



Employment, Occupation, Working Conditions and Health

You may not be reading them in the same sequence, but so far, in our sequencing at least, we've talked about income and education which are two of the three components of socioeconomic status. And in this slide set we're going to talk about occupation and employment.



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References



- ▶ Berkman LF, Kawachi I, & Glymour MM (eds). *Social Epidemiology* (2nd edition). Oxford University Press, 2014.
 - ▶ Chapter 2: Socioeconomic status and health
 - ▶ Chapter 5: Working conditions and health
 - ▶ Chapter 6: Labor markets, employment policies, and health

Occupation



- ▶ Association with health well-established
 - ▶ Farm workers have more injuries
 - ▶ Rubber workers have more cancer
 - ▶ Many other examples

- ▶ But what IS it?

Again, there is a very large and well-established body of literature establishing the association between occupation and occupational exposures and health. It is well established in many, many areas. For example, farm workers have more injuries, rubber workers have more cancer, and there are many, many other examples of that association. But, as we asked about income -- what is it about occupation that is driving its association with health?

Possible factors / mechanisms

- ▶ Exposures
 - ▶ Chemical agents
 - ▶ Biological agents
 - ▶ Physical agents
 - ▶ Air
 - ▶ Noise
 - ▶ Heat
 - ▶ Radiation
- ▶ Working conditions
 - ▶ Physical demands
 - ▶ Ergonomics
 - ▶ Work schedules
 - ▶ Schedule control
 - ▶ Others

There are lots of possibilities here and they vary, of course, to some extent by type of occupation, length of occupation, and other factors. Generally speaking they fall into at least two areas to begin to consider. The first is exposures. People because of their jobs are exposed to chemical agents, biological agents, and physical agents in manufacturing plants and other occupational environments. There are also working conditions to be considered – the physical demands of the job, ergonomics and repetitive motions, nonstandard or shifting work schedules, schedule control, and probably many others.

Possible factors / mechanisms

- ▶ Psychosocial factors
 - ▶ Job stress
 - ▶ Excess productivity demands
 - ▶ High level of responsibility
 - ▶ Effort-reward imbalance
 - ▶ Demand – control imbalance
 - ▶ Discrimination
 - ▶ Hostile environment

There's also a body of literature linking psychosocial factors as a potential mechanism for the link between occupation and health. Consider job stress as an example. Most people think of job stress as excess productivity demands. "I'm under a lot of stress at work. They're asking so much of me. I'm having to work such long hours." Alternatively, we may think of job stress created by a high level of responsibility. There are also other things that have been linked – see the long list on this slide. Each of these has been documented through research studies as being associated with job stress and health outcomes.

For example:

- Effort-reward imbalance refers to the amount of effort you are required to put in to complete your work versus the amount of reward you get from that. In this model, 'reward' is a combination of financial reward, self-esteem, and external recognition.
- Demand-control imbalance occurs when the worker has the responsibility for completing the work but little control over the job's circumstances or demands. The theory argues that job strain arises from this imbalance.
- Discrimination and hostile environments clearly have the potential to create job-related stress.

Possible factors / mechanisms



- ▶ Skill level
 - ▶ Absolute
 - ▶ Mismatch
- ▶ Adverse work schedules
 - ▶ Frequent rotation between night and day work

And the list goes on – more job-related circumstances that potentially create stress. For example:

- Skill levels, particularly, when there is a mismatch between the skill level that is required for the job and the skill level that the employee actually has;
- Adverse work schedules. Sleep deficiency is now recognized as a common factor in poor health outcomes, such as metabolic and cardiovascular disorders, job-related accidents and injuries, vehicle crashes, musculoskeletal disorders, and many others. There is also a growing recognition that a frequent rotation between night and day work has a negative impact on health. Generally speaking, it is not which shift you work (i.e., during the day or at night) but the changing shifts (days this week, nights next week) that disrupts sleep patterns and other biological rhythms.

