



Mixing Survey Modes: Why do it and What are the Consequences?

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Modes of Data Collection



- Interviewer-administered Modes
 - Face-to-face interviews (PAPI or CAPI)
 - Telephone Interviews (PAPI or CATI)

- Self-administered
 - Postal or mail survey
 - Self-administered with interviewer present
 - PAPI or CASI
 - Web or Internet Survey
 - IVR (Interactive Voice Response)



Mixed Mode Survey

- Combine two or more modes
 - Contact
 - Data collection
- Contact
 - Screening or convincing or reminding
- Data Collection
 - Nonresponse follow-up by different method
 - SAQ-module during face-to-face interview
 - Dual frame, offering choice, etc

Types of Mixed Mode Surveys



- ❑ Two major distinctions:
 - ❑ Different contact methods are used in different survey phases (e.g., recruitment, screening, questionnaire administration, etc.)
 - ❑ Mostly win-win situation, no threat to measurement if data collection is done in **one- single** mode
 - ❑ Different methods used for data collection
 - ❑ Concurrent mixed mode:
 - ❑ Offer two or more modes at same time
 - ❑ Sequential mixed mode
 - ❑ Assign modes sequentially during life of the survey

Why Mix Modes?



- ❑ Increase in International Surveys
 - ❑ Different tradition in countries
 - ❑ Different coverage

- ❑ Increase in Online Surveys
 - ❑ Coverage
 - ❑ Special groups

- ❑ Response/nonresponse problems
 - ❑ Effort to increase response
 - ❑ Investigating bias

Why Mixed-Mode 2

Choosing the Optimal Data Collection Method



- ❑ Best data collection procedure given
 - ❑ Research question
 - ❑ Population

- ❑ Reduce total survey error

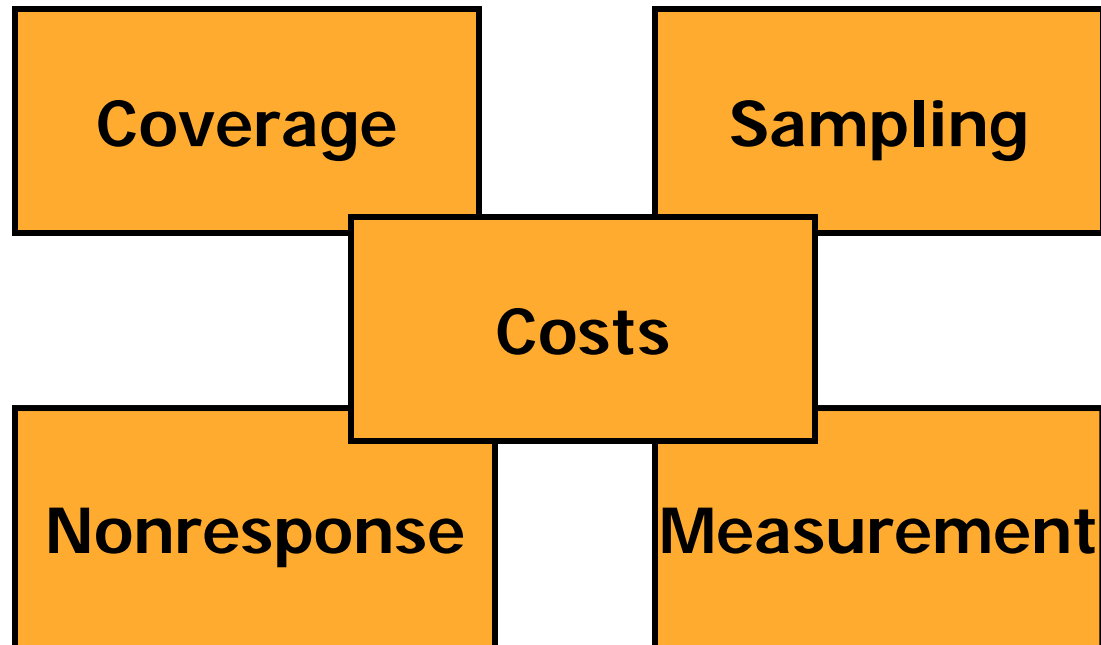
- ❑ Respect survey ethics/privacy
- ❑ Within available time
- ❑ Within available *budget*

Best Affordable Method



- ❑ Mixed-mode explicit trade-off
 - ❑ Survey Errors
 - ❑ Costs
- ❑ Example: Nonresponse follow-up
 - ❑ Mail survey
 - ❑ Telephone follow-up
 - ❑ Face-to-face for sub-sample of remaining nonrespondents

