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**Long-term Care Directors and Administrators**

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***An Actuarial Perspective***

***on***

***Long Term Care Insurance***

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# Coverage

Need for Long Term Care (LTC) Insurance

Increasing potential role of Private LTC markets

Financing and Insuring LTC

Types of LTC insurance

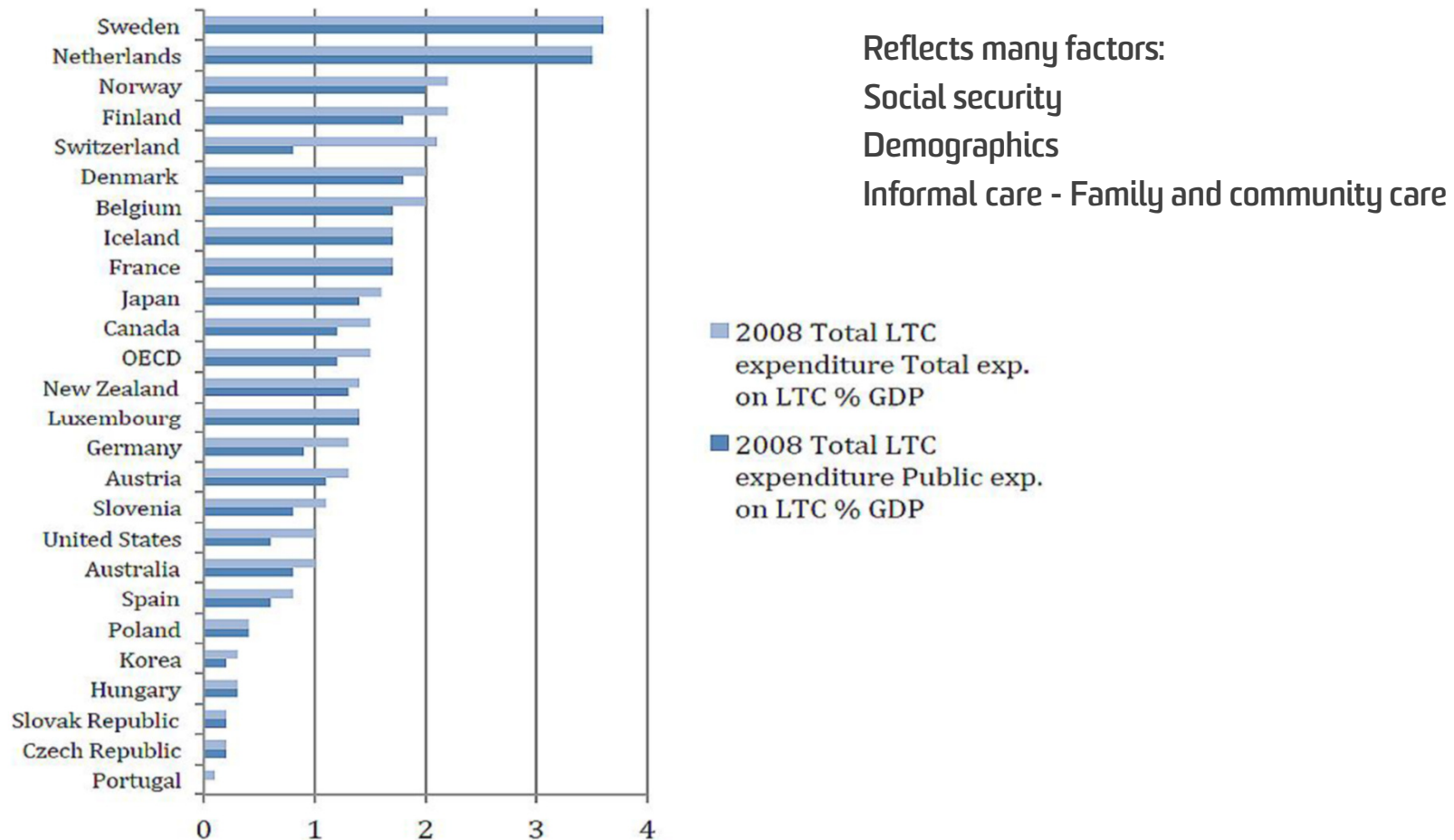
Actuarial aspects – risks, pricing

Actuarial research at CEPAR



# LTC costs - Mostly Public Expenditure

Figure 14 – LTC expenditures as a percent of GDP (total and public share)



Source: International Actuarial Association Population Issues Working Group, (2017), Long Term Care: An Actuarial Perspective on Societal and Personal Challenges

Source: OECD Health Data, 2011

# Australian LTC Costs and Public Share

**Table 6.6 Aged care services funding by funding source**

	Ave public \$ per recipient in 2010	Ave. private contribution %	Ave. Gov. share %
Residential high care	51,550	26	74
Residential low care	20,150	53	47
EACH packages	39,250	4	96
EACH-Dementia packages	43,450	4	96
CACPs	12,700	10	90
HACC		5	95
Other Australian Government programs (for example, National Respite for Carers)	Variable	No compulsory contribution	100

