

**Health and Working Conditions
of Hotel Guest Room Attendants in Las Vegas**

Report

Prepared for the Culinary Workers' Union, Local 226, Las Vegas

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EXECUTIVE SUMMARY

Background and Significance.

This report describes initial results of a study of working conditions, health, and quality of life of hotel guest room attendants in the hospitality industry of Las Vegas. The hospitality industry has experienced a wave of restructuring, consolidation, and new practices to cut costs, including lean staffing and greater performance demands while constantly upgrading services in a competitive environment. The research project explores the impact of these and related changes on the health and quality of life of the largest occupational group within the hospitality industry, hotel room cleaners (guest room attendants or GRAs).

Jobs in housekeeping (and food and beverage) operations of the hospitality industry represent the future of work in the growing service sector. The hospitality industry is a major employer of low-wage service workers in U.S. metropolitan areas and tourism centers, and in Nevada in particular. A \$75 billion industry, it employs 1.1 million workers in full- and part-time jobs at 47,000 establishments nationwide. Unlike other services, businesses in the hospitality industry cannot be moved across borders. It is likely that this industry will remain a fast growing sector in industrialized societies. Room cleaning jobs in the hospitality industry are characterized by increasing repetitive physical workloads, low income, low skill utilization, low job control, increasing use of contingency employment, and virtually no prospects for training and career advancement. There is compelling evidence that such low-income jobs result in a disproportionately high burden of illness, injury, and disability. High workers' compensation and health care utilization costs reflect only a small proportion of the total societal burden associated with these working conditions, which are representative for a growing number of immigrant workers, workers of color, working women, and former welfare recipients. The hospitality industry has become a major target for welfare-to-work and job training programs in cities throughout the country. An aging workforce is faced with increasing job demands in a competitive industry constantly upgrading services. Few and only limited epidemiological studies have been done including this growing workforce, and little is known about the specific working conditions, quality of life, and health risks of these workers and how they could be addressed by workplace health promotion programs, ergonomic and organizational job redesign interventions, improved medical care, and labor-management cooperation on occupational health and safety.

Study goals.

This study takes a broad view of physical and psychosocial job factors, health, musculoskeletal disorders, work-related injury, and health-related quality of life. The goal of this research is to describe the work environment in terms of biomechanical and organizational risk factors that may impede health and quality of life of guest room attendants. The specific objectives of this study are to (1) develop a survey instrument for measuring working conditions and health outcomes of hotel workers, (2) compare health and working conditions among 5 different types of hotels including one upscale tourist hotel, one mid-level tourist tour and travel hotel, one convention center and mid-level tourist hotel, one all-suite mid-level tourist hotel, and one economy tourist hotel, and (3) compare health and working conditions of GRAs in Las Vegas with those of hotel room cleaners in San Francisco previously studied by the same investigators.

Methodological Approach.

The study combines qualitative and quantitative research methods and is participatory in design and implementation, thereby laying the groundwork for sustainable efforts in understanding and improving health and safety of service workers. This is a collaborative project of the Las Vegas hotel guest room attendants organized in the Culinary Workers Union Local 226 and researchers from the Department of Medicine at the University of California at San Francisco and the Labor and Occupational Health Program of the University of California at Berkeley. The cooperation follows the model of participatory action research: guest room attendants are involved in all aspects of the project including the formulation of the research questions, survey instrument development, study planning, design and implementation, and interpretation of study results. The main advantages of this approach are that: (1) the research addresses the specific needs of the research user, (2) research questions and methods are informed by the first-hand experience and knowledge of the people whose work conditions and health status are examined, and (3) a context is developed in which interpretation of results become meaningful for all participants. In addition, involvement of study participants will help the dissemination of study results among the various stakeholders, and may increase the motivation for sustained efforts in planning and implementing changes which improve working conditions, health, and quality of life for hotel workers.

Study Results and Conclusions.

1. Limited job potential. In general, the occupational potential of room cleaners appears to be restricted in all hotels in terms of job security, job promotion prospects, and the

quality of work. Guest room attendants in Las Vegas report nearly twice as often to be dissatisfied with their job than those in San Francisco (55% versus 25%), more often rate their job security as poor (69% versus 48%), and that they have experienced or expect to experience undesirable changes in their work situation (72 % versus 46 %). These differences indicate a substantial potential for improvement of job security and job quality in Las Vegas hotels. This study identifies several physical and organizational characteristics of the work environment of Las Vegas GRAs which are known risk factors for health and safety, and which are also amenable to change.

2. Increase of physical workload during last five years. Although no longitudinal data are available, the results of this survey and reports from focus groups suggest that the physical workload of GRAs increased during the last five years. 87 percent of all guest room attendants agreed with the statement "Over the past few years, my job has become more and more demanding." On average, 4.2 of 26 tasks surveyed are performed less often than five years ago, 12.4 tasks are performed about as often as before, and 9.4 tasks are performed more often than five years ago. Continuous upgrading of the hotels has led to an increase in the frequency of strenuous or time-consuming tasks such as cleaning of Jacuzzis, cleaning of large shiny surfaces (glass, mirror, brass, or marble), or taking out trash. The extent of the increase, the particular tasks involved, and the reasons for the increase differ between the five hotels studied, indicating a potential for change. In addition, the number of rooms to be cleaned during an 8-hour shift has increased in several hotels.

3. Current physical workload and time pressure. Nearly all guest room attendants (87%) described their job as "physically demanding." There are considerable differences in current workload by several measures between different hotels. The number of rooms assigned per room cleaner per day alone is insufficient to measure physical workload or to assure appropriate and equal workload assignments for room cleaners. This study identified important additional factors that determine the actual workload of room cleaners including: (1) the number of guests staying in each room, (2) the number of beds to be made, (3) the need to travel to another floor or building, (4) cleaning Jacuzzis, marble, glass, and mirrors, (5) the need to restock missing supplies on linen cart, (6) garbage and food left in the room, and (7) having to call in from each room, among other items.

Las Vegas guest room attendants clean more rooms and especially more suites than those in San Francisco and report more time pressure. An average of 75 percent of all

guest room attendants report that their jobs requires them to work very fast, and 88% report having constant time pressure due to a heavy workload. On average only 18% of GRAs say that they have enough time to get the job done. In comparison, an average of 46 percent of San Francisco room cleaners reported to have enough time to get their job done. Two thirds (66%) of GRAs in Las Vegas report skipping lunch or breaks or work longer in order to complete their daily room assignments. In focus groups, several room cleaners reported they regularly come to work 30-60 minutes early in order to be able to finish their work in time in the afternoon or to deal with extra assignments during the day.

4. High levels of work stress. More than three quarters of all GRAs experience time pressure, and two thirds skip lunch or breaks or work longer hours to complete their work assignments. High workloads and time pressure produce high levels of job stress. Stress researchers commonly measure job stress by asking standard questions about the psychological or mental demands of the job together with questions about how much control or influence workers have over their work, including how and when to do the work. The combination of high job demands and low job control is called "job strain" or "job stress". High levels of job stress were experienced by a quarter of all employees. On average, a total of 78 percent of guest room attendants also experience an imbalance between their work efforts and rewards. Most indicators of job stress were higher in Las Vegas than in San Francisco hotel workers. The level of job strain measured by a standard questionnaire was 2-4 times higher among GRAs in Las Vegas than among San Francisco hotel room cleaners surveyed in 1998. This indicates strong regional differences and/or increases in job stress over time in the hotel industry. This also suggests a substantial potential for improving working conditions for Las Vegas GRAs. Job strain has been shown to be a major risk factor for several diseases including high blood pressure, myocardial infarction, musculoskeletal disorders and associated work disability. Effort-reward imbalance, another indicator of job stress, was reported by 57% of GRAs in Las Vegas compared to 31% in San Francisco.

5. Respect, social support, and problem solving at work. According to scientific research, social support at work from supervisors and from coworkers can buffer some of the detrimental health effects associated with job stress. On the other hand, lack of support, especially lack of supervisory support and respect, can be the cause of chronic disease, absenteeism, and occupational injury. Respect from supervisors and management has been a major issue for room cleaners, which they discussed extensively in the focus groups. Respect and social support from supervisors and coworkers differed

significantly between hotels, but overall ratings were similar to San Francisco. The local union and management were rated differently with regard to their commitment to health and safety issues: 88% of GRAs agreed that the union considers health and safety an important issue, but only 42% said that management did so.

6. Low levels of general health and high levels of pain. The health status of guest room attendants was studied by self-report using standardized questionnaires. The general health rating on a standardized scale from 0-100 (Short-Form-36 Health Survey) appears to be considerably worse for guest room attendants in Las Vegas (39) than that of the general US population (72) or of room cleaners in San Francisco (56). These differences cannot be explained by age differences, because Las Vegas workers are younger than San Francisco workers.

More than three quarters of guest room attendants reported work-related pain or discomfort during the past 12 months which was severe enough to visit a doctor (in 62% of all cases) and to take time off from work (in 32% of all cases). 83% of all GRAs reported taking pain medication during the last 4 weeks for pain they had at work.

Severe or very severe pain was experienced by 50% or more GRAs in the lower back (62%), upper back (59%), feet or ankles (56%), upper arms or shoulders (54%), and hips and legs (each 50%). Severe or very severe pain was reported also in the neck (43%), the hands (43%), and the knees (44%). Although hotel room cleaners in San Francisco are on average 6 years older than Las Vegas GRAs, they reported much less severe or very severe pain in the musculoskeletal system, on average 26% in hands, 21% in upper backs, 24% in lower back and a maximum of 31% in the shoulders.

Physical functioning is measured by a series of questions assessing if and how much workers are limited by their health in typical daily activities such as running, lifting groceries, pushing a vacuum cleaner, etc. Average physical functioning scores (50.0) were considerably lower than in the San Francisco study (62.1).

General feelings of vitality and energy or (inversely) fatigue are important indicators of health. Guest room attendants in Las Vegas showed relatively low average vitality scores (36.3) compared with San Francisco hotel room cleaners (51.5) or the general US population (60.9).

7. High rates of elevated blood pressure. High blood pressure can be the result of chronic job stress and may lead to cardiovascular diseases such as congestive heart failure, acute myocardial infarction, or stroke. About 25% of the adult US population has high blood pressure. In this study, 39.3% of guest room attendants had elevated blood

pressure, based on reported doctor's diagnosis, medication, or direct measurement of resting blood pressure during the survey.

8. High rates of work-related disability and under-reporting of workers'

compensation injury. More than three quarters (78% in Las Vegas, 77% in San Francisco) of all guest room attendants reported work-related pain during the last year, however only 32% (50 % in San Francisco) reported this pain to their supervisors or management, and only 21% (23% in San Francisco) of all workers had a formally reported work-related injury during the last year. Several reasons for this apparent under-reporting of potentially compensable work-related pain were given by GRAs in Las Vegas including: (1) punitive actions by the employer, (2) discouragement by medical providers, and (3) the need to pay medical bills. This can be expected to cause substantial cost-shifting from employer liability insurance into health insurance or employee out-of-pocket expenses. Work days lost because of work-related pain in general, and because of formally reported workers' compensation injuries or illnesses specifically, varied between the different hotels. Further analyses are needed to determine how much of these differences are caused by differences in physical workload and psychosocial working conditions.

In focus groups workers frequently reported punitive experiences after reporting a work-related injury, having to take drug tests before receiving medical care, or the discounting of their pain and health care needs by their direct supervisors or medical care providers. To investigate this issue further, GRAs were surveyed about their experiences after reporting an injury or illness. 33% of GRAs answered that they had to take a drug test, but this practice differed significantly between hotels. After the injury, 89% of GRAs were taken to a clinic or doctor. Only 46% of GRAs say they got well before returning to work. After returning to work 36% missed additional days of work because of their injury. In the course of their work-related injuries, 21 % of GRAs reported to have received a warning or other discipline for missing work. These responses show that GRAs experience important barriers at work for reporting work-related injury and illness.

9. Associations Between Poor Work Conditions, Poor Health, and Severe Pain.

Physical workload is associated with ill general health and, to a lesser degree, with severe pain in this study. For example, GRAs cleaning more than 14 rooms are 30 % more likely to suffer from fair or poor health, and to report 25% more often severe or very severe pain during the past 4 weeks. A workload of more than 18 beds per day increases the risk of fair or poor health by 43%. Traveling 3 buildings per day increases the risk of

ill health 2.5-fold, and the risk of severe pain 4-fold. Similarly, having to travel 3 floors per day increases the risk of ill health and the risk of severe pain about 2-fold compared with working in one building or on one floor, respectively.

Two psychosocial job factors, time pressure and low job control, increased the risk of ill health by 65% and 50%, respectively. All psychosocial workplace factors analyzed in this section were strongly associated with severe pain. The report of severe or very severe pain increased 2.36-fold or 236% with time pressure, 1.75-fold or 175% with high psychological demands, 1.67 or 167% with having low job control, and 1.58 or 158% with job strain.

These results suggest that physical workload, time pressure, low job control, high psychological demands, and high job stress all increase the risk of ill health or severe pain in Las Vegas GRAs, regardless of age. Although these results need to be repeated in a longitudinal (prospective) study in order to establish causality, the findings are consistent with the scientific literature showing that biomechanical and psychosocial stressors can cause pain and chronic disease. The findings of this study clearly suggest that the relatively high levels of poor health and severe pain among Las Vegas GRAs – compared to those in San Francisco or to the general US population – are at least in part attributable to the relatively high physical workload, time pressure, and other job stressors described in this study. All these job factors are amenable to change, therefore indicating a considerable potential for job redesign, workplace health promotion, and disease prevention. The study provides detailed analyses of work conditions which can be utilized by stakeholders for planning specific interventions.

10. Outlook: Potential for improving working conditions and health status of guest room attendants. The findings of this study are suggestive of an association between poor working conditions and reduced health in hotel room cleaners. Room cleaners report increasing physical workloads in recent years, and a large proportion of room cleaners are exposed to high levels of job stress. This study also found that room cleaners have high rates of work-related pain and disability, and that the health status of room cleaners is below the national average. Age-adjusted multivariate analyses showed statistically significant associations between work conditions and health. Further analyses are needed to determine the most important occupational risk factors. The substantial variation in both working conditions and health status between hotels in San Francisco and Las Vegas indicates that workload and work organization in housekeeping can be designed in ways which would reduce the burden of illness and disability currently experienced in this occupation.

PREFACE

The hospitality industry has experienced a wave of restructuring, consolidation, and new practices to cut costs, including lean staffing and greater performance demands. This research project investigates the impact of these and related changes on the health and quality of life of the largest occupational group within the hospitality industry, hotel room cleaners. This first report describes initial results of a study of hotel guest room attendants (GRAs) in Las Vegas. Additional analyses and results will be presented peer-reviewed scientific publications.

This is a report on the health and working conditions of guest room attendants in the hotel industry of Las Vegas. This report is made available primarily to facilitate ongoing internal discussions of these topics between room cleaners, union, and management representatives. In addition, other labor and management groups or researchers may find this report useful for planning their own investigations. The names of involved hotels are not presented in this document to grant anonymity to the hotels.

The study was a collaborative effort involving individuals from several academic and non-academic institutions. Niklas Krause, a physician and epidemiologist from the Division of Occupational and Environmental Medicine of the University of California in San Francisco (UCSF), directed the project in collaboration with Pam Tau Lee and Robin Baker from the Labor and Occupational Health Program (LOHP) of the School of Public Health at the University of California in Berkeley (UCB). LOHP, directed by Robin Baker, is a public service arm of the Center for Occupational and Environmental Health (COEH) at the School of Public Health at UCB. LOHP has nearly 30 years of experience providing training, information, and technical assistance to labor, joint labor-management groups, and community-based organizations on an array of occupational health issues. This project followed a participatory approach, i.e., the study population participated directly through a Guest Room Attendant Research Advisory Council, focus groups, and indirectly through union representatives of the Culinary Workers Union Local 226 in the planning and design of the study, the design, translation, and pilot-testing of the survey questionnaire, and in the recruitment of study participants. Pam Tau Lee directed and coordinated all field activities in Las Vegas, conducted focus groups, and, in cooperation with Cheri Young from the William F. Harrah College of Hotel Administration of the University of Nevada, Las Vegas (UNLV), trained all graduate student research assistants from UNLV and the Community College of Southern Nevada (CCSN). Preliminary

study results were presented and discussed in separate meetings with focus group participants, union representatives, employer representatives, and several hundred Las Vegas guest room attendants during May 2002, about six weeks after data collection was completed. Final decisions regarding the study design, scientific methods, statistical analysis, and presentation of study results were made by Niklas Krause, the principal investigator from the University of California at San Francisco. Robin Baker acted as liaison between academic researchers and union representatives, and shared the supervision of the field coordinator and the overall administration of the project with Niklas Krause.

This report was written by Niklas Krause, and he takes full responsibility for its scientific integrity and accuracy. Teresa Scherzer, a post-doctoral fellow from the University of California at Berkeley, and Reiner Rugulies, a research scientist from the University of California at San Francisco, assisted with the survey questionnaire design, and performed all data management and statistical analysis tasks. Patricia Sinnott, a physical therapist and doctoral student from the School of Public Health at UC Berkeley, assisted in the development of procedures and training protocols regarding casual and ambulatory blood pressure measurement, and drafted the respective sections of the report.

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INTRODUCTION

Study rationale. Jobs in housekeeping (and food and beverage) operations of the hospitality industry represent the future of work in the growing service sector. The hospitality industry is a major employer of low-wage service workers in U.S. metropolitan areas and tourism centers, and in Nevada in particular. A \$75 billion industry, it employs 1.1 million workers in full- and part-time jobs at 47,000 establishments nationwide (American Hotel and Motel Association, 1997). Unlike other services, businesses in the hospitality industry cannot be moved across borders. It is likely that this industry will remain a fast growing sector in industrialized societies.

Room cleaning jobs in the hospitality industry are characterized by increasing repetitive physical workloads, low income, low skill utilization, low job control, and virtually no prospects for training and career advancement. There is compelling evidence that such low-income jobs result in a disproportionately high burden of illness, injury, and disability. (Judge et al., 1998; Kaplan et al., 1996; Lynch et al., 1997; Lynch et al., 1998; Mackenbach, 1992; North et al., 1993; Syme, 1986) High workers' compensation and health care utilization costs reflect only a small proportion of this total burden.

Working conditions in the hospitality industry are important for a growing number of immigrant workers, workers of color, working women, and former welfare recipients. The hospitality industry has become a major target for welfare-to-work and job training programs in cities throughout the country. An aging workforce is faced with increasing job demands in a competitive industry constantly upgrading services. Few epidemiological studies have been done on this growing workforce and little is known about the specific working conditions and health risks and how they could be addressed.

This study takes a broad view of physical and psychosocial job factors, general health, musculoskeletal disorders, work-related injury and disability, and health-related quality of life. The study combines qualitative and quantitative research methods and is participatory in design and implementation, thereby laying the groundwork for sustainable efforts in understanding and improving health and safety of service workers. The study focuses on housekeeping workers since they are the largest occupational category in the industry.

Study goals. The goals of this study are to (1) develop a survey instrument for measuring working conditions and health outcomes of hotel workers, (2) measure heart rate and blood pressure before, during, and after work in a subsample of about 500 guest room attendants, (3) compare health and working conditions among 5 different types of

hotels including one upscale tourist hotel (Hotel A), one mid-level tourist tour and travel hotel (Hotel B), one convention and mid-level tourist hotel (Hotel C), one new upscale all suites hotel (Hotel D), and one old economy tourist hotel (Hotel E), and (4) compare health and working conditions of GRAs in Las Vegas with hotel room cleaners in San Francisco where a similar survey was conducted in 1998 (Krause et al., 1999).

