International Seminar on Information and Communications Technology Statistics

Session 4: Measuring the Information Society

Digital divide: from computer access to online activities. A Micro data Analysis

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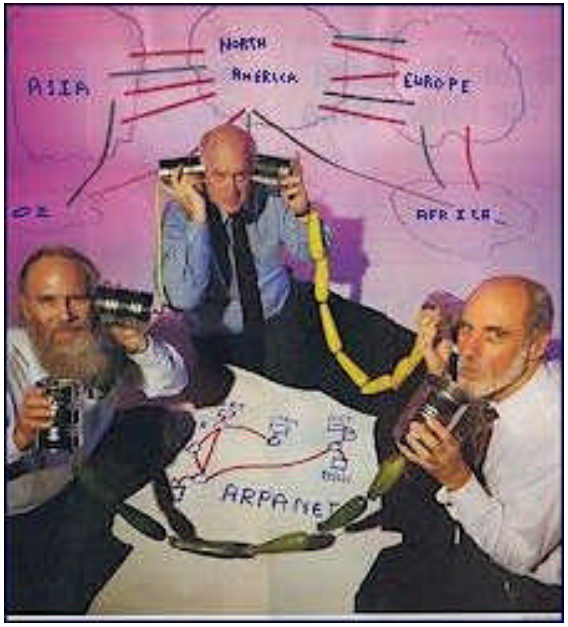
OUTLINE

- Context
- Objective
- Data
- Digital Divide
- Results
- Conclusion
- Policy context



Context

- Analysis based on micro data provides value added compared to aggregated data

- OECD projects
  - Digital Divide

- Digital competitiveness report for benchmarking European Information Society

Context (2)

- Complementing the paper on « *Micro data analysis on the determinants of frequency of Internet use and downloading of audiovisual content* » (October 2009)
- Using the same data source for the EU countries (micro data of the Community Survey on the use of ICTs in households and by Individuals) and methodology (logistic and linear regressions), enlarged to Korea
- Separate study for Canada also used for benchmarking

Objective of the study

- Feasibility of micro data analysis
- Considering socio-economic background characteristics, analyse determinants of:
  - Access and use / dropouts
  - Frequency of internet use
  - Downloading of audiovisual content
  - Scope of online activities (variety)
- As function of socio-economic background characteristics, applying Logistic (or Linear) Regression Models

Data availability

- Micro data on access and use of ICTs in households and by individuals
- 21 EU countries + Korea
  - 19 EU Member States
  - NO, IS
  - Sample size
  - 79 000 households 17 000 households
  - 166 000 individuals 41 644 individuals
  - DE, FR, PL, UK, RO missing
  - IT, ES almost half of total population

Digital Divide

First level

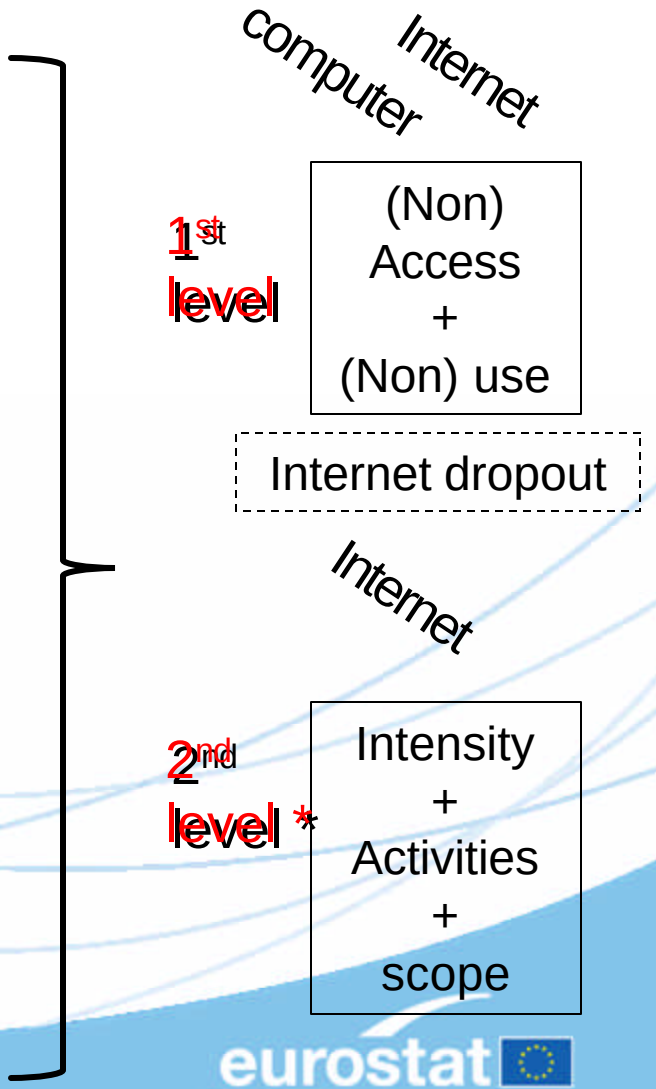
- Non access from home
- Non use
- Internet dropouts

