



**ined**

INSTITUT  
NATIONAL  
D'ÉTUDES  
DÉMOGRA  
PHIQUES

---

## Consumption units and equivalence scales in a multi-residence framework

---

Paris Seminar in Economic Demography

Palais Brongniart, Place de la Bourse

June 5<sup>th</sup>, 2012, 16:30-19:30

Laurent Toulemon, [toulemon@ined.fr](mailto:toulemon@ined.fr)

# Consumption units and equivalence scales in a multi-residence framework



- I - Multi-residence, commuters between households
  - a. Definitions of multiple residence
  - b. Identifying two-home people: data
- II – Who are the commuters between households?
  - a. Prevalence by sex and age
  - b. Family situations and multi-residence
- III – Dwellings, families and individuals
  - a. Multi-residence as a specific category
  - b. Describing families and households
- IV – Standard of living in case of multiple residence
  - Adjusting income and expenses
- Conclusions

# I - a. Definitions of multi-residence

---

- What is multiple residence?
  - Commuters between households (Saraceno, 1994)
  - Pendolari della famiglia, Two-home children, young adults (did they leave the nest), Partially coresident couples (LATs?)
  - More than one “usual” residence
    - During a week, a year? During the observation period?
- Three approaches of multi-residence
  - 1. Counting and weighting individuals
  - 2. What are the concrete family situations of commuters between households?
  - 3. What about the usual categories?

# I - a. Definitions of multi-residence

---

- 1. Counting and weighting individuals
  - An individual living in two dwellings is at high risk of double count in census and surveys
  - If it is the case, a solution is to define one and only one “main residence”; another is to halve his/her weight in both dwellings
- 2. A precise description of family situation
  - Taking all dwellings into account
  - Different issues for children, adults, old people

# I - a. Definitions of multi-residence

---

- 3. What about the usual core variables?
  - People living as a couple
    - When a couple has two “usual” dwellings
    - Partners may live together all the time, partly, or never
  - People living alone may live...
    - In one household only, with usual “visitors”
    - In more than one dwellings, living alone in one of them
  - One-parent families
    - Children living also elsewhere
    - Parent partly living with a partner
  - Standard of living, consumption units
    - Partial providers and consumers?

## I - b. Identifying two-home people: data

---

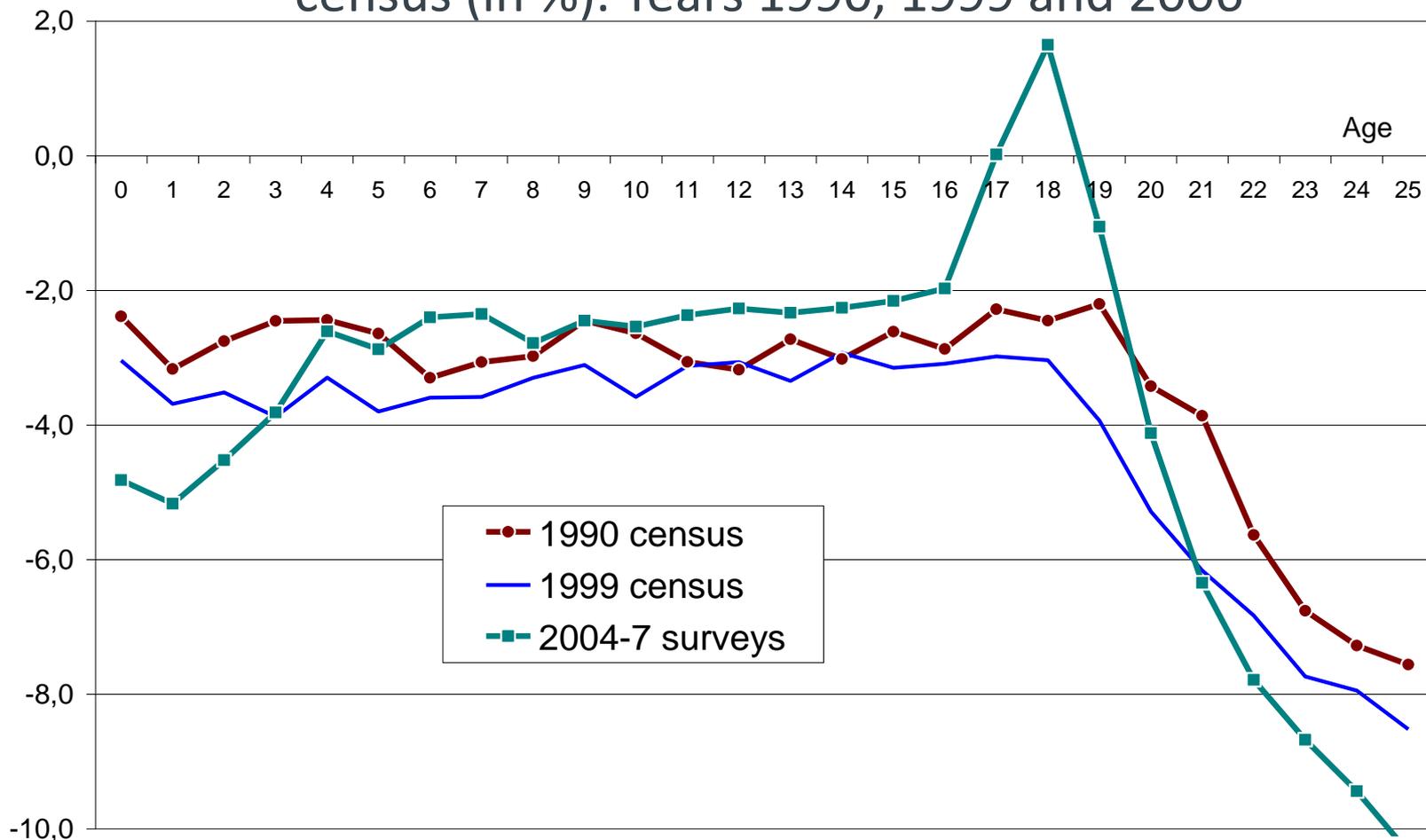
- Two different definitions of multi-residence
  - More than one “usual” dwelling (during a week, a year?)
  - More than one dwelling during the observation period
- Concrete definitions in censuses and surveys
  - Single residence rule: one dwelling only for each individual
  - Double counting rule: counting people everywhere they are
  - Complete information rule: explicitly consider commuters
- Eligible criteria for a complete information rule
  - Period of time used in the definition
  - Time spent in each dwelling

# I - b. Identifying two-home people: data

- The census deals with dwellings
  - Members of the household
    - Those whose “main residence” is in this dwelling fill in a census form
    - The other members are not counted in the dwelling
    - “Population at census night” in England
- Risks of double count and omission
  - In France, yearly census surveys
    - This increases the risk of double count,
    - while the risk of omission has diminished
  - In some countries (Switzerland) people fill in a form in all their “usual” dwellings
    - In order to control and avoid double counting

