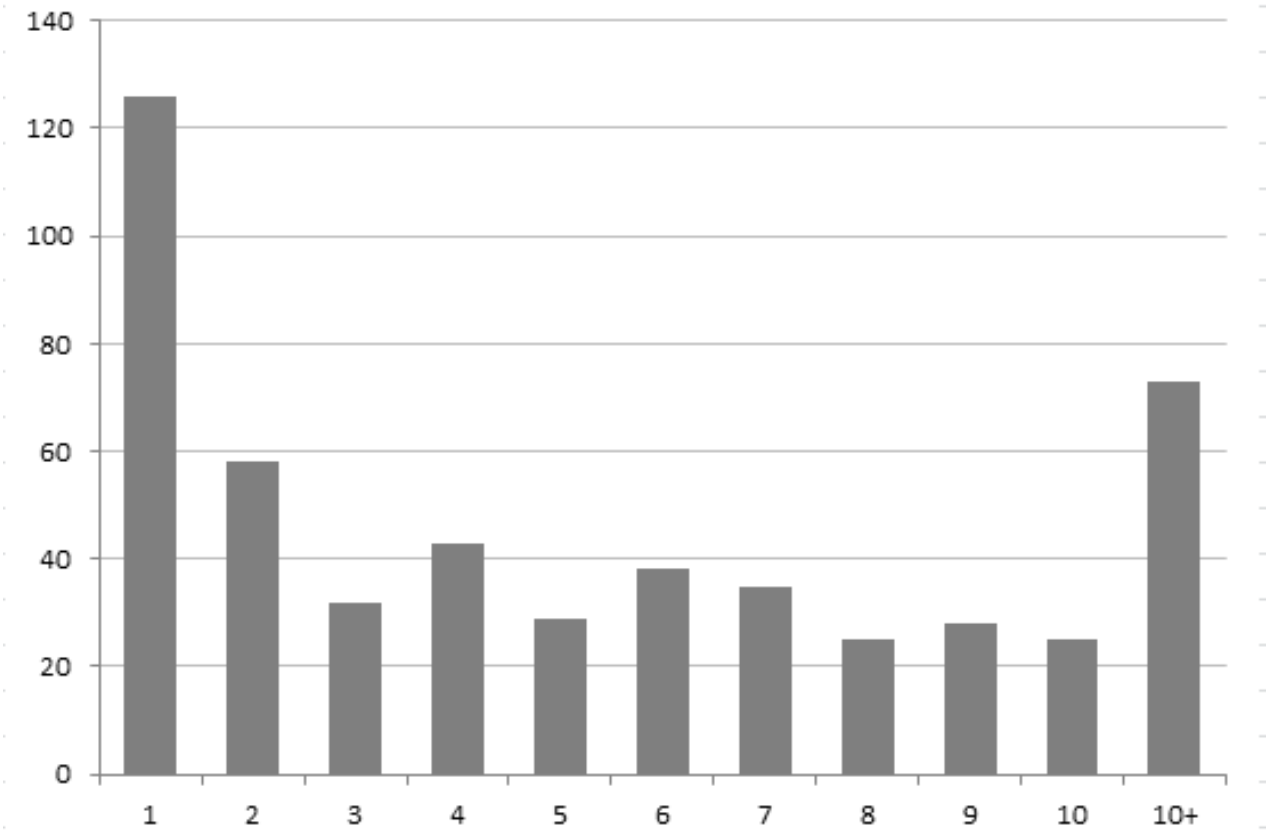
Note: Zeros are excluded from the figure. Their frequency is 1784.

LoTI

Data - Length of Terminal Illness (LoTI)