Second level

- Intensity of Internet use
- Selected Internet activities
- Scope of Internet use

Digital Divide (2)

- Household composition
- Age
- Income
- Education attainment
- Density of population
- Gender (reference person)
- Employment situation
- Occupation *
- Broadband connection *
- Place of use *
- Tool to access the Internet *



First level - Results (1)

- HAVING ACCESS TO { a computer / the Internet } AT HOME

Independant variable	*Effect on the probability*
Density of population ↗	increase
Income (quartiles) ↗	increase
children	increase

Having access to the Internet at home

Odds Ratio estimates

Countries Explanatory variables	All	max		min	
model 1					
Densely-populated area	1.340	2.786	Bulgaria	1.366	Italy
Intermediate area	1.012 †	2.342	Greece	1.368*	Finland
lowest quartile	0.577	0.645	Finland	0.242	Cyprus
second highest quartile	2.024	3.676	Bulgaria	1.460	Austria
highest quartile	4.444	13.889	Portugal	2.611	Austria
1 adult with one or more children	2.882	27.027	Slovenia	2.237	Austria
2 adults	0.718	1.961	Norway	0.338	Cyprus
2 adults with one or more children	1.639	41.667**	Norway	2.500	Greece
3 or more adults	1.323	7.407	Netherlands	1.642**	Bulgaria
3 or more adults with 1 or more child.	1.664	17.544	Malta	2.299	Bulgaria
model 2					
household with dependent children	1.862	7.752	Norway	1.508	Greece

Internet intensive users

Odds Ratio estimates (selected results)

Explanatory variables (socio-economic background characteritics)		EU	Korea
		Intensive (daily)	Intensive (daily)
Age	16-24	1.283	1.637
	25-34	1.112	1.225
	45-54	0.847	0.805
	55-64	0.858	0.824
	65-74	0.690	0.458
Gender	Female	0.763	0.770
Education	ISCED3	1.546	1.915
	ISCED5	2.384	3.633
Employment	Unemployed	0.815	n.a.
	Student (not in the labour force)	2.019	2.010
	Other not in the labour force (retired, inactive, in compulsory military service, etc.)[3]	0.577	0.781
Density	Densely-populated area	1.342	0.955
	Intermediate area	1.290	n.a.
Income	Lowest quartile	1.021†	0.773
	Second highest quartile	1.299	0.973
	Highest quartile	1.685	0.955

Internet intensive users (continued)

Odds Ratio estimates (selected results)

