

ONLINE APPENDIX

Validation Studies for Presenteeism Measures

For most types of employment, there is no objective account of productivity with which to assess an employee's performance. Therefore, it is generally impossible to establish the validity of productivity survey instruments that capture presenteeism by comparison with objective data. However, researchers have used various strategies to validate presenteeism instruments by examining their construct validity, content validity, and criterion validity (**Appendix Table**).

Construct Validity. Construct validity, a measure of whether the instrument measures what it purports to measure, is the primary factor used to assess presenteeism instruments. To evaluate construct validity, researchers usually examine an instrument's convergent and discriminant validities. Convergent validity refers to how well the instrument correlates with expectations and to other instruments measuring the same concept. Convergent validity can be measured by comparing the data with the following 3 measures: (1) existing reliable data generated with different instruments, (2) other existing instruments, and (3) expected values. All 3 methods have been used to assess the convergent validity of various instruments.

Instruments that were validated by comparison of new data obtained using those instruments with existing data include the Health and Labor Questionnaire, Health and Work Questionnaire, Migraine Disability Assessment Questionnaire, and Work Productivity Short Inventory. Validation of the Health and Labor Questionnaire relied on an examination of labor statistics,¹ while the Migraine Disability Assessment Questionnaire compared results with a diary-based collection of data.² Health and Productivity Questionnaire data and Health and Work Questionnaire data have been compared against independent employer records of job performance, including audits, peer ratings, and supervisor ratings (Halpern et al³ and telephone interview with Ronald C Kessler, PhD [February 8, 2005]). Data obtained using the Work Productivity Short Inventory were compared with medical claims data to examine correlations between conditions and presenteeism.⁴

Many instruments were validated by comparing data obtained from them with those obtained using other instruments. Specifically, validation of the Angina-Related Limitations at Work Questionnaire, Endicott Work Productivity Scale, Health and Labor Questionnaire, Health and Productivity Questionnaire, Health-Related Productivity Questionnaire Diary, Migraine Work and Productivity Loss Questionnaire, Osterhaus technique, and Work Productivity

and Activity Impairment Questionnaire relied on examination of data from other instruments. Several used data from the Medical Outcomes Study 36-Item Short-Form Health Survey.

Three instruments were validated by correlation with expected values. The Health-Related Productivity Questionnaire Diary produced expected correlations between productivity and symptom scores.⁵ The Migraine Disability Assessment Questionnaire data showed expected differences in productivity levels between subjects with migraine and the control group.⁶ Finally, the Work Limitations Questionnaire scores significantly varied by condition in an expected pattern.⁷

Discriminate validity examines whether instruments that are used among different populations or that are used to measure different concepts provide data that do not correlate with one another. The American Productivity Audit was tested among different populations, namely, those with health conditions and those without.⁸ The Health and Productivity Questionnaire has been evaluated in several investigations across different employee and occupational settings.⁹ Finally, the Stanford Presenteeism Scale used 2 different weakly related constructs, job stress and job satisfaction, to examine discriminant validity.¹⁰

Content Validity. Content validity refers to the ability of the instrument to capture the concepts it sets out to measure. To our knowledge, only the Work Productivity Short Inventory has been assessed for content validity.¹¹ Data collected from the Work Productivity Short Inventory were compared with medical claims data to assess whether high-cost conditions were prevalent in the data set (ie, whether the Work Productivity Short Inventory asks about the right set of conditions). For conditions such as stress and allergies, which might not be captured by medical claims data, the findings of the analysis were compared with those of other productivity investigations. The content validity of the Work Productivity Short Inventory was found to be high.

