Agenda

- Short presentation of Statistics Denmark

- A few points related to survey sampling
  - Frames for different kinds of surveys
  - Coordination of samples
  - Software
  - Organization / Workflow

Statistics Denmark

Independent

- Professional independence
- Objective and impartial

We have to secure the status of Statistics Denmark as the central, independent provider of official Danish statistics.

– Jørgen Elmeskov, June 2013

National Statistician

Jørgen Elmeskov

National Statistician from October, 2013

Former Director and Deputy Chief Economist at the OECD

Master in Economics From the University of Copenhagen

Born 1956

Mission and Vision

Mission:
- Statistics Denmark produces impartial statistics on society as the basis for democracy and the national economy

Vision with four elements:
- user-friendly & data supplier-friendly
- effective and innovative
- integrate the official statistics
- attractive workplace

Subjects

| Social statistics	Business statistics	Economic statistics
• Population & Elections	• Business Sector in General	• Prices and Consumption
• Living Conditions	• Business Sectors	• National Accounts & Government Finances
• Education & Knowledge	• Geography, Environment & Energy	• Money & Finance Market
• National Church	• Culture	• External Economy
• Labor, Earnings & Income		

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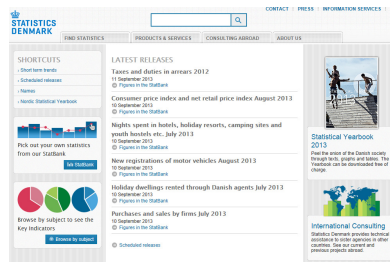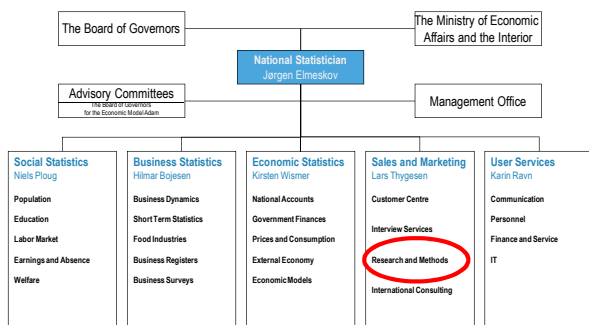
www.dst.dk/en

All numbers are available online

New releases daily at 9:00 a.m.

270,000 visits per month

Browse by subject: www.dst.dk/subjects

Statbank
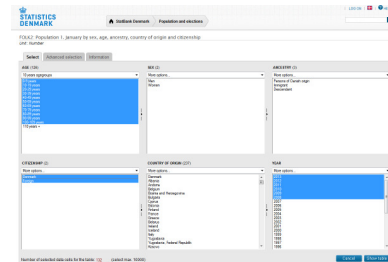
Billions of numbers

3,000 tables

Updated daily at 9:00 a.m.

www.statbank.dk

Organisation

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The Board of Governors                    The Ministry of Economic
                                          Affairs and the Interior

              National Statistician
              Jørgen Elmeskov

Advisory Committees
The Board of Governors                    Management Office
for the Economic Model Adam
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Social Statistics Niels Ploug	Business Statistics Hilmar Bojesen	Economic Statistics Kirsten Wismer	Sales and Marketing Lars Thygesen	User Services Karin Ravn
Population	Business Dynamics	National Accounts	Customer Centre	Communication
Education	Short Term Statistics	Government Finances	Interview Services	Personnel
Labor Market	Food Industries	Prices and Consumption	Research and Methods	Finance and Service
Earnings and Absence	Business Registers	External Economy	International Consulting	IT
Welfare	Business Surveys	Economic Models		

Division of Research and Methods

- Research Services, 14 employees
- Statistical Methodology, 7 employees
- Metadata and Quality, 4 employees

- Statistical Methodology employees have background in statistics (2), mathematics, economy, physics, engineering, and forest science (me)

- Statistical Methodology performs consulting on
  - Samples and estimation
  - Editing and imputation
  - Seasonal adjustment
  - Ad hoc statistical analysis

Staffing and budget

Employees: 562 man-years

Budget: DKK 384 m.
Euro 51.5 m.

Of this own income: DKK 114 m.
Euro 15.3 m.

All numbers of 2013

Historical and legal background

1849: Democracy in Denmark
1850: Establishment of Statistics Denmark
1966: Act on Statistics Denmark
1994: UN fundamental principles of official statistics
2001: Free access to the Statbank
2005: European Statistics Code of Practice
2009: Strategy 2015

STRATEGY 2015

STATISTICS DENMARK

More statistics

www.dst.dk/dif

www.dst.dk/en/OmDS/opgaver-og-strategi.aspx

A few points related to survey sampling...

