Industry and Occupation Data Using the American Community Survey

Melissa C. Chiu

Presentation for
National Committee on Vital and Health Statistics

March 8, 2012

Overview

- Context
- Collection of industry and occupation (I&O) information
- Coding and classification
- Data editing
- Studies of data quality
- Considerations and recommendations

History of I&O Data

- **Industry**
  - first collected in 1820 census
  - continuous basis since 1910

- **Occupation**
  - collected since 1850 census

- **Class of worker**
  - collected since 1910 census

- Questions describe the work activity and occupational experience of the American labor force.

Uses of I&O Data

- **Government**
  - to formulate policy and programs for employment, career development, & training
  - to provide information on the occupational skills of the labor force in a given area to analyze career trends
  - to help create estimates used in the allocation formulas or for eligibility criteria in many federal programs
- **Businesses**
  - to measure compliance with antidiscrimination policies
  - to decide where to locate new plants, stores, or offices
  - to develop business plans
  - to plan, budget, and pay benefits
- **Researchers**
  - to analyze social and economic issues, such as:
    - earnings inequality
    - labor force transitions
    - employment outcomes
    - returns to education

ACS I & O Data Process

Questionnaire completion (collection)

Data capture

Clerical coding

Edits

- Paper
- CATI
- CAPI

- Keyed from image (KFI)
- Data capture file

- Coders
- Referralists
- QA

3 Modes of Data Collection

Paper

(mail out, mail back)

Computer assisted telephone interview (CATI)

Computer assisted personal interview (CAPI)

2012 ACS Paper Questionnaire

- 3 million addresses annually

- 21 housing questions

- 5 demographic questions

- 42 population questions
  - I & O Questions # 41-46

Everyone 15 and older who had a job during the past 5 years

- With a job last week
  - Only 1 job
  - Job with most hours
  - Most recently reported to

- If not working last week
  - Most recent job in past 5 years

L *Answer questions 41 – 46 if this person worked in the past 5 years. Otherwise, SKIP to question 47.*

41 – 46 CURRENT OR MOST RECENT JOB ACTIVITY. *Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give information for his/her last job or business.*

ACS Questionnaire
Class of Worker Item

41 **Was this person –**
Mark (X) ONE box.

- ☐ an employee of a PRIVATE FOR-PROFIT company or business, or of an individual, for wages, salary, or commissions?

- ☐ an employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization?

- ☐ a local GOVERNMENT employee (city, county, etc.)?

- ☐ a state GOVERNMENT employee?

- ☐ a Federal GOVERNMENT employee?

- ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm?

- ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm?

- ☐ working WITHOUT PAY in family business or farm?

- Class of worker categorizes people according to the <u>type of ownership</u> of the employing organization

ACS Questionnaire
Industry Items

42 **For whom did this person work?**

If now on active duty in the Armed Forces, mark (X) this box → ☐ *and print the branch of the Armed Forces.*

Name of company, business, or other employer

43 **What kind of business or industry was this?**
Describe the activity at the location where employed. (For example: hospital, newspaper publishing, mail order house, auto engine manufacturing, bank)

- Industry data describe the <u>kind of business</u> conducted by a person's employing organization

- 3 industry questions

ACS Questionnaire
Industry Type Check box

44. **Is this mainly** – *Mark (X) ONE box.*

☐ manufacturing?

☐ wholesale trade?

☐ retail trade?

☐ other (agriculture, construction, service, government, etc.)?

- Check box on industry type

ACS Questionnaire Occupation Items

45 **What kind of work was this person doing?**
(For example: registered nurse, personnel manager, supervisor of order department, secretary, accountant)

46 **What were this person's most important activities or duties?** *(For example: patient care, directing hiring policies, supervising order clerks, typing and filing, reconciling financial records)*

- Occupation describes the <u>kind of work</u> a person does on the job

- 2 occupation questions

Instruction Guide (Mail)

- Industry

  "Print one or more words to describe the business, industry, or kind of work the individual employer named. If there is more than one activity, describe only the major activity at the place where the person worked. Enter what is made, what is sold, or what service is given.

  Enter descriptions like the following: hospital, newspaper publishing, mail order house, auto engine manufacturing, bank.

  Do not enter: newspaper, order house, engine."

Instruction Guide (Mail)

- Occupation

  "Print one or more words to describe the kind of work the person did. If the person was a trainee, apprentice, or helper, include that in the description.