Figure A1 Histogram Length of Terminal Illness in Years

- Single Males -



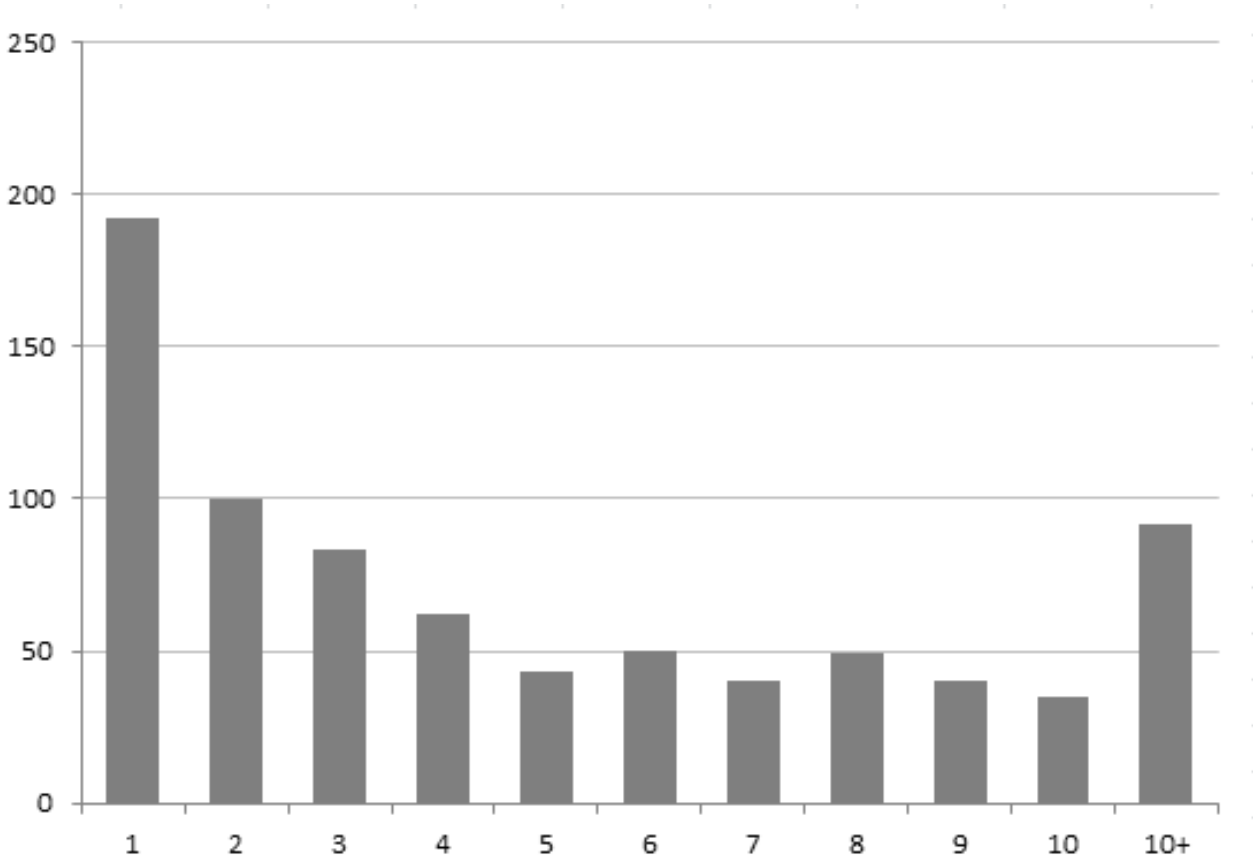
Note: Zeros are excluded from the figure. Their frequency is 890.

LoTI

Data - Length of Terminal Illness (LoTI)

