

Measuring Occupation as an Element of Socioeconomic Status/Position

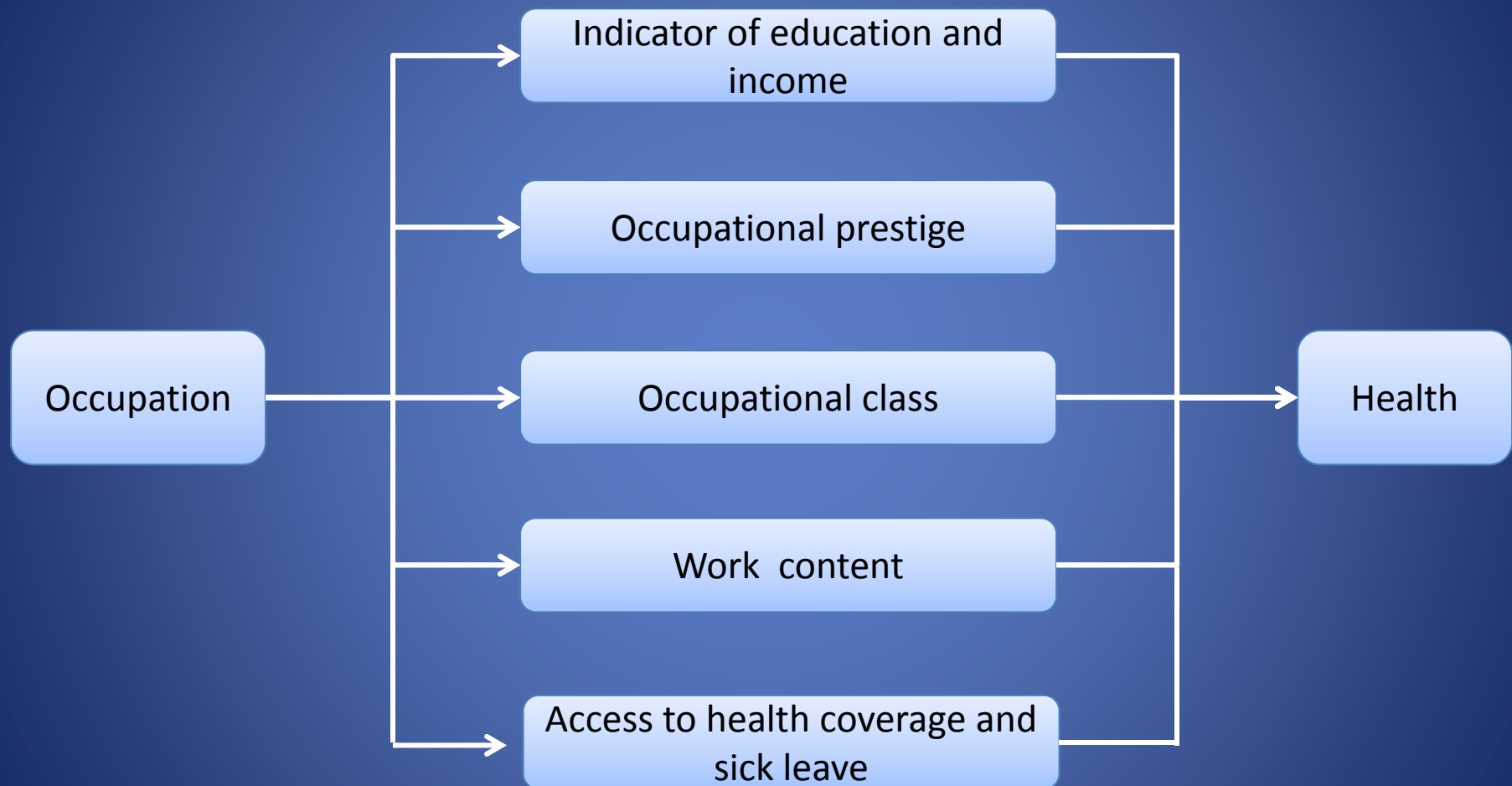
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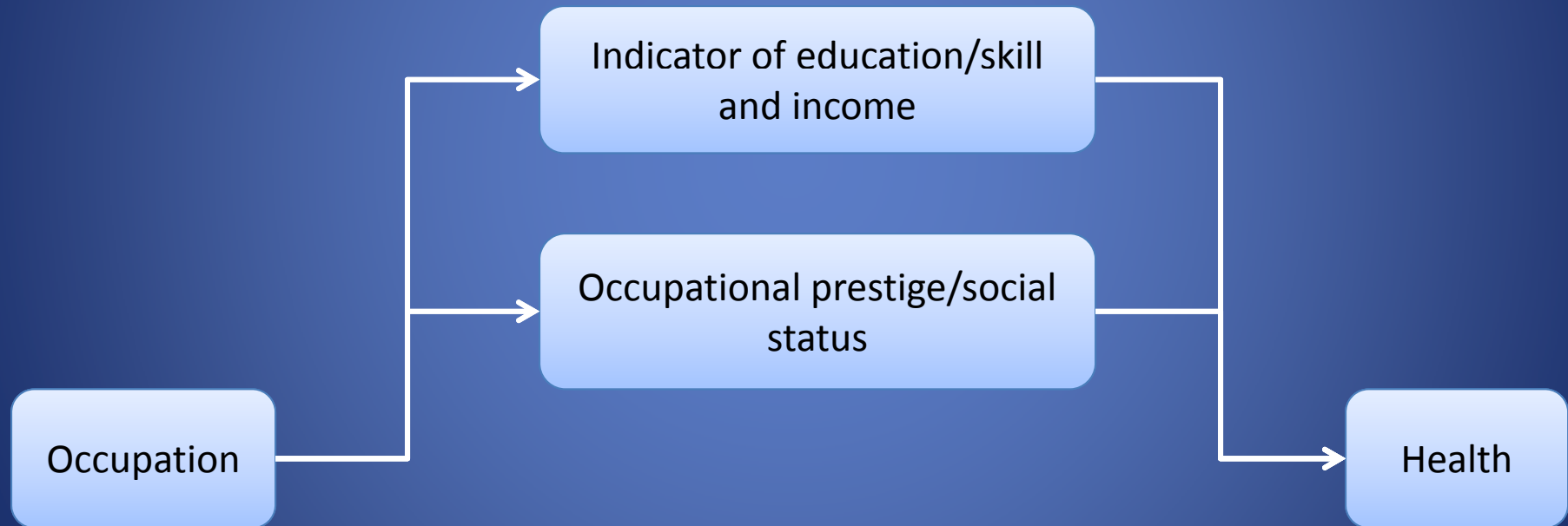
Outline of presentation

