IBI Quick Study

IBI INTEGRATED BENEFITS INSTITUTE

The Impact of Chronic Conditions and Co-morbidity on Lost Work Time

Evidence from IBI's HPQ-Select Data

Background

Chronic health conditions have become a focal point of healthcare cost control efforts in the U.S. Recent research, however, tells us that chronic health conditions typically do not exist in isolation but in combination with other chronic conditions, and that these co-morbidities influence lost time from work.[1, 2, 3, 4] Thus, to move beyond the traditional medical/pharmacy view of the costs of ill health to a goal of managing the "full costs" of chronic conditions - medical care, pharmacy, lost work time and lost productivity - we must address two critical questions:

1. How do chronic health conditions group together into related clusters?
2. How do specific condition clusters and co-morbidity among these clusters impact lost work time and, therefore, lost productivity?

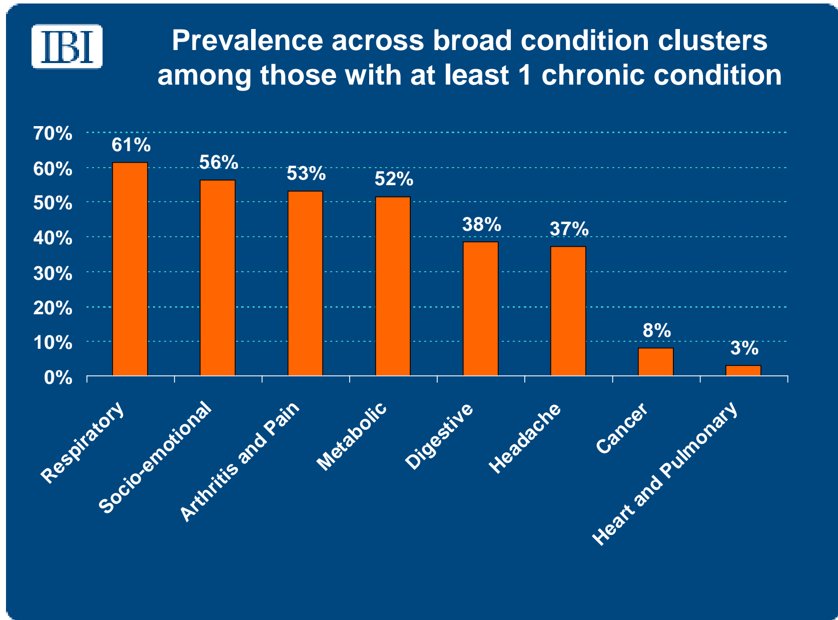
This issue of IBI Quick Study draws on the HPQ-Select database[5] to address these two questions.

Data and Analysis

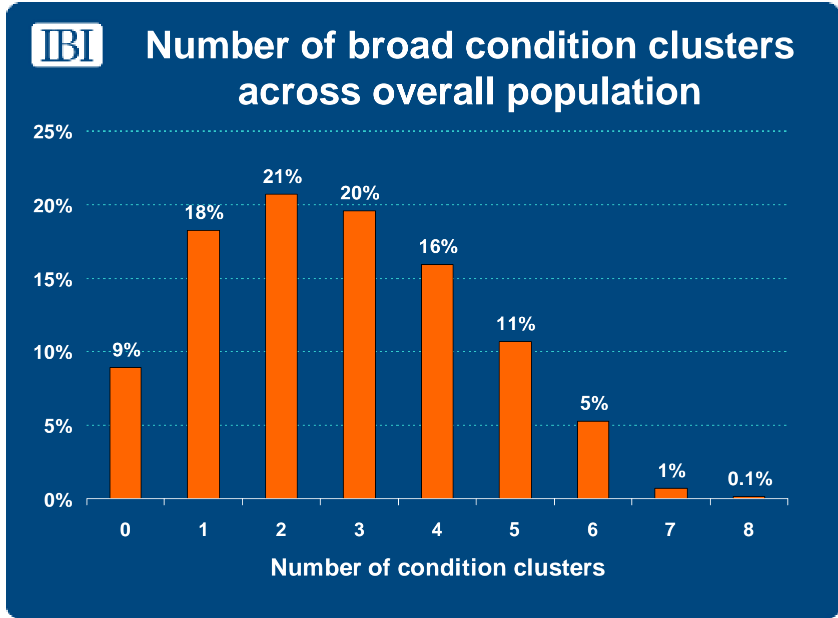
IBI used a data reduction technique called factor analysis[6] to re-categorize the 27 chronic conditions that are included in the HPQ-Select self-report tool into eight broad clusters of related conditions. Each chronic health condition is grouped into these eight condition clusters as follows:

- **Socio-emotional conditions:** depression, anxiety, fatigue, sleeping problems and other emotional conditions.
- **Metabolic conditions:** hypertension, diabetes, obesity and high cholesterol.
- **Arthritis and Pain conditions:** arthritis, chronic pain, back/neck pain and osteoporosis.
- **Headache conditions:** migraine and other headache.
- **Respiratory conditions:** asthma, bronchitis and allergy.
- **Digestive conditions:** ulcer, gastroesophageal reflux disease (GERD), irritable bowel and bladder/urinary conditions.
- **Heart and Pulmonary conditions:** congestive heart failure, coronary heart disease and chronic obstructive pulmonary disease (COPD).
- **Cancer conditions:** skin cancer and other cancers.