Specific Objectives. The specific objectives of this study include:

- (1) Develop survey instrument in collaboration with GRA Research Advisory Council
- (2) Assess current physical workload of GRAs
- (3) Estimate change in physical workload over a 5-year period
- (4) Assess psychosocial (organizational) job characteristics
- (5) Assess health status, functional limitations, and quality of life
- (6) Assess the frequency of work-related injury and duration of disability
- (7) Measure heart rate and blood pressure at rest and during work
- (8) Examine the associations between work and health while accounting for age
- (9) Compare working conditions of GRAs in Las Vegas with those in San Francisco
- (10) Compare health status of GRAs in Las Vegas with those in San Francisco and of the general US population

Organization of this report. The report is organized in sections according to the study objectives listed above with a description of the research methodology preceding the report of the results. The report on the first objective, "Development of a survey instrument in collaboration with room cleaners" is integrated into the description of the study methodology. Comparisons of health and working conditions in Las Vegas with San Francisco (Objective 9) or the general US population (Objective 10) are integrated within the respective content areas presented in the results section. The English version of the final survey instrument is attached at the end of this report.

METHODOLOGY

1. Questionnaire Survey Project Description and Study Design

Introduction. This is a collaborative project of the Las Vegas hotel guest room attendants organized in the Culinary Workers Union Local 226 and researchers from the Department of Medicine at the University of California at San Francisco and the Labor and Occupational Health Program of the University of California at Berkeley. The cooperation follows the model of participatory action research: room cleaners are involved in all aspects of the project including the formulation of the research questions, survey instrument development, study planning and design, implementation of the study plan, and interpretation of study results. The main advantages of this approach are that the research addresses the specific needs of the research user, that research questions and methods are informed by the first hand experience and knowledge of the people whose work conditions and health status are examined, and that a context is developed in which interpretation of results become meaningful for all participants. In addition, involvement of study participants will help the dissemination of study results among the various stakeholders, and may increase the motivation for sustained efforts in planning and implementing changes which improve working conditions, health, and quality of life for room cleaners.

Unfortunately, during the initial phases of this study collaboration with management could not be sought for several reasons. Most importantly, it was necessary to insure anonymity of prospective participants, some of whom had expressed fear of reprisal by supervisors. Therefore the survey administration and all research activities were conducted off site. Further, the research project coincided with upcoming contract negotiations which tend to temporarily reduce the willingness to cooperate between labor and management. Since work conditions of supervisors or managers were not part of the study's objectives, their input, which could be helpful in understanding and interpretation of the results, can be sought at a later point in time. The following paragraphs describe how the study was implemented.

Convening advisory council of room cleaners (focus groups). Union representatives selected about 29 union members to establish a Research Advisory Council to identify and discuss key issues of work and health among guest room attendants and to collaborate with university researchers in the development and

administration of a survey instrument (hotel worker questionnaire). Selected members represented a cross-section of low, middle, and high seniority guest room attendants from 24 different hotels in Las Vegas, not including the target hotels. All target hotels are located on the "strip" in the newer section of the city's gaming industry. Members of the council came from diverse ethnic backgrounds and meetings were simultaneously translated into Spanish by union field representatives and interpreters, who themselves did not participate in the discussions.

Conducting focus group sessions. Meetings were led by researchers and health educators from the University of California. A total of eight 3-hour focus group sessions, attended by 25-29 guest room attendants, were held between June 7 and September 6, 2001, at the union hall in Las Vegas. Guest room attendants received a small stipend (\$30 per 3-hour session) for their participation on the council. During the sessions guest room attendants from 24 representative hotels described and compared their job tasks, daily schedules, the type of hotels, rooms and guests, and changes in job tasks and in the hotels during the last five years. They identified job stressors such as ergonomic problems, physical strain, musculoskeletal problems, productivity demands, and relationships with supervisors and management.

Selecting participating hotels for room cleaner survey. Researchers suggested the selection of hotels that could be expected to differ in both physical workload and psychosocial work conditions. Focus groups developed a list of characteristics for classifying hotels according to these criteria. However, it was difficult to rank hotels in these discussions because most guest room attendants typically had direct work experience with only one hotel. Finally, five out of 39 unionized hotels were selected for inclusion in the study, representing five different types: one upscale tourist hotel (Hotel A), one mid-level tourist tour and travel hotel (Hotel B), one convention center and mid-level tourist hotel (Hotel C), one all-suite mid-level tourist hotel (Hotel D), and one older economy tourist hotel (Hotel E). The individual hotels were selected by union leaders based on logistical and recruitment considerations, and to insure a minimum eligible study population of 1,500 GRAs. The total bargaining unit list of these five hotels counted 1724 guest room attendants. However, due to layoffs during the fall of 2001 and exclusion of non-working and swing and night-shift workers, the eligible study population was only 1276 active daytime GRAs at the time of the survey.

Defining the study population (inclusion and exclusion criteria). The eligible study population was determined from union membership rosters provided by the union director of operations. These lists were crosschecked with seniority lists and work schedule lists provided by hotel management to the union. Swing and night shift GRAs were excluded because their job tasks differ considerably from day shift work. The eligible day shift study population derived this way consisted of 1303 guest room attendants from the five selected hotels, 288 from Hotel C, 354 from Hotel A, 293 from Hotel B, 256 from Hotel D, and 112 from Hotel E. This includes 27 GRAs (8 at Hotel C, 9 at Hotel A, and 10 at Hotel B) who appeared on the work schedule lists but did not show up at the hotels during the survey weeks. These GRAs received no invitation to participate in the survey and were therefore excluded from the study population for the calculation of participation rates. Thus, the final eligible study population consisted of 1276 dayshift GRAs.

2. Development of Survey Instrument (Objective 1)

Identifying key issues and developing survey questions. Key issues covered by the survey were identified in focus groups with the room cleaner Research Advisory Council (see above). Researchers developed a draft survey using questionnaire items developed from focus group discussions and items from standard questionnaires previously used in other study populations. The standardized questions were used to assess organizational and psychosocial job characteristics but were not specific enough to measure differences in physical workload among hotels and were not sensitive enough to measure change over the last 5 years. Therefore, most questions regarding the physical workload had to be newly developed. This question development was greatly facilitated by an earlier study of hotel room cleaners in San Francisco (Krause et al., 1999). For the psychosocial work conditions, researchers presented union representatives with several established instruments so that they could pre-select items that were of special interest. Researchers integrated the original scales that included these items in the draft survey instrument to insure that results could be compared with other study populations in future analyses. For general health indicators and health functioning standard measurement instruments were selected by researchers. In addition, based on focus group discussions, questionnaire items on pain in different body regions were developed and included.

Pre-testing of survey questionnaire. The survey instrument was pre-tested in an expanded focus group which included lower, middle, and high seniority guest room

attendants. This group of 20 room cleaners represented 15 different hotels. Translators helped room cleaners to understand the English questions. Based on this pre-test, researchers made minor edits and rearranged the format of a few questions to make them easier to understand.

Translating the survey instrument into Spanish and Serbo-Croatian. The revised survey instrument was translated by professional (Serbo-Croatian) and lay (Spanish) translators. Limited resources did not allow for a formal back translation for the Serbo-Croatian survey. A translation into Tagalog or other languages spoken by the substantial number of hotel workers who had immigrated from the Philippines was not attempted because most of these workers appeared to have sufficient English language skills.

3. Survey Administration

Introduction. Given that it was to be the first time that this population would participate in such a comprehensive and complex survey and given the fact that on-site translators did such an effective job during the pre-test of the survey instrument, it was decided to invite guest room attendants to scheduled meetings where they could fill out the survey questionnaire with the help of translators. This format was also chosen to secure confidentiality of all responses and anonymity of all participants (see below). For this purpose, a meeting room outside the participating hotels was selected for the survey administration. This room was part of the union hall complex and has a separate entry and exit doorway on the rear of the building not in sight of union offices. Only survey administrators, university researchers, and participating guest room attendants were allowed to enter this room. Survey administrators were trained and supervised by university researchers.

Recruitment and training of survey administrators. Researchers recruited 27 research assistants including graduate students from the University of Nevada at Las Vegas, the Community College of Southern Nevada, and guest room attendants from non-participating hotels. These assistants received a one half-day training from university researchers describing their roles and responsibilities, and an overview of the questionnaire with special attention to difficult questions and skipping patterns.

Administration of questionnaires. The questionnaire was administered in two waves, March 21 - 25 and April 4 - 8, from 5 p.m. to 8 p.m., to insure equal opportunity for room cleaners to participate. Using flyers and union announcements and reminder calls, all active dayshift guest room attendants working at the pre-selected hotels were invited to fill out the survey questionnaire at the union hall. An attempt to mail invitations failed because of some technical error in assigning zip codes, all mail was returned by the post office. During the second wave of the survey, non-responders from the first wave received another personal invitation from guest room attendants and union representatives at their hotel to participate in the study.

At the time of the survey guest room attendants were checked in using a registration form. The registration form asked the participant for consent to participate in a blood pressure (BP) screening and measurement of height and weight, and whether they preferred to fill out the survey themselves or be interviewed one-on-one. Participants were provided with a questionnaire in their preferred language or, if this language was not available, were given the option to be interviewed by a translator. The researcher affixed a code-numbered label to the registration form, the survey, and to a blood pressure data card if the participant agreed to participate in the BP screening, or to the BP log sheet if she had participated in an earlier BP screening (see following description of blood pressure pilot study). Again referring to the registration form, the researcher gave each participant appropriate consent forms for her signature after explaining the content and purpose of the form.

Researchers supervised the entire procedure; trained research assistants and translators were available to assist guest room attendants if they did not understand a question. Guest room attendants wishing to be interviewed were directed to the interview table and given assistance. This option was utilized mostly by participants who had limited reading and writing skills. Those who spoke Korean, Thai, Lao, Chinese, and Tagalog had the option to be interviewed by researchers in their own language. Completed surveys were deposited into a ballot-type box or sealed envelopes and were handled only by university researchers. Union personnel did not have access to any of the completed surveys.

Telephone follow-up. About 20 guest room attendants turned in incomplete surveys with missing information on whole sections. These guest room attendants had to leave early during the survey administration mostly because of home responsibilities and long or shared commutes. During the second wave of the survey administration waiting

husbands and children of participants were allowed to enter the room in order to reduce the potential of conflicts with personal or family responsibilities. Researchers and trained research assistants made follow-up phone calls to participants with incomplete surveys and were able to collect the missing information from about 8 of them.

4. Blood Pressure and Heart Rate Project Description and Study Design

Introduction. Concurrent with the survey project, the researchers from the University of California (San Francisco and Berkeley) developed and implemented the second project to collect cardiovascular and anthropometric measurements on a smaller group of guest room attendants from selected hotels. The purpose of this second study was to establish baselines for these measurements (blood pressure, heart rate, height and weight measurements) and to measure the guest room attendants' blood pressure and heart rate responses to their work and home activities. This part of the overall study was developed to address Goal 2 of the Study Goals, "measure heart rate and blood pressure during and after work in a subsample of about 500 GRAs" and Specific Objectives 2. "assess current physical workload of GRAs", 6. "measure heart rate and blood pressure at rest and during work," and 8 " assess health care needs." This portion of the overall study included two components: 24 hour monitoring of heart rate and blood pressure using personal heart rate and blood pressure monitors in a sample of 591 GRAs; baseline data collection of heart rate, blood pressure, height and weight after work, in a sample of 290 GRA survey participants.

Development of the data collection protocols. Several data collection protocols were developed for this phase of the study including blood pressure measurement by research assistants, heart rate measurement by research assistants, weight measurement by research assistant, height measurement by research assistants. These protocols were integrated into a manual used to train the research assistants who would be both taking the measurements on the GRAs and training the GRAs to take their own measurements with a personal device. In this way training was standardized and data collection consistency maximized.

Blood pressure and heart rate measurement by research assistant. The protocols for measurement of blood pressure with an arm cuff sphygmomanometer and manual heart rate measurement were developed by researchers from the literature(1992) and adapted, slightly, for the expected environment at the union hall. The protocol included identification of the dominant arm, support for the arm to be measured, repeated

measurements, placement of the cuff, dial, and stethoscope, and finger placement for the heart rate reading.

Height and weight measurement by the research assistant. Protocols for measuring height and weight using a standard physician office scale were developed and integrated into the training manual, including provisions to maintain participant confidentiality.

Blood pressure and heart rate measurement by the individual participant. The protocol for participant measurement of their own blood pressure and heart rate using an electronic wrist cuff monitor were developed by the researchers. The study required a standardized protocol which was slightly different from the manufacturer's protocol and not expected to influence the accuracy of the readings.

Data collection materials and physician referral forms. Several data collection forms and protocols were developed to provide for consistency of reporting and retrieval of the data, including materials to record baseline measurements and methods to track use of different electronic wrist cuffs. A diary was developed for the participants to record the measurements from the wrist cuff alongside the activity they were performing at the time of measurement. In addition, because it was anticipated that some participants might have unexpected high blood pressure readings or undiagnosed hypertension, a protocol for notifying the participant of the readings and providing this information to their individual physician was developed. Measurement criteria for referral to their physicians was developed by researchers from the literature (Tsuji et al., 1997; Weisser et al., 2000).

Consent forms. Consent forms for participation in each phase of this portion of the study were developed and approved by the University of California at Berkeley and San Francisco.

Pilot testing. In December 2001, a pilot test of the proposed blood pressure study was done with the participation of approximately 40 Las Vegas GRAs. The study was explained by the researchers, both in English and with the assistance of translators, consent was given, and the participants were trained per the protocols on the use the home measurement devices, and how to record the readings in the study diary. The protocol included taking one blood pressure and heart rate reading before retiring that night, one reading in the morning before work, and then 8 – 16 readings throughout the day, following completion of several specific activities in the diary. Pilot participants took the wrist cuff monitor home with them in the evening after training, and returned it the next evening after work. After returning the device, and while the researchers were

downloading the memory from the devices, the participants completed a brief survey to give the researchers information on any problems or any suggestions they had to make the procedure easier. After the pilot test was done, small refinements of the procedure were made, and the training manual for the research assistants was finalized.

Training the research assistants. Research assistants were recruited from the University of Nevada at Las Vegas and the Community College of Southern Nevada to assist with the participant training and data collection for this phase of the study. These research assistants were trained over 2 days by university researchers, using the manuals prepared for this purpose, and participating in protocol simulation and practice.

24-hour ambulatory blood pressure measurements. In February 2002, the ambulatory blood pressure study was begun. The target of 100 room cleaners per hotel was exceeded and a total of 591 participants from the five study hotels were recruited by university researchers through the union. Over a period of five weeks participants came in small groups to the union hall to be trained in the protocols, and to collect data on the wrist cuff blood pressure monitors for one day each. Each participant had baseline blood pressure, heart rate, weight and height measurements taken on the first night of their participation. The research assistants, supervised by university researchers, trained the GRA participants and took the baseline measurements. This procedure occurred over several nights, requiring rotation of the devices. The research assistants had several responsibilities, they described the study, obtained informed consent, trained the participants, took baseline measurements, then downloaded data from the returning participants (from the previous day and night) and cleared the memory of the devices for the following day's use. Each night the research assistants, while downloading the measurements from the wrist cuff device, recorded any variation from the diary report onto the diary (in red ink). Ambulatory blood pressure was measured with the Omron HEM-630 device.

Resting blood pressure measurements during the questionnaire survey. During the survey GRAs who had not participated in the ambulatory blood pressure study were invited to have their blood pressure, heart rate, body weight and height taken during the evening they completed the questionnaire survey. Each participant gave informed consent, and using the protocols developed for collecting these measurements, research assistants took blood pressure, heart rate, body weight and height measurements on an additional 296 GRAs during the survey evenings. 6 records were excluded because of

missing information on blood pressure readings. In total, 783 survey participants had their blood pressure measured either during the survey (290) or during the earlier ambulatory blood pressure study (493).

Overall participation in blood pressure screening. 83.2 percent (783 out of 941) of questionnaire survey participants had their resting blood pressure checked either during the questionnaire survey or during the ambulatory blood pressure study. Another 98 GRAs had their blood pressure taken during the ambulatory blood pressure study but did not participate in the survey. However, these participants completed a shortened questionnaire during their blood pressure training session. In total, 881 (783+98) GRAs participated in any blood pressure screenings.

5. Data Management and Analyses

Data management and data entry. Researchers developed (1) an electronic database for all sample and questionnaire data using Microsoft Access 97 software for the PC, and (2) a manual with decision rules for data entry and coding. Decision rules were created to deal with ambiguous or contradictory responses. Data were entered from questionnaires into the database by research assistants especially recruited and trained for this task. Data entry was checked by two other people, with one person reading information aloud from the questionnaire while the other person compared the item with corresponding data in the database on the computer screen and by statistical algorithms. Similar procedures were used to enter and check blood pressure screening data.

Statistical analyses. Electronic data were transferred from the Access Database into Stata Statistical Software, Release 6.0 program for further analyses. Analyses for this preliminary report include the calculation of frequencies, averages (means), standard deviations (SD), and totals for each questionnaire item, and the construction of summary scales. Analyses were done separately for each participating hotel and totals across all hotels were also calculated. For differences in frequencies between hotels, chi-square tests were used; for comparisons of means one-way analysis of variance was used. Variables that showed any statistically significant difference between any of the hotels (p-value less than 0.05) are marked by an asterisk in the tables, p-values greater than 0.05 but less than 0.1 showing a trend for statistical significance are marked by an asterisk in parenthesis. In the description of the results, statistical significance is not emphasized,

because statistical significance is mainly a function of sample size and variation, which are by definition relatively small in this study of a single occupation with five subsamples from several hotels. The significance of data should be evaluated by the size of the differences, the range of responses (captured by the standard deviation for means) and, most importantly, by its meaning to stakeholders.

RESULTS

1. Study Population

Introduction. This section (1) reports how many of the guest room attendants from the five selected hotels participated in the study by filling out the questionnaire, and (2) describes general characteristics of the study participants such as their age and work history. The text makes reference in underlined characters to Tables which can be found at the end of the text section and to Questions numbered as they appear in the questionnaire, a copy of which is attached to this document.

Participation rates. Participation rates are reported as the percentage of eligible guest room attendants who completed the survey questionnaire. The universe of eligible GRAs were those scheduled to work day shifts at five selected Las Vegas hotels in March and early April 2002, i.e., at the time of the survey administration, as determined by hotel work schedule lists (see above under Methodology). Of 1276 eligible daytime guest room attendants 941 participated in the survey (74 percent participation rate).

Table 1 shows the numbers of eligible and participating guest room attendants and participation rates separately for each hotel. In each hotel the majority of GRAs participated and completed the survey questionnaire. Participation rates differed between hotels ranging from 55 percent at Hotel D to 93 percent at Hotel E. GRAs attending a focus group meeting at May 10, 2002, to discuss initial study results, attributed the low participation rate at Hotel D to fears of reprisal from management. Apparently, management did unilateral decide to raise the number of rooms to be cleaned within an 8 hour work day from 13 to 14 which gave rise to some protests from GRAs. In the weeks before the survey was administered management fired 23 people who were wearing red solidarity ribbons. According to a union spokesperson, 22 of them were rehired, while one union person, who had explained to her co-workers that they were being paid by the hour and not by the room, remained fired during the survey administration and up to the time of this report writing. Union representatives shared the opinion that fear of losing one's job is the most likely explanation of the low participation rate at Hotel D.