Costs & Errors



Survey Errors



Coverage

Sampling

Costs

Nonresponse

Measurement

Coverage Error and Mode



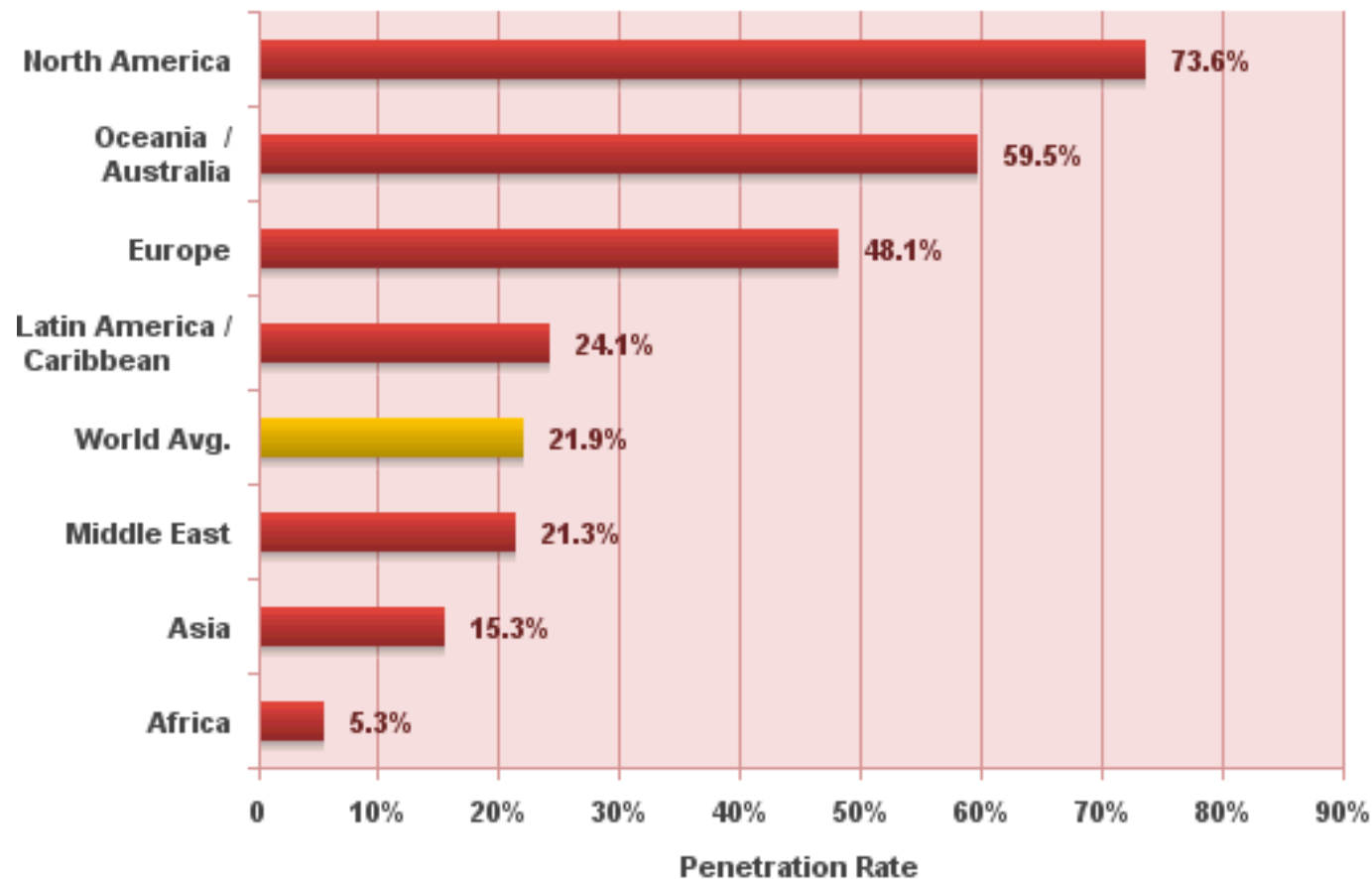
- Sampling frame must include *all* units of population of interest (once)

- Are all intended covered by mode or is there danger of undercoverage?
 - Telephone
 - Telephone penetration
 - Landlines vs mobile (cell) phones
 - Web
 - Internet penetration differs per country

Web Surveys and Coverage



World Internet Penetration Rates by Geographic Regions



Mid year 2008
Miniwatts Marketing Group

Europe Diverse Picture



- ❑ Euro Barometer Data: face-to-face survey!
- ❑ Internet Access at Home Adults 15 + (2008)
 - ❑ Holland: 86%, Sweden: 83%, Denmark: 81%, Finland: 73%
 - ❑ Germany: 58% overall;
 - ❑ Former West Germany: 61%
 - ❑ Former East Germany: 48%
 - ❑ Romania: 11 %, Turkey 15%, Bulgaria 21%
- ❑ Positive trend over time: Growth 2005 to 2008
 - ❑ Between 1% (Holland) and 21%(Bulgaria 0→21%)
 - ❑ 10% (UK: 53→63; Estonia 48→58%)