Bridget Brown, (2011), Long Term care Insurance in Australia

# Funding and Insurance

## Pre-funding - Financing and Insurance

- Social insurance contributions (e.g. Germany, Japan)
- Private insurance (US, France, Germany)
- Private savings – housing equity, private retirement savings

## Pay-as-you go

- General tax revenues, often with means tests (Australia)
- Safety net cost sharing (US Medicare and Medicaid)
- Personal savings and insurance (includes LTC insurance and Reverse Mortgages)
- Family and community

# Types of LTC Insurance

- Periodic LTC benefits from stand alone LTC Insurance contract (income payments, specified amount or indemnity based)
- Lump sum benefits (critical illness insurance, acceleration of life insurance)
- Increase in pension or annuity payments (care annuity)
- Disability income insurance (conversion to LTC insurance)
- Innovations – reverse mortgage and LTC insurance

“Combo” products in US market

LTC insurance usually based on Activities of Daily Living (ADL's)  
sometimes Instrumental Activities of Daily Living (IADL's) and  
Cognitive Impairment

ADLs's - six basic ADLs: bathing, eating, continence, toileting, getting dressed and transferring

# ADL's – Triggers for LTC

Bathing: The ability to sponge bathe or get in and out of bath tub or shower.

Eating: The ability to feed oneself by getting food into the body or by a feeding tube.

Continence: The ability to maintain control of bladder and bowel functions.

Toileting: The ability to get to and from the toilet and perform associated personal hygiene.

Dressing: The ability to put on and remove all items of clothing and any braces or artificial limbs.

Transferring: The ability to get in and out of bed, chair, or wheelchair. A person qualifies for benefits when they are unable to perform two or three ADLs, depending on the long-term care insurance policy.

Source National Association of Insurance Commissioners

# IADL's – Triggers for LTC

## Instrumental Activities of Daily Living (IADLs)

Shopping- Can the person select and buy food and clothing by themselves, or are they unable to shop at all?

Traveling locally and afar—Is the person able to drive safely or travel independently on buses or taxis either by themselves or with a companion; or are they simply unable to travel at all?

Managing their money – Is the person able to manage their finances, such as paying bills or balancing their checkbook? Can the person manage their daily purchases, but needs help paying bills; or are they simply unable to handle money at all?

Housework and chores – Can the person do heavy housework that must be done, such as cleaning the floors and taking out the trash; or can they perform light housework but may need help with heavy chores; or are they unable to perform any household duties at all?

Preparing food – Can the person plan and cook full meals; or are they able to prepare only light meals by themselves; or are they unable to prepare any food by themselves?

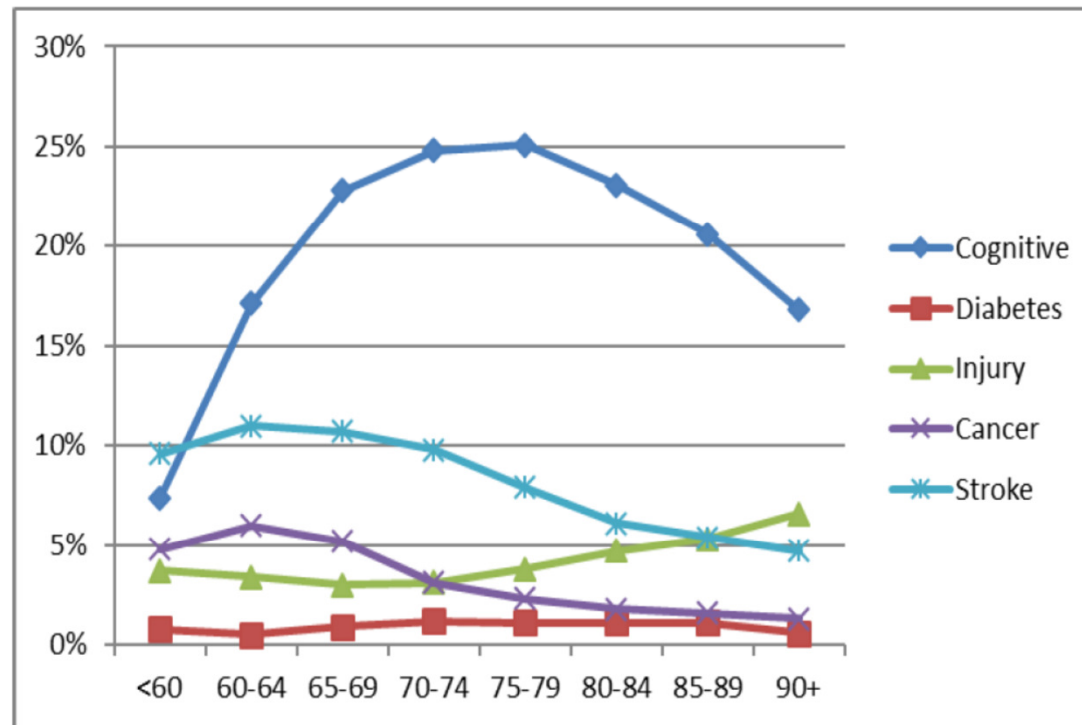
Using the phone – Can the person independently dial and receive calls with no help? Can the person answer the phone or dial 911 in emergencies, or do they require a special telephone to assist with finding the number and dialing? Is the person unable to use the telephone at all?