Characteristics of study participants (Questions 2-3 and 55-68). Sociodemographic characteristics and work history information are available for the guest room attendants who filled out the questionnaire.

Table 2 shows sociodemographic and occupational characteristics of study participants by hotel.

Gender: Nearly all guest room attendants are women (99%).

Age: 42% of guest room attendants are less than 40 years old, 35% between 40 and 49 years, 19% between 50 and 59 years, and 4% were 60 or more years old. The average age of all participants was 41.7 years (Standard deviation 9.6 years). Although there is no significant difference in the mean age across hotels, the older age groups (50 or more years) constitute a larger percentage of the workforce at Hotel A (25%), Hotel C (29%), and Hotel E (27%) compared to Hotel B (15%) or Hotel D (15%). On average 23 percent of guest room attendants were over 50 years old. The respective proportion was 44% in the San Francisco Hotel Room Cleaner Study, where participants were on average 6 years older (47.7 years).

Ethnicity, language and nationality: The majority of guest room attendants consider their race or ethnic group to be Latina (76%). Only 6 percent classify themselves as African American, 6 percent as White/Caucasian, and less than 1% as Native American. Filipino and Asian constituted each 5 percent of the study population. Significant differences regarding ethnicity were found between the hotels. The highest proportion of Latinas was found at Hotel B (90%), the highest proportion of African Americans at Hotel E (16%), and the highest proportion of Asians at Hotel C and Hotel D with 10 percent each. Most employees were born outside of the US (85%) and for 89 percent English is not their native language.

Years of education: GRAs on average report about 9 years of education, however, some room cleaners counted years with some on-the-job training thereby making these numbers difficult to interpret. However, no significant differences were found between hotels.

Family income: The monthly family income before taxes averaged \$2,127 dollars.

Homeownership: 60 percent of room cleaners owned their home or apartment, 40 percent were renting.

Household size and dependents needing care: On average GRAs lived in households with three adults and 2.4 children. 59 percent of households needed child, elderly or disabled care for an average of two dependents.

Years working as guest room attendant: On average, participants had worked as guest room attendants for 7.7 years, mostly at the current hotel, and there were no significant differences between hotels.

Work status: Most guest room attendants are full-time employees (92%). The number of part-time employees differed significantly between hotels, ranging from 5 percent at Hotel B to 15 percent at Hotel E.

Work hours: Full-time employees work at least 8 hours five days per week, respondents reported a total of 42.2 hours on average. Part-time employees generally work 8 hours per day but less than 5 days per week; respondents reported an average of 18 hours per week.

Second jobs were held by a total of 4 percent of guest room attendants.

Comparison of responders and non-responders. The study population comprises a non-probability sample of all eligible guest room attendants and the sample therefore may be biased in the direction of availability and willingness to participate. For example, people who are not working during survey days are less available, especially if they are on sick or disability leave. This could mean that the health status of employees appears to be better in the study sample than in the entire room cleaner population. No data were available for people who did not respond at all, making it impossible to compare responders and non-responders. However, given the high participation rate of 74 percent, differences between responders and non-responders are unlikely to bias the study results. In general, epidemiologists consider studies with response rates of more than 60 or 70 percent as being of high methodological quality and unlikely to be biased by self-selection of respondents.

2. Current Physical Workload and Ergonomic Problems (Objective 2)

Introduction. General questions about physical workload (15e, 16l) were taken from standardized questionnaires which were originally designed to capture differences *between* occupations, but not *within* one particular occupation. For this study comparing physical workload *within* the same occupation new questions were developed in focus groups. These questions capture those specific features of the physical work environment of guest room attendants that may differ from establishment to establishment. The discussions with guest room attendants in focus groups revealed that the number of rooms to clean per day does not fully account for differences in physical workload experienced by guest room attendants. Guest room attendants developed a long list of specific factors which influence their workload even if the number of rooms is equal. This list was incorporated in questions 6-14 developed specifically for guest room attendants. These

questions assess the workload of guest room attendants broadly by number of buildings, floors, rooms, and beds, and baths per day (Questions 6-9), and in detail by assignment to special rooms ("check-out," "VIP," "rush," "Jacuzzi"), type of beds ("king," "queen," "roll-away" etc.), special amenities (e.g., coffee machines), and frequency of specific tasks or problems involved in room cleaning (Questions 12-14).

Responses to questions about physical workload are not presented in the same order they were asked in the questionnaire. Rather, responses to the more general questions on physical workload are reported first, followed by responses to the more detailed questions regarding specific physical job characteristics. The latter are summarized in Tables 5-9.

Physical job demands (Question 15e). Nearly all guest room attendants (87%) described their job as "physically demanding." The percentage was highest at Hotel C and Hotel D (94%), followed by Hotel B (90%), Hotel A (89%), and Hotel E (87%). The more detailed questions developed specifically for this study show that there are a number of aspects of the physical workload that differ significantly between hotels.

Physical workload (Questions 6-9). The physical workload of guest room attendants is in part determined by the number of assigned rooms during a typical day. Unlike in San Francisco, there is no contract language setting a daily maximum number of rooms a GRA can be assigned. Therefore, the number of rooms management expects to be cleaned during an 8-hour workday varies between hotels in Las Vegas. For example, workers reported in focus groups that their quota was 10 regular rooms and 4 suites at Hotel B, and 12-13 regular rooms and 1-2 suites at Hotel C. Some hotels have rules that give more credit to cleaning suites than to cleaning regular rooms. For example, at Hotel E 1 suites counts as 2 rooms, and a penthouse apartment counts for 3 rooms. At Hotel C, normal suites count as 1 room and penthouse suites as 7 rooms. At Hotel D, so-called mini-suites count as 1 room, other suites between 2-4 rooms, and penthouse suites for 4 rooms. At Hotel B most suites get credited as 1.5 rooms. At Hotel A, suites count as 3 rooms, or as 4 rooms if they contain two bedrooms. GRAs reported an increase of their quota in several hotels. GRAs reported that the 2-bedroom suites at Hotel A used to get 6 rooms credit until about 2 years ago; now the credit is only 4 rooms. GRAs from Hotel E reported a reduction of credits for some suites, and a change of total number of required rooms from 12 to 16 to 17 or 18 and back to 16 over the past ten years. Hotel D workers were required to clean 13 suites until last year when the quota was increased to 14. None of the participating hotels had any rule about dropping the number of rooms after a certain number of checkouts. However, Hotel E gives 1 room

credit if the penthouse suite is a checkout. For comparison, in San Francisco the maximum number of regular rooms is currently 14, and one room gets dropped for every 7 checkouts, and 2 rooms for every 10 checkouts. Hotels in Los Angeles drop 1 room for every 8 checkouts. In Atlantic City, the maximum number of regular rooms per day is 14, and 2-room suites count as 2 regular rooms.

Questions 8 a-d assess the number of different rooms cleaned during the last workday. This question takes a snapshot at the physical workload during the last workday. The most recent workday was chosen to facilitate accurate recall. Since questionnaires were filled out during different weekdays, aggregated results from this question can be expected to be comparable to an average "typical" workday. However, since questionnaires were administered during March and early April, i.e., outside the Las Vegas high tourism and convention seasons, responses may underestimate the average workload. Also, following the events of September 11, 2001, occupancy rates were still below average. On the other hand, reduced staffing levels after lay-offs following the events of September 11, 2001, may have resulted in an increased workload for GRAs compared to pre-September 11 levels.

The workload in each room not only varies by number and type of room but also by the number and type of beds and the corresponding number of guests staying in the rooms. Therefore, guest room attendants were also asked to recall the number and type of beds they made during their last workday (Question 8 e, f, g). The highest number of guests per room or suite is expected during the holiday and summer vacation seasons when more families travel to Las Vegas. During these times up to 8 or 9 persons may stay at a suite including the use of up to 3 rollaway beds per suite.

Table 3 shows the mean number of rooms and beds cleaned per day. The average total number of rooms cleaned was 15.2, ranging from 13.8 at Hotel A to 17.1 at Hotel D. The average number of regular rooms ranged from 5.6 (Hotel D) to 14 (Hotel C), and the average number of suites from 1.5 at Hotel B to 11.6 at Hotel D. Although Hotel D is considered a suite-only hotel, GRAs at Hotel D reported an average number of 5.6 regular rooms per day. This discrepancy was presented to employees in a focus group discussing preliminary survey result and the following explanation emerged in the discussion: Some room cleaners probably converted mini-suites into regular rooms, because they count as one regular room only.

There are four types of "special rooms" requiring extra work efforts: checkouts, VIP's (requiring special cleaning and stocking,), rush rooms, and rooms with Jacuzzi (to be cleaned at floor level). Daily checkouts range from 5.3 at Hotel D to 6.9 at Hotel C, and VIP's and rush rooms combined ranged from 0.4 at Hotel B to 1.5 at Hotel E. The total number of all kinds of special rooms assigned per day was on average 10.2, highest at Hotel A (10.7), and lowest at Hotel D (9.2).

The number of beds to be made each day averaged 19.4 and ranged from 15.8 (Hotel A) to 22.9 (Hotel B). The breakdown by type of bed is also shown in Table 3. On average, a room cleaner makes about 12 "Queen", about 6 "King", and 1 "Rollaway, Crib or Sofa" beds each day. This translates in at least 19 guests per day, but may represent an average of up to 28 guests if Queen and King size beds are occupied by 2 persons. Since the amount of trash and the amount of linen, bath towels, and garbage is proportional to the number of guests, future assessments of the workload of room cleaners should take the number of guests into account.

Assignments of the same worker to different floors or buildings during the day adds to the physical workload (walking, pushing or pulling cart) and can be time-consuming, depending on frequency, distance, service elevator wait time, etc. Usually there is only one service elevator for room cleaners on each floor, and they are not allowed to use other elevators which results in wait time, especially at the beginning of the shift when all room cleaners travel to their different floors. Therefore, physical workload measures need to also take into account the frequency of traveling between floors or buildings. Questions 6 and 7 capture these circumstances for a normal workday.

Table 4 shows the number of floors or buildings traveled during a typical day. As shown in the last columns of Table 4, 64 percent of all guest room attendants travel to more than one floor during a typical workday, and 14 percent travel to more than one building. The required traveling differs considerably between hotels. For example, the percent of guest room attendants assigned to only one floor is 71% at Hotel A, 34% at Hotel B, 20% at Hotel C, 16% at Hotel D, and 12% at Hotel E (see Table 4). Most (86%) GRAs work in one building with the exception of Hotel E where 45 percent work in two or more buildings during a typical workday.

Pushing and pulling the linen cart constitutes heavy physical labor. Some hotels in Las Vegas (e.g., New York, Paris, and Cesar's) provide electrical carts but none of the

hotels selected for study in Las Vegas or previously in San Francisco furnished carts with electrical motors.

Comparison of assigned rooms in Las Vegas and San Francisco hotels. Table 5 compares the mean number of assigned rooms and suites between hotels in Las Vegas (in March 2002) and in San Francisco (in March 1998). Las Vegas GRAs clean one more room per day compared with their colleagues in San Francisco in 1998. The rooms they clean are also more often suites; on average they clean 3 more suites per day than San Francisco room cleaners. The total number of assigned rooms requiring special efforts is also higher for GRAs in Las Vegas if Jacuzzis are included, although checkouts and VIP or rush rooms were more frequently assigned in San Francisco. The differences reported here are based on a survey of San Francisco hotels before the number of assigned rooms was decreased by 1 room (or 7 percent) in new contracts negotiated in 1999. Therefore, the data presented here suggest that GRAs in Las Vegas carry an about 14 percent higher room quota than their colleagues in San Francisco.

Frequency of specific work tasks (Question 12). An even more detailed assessment of the current physical workload was performed at the task level. In focus groups, guest room attendants developed a list of common work tasks and job problems which they felt determined their workload beyond the number of rooms, beds, or guests. These tasks or problems are listed in Question 12. Guest room attendants were asked how often these items usually occur.

Table 6 shows the average frequency of each work task or problem per day for each hotel and across all hotels. The 10 most frequently occurring problems in across all hotels were "Clean large glass or mirror doors" (on average 10.7 times per day) followed by "call in from each room" (9.4 times per day), "Problems dusting high or low areas in room" (9.1 times per day), "Clean marble sinks" (9.0 times per day) and "Lots of garbage left in the room" (8.1 times per day), "Restock missing supplies on cart" (7.7 times per day), "Bathrooms very wet and dirty" (7.7 times per day), "clean chrome or brass fixtures" (7.2 times per day), "Ashtrays in room need cleaning" (7.1 times per day), "food left in room on tables or carpet" (6.9 times per day) or "Extra scrubbing required in bathroom" (6.6 times per day), in that order.

In this study we did not measure the duration of time required to complete any of these tasks. However, experience from hotels in San Francisco suggest that these tasks

may substantially contribute to the average time needed to complete cleaning a unit. Based on data from San Francisco hotels the following items represent the most time consuming tasks: "Restock missing supplies on cart" (about 16 minutes each time), dealing with bathrooms that are "very wet or dirty" or "require extra scrubbing" (12.7 minutes each), "need to travel to another floor" (11.8 minutes each time), and "Do not disturb sign on door" (10.7 minutes) requiring a return visit at a later time.

Combining the frequency and duration of each task can lead to an estimate of extra work time spent on dealing with each problem. For example, guest room attendants in San Francisco on average estimated that it takes them 8.8 minutes extra time if they have to deal with "lots of garbage left in the room." Multiplying this number by the average number of times this occurs in Las Vegas yields an average of 71 minutes of extra work each day (8.1 x 8.8). However, these estimates should be interpreted with caution because they are based on subjective assessments of time and on estimates from hotels in a different city. Future studies should employ direct observation by researchers to validate these estimates. Despite these limitations these calculations demonstrate that these extra tasks or problems may have an important impact on time needed to clean a certain number of rooms. Clearly the frequency of these extra tasks and problems need to be considered in setting equitable room quota for hotel room cleaners.

Ergonomic problems (Question 14). The physical workload of guest room attendants increases when equipment and supplies are inadequate, need repair or replacement, and when there is no housekeeper to turn to when these or other problems occur. During focus groups, guest room attendants reported several such recurring problems that cannot be easily measured in terms of frequency or duration, ten of which are listed in Question 14. Examples include difficulties with heavy or broken linen carts or dysfunctional vacuum cleaners. Guest room attendants were asked how much of a problem each item is in their work. The four answer options were "No problem at all", "Very little problem", "Somewhat of a problem", and "A big problem".

Table 7 shows the percentage of guest room attendants who reported experiencing some problem or big problems with these items in their work. The three most frequently reported problems of this severity were "Linen cart too heavy" (84% of all guest room attendants), "Heavy bedspreads or comforters" (74%) and "cleaning supplies irritate skin or eyes" (72%). In addition 62 percent of all guest room attendants reported having some or big problems with "Vacuum cleaner too heavy," "Vacuum cleaner needs repair"

(especially at Hotel C), and "cleaning supplies do not clean well" (especially at Hotel D). It is interesting to note that specific problems were much less of a problem in certain hotels, e.g., only 37 percent reported "vacuum cleaner needs repair" at Hotel D as problematic, indicating a possibility for improvement in other hotels.

Conclusion (current physical workload and ergonomic problems). The number of rooms assigned varies by hotel and is on average higher than in comparable hotels in San Francisco. There are also considerable differences in current workload by several other measures between different hotels. Therefore the number of rooms assigned per room cleaner per day is insufficient to measure physical workload or to assure appropriate and equal workload assignments for guest room attendants. Important additional factors that determine the actual workload of guest room attendants include the number of guests staying in each room, the number of beds to be made, the need to travel to another floor or building, cleaning Jacuzzis, marble, glass, and mirrors, the need to restock missing supplies on cart, garbage and food left in the room, and having to call in from each room, among other items. The considerable variation between hotels in Las Vegas and the lower number of rooms assigned to room cleaners in San Francisco indicate a potential for interventions to reduce physical workload for GRAs in Las Vegas hotels.

3. Change of Physical Workload During the Last 5 Years (Objective 3)

Introduction. Since there is no contractual language specifying the maximum number of rooms to be cleaned per day or any credits for suites, checkouts and other special rooms, it is difficult to document the exact degree of an increase in physical workload during the past five years. However, as described in the previous section, GRAs reported an increase of the room quota in several hotels during previous years. Together with structural changes and continuous upgrade of Las Vegas hotel rooms, one can infer an increase of physical workload in terms of the number of units to be cleaned and in terms of specific work tasks related to upgrades. On the other hand, some work task may have been reduced. The questionnaire therefore includes 27 questions to assess any change in physical workload over the last five years. One general question (Question 15f) and 26 task-specific questions (Question 13a-z).

Question 15f. On average, 87 percent of all guest room attendants agreed with the statement "Over the past few years, my job has become more and more demanding" (94%

agreed at Hotel D, 88% at Hotel C, 87% at Hotel A, 84% at Hotel E, and 83 % at Hotel B). Only 13 percent disagreed. In addition to an increase in room quotas other explanations for increased workloads could be that the workforce perceives the same job tasks as more demanding because of aging or ill health. However, an alternative explanation was offered by guest room attendants in focus groups. They reported that over the last years they have more extra work to perform in each room because of upgrading of facilities (e.g., more sheets per bed, more glass or mirror doors) or because of an increase in trash, food, and room service trays left in the room, and other changes.

Question 13. Question 13 was designed to find out whether such extra tasks or problems occurred "less," "about the same," or "more" than five years ago. Question 13 lists the same 26 specific work tasks used in Question 12 (see above, table 6) for measuring the current workload.

Table 8 summarizes the responses to question 13. On average, 4.2 of the 26 tasks are performed less often than five years ago, 12.4 tasks are performed about as often as before, and 9.4 tasks are performed more often than five years ago. The greatest number of tasks required more frequently was reported at Hotel A (10.3 on average) and the fewest tasks at Hotel B (8 on average).

Table 9 shows in detail for each of the 26 work tasks which percentage of workers does them more often, and which percentage does them less often. (The percentage of workers doing these tasks "about the same" is not presented in the table but can be easily calculated by subtracting the two reported percentages from 100). Across all hotels, 50 to 59 percent of guest room attendants report that lots of garbage is left in the room more often, possibly reflecting the increase in room service, availability of take-out food, and/or a change in the behavior of guests over the years. In an advisory group meeting discussing these preliminary results, guest room attendants commented that other changes may be even more important, namely recent room upgrades including installation of glass mirrors and doors, chrome and brass fixtures, and marble sinks to be polished. Other examples with increasing frequency in all hotels include "Problems with replacement linens" (35-46%), "Need to put away iron and ironing board" (27-58%), and "Need to restock missing supplies on linen cart" (28-51%) among others. Changes in the frequency of job problems varied considerably between hotels indicating a potential for improvement.

Conclusion (change of physical workload during last five years). Although no longitudinal data are available, the results of this survey and the focus group discussions suggest that the physical workload of guest room attendants increased during the last five years. The extent of the increase, the particular tasks involved, and the reasons for the increase differ between the five hotels studied.