Job insecurity



- ▶ Job loss
 - ▶ Actual
 - ▶ Insecurity
- ▶ Under-employment
 - ▶ Inadequate employment
 - ▶ Part-time work
 - ▶ Inadequate pay
 - ▶ Mismatch between education and employment

Job insecurity is a potentially powerful factor in both stress associated with occupation, financial difficulties, loss of access to health care, anxiety, depression, anger and resentment, and the like. While we most often think about the stress associated with actually losing one's job, there is also stress for those who are in work environments where the potential for job loss (through company downsizing or closure) is omnipresent. The insecurity in the work environment can create a number of reactive circumstances.

Downsizing studies have examined whether the health of individuals in workplaces that experienced downsizing differed from health of workers in comparable workplaces that did not experience downsizing – and it is not a surprise that they found that there are adverse effects associated with working in such environments. The mechanisms are less clear. Those mechanisms could include negative changes in job control, impaired support from one's spouse, and increased prevalence of unhealthy coping behaviors, such as smoking or using alcohol or drugs. Much more research is needed to understand these circumstances.

Another issue that is being discussed in the research literature is the effect of under-employment. This term refers to forms of inadequate employment, based on involuntary part-time work and/or low levels of pay. An important aspect of underemployment is the mismatch between levels of education and occupation.

Studies suggest that underemployed workers report lower levels of health and well-being than workers with “adequate” employment, but relationships vary across studies. Again, more research is needed.

Retirement



Voluntary

Forced

- ▶ Financial impact
- ▶ Psychological impact
- ▶ Social impact

- Retirement is typically thought of as something positive. Most of us, especially those of us getting close to that time, begin to look at it as a state to be desired. However, even if retirement is voluntary, there can be impacts that may have an impact on one's health. For example, there is likely stress related to the potential financial impact – that is, going from a steady employment to a reduced income, a fixed income. In addition, there is potential psychological impact associated with having one's life change substantially and somewhat suddenly: one day you're employed and the next day you're not. There are often social impacts as well. For many people, the office, the job, the work, the employment, the occupational location – all of that is part of their social support system, their social network. Work may be where they get their social interaction. Leaving that environment will have an impact on the retiree's social activities and social well-being. One can only imagine how much greater the impact might be if the retirement is forced. Forced retirement may be considered a type of job loss.

Whether retirement is voluntary or involuntary, there is a lot of individual variability. I spoke to a colleague recently who is in his mid-80s now and still working full-time. He has worked full-time essentially his entire life. He was talking about impending retirement and preparing someone new to take over his responsibilities. He said, "I have no hobbies. I don't enjoy doing really anything outside of my work." He said that he liked to read, but that was his only real recreational activity. He didn't fish. He didn't hunt. He didn't particularly like to travel. He was anticipating that his

retirement – giving up the work that dominated his life -- would be very stressful for him.

There are others who have hobbies, volunteer work, projects around the house – many things to occupy their time. These individuals often look forward to retirement because it provides them with opportunities to do things they have not had time to do before. While there will inevitably be an adjustment, the adjustment will be different for these individuals. Thus, there is much individual variation in retirement-associated stressors.

Interactions with....



- ▶ Economic factors
 - ▶ Income
 - ▶ Access to resources
 - ▶ Insurance
- ▶ Psychosocial factors
 - ▶ Depression
 - ▶ Stress
- ▶ Education

Thinking about occupation and changes, then, one can see that there are interactions between occupation and:

- economic factors, such as income, access to resources like insurance.
- psychosocial factors like depression, stress, and others
- education. Education is associated with greater levels of occupation, but, beyond that, your education may make an individual more or less likely to be able to manage the stresses of his/her job.

Thus, there are a number of ways in which occupation may interact with other factors to impact health outcomes -- in addition to having direct pathways to health outcomes because of exposures.

Mediated / moderated by...