Taking medicine – Can the person take medications safely at the correct time of day or they unable to take medications without supervision at all?



# Risks for LTC Insurance

Figure 11 – Analysis of LTC insurance claims (U.S.) by age at incurral and cause of claim

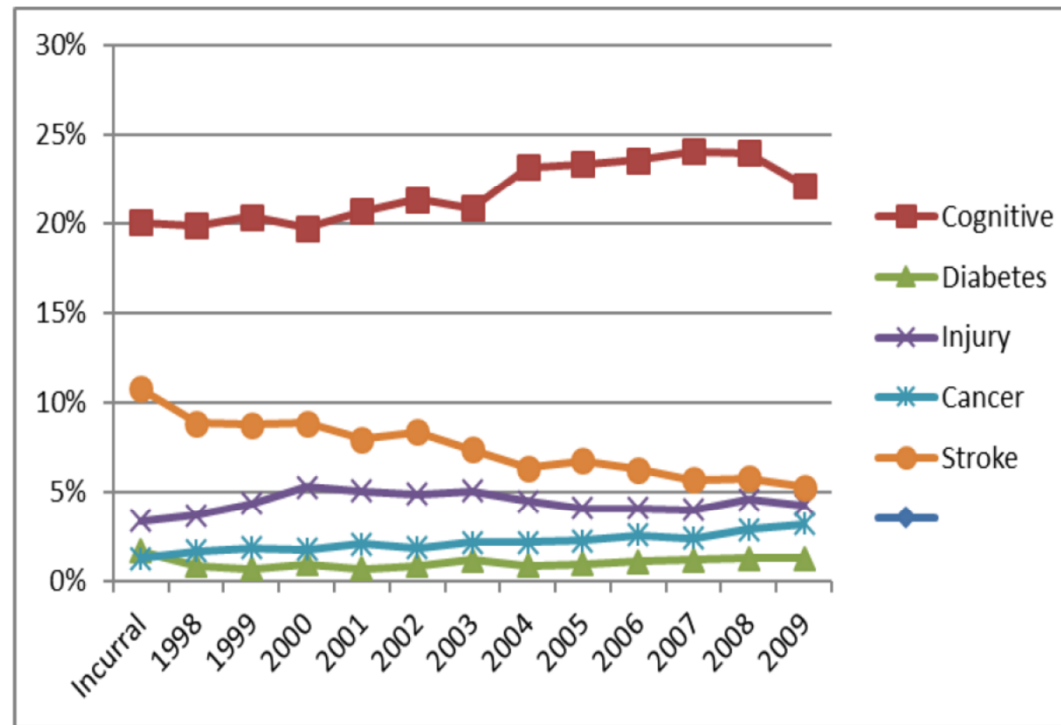


Source: Society of Actuaries' 2000-2011 Long Term Care Experience Study

Source: International Actuarial Association Population Issues Working Group, (2017), Long Term Care: An Actuarial Perspective on Societal and Personal Challenges

# Risks for LTC Insurance

Figure 12 – Analysis of outstanding LTC insurance claims (U.S.) by incurral year and cause of claim