1. What are the major approaches to utilizing occupational codes as an element of SES/SEP
2. Are there differences by gender, education, race/ethnicity or income in the quality of occupational survey measures
3. What are important survey items to consider in measuring occupation as part of SES/SEP

Issue 1: What are the approaches for examining occupation as an indicator of SES/SEP in health studies



Approach 1: Socioeconomic status as a relative rank in social hierarchies with occupation as a reflection of education and skills, income, and social status



Example 1: Occupation as an indicator of income and education: Nam-Powers Score

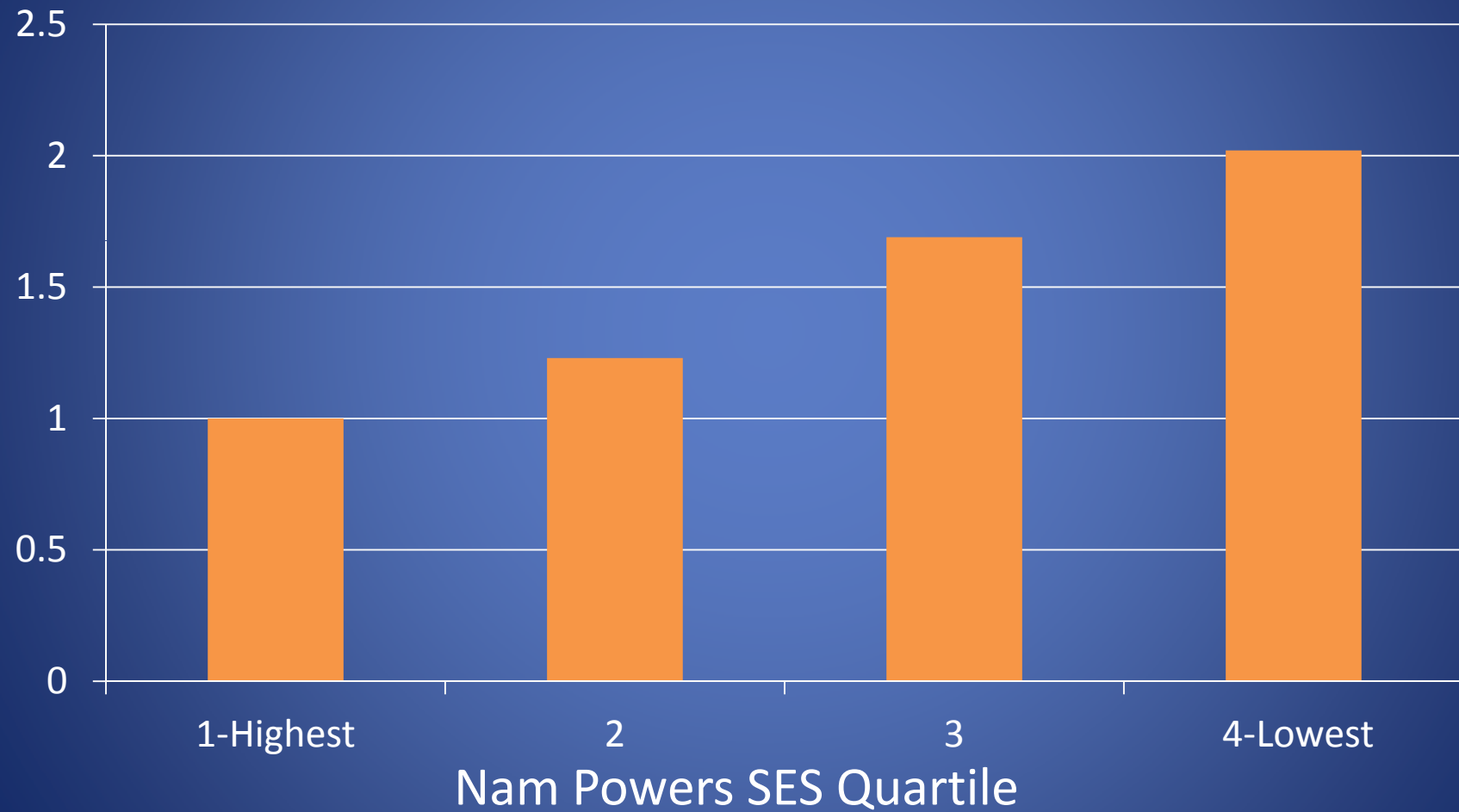
- Assigns a score from 1-99 based on a composite of education and income for incumbents of that census occupation code
- Based on census data, 1980, 1990, 2000
- Examples
 - Doctor =99
 - Plumber=50
 - Maid=8

