



***“Good Life Time” (GLT): Health,
Income, and the Time to Enjoy Them***

***A New Framework and Index for
Measuring Social Progress***

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***n.b. don't forget to look at
(speaker's) notes view***

Basic Ideas



- develop a statistical framework + summary index for measuring social progress
- focus on three major life domains – patterns of time use, money, and health status
- build on the concepts underlying the most widely used health measure, life expectancy (LE) – the life table and generalizations
 - marital status life tables in demography
 - working life tables in economics
 - health-adjusted life expectancy (HALE)

Plan of Presentation

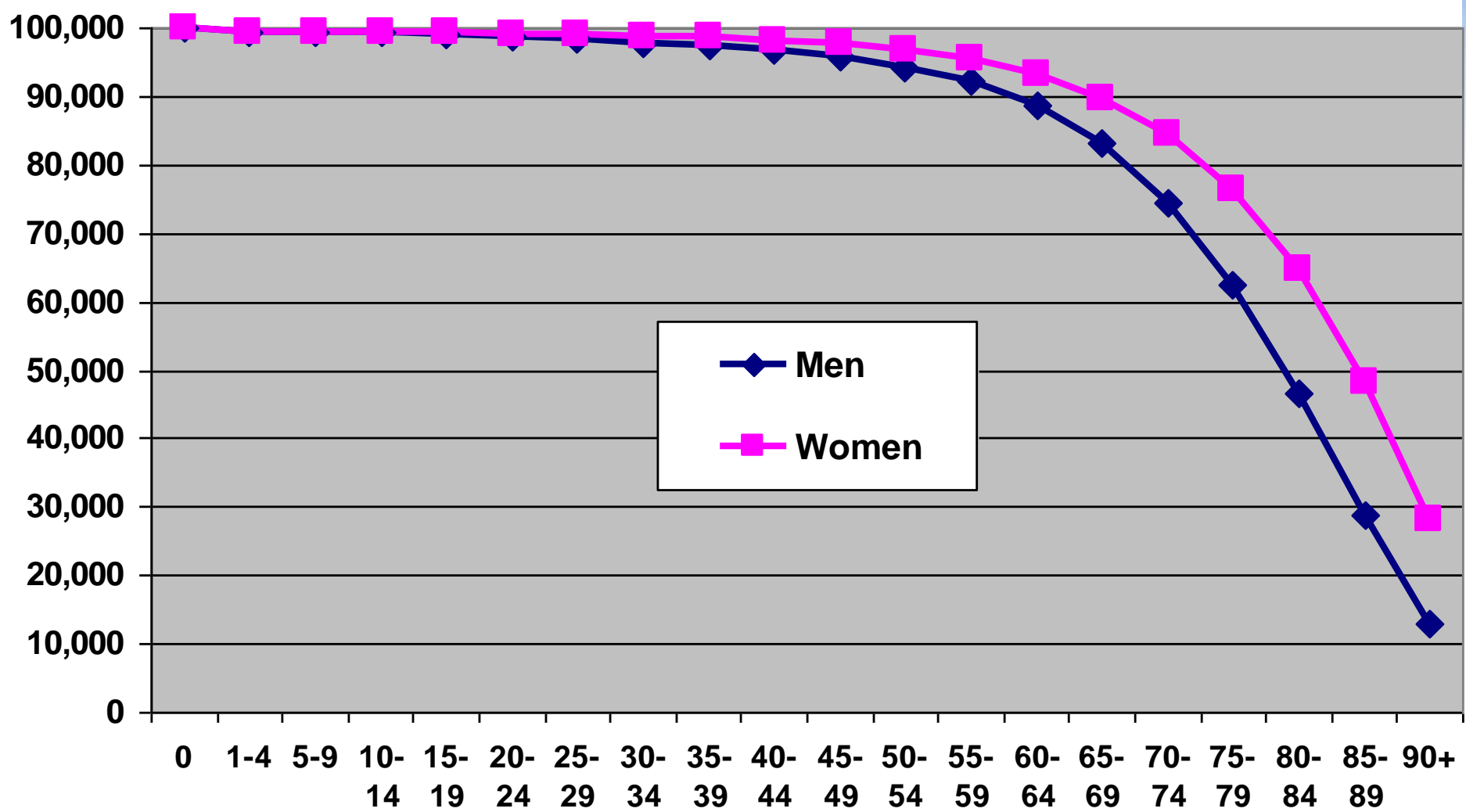


- clarify basic population demography and related concepts to be used
- show how life expectancy (LE) can be generalized, based on Canadian data
- examine three core aspects of social activity – time, money, health – one at a time
- then define GLT as the intersection: enough time + enough money + adequate health
- acknowledge intellectual foundations
- brief description of underlying methods