Types of Condition Clusters. More than 9 in 10 (92%) of the 26,671 employees included in this study have at least one chronic health condition. Within this group, the majority of employees (61%) have at least one condition in the respiratory condition cluster. Similarly socio-emotional (affecting 56% of the sample) and arthritis and pain (53%) round out the top-three condition clusters most frequently affecting employees. Heart and pulmonary (3% of the sample) is the least frequently occurring condition cluster.

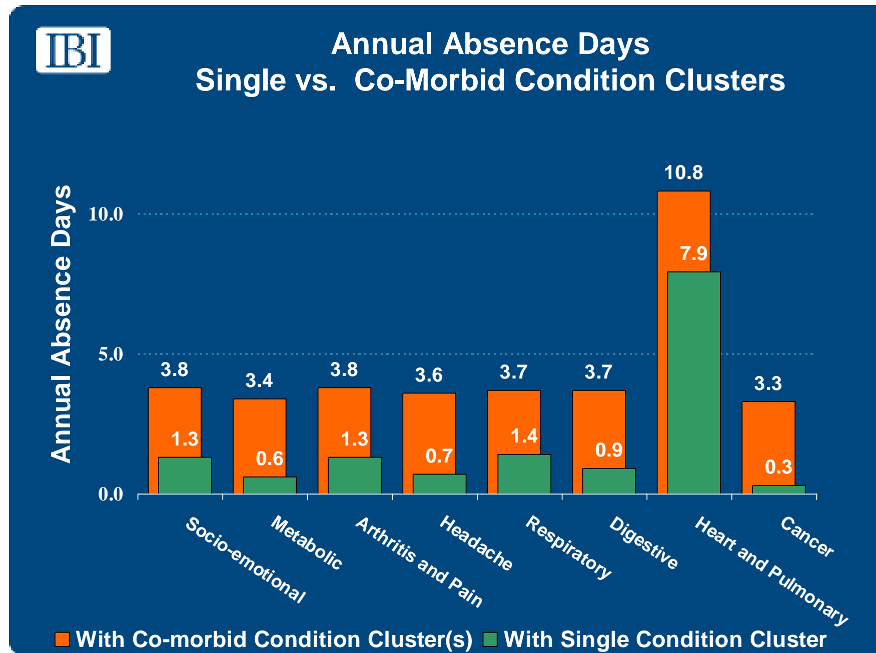


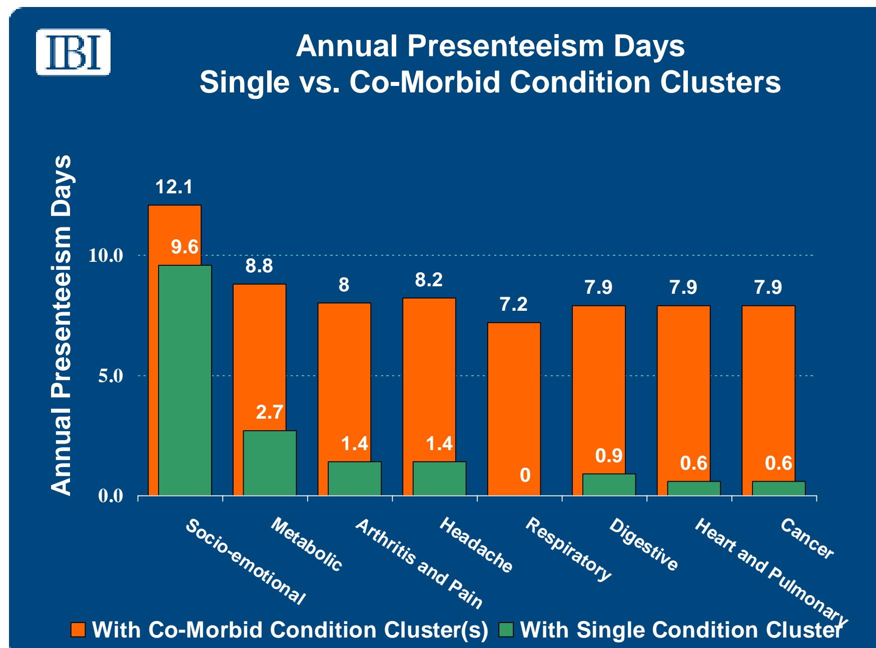
Number of Condition Clusters. Individuals in our sample have, on average, chronic conditions falling in three of the eight condition clusters. A striking 17% have chronic health conditions in five or more condition clusters across the eight groups.



