

Beyond GDP: Recalling and Rejuvenating Sir Richard Stone's System of Social and Demographic Statistics (SSDS)

Michael Wolfson and Geoff Rowe

University of Ottawa and Statistics
Canada (mwolfson@uottawa.ca)

Basic Ideas

- “appropriate measures of social progress are too important to be mere satellites orbiting the sun of the SNA” = not a satellite account
- develop a new statistical framework + its own “apex indicator”; time (not \$) as numeraire
- focus on three major life domains – patterns of time use, money, and health status
- build on concepts underlying
 - used health measure, life expectancy
 - the life table and its generalization
 - marital status life tables in demography
 - working life tables in economics
 - health-adjusted life expectancy (HALE)

- **n.b not HDI**
- **education → time**
- **not instrumental, directly valued**

Credits / Intellectual Foundations

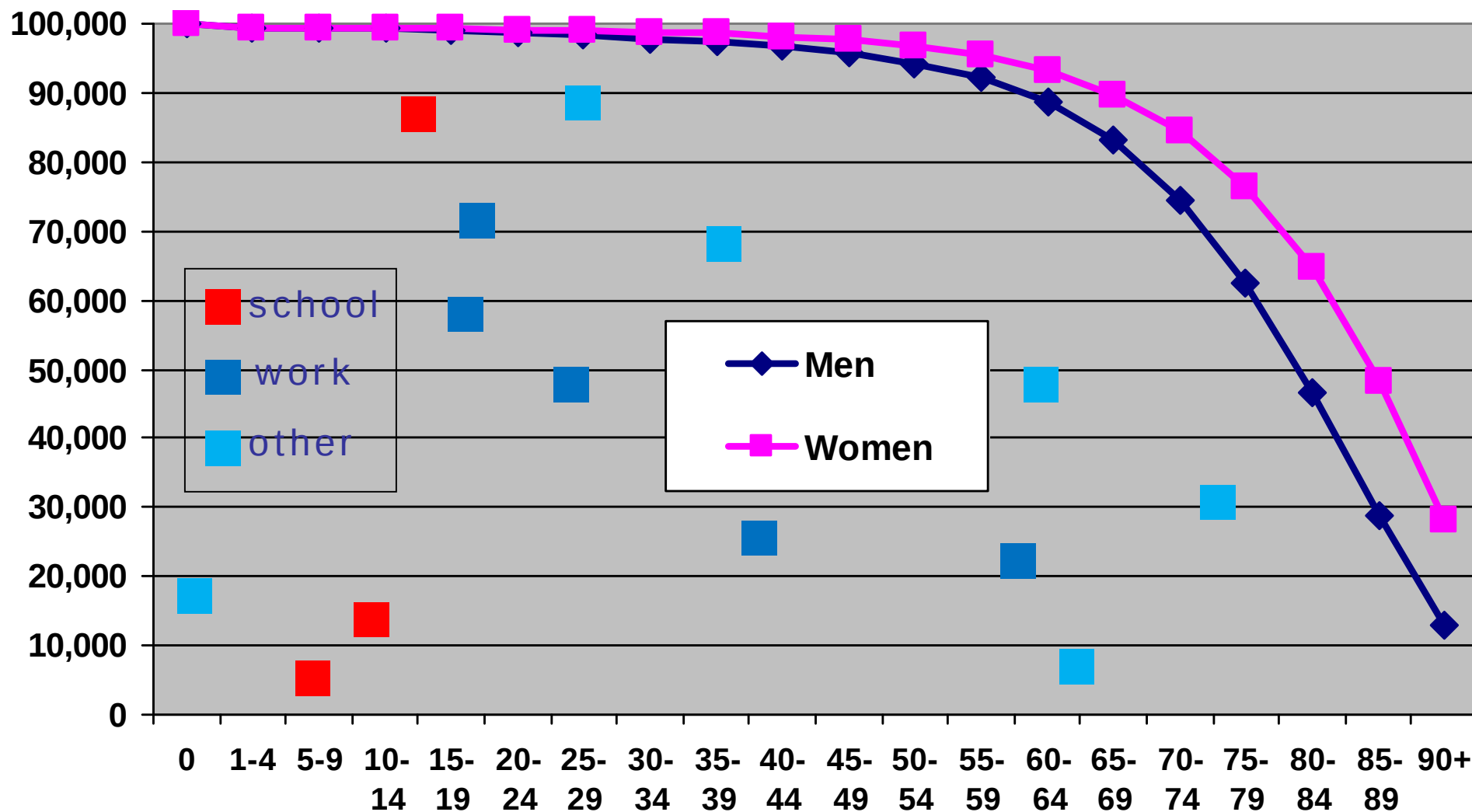
- **Sir Richard Stone's (1973) System of Social and Demographic Statistics (SSDS)**
- **Guy Orcutt (1971) – dynamic microsimulation**
- **UN (1979, Kerstenetzky, Fellegi) – integrated cross-sectional data bases via synthetic matching**
- **Richard Ruggles (1981) – creation of synthetic longitudinal microdata 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**
- **Peter Hicks – intellectual and financial support**

Reasons for the Failure of the SSDS

- depression and financing WW II versus social policy
- need for longitudinal microdata, technical complexity
- rise of SAMs and environmental accounting
- “the system did not catch on in the way the SNA had. I think I can see the reasons why. Unlike the SNA, it had not been introduced in gradual, easily digestible stages. From the point of view of official statisticians, it was long and full of unfamiliar stuff, the taxonomic proposals were very elaborate, and there was a lot of mathematics, which is still apt to turn people off. ... I think it fell between three stools, that is between the three specialisms of economics, demography, and sociology.” (quoted in Pesaran, 1991)