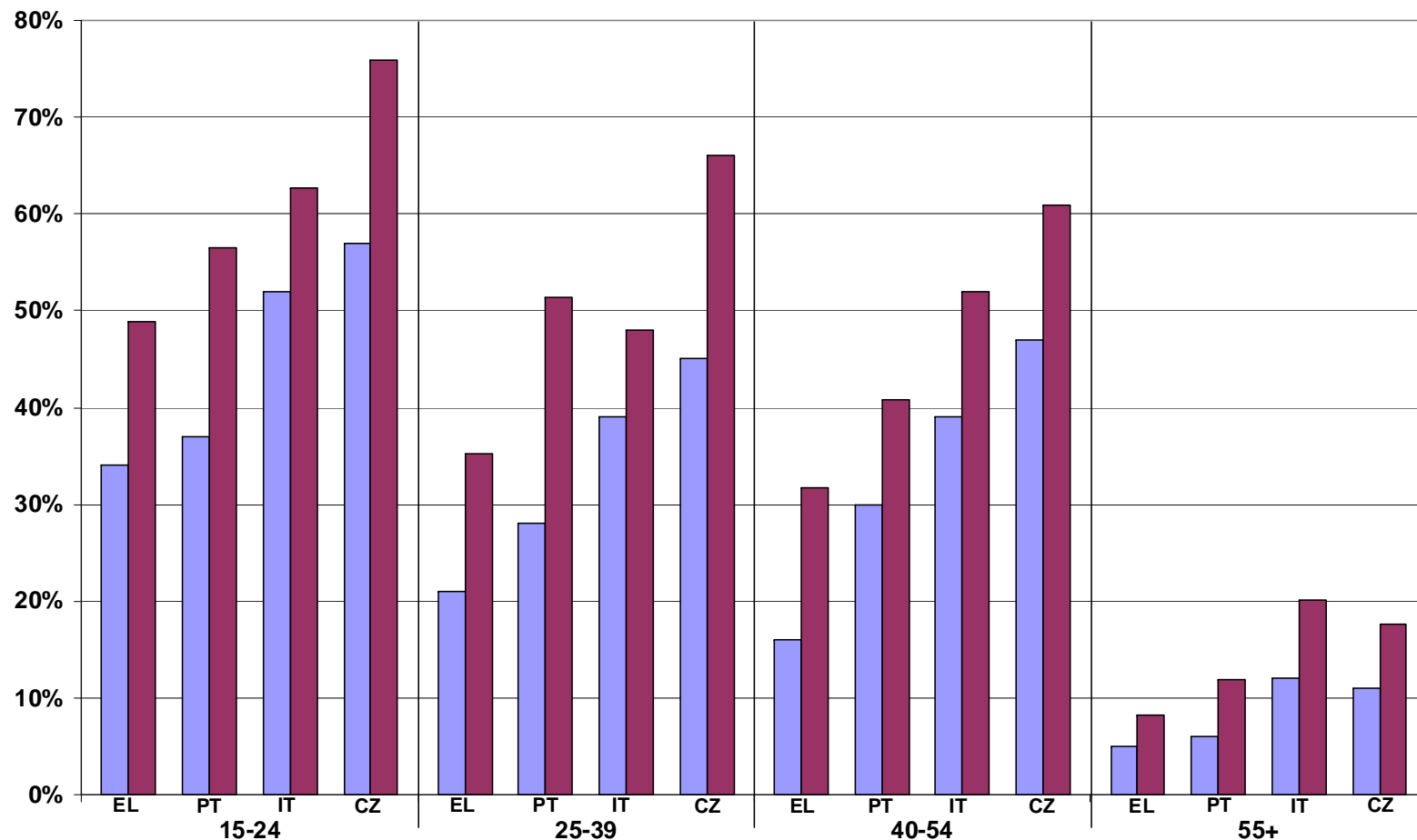
% Individuals with Internet Access at Home by Age