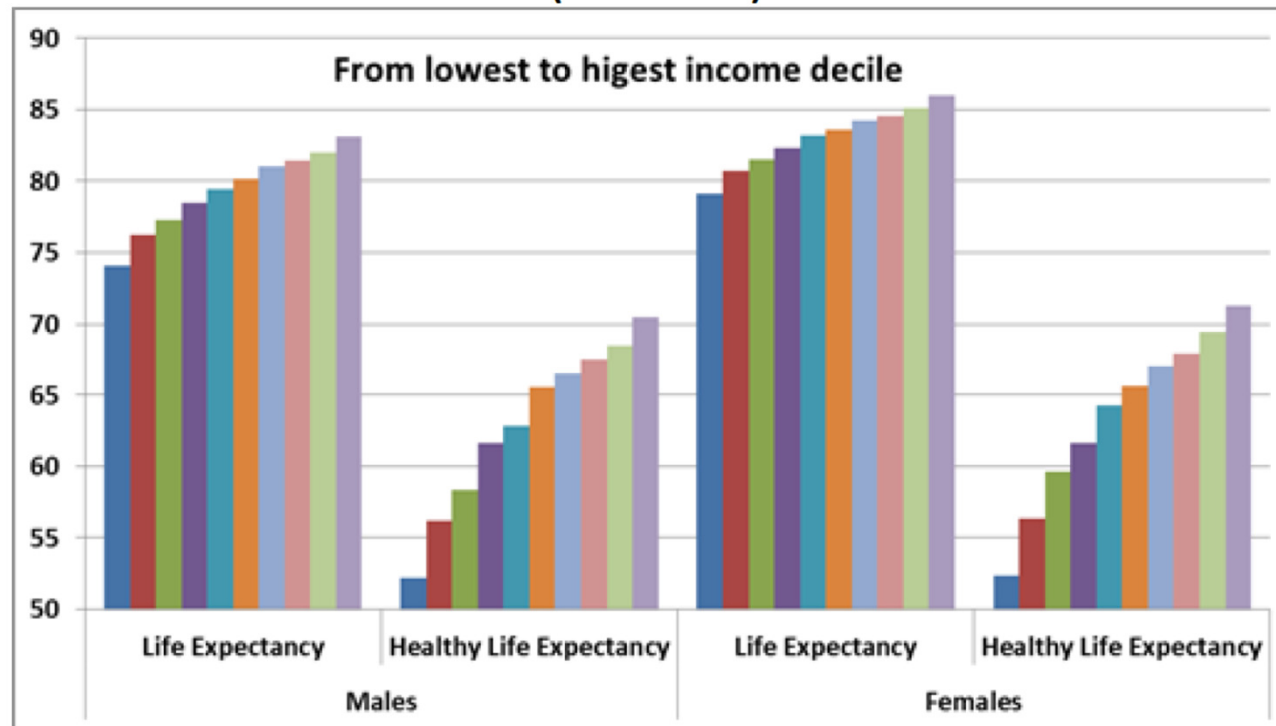


Source: Society of Actuaries' 2000-2011 Long Term Care Experience Study

Source: International Actuarial Association Population Issues Working Group, (2017), Long Term Care: An Actuarial Perspective on Societal and Personal Challenges

# Healthy Life Expectancy – UK Data

Figure 13 – Periods of total and healthy life expectancies by income deciles in the U.K.  
(2011-2013)



Source: Office for National Statistics, U.K.

# Estimated Functional Disability Life Table – HRS data

Demographic Characteristics	Males	Females
Mean years of life after age 65	16.33	19.43
Mean years with mild disability	1.78	2.80
Mean years with severe disability	0.89	1.68
Share with disability	56.43%	72.70%
Share with mild disability	47.89%	63.37%
Share with severe disability	26.82%	42.39%
Average age of first disability, conditional on becoming disabled	76.23	76.52
Average age of first mild disability, conditional on becoming mildly disabled	75.83	76.38
Average age of first severe disability, conditional on becoming severely disabled	80.51	81.70

- Disability (functional) free life expectancy
- Estimated from Health and Retirement Study (HRS) data

Fong, H. Y., Shao W., and Sherris, M. (2015), Multi-State Actuarial Models of Functional Disability, North American Actuarial Journal, 19:1, 41-59.

# SOA On line survey – likelihood of needing LTC

- Nursing Home
  - 9% Very Likely
  - 35% Likely
  - 39% Not Very Likely
  - 17% Not At All Likely
- Assisted Living Facility
  - 14% Very Likely
  - 44% Likely
  - 30% Not Very Likely
  - 12% Not At All Likely
- In-Home Care
  - 17% Very Likely
  - 44% Likely
  - 27% Not Very Likely
  - 11% Not At All Likely

Society of Actuaries, Long Term Care and the Middle Market: Sizing the Opportunity for New Ways to Finance Long Term Care, July 2018.