Explanatory variables (socio-economic background characteritics)		EU Intensive (daily)	Korea Intensive (daily)
Household composition	One adult with one or more children	0.884†	1.053
	Two adults	0.753	0.968
	Two adults with one or more children	0.555	0.897
	Three or more adults	0.542	0.643
	Three or more adults with one or more child.	0.446	0.774
Household with a broadband connection		1.345	2.012
Individual having used Internet in the last 3 months at home		5.152	n.a.
Individual having payed in the last 3 months for online audiovisual content		1.993	n.a.
Individual accessing the internet with a mobile phone via GPRS		1.577	1.927
Individual accessing the internet with a mobile phone via UMTS (3G)		1.566	n.a.
Individual accessing the internet with a handheld computer (palmtop, PDA)		2.160	1.489
Individual accessing the internet with a portable computer (laptop) via wireless connection away		2.185	n.a.
C		0.787	0.733

Scope of use – EU, Korea and Canada

Linear regression , selected results

	EU (2008)		Korea (2008)	Canada (2007)	
User characteristic	**Group or category**	**Coefficient**	**Coefficient**	**Group or category**	**Coefficient**
AGE					
	16-24	2.562	2.147		
	25-34	2.301	1.886		
	35-44	1.600	1.293	per 1 year increase in age (age 18 and older)	-0.102
	45-54	1.016	0.640		
	55-64	0.307	0.311**		
(reference group)	65-74				
SEX					
	male	0.464	0.057*	male *(reference group)*	
(reference group)	female			female	-1.053
EDUCATIONAL LEVEL					
	primary or lower secondary education	-1.424	-1.887		
	upper secundary education	-0.665	-0.902	High school (or less) *(ref. group)*	
(reference group)	tertiary education			Some post-secondary	1.379
TYPE OF LOCALITY					
	densely-populated area	0.378	0.239	urban (reference group)	
	intermediate area	0.103	n.a.	rural	-0.252
(reference group)	thinly-populated area				
HOUSEHOLD INCOME					
	lowest quartile	-0.353	-0.427		
	second lowest quartile	-0.369	-0.393	Per 1 unit increase in log (base 10) of household income	0.948
	second highest quartile	-0.228	-0.254		
(reference group)	highest quartile				

More activities +

Less activities -

Conclusion and next steps

- Influence of a number of socio-economic background characteristics on:
  - non access to and non use of computer and the Internet
  - intensity (frequency) of Internet use,
  - propensity to undertake online activities,
  - scope of Internet use

- On non access, non use and dropouts:
  - Low **income** is the single most important factor for non access to a computer and to the Internet
  - The **presence of children** is the second most important factor for the access to a computer and to the Internet
  - **Living in a town** in Europe increases the odds to have access to a computer and to the Internet by over 30% as compared to living in the countryside
  - **Elderly age** and **economic inactivity** are by far the most important factors for having never used a computer or the Internet

Conclusion and next steps (2)