Internet Penetration within Age

Source: Eurobarometer 2005 & 2008

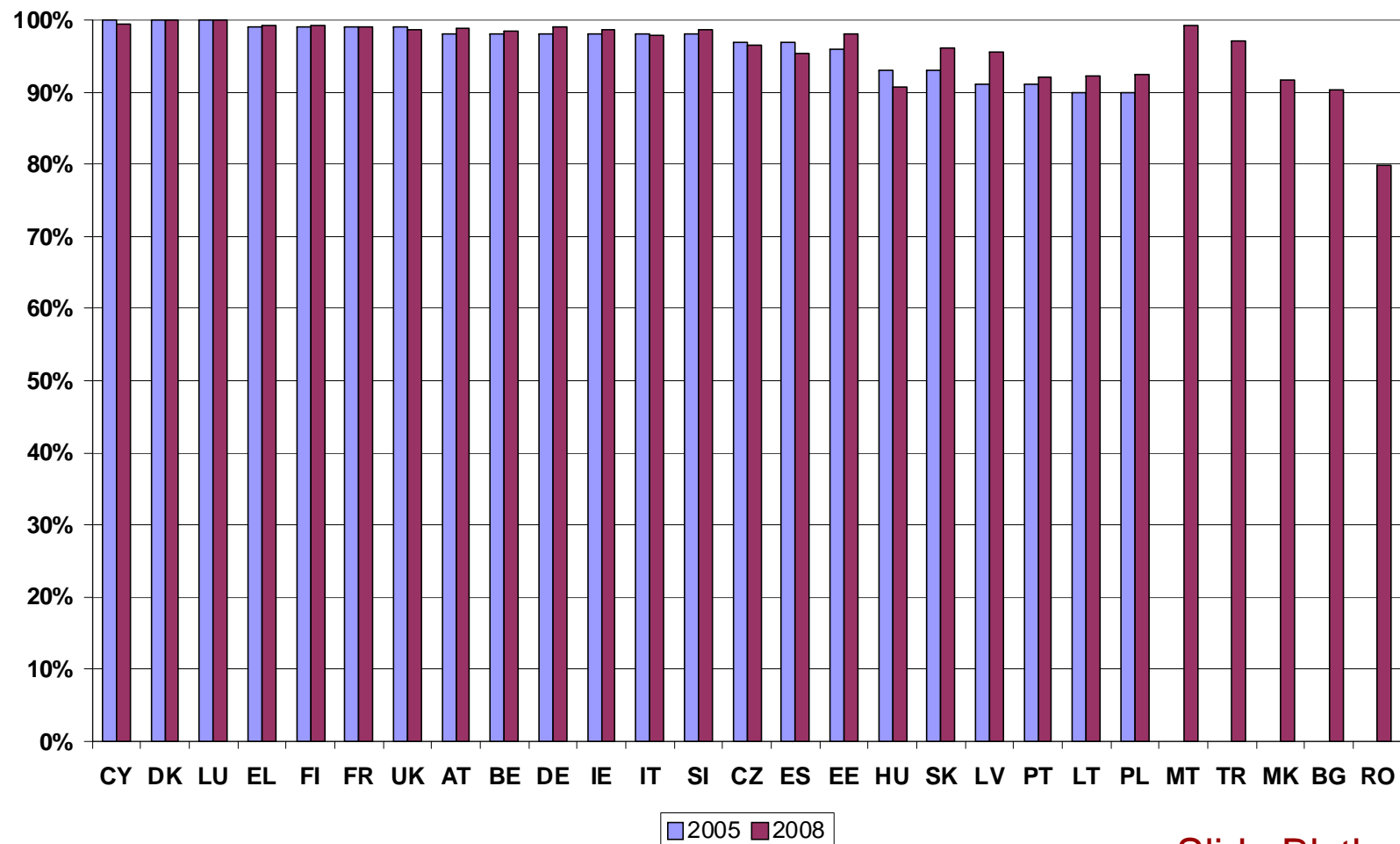
Slide Blyth, 2008



% Individuals with a Telephone (of any sort)