# Functional Disability including Trends and Uncertainty – HRS Data

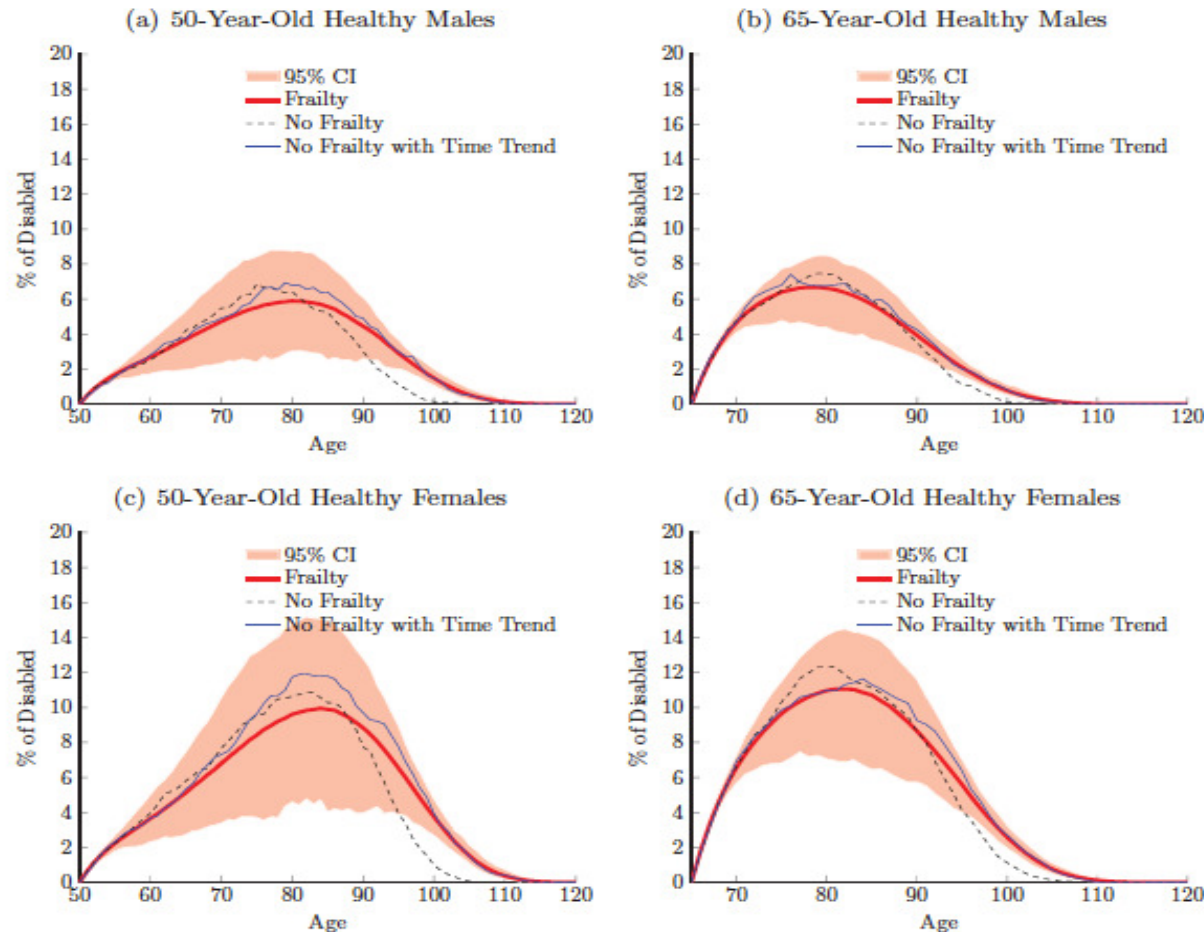


FIGURE 7. Simulated Proportion of Disabled Individuals for  $x = 50, 65$ .

Li, Z., Shao, W. A., and Sherris, M. (2017), The Impact of Systematic Trend and Uncertainty on Mortality and Disability in a Multistate Latent Factor Model for Transition Rates, *North American Actuarial Journal*, 2017, 1-17, doi: 10.1080/10920277.2017.1330157

# LTC Risks – HRS data

Table 4. Proportion of survivors in each health state for the simulated 65-year-old healthy male and female cohorts.

Age	Survivors	Healthy	Mildly Disabled	Severely Disabled
<i>Males</i>				
65	40,000	100.00%	0.00%	0.00%
70	35,834	90.30%	7.45%	2.25%
75	29,735	83.96%	11.68%	4.36%
80	22,129	78.44%	14.54%	7.02%
85	13,912	71.37%	17.91%	10.72%
90	6,612	61.04%	21.46%	17.50%
95	2,064	47.77%	24.90%	27.33%
100	340	27.35%	22.94%	49.71%
<i>Females</i>				
65	40,000	100.00%	0.00%	0.00%
70	37,597	88.25%	8.98%	2.77%
75	33,587	81.26%	12.86%	5.88%
80	27,735	73.17%	17.48%	9.35%
85	20,001	62.62%	22.47%	14.91%
90	11,375	47.41%	28.44%	24.15%
95	4,273	28.32%	32.44%	39.25%
100	855	11.46%	29.12%	59.42%

Shao A. W., Sherris, M and Fong, H. Y., (2017), Product Pricing and Solvency Capital Requirements for Long-Term Care Insurance, Scandinavian Actuarial Journal, Vol 2017, Issue 2, 175-208.