# French census (waves 2005 to 2007): omission, Double counting of children and young adults

Relative apparent net migration of natives between birth and census (in %). Years 1990, 1999 and 2006



# I - b. Identifying two-home people: data

---

- A new feature in the French surveys
  - Introduced by the Insee in 2004
- The list of dwelling members
  - includes all people who live usually in the dwelling, even if they also usually live elsewhere
  - Includes information on all family links
- Specific information on the other dwellings
  - If a person also lives elsewhere, some information is asked on the other dwelling
    - How much time is spent in each dwelling, type of dwelling (household or communal establishment), who lives there

# I - b. Identifying two-home people: data

---

- Dwellings, households, individuals
  - Household = common budget
  - Several households can share a dwelling
  - A household may use more than one dwellings
- Merging surveys since 2004
  - A very large dataset (600,000 individuals)
  - Almost the same information in all surveys
  - The EU-SILC is a panel survey
- Here analyses are presented at the dwelling and individual levels
  - Household level for income and standard of living

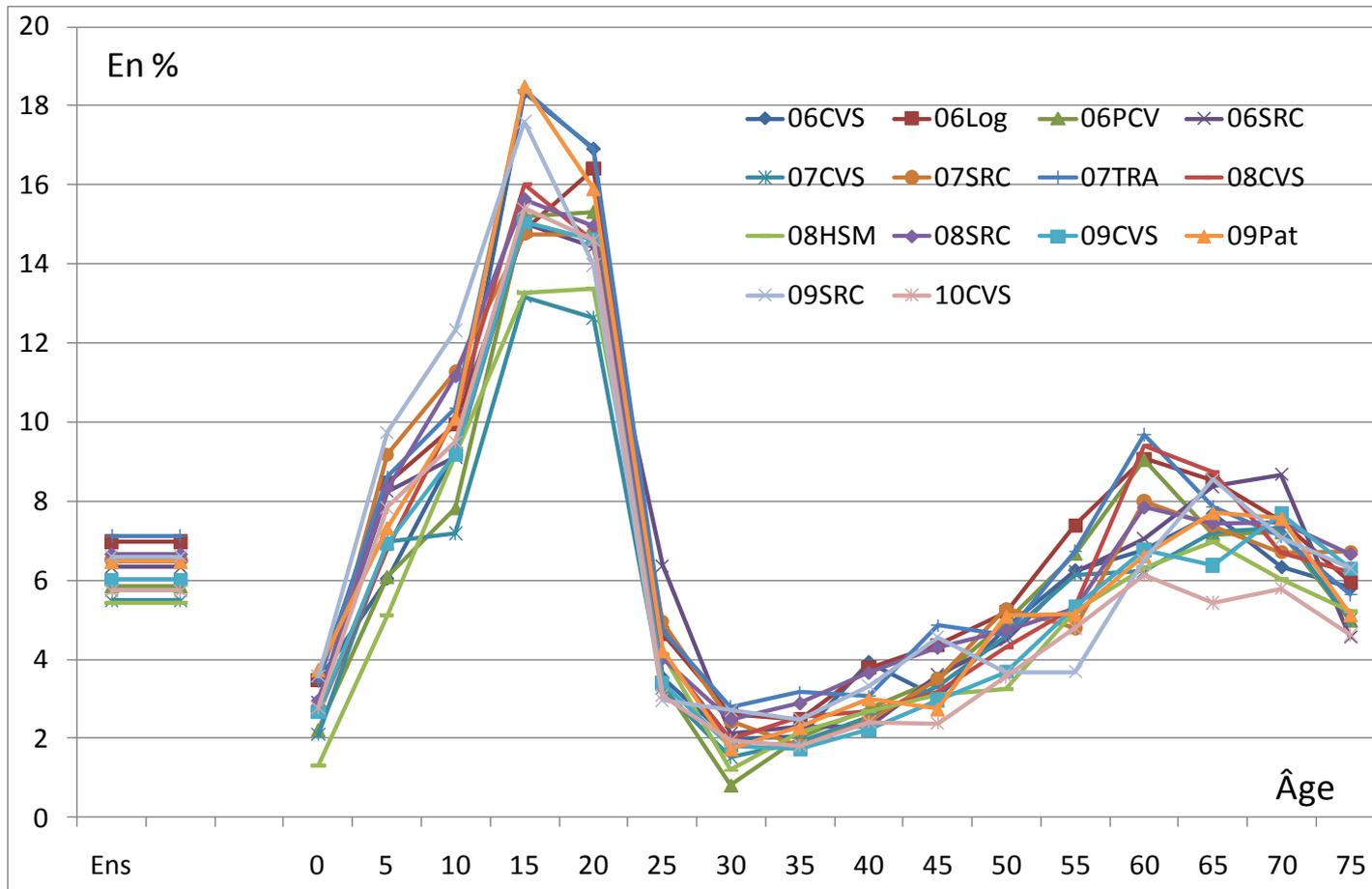
# II – Who are the commuters between households?

---

- a. Prevalence of multi-residence
  - by sex and age, in several surveys
  - among respondents and in the population
- Weighting the individuals
  - If the other dwelling could be included in the sample, then the weight must be halved
  - A check with life table estimates
    - Based on entries into and exits from “commuting”, by sex and age, as commuting is not lasting so long

# II – a. Multi-residence by age

Proportion of *respondents* having another “usual” dwelling, by age (%)