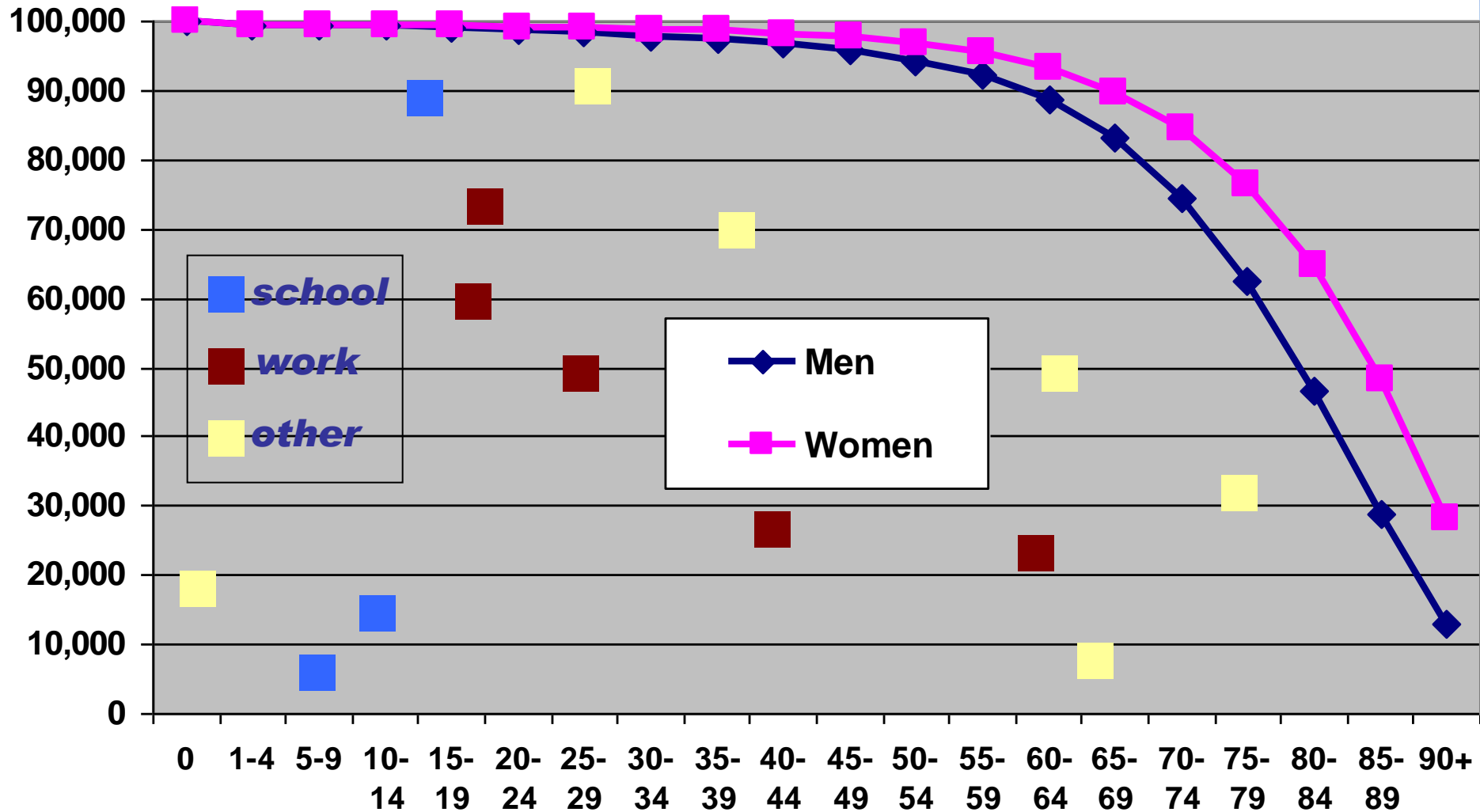
Basic (Very Abridged) Life Table

<u>Age Group</u>	<u>Population</u>	<u>Mortality Rate</u>	<u>Deaths</u>
births	1,000		
0 - 19	980	2%	20
20 - 39	970	1%	10
40 - 59	922	5%	49
60 - 79	783	15%	138
80 - 99	392	50%	392
100+	-	100%	392
	80,941	= total life years	
	80.9	= life expectancy	

Survival Curves (Canada, 1998)



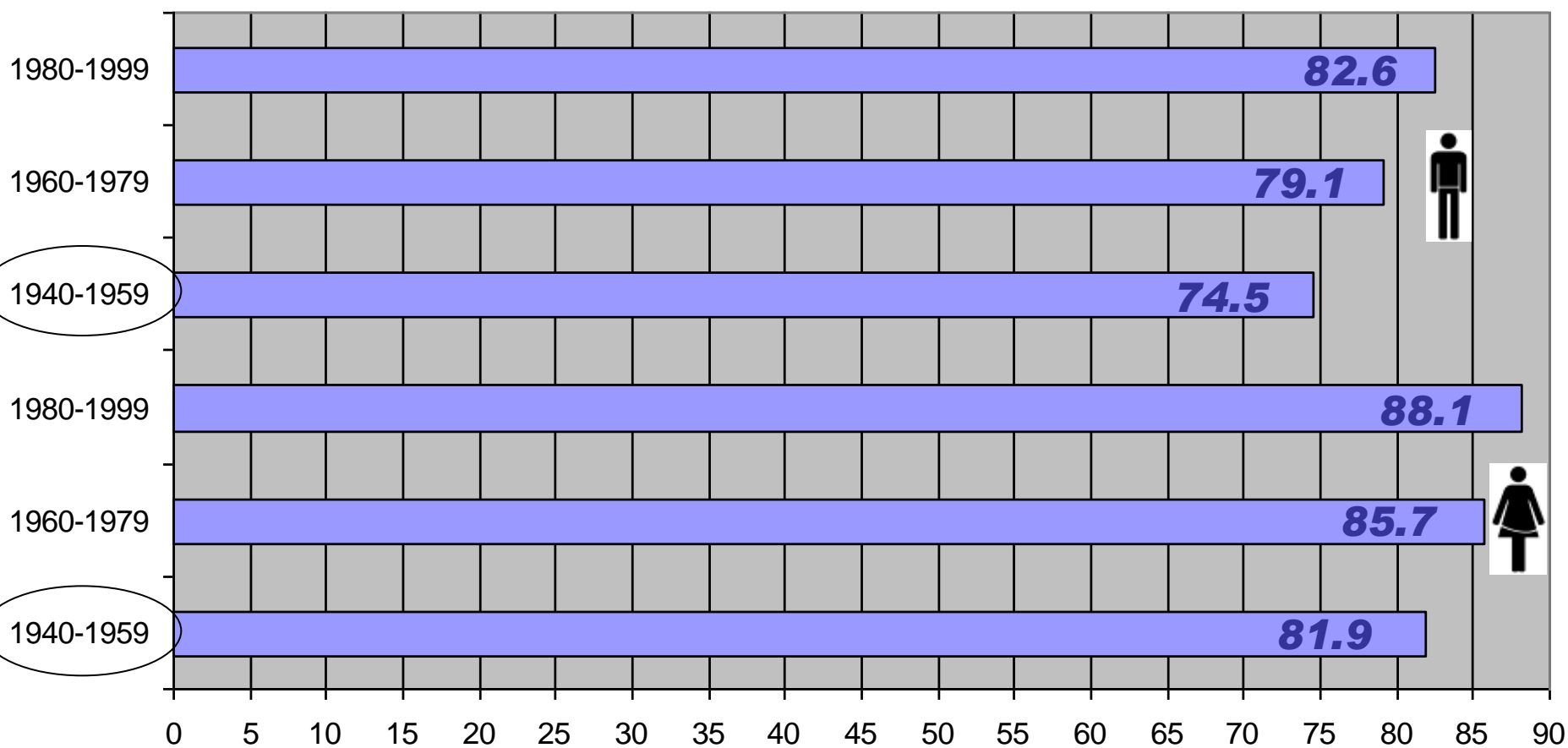
Survival Curves (Canada, 1998)