# Incidence of Disability – HRS data

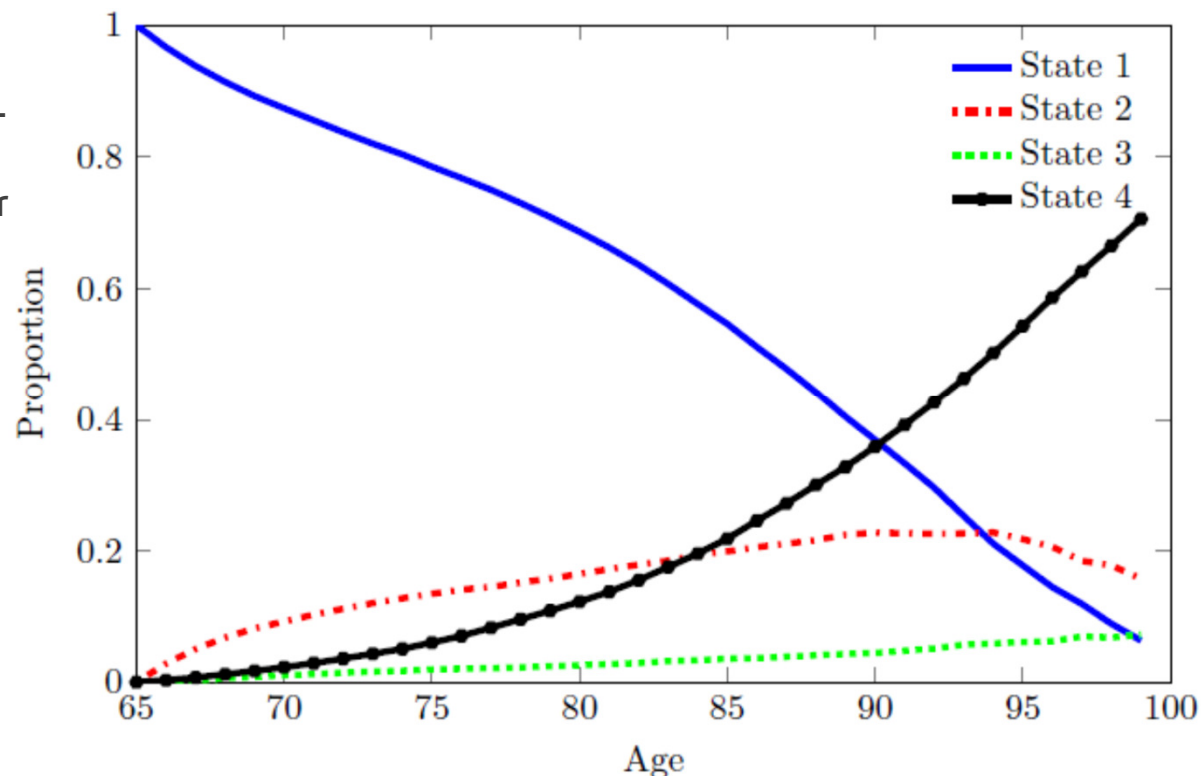
State 1 – Healthy

State 2 – Mildly Disabled – 1 ADL and at home

State 3 – Severely Disabled – 2 or more ADL and at home

State 4 – Institutionalised

Proportion of survivors



Shao, W. A., Chen, H. and Sherris, M. (2017), To Borrow or Insure? Long Term Care Costs and the Impact of Housing. CEPAR Working Paper (submitted for publication)



# LTC Insurance Premiums

Stand Alone Product – at home care support

Costs are relatively substantial

Table 6. Premiums (\$) of generic stand-alone LTC insurance policies sold to individuals in different health states and at different ages. The generic stand-alone LTC insurance pays \$100 per day while the insured is severely disabled.

Age	Males				Females			
	Lump sum	Continuous	Annual	Monthly	Lump sum	Continuous	Annual	Monthly
<i>Stand-alone policies sold to the healthy</i>								
55	15,923	1,138	1,126	95	27,526	1,825	1,806	152
60	16,766	1,350	1,333	112	28,913	2,127	2,101	177
65	17,448	1,619	1,596	135	30,313	2,535	2,501	211
70	17,915	1,964	1,933	163	31,469	3,084	3,036	257
75	18,193	2,428	2,383	202	32,099	3,824	3,753	318
80	18,403	3,094	3,025	257	31,924	4,828	4,719	402

Shao A. W., Sherris, M and Fong, H. Y., (2017), Product Pricing and Solvency Capital Requirements for Long-Term Care Insurance, *Scandinavian Actuarial Journal*, Vol 2017, Issue 2, 175-208.

# LTC Insurance Premiums

## Combo products – at home care support

Table 7. Premiums (\$) of generic rider benefit policies and life care annuities. The generic rider benefit policy pays \$100 per day while the insured is severely disabled and pays a death benefit of \$500,000 when the insured dies. The generic life care annuity pays \$50 per day while the insured is alive and additional \$50 per day while the insured is severely disabled.

Age	Males				Females			
	Lump sum	Continuous	Annual	Monthly	Lump sum	Continuous	Annual	Monthly
<i>Rider benefit policies sold to the healthy</i>								
55	226,927	16,219	16,042	1,350	209,708	13,906	13,759	1,158
60	258,649	20,826	20,570	1,734	239,785	17,637	17,426	1,468
65	291,614	27,053	26,675	2,252	272,847	22,820	22,509	1,900
70	324,797	35,615	35,044	2,964	307,940	30,183	29,708	2,512
75	357,067	47,658	46,767	3,965	343,570	40,930	40,171	3,406
80	387,212	65,096	63,649	5,415	377,597	57,100	55,821	4,750
<i>Life care annuities sold to the healthy</i>								
55	267,773	-	-	-	298,983	-	-	-
60	240,319	-	-	-	273,634	-	-	-
65	211,479	-	-	-	245,530	-	-	-
70	182,067	-	-	-	215,110	-	-	-
75	153,053	-	-	-	183,191	-	-	-
80	125,472	-	-	-	150,957	-	-	-

Shao A. W., Sherris, M and Fong, H. Y., (2017), Product Pricing and Solvency Capital Requirements for Long-Term Care Insurance, Scandinavian Actuarial Journal, Vol 2017, Issue 2, 175-208.