Source: Eurobarometer 2005 & 2008



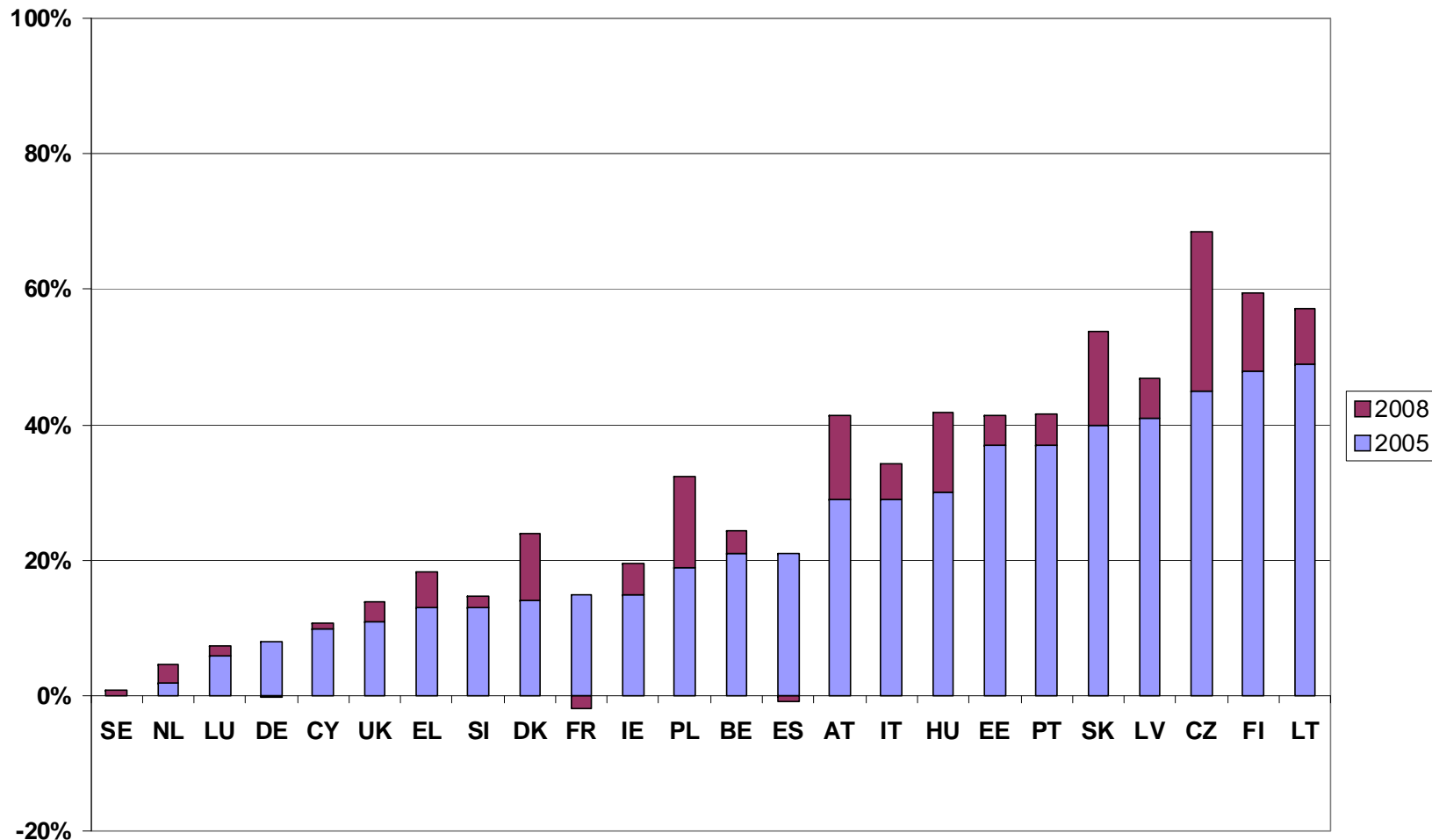
Slide Blyth, 2008

% Individuals Mobile only No Fixed (land)line

Slide Blyth, 2008



Source: Eurobarometer 2005 & 2008

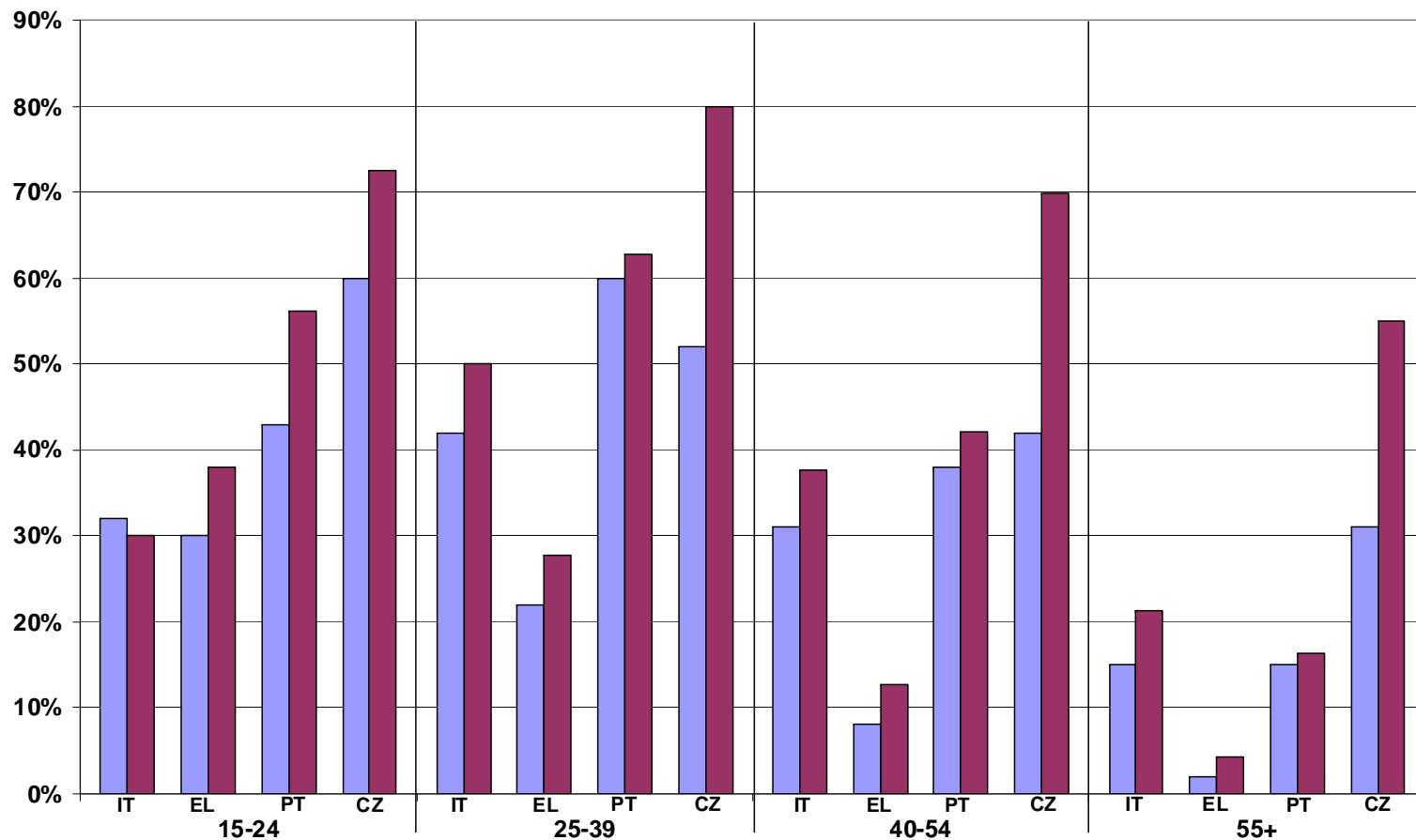


Individuals with a Mobile Only Phone by Age



Internet Penetration within Age
Source: Eurobarometer 2005 & 2008

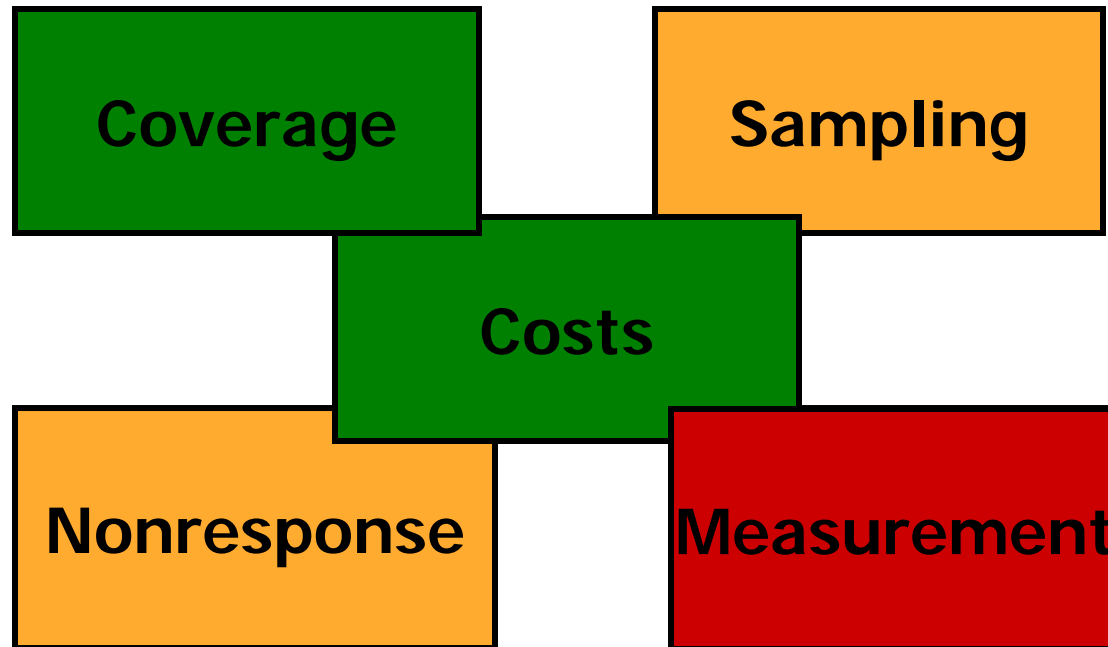
Slide Blyth, 2008



Solution (Web) Coverage



Concurrent Mixed Mode



Survey Errors



Coverage

Sampling

Costs

Nonresponse

Measurement

Types of Samples



- ❑ Information from whole population,
 - ❑ NO sampling: A Census 😊
- ❑ Probability Sampling
 - ❑ Random selection, random sampling
 - ❑ Allows for statistical theory, inference 😊
 - ❑ Complicated samples, complicated statistics
- ❑ Non probability Sampling
 - ❑ Selection probability unknown
 - ❑ No known probabilities of inclusion in sample