4. Psychosocial Job Factors (Objective 4)

Introduction. The term "psychosocial job factors" is used as a catchall term to describe a large number of job factors including a host of conditions in the job and work environment. In general, these include characteristics of the "work organization" in terms of job content (e.g., job clarity, job control, and psychological or mental job demands), temporal aspects (e.g., work and rest schedules), interpersonal relationships at work (e.g., supervisor-employee relationships and social support), organizational characteristics (e.g., communication issues), financial aspects (e.g., economic reward in terms of pay or benefits), and community aspects (e.g., job security, and occupational prestige and status). These psychosocial job factors are often thought of as "risk factors" that may pose a threat to health and well-being. Hazardous combinations of these factors are sometimes referred to as "job stress" or "job strain" and may also have a negative effect on job satisfaction and productivity.

Questionnaire items were selected from standardized questionnaires in the scientific literature. Researchers discussed these existing questions with union representatives and the Research Advisory Council of guest room attendants to select the most appropriate questions. Some items were selected despite a low immediate relevance for guest room attendants if these items were useful in constructing standardized scales and summary scores. Standardized scales are needed to facilitate comparisons with room cleaners in other cities and other working populations.

The following section of the report describes psychosocial factors in the work environment of guest room attendants regarding (1) the overall potential of the job (i.e., job satisfaction, job security, job promotion, and quality of work), (2) work stress (i.e., job strain, time pressure, psychological demands, imbalance between work effort and rewards), and (3) communication and support within the organization (i.e., problem solving capacities, social support at work, employee-supervisor and labor-management

relations, and responsiveness of unions and management regarding health and safety issues at work). Responses to questions about psychosocial job factors are not presented in the same order they were asked in the questionnaire. Rather, responses are presented in themes displaying individual questionnaire items or standard summary scales which combine responses of several questions into a single score. Results are summarized in Tables 12-25 described in detail below.

Potential of the Job

Job satisfaction (Question 20). To assess the overall level of job satisfaction guest room attendants were asked, "How satisfied are you with your job?"

Table 10 shows the percentage of guest room attendants for each answer by hotel. Overall, about 55 percent of guest room attendants reported to be "not at all satisfied" (25%) or "not too satisfied" (30%) with their job, 39 percent were somewhat satisfied, and 6 percent were very satisfied. Differences between hotels were not statistically significant. However, satisfaction levels appear considerably lower among GRAs in Las Vegas compared to San Francisco room cleaners. In the 1998 survey of San Francisco room cleaners about 21 percent of room cleaners reported to be "not at all satisfied" (3%) or "not too satisfied" (18%) with their job, 50 percent were somewhat satisfied, and 29 percent were very satisfied. In other worker populations reported levels of job satisfaction are usually considerable higher than the ones observed among Las Vegas GRAs. The results warrant further investigation of the underlying reasons for the low level of job satisfaction in this group. Some reasons could be an increased prevalence of psychosocial stressors described below.

Job security (Question 15k). Overall, 69 percent of guest room attendants rate their job security as poor, ranging from 65 percent at Hotel A to 82 percent at Hotel D. (See Table 11). These rates are considerable higher than those in San Francisco in 1998 where the average was 48 percent with a range from 34 to 54 percent. Recent layoffs after September 11, and targeted firing at Hotel D described above may have contributed to this high level of job insecurity among Las Vegas GRAs.

Undesirable changes in the work situation (Question 15h). Overall, 72 percent of workers report that they "have experienced" or "expect to experience an undesirable

change in my work situation". The percentage ranges from 67% at Hotel A to 82% at Hotel D. (See [Table 11](#)). In San Francisco the overall percentage was 46 percent.

Job promotion prospects (Question 15j, and 15p). Overall, 67 percent of guest room attendants report that their "job promotion prospects are poor" (Question 15j). This assessment was shared by the highest percentage of workers at Hotel C (70%), and was endorsed the least at Hotel A (64%). When workers were asked to consider all their "efforts and achievements," 40 percent evaluate their "prospects for job advancement" as "adequate" (Question 15u), ranging from 32 percent at Hotel D to 44 percent at Hotel C (see [Table 11](#)). For comparison, in San Francisco, 61 percent rated their work prospects as adequate.

Quality of Work (Questions 16a-c, 16g, 16i, 16n). The quality of the type of work was assessed by questions about repetitiveness (Questions 16b and 16g), skill development (Questions 16a and 16i), and skill utilization (Questions 16c and 16s).

[Table 12](#) shows the percentage of guest room attendants who "agree" or "strongly agree" with different statements about the quality of their work. Regarding repetitiveness of work tasks the majority of guest room attendants (73%) describe their jobs as "involving doing a lot of things over and over again," less so at Hotel B (66%), and more so at the other hotels (73-77%). In terms of task variety on the job, on average 51 percent of guest room attendants report "I get to do a variety of different things on my job", without any significant difference between hotels. Across all five hotels the majority of guest room attendants (60%) feel that their jobs require them to "learn new things" and 26% say that they have an "opportunity to develop" their "own special abilities" (skill development). In terms of being able to apply their skills (skill utilization) an average of 54 percent guest room attendants agree with the statement "My job requires me to be creative", fewer at Hotel E (46%) and more at the other hotels (54-59%). Room cleaners in San Francisco reported higher levels of repetitiveness (81% "doing things over and over again") but also higher levels of skill development (78% learn new things, 53% develop their own special abilities).

Conclusion (job potential). In general, the occupational potential of guest room attendants appears to be restricted in all hotels in terms of job security, job promotion prospects, and the quality of work. While repetitiveness of work was rated similar in Las Vegas and San Francisco, all other aspects of the quality of work, job security, and experience or expectations of undesired changes at work were rated considerably worse in

Las Vegas hotels. The remarkably low level of job satisfaction among Las Vegas GRAs may be an expression of these and other working conditions described in this report. The responses did not vary substantially between hotels with the possible exception of job security being rated as poor by 75 and 77 percent of employees at Hotel E and Hotel D compared to 65 and 66 percent at Hotel A and Hotel B, respectively.

Work Stress

Time pressure (Questions 16j, 16n, 15a, and 15d). Time pressure on the job has been measured with the following four statements: "My job requires working very fast" (Question 16j), "I have enough time to get my job done" (Question 16n), "I have constant time pressure due to a heavy workload" (Question 15a), and "I am often pressed to work overtime" (Question 15d).

Table 13 shows the percentage of guest room attendants agreeing with these statements about time pressure on the job. An average of 75 percent of all guest room attendants report that their jobs requires them to work very fast, and 88% report having constant time pressure due to a heavy workload. On average only 18% of GRAs say that they have enough time to get the job done with the lowest percentage at Hotel D (14%). In comparison, an average of 46 percent of San Francisco room cleaners reported to have enough time to get their job done. Nearly a quarter of GRAs (23%) feel pressed to work overtime with the highest percentage at Hotel B (30%) and the lowest at Hotel A (19%). A similar percentage (24%) of hotel room cleaners in San Francisco reported pressure to work overtime. Therefore, the higher levels of time pressure reported by Las Vegas GRAs are less likely a result of official overtime work but more likely a reflection of higher workloads including higher quotas of rooms and suites, and more special features such as Jacuzzis or shiny surfaces to clean as described above.

It appears that GRAs cope with time pressure and complete assigned rooms by working longer or through breaks. Table 14 shows that two thirds (66%) of all GRAs reported skipping or shortening their lunch or break or working longer hours. And 90% of these say they do this "to make sure I can finish all rooms by the end of the day." Thirty percent say they do this in order "to avoid discipline, points, or other penalties." The practice of skipping lunch and breaks and working longer was reported at similar high levels from all hotels. However, fear of discipline differed significantly between

hotels and was highest at Hotel D (39%) and lowest at Hotel E (24%). In focus groups GRAs reported that management offers small tokens such as buffet coupons as incentives for cleaning extra rooms (in addition to the regular daily quota). Further it was reported that room cleaners who agree to clean extra rooms have to personally ask for overtime pay at some hotels.

Conflicting demands (Questions 16o and 15b). Conflicting demands at work made by others on guest room attendants were reported by 63 percent of all workers (calculated from question 16 o: 63 percent = 100 percent minus 37 percent of guest room attendants saying they are free of conflicting demands). Frequent interruptions and disturbances during work (Question 15b) were reported by 73 percent of all workers. The highest percentage of guest room attendants reporting these stressors (or not being free from them) was found at Hotel D (72 percent reported conflicting demands, and 76 percent reported frequent interruptions). (See [Table 13](#))

Job Strain: Job stress as the combination of high psychological job demands (Questions 16j-k, and 16m-o) and low job control (Questions 16d-f, 16h). Stress researchers commonly measure job stress by asking questions about the psychological or mental demands of the job together with questions about how much control or influence workers have over their work, including how and when to do the work. The combination of high job demands and low job control is often called "job strain" and can lead to stress and disease (including musculoskeletal and cardiovascular diseases) in employees working under such conditions. (Bernard, 1997; Karasek and Theorell, 1990; Krause et al., 1998; Schnall et al., 1994)

[Table 15](#) shows all those questions that have been taken from a standard "Job Content Questionnaire" (developed by Dr. Karasek and his colleagues in 1985 (Karasek, 1985)), which has been used in many populations. Two sets of questions are asked to measure job stress in this questionnaire. One set asks about the psychological demands at work ("job demands") and the other set asks about worker control over the job ("job control"). Some responses to these questions have been described above. They are presented again in this table, but are not being discussed again. Summary scores of all answers are presented in [Tables 16 and 17](#).

[Table 16](#) shows the average sum score by hotel for all questions about psychological job demands and, separately, for all questions about job control. Responses were recoded

and combined in a way so that higher average values indicate higher job demands or, in the case of job control, more worker influence. There are statistically significant differences between the hotels regarding job demands but not regarding job control. The highest job demands were found at Hotel D (average score of 39.2), the lowest at Hotel E (average score of 34.5). Job control averaged 56.1 points across hotels.

Table 17 combines the results regarding job demands and job control in a single measure of job stress called "job strain". The calculation was done as follows. All workers were evenly split into two groups above and below the median ("middle") value for job demands. Those workers with a higher than median value were considered having high job demands, and those workers with a lower than median value as having low job demands. The same procedure (median split) was used to determine which workers have high control over their job, and which have low control. A worker is considered to experience "job strain" if her work can be described as having both high demands and low control. Table 17 shows the percentage of workers experiencing high job strain by hotel. A total of 25 percent of workers experience high job strain across all hotels. There are only slight and statistically not significant differences between the five hotels.

Very high levels of job stress, based on the upper third (tertile) of workers in terms of job demands and the lower third of workers in terms of control, were reported by 15 percent of all workers. Again, differences between hotels were not statistically significant.

Comparison of psychological demands and job control in Las Vegas GRAs with San Francisco GRAs and female public transit operators. Because recent data for the general population are not available, another high stress occupation in the service sector, urban public transit operators (Evans, 1994; Krause et al., 1998), was chosen as a comparison group. Data on San Francisco transit operators was collected between 1993- and 1995 (Krause et al., 1998; Krause et al., 1997). A within-industry comparison was made with 1998 data from San Francisco hotel room cleaners. To compare the level of psychological demands and job control between these groups, the same questionnaire items and the same cut-points (as reported for Las Vegas) were used for all groups compared.

Table 18 compares the scores for psychological demands, job control, and job strain in Las Vegas GRAs with GRAs in San Francisco and female San Francisco public transit operators. Las Vegas GRAs scored on all scales the least favorable values; that is, they

had the highest psychological demands, the lowest control in their jobs, and experienced the highest level of job strain. While the differences were rather small regarding psychological demands, they were substantial for job control, where Las Vegas GRAs scored on average 5 points less than female public transit operators and 7.4 points less than San Francisco GRAs. To compare the level of job strain of GRAs in Las Vegas to room cleaners in San Francisco, job strain was recalculated among the comparison groups using the cut-points that defined the median or tertile split in Las Vegas. Using Las Vegas as a standard in this way, 13 percent of San Francisco room cleaners experienced high and 4 percent very high job strain (see [Table 18](#)). This means that Las Vegas room cleaners experience nearly twice as often (1.9 times) high levels of job strain and nearly four times as often (3.8 times) very high levels of job strain than their colleagues in San Francisco. The difference is even more striking (3- and 4-fold, respectively) when comparing Las Vegas GRAs to San Francisco bus drivers, an occupational group with documented high job stress. Another indicator of job stress, effort/reward imbalance, is nearly twice as common among Las Vegas GRAs than among San Francisco bus drivers.

Effort-reward imbalance: Job stress as the combination of exerting high work efforts and receiving low rewards (Question 15). Another questionnaire for measuring job stress was developed more recently by Dr. Siegrist and has been used in few other populations at this time.(Siegrist, 1996) It is based on questions about how much personal effort employees put into their work, with how many physical and psychological demands they have to cope with, and about how many rewards they receive in return (in the form of respect from their supervisors, prestige and support at work, job security, job promotion, or adequate salary). The combination of high efforts and low rewards is often called "effort-reward imbalance" and can lead to stress and disease (including cardiovascular disease such as myocardial infarction) in employees working under such conditions.

[Table 19](#) shows all those questions that have been taken from Dr. Siegrist's standard "Effort-Reward-Imbalance Questionnaire." Two sets of questions are asked to measure job stress in this questionnaire. One set asks about the demands and obligations at work ("extrinsic efforts" or "effort") and the other set asks about perceived rewards for these efforts ("rewards"). Some responses to these questions are described in other parts of this report, but they are presented again in this table to give a complete list of questions used in this standardized stress measure. There were significant differences between hotels for several effort and reward items (indicated by an asterisk in [Table 19](#)).

Summary scores of all answers to questions listed in Table 19 are presented in Tables 20 and 21.

Table 20 shows the average sum score by hotel for all questions about demands and obligations at work (efforts) and, separately, for all questions about rewards. Responses were coded and combined in a way so that higher average values indicate higher efforts or more rewards. The highest efforts were required at Hotel D (average score of 21.4), however differences between hotels were small and not statistically significant. Rewards, on the other hand, were significantly different between hotels: they were highest at Hotel B (37.2) and Hotel C (36.6), and they were lowest at Hotel D (32.8) and Hotel E (33.5). There was a tendency for hotels requiring the most effort to provide the least reward for guest room attendants. This pattern can be considered a stressful effort-reward imbalance on the group level.

Table 21 combines the results regarding efforts and rewards in a single measure of job stress called "effort-reward imbalance" for each worker. The calculation was done as follows. Each worker's score on efforts was divided by her score on rewards and weighted by the number of questions, so that a value greater than one indicates an imbalance in terms of high efforts and low rewards. Table 21 shows the percentage of workers experiencing this effort-reward imbalance, by hotel. Statistical significant differences were found between hotels. The proportion of workers reporting effort-reward imbalance is highest at Hotel D (70%) compared to 53-56% in the other hotels. On average, 57% of GRAs experience effort-reward imbalance in their jobs. The comparable calculation for San Francisco room cleaners was 31 percent, but in one San Francisco hotels the percentage of room cleaners with effort-reward imbalance was only 9%.

Conclusion (work stress). More than three quarters of all GRAs experience time pressure, two-thirds skip lunch or breaks or work longer hours to complete their work. High levels of job strain were experienced by a quarter of all employees. On average, a total of 78 percent of guest room attendants experience an imbalance between their work efforts and rewards. Most indicators of job stress were higher in Las Vegas than in San Francisco hotel workers. The level of job strain measured by a standard questionnaire was 2-4 times higher among GRAs in Las Vegas than among San Francisco hotel room cleaners surveyed in 1998. This indicates strong regional differences and /or changes

over time in job stress in the hotel industry and also suggests a substantial potential for improving working conditions for Las Vegas GRAs. Job strain has been shown to be a major risk factor for several diseases including high blood pressure, myocardial infarction, musculoskeletal disorders and associated work disability (Krause et al., 2001; Schnall et al., 2000). Effort-reward imbalance, another indicator for job stress was reported by 57% of GRAs in Las Vegas compared to 31% in San Francisco.

Respect, Social Support, and Problem Solving at Work

Respect and social support (Questions 16p-x). Respect and support from supervisors have been important issues in focus group discussions with guest room attendants. Supervisors are involved in work assignments, quality control, help in dealing with customers, and in organizing help when equipment and material are missing or need repair. According to scientific research, social support at work from supervisors and from coworkers can buffer some of the detrimental health effects associated with job stress.(Karasek and Theorell, 1990) On the other hand, lack of support, especially lack of supervisory support and respect, can be the cause of chronic disease, absenteeism, and occupational injury.(Bongers et al., 1993; Cohen and Syme, 1985; Hemingway et al., 1997; North et al., 1996) The survey devoted 9 standard questions to measure social support at work.(Karasek, 1985) Some questions specifically asked about respect and social support from supervisors (Questions 16p-u). Guest room attendants were instructed to answer these questions with their immediate supervisors in mind. Additional questions (Questions 16v-x) about "people I work with" refer to co-workers. Results are shown in Table 22, for each question, and in Table 23 in the form of summary scores for each hotel.

Table 22 shows by hotel, the percentage of guest room attendants agreeing with each of nine different statements about supervisory and co-worker support. At two hotels (Hotel B and Hotel C) the majority of guest room attendants (50 to 68 percent) feel supported and respected by their immediate supervisors, but one third to one half do not, based on the answers to several questions. Supervisory support at Hotel A, Hotel D, and Hotel E hotels has been rated significantly lower.

Co-workers receive substantially higher ratings than supervisors and 70-88% of room cleaners perceive them as "friendly," and "competent in doing their jobs." However,

Hotel A and Hotel D employees receive lower ratings for coworker support, and score significantly lower than Hotel C and Hotel E (46-48 versus 57-62 percent) in terms of agreement with the statement "People I work with are helpful in getting the job done."

Table 23 shows that average sum scores for supervisor and co-worker support differ significantly between hotels. Supervisory support is highest at Hotel C and Hotel B (average score of 13.1 and 13.0, respectively), followed by Hotel A and Hotel D (both 12.1), and lowest at Hotel E (11.7). Co-worker support is highest at Hotel C and Hotel E (11.4), followed by Hotel B with an about average score (11.1) and Hotel A and Hotel D with below average scores of 10.6 and 10.5, respectively.

Overall supervisor support was basically the same at Las Vegas hotels (average score 12.1) than in San Francisco hotels (average score 12.3); co-worker support scored 11.0 equally in both cities.

Problem solving at work (Questions 19a-f, and 16aa-bb). Several questions addressed experiences of workers when they tried to do something about stressful problems at work.

Table 24 shows the responses to each question about problem-solving attempts. The inability to solve problems and the degree of resignation was addressed by two questions. The statement "I tried to change my work situation but gave up" was considered "Almost never true" by 38 percent of all guest room attendants, "sometimes true" by 39 percent, "often true" by 12 percent, and "almost always true" by 12 percent. The statement "I learned to live with the stress because there was nothing I could do about it" was considered often or always true by an average of 63 percent of all guest room attendants. The statement "I had some bad experiences when I made suggestions at work" was endorsed as often or always true by 20 percent of all GRAs, most frequently at Hotel E (26%). Differences between hotels for these questions were not statistically significant.