# LTC Insurance Costs and Reverse Mortgage

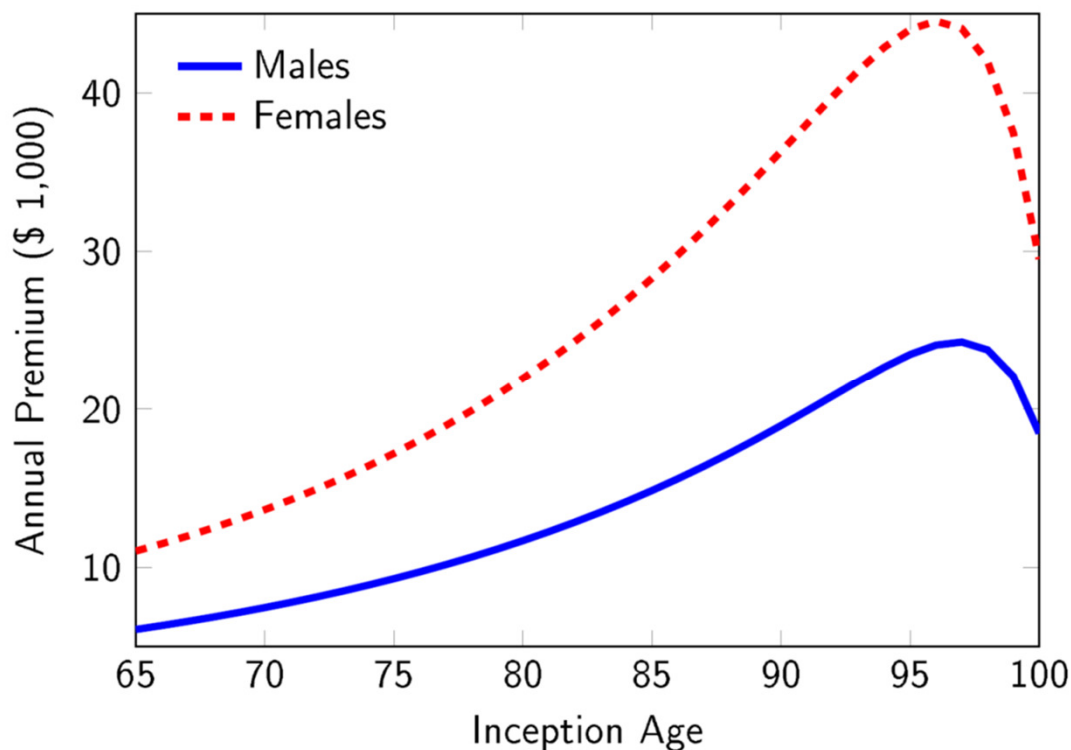
Private Insurance Genworth data (2016)

Assumed annual LTC costs

- Health State 2 - \$20k
- Health State 3 - \$40k
- Health State 4 - \$80k
- LTC costs growth rate 3% p.a.

Indicative pure risk premiums (no loadings or expenses)