 - ❑ No statistical theory
 - ❑ No p-values, no margins of error 😞

Survey Errors



Coverage

Sampling

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Nonresponse

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Nonresponse Internationally



- ❑ Nonresponse increasing
 - ❑ Example: International Comparison Official Statistics
 - ❑ Longitudinal data statistical offices around the world
 - ❑ Internationally nonresponse increased over time, both noncontact and refusal
 - ❑ Countries differ in overall response rate
 - ❑ Speed of increasing nonresponse differ from country to country
 - ❑ Source De Leeuw & De Heer (2002)

Non-Response Error



- ❑ Beware Nonresponse Error is more than nonresponse!

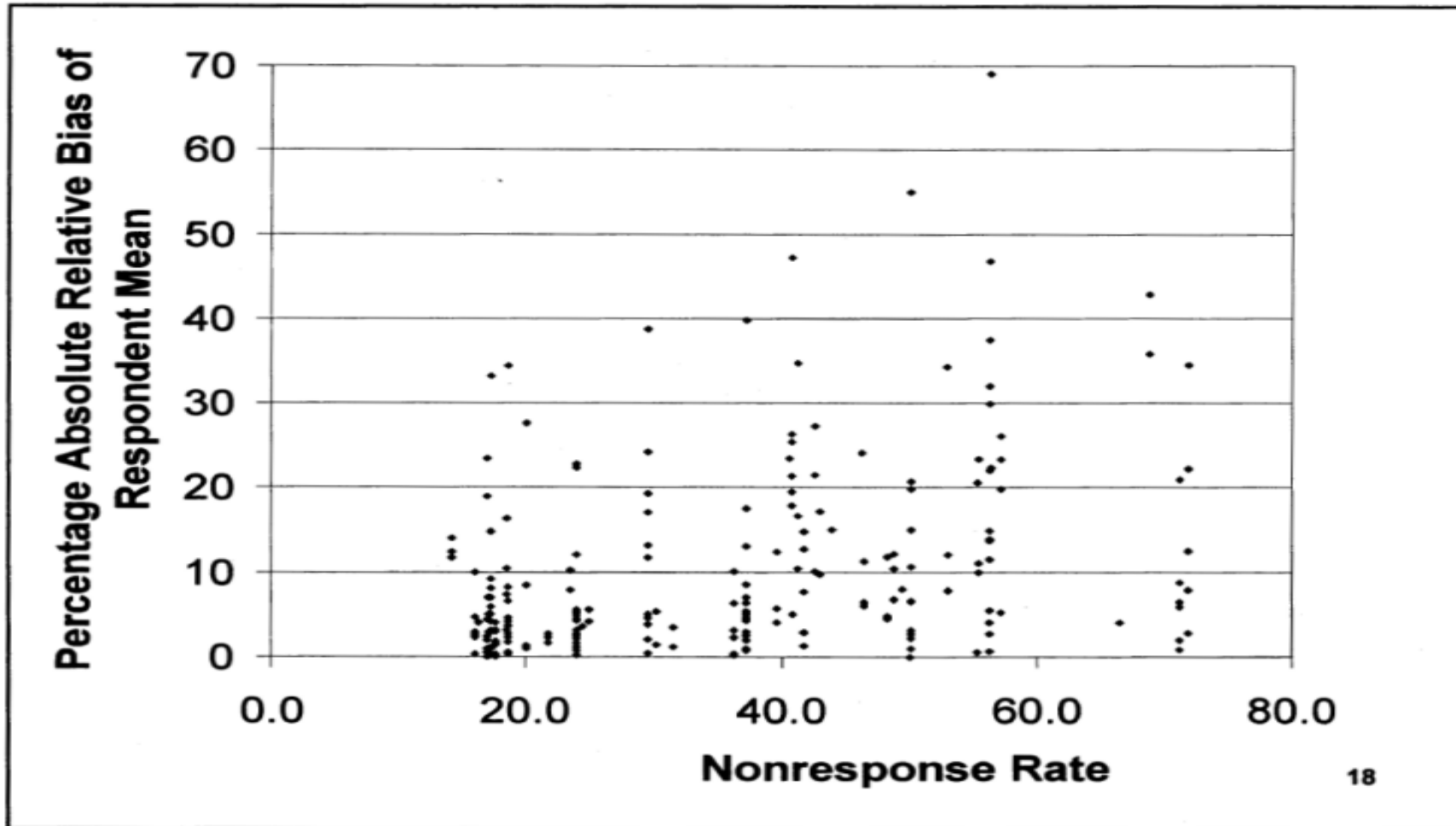
- ❑ Nonresponse error
 - ❑ I. Nonresponse occurs
 - ❑ II. Respondents and non-respondents differ on variable of interest (key variable study)