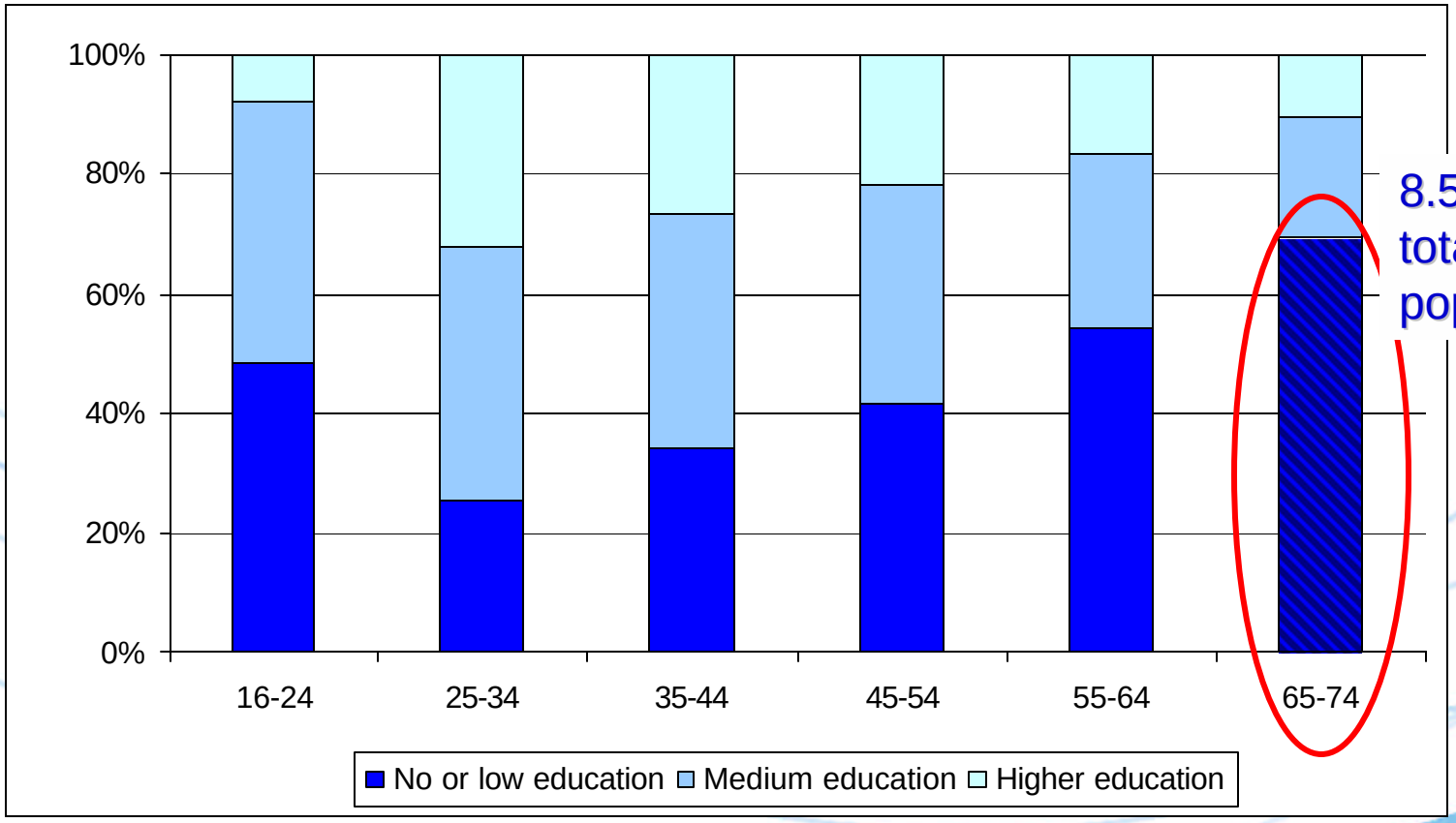
- On intensity of internet use:
  - **Education** is the most important determinant of the intensity of Internet use
  - Being **student** is the second most important determinant of the intensity of Internet use
  - **Income** (in Europe) and **broadband access** (in Korea) are the respective third factor explaining the intensity of Internet use
- On scope:
  - Young **age** and higher **education** are the main determinants for the scope of Internet use in Canada, Europe and Korea
- Potential risk of a growing second level digital divide

  (cumultative dimension of the frequency of use and the effects of education and age)
- Results preliminary. Include other countries (i.e. United States)