  Enter descriptions like the following: registered nurse, personnel manager, supervisor of order department, secretary, accountant, high school teacher, etc.

  Do not use/ Avoid single words such as: nurse, manager, teacher, etc."

Instruction Guide (Mail)

- Job duties

  "Describe the most important activities or duties the person performed.

  Enter descriptions like the following: patient care, directing hiring policies, supervising order clerks, typing and filing, reconciling financial records, etc."

Instructions- Field Representatives (FRs)

- CATI and CAPI modes
- Extensive training
- Interacting with respondents
  - Purpose of the survey questions
  - Instructions on what information is sought
  - Importance of accuracy and more specificity (multiple-word descriptions)
  - Accuracy of text affects I & O codes assigned

Instructions- Field Representatives (FRs)

- Probing to get more detailed information
  - "Could you be more specific?"
  - Examples
    - "What type of clerk are you?"
    - "What kind of engineer are you?"
    - "What field of research are you in?"
    - "What do you sell?"
    - "What level of school do you teach? What subject do you teach?"
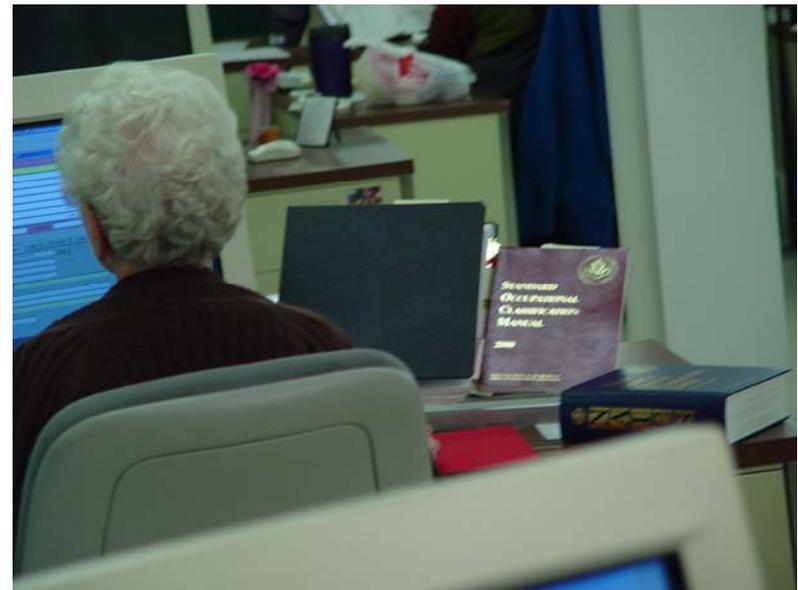
Creation of Data Capture File

- Written text keyed from scanned image (KFI)

- About 45 keyers daily at National Processing Center

- Keying rules – key exactly what is seen, including misspellings and foreign languages

- Illegal value responses identified (multiple check marks, invalid entries)