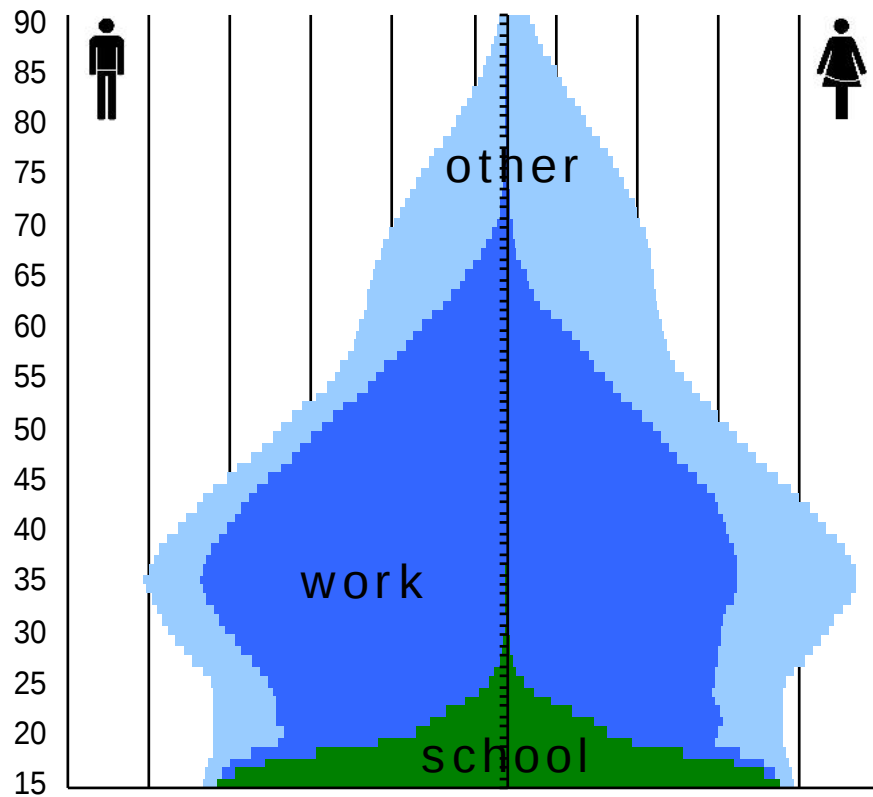
Survival Curves (Canada, 1998)

+ Partitioning and Classifying Life Years

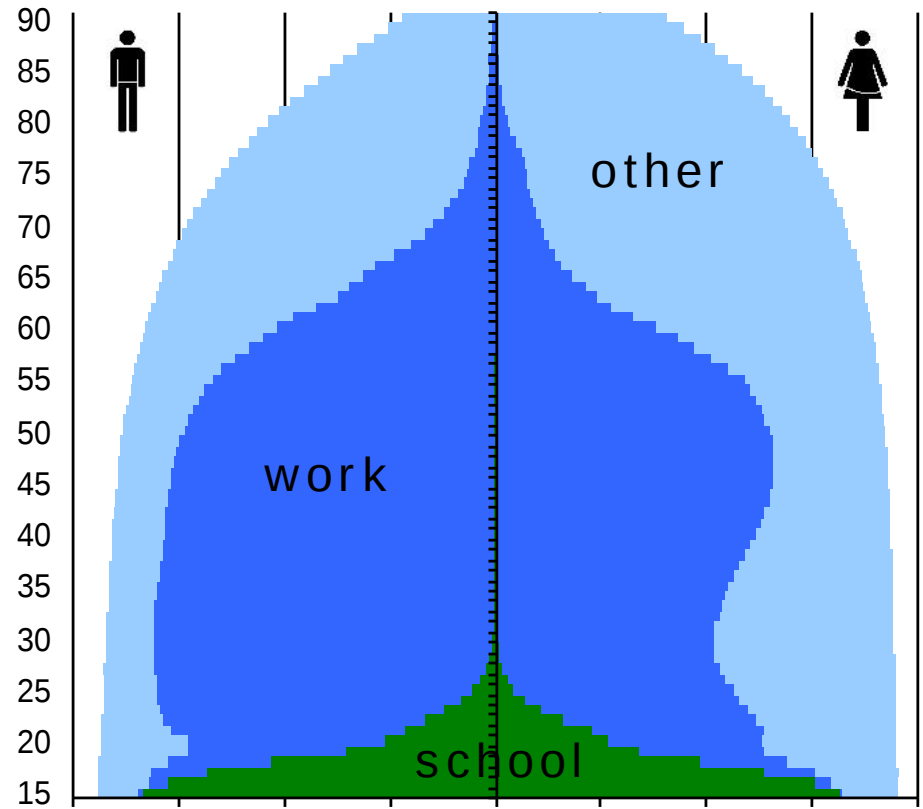


Canadian 1990s Population Pyramids by Main Activity and Method – Period (1990s) and Cohort (1940-59) Views