Policy context

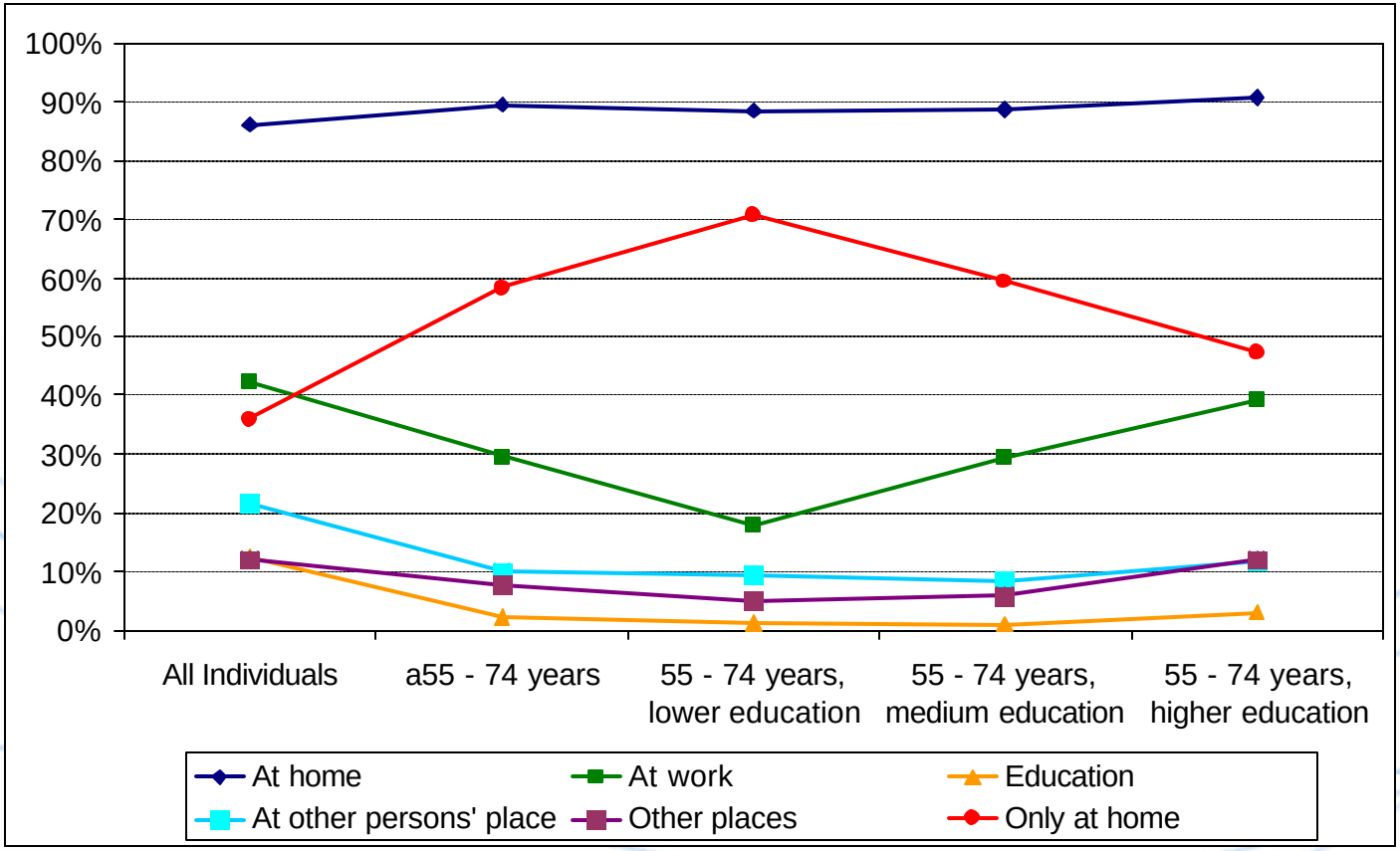
- **How could the analysis contribute to policy measures?**
- An example
  - Multivariate analysis of phenomena
  - Analysis of compositoin of population to define target population for policy measures
  - Analysis of additional characteristics, e.g. place of access to computer
  - Identification of specific interests of target population
    - What are the preferred online acticvities?
  - Definition of initiatives for attracting persons to using the internet