- Truncate write-ins to 60 characters for I&O items

Examples of Write-ins

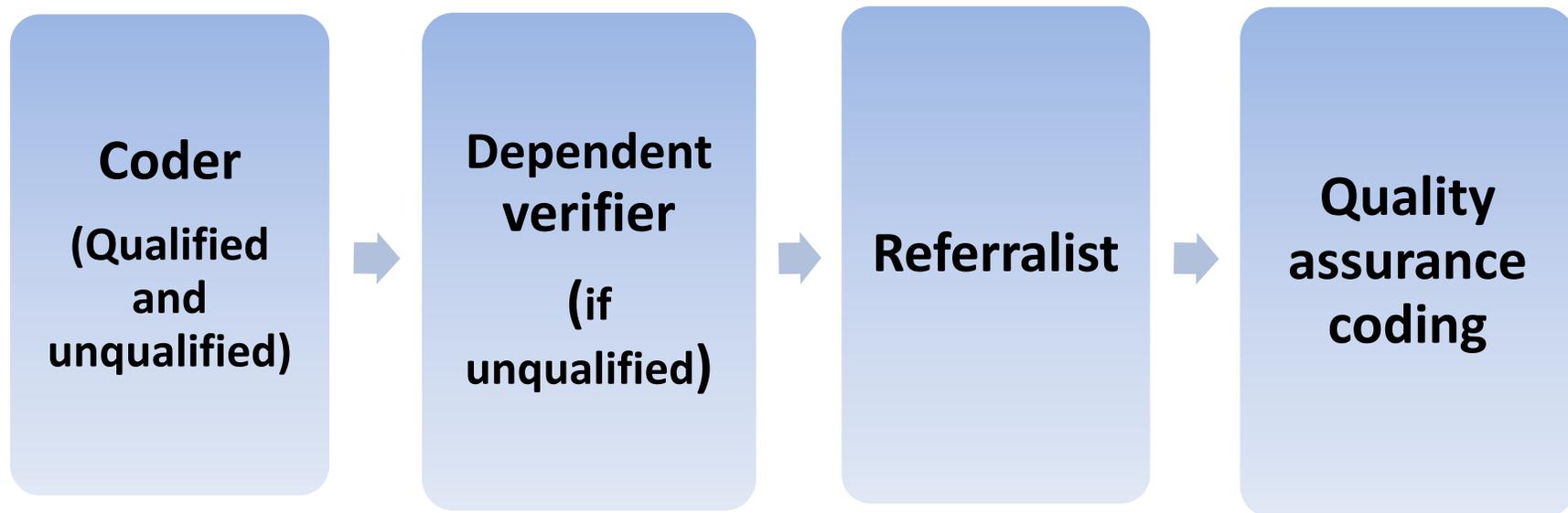| Industry Write-in (INW3)	Occupation Write-in (OCW1)
BANK	ASSISTANT VP LOAN DEPARTMENT
CONSTRUCTION COMPANY	PROJECT MANAGER
CONSTRUCTION CONTRACTER	BRIDGE CARPENTER
CROP CATTLE FARM	**ALL JOBS THAT NEEDED DOING**
UNIVESITY HIGHER EDUCATION	ASSISTANT DEAN/ADMINISTRATION
CHILED CARE	BBOSS
PROPERTY MANAGEMENT	PROPERTY MANAGER
MEAT PROCESSING	MEAT PROCESSING
BOWLING ALLEY- SNACK BAR	NIGHT SUPERVISOR FOR SNACK BAR
STEEL BRIDGE FABRICATOR	MACHINE PROGRAMMER-LAYOUT
HIGH SCHOOL	COUNSELOR
NON-PROFIT LAW FIRM	ATTORNEY
UNIVERSIDAD	**AYUDANTE DE PROGRAMA P E A N**
EDUCATION	INSTRUTOR OF ENGLISH
RESTAURANT	COOK
PIZZA	HE MAKES PIZZAS
BURYING PEOPLE	I BURY THE DEAD
MILITARY	RADIO MAINTENANCE
GOVERNMENT	**D**

I & O Coding

- ACS I&O coding is all computer assisted clerical coding

- Over 200,000 ACS cases per month

- Batches of 100 cases at a time

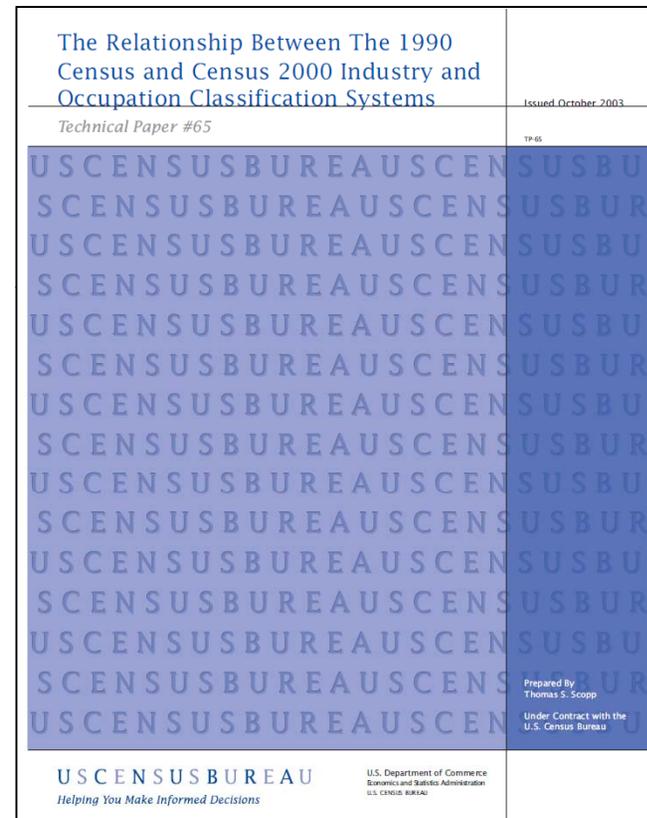- Autocoding beginning in 2012

Clerical Coding Process

Coder

(Qualified and unqualified)