See Nam CB and Boyd M, Population Research and Policy review, 2004.

All cause mortality by SES using Nam-Powers 1994-1997

(Steenland K et al. AJP 2004)

Rate Ratio



Example 2: Occupational Prestige Scores

Occupation as an indicator of social status

- Respondents were asked to rank order the social standing of jobs into 9 categories
- A composite of responses generated a score 0-100
- Updated in 1989 in the General Social Survey (Nako and Treas, 1994-NORC)

Comparison of NAM Powers and Prestige Scores

Occupation	Occupational prestige score (1)	Predicted from income and education (2)	Difference (1)-(2)
Registered nurse	59.9	48.9	11.0
Minister	69.0	58.3	10.7
Housekeeper	24.7	17.5	7.2
Taxi driver	21.5	30.4	-8.9
Bill collector	29.2	39.5	-10.3
Salesperson	39.3	50.0	-10.7

MacKinnon & Langford, 1994

Occupational prestige as predictor of self-rated fair/poor health

(Fujishiro et al. *Social Science & Medicine*, 2010)

- Study assigned occupational prestige scores to data from the General Social Survey
- Incumbents of higher prestige jobs were less likely to reported fair/poor health
- This relationship remained after accounting for differences in demographic variables, income, census occupational categories and work stress measures

Measuring SES/SEP

Approach #2:Occupational Class

- Considers differences in employment conditions and relations within workplaces which may cut across levels of education, income, and social standing
- The UK's National Statistics Socioeconomic Classification System (NS-SEC) uses this approach.
- In addition to the occupation code it uses 3 variables:
 - an employer, self-employed or an employee
 - size of organization
 - supervisory status



Example: UK's National Statistics socioeconomic classification system (NS-SEC)

- 1. Managerial and professional
- 2. Intermediate- technical, administrative support
- 3. Small employers and self-employed
- 4. Lower supervisory
- 5. Semi-routine and routine

See: www.ONS.gov/UK

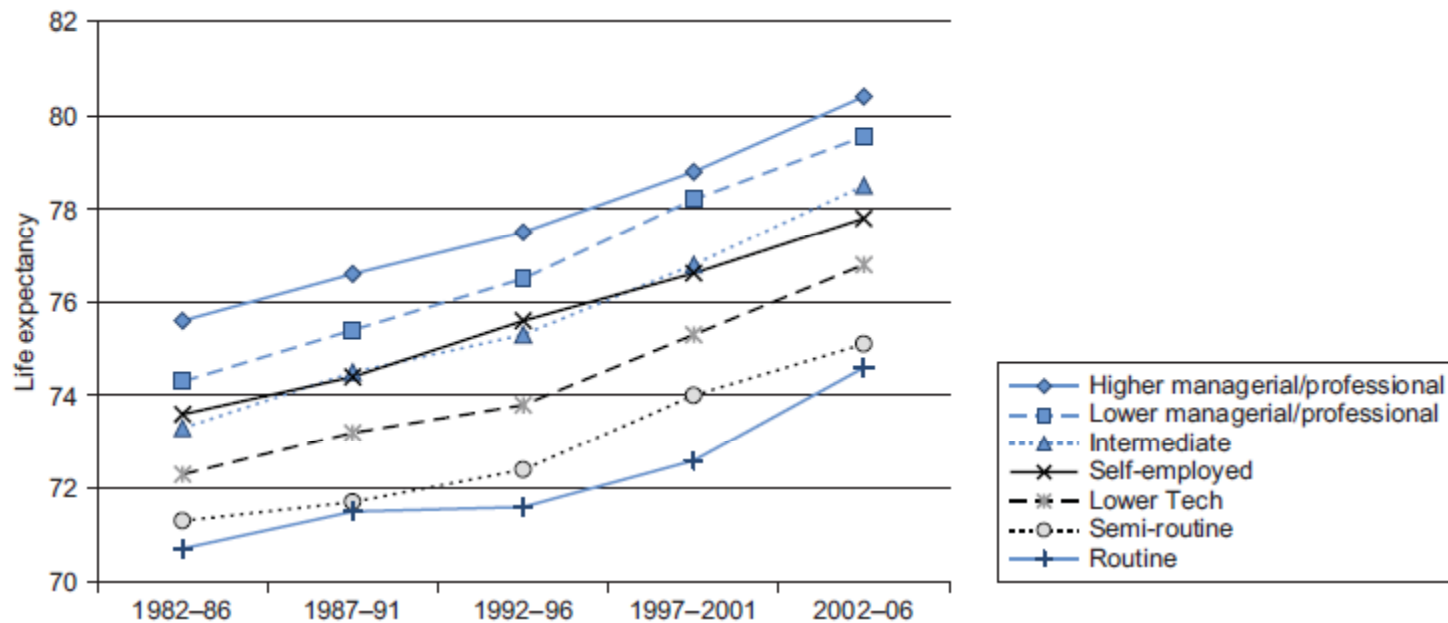
Trends in life-expectancy- England, Wales