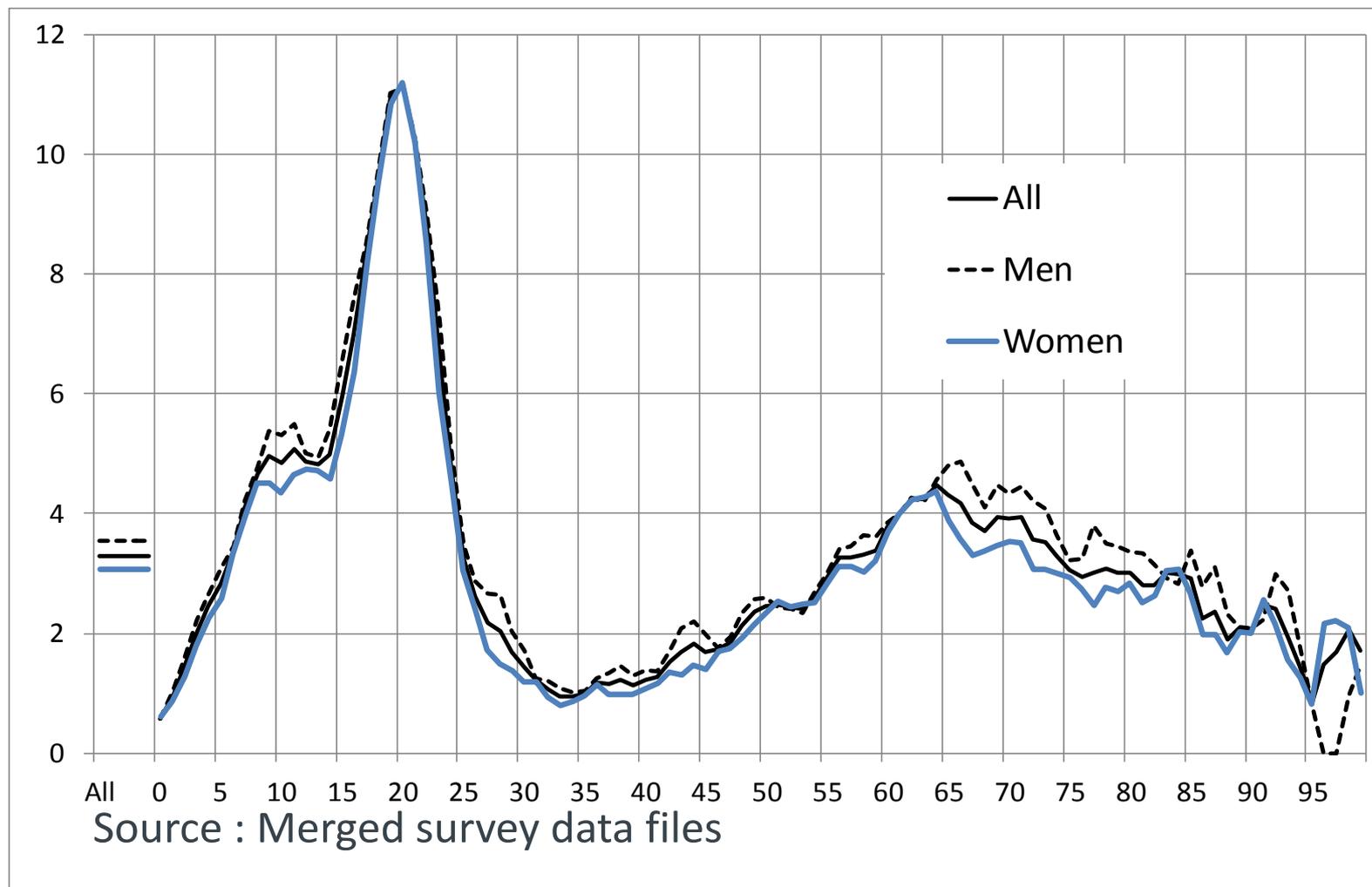
— Source : Thomas Denoyelle, merged survey data files

## II – a. Prevalence by sex and age

- Weighting the individuals
  - Large differences from one survey to the next
  - Taking into account their inclusion probability
  - Halving the weight of those who can be included twice
  - The inclusion probability in the other dwelling is not always easy to know
    - Communal establishments may be excluded
    - Is the other dwelling “the main residence for a household” (French criterion for inclusion)
  - Very diverse situations
    - Weight divided by the number of “usual” residences eligible for inclusion in the sample

# II – a. Multiple residence by sex and age

Proportion of *inhabitants* having another “usual” dwelling, by age (%)



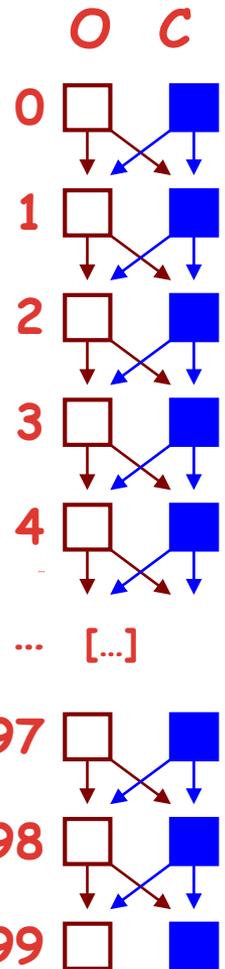
# Checking the estimates: A life table estimate from the changes between 2004 and 2005

## 1. The transition probabilities

- Entry to multi-residence ( $O \rightarrow C$ ) by sex and age  $q_{12}(x, s)$
- Exit from multi-residence ( $C \rightarrow O$ ) by sex and age  $q_{21}(x, s)$
- **These probabilities are NOT sensitive to weighting errors, as far as groups at risk are homogenous**
- They are sensitive to the assumptions on people lost from one wave to the next. Here the assumption is made that those lost have one dwelling only in 2005

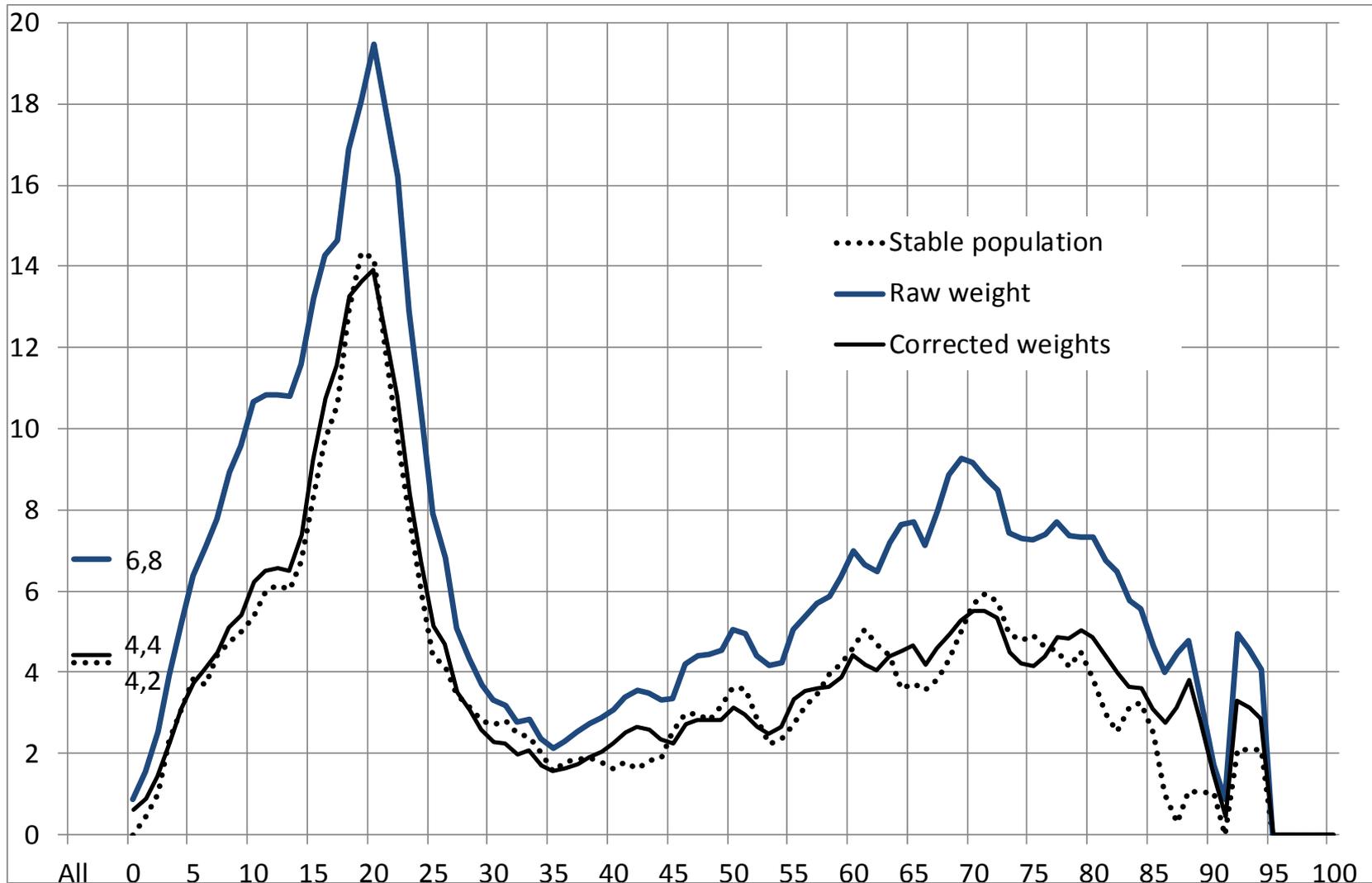
## 2. – The estimates from the life table