→

Dependent verifier

(if unqualified)

→

Referralist

→

Quality assurance coding

Information used to Code I&O

- Age

- Sex

- Date of birth

- Educational attainment

- Residence county, state

- Active duty Armed Forces checkbox

- Class of worker checkbox

- Employer name write-in

- Kind of business write-in

- Industry type checkbox

- Kind of work write-in

- Job duties write-in

Census I&O Codes

- Unique set of codes for household surveys

- Collectability – observable detail on write-in

- Degree of aggregation varies by sector or major group

- Updated with NAICS and SOC changes

The Relationship Between The 1990 Census and Census 2000 Industry and Occupation Classification Systems

Issued October 2003

Technical Paper #65

TP-65

USCENSUSBUREAU
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN
SCENSUSBUREAUSCEN
USCENSUSBUREAUSCEN

Prepared By
Thomas S. Scopp

Under Contract with the
U.S. Census Bureau

USCENSUSBUREAU
Helping You Make Informed Decisions

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU

Industry Codes

- **Census industry codes based on NAICS**

- **Classifies establishments based on similarity of production processes**

- **Covers all 20 sectors**

- **Classified based on NAICS two-digit through six-digit codes**

- **269 Census industry codes**

NAICS Manual-Industry
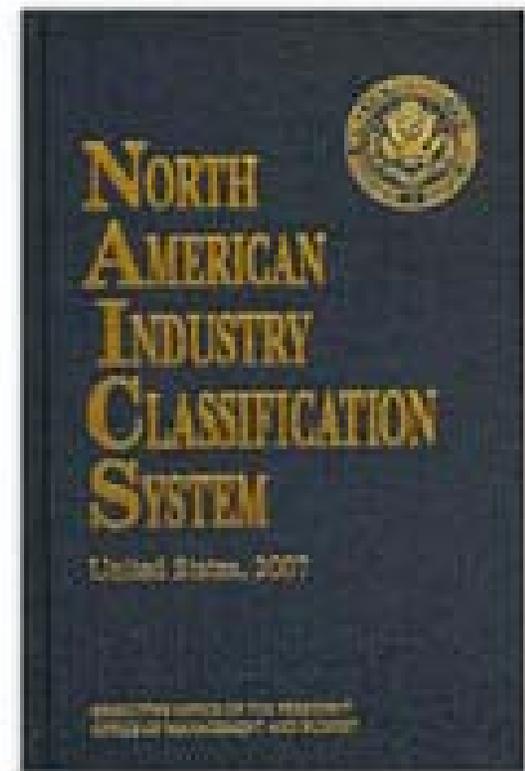
Industry Code Crosswalk (*excerpt*)

Industry Code List Industry 2009 Description	2009 Census Code	2007 NAICS Code
Other Services, Except Public Administration	**8770-9290**	**81**
Barber shops	8970	812111
Beauty salons	8980	812112
Nail salons and other personal care services	8990	812113, 81219
Drycleaning and laundry services	9070	8123
Funeral homes, and cemeteries and crematories	9080	8122
Private households	9290	814
Construction	**0770**	**23**
Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	0770	23

Occupation Codes

- **Census occupation codes based on SOC**
- **Classified primarily on work performed**
- **Covers all 23 major groups**
- **Classification detail based on SOC two-digit through six-digit codes**
- **539 Census occupation codes**