Composition of Population by Age and Education



Source: Eurostat, survey on ICT usage in households and by individuals 2008

Places of Internet Access



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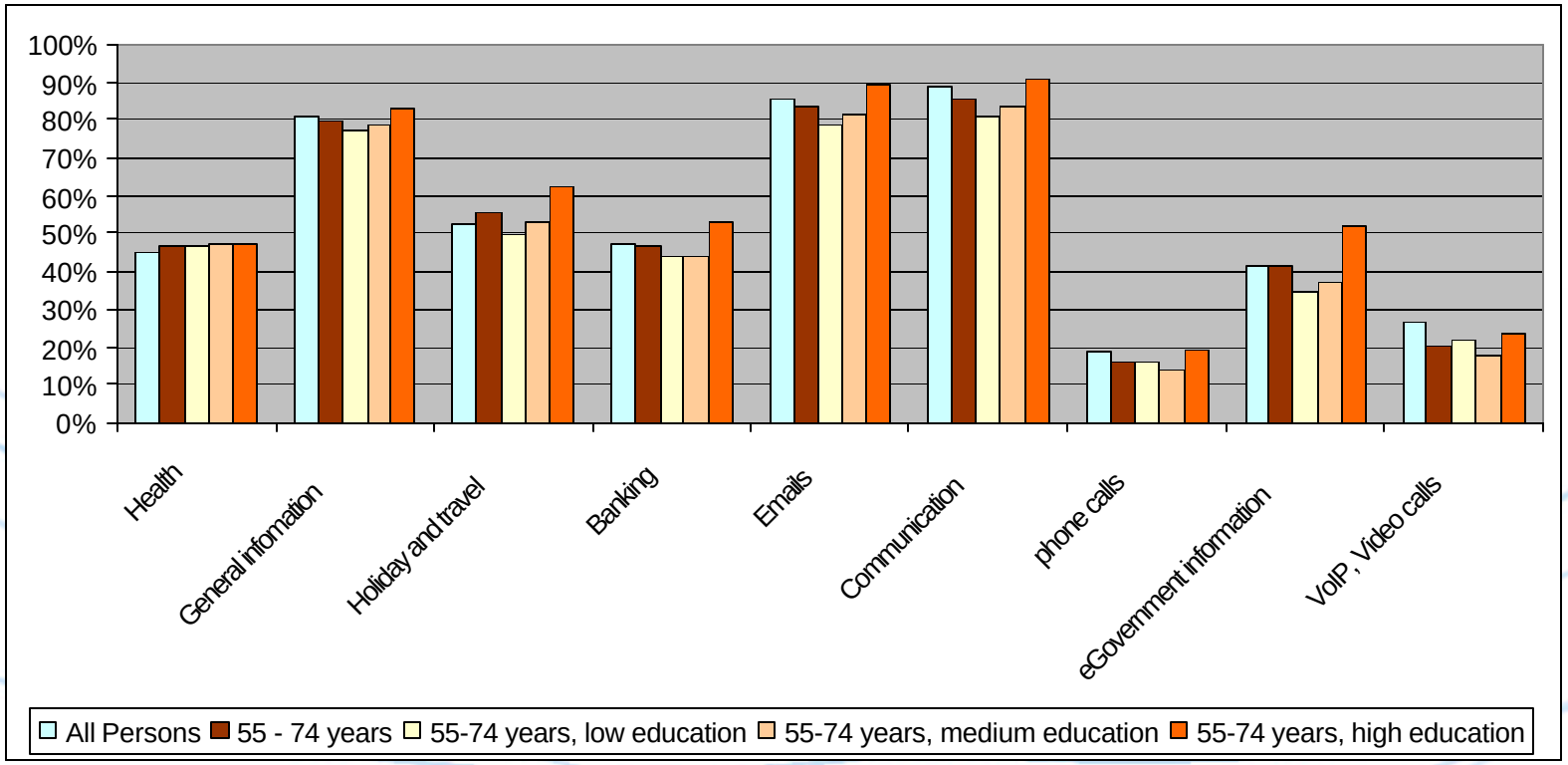
Preferred Activities



Source: Eurostat, survey on ICT usage in households and by individuals 2008

Thank you for your attention

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