$$\left( \begin{array}{l} O(0) = 1 \\ C(0) = 0 \\ O(x+1) = O(x) (1 - q_{12}(x)) + C(x) q_{21}(x) \\ C(x+1) = C(x) (1 - q_{21}(x)) + O(x) q_{12}(x) \end{array} \right.$$



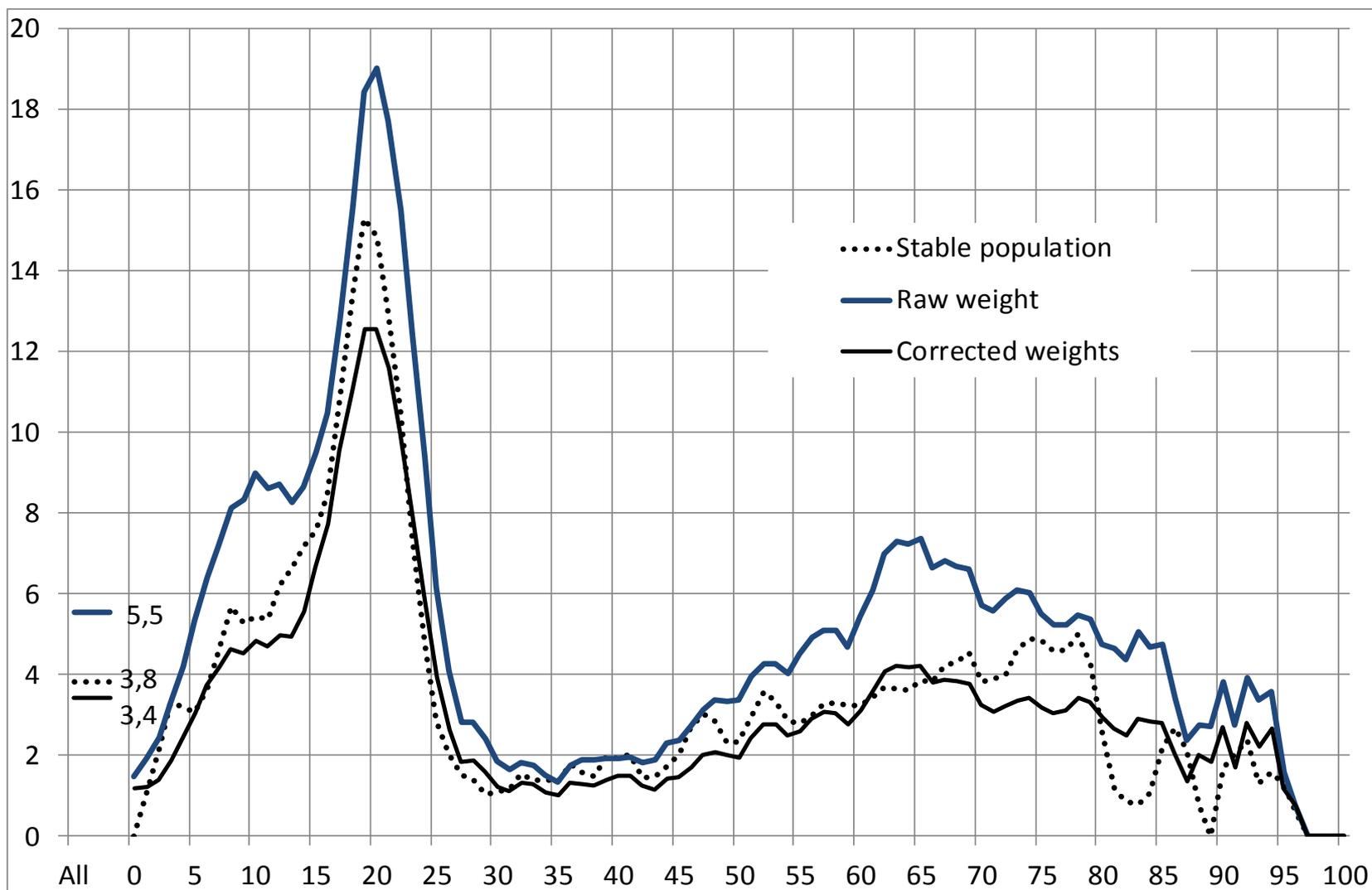
# Prevalence by age. Life table estimates

## Men, EU-SILC 2004-9, transitions from 2004 to 2009



# Prevalence by age. Life table estimates

## Women, EU-SILC 2004-9, transitions from 2004 to 2009



- Comparison between prevalence estimates
  - The prevalence falls between those based on raw and corrected weights
  - The life table estimates are closer to the one based on corrected weights for children and young adults
  - But not so much for young women
- The prevalence is stable between 2004 and 2009
  - The definition of multi-residence may be at stake
    - Multi-residence at the time of the survey, or multi-residence during the year since the last wave of the survey ?