Working Life Table Results, Canada

Year	average age at			number of	
	entry to labour force	retire- ment	death	working years	retire- ment years
1921	16.5	63.7	67.6	47.2	3.9
1931	17.0	64.0	68.4	47.0	4.4
1941	17.2	64.1	69.1	46.9	5.0
1951	17.5	63.9	70.4	46.4	6.5
1961	18.2	64.0	71.2	45.8	7.2
1971	19.8	63.3	71.3	43.5	8.0

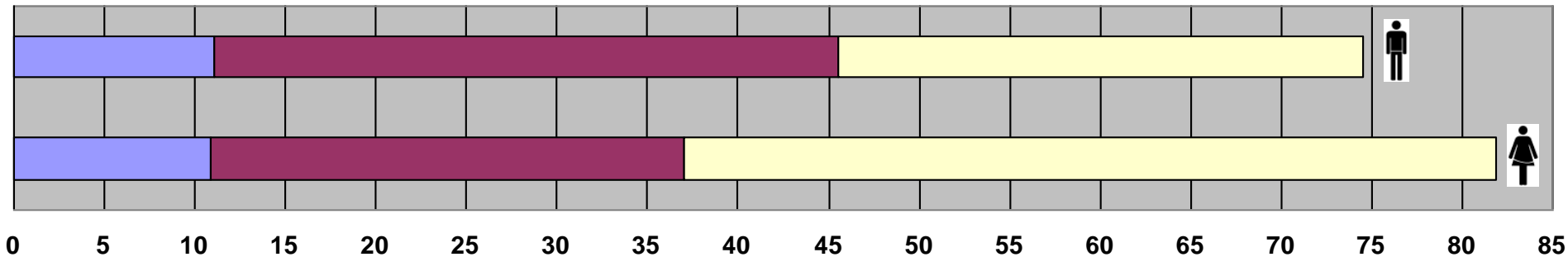
Life Expectancy by Sex for Three Birth Cohorts, Canada



Life Expectancy by Main Activity

(Canada, 1940 – 1959 birth cohort)

Sir Richard Stone's "Active Sequence" from UN proposed System of Social and Demographic Statistics
in school, employed at least 15 hours per week, other