- ▶ Lifestyle factors/behaviors
 - ▶ Alcohol consumption
 - ▶ Smoking
 - ▶ Physical activity/inactivity
 - ▶ Dietary habits

The relationship between occupation and health, particularly occupational exposures and health, can be mediated or moderated by a number of factors, lifestyle factors in particular. Alcohol consumption may be a mediator or a moderator for the relationship between occupation and stress and health outcomes. The same is true of smoking. Many people use smoking as a way of coping with stress, particularly occupational stress. Smoking may also moderate the effect of some kinds of occupational exposures – that is, people who smoke may be more susceptible to the occupational exposures or the exposure may have a greater impact on health because of the addition of smoking.

Physical activity and inactivity is another factor that may modify the association between occupation and health. People may be more or less likely to be physically active because of their jobs and that may have an impact on health. Finally, at least for this slide, the availability of food within the workplace, the influence of work schedules on eating patterns, the quality of the foods you eat can influence or interact with occupational exposures. Lots of things. Even these lifestyle factors may be into the mix, if you will, in looking at the relationship between occupation and health.

Measuring occupation



- ▶ Should be simple
- ▶ Can be complex

On the surface, the measurement of occupation should be simple. You ask the question: are you employed or not? If the answer is yes, you may need to ask if the person is employed full-time or part-time...and if the answer is no, it may be important to know if the person is not employed because they are retired, because they are a student, because they are a homemaker but do not work outside the home. They may be self-employed or employed by someone else. They may be disabled and unable to work. So even at the simplest level of employed or not employed, there are some things that should be considered when drafting the question. Fortunately, there are many examples of how those questions are asked in fairly standardized ways to get at some of those issues.

There is a separate set of slides with some additional information about the measurement of occupation in surveys.

Thought questions



- ▶ What did you read or hear in this discussion that was new information for you?
- ▶ What surprised or challenged you?
- ▶ What did you agree with or disagree with and why?
- ▶ How does this information make sense in terms of your work in the field of public health?



Measurement of Occupation

OPTIONAL SLIDES

Measurement issues



- ▶ Occupation
 - ▶ Job title
 - ▶ Actual tasks
 - ▶ Proportion of time spent in tasks

- ▶ Coding
 - ▶ Dictionary of Occupational Titles
 - ▶ Several standard coding schemes

As we said, on the surface, the measurement of occupation should be simple. But depending on the mechanism of action you envision for the relationship between occupation and health, it may not be simple at all.

If an individual is employed, it is likely to be important to know what the individual does. It is likely important to know what it is about that occupation or work that is driving the health outcome. So often we just record the job title. That may give you some information about what the person does, but may not give you enough information. Think about “vice president”, “health services specialist”, “machine operator” ... These are not very specific in terms of what the person really does and what they are likely to be exposed to in the course of doing it.

Perhaps you need to explore a little deeper and consider what actual tasks they perform. This is what the early studies that looked at chemical exposures among people who worked in tire manufacturing plants did. They had to go into some depth in documenting what each worker did on a day-to-day basis to find out what they were actually exposed to in the workplace. They also had to document the proportion of time that was spent doing those things, and the length of time that the employee functioned in that position. Clearly, this is important for exposure to toxic substances – being exposed for 15 minutes in a day is likely very different from being exposed for 6 straight hours? Consider how that applies to not only chemical

exposures but also to ergonomic conditions. How much of my time do I spend using a computer? Using a mouse? Sitting at a desk?

There have been a number of attempts to try to standardize the coding of job titles. There is a dictionary of occupational titles that can help you figure out how to frame questions. There are also several standard coding schemes.

ISCO

International Standard Classification of Occupations



- ▶ First adopted in 1957
- ▶ Established by International Labour Office (Switzerland)
 - ▶ 9th International Conference of Labor Statisticians
- ▶ Current version = ISCO -08

The International Standard Classification of Occupations was first adopted in 1957 by a number of international labor statisticians. It has been revised several times. The overall purpose, though, was to try to come up with an international classification scheme that would allow people to compare studies across countries.