We would expect that the greater the number of condition clusters in which an employee falls, the greater the challenges in care coordination. Rather than having two conditions that might be treated within the same specialty (depression and anxiety as socio-emotional conditions, for example), individuals spanning clusters (e.g., hypertension and depression) will require increased care coordination to ensure that any prescribed medical and pharmacy treatments as well as disability management and return-to-work programs work in concert rather than at odds. As the number and types of conditions increase, the scrutiny and resources required of employers and their health and disability partners also increases if health-related lost time is to be managed well.

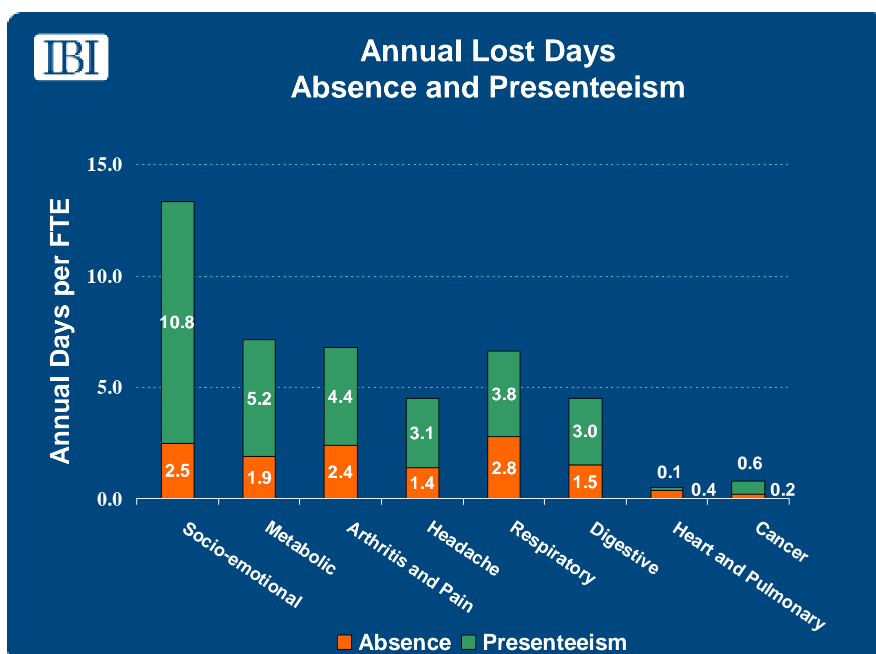
Condition Clusters and Lost Time. Using multiple regression analysis, we also assessed the relationship between these eight condition clusters and average lost time -- both for absence and for presenteeism.[7] Heart and pulmonary conditions result in the most absence lost time while socio-emotional conditions result in the most presenteeism lost time, as shown in the two displays below. We show in the green bars the average amount of lost time for individuals whose chronic health condition(s) can be categorized into a single condition cluster. We also show in the orange bars the overall average lost time for individuals in the cluster that also have co-morbid conditions in other clusters.[8]





In each case, co-morbid chronic health conditions drive more lost time. For example, absence lost time for individuals with conditions in the heart and pulmonary condition cluster average about 11 days per year (10.8) for individuals with additional co-morbidities compared to about eight per year (7.9) for individuals who have only conditions in the heart and pulmonary group. Likewise for presenteeism, individuals with both socio-emotional conditions and additional cluster co-morbidities average about 12 (12.1) annual presenteeism lost days compared to about 10 (9.6) for individuals with only socio-emotional conditions.

Application to the Workforce. We also offer a "workforce view" of related lost time that takes into account the prevalence of these condition clusters across the employee population. In this view, we show estimated annual lost days per FTE (where we assume 260 work days per year and eight-hour work days). The "condition" view above shows that an individual with a heart or pulmonary condition had the most absence lost time. But when we examine overall lost days for each condition cluster, and consider the lower prevalence of heart and pulmonary conditions throughout the workforce, we see that the heart and pulmonary group is no longer ranked at the top of the list for lost days per FTE. In fact, because of differences in prevalence, it is at the bottom. Instead socio-emotional conditions rise to the top of the list for overall lost time with, about 11 days presenteeism (10.8) and 3 days absence (2.5) each year.