- Children
  - Two-home children and separated parents
  - children living with their father often have two homes
- Couples
  - How many partially co-resident couples?
  - Definition of living as a couple
- People living alone
  - Living only sometimes alone
  - in one or two dwellings

## II – b. Family situations of children

- Children living (partially) with their father (%)

→ Double counts: 4.7% ; corrected: 3.5% ; LFS: 2,6%

<b>Family situation of children In the dwelling</b>	Raw Distribution In SILC	Corrected Distribution In SILC	Distribution In the LFS
With both parents	79,1	80,9	81,8
Mother, one-parent family	10,4	10,1	10,8
Mother and stepfather	4,6	4,4	4,1
<b>Father, one-parent family</b>	<b>2,3</b>	<b>1,6</b>	<b>1,3</b>
<b>Father and stepmother</b>	<b>2,4</b>	<b>1,9</b>	<b>1,3</b>
No parent	1,3	1,2	0,7
<b>All children</b>	<b>100</b>	<b>100</b>	<b>100,0</b>
One only parent	19,6	17,9	17,5
Mother	15,0	14,5	14,9
<b>Father</b>	<b>4,7</b>	<b>3,5</b>	<b>2,6</b>

# Multi-residence as a specific category

→ 2.1% of children live with their father; 2,2% share their time between both parents' homes

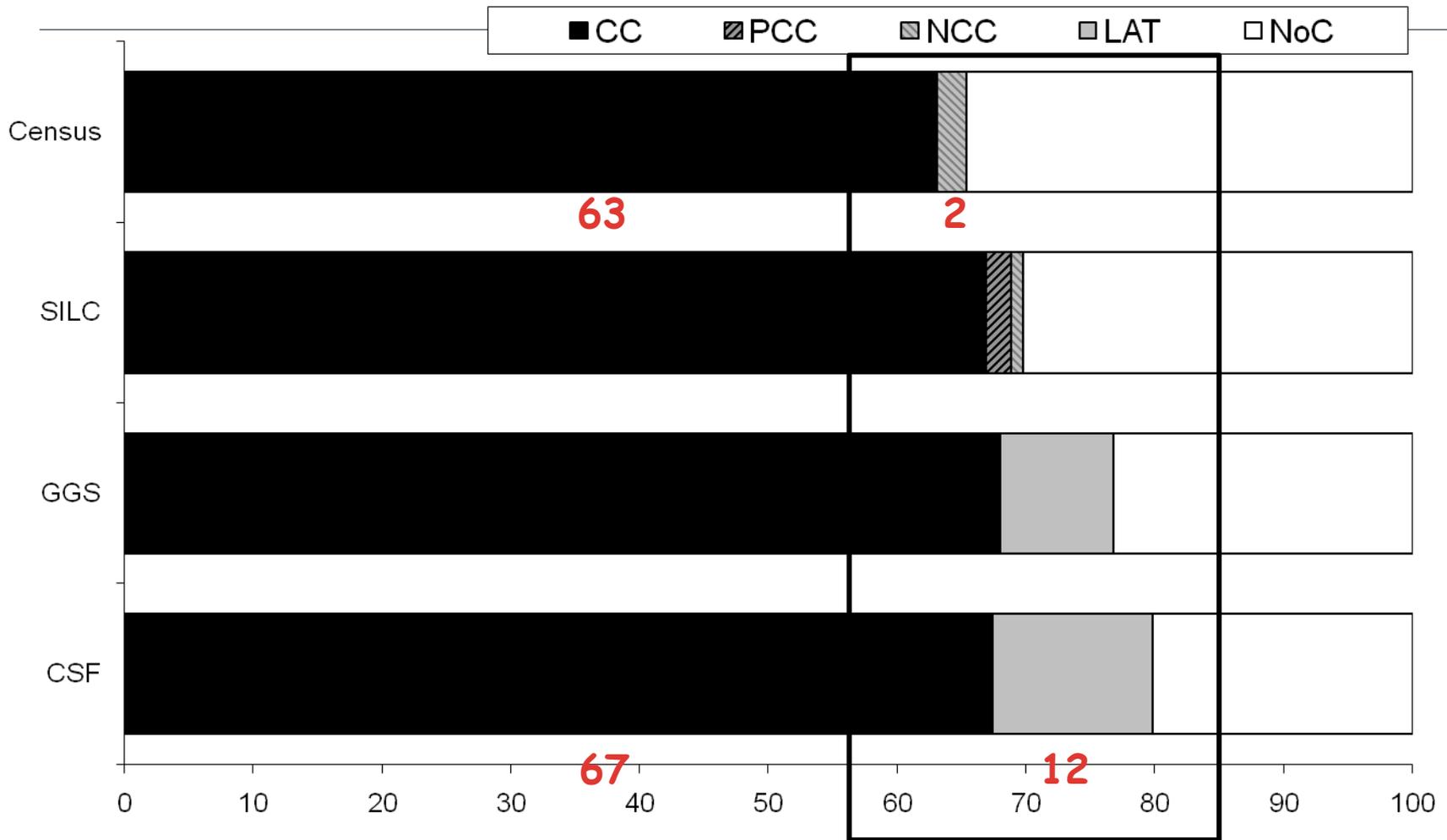
Children's family situation in their dwelling and in the eventual other dwelling	Children aged less than 18
Both parents, no other dwelling	81,1
Mother, one-parent family, no other dwelling	13,6 { 9,5 4,1
Mother, and stepfather, no other dwelling	
<b>Mother in a dwelling, father in another</b>	<b>2,2</b>
<b>Father, one-parent family, no other dwelling</b>	2,1 { 0,8 1,3
<b>Father and stepmother, no other dwelling</b>	
Lives with no parent	0,9
All	100,0