However, significant differences between hotels were found regarding the cooperation between union and management in problem solving. Overall, about three quarters of all guest room attendants (76%) "agree" or "strongly agree" with the statement "The local union and management work well together to solve problems." The highest level of agreement was found at Hotel A (82%) and Hotel B (83%), about average at Hotel D (75%) and Hotel E (72%) and considerably lower at Hotel C (63%). On average, 88 percent of guest room attendants agree or strongly agree to the statement

"The local union in my Hotel Considers health and safety (ergonomics) an important issue." Considerably lower levels of agreement were reported with the statement "The management in my Hotel Considers health and safety (ergonomics) an important issue." On average, 42 percent agreed with this statement, and there were statistically significant differences between hotels (56 percent at Hotel E, 44 percent at Hotel A, 40 percent at Hotel C, 39% at Hotel B, and 33 percent at Hotel D).

Conclusion (respect, social support, and problem solving at work). Respect and social support from supervisors and coworkers differed significantly between hotels. The local union and management were rated differently with regard to their commitment to in health and safety issues: 88% of GRAs agreed that the union considers health and safety an important issue, but only 42% said that management did so. Support from immediate supervisors and coworkers was rated similar in Las Vegas and San Francisco.

5. Health Status and Functional Limitations (Objective 5)

Introduction. The health status of guest room attendants was studied by self-report using standardized questionnaires. The terms "self-reported" or "self-rated" health refer to the fact that health status is assessed by the individual worker rather than by a physician or any other outside observer. Scientists often consider self-reported health as the superior measurement.(Bjorner et al., 1996) In fact, it has been shown in several studies that self-rated health is a better predictor of mortality than medical doctors' examinations. This report uses several measurements of health; one questionnaire on musculoskeletal symptoms developed with guest room attendants in focus groups, one standard questionnaire on psychosomatic symptoms, and the most widely used Short-Form-36 Health Survey (SF-36), an abbreviated and updated version of the Medical Outcomes Study questionnaire which was developed by the Rand Corporation during the 1970's and by John E. Ware in 1990.(Ware and Sherbourne, 1992; Ware et al., 1993)

General Health (Question 21). This question is part of the SF-36 questionnaire. Guest room attendants were asked "Would you say your health in general is now excellent, very good, good, fair, or poor?"

Table 25 presents the results in two ways. An average ("mean") sum score based on each individual's answer is shown for each hotel. A higher score means better health, and

the highest possible score is 100. Regarding the standard deviation (SD) given in brackets, higher values mean a greater variation in health status in the respective group of workers. There are statistically significant differences in general health between hotels. General health was highest at Hotel D (average score of 43.3), followed by Hotel C (41.6) and Hotel A (40.8), Hotel E (36.6), and Hotel B (33.6).

The average health rating of guest room attendants (39.1) is well below the average health rating of the general US population (72.0). Although this finding is suggestive of an above average health risk for guest room attendants, conclusive comparisons need to be based on age- and gender-specific ratings of the working population. The average rating of their general health by San Francisco hotel room cleaners was 56.0, higher than in Las Vegas, and also lower than the general working population. The substantially lower rating of general health among Las Vegas GRAs cannot be due to older age because the Las Vegas GRAs were on average 6 years younger than those in San Francisco.

Table 25 also shows, by hotel, the percent and exact number of guest room attendants at each health level. On average, 4 percent reported their health to be in general "excellent", 8 percent "very good", 29 percent "good", 44 percent "fair", and 15 percent "poor." In other words, over half (59%) rated their health to be either fair or poor.

Table 26 shows the results for all health measures derived from the SF-36 questionnaire including general health and physical functioning and others which are described below. In the different health measures of the SF-36 questionnaire, answers are combined in a sum score where a higher score means better health, and the highest possible score is 100 and the lowest possible value is 0. Table 26 shows the average scores of guest room attendants by hotel for each health measure.

Physical functioning (Questions 23a-j). Physical functioning is measured by a series of questions assessing if and how much workers are limited by their health in typical daily activities such as running, lifting groceries, pushing a vacuum cleaner, etc. There are significant differences in physical functioning between hotels. The highest (best) score in physical functioning was found at Hotel A (54.2) and Hotel D (52.8), below average scores at Hotel C (48.3), Hotel E (47.6), and Hotel B (45.8). (See Table 26, second row). Average physical functioning scores (50.0) were considerably lower than in the San Francisco study (62.1).

Role limitations due to physical health problems (Questions 24 a-d). Role limitations were considered present if the worker, as a result of physical health problems, "cut down on the amount of time spent on work or other activities," "accomplished less than she would like", was "limited in the kind of work or activities," or "had difficulty performing the work or other activities." The best health in terms of absence of these role limitations was found at Hotel A (average score 39.7), followed by Hotel E (36.6), Hotel D (34.5), Hotel C (33.2), and Hotel B (29.8). (See Table 26, third row). The average health score regarding physical functioning was 34.8 in Las Vegas, much lower than the average score of 61.6 in San Francisco.

Role limitations due to emotional problems (Questions 25 a-c). Role limitations because of emotional problems such as feeling depressed or anxious were measured similar to role limitations because of physical health problems. The best health in terms of absence of these role limitations was found at Hotel A (average score of 44.7), and the worst at Hotel D (34.8). (See Table 26, fourth row). The average score of this health measure was much lower in Las Vegas than in San Francisco (40.2 versus 65.5).

Bodily pain during the past 4 weeks (Question 32). Workers were asked, "How much bodily pain have you had during the past 4 weeks?" with answer options on a 6-point scale ranging from "none" to "very severe." The best health in terms of absence of bodily pain was experienced by the workers at Hotel C (37.3), slightly about average values at Hotel A (34.5), Hotel E (33.9), and below average scores at Hotel D (32.9) and Hotel B (29.3). (See Table 26, fifth row). The average score of this health measure was much lower in Las Vegas than in San Francisco (33.5 versus 53.3).

Bodily pain during the past 4 weeks interfering with normal work (Question 36). Health status measured by bodily pain interfering with work (outside the home or housework) did not differ significantly between hotels. On average scores (36.8) were considerably lower than in San Francisco hotels (48.3), indicating more bodily pain interfering with work among Las Vegas GRAs. (See Table 26, sixth row)

Vitality, energy, and fatigue (Questions 22a-c). General feelings of vitality and energy or fatigue are important indicators of health. No significant differences were found between hotels in Las Vegas. (See Table 26, last row). Guest room attendants

showed relatively low average scores (36.3) compared with San Francisco hotel room cleaners (51.5) or the general US population (60.9).

Comparison of self-rated health in Las Vegas guest room attendants with San Francisco hotel room cleaners, and with the general US population. All general health measures described above were calculated using a reliable and validated questionnaire (SF-36) with standardized measures of health and functioning (McDowell and Newell, 1987, 1996). Therefore it is possible to compare self-rated health and function to other occupational groups and representative samples of the general US population who answered the same questions in previous surveys.

Table 27 compares self-rated health of Las Vegas GRAs with the San Francisco hotel room cleaners and the general adult US population. As said before, the values are scored on a scale from 0 to 100 with higher values meaning better health. For all health dimensions measured, the same trend could be observed: The general population experienced the best health, Las Vegas GRA the worst health, and San Francisco GRA were in between these two groups. The difference between the Las Vegas GRA and the two other groups were substantial. On average, Las Vegas GRAs had an 18.7 lower score than their counterparts in San Francisco and a dramatically 36.6 lower score than the general population on the six health dimensions.

Psychosomatic symptoms (Questions 26 a-i). Psychosomatic symptoms such as feeling tense, nervous, easily exhausted, having poor appetite, trouble with sleep, or frequent headaches are often the result of stress and, if chronically present, can be the precursor of serious health problems. Question 34 asked guest room attendants how often they had any of such symptoms during the past year. These questions are not part of the SF-36 health survey and the responses are combined in a way so that higher scores mean more psychosomatic symptoms, i.e., worse health.

Table 28 shows the psychosomatic symptom score by hotel. No significant differences were found between hotels. However, on average, Las Vegas GRAs suffered from about 21 percent more psychosomatic symptoms than those in San Francisco (average score 27.0 versus 22.4).

Musculoskeletal pain (Questions 33 a-l). Guest room attendants were asked how much pain they experienced in different parts of their body during the past four weeks.

Answer options ranged from none to very severe on a 6 point rating scale for each of 12 different body regions. Results are shown by hotel in Table 29, and by age group in Table 30.

Table 29 shows the percentage of guest room attendants who experienced musculoskeletal pain during the last four weeks by body region and by hotel. Severe or very severe pain was experienced by 50% or more GRAs in the lower back (62%), upper back (59%), feet or ankles (56%), upper arms or shoulders (54%), and hips and legs (each 50%). Severe or very severe pain was reported also in the neck (43%), the hands (43%), and the knees (44%). Significant differences between hotels were found for pain in hands, lower arms and elbows, head, upper back, and hips. Severe or very severe pain in hands was reported by 43% of GRAs, most frequently at Hotel B (48%) and least frequently at Hotel D (39%). Severe or very severe pain in the upper back was experienced most frequently at Hotel B (66%), and least frequently at Hotel A (55%).

The relatively older population of hotel room cleaners in San Francisco reported much less severe or very severe pain in the musculoskeletal system, on average 26% in hands, 21% in upper backs, 24% in lower back and a maximum of 31% in the shoulders.

Table 30 shows the percentage of guest room attendants who experienced musculoskeletal pain during the last four weeks by body region and by age group. Pain severity was compared for 4 age groups, GRAs under 40 years, 40-49 years, 50-59 years, and 60 or more years old. Statistically significant differences between age groups were found for pain in Hands, head, upper back, lower back, hips, and feet and ankles ($p < .05$). Marginally significant differences were found for Lower arms and knees ($p < .10$). A close examination of this table shows that, with the exception of knee pain, older employees aged 50 or more report more frequently no or very mild pain compared to middle aged (40-49) and younger employees. Similarly, severe or very severe pain of the upper back, lower back, or feet and ankles is significantly more prevalent among the younger age groups. In other words, there is no indication that the high prevalence of musculoskeletal pain in GRAs is due to age differences.

Taking medication for pain at work during the last 4 weeks (Question 35). 83 percent of all GRAs took some pain medication (for example Aspirin, Motrin, Ibuprofen, Advil, Tylenol) during the last 4 weeks for pain they had at work. The percentage was nearly the same across all hotels, with 80 percent at Hotel D up to 87% at Hotel B. (See Table 31).

Work-related pain (Questions 37 a-e). Guest room attendants were asked specifically about pain or discomfort which they experienced as work-related, i.e., "caused or made worse by their work as a room cleaner." Such work-related pain or discomfort was experienced by 78 percent of all guest room attendants during the last year.

Table 32 shows the percentage of guest room attendants experiencing work-related pain or discomfort by hotel. The percentage was highest at Hotel E (84%), lowest at Hotel C (74%) and about average in the other hotels. Nearly all workers (96%) reported that this pain began after starting their current job. 32% of all workers with work-related pain reported this pain to their supervisor or somebody else in management. 62% of workers visited a doctor because of this work-related pain or discomfort. 57 % took some time off from work during the last year. The number of days off work because of this work-related pain is presented in the next section on work-related disability.

Conclusion (health status). Significant differences in health between the five types of hotels were found for several health measures. Further analyses are needed to determine how much of these differences are caused by differences in age or physical workload and psychosocial working conditions, which also vary across hotels. More than three quarters of guest room attendants reported work-related pain or discomfort during the past 12 months which was severe enough to visit a doctor (in 62% of all cases) and to take time off from work (in 32% of all cases). 83% of all GRAs reported taking pain medication during the last 4 weeks for pain they had at work. The general health status of guest room attendants in Las Vegas appears to be considerably worse than that of hotel room cleaners in San Francisco and even more so compared to the general US population.

6. Work-related Injury and Disability (Objective 6)

Introduction. In this section, work disability is measured as the number of self-reported days off work because of (a) work-related pain in general (Question 37 d-e), and (b) work-related injury or illness formally reported to workers' compensation (Questions 42). In the tables below the number and percent of workers who missed work is shown for each hotel. In addition, the average number of days lost by those workers who missed any workdays because of work-related pain or injuries is presented, separately for sick and vacation days as well as combined. Finally, the total number of work days lost per 100 guest room attendants in each hotel is shown at the bottom of Tables 32 and 33. This

standardized number should be used to compare the total number of workdays lost between hotels.

Workdays lost during the last year because of work-related pain (Questions 37 d-e). Guest room attendants were asked specifically about pain or discomfort which they experienced as work-related, i.e., "caused or made worse by their work as a room cleaner." As mentioned earlier in the discussion of Table 32, such work-related pain or discomfort was experienced by 78% of all guest room attendants during the last year. More than half of them (57%) missed one or more workdays because of this work-related pain or discomfort.

Table 33 summarizes the results on the number of self-reported workdays lost due to work-related pain or discomfort. The average number of sick days reported per worker with at least one sick day because of work-related pain was 7.7 days. The average number of vacation days taken because of work-related pain was 10.7 days per worker with at least one vacation day taken. The total number of days lost (sick and vacation days because of work-related pain) per 100 workers during the last year was on average 506 days, highest at Hotel B (661 days), followed by Hotel E (640 days), Hotel A (552 days), Hotel C (378), and Hotel D (289 days). Work-related lost time differs significantly between hotels. For example, Hotel B experienced 2.3 times more lost workdays per 100 guest room attendants in the last year than Hotel D because of work-related pain or discomfort.

Workdays lost during the last year because of workers' compensation injuries (Question 42). Guest room attendants were asked how many work-related injuries or illnesses they formally reported to workers' compensation during the last year (Question 40). They were also asked how many work days they lost during the last year because of such work-related injury or illness (Question 43).

Table 34 shows the frequency of formally reported work-related injury or illness and the associated number of lost workdays for each hotel. 21% of all guest room attendants formally reported a workers' compensation injury during the last year, 30 percent at Hotel A, 20 percent at Hotel E, 19% at Hotel B, and 16 percent at Hotel C and Hotel D. The average number of workdays lost per worker with reported lost-time injury was 9.6 days, highest at Hotel E (20.5 days), below average at Hotel A (7.0 days), and about average at the other hotels. To take into account the fact that the number of workers and

respondents to the survey differed between hotels, comparisons between hotels should be based on the standardized number of lost workdays per 100 responding workers. The total number of workdays lost per 100 workers during the last year was on average 197 days, highest at Hotel E (409 days per 100 workers), slightly above average at Hotel A (210 days), and relatively low at Hotel B (157 days), Hotel D (150 days), and Hotel C (146 days).

The percentage of workers formally reporting a work-related injury in San Francisco (23%) and the average number of lost workdays per 100 room cleaners there (201 days) were slightly higher than in Las Vegas.

Under-reporting of work-related injury and illness. More than three quarters (78% in Las Vegas, 77% in San Francisco) of all guest room attendants reported work-related pain during the last year, however, only 32% (50 % in San Francisco) reported this pain to their supervisors or management. However, only 21% (23% in San Francisco) of all workers formally reported a work-related injury during the last year. (See [Table 34](#))

The reasons for this apparent under-reporting of potentially compensable work-related pain had not been addressed in the earlier San Francisco study. In the Las Vegas study GRAs were asked directly if they had a work-related injury or illness that they did not report (Question 38).

As [Table 35](#) shows, 168 GRAs (19%) answered yes to this question. The reasons given for not reporting included "I did not know how" (17%), "I was afraid" (23% on average, and 31% or twice as many at Hotel D compared to 15% at Hotel C), "I thought it would be too much trouble" (39%), and other reasons (29%) not yet analyzed.

In focus groups workers frequently reported of punitive experiences after reporting an work-related injury, having to take drug tests before receiving medical care, or discounting of their pain and health care needs by their direct supervisors. To investigate this issue further, question 41 of the survey asked GRAs about their experiences after reporting an injury or illness. As [Table 35](#) shows, 33% of GRAs answered that they had to take a drug test, but this practice differed significantly between hotels, ranging from 13% at Hotel A to 89% at Hotel E. 89% of GRAs were taken to a clinic or doctor. Only 46% of GRAs say they got well before returning to work. After returning to work 36%

missed additional days of work because of their injury. 21 % of GRAs reported to have received a warning or other discipline for missing work. These responses show that GRAs experience important barriers at work for reporting work-related injury and illness.

Additional barriers for reporting work-related injuries occur in the contact with medical care providers (see [Table 36](#)). 39% of workers reporting a work-related injury said that workers' compensation did not pay for their medical care. Disbelief by medical providers and the need to pay medical bills without delay were some of the given reasons that discouraged workers from formal reporting of their injuries.

Conclusion (Work disability). More than three quarters (78% in Las Vegas, 77% in San Francisco) of all guest room attendants reported work-related pain during the last year, however only 32% (50 % in San Francisco) reported this pain to their supervisors or management, and only 21% (23% in San Francisco) of all workers had a formally reported work-related injury during the last year. Several reasons for this apparent underreporting of potentially compensable work-related pain were given by GRAs in Las Vegas including punitive actions by the employer, discouragement by medical providers, and the need to pay medical bills. This can be expected to cause substantial cost-shifting from employer liability insurance into health insurance or employee out-of pocket expenses. Workdays lost because of work-related pain in general, and because of formally reported workers' compensation injuries or illnesses specifically, varied between the different hotels. Further analyses are needed to determine how much of these differences are caused by differences in physical workload and psychosocial working conditions.

7. Blood Pressure Screening (Objective 7)

Overall participation in blood pressure screening. 83.2 percent (783 out of 941) of questionnaire survey participants had their resting blood pressure checked either during the questionnaire survey or during the ambulatory blood pressure study. Another 98 GRAs had their blood pressure taken during the ambulatory blood pressure study but did not participate in the survey. However, these participants completed a shortened questionnaire during their blood pressure training session. In total, 881 (783+98) GRAs participated in any blood pressure screenings.

Prevalence of hypertension. The prevalence of hypertension was assessed by several methods:

(1) *Hypertension based on self-report.* As shown in Table 37, 221 survey responders reported either having received a doctors diagnosis of hypertension (i.e., answered "yes" to question 30 "Have you ever been told by a doctor that you have high blood pressure?") or reported taking any ant-hypertensive drugs (i.e., answered "yes" to question 31 "Are you currently taking any medication to lower your blood pressure?"). Based on these questions 23.5 % (221 out of 941) had hypertension. In the subgroup of participants who also volunteered to have their blood pressure taken during the survey, 26.1 % (76 out of 290) reported high blood pressure.

(2) *Hypertension based on resting blood pressure measurement during the questionnaire survey.* 26.6% (77 out of 290) who volunteered to have their resting blood pressure taken during the survey had elevated blood pressure.

(3) *Hypertension based on both self-report and/or resting blood pressure measurement during the survey.* 39.3 % (114 out of 290) had elevated blood pressure based on doctor's diagnosis, medication, or resting blood pressure measurement.

Additional methods to calculate the prevalence of hypertension based on all screened GRAs require the merging of information from the questionnaire, resting blood pressure during survey administration, and ambulatory blood pressure measurements. These analyses will be conducted and reported at a later complete report.

Conclusion (hypertension). The combination of self-report and actual measurement among the 290 GRAs with complete information from the survey and resting blood pressure checks (Method 3) shows that 39% of GRAs in Las Vegas have hypertension. For comparison, 25% of the adult US population has high blood pressure.

8. Associations Between Work Conditions, General Health, and Severe Pain

(Objective 8)

Tables 38 and 39 show the impact of selected job factors on the probability of reporting "fair" or "poor" general health (Table 38) and severe or very severe pain (Table 39).