Detailed agenda

- Frames for different kinds of surveys
  - Statistical business register
  - Central personal register

- Coordination of samples

- Software - SAS / CLAN

- Organization of work – GSBPM

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Sources for sampling frames 1

- The Statistical Business Register (SBR) is a statistical register maintained by Statistics Denmark
  - http://www.dst.dk/en/Statistik/dokumentation/Declarations/the-statistical-business-register.aspx

- Danish Business Authority maintain the Central Business Register (CVR) – this is an administrative register
  - We get daily updates from CVR that are fed into SBR including information about address and NACE classification

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Sources for sampling frames 2

- The SBR is supplemented with information from SKAT (Danish tax authorities), namely turn-over and number of employees (eIncome)

- The update is quite fast but not real-time
  - There might be a slight over-coverage…

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Sources for sampling frames 3

- For agricultural statistics we can rely on supplemental information from the Central Register for Domestic Animals administered by the Danish Veterinary

- … and applications for farm subsidies

Sources for sampling frames 4

- The Central Personal Register is a register of Personal Identification Numbers
- Merged with other official registers so that we have Marital status, income, education, ethnicity…
- Danish citizens much be in CPR, but what about
  - Homeless
  - Guest workers (not immigrant or refugees)
  - Immigrant waiting for asylum in camps…
  - Danish citizens staying abroad

Non-eligible persons…

POLITIKEN Torsdag

788.000 danskere afviser forskere

Monthly growth in numbers of non-eligible persons
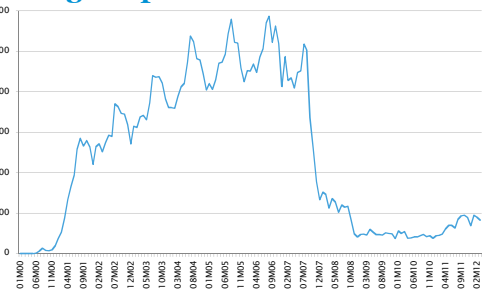
Age distribution on non-eligible

Age group	Eligible	Non-eligible	Total	Non-eligible [percent]
-14	890.734	93.144	983.878	9,5
15-17	189.486	26.220	215.706	12,2
18-24	432.274	61.727	494.001	12,5
25-34	477.251	171.795	649.046	26,5
35-44	616.195	154.195	770.390	20,0
45-54	697.762	97.285	795.047	12,2
55-64	644.535	55.461	699.996	7,9
65-74	542.247	35.410	577.657	6,1
75+	380.206	18.831	399.037	4,7
Total	4.870.690	714.068	5.584.758	12,8

Typical sampling fraction

- Labour Force Survey (LFS); quarterly
  - N = 4.500.000
  - n = 35.000
  - f = 0,78 percent

- Research and Development Survey; yearly
  - N = 18.000
  - n = 4.000
  - f = 22 percent

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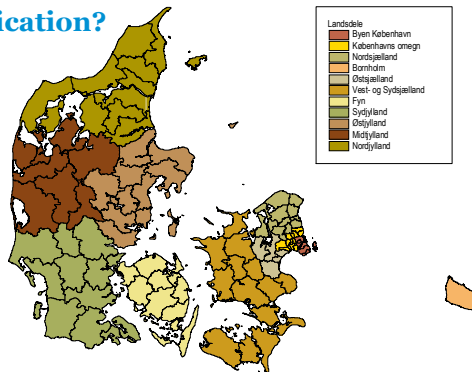
Stratification?

Landsdele
- Byen København
- Københavns omegn
- Nordsjælland
- Bornholm
- Østsjælland
- Vest- og Sydsjælland
- Fyn
- Sydjylland
- Østjylland
- Midtjylland
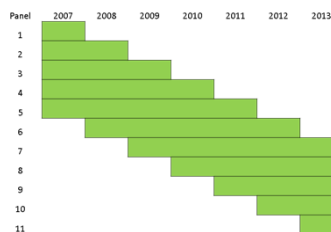- Nordjylland

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Rotating panel

- Controlled overlap between samples…

Principles in a rotating panel

- With a 5-wave panel the selected units stay in the sample for five years – then they are "released"

- Ideally, this corresponds to 80 percent overlap and 20 percent replacement

- However, this demands a fixed population and that the same allocation is used time after time (and that none of the newly relased units are selected again)

Advantages with a rotating panel

- The selected businesses learn to fill in the questionnaire fast and correctly
  - Reduced burden with one units participating five times compared to five units participating a single time
  - Perhaps smaller measurement error

- Smaller error on the change $\Delta_t = y_t - y_{t-1}$ due to the positive correlation between answers in the two surveys
  - However, this reduction can be hard to quantify…

The "only 3" rule

- Businesses with less than 10 employees can only be selected for three different mandatory surveys

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STATISTICS
DENMARK

Detailed agenda

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Software for calibration and estimation of standard error

- SAS
  - proc surveyselect
  - proc surveymeans
  - CLAN

- R
  - Survey-package (Thomas Lumley)

Analyses of non-response

Uddannelsesgruppe	Udtrukket til stikprøven?			Respondent?		
	Nej	Ja	I alt	Nej	Ja	I alt
1. Folkeskole el.lign.	69.423	1227	70.650	359	868	1227
	98,26	1,74		29,26	70,74	
2. Gymnasial	14.097	235	14.332	88	147	235
	98,36	1,64		37,45	62,55	
3. Erhverv og korte videregående	68.744	1172	69.916	275	897	1172
	98,32	1,68		23,46	76,54	
4. Mellemlang videregående	22.352	390	22.742	67	323	390
	98,29	1,71		17,18	82,82	
5. Længere videregående	14.019	247	14.266	60	187	247
	98,27	1,73		24,29	75,71	
6. Ingen uddannelse eller uoplyst	11.365	205	11.570	104	101	205
	98,23	1,77		50,73	49,27	
Total	200.000	3476	203.476	953	2523	3476

Work flow according to GSBPM

- Generic Statistical Business Process Model is joint UNECE / Eurostat / OECD Work

- Intention: To provide a basis for statistical organizations to agree on standard terminology to aid their discussions on developing statistical metadata systems and processes.

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