National Statistics Socio-economic Classification (Office of National Statistics 2011)

Figure 1 Life expectancy by NS-SEC class, males at birth

England and Wales

Years



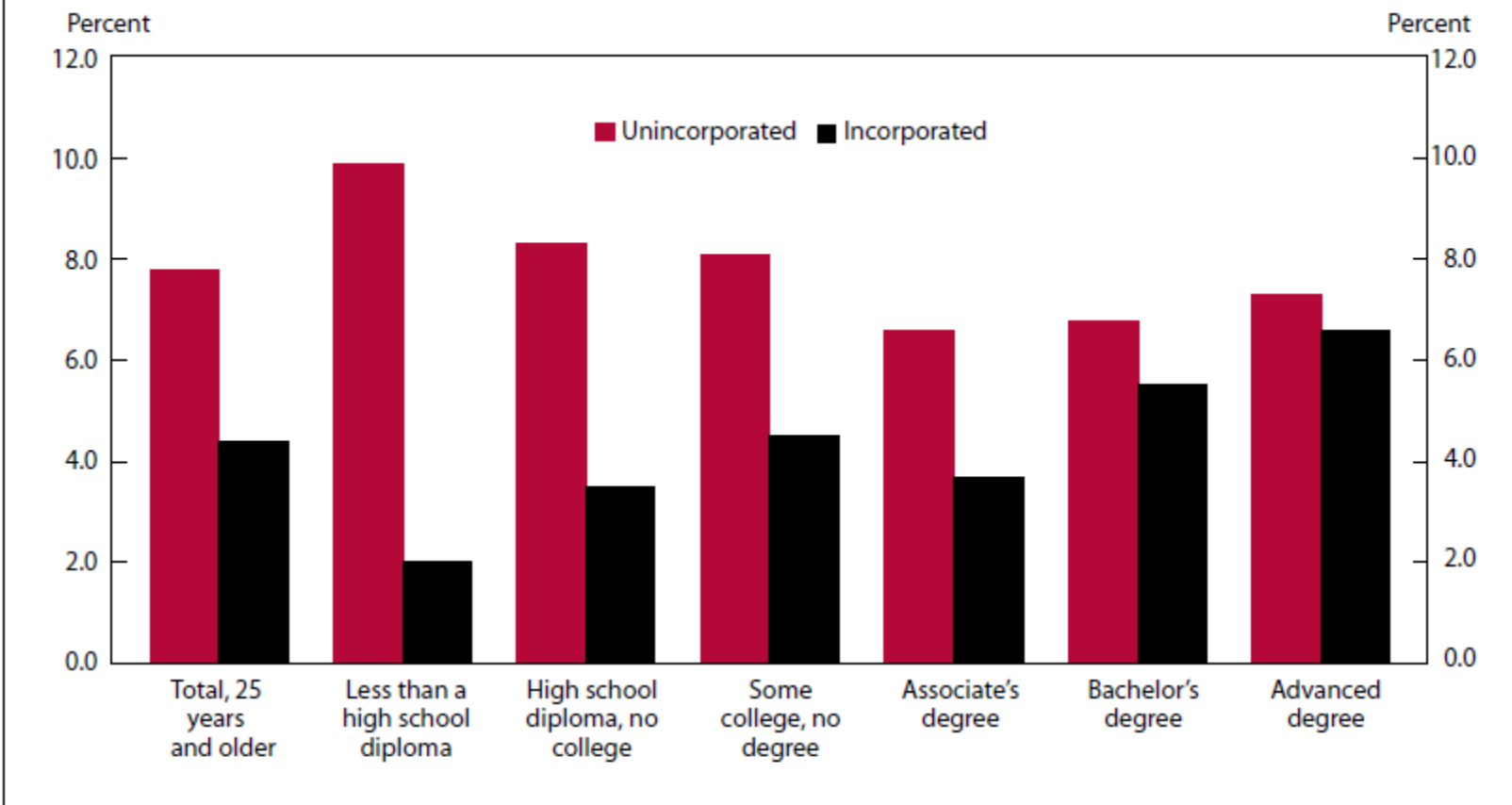
Source: ONS Longitudinal Study

Social Class in US Statistics

- Underexplored
- Self-employment is measured in many federal surveys (NHIS, CPS, ACS) but under utilized in health studies.
 - 1 of 9 US workers are self-employed in 2009
(Hipple S, Monthly Labor Review , 2010)
- Supervisory status usually thought to be subsumed under the “management” occupational group but this is not necessarily the case

Those with less than a high school education are more likely to be unincorporated self-employed (Hipple Monthly Labor Review, 2010)