a. directly observed

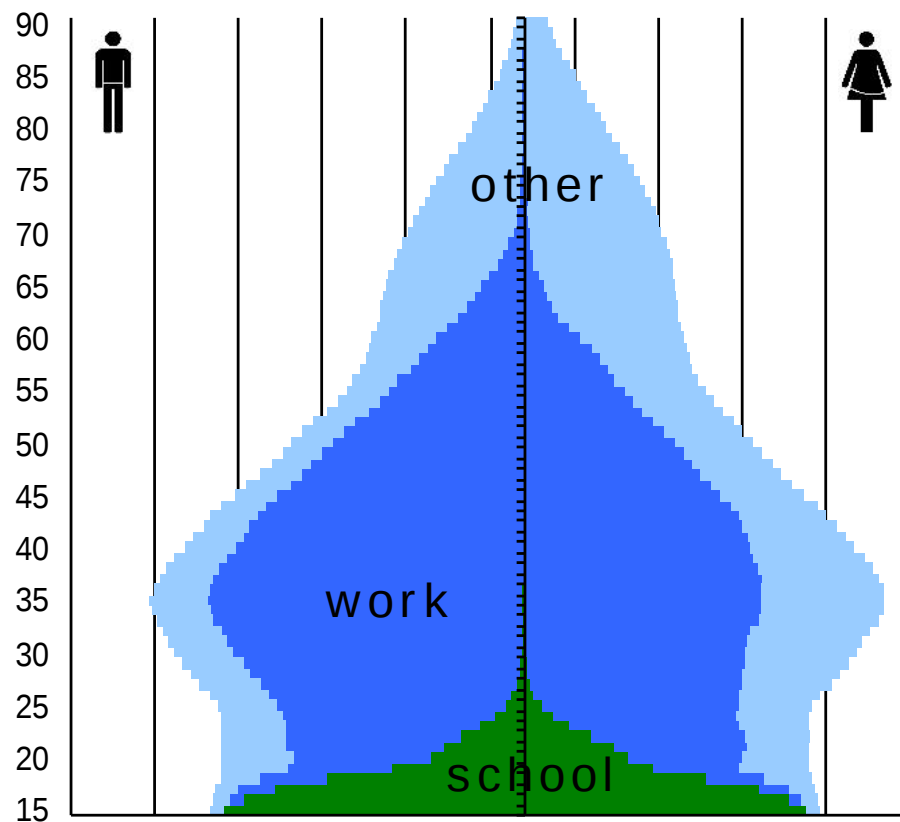


b. life table

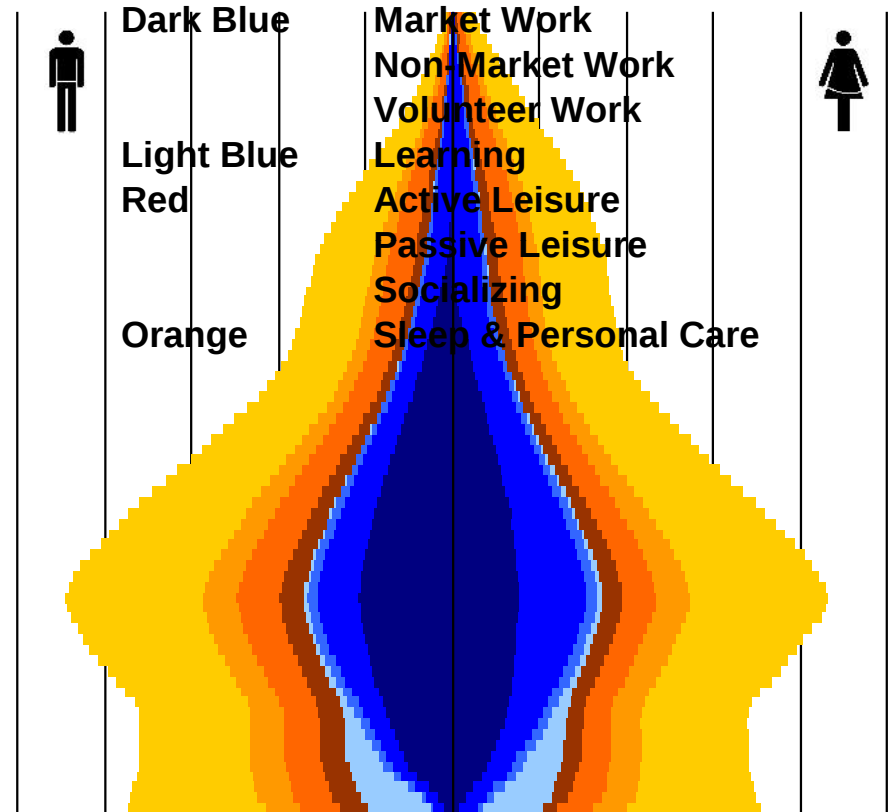


Period (1990s) View – Conventional Main Activity and Time Use Views

a. conventional main activity



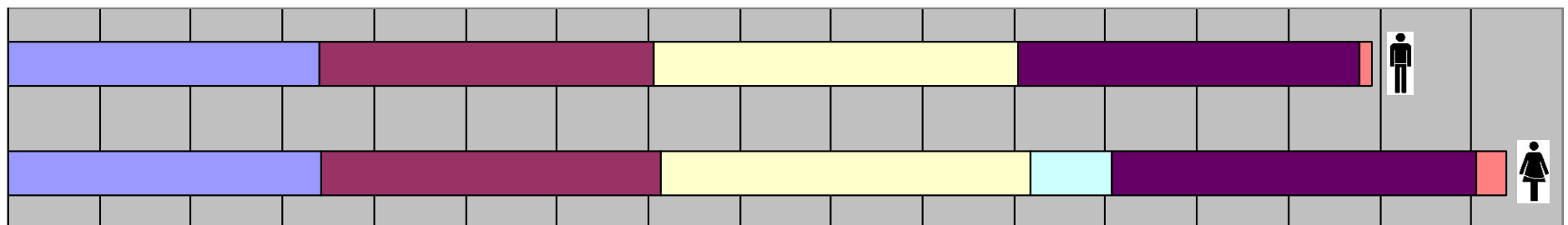
b. using time use patterns



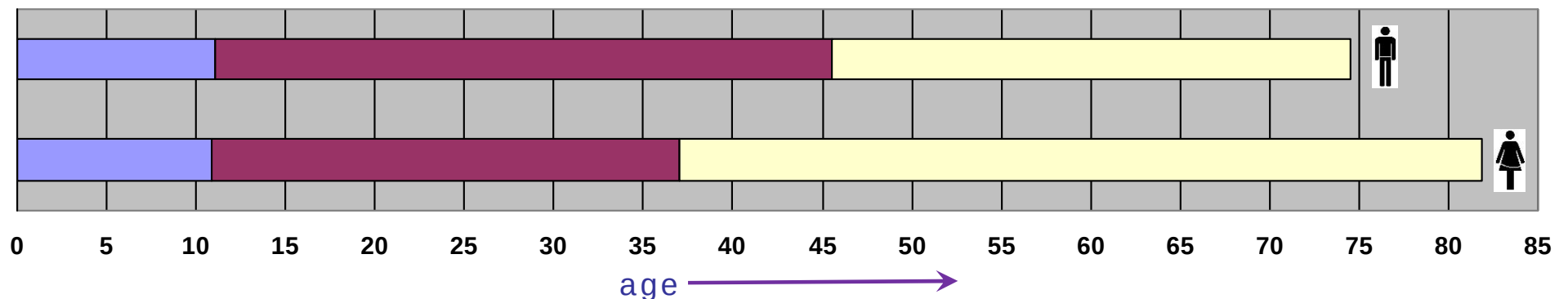
Life Expectancy by Main Activity and Demographic Status

(Canada, 1940 – 1959 birth cohort)