# LTC Annual Premiums – HRS data

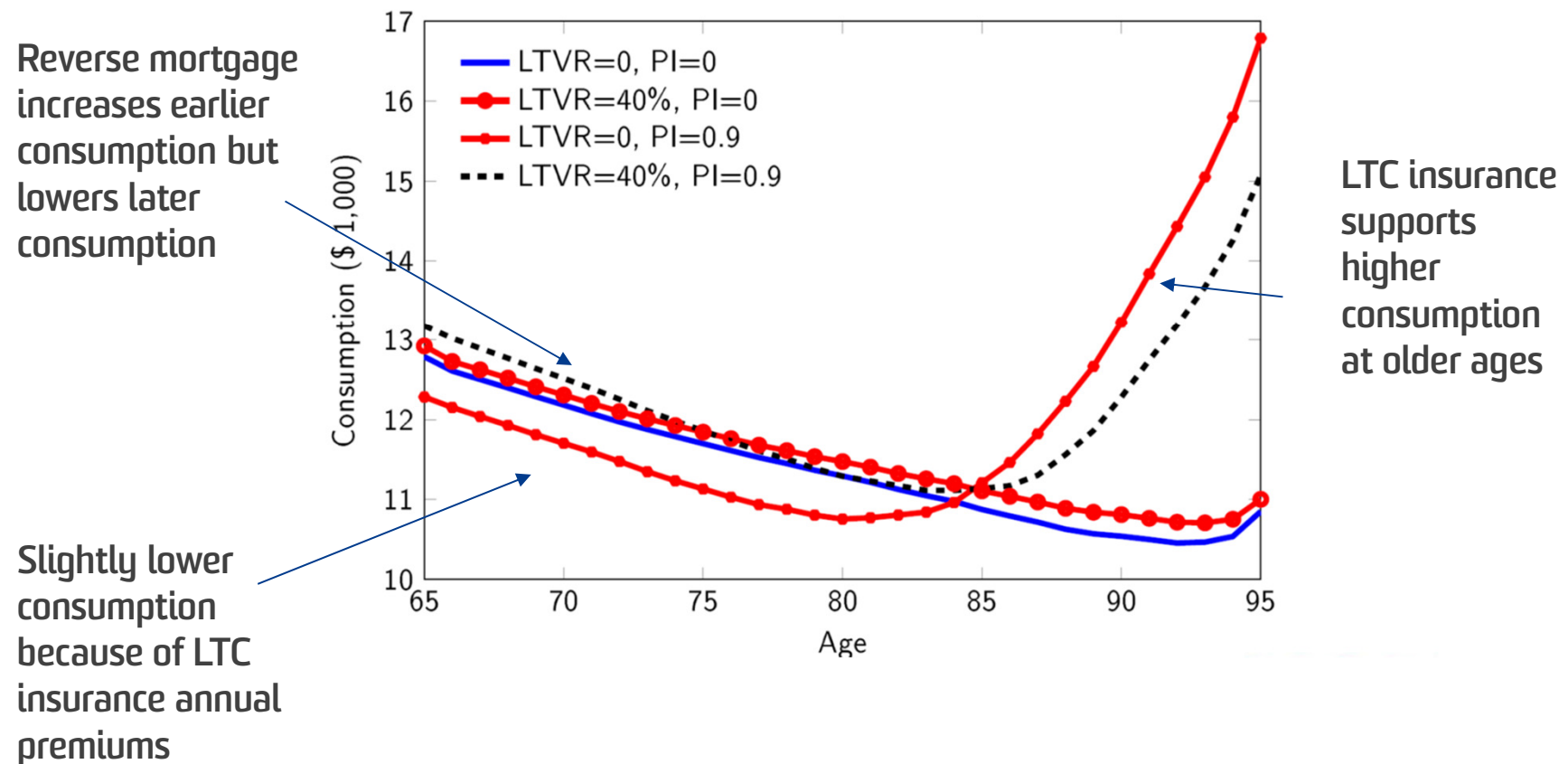


Significantly higher annual premiums for females

Substantial increases for later age purchases

Shao, W. A., Chen, H. and Sherris, M. (2017), To Borrow or Insure? Long Term Care Costs and the Impact of Housing. CEPAR Working Paper (submitted for publication)

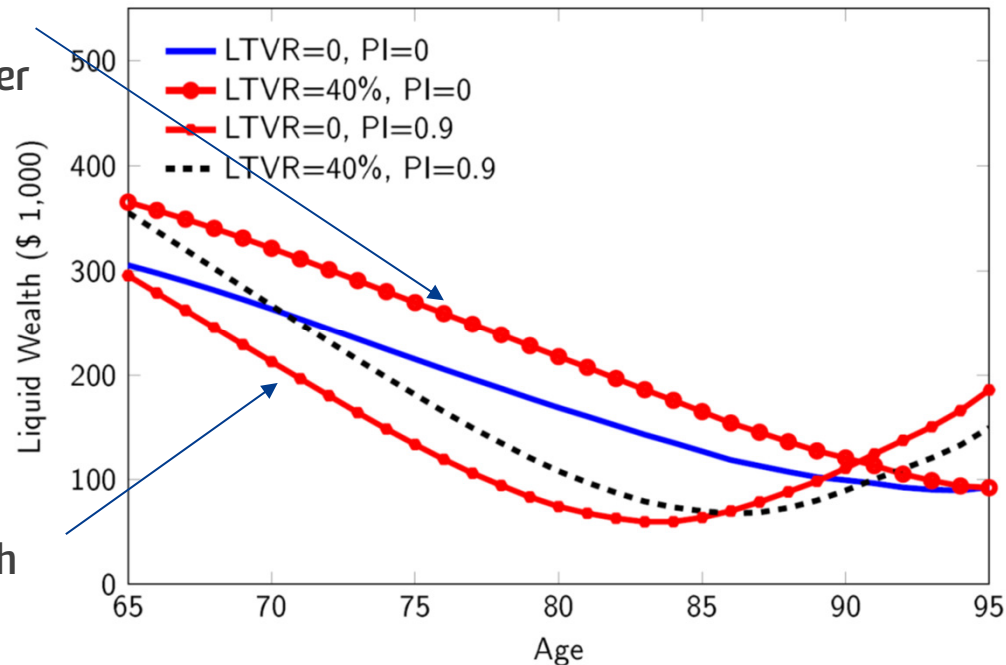
# Consumption with and without LTC Insurance and Reverse Mortgage



Shao, W. A., Chen, H. and Sherris, M. (2017), To Borrow or Insure? Long Term Care Costs and the Impact of Housing. CEPAR Working Paper (submitted for publication)

# Liquid Wealth with and without LTC Insurance and Reverse Mortgage

Reverse mortgage increases liquid wealth at younger ages



Lower liquid wealth because of LTC insurance annual premiums

Higher liquid wealth at older ages because of LTC insurance payments

Shao, W. A., Chen, H. and Sherris, M. (2017), To Borrow or Insure? Long Term Care Costs and the Impact of Housing. CEPAR Working Paper (submitted for publication)

# Wrap Up

Currently mostly government funded but increasing need for individual private LTC - changes expected in risk and cost sharing in many countries

Range of ways of insuring and funding LTC

- LTC insurance depending on functional disability (higher benefits for higher levels), stand alone and “combo” products
- life care pensions/annuities,
- life insurance riders for critical illness,
- reverse mortgages and other private savings

Risks and costs are substantial and earlier funding or insuring is beneficial

Need for integration with public/government financing, community and family support

# References

- Fong, H. Y., Shao W., and Sherris, M. (2015), Multi-State Actuarial Models of Functional Disability, North American Actuarial Journal, 19:1, 41-59.
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