The impact of each factor is measured by odds ratios, which means that the odds of ill health are compared between individuals with high and low scores on any risk factor. Although not identical, odds ratios approximate relative risks. An odds ratio higher than 1 indicates a higher risk of ill health, conversely, an odds ratio lower than 1 indicates a lower risk. For example, an odds ratio of 1.5 for a risk factor means that persons with this risk factor are one and a half times (or 50%) more likely to experience ill health, compared to persons who do not have this risk factor (the reference group). In other words these persons experience a 1.5-fold increased risk for ill health (a relative risk of 1.5). All analyses were statistically adjusted for age of the GRA, i.e., age was taken into account when determining the impact of other risk factors.

Physical workload (number of rooms, beds, buildings, floors) and general health.

Physical workload was measured by (1) numbers of rooms to clean, (2) numbers of beds to make, (3) number of buildings, and (4) number of floors to travel per day. In this analysis two or three groups are compared with regard to their health. Cleaning more than 15 or more rooms per day was associated with a 1.3-fold or 30% higher risk of low self-reported health compared with room cleaners who cleaned 14 rooms or less. Similarly, making more than 18 beds per day was associated with a 1.43-fold or 43% higher risk of fair or poor health. Traveling 3 buildings was associated with a 2.42-fold risk, and traveling with a 1.87-fold higher risk of having fair or poor health. The age-adjusted associations for buildings, floors, and beds were statistically significant ($p < 0.05$), and number of rooms showed a marginally significant association with ill health ($p < 0.10$).

Time pressure (skipping breaks) and general health. Time pressure was measured by skipping or shortening of breaks or working longer hours in order to complete work assignments. GRA who skipped or shortened their breaks had a 1.65-fold or 65% higher risk of fair or poor health.

Low job control and general health. Low control over one's job was also associated with ill health. GRAs who scored in the lowest tertile of the job control scale were 1.5-fold or 50% more likely to report fair or poor health than GRAs in the highest tertile.

High psychological job demands, job strain, and general health. Psychological demands and job strain, the combination of low job control and high job demands, showed no statistical significant association with general health.

Place of birth, language, and general health. Regarding demographic factors, both place of birth and language were associated with ill health. Being born outside the USA increased the risk for being at fair or poor health 1.7-fold or 70%. Compared to native English speakers, Spanish speakers were almost 3 times more likely to suffer from fair or poor general health.

Physical workload (number of rooms, beds, buildings, and floors) and severe pain. Cleaning more than 14 rooms per day increased the likelihood of severe pain 1.25-fold or 25%, however this association was not statistically significant. Similarly, making more than 18 beds per day slightly increased the risk of pain, but this may represent a chance finding, because the difference was not statistically significant. Strong and statistically significant relationships were found between severe pain and the number of buildings (age-adjusted odds ratio 3.86), and the number of floors (age-adjusted odds ratio of 1.87) traveled each day.

Time pressure (skipping breaks) and severe pain. The report of severe or very severe pain increased 2.36-fold or 236% with time pressure.

High psychological demands and severe pain. The frequency of reporting of severe or very severe pain increased 1.75-fold or 175% with high psychological demands.

Low job control and severe pain. The frequency of reporting of severe or very severe pain increased 1.67-fold or 167% with having low job control.

Job strain and severe pain. GRAs with the combination of high psychological demands and low job control (i.e., high job strain) experienced severe pain 1.58 times or 158% more often than GRAs with low job strain.

Place of birth, language, and general health. Like for self-reported ill general health, people who were born outside the US and who were Spanish speakers were at higher risk for severe or very severe pain. The odds ratios were 1.49 for being born outside the USA and 2.65 for being a Spanish speaker.

Conclusion (association between work and health): For Las Vegas GRAs, physical workload is associated with ill general health and, to a lesser degree, with experiencing severe pain. For example GRAs cleaning more than 14 rooms are 30 % more likely to

suffer from fair or poor health, and 25% more likely to experience severe or very severe pain during the past 4 weeks. Making more than 18 beds per day increases the risk of fair or poor health by 43%. Having to travel between 3 buildings increased the risk of ill health nearly 2.5-fold, and traveling 3 floors per day was associated with a nearly 2-fold risk. These factors were also strongly associated with severe pain: a nearly 4-fold risk for travelling 3 buildings, and an about 2-fold risk for travelling 3 floors per day.

Two psychosocial job factors, time pressure and low job control, increased the risk of ill health by 65% and 50%, respectively. All psychosocial workplace factors analyzed in this section were strongly associated with severe pain. The report of severe or very severe pain increased 2.36-fold or 236% with time pressure, 1.75-fold or 175% with high psychological demands, 1.67 or 167% with having low job control, and 1.58 or 158% with job strain.

These results suggest that physical workload, time pressure, low job control, high psychological demands, and high job stress all increase the risk of ill health or severe pain in Las Vegas GRAs, regardless of age. Although these analyses need to be repeated in a longitudinal (prospective) study in order to establish causality, the findings are consistent with the scientific literature showing that biomechanical and psychosocial stressors can cause pain and chronic disease (Bernard, 1997; Davis and Heaney, 2000; Schnall et al., 2000; Schnall et al., 1994). The findings of this study clearly suggest that the relatively high levels of poor health and severe pain among Las Vegas GRAs, compared to those in San Francisco or to the general US population, are at least in part attributable to the relatively high physical workload, time pressure, and other job stressors described in this study. All these job factors are amenable to change, therefore indicating a considerable potential for job redesign, workplace health promotion, and disease prevention.

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TABLE 1. Participation Rates by Hotel.

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
Eligible room cleaners (n)	345	283	280	256	112	1276
Participants (n)	271	228	197	141	104	941
Participation rate (%)	79	81	70	55	93	74

TABLE 2. Characteristics of Study Participants by Hotel.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)
Female gender*	100 %	264	99 %	212	96 %	184	99 %	134	100	98	99 %	892
Age in years*												
Average (SD)	41.8	(10.5)	40.9	(8.4)	43.2	(10.0)	39.5	(9.0)	43.4	(9.1)	41.7	(9.6)
Age groups*												
< 40	43 %	113	45 %	97	39 %	74	49 %	68	34 %	33	42 %	385
40 – 49	32 %	84	40 %	86	33 %	62	36 %	49	40 %	39	35 %	320
50 – 59	20 %	53	14 %	31	22 %	41	13 %	18	27 %	26	19 %	169
≥ 60	5 %	13	1 %	3	7 %	13	2 %	3	0 %	0	4 %	32
Ethnicity*												
African American	2 %	5	2 %	5	10 %	19	4 %	6	16 %	16	6 %	51
Native American	1 %	2	0 %	1	0 %	0	1 %	1	0 %	0	0 %	4
Latino	77 %	204	90 %	199	66 %	127	71 %	98	70 %	71	76 %	699
Filipino	9 %	24	4 %	8	2 %	4	5 %	7	3 %	3	5 %	46
Asian	2 %	6	0 %	1	10 %	20	10 %	14	1 %	1	5 %	42
White	8 %	21	3 %	7	7 %	13	5 %	7	6 %	6	6 %	54
Other	1 %	2	0 %	1	4 %	8	4 %	5	5 %	5	2 %	21

TABLE 2 (cont.). Characteristics of Study Participants by Hotel.

Native language*												
Cantonese	0 %	0	0 %	0	2 %	3	0 %	0	0 %	0	0 %	3
English	10 %	28	3 %	6	15 %	29	12 %	17	20 %	20	11 %	100
Mandarin	2 %	4	0 %	1	1 %	2	0 %	0	0 %	0	1 %	7
Russian	1 %	2	0 %	1	0 %	0	0 %	0	1 %	1	0 %	4
Serbo-Croatian	0 %	0	2 %	5	4 %	7	0 %	0	0 %	0	1 %	12
Spanish	75 %	200	90 %	199	66 %	126	71 %	98	70 %	70	75 %	693
Tagalog	8 %	21	3 %	7	2 %	4	5 %	7	4 %	4	5 %	43
Vietnamese	1 %	2	0 %	0	2 %	4	0 %	0	0 %	0	1 %	6
Other	4 %	10	1 %	3	9 %	17	12 %	17	5 %	5	6 %	52
Born outside the USA*	83 %	221	92 %	204	82 %	159	85 %	117	79 %	80	85 %	781
Years of education*	9.5	(3.6)	8.8	(3.6)	9.6	(3.6)	9.2	(3.5)	9.3	(3.8)	9.3	(3.6)
Family income, \$ per month before taxes*	2120	(899)	2266	(1008)	2061	(970)	2185	(900)	1880	(1177)	2127	(978)
Homeowners*	59 %	158	68 %	147	62 %	119	47 %	63	55 %	56	60 %	543
Household Size												
Adults	2.8	(1.4)	3.0	(1.4)	3.1	(1.5)	2.9	(1.3)	3.2	(1.4)	3.0	(1.4)
Children ^(*)	2.3	(1.1)	2.4	(1.2)	2.2	(1.2)	2.6	(1.2)	2.5	(1.4)	2.4	(1.2)
% of Households with one or more children	94 %	256	97 %	222	65 %	187	92 %	130	94 %	98	95 %	893
% of Households with persons needing child, elder, or disability care*	61 %	164	67 %	152	55 %	109	59 %	83	49 %	51	59 %	559
Number of dependents needing care	1.9	(0.8)	2.0	(1.1)	2.02	(1.4)	1.7	(0.9)	2.3	(1.6)	2	(1.1)

TABLE 2 (cont.). Characteristics of Study Participants by Hotel.

Years as a room cleaner												
Current hotel*	5.7	(4.0)	5.5	(3.0)	8.4	(5.9)	3.8	(2.8)	9.0	(5.5)	6.3	(4.6)
Other hotels*	1.7	(3.1)	1.4	(2.9)	0.7	(2.5)	1.9	(4.1)	1.4	(2.9)	1.4	(3.1)
Total*	7.4	(5.2)	6.9	(4.4)	9.2	(6.5)	5.6	(5.0)	10.4	(6.2)	7.7	(5.6)
Work status*												
Full-time (40+ hours)	94 %	238	95 %	210	90 %	164	91 %	114	85 %	80	92 %	806
Part-time (<40 hours)	6 %	16	5 %	10	10 %	18	9 %	11	15 %	14	8 %	69
Not working	1 %	2	0 %	0	2 %	3	2 %	2	1 %	1	1 %	8
Average work hours per week												
Full-time	42.4	(9.4)	42.0	(8.0)	41.1	(6.3)	43.6	(11.2)	42.0	(8.8)	42.2	(8.7)
Part-time*	15.7	(11.8)	8.0	(0.0)	22.6	(12.7)	21.7	(13.2)	18.4	(12.6)	17.9	(12.3)
Working an additional job	3 %	8	4 %	9	3 %	6	4 %	5	7 %	7	4 %	35

(*) p < .10

* p < .05

TABLE 3. Number of Rooms and Beds During Last Work Day, by Hotel. ¹

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Total number of rooms and suites*	13.8	(4.0)	15.2	(3.0)	15.6	(2.3)	17.1	(7.6)	15.8	(4.8)	15.2	(4.4)
Regular rooms*	11.9	(5.1)	13.7	(2.6)	14.0	(2.3)	5.6	(6.3)	12.9	(5.0)	12.0	(5.1)
Suites*	1.9	(3.9)	1.5	(2.0)	1.6	(1.5)	11.6	(4.2)	2.9	(3.9)	3.2	(4.6)
Total number of special rooms	10.7	(7.0)	10.3	(6.5)	10.3	(6.4)	9.2	(5.8)	10.1	(6.4)	10.2	(6.5)
Checkouts*	5.9	(3.2)	5.7	(3.0)	6.9	(3.6)	5.3	(2.4)	6.4	(4.2)	6.0	(3.3)
VIP or Rush*	1.3	(2.0)	0.4	(0.9)	0.8	(1.3)	1.2	(2.4)	1.5	(2.2)	1.0	(1.8)
Rooms with Jacuzzi*	3.4	(5.2)	4.2	(5.4)	2.6	(4.3)	2.6	(4.7)	2.2	(3.7)	3.2	(4.9)
Total number of beds made*	15.8	(5.1)	22.9	(7.4)	19.5	(6.4)	18.1	(6.3)	22.4	(6.9)	19.4	(7.0)
King*	7.3	(2.4)	4.8	(2.7)	6.6	(4.0)	6.3	(2.9)	5.8	(2.9)	6.2	(3.1)
Queen*	7.6	(5.1)	17.2	(8.1)	12.1	(7.0)	11.2	(6.7)	15.9	(7.3)	12.4	(7.8)
Rollaway, Crib or Sofa	0.9	(1.4)	0.9	(1.8)	0.8	(1.4)	0.5	(0.8)	0.7	(1.1)	0.8	(1.4)
Number of bathrooms*	13.1	(3.4)	15.1	(1.9)	15.7	(1.0)	12.4	(3.0)	16.5	(3.0)	14.4	(2.9)

* p < .05

¹ Full-time employees, n = 799

TABLE 4. Number of Floors or Buildings Traveled During a Typical Work Day, by Hotel.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	%	n	%	n	%	n	%	n	%	n	%	n
Number of Floors*												
1 Floor	71 %	184	34 %	76	20 %	39	16 %	22	12 %	12	36 %	333
2 Floors	26 %	69	48 %	106	55 %	105	68 %	94	43 %	43	46 %	417
3 or More Floors	3 %	8	18 %	40	25 %	48	16 %	22	45 %	45	18 %	163
Number of Buildings*												
1 Building	93 %	241	89 %	187	87 %	164	89 %	122	55 %	55	86 %	769
2 Buildings	6 %	16	5 %	11	9 %	16	9 %	13	30 %	30	10 %	86
3 or More Buildings	0 %	1	5 %	11	4 %	8	1 %	2	15 %	15	4 %	37

* $p < .05$

TABLE 5. Scheduled Room Cleaning Assignments by City.

	Las Vegas		San Francisco	
	Mean	(SD)	Mean	(SD)
All rooms per day	15.2	(4.4)	14.2	(1.7)
Regular rooms	12.0	(5.1)	13.9	(1.9)
Suites	3.2	(4.6)	0.2	(0.8)
Special rooms per day	10.2	(6.5)	8.7	(3.8)
Check-Outs	6.0	(3.3)	6.3	(2.7)
VIP or Rush Rooms	1.0	(1.8)	2.3	(1.8)
Jacuzzi Tubs	3.2	(4.9)	0	(0)

TABLE 6. Usual Frequency of Work Tasks Per Day.

Task or Problem	Average Number of Times the Problem Occurs Per Day										Average Frequency Per Day ¹	
	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Across Hotels	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Problems with replacement linens*	3.0	(4.3)	4.1	(5.1)	4.6	(5.2)	3.4	(4.4)	3.7	(5.0)	3.7	(4.8)
Room needs extra linens like robes, etc.	2.6	(3.9)	2.5	(4.3)	2.9	(4.4)	2.6	(3.6)	2.9	(4.3)	2.7	(4.1)
Coffee pot in room needs cleaning*	0.9	(3.0)	0.4	(2.4)	0.8	(3.2)	2.4	(4.7)	3.0	(4.6)	1.3	(3.6)
Put away iron and ironing board*	5.9	(5.1)	7.7	(5.9)	7.4	(5.8)	5.0	(4.8)	2.6	(4.1)	6.1	(5.5)
Room service trays left in room ^(*)	5.3	(4.5)	4.4	(4.5)	5.2	(4.4)	4.8	(3.8)	4.1	(4.3)	4.9	(4.4)
Lots of garbage left in room*	7.5	(5.3)	8.5	(5.8)	9.9	(5.7)	6.1	(4.9)	8.3	(6.6)	8.1	(5.7)
Ashtrays in room need cleaning*	6.3	(6.2)	8.3	(6.2)	7.7	(7.2)	5.0	(5.9)	8.8	(6.9)	7.1	(6.5)
Food left in room on tables or carpet*	6.5	(5.2)	7.6	(5.8)	7.5	(5.9)	5.6	(4.8)	7.2	(6.2)	6.9	(5.6)
Extra scrubbing required in the bathroom*	5.8	(5.4)	6.5	(6.3)	8.6	(6.5)	4.9	(5.0)	8.0	(6.9)	6.6	(6.1)
Bathroom very wet or dirty*	6.8	(5.3)	8.7	(6.0)	8.8	(6.1)	6.4	(5.0)	7.6	(6.3)	7.7	(5.8)
Restock missing supplies on cart*	7.1	(5.4)	9.4	(6.3)	8.1	(6.0)	6.4	(5.3)	6.2	(7.1)	7.7	(6.0)
Problems dusting high or low areas in room*	8.2	(5.9)	10.7	(6.4)	9.6	(6.6)	7.6	(5.9)	9.2	(6.9)	9.1	(6.4)
Do not disturb sign on door*	4.8	(4.3)	6.0	(5.1)	5.8	(5.0)	5.0	(3.9)	4.0	(4.4)	5.3	(4.6)
Deep cleaning of room required*	5.9	(5.4)	5.8	(6.1)	6.7	(6.3)	4.3	(4.9)	7.0	(6.6)	5.9	(5.9)
Need to report a problem to someone else	2.5	(3.6)	2.5	(4.3)	2.4	(4.2)	2.5	(3.7)	3.2	(4.9)	2.5	(4.1)
Make extra beds	2.1	(3.3)	2.0	(3.5)	2.6	(4.1)	1.8	(3.1)	1.7	(3.0)	2.1	(3.5)
Clean Jacuzzi*	3.2	(5.0)	3.4	(4.8)	2.2	(4.0)	1.3	(2.8)	2.1	(3.9)	2.6	(4.4)
Travel to another floor or building*	2.2	(3.7)	2.8	(4.4)	3.0	(4.5)	2.8	(3.7)	3.8	(5.1)	2.7	(4.2)

TABLE 6 (cont.). Usual Frequency of Work Tasks Per Day.

Clean VIP or rush rooms*	2.2 (3.2)	0.8 (1.9)	1.7 (2.7)	1.3 (2.4)	2.1 (2.8)	1.6 (2.7)
Clean large glass or mirror doors*	9.2 (5.3)	11.7 (6.4)	11.8 (5.8)	9.9 (5.1)	11.2 (6.8)	10.7 (5.9)
Clean marble sinks*	9.0 (5.8)	9.7 (7.2)	10.6 (7.1)	6.9 (6.3)	7.6 (7.6)	9.0 (6.8)
Clean chrome or brass fixtures*	7.1 (6.0)	5.9 (6.8)	9.3 (7.4)	5.7 (6.2)	8.7 (7.5)	7.2 (6.9)
Elevator not working*	1.8 (4.1)	0.8 (2.6)	2.5 (5.0)	1.5 (3.2)	1.6 (4.4)	1.6 (3.9)
Count linens*	4.9 (6.1)	2.1 (5.0)	4.1 (6.7)	1.7 (4.1)	1.0 (3.3)	3.1 (5.6)
Call in from each room*	7.7 (6.5)	9.4 (7.5)	11.7 (6.7)	9.3 (5.8)	9.7 (7.6)	9.4 (6.9)
Put three sheets on bed*	12.5 (2.9)	2.1 (3.0)	3.1 (3.7)	2.0 (3.7)	5.1 (6.2)	5.7 (5.8)

(*) $p < .10$

* $p < .05$

¹ Average number of times the task or problem occurs per day, across all hotels

TABLE 7. Ergonomic Problems by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Linen cart too heavy	87	84	80	82	87	84
Linen cart broken*	43	52	52	39	63	49
Linen cart difficult to stock	47	43	44	43	45	44
Heavy bedspreads or comforters on beds*	86	63	83	51	79	74
Cleaning supplies don't clean well*	44	62	68	83	69	62
Cleaning supplies irritate skin or eyes	69	69	76	79	72	72
Vacuum cleaner too heavy*	57	66	74	44	64	62
Vacuum cleaner needs repair*	66	62	73	37	70	62
Vacuum cleaner cord too short*	38	20	40	15	34	30
No squeegee*	36	33	48	42	36	39
No mop*	13	48	40	46	15	32
Moving furniture*	38	41	50	61	22	43

(*) $p < .10$

* $p < .05$

¹ Shown is the percentage of room cleaners reporting that it is “somewhat of a problem” or “a big problem;” the remaining room cleaners reported “no problem at all” or “very little problem.”