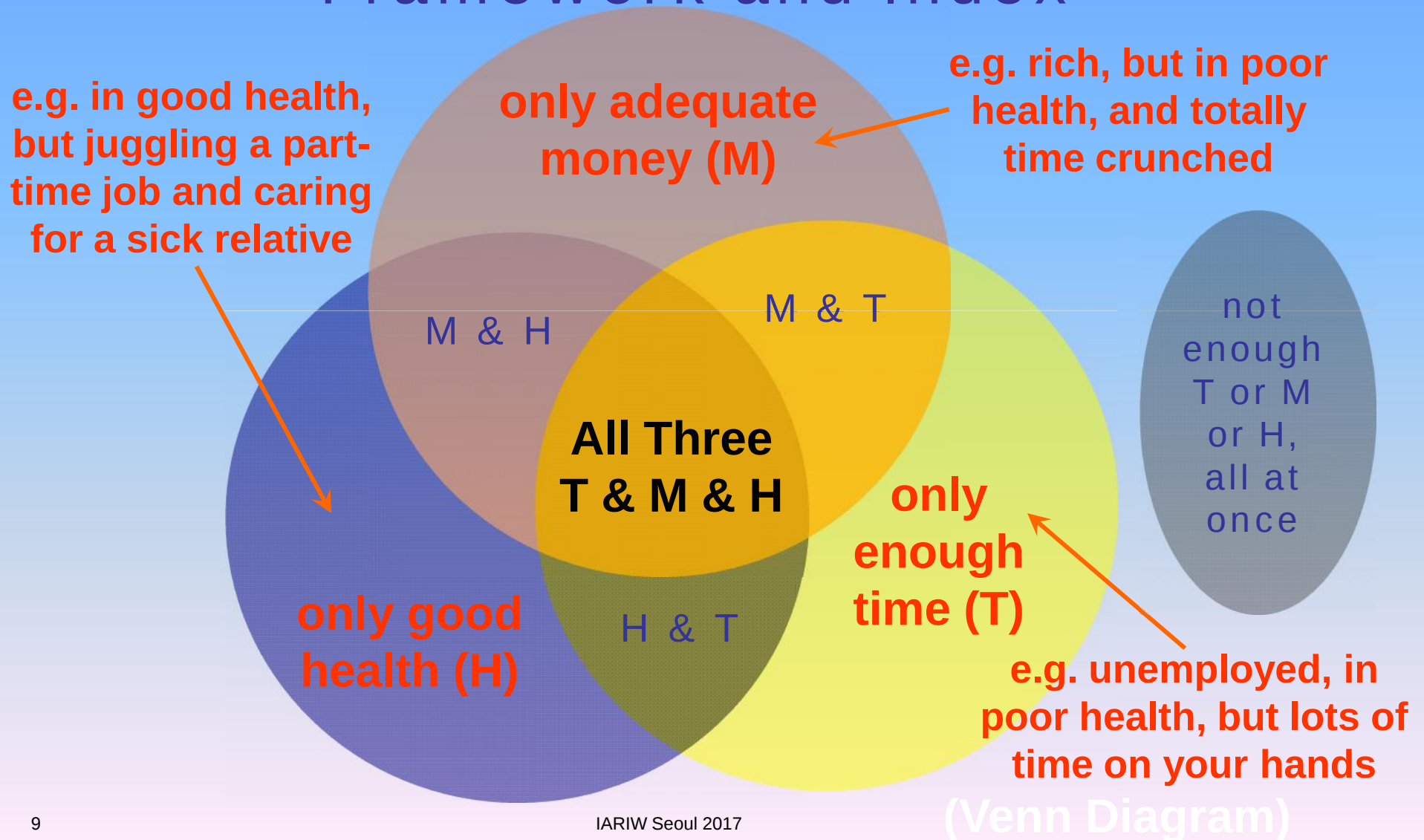
b. “Passive Sequence” (never married and age < 18, couple no kids, couple with kids, lone parent, other household, institution)



a. “Active Sequence” (in school, employed at least 15 hours per week, other)



Adequate Time, Money and Health – the Focus of the GLT Framework and Index



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

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

• **n.b more general than MELI**

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 (0.0 = dead) to one (1.0 = full health) index for each person
- cut-points at 0.9 and 0.5
- data from National Population Health Survey

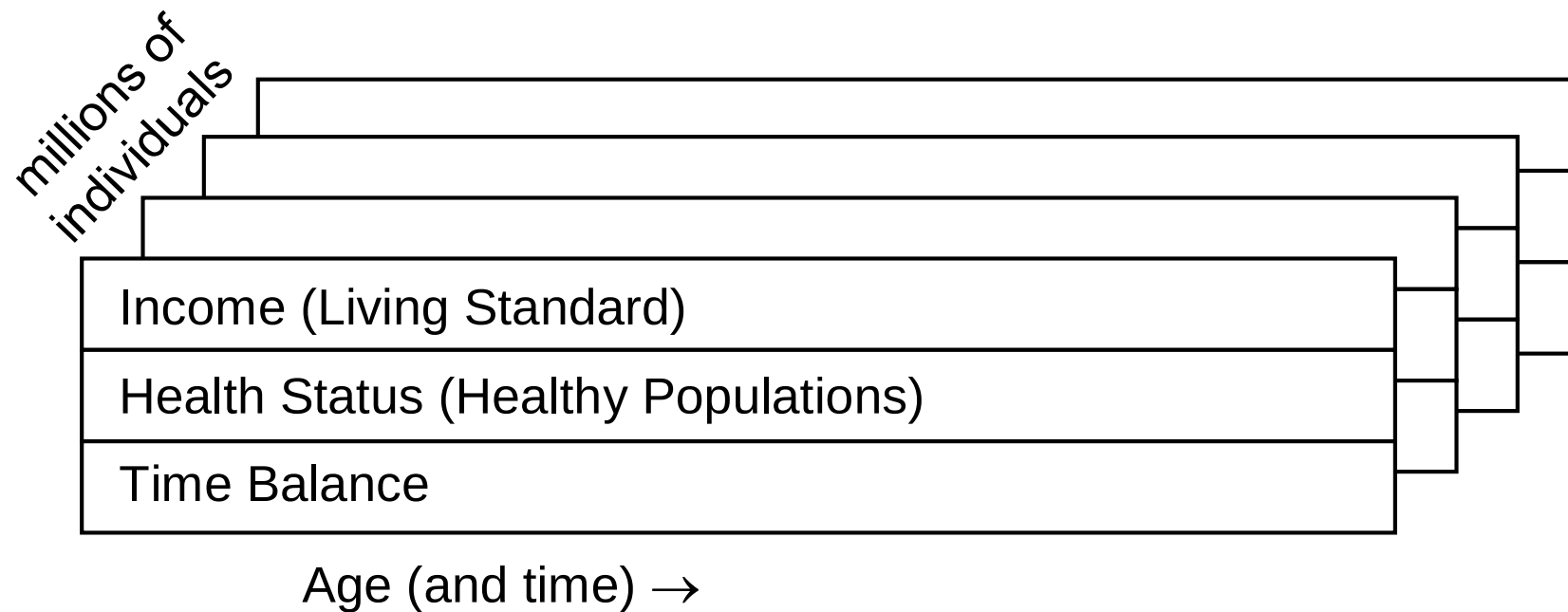
Methods for Constructing GLT Index

- cross-sectional options (easier)
 - single time use survey – provided it also includes health and income questions
 - Sullivan method – different surveys, and grouped data imputation
 - synthetically matched surveys – different surveys all combined retaining full individual-level detail
- complete life cycle / fully microanalytic / explicitly dynamic and longitudinal