SOC Manual-Occupation
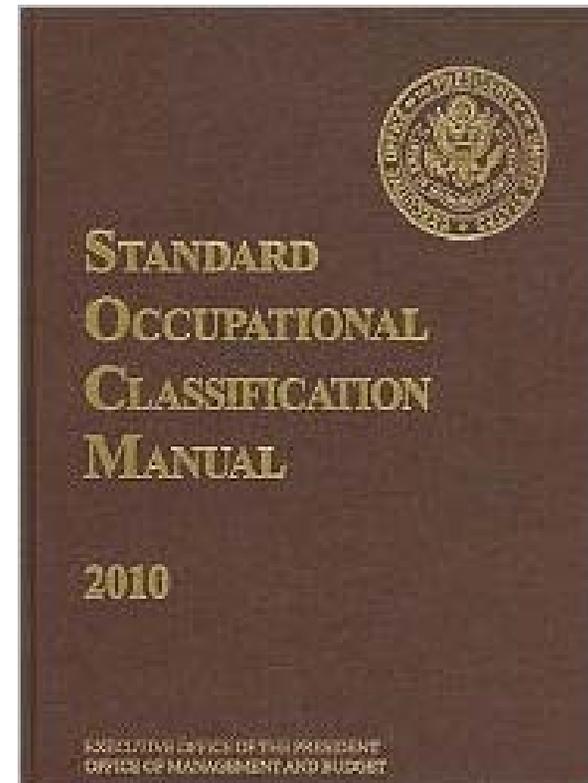
Occupation Code Crosswalk (*excerpt*)

Occupation 2010 Description	2010 Census	2010 SOC
Education, Training, and Library Occupations:	**2200-2550**	**25-0000**
Postsecondary teachers	2200	25-1000
Preschool and kindergarten teachers	2300	25-2010
Elementary and middle school teachers	2310	25-2020
Secondary school teachers	2320	25-2030
Special education teachers	2330	25-2050
Other teachers and instructors	2340	25-3000
Archivists, curators, and museum technicians	2400	25-4010
Librarians	2430	25-4021
Library technicians	2440	25-4031
Teacher assistants	2540	25-9041
Other education, training, and library workers	2550	25-90XX

Coding Indexes

- Reference guide for classifying specific responses
- Maintained regularly

OCCUPATION TITLE	NAICS RESTRICTION	SOC CODE	INDUSTRY RESTRICTION	OCCUPATION CODE
Teacher, elementary school	6111	25-2021	7860	2310
Teacher, french	6112, 6113	25-1124	7870	2200
Teacher \ n.s.	51331	43-2011	6680	5010
Teacher \ n.s.	6112, 6113	25-1199	7870	2200
Teacher \ n.s.	524, 8121, 6114, 6115	25-1194	6990, 7880, 8870, 8880, 8970	2200
Teacher \ n.s.	Bible school 611699	21-2099	Bible school 7890	2060
Teacher \ n.s.	Elementary school 6111	25-2021	Elementary school 7860	2310

Data Edits

- Universe Check

  For each person record:

  Age > 15 and Worked in past 5 years

- Logical edits

- Imputation

Example of an Edit: *Lawyers*

- *Where AGE* > 15 and *EMPLOYED* and *OCCUPATION CODE* is "Lawyers"

  and

- *EDUCATIONAL ATTAINMENT* < Master's degree and *INCOME per Week* < $930

- Change *OCCUPATION CODE to* "Paralegals and legal assistants"

Incomplete Data: Assignment from Donors

Donor respondent – a "similar" person based on characteristics such as age, sex, educational attainment, income, employment status, and weeks worked

- Used to fill missing item when
  - missing code for industry, occupation, class of worker item

  - all labor force and income data are blank, all of these economic questions are assigned from a "similar" person who provided all these data