Chart 3. Self-employment rates, by educational attainment, 2009 annual averages



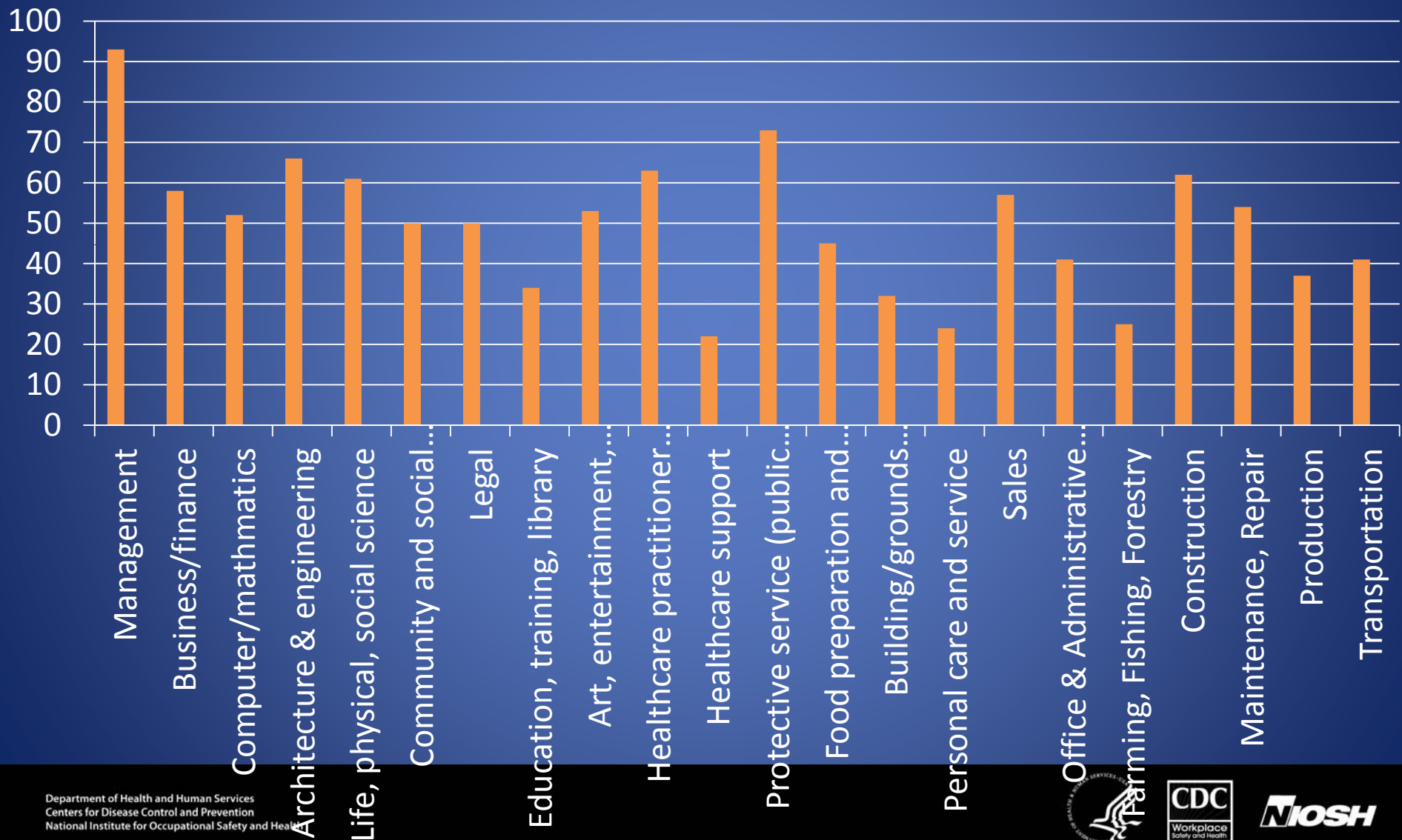
Supervisory status not commonly collected in US surveys

- NIOSH collaboration with the NIH funded longitudinal study at University of Alabama: Reasons for Geographic and Racial Difference in Stroke (REGARDS)
- Added an occupational module to the annual telephone survey
- Study includes about 30,000 subjects over age 45. Sample chosen to compare African Americans and whites and the “stroke belt” to other regions of the country

Rate reporting supervisory responsibilities across job codes

Q: Do you have formal responsibility for supervising other employees?

% (Source: REGARDS longest held job (N=11,237) unpublished data)