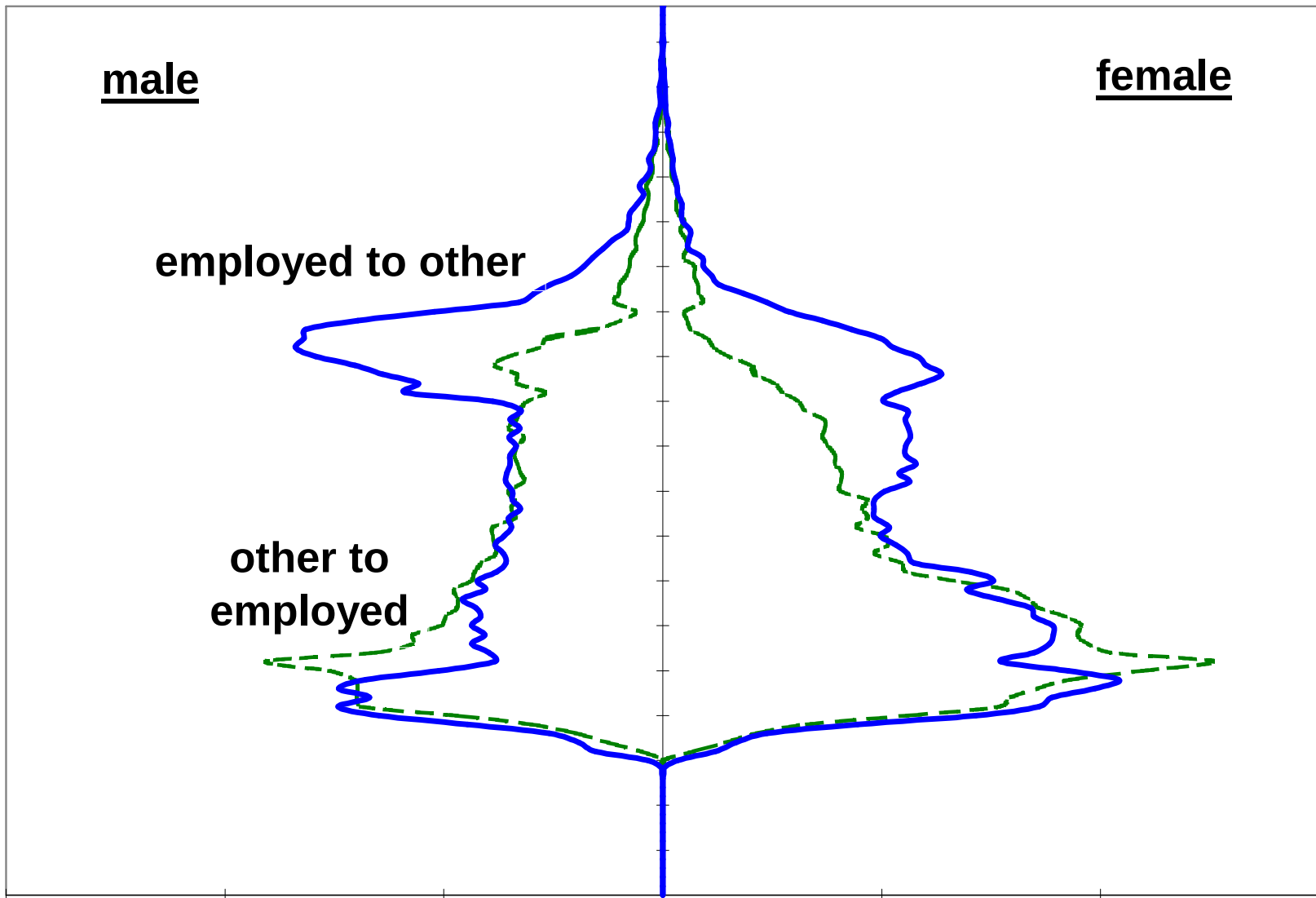
Methodology Being Used Here

- microsimulation modeling – building on Statistics Canada's LifePaths model
- 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 / health care (H)
- resource intensive – but recall OECD and Bourguignon etc. – 2017 data and computing capabilities >> 1940s or 1960s or 2000s

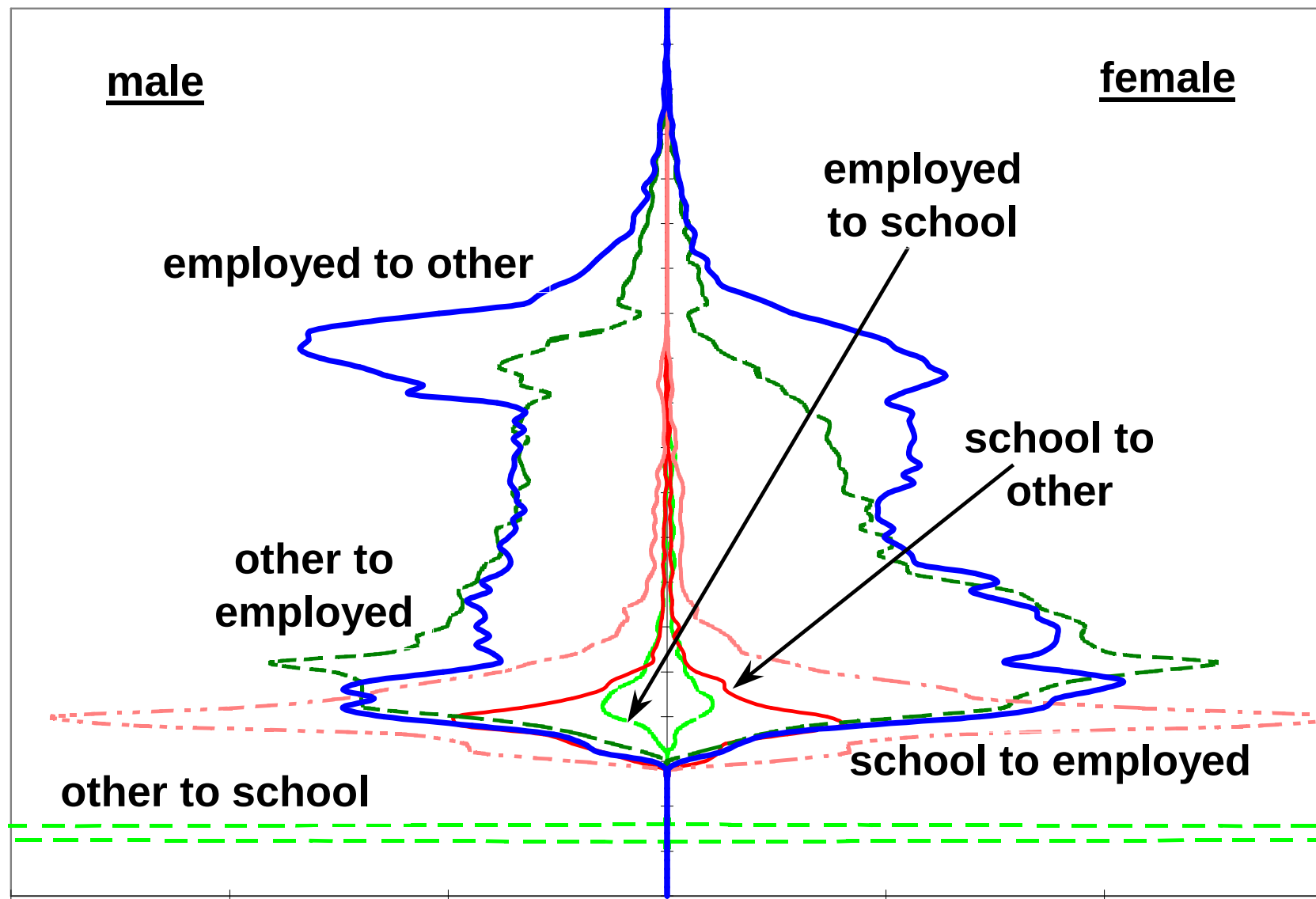
Microsimulation Method – Millions of Simple (Synthetic, but Realistic, Empirically-Based) Biographies