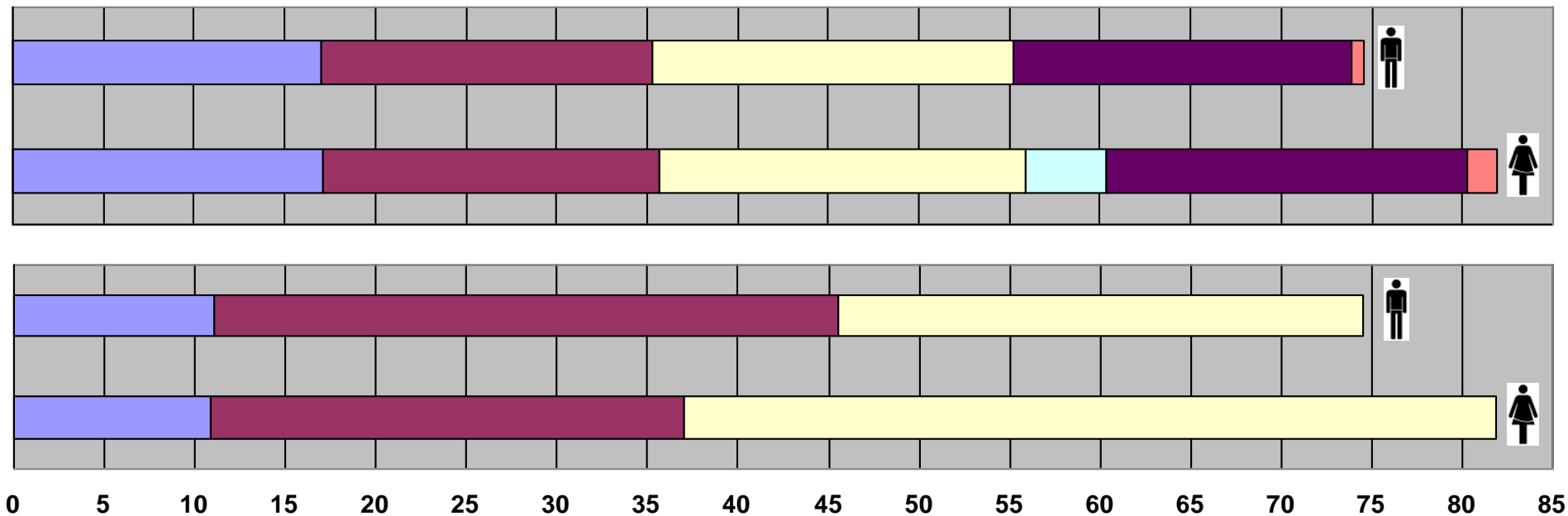


Life Expectancy by Main Activity and Demographic Status

(Canada, 1940 – 1959 birth cohort)

Sir Richard Stone's "Active" and "Passive Sequences" from UN proposed System of Social and Demographic Statistics

never married and age < 18, couple no kids, couple with kids, lone parent, other household, institution



A Different way to Decompose Life Expectancy



- continue to use time (years) over the life cycle, and decompositions of LE, as the basic framework (i.e. time as measure for accounting)
- consider three distinct ways of decomposing – how many days over a lifetime have adequate
 - time (minutes or hours per day)
 - money (income in dollars)
 - health (some health status metric)
- and finally, all three at once
- n.b. we really have four numeraires here

Time Domain



- **key choices**
 - **which basic concept to use for “adequate time”**
 - **what cut-points**
- **use “leisure time” (minutes per day) =**
 - active leisure – e.g. physical activity +**
 - passive leisure – e.g. TV, movies +**
 - socializing – e.g. dining out**
- **cut-points: 3 or 6 hours per day**
 - **n.b. averaged over both weekdays and weekends**
- **based on time diary data from the General Social Survey**

Digression – Leisure Is Not Always the Most Valued Use of Time

	Age Groups						
	<u>all*</u>	<u>males</u>	<u>females</u>	<u>15-24</u>	<u>25-44</u>	<u>45-64</u>	<u>65+</u>
Cleaning	2.4	2.2	2.6	2.1	2.4	2.5	2.8
Groceries	2.7	2.5	2.8	2.6	2.6	2.6	2.9
Maintenance	2.9	3.3	2.5	2.6	2.9	3.0	3.1
Other Shopping	3.0	2.5	3.4	3.5	2.9	2.7	2.9
Communting	3.0	3.0	3.0	2.8	3.0	3.2	3.8
Clubs	3.1	3.0	3.1	3.4	3.1	2.9	3.0
Volunteering	3.3	3.0	3.5	3.1	3.2	3.4	3.5
Cooking	3.3	3.1	3.4	3.1	3.3	3.3	3.3
TV	3.3	3.3	3.2	3.4	3.2	3.1	3.6
Social Events	3.5	3.3	3.7	3.8	3.5	3.3	3.2
Movies / Plays	3.7	3.7	3.7	4.3	3.9	3.4	2.9
Paid Work	3.8	3.8	3.8	3.7	3.7	3.9	4.2
Dining Out	4.0	3.8	4.1	4.0	4.1	3.9	3.7
Supper at Home	4.0	4.1	4.0	3.8	4.1	4.1	4.1

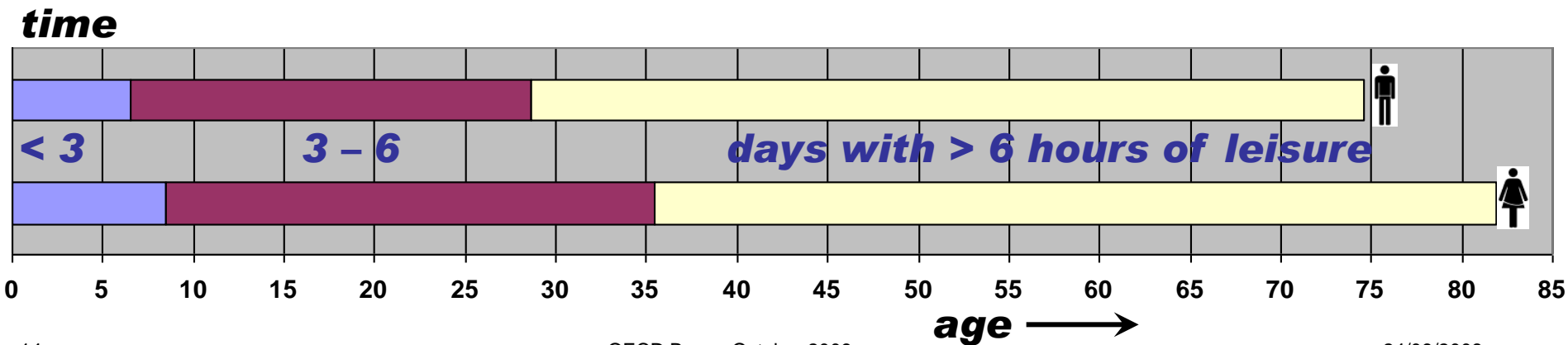
* basis for sorting

five-point scale with 1 being “dislike a great deal” and 5 being “enjoy a great deal”