Figure A1 Histogram Length of Terminal Illness in Years

- Married Females -



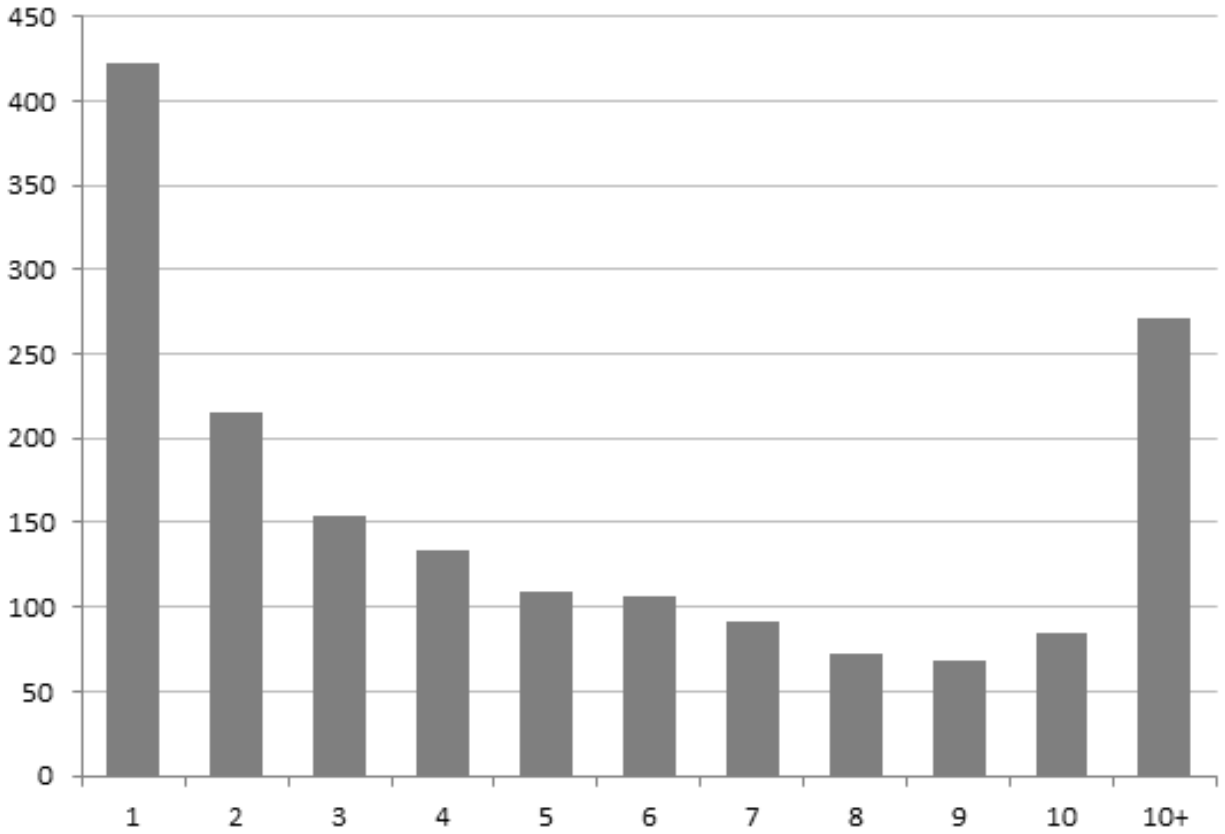
Note: Zeros are excluded from the figure. Their frequency is 932.

LoTI

Data - Length of Terminal Illness (LoTI)

Figure A1 Histogram Length of Terminal Illness in Years

- Married Males -



Note: Zeros are excluded from the figure. Their frequency is 2113.

LoTI

Inheritance and Gift Taxation

Gift and Inheritance Tax Rates (before 01/01/2010)

Brackets (1000 €)	Partners and children	Grandchildren	Siblings and parents	Non-relatives
0-22	5%	8%	26%	41%
22-45	8%	13%	30%	45%
45-90	12%	19%	35%	50%
90-180	15%	24%	39%	54%
180-360	19%	30%	44%	59%
365-900	23%	37%	48%	63%
Above 900	27%	43%	53%	68%

Tax

Inheritance and Gift Taxation

- Exemptions for gifts (1000 €):
  - **Children:** 4.5.
  - **Children from 18 to 35 years (one-time):** 23.
  - **Others:** 3.
- Exemptions for inheritances (1000 €):
  - **Partners (married):** 530.
  - **Partners (not married):** 100 - 530, depending on length of cohabitation.
  - **Children $\geq$ 23 years:** 10 provided that inheritance $<$ 27.
  - **Children $<$ 23 years:** 4.5 per year below 23, with a minimum of 10.
  - **Handicapped children:** 4.5 per year below 23, with a minimum of 14. 10 if children older than 23 years.
  - **Parents:** 45.
  - **Grandchildren:** 10 provided that inheritance $<$ 10.
  - **Others:** 2.

Inheritance and Gift Taxation

Gift and Inheritance Tax Rates (after 01/01/2010)

Brackets (1000 €)	Partners and children	Grandchildren	Others
0-118	10%	18%	30%
Above 118	20%	36%	40%

Inheritance and Gift Taxation

- Exemptions for gifts (1000 €):
  - **Children:** 5.
  - **Children from 18 to 35 years (one-time):** 24.
  - **Children from 18 to 35 years (one-time, if used for home purchase or studies):** 50.
  - **Others:** 2.
- Exemptions for inheritances (1000 €):
  - **Partners:** 600.
  - **Children and grandchildren:** 19.
  - **Handicapped children:** 57.
  - **Parents:** 45.
  - **Others:** 2.