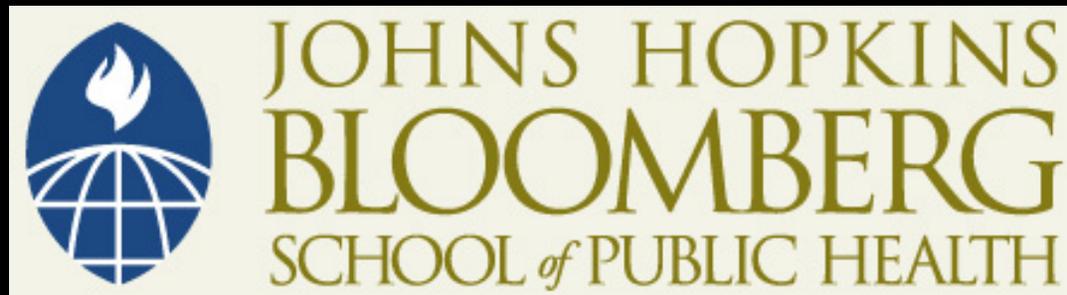


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Productivity Cost Concepts

Lecture 6

Kevin Frick

Indirect Cost

- Recall that indirect costs are generally productivity costs for the patient and family members
 - How should we think about productivity costs?
 - Human capital approach
 - Friction cost approach
 - Something else

Fundamental Debate Over Productivity Costs

- Panel on Cost-Effectiveness in Health and Medicine
 - *'...costs associated with lost or impaired ability to work or to engage in leisure activities due to morbidity and lost economic productivity due to death.'*
- Brouwer et al.
 - *Costs associated with production loss and replacement costs due to illness, disability and death of productive persons, both paid and unpaid.*

Reference case, productive time, and quality of life

- Reference case counts lost productivity while getting care
 - Travel, waiting, treatment
 - Do not count lost productivity while “ill but not receiving care” separately—CEA implications
- Koopmanschap’s idea (Brouwer et al.)
 - Separates lost production time and lost productivity
 - Concerned with full employment & Panel’s inclusion of leisure

Friction costs

as defined *by the Panel*

- Count “friction costs” associated with illness or loss of life
- “Friction costs are direct, non-health care costs [related]—transaction costs—associated with the replacement of a worker.”
 - Substitute labor is less productive
 - Not captured in wage rates
 - Training costs

Relevance of friction costs according to the Panel

- Primary importance to employer
 - Searching for a new employee
 - Training a new employee
 - Paying “too much” for a new employee
- With this version of friction costs, the human capital approach captures what is relevant to the employee & to society according to the Panel

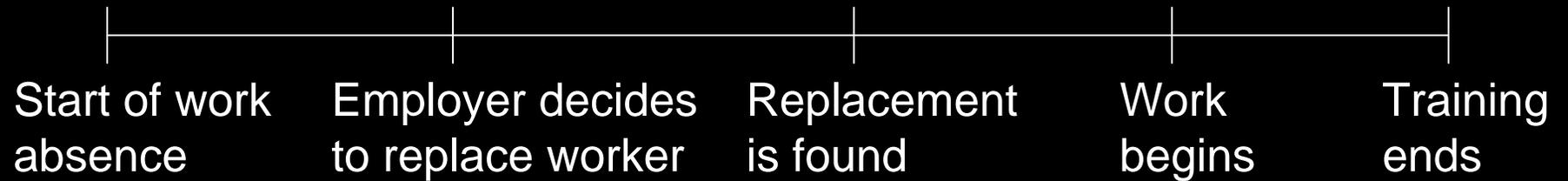
Individual tradeoffs

- Koopmanschap et al.'s definition of friction costs focuses on a societal perspective of production, but not a societal perspective of the value of time
 - Should the value of time or how the time is used be our most important consideration?
- Patient or other individual is paying “intangible” cost of losing quality of time at work or quantity of time at home when has to work longer or harder to make up missed productivity

Unemployment and the friction cost approach

- Friction cost approach will give a result identical to human capital approach if the unemployment is very low
 - There may not be a person to replace the worker who is absent
 - With unemployment that is any higher than the 'frictional' level, the person can be replaced with someone who was not working

Friction cost time line



Differential data requirements

- Reference Case Costs
 - Do not consider costs of time missed purely due to illness as it is considered to be part of the QALY denominator
- Cost-benefit analysis
 - Simply use time with condition not doing normal activities
- Friction Costs
 - Absence spells
 - Time until vacancy
 - Time to fill vacancy
 - Time till first work day
 - Time in training
 - Value of production
 - Relationship between time absent and lost production

Worker's assessment of productivity loss

- Are there validated instruments to ask workers about what they cannot do on a symptomatic day on which they report to work?
- Does worker have any incentive to respond other than honestly to a survey of this sort?
- How good is a patient's assessment of what he/she gets done when not at full capacity?

Assigning wages

- Age, sex, & education level specific
- Different from reference case suggestion of age and sex specific, only
- Possibly lead to higher friction costs for higher paid workers
- If higher paid workers are more likely to have no lost productivity, this will decrease friction costs for these workers
- Equity result is somewhat ambiguous

Friction costs and acute diseases

- Since Koopmanschap's friction period begins with work absence, even acute diseases have them
 - Authors suggest that for short term absences the friction costs may be close to zero
 - Rule of thumb that half of all absences of less than one week result in no productivity loss
 - Might these be industry or occupation specific?