*No other dwelling (or a dwelling with no parent)*

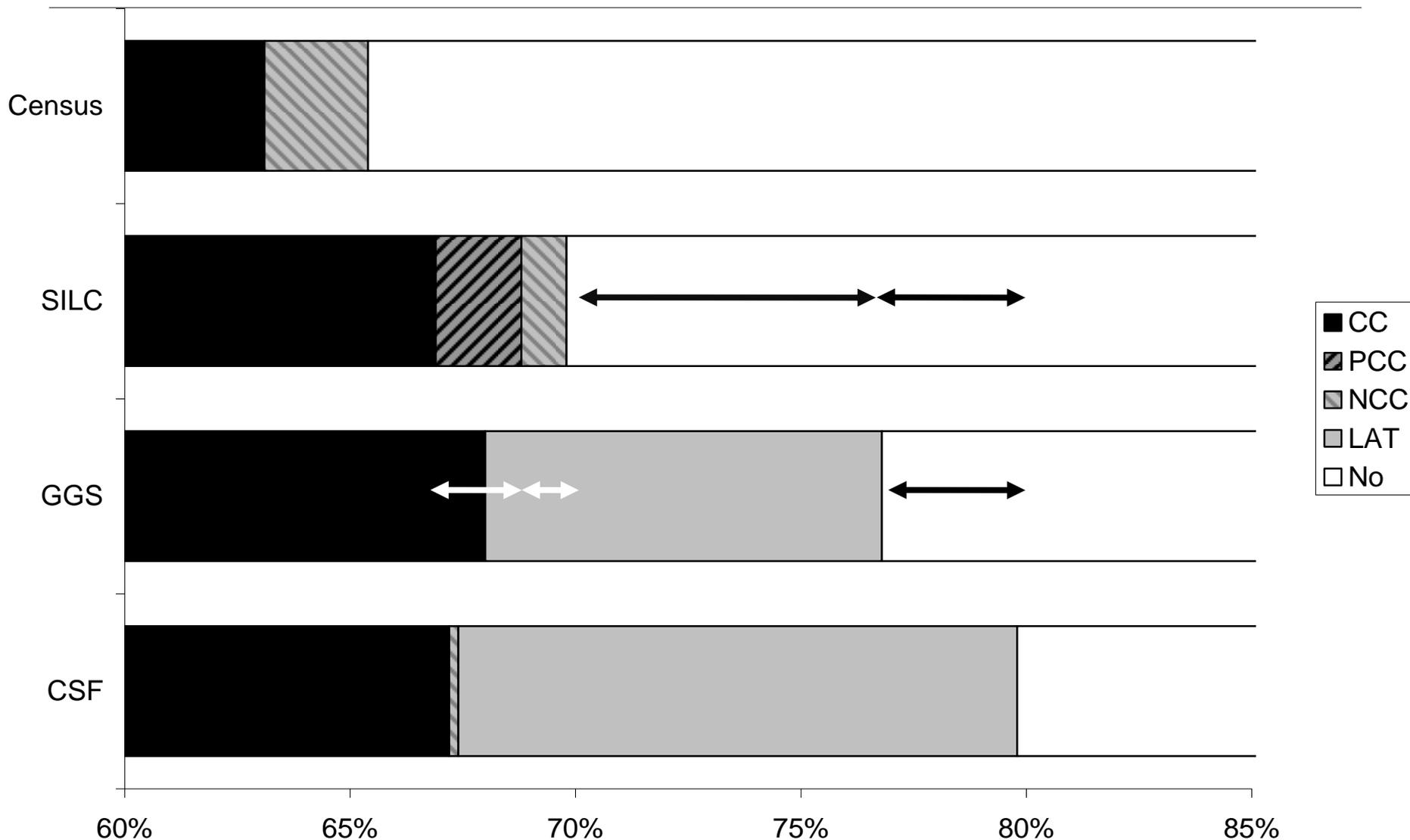
## II – b. Family situations of adults

- How many people live as a couple?
- Co-resident couples (CC)
  - With or without a secondary home, always together
- Partly co-resident couples (PCC)
  - One common residence, a partner has another residence
- Non co-resident couples (NCC) -- Insee definition
  - Consider themselves as a couple, do not live in a common residence
- A steady relationship (LAT) -- GGS definition
  - Intimate (couple) relationship without living together
  - “Couple-like”: not living with (but you could),
- Other sexual or intimate relationships?
  - Not “couple-like”

# II.b – Living as a couple in 2006 (ages 18-69)



# II.b – Living as a couple in 2006 (ages 18-69) Detail (from 60 to 85%)



## II – b. How many people live alone?

Situation in the dwelling	Number of dwellings		
	One	Two	All
Always alone	12,5	0,2	12,7
Sometimes alone	0,9	0,6	1,5
Never alone	83,3	2,4	85,8
All	96,8	3,2	100,0
Always alone			12,7
Alone at survey day			13,4
Alone in at least one dwelling			14,2
Alone in the LFS			13,3
Alone in the census			14,2

Between 12.7% and 14.2% of inhabitants live alone

**1.5% are sometimes alone**

14.2% are considered as living alone in the census

## II – b. One parent families

- Comparison between surveys and census. Families with at least one child aged less than 18

→ 20% of families

→ Many of them are not really “one-parent families”

- 4% : all children are commuting
- 3% : parent partially living as a couple

---

One-parent families at census (%)

1999	16,9
------	------

2008	20,6
------	------

---

One-parent families in surveys, 2006-10 (%)

All	19,9
-----	------

of which: parent not in a couple and...

- at least a child always present	12,6
-----------------------------------	------

- all children are commuting	3,9
------------------------------	-----

Parent partially in a couple and...

- at least a child always present	1,9
-----------------------------------	-----

- all children are commuting	1,5
------------------------------	-----

---

- a. Multi-residence as a specific category
  - In order to avoid to “split” the individuals between their dwellings
  - Are nomenclatures robust when multi-residence is taken into account?
- b. Counting families and households
  - Siblings
  - Equivalence scale, consumption units
- c. Households and dwellings
  - Two households in the same dwelling
  - A household spread over several dwellings?

# III – a. Multi-residence as a specific category

---

- New specific categories
  - Children whose parents are separated and share their time between both parents' homes
  - Young adults who are living alone and still in the nest
  - Adults who work far away from their family home
- These new categories seem convenient...
  - Children in shared custody or residence
  - Partly-coresident couples (one is multi-resident)
  - People living partially alone (different situations)
- But they may be difficult to use
  - One-person household? Household size?
  - 10% of households have at least one “partial” member

- Siblings
  - Number of children in the household
  - Number of children who also live elsewhere
  - Is the whole siblings commuting, or only some of the children?
- Equivalence scale, consumption units
  - The OECD equivalence scale is based on consumption units
  - What about multi-residence?

# III – b. Siblings and their dwellings

---

- a. All siblings
  - Distribution of siblings by number of two-home children
  - Distribution by sibship size
- Siblings with at least one child living with a separated parent
  - Father or mother living with the children
- When we study siblings, two-home children are counted twice
  - Because they belong to two siblings

# Distribution of siblings by number of two-home children (aged less than 18)

- 6.4% of families include at least one child sharing residence
- Families with 2 children are less likely to include children sharing residence
- The most common sharing situation is among only children
- In 4.9% of siblings, all children have two homes
- In 1,4% of siblings, some but not all children have two homes

All siblings (column percentage)						
	Number of children					
	1	2	3	4	5+	All
0	93,6	94,3	93,2	90,2	92,5	93,7
1	6,4	1,8	2,6	1,9	1,7	4,0
2		3,9	1,7	3,5	2,3	1,8
3			2,5	2,2	1,1	0,3
4				2,3	2,5	0,1
All	100	100	100	100	100	100
All siblings (percent on all)						
	Number of children					
	1	2	3	4	5+	All
0	43,7	36,4	10,9	2,1	0,7	93,7
1	3,0	0,7	0,3	0,0	0,0	4,1
2		1,5	0,2	0,1	0,0	1,8
3			0,3	0,1	0,0	0,4
4				0,1	0,0	0,1
All	46,7	38,6	11,6	2,3	0,7	100

# Siblings with at least one child aged less than 18, with separated parents

- Only 25% of such siblings include one two-home child
  - For 19% of siblings, all children commute between households
  - In 6% of siblings, only some do
- No increase with siblings size
- For each siblings size, the situations are very diverse when some children are commuting:
  - with 2 children, 1 or 2 may commute
  - with 3 children, 1, 2, or 3