ISCO-88



- 1 **Legislators, senior officials, managers**
 - Legislators & senior officials
 - Corporate managers
 - General managers
- 2 **Professionals**
 - Physical, math, engineering
 - Life science & health
 - Teaching
 - Other
- 3 **Technicians and associate professionals**
 - Same categories as 2
- 4 **Clerks**
 - Office clerks
 - Customer service clerks
- 5 **Service workers & shop and market sales workers**
 - Personal & protective
 - Models, salespersons, demonstrators
- 6 **Skilled agricultural & fishery workers**
 - Market oriented workers
 - Subsistence workers
- 7 **Craft and related trade workers**
 - Extraction & building trade workers
 - Metal, machinery & related trades workers
 - Precision, handcraft, printing & related trades workers
 - Other
- 8 **Plant and machine operators and assemblers**
 - Stationary plant and related operators
 - Machine operators
 - Drivers and mobile plant operators
- 9 **Elementary occupations**
 - Sales and services
 - Agricultural, fishery and related labourers
 - Labourers in mining, construction, & transport
- 0 **Armed forces**

This classification scheme puts job titles into categories – for example, professionals, clerks, craft and related trade workers, skilled agricultural and fishery workers, and others (there are 10 separate categories on the slide). Underneath each broad category, there are subcategories to further define the job. For example, “clerk” is broken out by office clerk and customer service clerk. The category “professionals” is divided into: physical, math and engineering; life science and health; teaching; and other.

ISCO-88



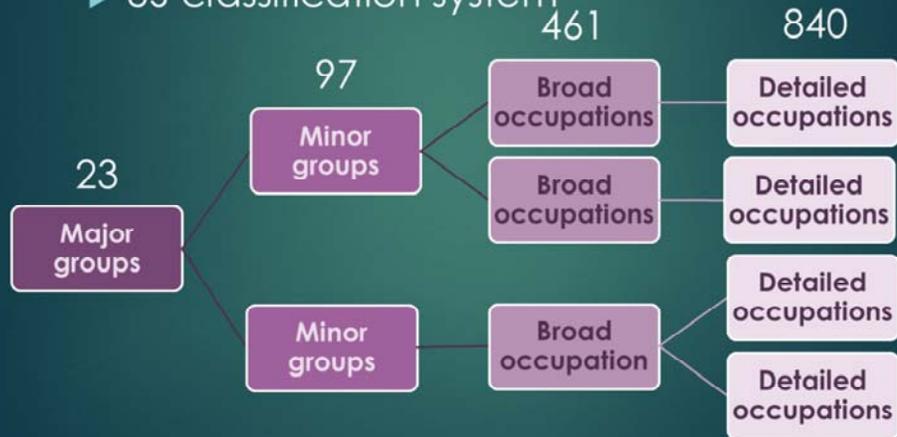
- ▶ Intended to serve as
 - ▶ Basis for international reporting, comparison
 - ▶ Model for development of national & regional classification systems
 - ▶ System that can be used in countries that do not have their own national classification

This classification scheme was intended to serve as a basis for international reporting and comparison, but it was also designed to be useful to countries that did not have their own national classification schemes. They were really hoping that it would develop as a model for future classification systems to be developed so that they would bring the field more and more into alignment around this particular classification scheme.

Standard Occupational Classification



► US classification system



The occupational classification scheme that is used in the U.S. most often is the SOC – the Standard Occupational Classification. It is based on 23 major groups of class of job titles which are then divided into 97 minor groups which are then divided into 461 broad occupational groups and 840 detailed occupations. The system gets complicated fairly quickly because it is very detailed. From a survey perspective, asking a person “What do you do or what is your occupation?” and giving them 23 response options is complicated enough. If you need to get down to a finer level of detail and have to ask them 840 categories, it is going to get even more complicated.

Of course, all of this points to a major point about measurement: If there is no reason for collecting the data, if it is clear on the front end that it is not going to be useful, why collect it? I believe occupation is one of those things where unless you’re looking at something specific tied to a particular occupation, like exposure to something specific, then it’s probably not really worth collecting very detailed data. In most cases collecting the most basic level -- “Are you employed full-time or part-time? Are you retired?” etc. – may be sufficient.