Life Expectancy by Leisure Time

(Canada, 1940 – 1959 birth cohort)

n.b. total days over an average lifetime where leisure time less than 3, between 3 and 6, or more than 6 hours per day



Money Domain



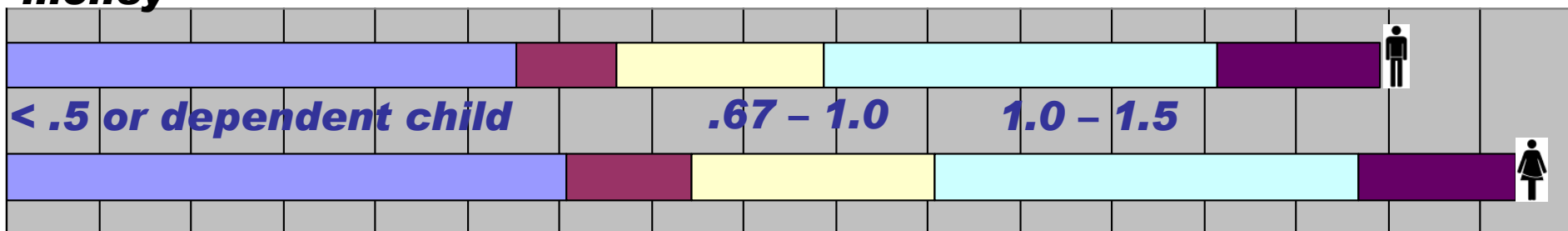
- key choices: income recipient unit, income concept, method for adjusting for family size, and income cut-point
- income unit: nuclear (census) family
- income concept: disposable money income
- family size adjustment: Stat Can LIM
- cut-points: 50, 67, 100 and 150% of (adjusted) median family disposable income
 - n.b. usual “low income line” = 50% of median
- based on data from household income and labour force surveys, census, and tax returns

Life Expectancy by Leisure Time and Money

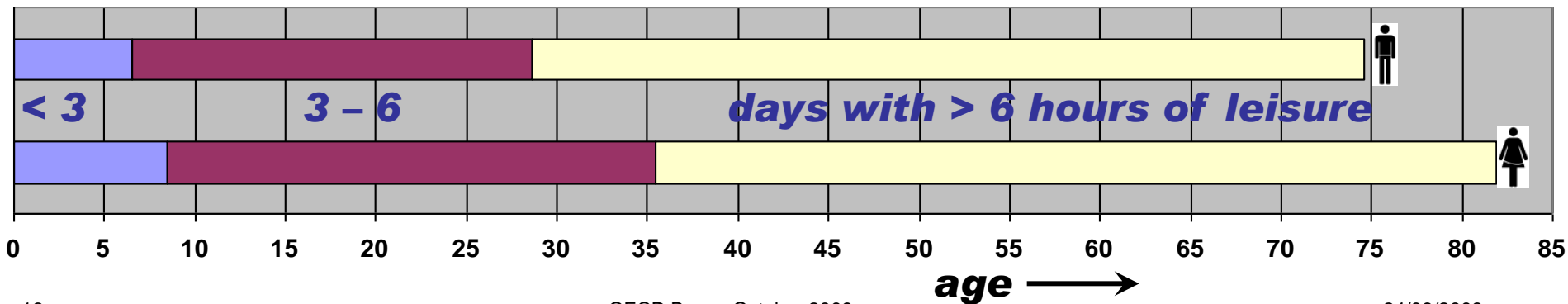
(Canada, 1940 – 1959 birth cohort)



money



time



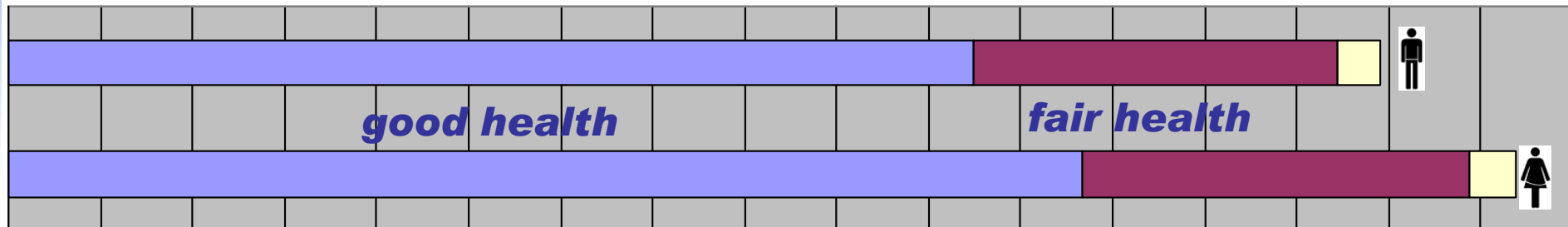
Health Domain

- key choices: definition of “health”, and cut-point dividing adequate and inadequate
- using McMaster “Health Utility Index” (HUI)
- based on eight health (sub) domains: vision, hearing, communicating, mobility, dexterity, pain, affect, cognition
- rolled up (based on an empirical preference function) into a zero (dead) to one (full health) index for each person
- cut-points at 0.9 and 0.5
- data from National Population Health Survey