Friction costs & intermittent symptoms

- Migraine or abnormal uterine bleeding
- If short absences do not lead to productivity loss, then have small friction cost
- Perhaps multiple short absences lead to higher productivity loss than the simple sum
 - Empirical question
- May find little difference between human capital results and friction cost results

Alternative definition of indirect costs

- Individuals' loss of production of goods and services due to their disease
 - Clear & concise
 - Individuals' loss
 - Translated to society's loss through individual
 - All time is important from worker's perspective
 - No attempt to ask questions like Koopmanschap regarding vacancy and replacement

Indirect cost measures and theory

- Human capital approach
 - Lists four sources of lost productivity
 - Absence from paid work
 - Decreased productivity at work
 - Unpaid production
 - Family and friends
 - Gross wages and wages after salary
 - Using a figure less than the full wage violates the theory of the firm

One disability/ multiple friction periods

- Koopmanschap had assumed that a sick worker is replaced by an unemployed worker
- What if a sick worker is replaced by an employed worker?
 - That worker is replaced by another employed worker?
 - And so on...

Productivity costs and quality of life

- No reason to think that people will or will not consider change in income because of illness
- People will not consider family burden, but that must be taken into account
- Easiest way to avoid problems is to state (when valuing health states) that income does not depend on health state

Perspectives

- Societal
 - FCA offers insight on the need to consider how lost productivity occurs
- Individual
 - Replacement is not relevant to worker himself
- Insurer
 - Friction cost approach is not relevant
- Employer
 - Friction cost approach is relevant

Sources of data from Liljas

- Liljas's arguments for data include costs to the family and value of unpaid production
 - Not included in Koopmanschap discussion
- Same type of data for FCA as in Koopmanschap

Koopmanschap and death

- Immediate death leads to friction costs because of a need to replace the worker who is now absent
- Death after disability does not lead to a friction cost
 - Friction costs would not be accumulating for individuals who are disabled
 - Long period of absence from work
 - Likely to have already been replaced

Education and friction costs

- Friction periods are longer for individuals with greater education
- Wages are higher with greater education
- More educated have chance to accumulate greater unit friction costs over a larger quantity of time
 - Still have issue of who is more likely to have no productivity loss for an absence

Lofland et al.: friction costs, migraines, and secondary data

- Applied friction cost approach to a data set collected for another purpose
- For migraines (which do not lead to long-term absence) have to base not 100% lost productivity on rules on thumb
- FCA approach led to values of productivity loss between 24% and 100% of the human capital approach
- Not clear what happens to the productivity of an individual who is absent repeatedly and unpredictably

Take Away Messages

- Ongoing debate about how to characterize lost productivity costs
- Argument of approximation and convention
- Continue research on...
 - How each absence or day at less than 100% results in lost productivity
 - Multiple non-consecutive days of missed work
 - Relation between job productivity and enjoyment or the job or time at home

More Take Away Messages

- Assumptions about the quantity of missed productivity time are driving results
- Methods based in theory or describing reality
- While human capital approach may better capture issues from patient's perspective should consider social insurance for income lost for individual

Pauly et al. on missed work time, wages, and productivity

- Suggest that the wage is actually a lower bound when there is full employment
- Suggest that with less than full employment
 - Positive costs of lost work time exceed friction costs
 - Variation across production processes
 - Variation across labor markets

Pauly et al. examples

- A firm produces goods that can be stored costlessly and doesn't offer sick leave
 - Worker bears entire loss and reaps all gains from decreased absenteeism
- Suppose workers are paid for the number of days worked on average (among workers) rather than actual days worked
 - Productivity lost will be higher than wage

More Pauly et al. examples

- If firm requires missed work to be made up, the worker will bear the cost of at least the wage
- Team production with “team specific human capital”
 - Lose more than wage
 - Perhaps entire productivity of team

Other Pauly et al. Examples

- With full employment, loss will be larger than wage especially with...
 - Team production
 - High cost of replacing an absent worker
 - High penalty associated with output shortfall
- With less than full employment, generally, use reservation wage

Workplace Productivity and Activity Impairment Instrument: 1

- On the web @ http://www.reillyassociates.net/WPAI_GH.html
- *If working: During the past seven days, how many hours did you miss from work because of your health problems? Include hours you missed on sick days, times you went in late, left early, etc., because of your health problems. Do not include time you missed to participate in this study.*

Workplace Productivity and Activity Impairment Instrument: 2

- *If working:* During the past seven days, how many hours did you miss from work because of any other reason, such as vacation, holidays, time off to participate in this study?
- *If working:* During the past seven days, how many hours did you actually work?

Workplace Productivity and Activity Impairment Instrument: 3

- *If working*: During the past seven days, how much did health problems affect your productivity while you were working?
 - (answer on a 0-10 scale)
- *Working or not*: During the past seven days, how much did health problems affect your ability to do your regular daily activities, other than work at a job?
 - (answer on a 0-10 scale)