Measuring SES/SEP

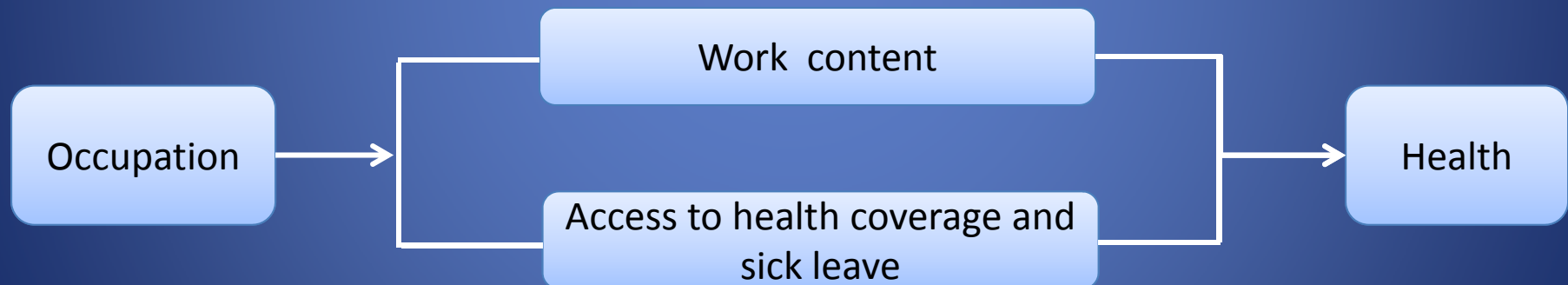
Approach 3: Work Content

- There is a wealth of occupational health research demonstrating the impact work exposures on health including the contribution of work exposures to explaining health disparities by SES/SEP¹
- Exposures
 - Chemical, physical, biologic, and safety-related exposures
 - Work-organization: job demands, decision latitude, social support
 - Long work hours and non standard shifts are common
 - Job insecurity/temporary employment
 - Access to health insurance and sick leave

1. See white papers prepared for a NIOSH sponsored conference on Eliminating Health and Safety Disparities at Work –Sept 2011
[www.aocedata.org/conference/health disparities](http://www.aocedata.org/conference/health%20disparities)

Health Inequities arise from *modifiable* exposures, associated with social disadvantage, and are considered ethically unfair (CDC Health Disparities and Inequalities Report, 2011)

- Workplace exposures are one of these modifiable exposures and thus one of the pathways for reducing health inequities



O*NET

- A new system (since 1998) created by the Department of Labor to replace the Dictionary of Occupational Titles- assigns job characteristics to each occupational code.
- Can be linked to census occupation codes
- Based on a content model including six domains
- Expands to collect 277 job descriptors
- Content determined by a combination of “experts” and incumbents

O*NET measurements

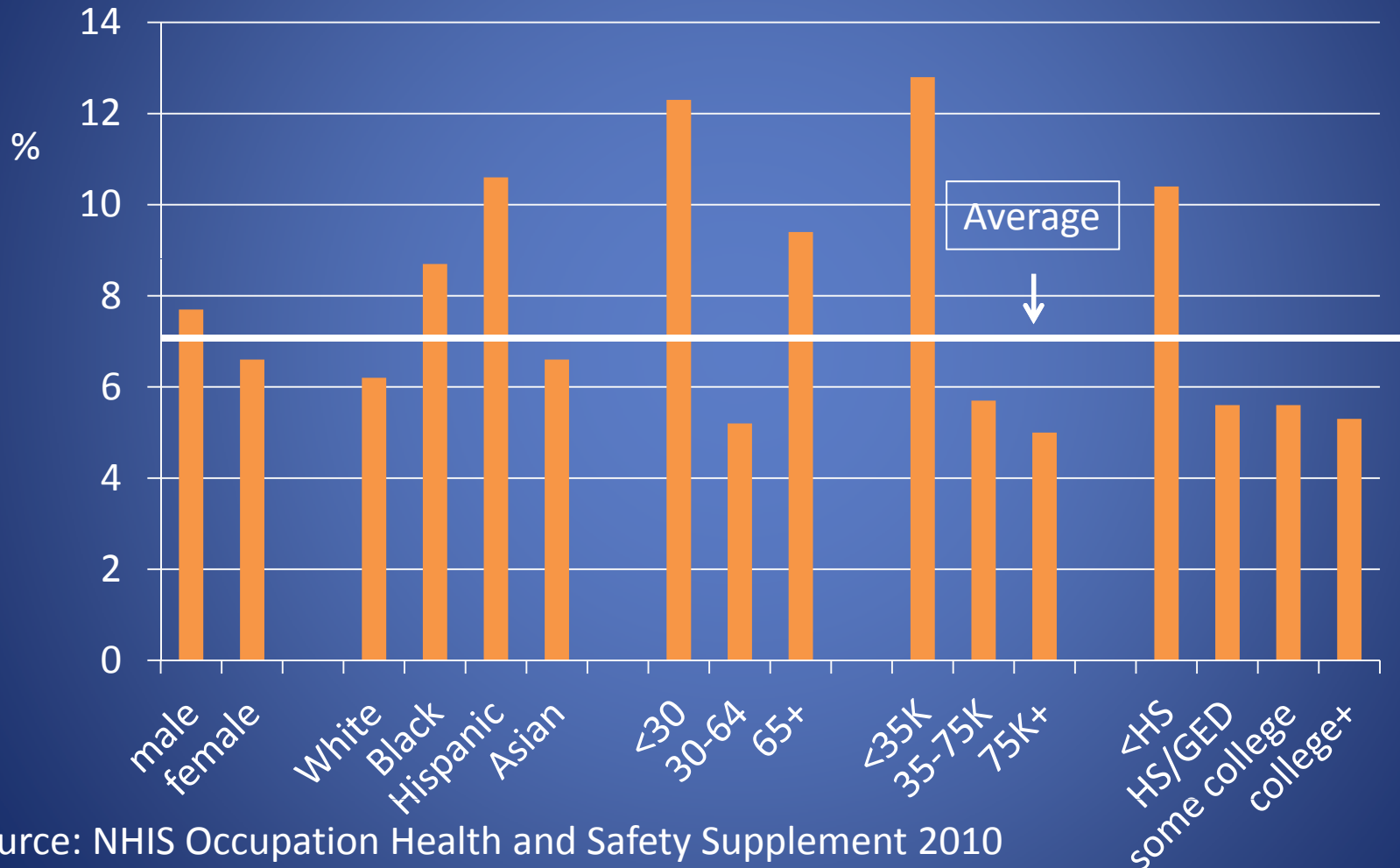
- Examples of measures relevant to health:
 - Exposure to: contaminants, hazardous equipment, disease or infection, noise, etc.
 - Physical demands: time spent bending, sitting, kneeling, standing, etc.
 - Psychological demands: Decision latitude, supervisor support, coworkers support, etc.
 - Work hours and shifts
- Several studies have demonstrated construct validity and predictive ability of O*NET
(see: Cifuentes et al.; Am J Ind Med 2010)