Criterion Validity. Criterion validity can be examined via predictive validity, or the ability to predict certain characteristics or associated behaviors, using the data collected by the instrument. Four instruments, the Stanford Presenteeism Scale, Health and Productivity Questionnaire, Work Limitations Questionnaire, and Work Productivity Short Inventory, have been analyzed for predictive capabilities. Specifically, Health and Productivity Questionnaire data were used to predict supervisor ratings of worker performance.¹² The Work Limitations Questionnaire was used to predict health outcomes,⁷ and the Stanford Presenteeism Scale was used to predict absenteeism, healthcare use, and health sta-

■ METHODS ■

tus.¹² Finally, regression analysis performed on data retrieved from the Work Productivity Short Inventory showed that the responses of absenteeism and presenteeism could accurately predict health status of the respondent.¹¹

REFERENCES

1. **Hakkaart-van Roijen L, Essink-Bot ML.** Manual: the Health and Labour Questionnaire. 2000. Available at: <http://www.imta.nl/publications/0052.pdf>. Accessed September 13, 2006.
2. **Prasad M, Wahlqvist P, Shikar R, Shih YC.** A review of self-report instruments measuring health-related work productivity: a patient-reported outcomes perspective. *Pharmacoeconomics*. 2004;22:225-244.
3. **Halpern MT, Shikar R, Rentz AM, Khan ZM.** Impact of smoking status on workplace absenteeism and productivity. *Tob Control*. 2001;10:233-238.
4. **Ozminkowski RJ, Goetzel RZ, Chang S, Long S.** The application of two health and productivity instruments at a large employer. *J Occup Environ Med*. 2004;46:635-648.
5. **Kumar RN, Hass SL, Li JZ, Nickens DJ, Daenzer CL, Wathen LK.** Validation of the Health-Related Productivity Questionnaire Diary (HRPQ-D) on a sample of patients with infectious mononucleosis: results from a phase 1 multicenter clinical trial. *J Occup Environ Med*. 2003;45:899-907.
6. **Stewart WF, Ricci JA, Chee E, Morganstein D.** Lost productive work time costs from health conditions in the United States: results from the American Productivity Audit. *J Occup Environ Med*. 2003;45:1234-1246.
7. **Lerner D, Amick BC III, Rogers WH, Malspeis S, Bungay K, Cynn D.** The Work Limitations Questionnaire. *Med Care*. 2001;39:72-85.
8. **Stewart WF, Ricci JA, Leotta C.** Health-related lost productive time: recall interval and bias in cost estimates. *J Occup Environ Med*. 2004;46(suppl):S12-S22.
9. **Kessler RC, Ames M, Hymel PA, et al.** Using the World Health Organization Health and Work Performance Questionnaire (HPQ) to evaluate the indirect workplace costs of illness. *J Occup Environ Med*. 2004;46(suppl):S23-S37.
10. **Koopman C, Pelletier KR, Murray JF, et al.** Stanford Presenteeism Scale: health status and employee productivity. *J Occup Environ Med*. 2002;44:14-20.
11. **Ozminkowski RJ, Goetzel RZ, Long SR.** A validity analysis of the Work Productivity Short Inventory (WPSI) instrument measuring employee health and productivity. *J Occup Environ Med*. 2003;45:1183-1195.
12. **Turpin RS, Ozminkowski RJ, Sharda CE, et al.** Reliability and validity of the Stanford Presenteeism Scale. *J Occup Environ Med*. 2004;46:1123-1133.

■ Appendix Table. Validation of Presenteeism Instruments

Test	Construct Validity					
	Convergent Validity					
	Existing Data	Other Instruments	Expected Values	Discriminant Validity	Content Validity	Criterion Validity
American Productivity Audit				✓		
Angina-Related Limitations at Work Questionnaire		✓				
Endicott Work and Productivity Scale		✓				
Health and Labor Questionnaire	✓	✓				
Health and Productivity Questionnaire		✓		✓		✓
Health and Work Questionnaire	✓					
Health-Related Productivity Questionnaire Diary		✓	✓			
Migraine Disability Assessment Questionnaire	✓		✓			
Migraine Work and Productivity Loss Questionnaire		✓				
Osterhaus Technique		✓				
Stanford Presenteeism Scale		✓	✓	✓		✓
Work Limitations Questionnaire			✓			✓
Work Productivity Short Inventory	✓				✓	✓