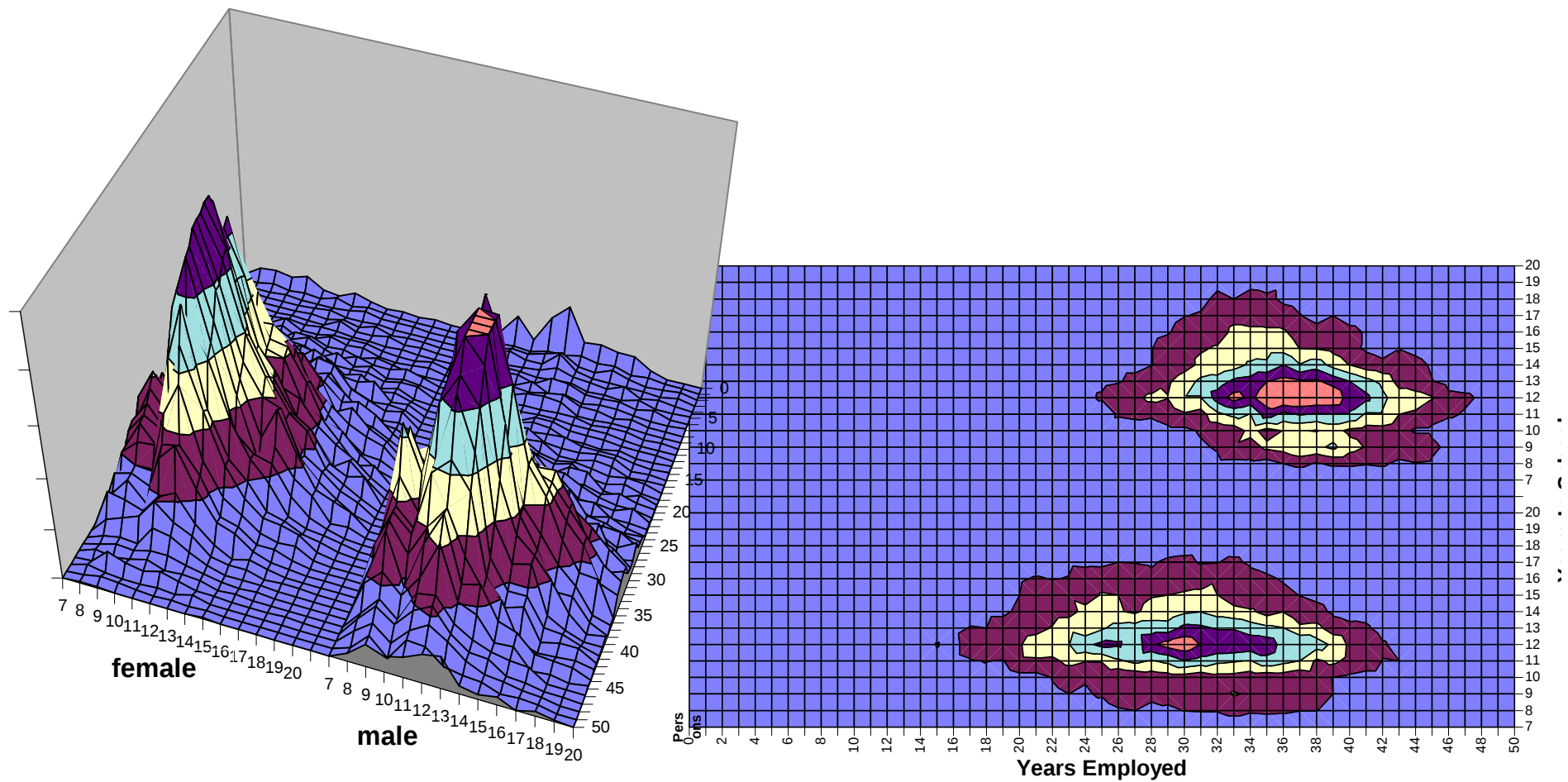
LifePaths Employment Flows by Age and Sex