Consistency Check

- Evaluates consistency among all of the labor force, education, and income data
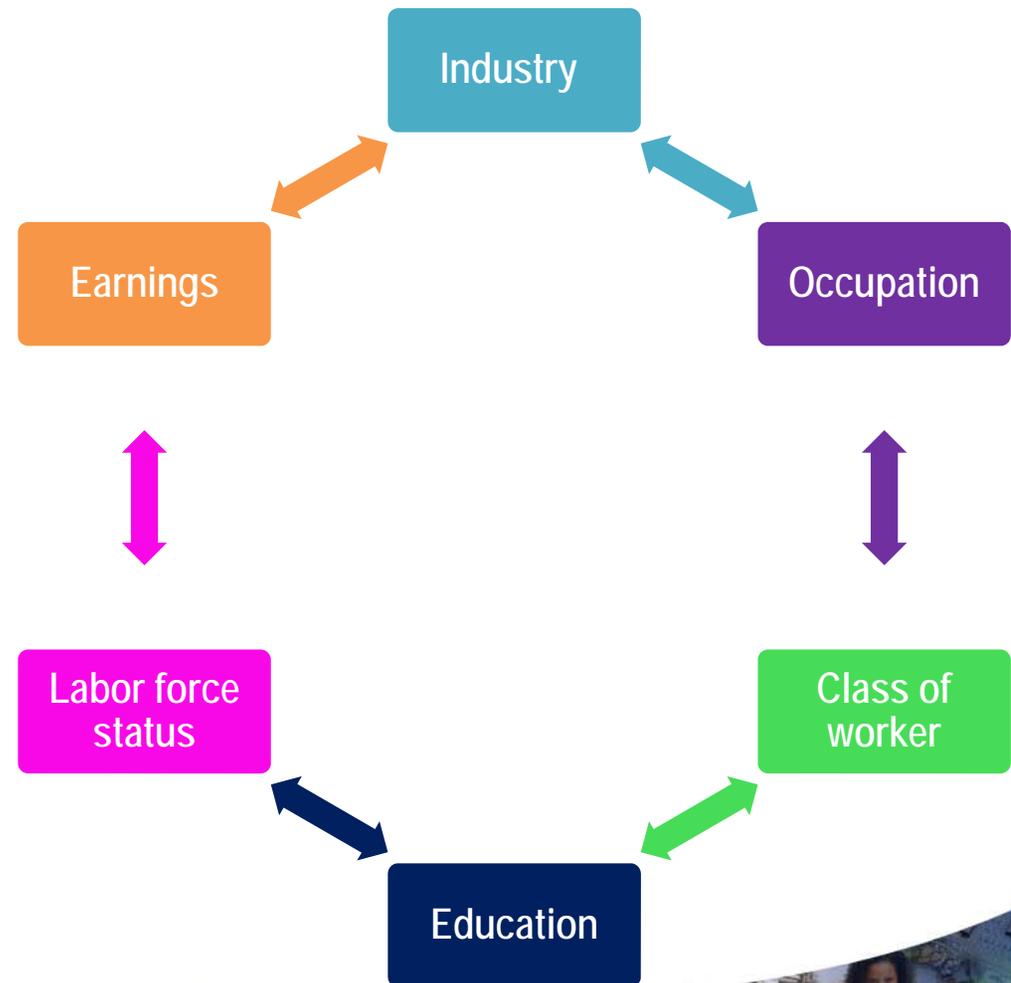
Summary of Standards for I&O Data

- Collection instructions and interview procedures
- Keying procedures
- Occupation, industry classification systems
- Coding procedures and quality assurance
- Editing and consistency checks
- Rigorous process for question changes
  - Pre-test- Cognitive test
  - Small sample field test- Content test
  - Questionnaire design test
  - Instrument test

Surveys Using Census I & O Coding

- American Community Survey (ACS)

- Current Population Survey (CPS)

- Survey of Income and Program Participation (SIPP)

- American Time Use Survey

- National Crime Victimization Survey

- National Health Interview Survey

- New York City Housing Vacancy Survey

- National Survey of College Graduates

Considerations- Data Source

- ACS
  - Large sample
  - More complete distributions on occupation, industry
  - Breadth of topics, more general usage
  - Good geographic coverage
- SIPP
  - Multiple jobs
  - Longitudinal, interviewed every 4 months, over 2 to 4 years
  - Respondent consistency issues
  - Inter-coder reliability issues

Considerations- Data Source

- ## Establishment surveys
  - – May be more consistent in reporting
  - – No activity in informal economy
  - – More organizational context
  - – Less person-level information

- ## Occupational Employment Statistics (OES) [Bureau of Labor Statistics]
  - – Wage and salary, no self-employment
  - – One job reported per worker

United States™
Census
Bureau

Considerations- Health Surveys

- Linking occupation and industry to health outcomes
  - On-the-job injuries vs. long-term disease onset
- Occupation, job
  - Current vs. most recent vs. longest job ever held vs. most time spent on the job
  - Multiple jobs and occupations
  - May need additional questions on tasks and activities
  - Is the detail needed collectible and standardizable?
- Industry
  - Not necessarily a substitute for workplace conditions or exposure on-the-job
  - Does not measure organizational structure, dynamics

More Information

- Census Bureau Industry & Occupation topic website:
  http://www.census.gov/hhes/www/ioindex/ioindex.html
- Industry and Occupation Statistics Branch, SEHSD
  301-763-3239
- Melissa Chiu, Branch Chief
  melissa.c.chiu@census.gov
  301-763-3421
- Jennifer Day, Assistant Division Chief, Employment Characteristics, SEHSD
  Jennifer.Cheeseman.Day@census.gov
  301-763-3399

United States™
Census
Bureau