One child separated from one parent						
Column percentage						
	Number of children					
	1	2	3	4	5+	Ens.
0	77,5	70,7	71,9	71,5	81,9	74,6
1	22,5	9,3	10,7	5,5	4,1	16,4
2		20,0	7,1	10,1	5,5	7,3
3			10,2	6,4	2,8	1,4
4				6,5	5,7	0,3
Ens.	100	100	100	100	100	100
Percent on all siblings with one child separat						
	Number of children					
	1	2	3	4	5+	Ens.
0	41,7	21,5	8,2	2,4	1,0	74,6
1	12,1	2,8	1,2	0,2	0,1	16,4
2		6,1	0,8	0,3	0,1	7,3
3			1,2	0,2	0,0	1,4
4				0,2	0,0	0,3
Ens.	53,8	30,4	11,4	3,3	1,1	100

# III - c. Households and dwellings

- Two households in the same dwelling
  - Questions badly understood
- A household spread over several dwellings?
  - Non successful attempt
- New attempts in the wording of questions
  - In case of multiple residence: OK
  - Without multiple residence: specific questions
- Equivalence scale, consumption units
  - Within a dwelling, including people with multiple residence

# IV. Equivalence scale, consumption units

- The OECD equivalence scale is based on consumption units
  - 1 for the first adult, 0.5 for other adults aged 14+, 0.3 for children aged less than 14
- How to estimate the number of CUs when some members are also living elsewhere?
  - Share consumption or double counts (are there economies of scale?)
  - When income providers are commuting with another household
  - Members of the household may also not live at all in the dwelling, according to the INSEE definition

# VI. Equivalence scale, consumption units

- Distinction between “main providers of income” and other members
- Simulation of different rules concerning commuters between households
  - For income
  - For consumption
- An issue for the estimates of standard of living?
  - Proportion of poor people (households with less than 60% of the median standard)
  - Proportion of wealthy people (households with more than 200% of the median standard)
  - Imputed incomes (survey HSM, 2008)

## IV – a. Consumption units

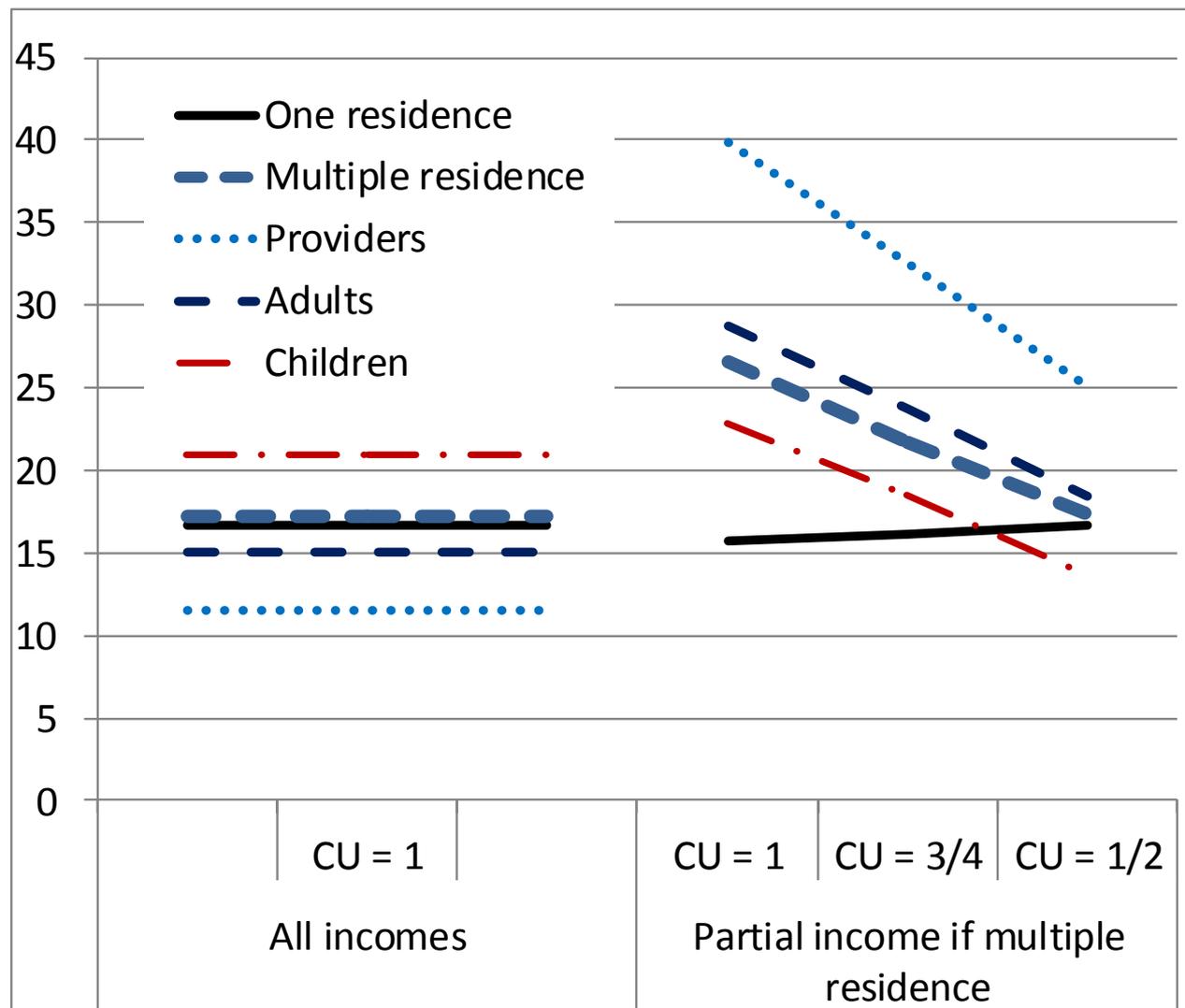
---

- Proportion of poor people (households with less than 60% of the median standard)
  - Counting all incomes and all household members (usual definition)
  - Assuming that providers only bring half of their income if they also live elsewhere
    - With different assumptions on consumption units related to people with another residence: complete (weight 1), or  $\frac{3}{4}$ , or  $\frac{1}{2}$  of their standard weight among the UCs
- Same estimates for wealthy people (households with more than 200% of the median standard)

# Multi-residence and standard of living

Proportion of people with less than 60% of the median (%)