- ❑ Nonresponse figures as such uninformative
 - ❑ High nonresponse but little or no error (or vice versa)
 - ❑ Need nonresponse studies / diagnostics

Nonresponse Rate vs. Bias



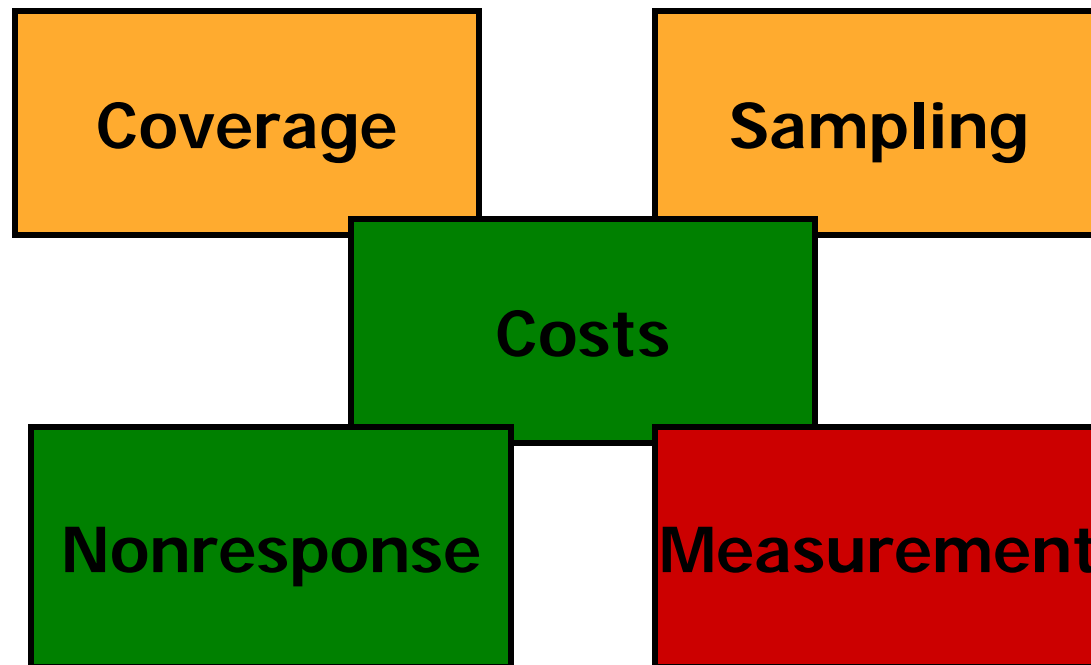
Figure 2. Percentage absolute relative nonresponse bias of 235 respondent means by nonresponse rate from 30 different methodological studies (Groves, 2006 POQ)



Nonresponse Solution



Sequential Mixed Mode



American Community Survey



- ❑ Sponsor: U.S. Census Bureau
- ❑ Target population: Households in U.S.
 - ❑ 2.9M addresses sampled
- ❑ Focus: social, housing, & economic characteristics
- ❑ Frame: Census Master Address File
- ❑ Modes (sequential):
 - ❑ Mail
 - ❑ Telephone follow-up
 - ❑ In-person follow-up
- ❑ Field period: 3 months
- ❑ Response rates: 97.3% (for 2005)
 - ❑ 1.9M interviews completed

Survey Errors



Coverage

Sampling

Costs

Nonresponse

Measurement

Measurement Error



- ❑ Measurement errors are associated with the data collection process itself

- ❑ There are three main sources of measurement error:
 - ❑ Respondent
 - ❑ Questionnaire
 - ❑ Method of data collection
 - ❑ When interviewers are used for data collection, the interviewer is a fourth source of error

Implications Mixed Mode in Data Collection Phase



- ❑ Potential Risk
 - ❑ Introducing mode effects in data set
- ❑ Result:
 - ❑ Increasing measurement error
- ❑ However:
 - ❑ Reduction of other errors
 - ❑ E.g., Coverage / nonresponse
- ❑ Careful consideration needed
- ❑ Careful design for optimal mixed mode

Summary Mixing Modes Data Collection Phase



- ❑ Some questions by one mode, other questions by another mode, but the same procedure for all respondents
 - ❑ Sensitive questions by SAQ, rest other mode
 - ❑ Data quality enhanced 😊
 - ❑ Selection and biographics first wave longitudinal/panel by one mode, next waves other modes
 - ❑ Mostly win-win
 - ❑ Beware of confounding mode vs. time effects longitudinal 😞
- ❑ Some respondents by one mode, other respondents by another
 - ❑ Nonrespondents by another mode
 - ❑ Offering choice of mode
 - ❑ Cross-national
 - ❑ Potential threats to data integrity 😞

To Mix is to Design



- ❑ Mixing data collection modes has advantages in reducing noncoverage and nonresponse errors, but
- ❑ Mixing methods may enhance measurement errors
- ❑ So,
 - I. Design for Mixed Mode Surveys
 - Design equivalent questionnaires!
 - II. If possible, measure potential mode effects
 - III. Adjust

I. Questionnaire Design



- ❑ 'Naively' mixing modes enhances measurement error as different modes have traditions of different question formats
 - ❑ Question format has effect on response distribution!
- ❑ As a consequence, designers routinely enhance unwanted mode effects in mixed-mode survey
 - ❑ Question format effects may be the main cause for mode effects in standard mixed-mode design
 - ❑ Try to avoid different question formats across modes
- ❑ Special design needed for mixed-mode surveys!