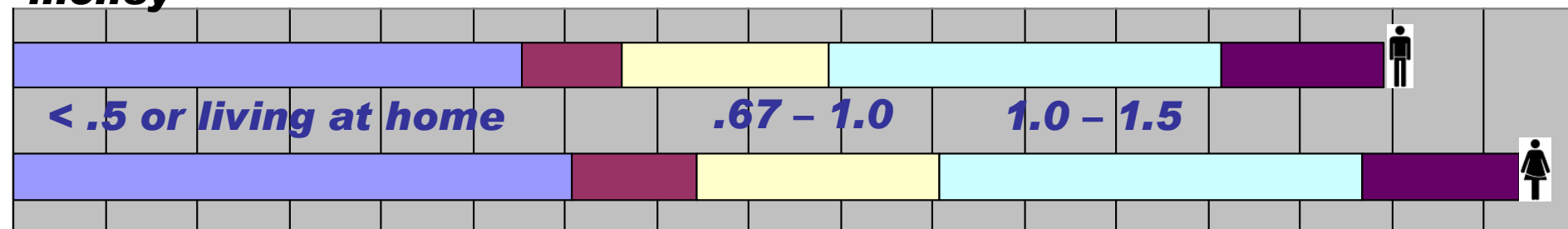
Life Expectancy by Leisure Time, Money, and Health

(Canada, 1940 - 1959 birth cohort)

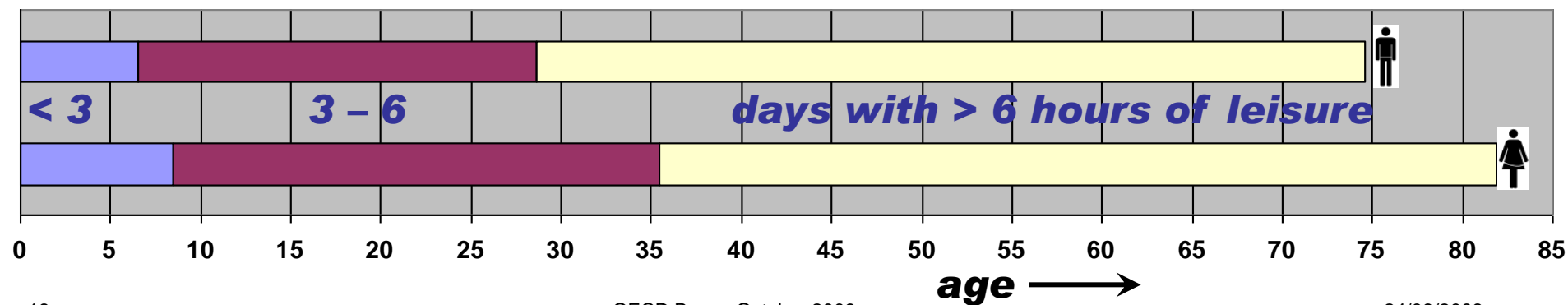
health



money



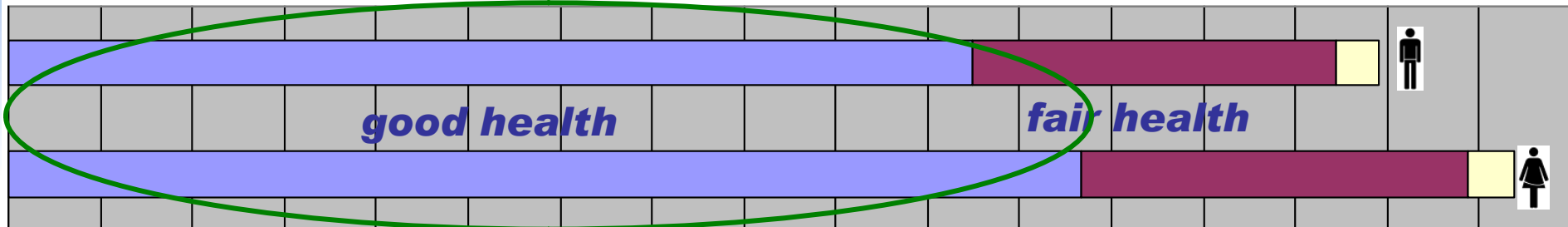
time



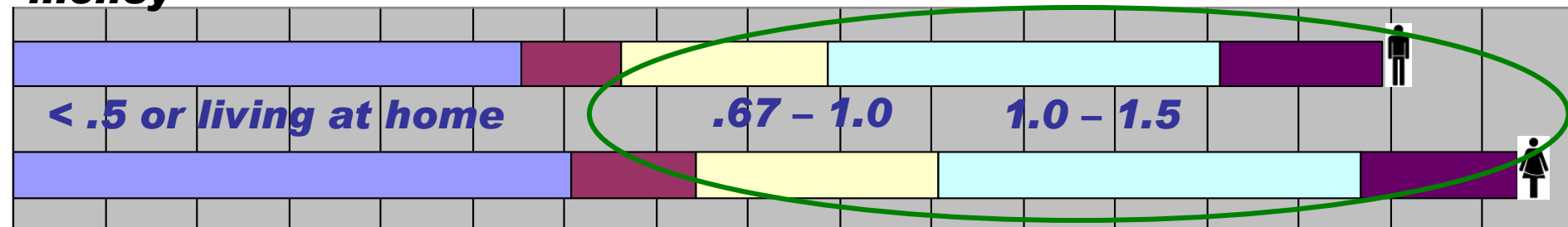
Life Expectancy by Leisure Time, Money, and Health