TABLE 8. Average Number of Work Tasks Performed Compared to Previous Five Years, by Hotel.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
“Do it less” ^(*)	4.0	(4.6)	4.5	(4.6)	3.6	(3.9)	4.9	(4.5)	4.6	(5.0)	4.2	(4.5)
“Do it about the same” ^(*)	11.7	(7.2)	13.5	(7.9)	12.5	(7.1)	11.7	(6.9)	12.5	(6.9)	12.4	(7.3)
“Do it more” [*]	10.3	(7.6)	8.0	(7.1)	9.9	(7.2)	9.4	(6.8)	8.9	(7.2)	9.4	(7.3)

^(*) p < .10

^{*} p < .05

TABLE 9. Changes in Work Tasks Compared to Previous Five Years, by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
<u>Problems with replacement linens</u>						
“Do it less”	13	16	14	11	16	14
“Do it more”	39	35	43	46	40	40
<u>Room needs extra linens like robes, etc.*</u>						
“Do it less”	18	28	21	20	18	21
“Do it more”	29	16	28	36	26	26
<u>Coffee pot in room needs cleaning*</u>						
“Do it less”	54	63	58	53	24	53
“Do it more”	13	7	7	17	31	14
<u>Put away iron and ironing board*</u>						
“Do it less”	7	8	7	13	24	10
“Do it more”	58	45	50	30	27	46
<u>Room service trays left in room*</u>						
“Do it less”	6	14	6	2	10	8
“Do it more”	53	32	38	52	46	44
<u>Lots of garbage left in room^(*)</u>						
“Do it less”	5	2	3	2	7	4
“Do it more”	58	50	59	58	56	56
<u>Ashtrays in room need cleaning^(*)</u>						
“Do it less”	26	16	25	25	18	22
“Do it more”	34	38	38	32	49	37

TABLE 9 (cont.). Changes in Work Tasks Compared to Previous Five Years, by Hotel. ¹

<u>Food left in room on tables or carpet</u>						
“Do it less”	8	8	9	7	9	8
“Do it more”	46	36	46	47	39	43
<u>Extra scrubbing required in the bathroom</u>						
“Do it less”	9	10	7	8	9	9
“Do it more”	49	37	44	53	49	46
<u>Bathroom very wet or dirty</u>						
“Do it less”	8	7	6	6	4	7
“Do it more”	47	45	45	53	46	47
<u>Restock missing supplies on cart*</u>						
“Do it less”	6	5	5	7	14	6
“Do it more”	50	44	51	50	28	46
<u>Problems dusting high or low areas in room</u>						
“Do it less”	6	4	5	9	10	6
“Do it more”	51	42	42	46	42	45
<u>Do not disturb sign on door*</u>						
“Do it less”	13	5	9	4	13	9
“Do it more”	24	27	31	29	24	27
<u>Deep cleaning of room required*</u>						
“Do it less”	7	6	5	13	11	8
“Do it more”	50	38	45	48	44	45

TABLE 9 (cont.). Changes in Work Tasks Compared to Previous Five Years, by Hotel. ¹

<u>Report a problem to someone else</u>						
“Do it less”	20	23	20	12	19	19
“Do it more”	25	23	25	22	31	25
<u>Make extra beds^(*)</u>						
“Do it less”	15	17	17	19	19	17
“Do it more”	37	23	30	28	24	30
<u>Clean Jacuzzi*</u>						
“Do it less”	32	20	7	45	33	25
“Do it more”	27	27	25	15	20	24
<u>Travel to another floor or building*</u>						
“Do it less”	19	16	10	19	17	16
“Do it more”	30	33	47	51	38	38
<u>Clean VIP or rush rooms*</u>						
“Do it less”	12	20	10	28	20	17
“Do it more”	41	17	34	23	18	28
<u>Clean large glass or mirror doors*</u>						
“Do it less”	8	13	6	5	5	8
“Do it more”	46	42	40	53	43	45
<u>Clean marble sinks*</u>						
“Do it less”	14	23	16	33	29	21
“Do it more”	38	29	36	28	28	33
<u>Clean chrome or brass fixtures</u>						
“Do it less”	24	26	17	29	19	23
“Do it more”	26	24	33	25	21	26

TABLE 9 (cont.). Changes in Work Tasks Compared to Previous Five Years, by Hotel. ¹

<u>Elevator not working*</u>							
“Do it less”	39	42	32	28	26	35	
“Do it more”	20	16	26	26	20	21	
<u>Count linens*</u>							
“Do it less”	34	41	29	46	48	38	
“Do it more”	23	18	32	13	10	21	
<u>Call in from each room*</u>							
“Do it less”	21	15	10	13	21	16	
“Do it more”	30	31	52	50	32	38	
<u>Put three sheets on bed*</u>							
“Do it less”	1	27	14	36	29	18	
“Do it more”	63	16	25	17	32	34	

(*) p < .10

* p < .05

¹ Shown is the percentage of room cleaners responding “I ‘Do it more’” or “I ‘Do it less’” to the question “How have these tasks or problems changed over the past 5 years?”

TABLE 10. Job Satisfaction by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Not at all satisfied	30	19	23	28	21	25
Not too satisfied	27	33	31	33	26	30
Somewhat satisfied	36	42	39	35	48	39
Very satisfied	7	6	7	4	6	6

¹ Shown is the percentage of room cleaners responding to the question “How satisfied are you with your job?”

TABLE 11. Job Potential by Hotel. ¹

	Hotel A %	Hotel B %	Hotel C %	Hotel D %	Hotel E %	Totals %
Job Security						
“My job security is poor.”*	65 %	66 %	72 %	77 %	75 %	69 %
Undesirable Work Changes						
“I have experienced or I expect to experience an undesirable change in my work situation.”*	67 %	69 %	73 %	82 %	79 %	72 %
Job Promotion Prospects						
“My job promotion prospects are poor.”	64 %	67 %	70 %	67 %	69 %	67 %
“Considering all my efforts and achievements, my prospects for job advancement are adequate.”	39 %	43 %	44 %	32 %	38 %	40 %

* p-value < 0.05

¹ Shown is the percentage of room cleaners reporting that they agree with the statement; the remaining room cleaners disagreed with the statement.

TABLE 12. Quality of Work by Hotel.

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Repetitiveness ¹						
“My job involves doing a lot of things over and over again.” ^(*)	73	66	76	77	74	73
“I get to do a variety of different things on my job.”	52	50	52	51	55	51
Skill Development ¹						
“My job requires that I learn new things.” ^(*)	59	56	60	71	57	60
“I have an opportunity to develop my own special abilities.”	29	23	28	20	32	26
Skill Utilization						
“My job requires me to be creative.” ¹	54	54	57	59	46	54
“My current occupational position adequately reflects my education and training.” ^{2(*)}	50	52	59	45	43	51

^(*) $p < .10$

* $p < .05$

¹ Shown is the percentage of room cleaners reporting that they “strongly agree” or “agree” with the statement; the remaining room cleaners reported “disagree” or “strongly disagree.”

² Shown is the percentage of room cleaners reporting that they agree with the statement; the remaining room cleaners disagreed with the statement.

TABLE 13. Time Pressure and Conflicting Demands at Work, by Hotel.

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Time Pressure						
“My job requires working very fast.” ^{1*}	77	69	82	83	62	75
“I have enough time to get the job done.” ¹	19	17	20	14	19	18
“I have constant time pressure due to a heavy work load.” ^{2(*)}	90	87	88	90	79	88
“I am often pressed to work overtime.” ^{2(*)}	19	30	22	22	23	23
Conflicting Demands						
“I am free from conflicting demands that others make on me.” ^{1(*)}	37	36	44	28	42	37
“I have many interruptions and disturbances in my job.” ²	72	75	72	76	72	73

(*) $p < .10$

* $p < .05$

¹ Shown is the percentage of room cleaners reporting that they “strongly agree” or “agree” with the statement; the remaining room cleaners reported “disagree” or “strongly disagree.”

² Shown is the percentage of room cleaners reporting that they agree with the statement; the remaining room cleaners disagreed with the statement.

TABLE 14. Skip Lunch or Breaks, or Work Longer to Complete Assigned Rooms.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	%	n	%	n	%	n	%	n	%	n	%	n
I skipped or shortened lunch or break or worked longer hours to complete assigned rooms in last work week	71%	(189)	61%	(133)	63%	(122)	70%	(97)	65%	(66)	66%	(607)
Reason:												
To make sure I can finish all rooms by end of day*	94%	(177)	86%	(114)	91%	(111)	88%	(85)	89	(59)	90%	(546)
To avoid discipline, points or other penalties	30%	(57)	27%	(36)	30%	(36)	39%	(38)	24%	(16)	30%	(183)
Other reason*	6%	(12)	6%	(8)	9%	(11)	15%	(15)	11%	(7)	9%	(53)

* $p < .05$

TABLE 15. Psychological Job Demands and Job Control, by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Psychological Job Demands						
“My job requires working very fast.”*	77	69	82	83	62	75
“My job requires working very hard.”*	80	74	85	87	69	79
“I am <u>not</u> asked to do an excessive amount of work.”	24	27	29	19	30	26
“I have enough time to get the job done.”	19	17	20	14	19	18
“I am free from conflicting demands that others make on me.”(*)	37	36	44	28	42	37
Job Control						
“My job requires that I learn new things.”(*)	59	56	60	71	57	60
“My job involves doing a lot of things over and over again.”(*)	73	66	76	77	74	73
“My job requires me to be creative.”	54	54	57	59	46	54
“My job allows me to make a lot of decisions on my own.”(*)	34	35	45	36	43	38
“My job requires a high level of skill.”*	50	63	59	63	47	57
“On my job, I have very little freedom to decide how I do my work.”	59	60	61	62	55	60
“I get to do a variety of different things on my job.”	52	50	52	51	55	51
“I have a lot of say about what happens on my job.”	29	28	32	26	27	29
“I have an opportunity to develop my own special abilities.”	29	23	28	20	32	26

¹ Shown is the percentage of room cleaners reporting that they “strongly agree” or “agree” with the statement; the remaining room cleaners reported “disagree” or “strongly disagree.”

(*) $p < .10$, * $p < .05$

TABLE 16. Average Scores for Psychological Job Demands and Job Control, by Hotel.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Psychological Job Demands ^{1*}	36.6	(7.0)	35.9	(7.2)	36.9	(6.6)	39.2	(6.9)	34.5	(6.6)	36.6	(7.0)
Job Control ²	55.9	(10.6)	56.3	(10.1)	56.3	(9.4)	56.5	(9.6)	55.5	(11.0)	56.1	(10.1)

* $p < .05$

¹ Range 5 - 20, higher scores = higher psychological job demands. The psychological job demands value is a composite score of 5 items rated on a 4-point scale. See Table 15 for a listing of the 5 items.

² Range 9 - 36, higher scores = more job control. The job control value is a composite score of 9 items rated on a 4-point scale. See Table 15 for a listing of the 9 items.

TABLE 17. High Levels of Job Strain by Hotel. (n = 881)

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	% (n)
High job strain ¹	27	27	24	25	22	25 (223)
Very high job strain ²	15	17	13	14	14	15 (132)

¹ High job strain is defined as the combination of high psychological job demands and low job control; high = upper 50th percentile, low = lower 50th percentile (median split), based on cut-points in Las Vegas.

² Very high job strain is defined as the combination of very high psychological job demands and very low job control; very high = upper tertile, very low = lower tertile, based on cut-points in Las Vegas.

TABLE 18. Psychological Demands, Job Control, and Job Strain: Comparison of Las Vegas Room Cleaners, San Francisco Room Cleaners, and San Francisco Bus Drivers

	San Francisco Bus Drivers (n=235)		San Francisco Room Cleaners (n=255)		Las Vegas Room Cleaners (n=905)	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Psychological Demands	34.0	(6.6)	35.1	(6.4)	36.6	(7.0)
Job Control	61.1	(10.3)	63.5	(12.5)	56.1	(10.1)
High Job Strain ¹	8%		13%		25%	
Very High Job Strain ²	4%		4%		15%	
Effort-Reward Imbalance ³	---		31%		57%	

¹ High job strain is defined as the combination of high psychological job demands and low job control; high = upper 50th percentile, low = lower 50th percentile (median split), based on cut-points in Las Vegas.

² Very high job strain is defined as the combination of very high psychological job demands and very low job control; very high = upper tertile, very low = lower tertile, based on cut-points in Las Vegas.

³ Effort-reward imbalance is defined as the combination of high effort and low reward at work (ratio >1). Because of slightly different computation methods used for San Francisco and Las Vegas room cleaners, the comparability of the results is limited.

TABLE 19. Work Effort and Reward, by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Effort						
“I have constant time pressure due to a heavy work load.” ^(*)	90	87	88	90	79	88
“I have many interruptions and disturbances in my job.”	71	75	73	76	72	73
“I have a lot of responsibility in my job.”	90	90	93	92	88	91
“I am often pressed to work overtime.” ^(*)	19	30	22	22	23	23
“My job is physically demanding.” ^(*)	89	90	94	94	87	91
“Over the past few years, my job has become more and more demanding.”*	87	83	88	94	84	87
Reward						
“I receive the respect I deserve from my supervisors.”*	44	52	55	40	40	47
“I receive the respect I deserve from my co-workers.”	71	74	74	76	70	73
“I experience adequate support in difficult situations.”	44	44	48	44	41	45
“I am treated unfairly at work.”*	63	56	58	69	73	62
“I have experienced or I expect to experience an undesirable change in my work situation.”*	67	69	73	82	79	72
“My job promotion prospects are poor.”	64	67	70	67	69	67
“My job security is poor.”*	65	66	72	77	75	69
“My current occupational position adequately reflects my education and training.” ^(*)	50	52	59	45	43	51

TABLE 19 (cont.). Work Effort and Reward, by Hotel. ¹

“Considering all my efforts and achievements, I receive the respect and prestige I deserve at work.”	36	38	41	33	30	36
“Considering all my efforts and achievements, my prospects for job advancement are adequate.”	39	43	44	32	38	40
“Considering all my efforts and achievements, my salary/income and benefits are adequate.”*	23	27	27	14	23	23

(*) $p < .10$

* $p < .05$

¹ Shown is the percentage of room cleaners reporting that they agree with the statement; the remaining room cleaners disagreed with the statement.

TABLE 20. Average Scores for Work Effort and Reward, by Hotel.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Effort ¹	20.6	(6.1)	21.1	(5.9)	20.4	(5.9)	21.4	(5.8)	20.8	(6.4)	20.8	(6.0)
Reward ^{2*}	35.3	(13.7)	37.2	(12.5)	36.6	(12.1)	32.8	(11.2)	33.5	(13.7)	35.4	(12.8)

* $p < .05$

¹ Range 6 - 30, higher scores = higher effort at work. The effort score is a composite of 6 items rated on a 5-point scale (from 1-5). See Table 19 for a listing of the 6 items.

² Range 11 - 55, higher scores = higher reward at work. The reward score is a composite of 11 items rated on a 5-point scale (from 1-5). See Table 19 for a listing of the 11 items.

TABLE 21. Percentage of Room Cleaners With Work Effort-Reward Imbalance by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Effort-Reward Imbalance*	57	53	54	70	56	57

* $p < .05$

¹ Effort-Reward Imbalance is the combination of high effort and low reward at work.

TABLE 22. Supervisor and Co-Worker Support, by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Supervisor Support						
“My supervisor is concerned about the welfare of those under him (her).”*	34.8	50.2	53.2	33.6	33.0	42.1
“My supervisor pays attention to what I am saying.”	54.7	59.5	65.1	51.9	52.1	57.4
“My supervisor is helpful in getting the job done.”*	40.4	52.4	51.6	34.1	28.7	43.5
“My supervisor is respectful to those under her.”*	57.8	67.9	64.4	55.6	46.9	60.1
“My supervisor shows favoritism in assigning work.”	57.1	52.8	51.9	59.7	59.2	55.7
Co-Worker Support						
“People I work with are competent in doing their jobs.”	78.5	82.5	83.7	75.4	85.2	80.8
“People I work with take a personal interest in me.”	40.3	44.1	49.5	41.1	52.0	44.6
“People I work with are friendly.”*	70.0	73.8	87.8	76.9	84.0	77.2
“People I work with are helpful in getting the job done.”*	45.6	50.9	61.5	47.7	56.5	51.7

(*) p < .10

* p < .05

¹ Shown is the percentage of room cleaners reporting that they “strongly agree” or “agree” with the statement; the remaining room cleaners reported “disagree” or “strongly disagree.”

TABLE 23. Average Scores for Supervisor Support and Co-Worker Support, by Hotel.

	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Supervisor Support ^{1*}	11.7	(3.6)	12.8	(3.9)	12.8	(3.5)	11.6	(3.6)	11.3	(3.6)	12.1	(3.7)
Co-Worker Support ^{2*}	10.6	(2.6)	11.1	(2.9)	11.4	(2.2)	10.5	(2.6)	11.4	(2.4)	11.0	(2.6)

* $p < .05$

¹ Range 4 - 16, higher scores = more supervisor support. The supervisor support score is a composite of 4 items rated on a 4-point scale from 1-4. See Table 22 for a listing of these items (the first 4 statements under supervisor support heading).

² Range 4 - 16, higher scores = more co-worker support. The co-worker support score is a composite of 4 items rated on a 4-point scale from 1-4. See Table 22 for a listing of the 4 items.

TABLE 24. Problem Solving at Work by Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
“I tried to change my work situation but gave up.”						
Almost never or sometimes	74 %	76 %	75 %	79 %	81 %	76 %
Often or almost always	26 %	24 %	25 %	21 %	19 %	24 %
“I was encouraged to say what was bothering me at work.”						
Almost never or sometimes	83 %	87 %	82 %	80 %	76 %	83 %
Often or almost always	17 %	13 %	18 %	20 %	24 %	17 %
“I learned to live with the stress because there was nothing I could do about it.”						
Almost never or sometimes	35 %	39 %	37 %	42 %	36 %	37 %
Often or almost always	65 %	61 %	63 %	58 %	64 %	63 %
“I was usually able to solve the problem.”						
Almost never or sometimes	78 %	81 %	80 %	80 %	72 %	79 %
Often or almost always	22 %	19 %	20 %	20 %	28 %	21 %
“I had some bad experiences when I made suggestions on how to improve my work.”						
Almost never or sometimes	80 %	82 %	82 %	82 %	74 %	80 %
Often or almost always	20 %	18 %	18 %	18 %	26 %	20 %
“When I complained about the problem, things improved.”						
Almost never or sometimes	87 %	87 %	88 %	91 %	82 %	87 %
Often or almost always	13 %	13 %	12 %	9 %	18 %	13 %

TABLE 24 (cont.). Problem Solving at Work by Hotel. ¹

“The local union and local management work well together to solve problems.” *						
Strongly agree or agree	82 %	83 %	63 %	75 %	72 %	76 %
Disagree or strongly disagree	18 %	17 %	37 %	25 %	28 %	24 %
“The local union in my hotel considers health and safety (ergonomics) an important issue.”						
Strongly agree or agree	90 %	88 %	84 %	91 %	88 %	88 %
Disagree or strongly disagree	10 %	12 %	16 %	9 %	12 %	12 %
“The management in my hotel considers health and safety (ergonomics) an important issue.” ^{2*}						
Strongly agree or agree	44 %	39 %	40 %	33 %	56 %	42 %
Disagree or strongly disagree	56 %	61 %	60 %	67 %	44 %	58 %

* $p < .05$

¹ Shown is the percentage of room cleaners responding to the question “When you think about all the stressful problems on your job, what were your experiences when you tried to do something about it?”