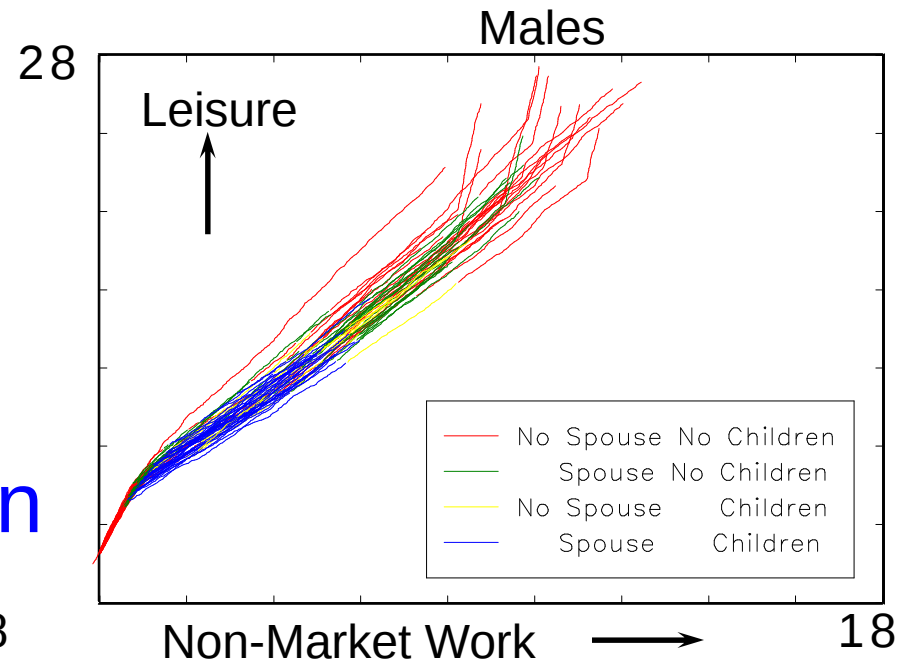
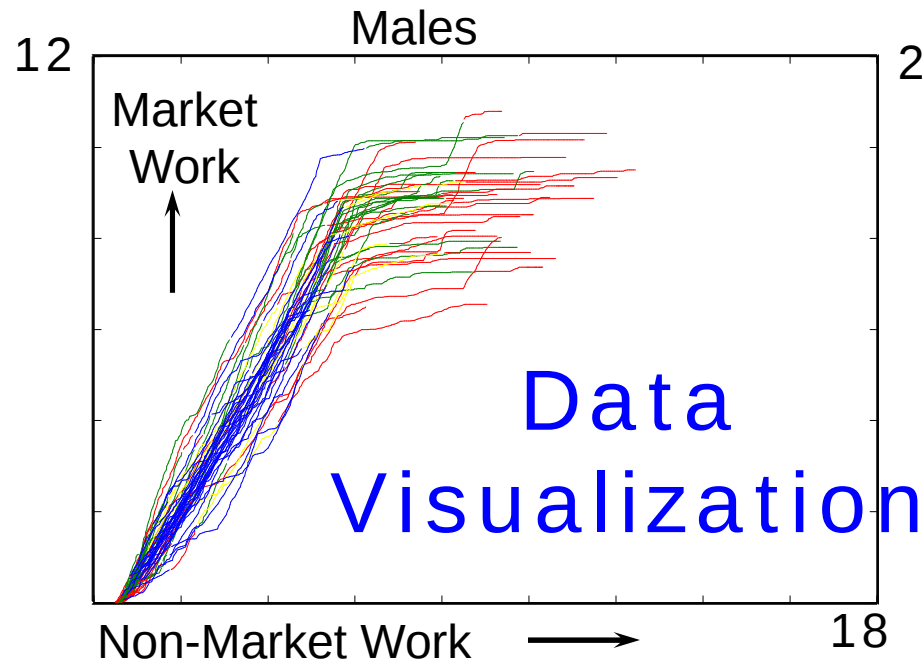
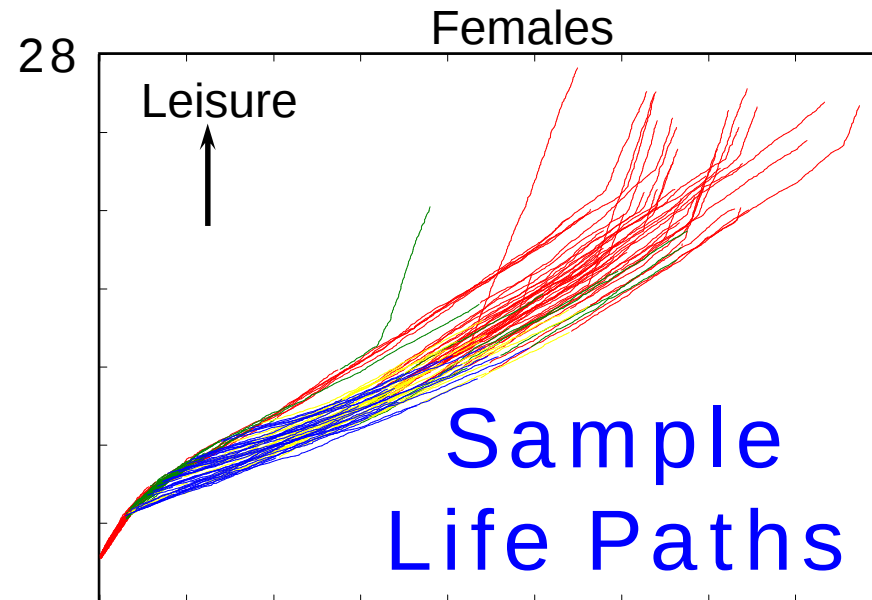
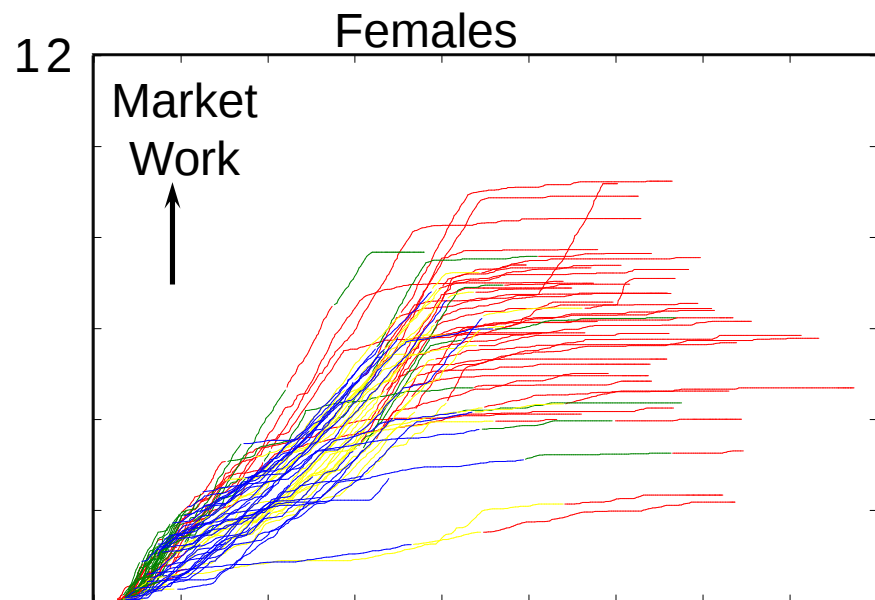