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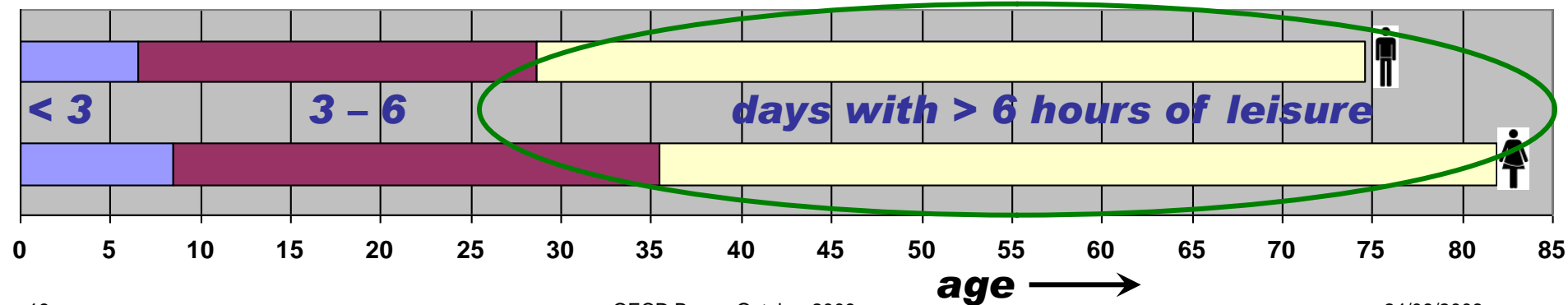
health



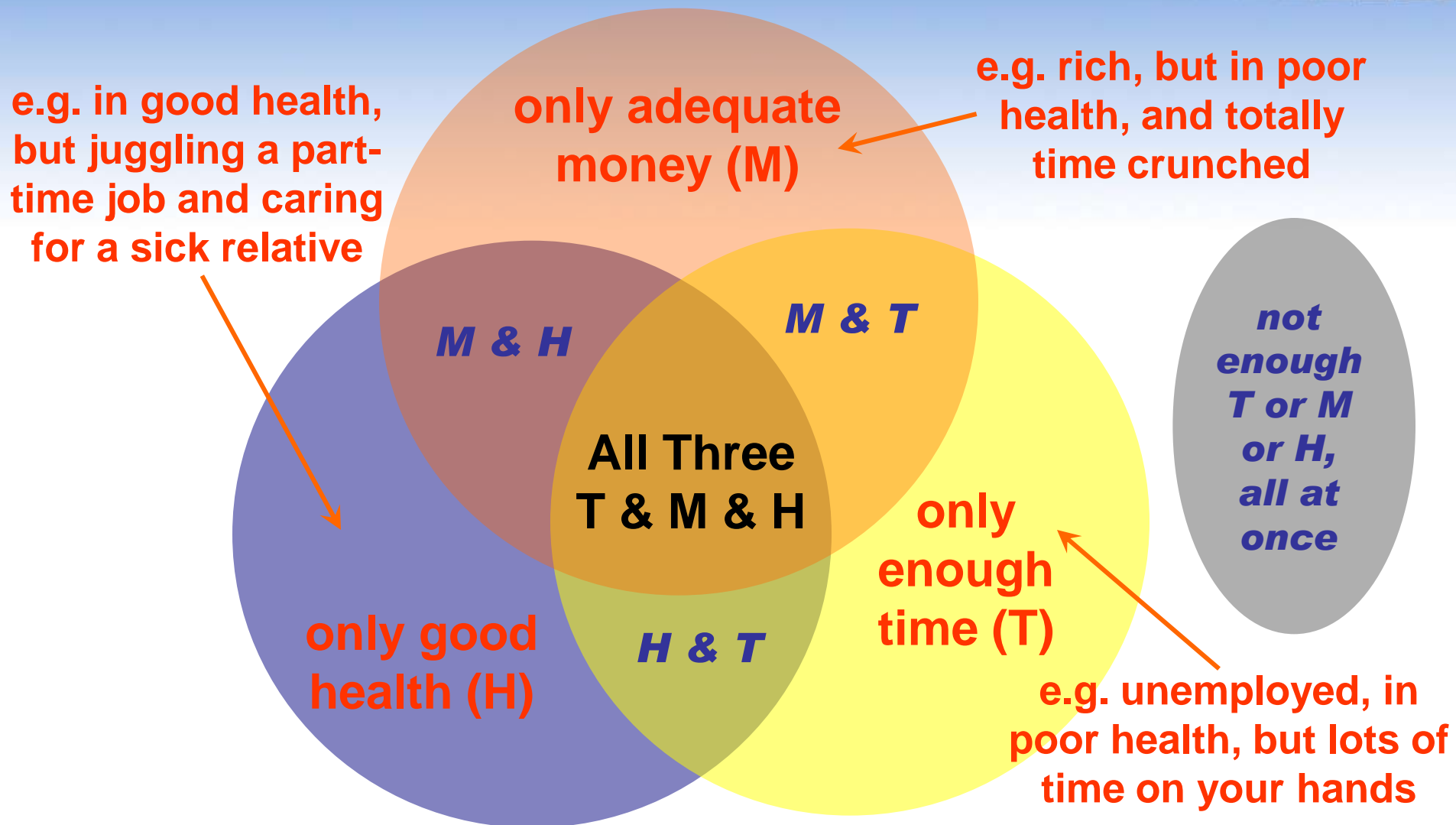
money



time



GLT – Combining Adequate Time, Money and Health



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(Canada, 1940 – 1959 birth cohort, ages 25+)