Work Content

- Job insecurity/temporary employment changes with fluctuations in the economy
 - There are examples of how to capture this element through Federal surveys (CPS contingent worker supplement, NHIS OHS supplement)

Minorities and low income are more likely to work in temporary jobs.

Q: Some people are in temporary jobs that last only for a limited time or until the completion of a project. Is your job temporary?



Source: NHIS Occupation Health and Safety Supplement 2010

Issue #2: Do demographic variables impact measurement of occupation?

1. Quality of industry and occupation coding
2. Importance of capturing longest held job in addition to current job

Examining whether demographic variables affect coding quality

- MESA is a NIH funded longitudinal study of subclinical atherosclerosis
- Multiethnic (white, Black, Hispanic and Chinese) older population 45+
- Investigators collected open text industry and occupation information through self administered survey forms
- NIOSH received and coded the open texted data

Example of MESA Survey Data

- Unemployed or laid off 6 months or less
- Unemployed or laid off more than 6 months
- Retired from my usual occupation and not working
- Retired from my usual occupation but working for pay
- Retired from my usual occupation but volunteering

9 For whom do/did you work? (name of company, business, organization or other employer) If you are not working now, please respond regarding your main occupation before you stopped working.

SUOSVILLE LAUNDRY

10 What type of business or industry is/was this? (e.g., hospital, newspaper publishing, mail order house, auto repair shop, bank, etc.)

LAUNDRY

11 What kind of work do/did you do or what was your job title? (e.g. registered nurse, personnel manager, auto mechanic, accountant, grinder operator, etc.)

ATTENDANT

12 What are/were your most important activities or duties? (e.g. patient care, directing hiring policies, repairing automobiles, reviewing financial records, operating grinding mill, etc.)