LifePaths Main Activity Flows by Age and Sex



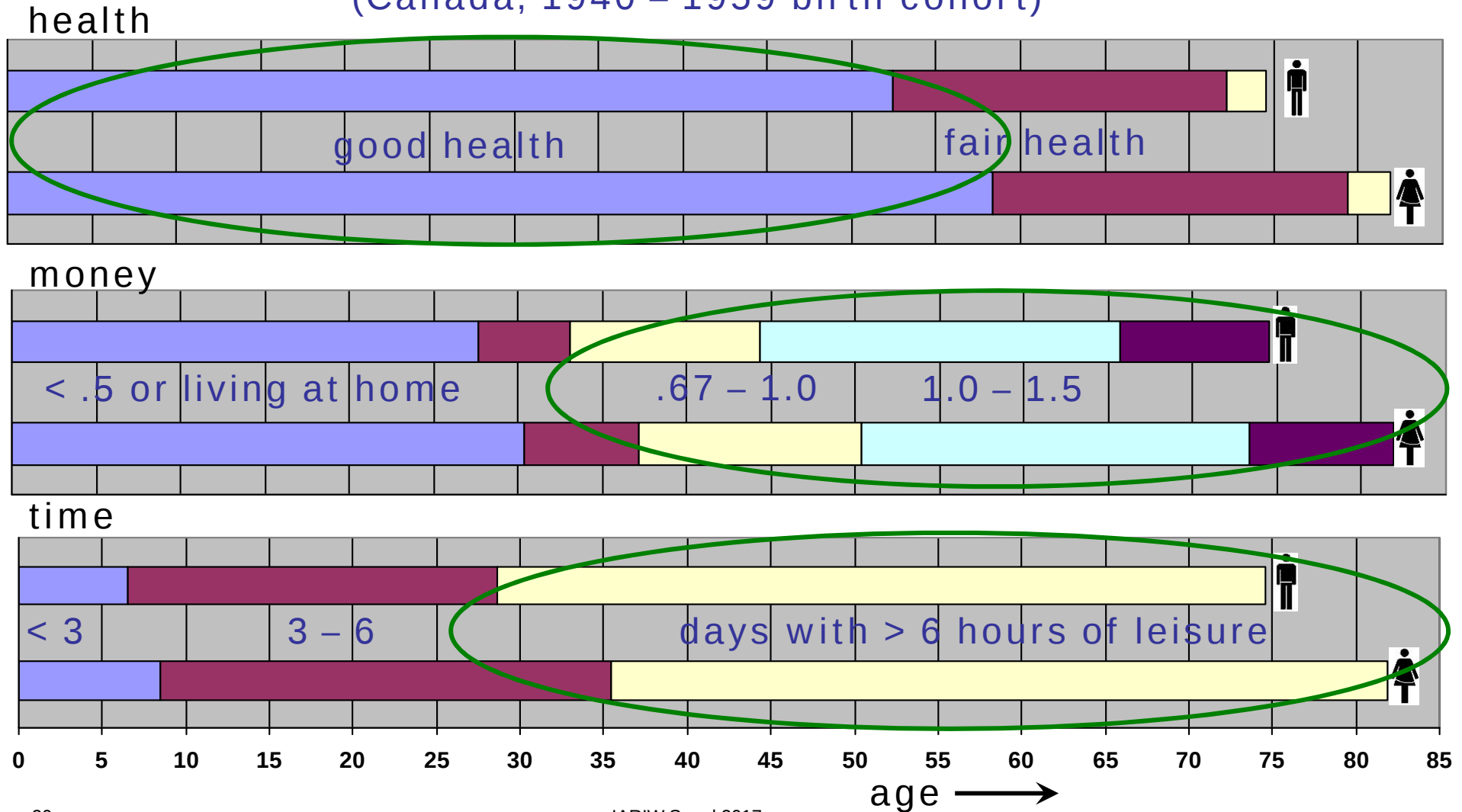
Joint Distribution of School and Work Sojourn Times





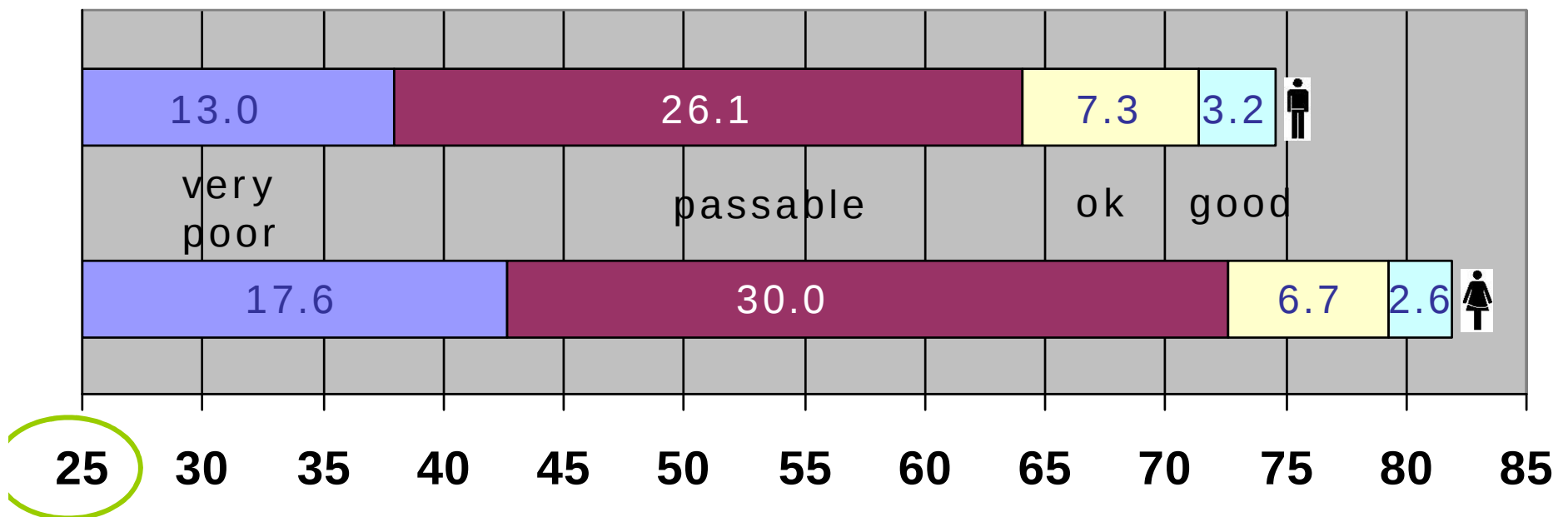
Life Expectancy by Leisure Time, Money, and Health

(Canada, 1940 – 1959 birth cohort)



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



GLT – Combining Adequate Time, Money and Health

(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

- yes, ministries of health;
- yes, ministries of finance / social affairs / labour / etc.
- but no “ministry of time”

t			
t			
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	

Concluding Comments

- have demonstrated the realization and major extension of Stone's SSDS, “proof by construction”
- plus salient “apex index” for assessing progress of societies & populations = GLT (rhymes with GDP)
- embedded in a coherent ***family*** of measures with data visualizations, based on explicit microanalytic foundations (recall Ruggles, Orcutt, still long overdue for SNA – recall SPSPD)
- feasible methodologies exist for many countries
- supports analysis (“what if” simulations, projections) of a novel range of policy options
- truly goes well “beyond GDP” + SNA + its pre-computer era tabular conceptualization