**estimated distribution
of days over entire
lifetime from age 25 for
all combinations of
TMH**

***t* < 6 hours leisure / day**

***T* > 6 hours leisure / day**

***m* < 0.67 median income**


***M* > 0.67 median income**

***h* < 0.9 health index**

***H* > 0.9 health index**

	Females	Males
t m h	3.2	2.1
t M h	9.2	9.5
t m H	8.8	6.2
T m h	5.2	4.1
t M H	30.4	27.3
T M h	10.4	13.1
T m H	9.7	9.5
T M H	23.1	28.0

Sensitivity Analysis – GLT Using Different Cut-Points for TMH

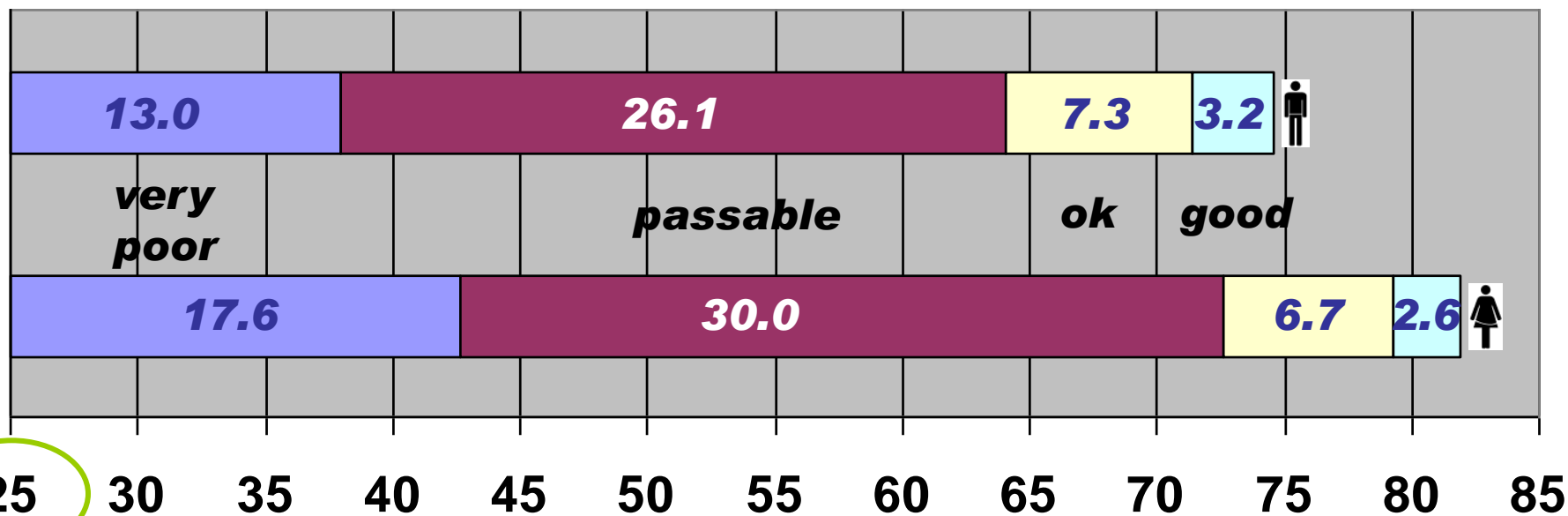


- very poor: at least one domain is at the lowest level -- < 3 hours per week of leisure time, < half the median family income (adjusted for family size), and a health index < 0.5
- passable: 3 to 6 hours leisure time, at least two-thirds median income, and health index between 0.5 and 0.9
- ok: at least 6 hours leisure time, income above median, and health index > 0.9
- good: not only “ok”, but also income above 1.5 median

(n.b. combinations actually more tricky than this)

GLT Estimate for 1940 – 1959 Birth Cohort, Canada

- for men in this cohort, of the almost 50 years life expectancy remaining at age 25, about 10.5 years are expected to be spent in “ok” or “good” GLT
- even though women have longer life expectancy, their “ok” or “good” GLT is less, about 9.3 years



Underlying Methodology



- microsimulation modeling – Statistics Canada’s LifePaths model in this analysis
- weaves together data from many different sources (e.g. census, labour force and health and time use surveys, vital statistics)
- can be extended to do policy / “what if” simulations – e.g. childcare (T), public pensions (M), health promotion / care (H)
- resource intensive

Simpler Methodology Available



- use only cross-sectional data – mortality rates, income / health status / leisure time (time use patterns) from population surveys
- start with conventional life table
- then layer on other characteristics (i.e. TMH \equiv time, money and health) using Sullivan method
 - joint distributions of TMH (by age and sex) can be constructed by synthetic matching if not all available on the same survey / microdata set
 - n.b. can only do period estimates properly

Credits / Intellectual Foundations



- **Sir Richard Stone's (1973) System of Social and Demographic Statistics (SSDS)**
- **Guy Orcutt (1971) – dynamic microsimulation**
- **UN (1979, Kerstenetzky, Fellegi) – integrated cross-sectional data bases via synthetic matching**
- **Richard Ruggles (1981) – creation of synthetic longitudinal microdata from dynamic microsimulation**
- **Tom Juster (1981) – time-based social accounts**
- **James Heckman et al. (1980s) – (r)evolution in longitudinal data use and analysis**
- **Steve Gribble et al. (1990s) – Statistics Canada's ModGen software and architecture, and LifePaths microsimulation model**

Concluding Comments



- we have demonstrated the construction of a salient summary measure for assessing the progress of societies – GLT
- this summary measure is at the apex of a coherent *family* of measures, based on a complete population life cycle framework → “drill down” capacity
- methodologies feasible for a broad range of countries
- next steps:
 - discuss / debate ideas in GLT framework
 - build up time series to track GLT and its components