<u>Commentary</u>

The goal of every employer is to have a highly-productive workforce. Chronic health conditions present a special challenge to this endeavor. First, a vast majority of employees has at least one chronic health condition and, as this analysis shows, chronic health conditions occur in condition clusters. Second, employees tend to have chronic conditions that cut across an average of three of these condition clusters, or co-morbidities, presenting special challenges for care management. Third, these chronic clusters are correlated with lost work time and, therefore, lost productivity.

Because chronic health conditions are often underreported and undertreated, getting better control of their management represents a significant challenge to employers. Employers can no longer rely solely on claims data as the single window into employee health but also must turn to a growing array of employee self-report tools if they are truly to move from employee health as a cost center to employee health as a key part of the business strategy.

In addition, reliance on average cost data by condition is likely to cause employers to choose the wrong conditions for intervention. As our employer view shows, interventions will be most likely to have the greatest impact if they focus on both cost and prevalence in the workforce, related both to presenteeism as well as absence. Employers must choose measurement techniques and metrics that relate to a broad view of the full, true costs of conditions.

Future IBI studies will include a focus on the specific combinations of conditions that drive the most absence and presenteeism lost time. Given the importance across a whole workforce of socio-emotional conditions and the wealth of information available on proper treatment for these conditions[9, 10, 11] we will further explore the extent to which these conditions appear in combination with other discrete medical conditions and whether being in treatment for socio-emotional conditions is related to lost time.

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1. Thomas Parry, PhD. *Diseases vs. Populations: The Impact of Chronic Conditions.* Research Insights. Integrated Benefits Institute, August 2008. <http://ibiweb.org/do/PublicAccess?documentId=870>

2. Loeppke R, Taitel M, Haufle V, Parry T, Kessler R, Jinnett K. *Health and Productivity as a Business Strategy: A Multiemployer Study*. J Occup Environ Med, Vol. 51, No.4, April 2009.

3. Thomas Parry, PhD. *Clash of the Titans.* Research Insights. Integrated Benefits Institute. May 2009. <http://ibiweb.org/do/PublicAccess?documentId=951>

4.Kathleen R. Merikangas, PhD, Minnie Ames, PhD, Lihong Cui, MS, Paul E. Stang, PhD, T. Bedirhan Ustun, MD, Michael Von Korff, PhD, and Ronald C. Kessler, PhD. *The Impact of Comorbidity of Mental and Physical Conditions on Role Disability in the US Adult Household Population.* Arch Gen Psychiatry. 2007 October ; 64(10): 1180-1188.

5. As part of the development of the HPQ-Select with Dr. Ron Kessler of Harvard Medical School, IBI has research access to a combined HPQ and HPQ-Select database. Data on 119,343 employees across 21 employers are available in this database. For this analysis, we used survey instruments that included the same 27 chronic condition questions and restricted the analysis to only full-time employees, resulting in 26,671 individuals included in the regression analyses.

6. To create the 8 broad groupings we used factor analysis (principal components analysis) with orthogonal rotation (varimax) and extracted the number of factors with eigenvalues greater than 1.0 to select individual conditions that tended to go together.

7. Regression analysis allows us to simultaneously test the contribution of each co-morbid group while controlling for other factors including age, gender, occupation and expected hours worked. The absence and presenteeism measures used are based on the validated HPQ instrument. The absence measure is the difference in expected and actual hours for a 28-day period. The presenteeism measure is based on a 0-10 performance scale over the past 28 days. The presenteeism scale is converted to a percentage, applied to the remaining work hours available after absence is removed and the scale is flipped (or reversed) resulting in the amount of presenteeism hours over a 28-day period. Finally, these hour values are converted to annual lost days for purposes of reporting by assuming 260 workdays and 8-hours per workday. More information on the measurement and analysis is available from the authors upon request.

8. Two estimates of lost time are developed in order to display the amount of lost time associated with condition clusters as stand-alone clusters and in combination with other condition clusters (or co-morbid with other condition clusters). For the stand-alone estimates, all individuals are assumed to belong to the condition cluster with none belonging to any of the other seven condition clusters. For the estimates including co-morbidities, all individuals are assumed to belong to the condition cluster with average membership across the remaining seven condition clusters.

9. *The Societal Promise of Improving Care for Depression: Nine Years Out*, RAND Research Brief, 2008 http://www.rand.org/pubs/research_briefs/RB9055-1/.

10. Rost, et al. *The Effect of Improving Primary Care Depression Management on Employee Absenteeism and Productivity A Randomized Trial*, Medical Care, 2004.

11. Kessler, et al. *The Prevalence and Correlates of Workplace Depression in the National Comorbidity Survey Replication.* J Occup Environ Med. Vol 50 (4): 381-390. April 2008.