OVERSEEING CUSTOMER NEEDS AND KEEPING
AREA CLEAN

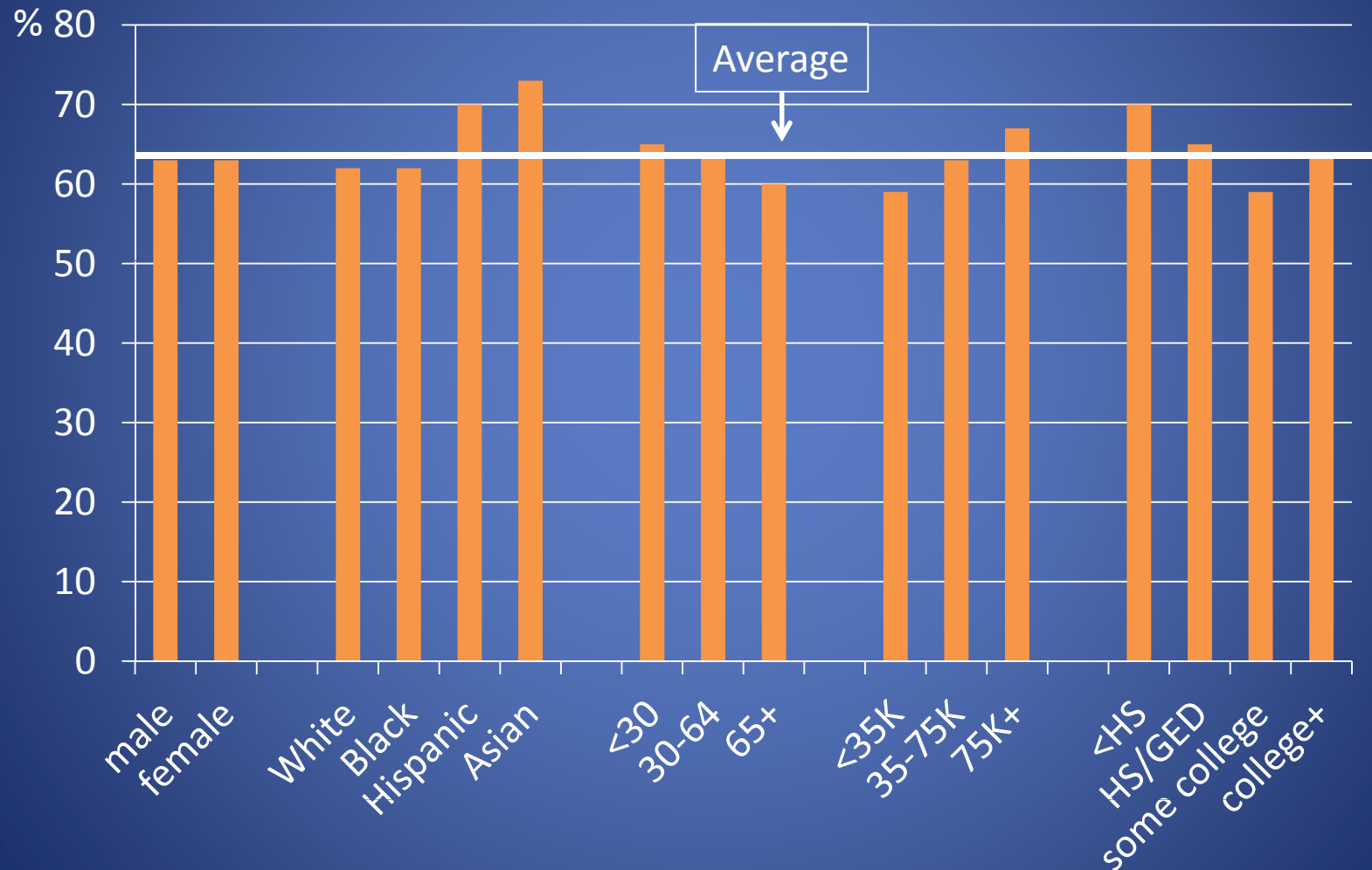
MESA Occupation Coding Process

- For each of 8260 records, occupation was coded independently by 2 coders using 3 digit census 2000 codes
- If the 2 coders did not agree (discordant), the NIOSH lead coder would assign the final code (about 35% of records)
- Coders were able to assign census occupation codes to 99% of the records
 - Demonstrating that self-reported occupational survey data is codable

From MESA data demographic characteristics had little impact on occupation coding reliability (2 coders did not agree)

- We examined whether race, ethnicity, age, education, current working status or immigrant status contributed to problems with coding data
 - They had no effect (unpublished data)
- Occupational characteristics were the main predictors of coding reliability

Current job is not the same as longest held job for about a third of respondents and doesn't vary much across demographic groups (Source NHIS 2010)



NIOSH Industry and Occupation Computerized Coding System



A new artificial intelligence system being developed at NIOSH that will automatically code text data to create census Industry and Occupation codes should decrease burden of generating codes

Beta version Fall 2012; First public use version expected Dec 2012

Example of NIOCCS computer assisted coding

NIOSH Industry and Occupation Computerized Coding System (NIOCCS)



[NIOSH > NIOCCS HOME](#)

Text size: [S](#) [M](#) [L](#) [XL](#)

[Coding](#)

[Profile](#)

[Help](#)

currently logged on as
sxn1@cdc.gov

[Logoff](#)

Assisted I/O Coding

Industry Title:

Occupation Title:

Employer:

Job Duties:

[Show Other I&O Info](#) [Show Coding Settings](#)

Scheme:
CENSUS 2000

File:
test4

Record 1 of 21

3 Ind Matches

	Ind Code	Ind Matched
Select	847	Child day care services
Select	837	ELDERLY DAY CARE
Select	829	FOSTER FAMILY DAY CARE SERVICE

« < 1 »

1 Occ Matches

	Occ Code	Occ Matched
Select	460	Child Care Workers

« < 1 »

Ind Code:

847

Occ Code:

460

[Notes](#)

Industry Index Find:

Title	Ind Code	NAICS	Occ Code
Select	338	334518	
Select	909	812990	
Select	917	813311	
Select	389	337121	
Select	389	337121	
Select	859	713990	
Select	847	624410	
Select	847	624410	
Select	837	624120	
Select	847	624410	

« < ... [537](#) [538](#) [539](#) [540](#) ... »

Occupation Index Find:

Title	Occ Code	Ind Restriction	SOC Code
Select	930		53-501
Select	243		25-402
Select	201		21-102
Select	201		21-102
Select	460	(929)	39-901
Select	460		39-901
Select	460		39-901
Select	023		11-903
Select	023		11-903

« < ... [465](#) [466](#) [467](#) [468](#) ... »

Results of NIOCCS preliminary testing

- Approximately 15,000 death certificate records
 - Autocoded 87% of records with 74% accuracy on industry and occupation
- Approximately 8200 MESA survey responses
 - Autocoded 73% with 67% accuracy on occupation
- The system will be adding several additional algorithms that should improve performance

Issue 3- What should be measured?

- Including standard census Industry and Occupation questions are important (current and longest held)
 - Coding burden should be decreased with autocoder
 - Linkages to work-related exposures through O*NET and other databases will improve the utility of occupational codes
- Other questions already included in many Federal studies to consider for inclusion or linkages
 - Self-employment (CPS, ACS, NHIS, BRFSS)
 - Work hours (NHIS) Work shift (NHIS 2010 OHS supplement)
 - Temporary work (NHIS 2010 OHS Supplement)
 - Employer health insurance and sick leave (NHIS)
- Supervisory status has not been frequently included in US surveys but deserves further evaluation

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Thank-you

Questions?