² Shown is the percentage of room cleaners responding to the question “For each statement below, check the box that comes closest to describing your job situation.”

TABLE 25. Self-Rated General Health in Room Cleaners by Hotel.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	%	n	%	n	%	n	%	n	%	n	%	n
	or Mean	or (SD)	or Mean	or (SD)	or Mean	or (SD)	or Mean	or (SD)	or Mean	or (SD)	or Mean	or (SD)
General health (Average score) ¹	40.8	(27.8)	33.6	(26.1)	41.6	(28.1)	43.3	(25.3)	36.6	(30.7)	39.1	(27.6)
General health ^{2*}												
Excellent	5 %	14	3 %	6	6 %	12	3 %	4	4 %	4	4 %	40
Very Good	7 %	18	6 %	13	8 %	16	9 %	12	11 %	11	8 %	70
Good	32 %	86	22 %	50	29 %	56	36 %	49	25 %	25	29 %	266
Fair	42 %	112	50 %	113	45 %	89	45 %	61	35 %	36	44 %	411
Poor	14 %	37	19 %	42	12 %	23	7 %	10	25 %	26	15 %	138

* $p < .05$

¹ All values are transformed to a 0-to-100 scale with higher values representing better health.

² Shown is the percentage and number of room cleaners responding to the question “Would you say your health in general is now excellent, very good, good, fair, or poor?”

TABLE 26. Self-rated Health According to the Short-Form-36 Health Survey (SF-36) by Hotel. ¹

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
General health*	40.8	(27.8)	33.6	(26.1)	41.6	(28.1)	43.3	(25.3)	36.6	(30.7)	39.1	(27.6)
Physical functioning*	54.2	(28.1)	45.8	(25.8)	48.3	(27.1)	52.8	(26.3)	47.6	(28.3)	50.0	(27.2)
Role limitations due to physical health problems ^(*)	39.7	(39.4)	29.8	(37.3)	33.2	(38.2)	34.5	(38.0)	36.6	(38.0)	34.8	(38.4)
Role limitations due to emotional problems ^(*)	44.7	(39.5)	37.3	(40.0)	42.2	(37.0)	34.8	(40.8)	37.8	(40.7)	40.2	(39.6)
Bodily pain during the past 4 weeks ^(*)	34.5	(27.9)	29.3	(25.1)	37.3	(28.9)	32.9	(25.7)	33.9	(27.1)	33.5	(27.1)
Bodily pain during the past 4 weeks that interferes with normal work	37.7	(23.8)	33.6	(22.4)	39.9	(26.6)	36.0	(22.8)	36.4	(23.3)	36.8	(23.9)
Vitality, energy or fatigue	35.4	(21.4)	36.3	(21.1)	37.4	(22.7)	36.3	(19.1)	36.8	(21.9)	36.3	(21.3)

^(*) p < .10

* p < .05

¹ All values are transformed to a 0-to-100 scale with higher values representing better health.

TABLE 27. Self-rated health: Comparison of Las Vegas Guest Room Attendants with San Francisco Guest Room Attendants and the General US Population

	General Population		San Francisco GRA		Las Vegas GRA	
	Mean ¹	(SD)	Mean ¹	(SD)	Mean ¹	(SD)
General health	72.0	(20.3)	56.0	(29.8)	39.1	(27.6)
Physical functioning	84.2	(23.3)	62.1	(25.9)	50.0	(27.2)
Role limitations due to physical health problems	81.0	(34.0)	61.6	(40.1)	34.8	(38.4)
Role limitations due to emotional problems	81.3	(33.0)	65.5	(38.6)	40.2	(39.6)
Bodily Pain	75.2	(23.7)	50.7	(24.6)	34.9	(22.4)
Vitality, energy and fatigue	60.9	(21.0)	51.5	(21.8)	36.3	(21.3)

¹ All values are transformed to a 0-to-100 scale with higher values representing better health.

TABLE 28. Psychosomatic Symptom Scores by Hotel.

	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Psychosomatic symptoms score	26.5	(6.6)	28.4	(5.5)	26.6	(6.2)	27.0	(5.7)	27.0	(6.4)	27.1	(6.1)

¹ All values are transformed to a 0-to-100 scale with higher values representing better health.

TABLE 29. Musculoskeletal Pain During the Past 4 Weeks by Body Part and Hotel. ¹

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Hands, Wrists, Fingers*						
None or very mild	23	14	28	22	14	21
Mild or moderate	33	38	34	39	41	36
Severe or very severe	44	48	39	38	44	43
Lower Arms, Elbows*						
None or very mild	26	17	33	24	19	24
Mild or moderate	40	35	35	39	38	38
Severe or very severe	34	47	32	37	43	38
Upper Arms, Shoulders						
None or very mild	15	12	16	16	11	14
Mild or moderate	35	29	34	29	30	32
Severe or very severe	50	59	50	56	59	54
Head*						
None or very mild	30	20	27	30	27	27
Mild or moderate	32	42	43	42	32	38
Severe or very severe	38	38	30	28	41	35
Chest or Abdomen						
None or very mild	46	37	50	49	39	44
Mild or moderate	33	39	34	30	33	34
Severe or very severe	20	25	16	21	28	21
Neck						
None or very mild	25	20	28	32	20	25
Mild or moderate	33	32	31	32	32	32
Severe or very severe	42	47	41	35	48	43
Upper Back*						
None or very mild	17	8	20	11	12	14
Mild or moderate	28	26	23	28	33	27
Severe or very severe	55	66	57	62	56	59
Lower Back						
None or very mild	11	6	13	13	11	10
Mild or moderate	28	29	27	22	34	28
Severe or very severe	61	65	61	65	55	62

TABLE 29 (cont.). Musculoskeletal Pain During the Past 4 Weeks by Body Part and Hotel. ¹

Hips*						
None or very mild	25	17	34	24	22	24
Mild or moderate	27	29	17	25	32	26
Severe or very severe	48	54	49	51	46	50
Knees						
None or very mild	22	23	30	26	23	25
Mild or moderate	31	33	31	35	29	32
Severe or very severe	47	44	39	39	48	44
Legs						
None or very mild	16	16	19	15	14	16
Mild or moderate	33	32	28	39	38	33
Severe or very severe	50	52	53	46	47	50
Feet, Ankles						
None or very mild	19	13	20	13	13	16
Mild or moderate	27	32	21	28	31	27
Severe or very severe	54	55	59	59	56	56

* $p < .05$

¹ Shown is the percentage of room cleaners responding to the question “How much pain have you experienced in the following parts of your body during the past 4 weeks?”

TABLE 30. Musculoskeletal Pain During the Past 4 Weeks, by Body Part and Age Group. ¹

	Age Groups				Total
	Under 40	40 - 49	50 - 59	60 or older	All ages
		%	%	%	%
Hands, Wrists, Fingers*					
None or very mild	23	16	20	39	21
Mild or moderate	39	35	34	13	36
Severe or very severe	38	48	46	48	43
Lower Arms, Elbows^(*)					
None or very mild	25	23	22	41	24
Mild or moderate	40	33	41	22	37
Severe or very severe	34	44	38	37	39
Upper Arms, Shoulders					
None or very mild	15	12	16	17	14
Mild or moderate	33	31	31	28	32
Severe or very severe	52	57	53	55	54
Head*					
None or very mild	20	28	38	34	26
Mild or moderate	41	40	28	41	38
Severe or very severe	40	32	34	24	35
Chest or Abdomen					
None or very mild	42	44	46	64	44
Mild or moderate	36	34	35	14	34
Severe or very severe	22	22	18	21	21
Neck					
None or very mild	23	24	30	37	25
Mild or moderate	34	30	31	23	32
Severe or very severe	43	46	38	40	43
Upper Back*					
None or very mild	11	12	19	37	14
Mild or moderate	27	27	29	13	27
Severe or very severe	62	61	52	50	59
Lower Back*					
None or very mild	8	10	15	23	10
Mild or moderate	26	26	32	26	27
Severe or very severe	66	64	53	52	62

TABLE 30 (cont.). Musculoskeletal Pain During the Past 4 Weeks, by Body Part and Age Group.¹

Hips*					
None or very mild	23	20	33	30	24
Mild or moderate	29	24	23	26	26
Severe or very severe	48	57	45	44	50
Knees ^(*)					
None or very mild	26	22	24	28	24
Mild or moderate	36	29	29	17	32
Severe or very severe	38	49	47	55	44
Legs					
None or very mild	14	16	20	23	16
Mild or moderate	36	33	30	23	33
Severe or very severe	49	52	50	53	50
Feet, Ankles*					
None or very mild	14	15	22	28	16
Mild or moderate	31	24	26	24	27
Severe or very severe	56	61	52	48	57

^(*) p < .10

* p < .05

¹ Shown is the percentage of room cleaners in each age group and over all ages responding to the question “How much pain have you experienced in the following parts of your body during the past 4 weeks?”

TABLE 31. Took Pain Medication During the Last Four Weeks, by Hotel.

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Totals
	%	%	%	%	%	%
Took Pain Medication (Aspirin, Ibuprofen, etc.)	84	87	81	80	83	83

TABLE 32. Work Related Pain, Discomfort or Injuries During the Past 12 Months, by Hotel. (n = 913)

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	%	n	%	n	%	n	%	n	%	n	%	n
Had pain/discomfort believed to be caused or made worse by work	77 %	200	79 %	173	74 %	142	79 %	109	84 %	86	78 %	710
Pain/discomfort began after current job started	98 %	192	95 %	164	93 %	130	94 %	101	96 %	78	96 %	665 ¹
Reported the pain/discomfort to supervisor or other management	34 %	67	28 %	48	31 %	43	32 %	34	34 %	29	32 %	221 ³
Visited doctor about the pain/discomfort	66 %	130	65 %	107	59 %	82	55 %	59	61 %	52	62 %	430 ²
Called in sick or used vacation day because of this pain/discomfort	63 %	126	55 %	96	56 %	80	47 %	51	57 %	49	57 %	402 ⁴

¹ A total of 695 persons responded to this question

² A total of 692 persons responded to this question

³ A total of 698 persons responded to this question

⁴ A total of 710 persons responded to this question

TABLE 33. Work Days Missed Because of Work-Related Pain or Discomfort During the Past 12 Months.

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)
Called in sick ^(*)	58 %	114	50 %	77	46 %	64	43 %	46	52 %	37	50 %	338 ¹
Number of sick days taken	7.6	(10.5)	10.5	(21.6)	5.5	(6.0)	6.2	(14.0)	7.4	(11.0)	7.7	(13.7)
Used vacation days*	27 %	53	34 %	56	30 %	42	11 %	12	38 %	30	28 %	193 ²
Number of vacation days taken	9.8	(6.7)	11.1	(9.4)	11.5	(7.0)	10.4	(7.8)	10.4	(7.1)	10.7	(7.7)
Total number of workdays lost per 100 workers/year*	552		661		378		289		640		506	

^(*) p < .10

* p < .05

¹ A total of 670 persons responded to this question

² A total of 684 persons responded to this question

TABLE 34. Reported Work-Related Injury or Illness During the Last 12 Months. (n = 880)

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)	% or Mean	n or (SD)
Reported work-related injury or illness to workers' compensation*	30 %	75	19 %	40	16 %	29	16 %	21	20 %	19	21 %	184
Average number of injuries reported	1.6	(1.0)	1.5	(0.8)	1.3	(0.7)	1.2	(0.4)	1.7	(1.0)	1.5	(0.9)
Days missed because of reported injury or illness	7.0	(13.5)	9.3	(19.6)	8.7	(27.2)	8.9	(28.0)	20.5	(28.3)	9.6	(21.3)
Days missed because of reported injury or illness per 100 workers*	210		157		146		150		409		197	

* p < .05

TABLE 35. Barriers to Reporting Work-Related Injuries or Illnesses.

	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	%	n	%	n	%	n	%	n	%	n	%	n
Had a work-related injury or illness but did not report it	17 %	44	21 %	46	18 %	33	21 %	29	16 %	16	19 %	168 ¹
Not reported because:												
“I didn’t know how.”	14 %	6	17 %	8	18 %	6	21 %	6	19 %	3	17 %	29
“I was afraid.”	25 %	11	22 %	10	15 %	5	31 %	9	25 %	4	23 %	39
“I thought it would be too much trouble.”	34 %	15	41 %	19	39 %	13	38 %	11	44 %	7	39 %	65
Other	30 %	13	24 %	11	30 %	10	28 %	8	44 %	7	29 %	49
If reported Work-related injury or illness:												
Had to take a drug test when the injury or illness was reported*	13 %	9	30 %	11	34 %	10	52 %	11	89 %	17	33 %	58 ²
Got taken to health care provider or clinic	92 %	68	83 %	29	86 %	25	90 %	19	89 %	17	89 %	158 ³
Got well before returning to work	47 %	34	54 %	20	36 %	10	33 %	7	53 %	10	46 %	81 ³
After returning to work, missed additional days of work because of the injury	38 %	27	41 %	15	43 %	12	11 %	2	33 %	6	36 %	62 ⁴
Got a warning or other discipline for missing work	26 %	19	28 %	10	8 %	2	14 %	3	18 %	3	21 %	37 ⁵

TABLE 35 (cont.). Barriers to Reporting Work-Related Injuries or Illnesses.

Workers compensation claim <u>not</u> accepted	38 %	26	64 %	18	33 %	7	50 %	8	33 %	5	43 %	64 ⁶
Declined claim was not appealed	78 %	14	93 %	13	100 %	5	100 %	5	100 %	4	89 %	41 ⁷
Appeal not made because:												
“I did not know I could.”	50 %	7	62 %	8	40 %	2	80 %	4	50 %	2	56 %	23
“I received information only in English.”	0 %	0	15 %	2	0 %	0	20 %	1	25 %	1	10 %	4

* $p < .05$

¹ A total of 891 persons responded to this question

² A total of 175 persons responded to this question

³ A total of 178 persons responded to this question

⁴ A total of 174 persons responded to this question

⁵ A total of 173 persons responded to this question

⁶ A total of 149 persons responded to this question

⁷ A total of 46 persons responded to this question

TABLE 36. Workers Compensation Payment of Medical Care Expenses for Reported Work-Related Injury or Illness (n = 166)

Characteristic	Hotel A		Hotel B		Hotel C		Hotel D		Hotel E		Totals	
	%	n	%	n	%	n	%	n	%	n	%	n
Workers' Compensation paid for medical care*	73 %	51	39 %	13	52 %	13	60 %	12	72 %	13	61 %	102
Workers' Compensation <u>did not</u> pay for medical care*	27 %	19	61 %	20	48 %	12	40 %	8	28 %	5	39 %	64
Reason given:												
“I did not file a claim.”	32 %	6	20 %	4	50 %	6	38 %	3	40 %	2	33 %	21
“I went to a doctor that was not approved.”	21 %	4	10 %	2	0 %	0	0 %	0	0 %	0	9 %	6
“I filed the claim too late.”	5 %	1	5 %	1	8 %	1	0 %	0	20 %	1	6 %	4
“They said my injury was not related to this job.”	16 %	3	0 %	0	0 %	0	13 %	1	20 %	1	8 %	5
“They said I did not prove my injury was work-related.”	16 %	3	15 %	3	0 %	0	13 %	1	20 %	1	13 %	8
“I needed medical bills paid so I filed with my health insurance.”	5 %	1	15 %	3	8 %	1	13 %	1	40 %	2	13 %	8

* p < .05

TABLE 37. Hypertension Among Room Cleaners. (n = 913)

	Hotel A %	Hotel B %	Hotel C %	Hotel D %	Hotel E %	Totals %
Doctor diagnosed high blood pressure ^(*)	28 %	22 %	19 %	16 %	30 %	23 %
Taking blood pressure medication						
Yes	45 %	49 %	57 %	38 %	58 %	49 %
No	55 %	51 %	43 %	62 %	47 %	51 %

^(*) p < .10

Table 38. Age-Adjusted Risk Factors for Self-Reported Fair or Poor Health (SF-36 scale), n = 872

Risk Factor	n	Adjusted Odds Ratio	95% Confidence Interval
No. rooms cleaned per day	820		
14 or less		1	Reference
15 or more (*)		1.30	0.96 – 1.75
No. beds made per day	819		
18 or less		1	Reference
19 or more *		1.43	1.08 – 1.90
No. of Buildings	850		
1		1	Reference
2		1.11	0.70 – 1.77
3*		2.42	1.03 – 5.72
No. of Floors	870		
1		1	Reference
2		1.14	0.85 – 1.54
3*		1.87	1.24 – 2.82
Lunch or breaks skipped or shortened to finish rooms	809		
No		1	Reference
Yes*		1.65	1.22 – 2.23
Psychological demands	800		
Low		1	Reference
Medium		0.88	0.62 – 1.24
High		0.94	0.66 – 1.33
Job control	798		
High		1	Reference
Medium		1.24	0.88 – 1.73
Low*		1.50	1.05 – 2.13
Job strain	791		
No		1	Reference
Yes		0.89	0.60 – 1.32
Effort/Reward Imbalance	815		
No		1	Reference
Yes*		2.56	1.92 – 3.42

(*) p < .10

* p < .05

Table 39. Age-Adjusted Risk Factors for Self-Reported Severe or Very Severe Pain (SF-36 scale), n = 872

Risk Factor	n	Adjusted Odds Ratio	95% Confidence Interval
No. rooms cleaned per day	814		
14 or less		1	Reference
15 or more		1.25	0.92 – 1.68
No. beds made per day	813		
18 or less		1	Reference
19 or more		1.13	0.86 – 1.49
No. of Buildings	844		
1		1	Reference
2		1.02	0.64 – 1.62
3*		3.86	1.63 – 9.12
No. of Floors	863		
1		1	Reference
2		0.90	0.68 – 1.22
3*		1.84	1.24 – 2.73
Lunch or breaks skipped or shortened to finish rooms	802		
No		1	Reference
Yes*		2.36	1.73 – 3.24
Psychological demands	790		
Low		1	Reference
Medium		1.09	0.77 – 1.55
High*		1.75	1.23 – 2.50
Job control	789		
High		1	Reference
Medium (*)		1.40	1.00 – 1.95
Low*		1.67	1.18 – 2.37
Job strain	782		
No		1	Reference
Yes*		1.58	1.07 – 2.34
Effort/Reward Imbalance	808		
No		1	Reference
Yes*		4.53	3.33 – 6.16

(*) p < .10

* p < .05