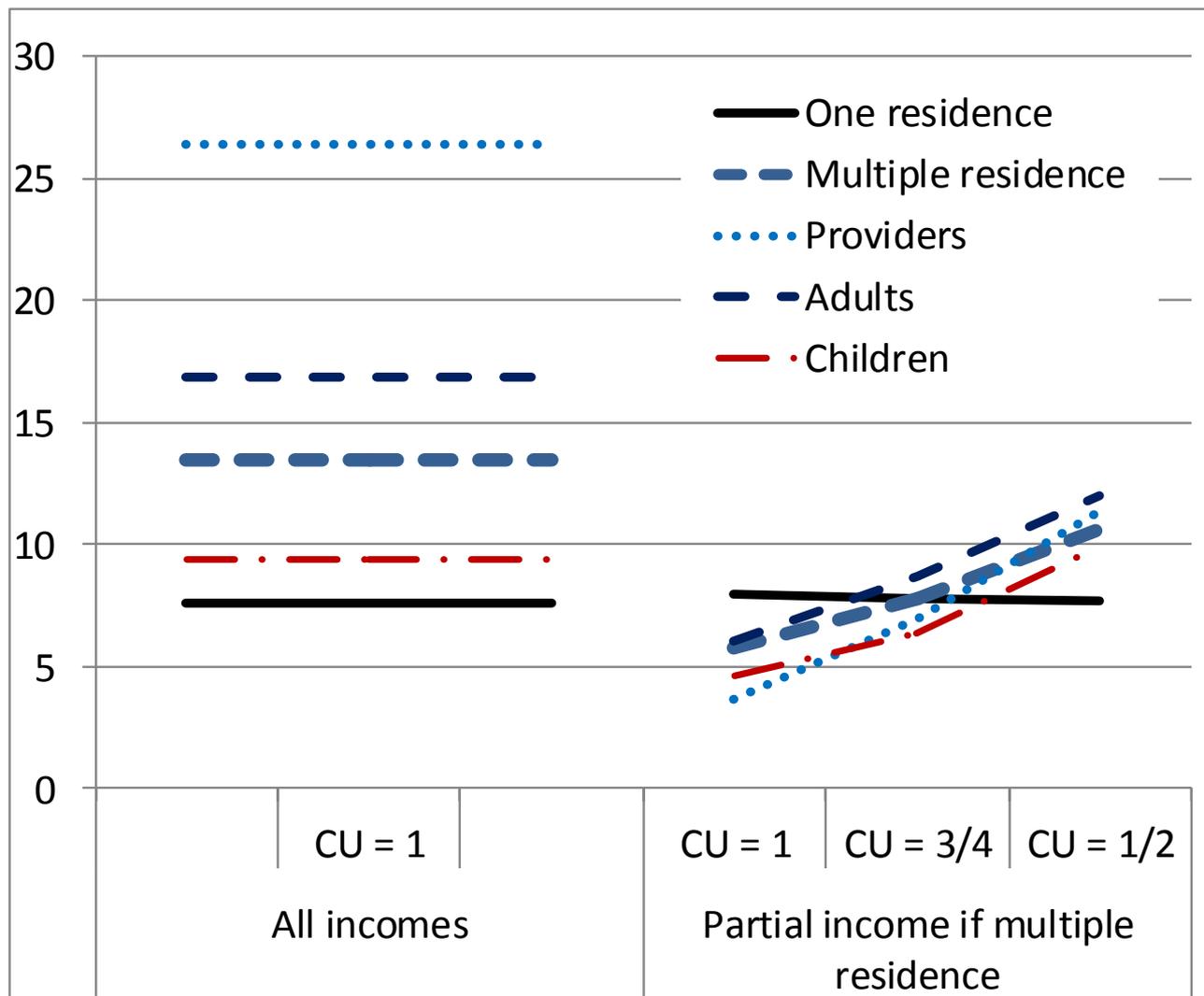
- On the left, all members of the household are counted
- On the right, partial income and several rules for weighting consumption units are used for commuters



# Multi-residence and standard of living

Proportion of people with more than twice the median (%)

- On the left, all members of the household are counted
- On the right, partial income and several rules for weighting consumption units are used for commuters





# Multi-residence and standard of living

- More widespread standard of living among households with multiple residence
  - More children living in poor households?
    - Overestimation of poverty rate because some children are counted twice?
    - Higher poverty rate among households where a provider has another residence, if s/he does not bring all his/her income to the household
  - Less wealthy people
    - When the share of resources is accounted for (counting only half the resources for the household)
    - Imputed expense in the other dwelling?
  - Difficult to disentangle resources within a household
  - Same for the share of income in each dwelling

# Conclusion (1)

---

- Prevalence of multiple residence
  - 3.5% to 5% inhabitants, 7% in survey samples,
  - 10% of households include at least one member who commutes with another household
- Weighting the individuals
  - Other information (time spent in each dwelling)
- Describing family situations
  - Taking multi-residence into account is necessary to avoid double counting
  - It is also useful to precisely describe the family situation of adults and children
  - All definitions based on co-residence are affected
  - It implies to rethink many demographic variables

## Conclusion (2)

---

- It may also change households characteristics
  - Household size, standard of living
  - Standard of living and family type
  - Rules for weighting the consumption units
  - Rules for weighting the income (expenses in the other dwelling)
  - One issue among others (imputed rents, other measures of wealth, etc.)
- A large improvement in French surveys since 2004
  - EU-SILC (panel), many surveys by INSEE
  - And a test within the 2011 French census
- **Data are available for international comparisons!**

# References (1/2)

- Multiple residence of children and adults in France and Australia
  - Toulemon Laurent, Pennec Sophie, 2010, “Multi-residence in France and Australia: Why count them? What is at stake? Double counting and actual family situations”, *Demographic Research* 23(1): 1-40.  
<http://www.demographic-research.org/volumes/vol23/1/>
- Transitions into and out of situations of commuting between households
  - Toulemon Laurent, Pennec Sophie, 2009, “Two-home adults and children: long-lasting or transitory family situation? The case of France”. Communication à la séance Session 501, Unions, families and households, XXVI IUSSP International Population Conference, Marrakech, 27 September – 2 October 2009, 39 pages,  
<http://iussp2009.princeton.edu/download.aspx?submissionId=93441>
- Questions on multiple residences in European censuses
  - Toulemon Laurent, 2010, “Commuters between households”, Chapter 2 in Freguja Ch. Valente P. (eds.), *Measurement of different emerging forms of households and families. Report by the Task Force on Families and Households*, UN-ECE – Eurostat, Conference of European Statisticians, p. 24-43.  
<http://www.unece.org/stats/documents/ece/ces/2010/47.e.pdf>

# References (2/2)

- People living alone
  - Toulemon Laurent, Pennec Sophie, “How many people live alone in France?”, *Population & Societies*, n° 484, 4 pages.  
[http://www.ined.fr/en/resources\\_documentation/publications/pop\\_so\\_c/bdd/publication/1570/](http://www.ined.fr/en/resources_documentation/publications/pop_so_c/bdd/publication/1570/)
- Standard of living
  - Toulemon Laurent, Denoyelle Thomas, 2011, « La définition des ménages dans les enquêtes françaises : Comment tenir compte des multi-résidences ? », XIèmes Journées de Méthodologie Statistique, Cité internationale universitaire de Paris, 26 janvier 2012.  
<http://jms.insee.fr>
- Data and projects
  - A documented standard file merging all surveys lists of residents
  - **The “Family and Dwellings” survey conducted within the 2011 census survey wave.** <http://lili-efl2011.site.ined.fr/en/>
  - A proposal for weighting individuals in all surveys from the Insee
  - Ongoing work on standard of living, and family links, taking multiple residence into account
  - On transitions, use of more than three waves of the EU-SILC
- **Thank you for your attention**