II & III Diagnosis/Adjustment: Design for Mix



<i>Build in overlap</i>	Method 1	Method 2
Group X	Main Data Collection	Some Data
Group Y	Some Data	Main Data Collection

Consequences

Mixed Mode Strategy



Coverage

Costs

Nonresponse

Measurement

Sampling

Logistics

Costs for Single Modes



- ❑ Face-to-face (most expensive):
 - ❑ 5-10 times higher than telephone
- ❑ Telephone:
 - ❑ 2-3 times more expensive than mail
- ❑ Mail:
 - ❑ Higher than Web due to fixed costs plus per completed questionnaire processing
- ❑ Web (least expensive):
 - ❑ Primarily fixed set-up costs, little per complete costs

Cost for Mixed Modes



- ❑ Typically design mix of modes to:
 - ❑ Optimize coverage, response, and costs
 - ❑ Less expensive to most expensive

- ❑ However:
 - ❑ Set-up costs with each mode
 - ❑ Per unit costs may be high even for “low cost” mode if few use the mode!

Logistics: Main Issues



- ❑ In-House Expertise
 - ❑ Communication
 - ❑ Implementation and Timing
 - ❑ Data Processing
 - ❑ Quality Control
 - ❑ Para information
 - ❑ (costs)
-
- ❑ Many of these issues well-known in International and Comparative Research
 - ❑ See for example CSDI International Workshop on Comparative Survey Design and Implementation & Cross-cultural survey guidelines at <http://ccsg.isr.umich.edu/>

MM adds to Operational Complexity



- ❑ Different recruitment and screening strategies
 - ❑ Designed, programmed, tested
 - ❑ Integration needed
- ❑ Survey instrument
 - ❑ Careful questionnaire construction for equivalence
 - ❑ Designing and programming
 - ❑ Duplication or integrated software
- ❑ Data handling
 - ❑ Ideal relational data base
 - ❑ Practice mixed-mode puts penalty during data analysis: reformatting disparate data files
- ❑ To meet needs of operational complexity.....

Expertise Needed



- Expertise on all modes
 - In-House Expertise
 - Subcontractors

- General expertise for all modes on
 - Questionnaire development
 - Questionnaire testing
 - Field work implementation
 - Sampling issues
 - Data management

Meeting the Challenge



- How to ensure high quality mixed-mode surveys:
 - Designing for Mixed modes
 - Questionnaire construction & Sampling
 - Embedding small experiments / mode comparisons
 - Provide data to estimate mode effect
 - Use data for empirically based adjustment
 - Weighting
 - Propensity score adjustment
 - Expertise in different fields: Communicate!

Future



“Survey organizations are going to have to change dramatically in some ways in order to do effective surveys as we bring new technologies online and still use our other technologies where they work”

Dillman, 2000

Mixed Mode Surveys



- ❑ Survey research history of changes
 - ❑ Forced by changes in society and technology
 - ❑ Increased knowledge
- ❑ Remember first face-to-face interviews
 - ❑ Short & simple questions
 - ❑ Later one of the most flexible methods 😊
- ❑ Mixed mode has many challenges
 - ❑ We will meet those and learn 😊 😊 😊

Suggested Websites



- ❑ Don A. Dillman's homepage
 - ❑ <http://survey.sesrc.wsu.edu/dillman/>
 - ❑ Papers
- ❑ Edith de Leeuw homepage
 - ❑ <http://www.xs4all.nl/~edith/>
 - ❑ Additional material and readings accompanying the International Handbook of survey methodology
- ❑ University of Michigan-ISR
 - ❑ <http://ccsg.isr.umich.edu/>
 - ❑ Guidelines for best practice in cross-cultural studies
- ❑ US Bureau of the Census
 - ❑ <http://www.census.gov/srd/mode-guidelines.pdf>
 - ❑ Guidelines on developing demographic questions for administration in different modes

Suggested Literature



- ❑ Overviews:
 - ❑ Edith de Leeuw, To mix or not to mix data collection modes in surveys. Journal of Official Statistics, 2005, 223-255, Freely available at www.jos.nu
 - ❑ Edith D. de Leeuw, Joop J. Hox, Don A. Dillman (2008) Mixed-mode Surveys: When and Why.
 - ❑ In De Leeuw, Hox & Dillman. International Handbook of survey Methodology. New York: Lawrence Erlbaum/Psychology Press, Taylor and Francis Group
- ❑ Designing questionnaires for mixed-mode
 - ❑ Don A. Dillman (2006). Mail and Internet surveys, New York: Wiley (chap 6)
 - ❑ Dillman in International Handbook of Survey Methodology
- ❑ Very good introduction to all types of probability sampling including how to analyse
 - ❑ Sharon Lohr (2008) in International Handbook of Survey Methodology
- ❑ Introduction to issues in nonresponse
 - ❑ Mick Couper & Edith de Leeuw (2003). Nonresponse in cross-cultural and cross-national surveys. In Harkness et al. Cross-cultural survey methods. New York: Wiley/ Peter Lynn (2008) Nonresponse. In De Leeuw, Hox & Dillman (eds). International Handbook of Survey Methodology

Acknowledgements



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