The Healthy College Student: The Impact of Daily Routines on Illness Burden

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Abstract
Studies on the impact of health behaviors on morbidity often focus on the limited impact of a single behavior or a limited group of behaviors. In this study, we examine college student behaviors and investigate the link of these behaviors with a 2-week illness profile. Through self-reported surveys, we measure acute illness and a general illness burden, a cumulative measure of major and minor ailments. We explore how daily routines correlate with these illness measures. Eighty-four students from a random sample of 90 students attending a small liberal arts school completed the survey for a response rate of 93%. Living arrangements, exercise, sleep patterns, eating preferences and habits, and “social” behaviors were all significantly associated with illness burden. Students living in “singles” and those who got regular exercise and an average of 7 hr of sleep per night reported less illness. Most interesting is the effect of social behaviors. Students who greet others with a handshake reported higher illness rates, as did students who share food and/or drinks. While we can conceptualize why these behaviors would lead to a greater illness burden, students who engaged more frequently in these behaviors also reported being “happier.” In trying to reduce illness among college students, we might suggest less handshaking and food and beverage sharing, but these actions are ways in which college students express and maintain friendships. College administrators are challenged to discover ways to reduce illness while maintaining the positive aspects of local student culture. This study begins to explore some ways to balance health and camaraderie.

Keywords
college students, health behaviors, reducing illness, health profile

Introduction
Popular American media regularly highlights articles on ways to increase our health, often in the name of productivity, instilling in us a sense of personal responsibility for our health status. We know the mantra: Eat right, exercise, and get quality sleep. Medical sociologists, however, have long recognized that humans do not conduct all of their social behavior with the goal of achieving some idealized level of health despite these obligations. Although we recognize our responsibility to eat a balanced diet, we occasionally indulge in unhealthy foods, especially those associated with celebratory rituals such as birthdays and Thanksgiving. Although we may attempt to get enough sleep, there are times when it is difficult if not impossible to fulfill all of our normative role obligations and still get the required amount of sleep, whether we are talking about young college students trying to complete all their coursework, or the parents of newborns who seem perpetually sleep-deprived.

Much of the literature that examines the link between our behaviors and health outcomes tends to focus on one health problem at a time. While one study will focus on the common cold, another will focus on asthma, and each will try to focus on what environmental and individual behaviors are significantly associated with a particular illness. Although this focus makes sense methodologically because it is challenging to look at more than one outcome and control for all the confounding factors, these studies provide a very useful but fragmented view of the overall association of our social behavior with our health outcomes.

In this study, we take a more comprehensive look at the relationship between social behaviors and health outcomes among a sample of college students for a 2-week period in the spring of 2008. This study itself is limited by the very limited time period under study—2 weeks. We assumed that students would have a very hard time recalling their health status with any reliability for more than a 2-week period, and pretesting corroborated our hypothesis. We wanted to test how students’ average daily behavior was correlated with episodes of acute illness and other illness conditions/symptoms. Pretesting also indicated that the most common
ailments experienced by the students on this particular college campus were sore throats, runny noses, headaches, earaches, intestinal discomfort, vomiting, diarrhea, coughing, pinkeye, sneezing, and fatigue. We collected information on specific cases of chronic illness and the presence of any of these ailments even if the student did not self-identify as having an acute illness over the 2-week period.

Data were collected through surveys. The survey questions were informed by different hypothesized relationships between behaviors/activities and the likelihood of reporting illness such as the impact of stress, food choices, sleeping patterns, exercise, alcohol and cigarette use, and hygiene, associations extensively discussed in the health literature. We also wanted to know the impact of ill health on normal routines, especially on class attendance. We asked student details about the following areas of their lives in addition to the presence of the symptoms/conditions cited above:

- Did you miss classes, job shifts, social events, sports events, meals due to illness?
- Did you visit the health center, and/or take prescription or over-the-counter medications?
- Describe living arrangements.
- Describe course load, perceived stress associated with academic work, and participation in extracurricular activities.
- Describe average sleeping patterns.
- Describe eating patterns, as well as satisfaction with food options, attempts to eat healthy meals, and frequency of sharing food and drink. (We recognize the limitation of asking students to report the quality of their general eating habits vs. asking students to actually record what they ate. Pretesting, however, indicated that the students had a fairly comprehensive and consistent idea about what defined “trying to eat a healthy meal.” The definition included eating a lot of fresh fruits and vegetables, lean cuts of meat, avoiding fried and highly processed foods, and avoiding an overload of fats.)
- Report levels of exercise, types of exercise, team participation.
- Report alcohol and cigarette use.
- Describe hygienic practices.
- Report on levels of human interaction/social behaviors including size of friendship networks and greeting practices (hugging, kissing, handshaking, etc.).
- Report on happiness. (Survey instrument can be found in the appendix.)

**Background**

Much of the research on the topic of college student health has centered on lost academic productivity due to colds and flu, and on some of the more problematic behaviors and health challenges associated with this age group, specifically, stress, drinking, drug use, and sexual health. Nichol, D’Heilly, and Ehlinger (2005, 2008) measured how colds and influenza negatively affect university students’ academic performance and, a few years later, investigated the positive impact of an influenza vaccination program on academic performance. In another study, Nichol, Timmers, Hoyer-Leitzel, Marsh, and Moynihan (2010) measured the considerable morbidity (8 days or more of illness) experienced by college students unfortunate enough to experience influenza during a semester with a focus on impaired academic performance. Data from the American College Health Association National College Health Assessment survey (2013) showed that nationally, 13.7% of college students reported that within the last 12 months, they had

... received a lower grade on an exam, or an important project; received a lower grade in the course; received an incomplete or dropped the course; or experienced a significant disruption in thesis, dissertation, research, or practicum work [due to a cold/flu/sore throat].

White et al. (2003) and White, Kolble, Carlson, and Lipson (2005) investigated how hand washing could help reduce colds (specifically upper-respiratory illnesses), flu, and absenteeism on college campuses, whereas Forquer, Camden, Gabriau, and Johnson (2008) proposed that sleep deprivation and disturbance may negatively affect academic performance.

A number of studies have also focused on the link between stress and physical illness among college students. The negative impact of chronic stress on the immune system and illness episodes has been well established (Adams, Wharton, Quilter, & Hirsch, 2008; Dhabhar, 2008; Roddenberry & Renk, 2010). Prolonged stress is a common complaint among college students. In the American College Health Association (2013) survey referenced above, 30.7% of students reported that stress negatively affected their academic performance, more than cold/flu/sore throat. Largo-Wright, Peterson, and Chen (2005) found that stress was a bigger predictor of poor health than physical activity, social support, or alcohol consumption, whereas Nguyen-Michel, Unger, Hamilton, and Spruijt-Metz (2006) found that physical activity reduced stress among college students.

One motivation for studying college student health behaviors and productivity is to identify areas where we can make recommendations for lifestyle/behavioral changes so that students can be both healthier and more productive. For example, noting that sleep deprivation impedes performance, Forquer et al. (2008) recommended that students improve their sleep at school through circadian rhythm management, sleep hygiene, and white noise machines. However, others worry that it is hard at best to get students to change their behaviors when they still display feelings of invulnerability and regularly underestimate their likelihood of getting sick, a common conception among the 18- to 22-year-old cohort (see also Fleming et al., 2010; Raverta et al., 2009). It will be
hard to get college students to go to bed at regular hours and wash their hands more if they assess their likelihood of getting sick as very small. It will also be hard if they assess the benefits of “bad behaviors” (staying up all night, drinking too much) as worth the unwanted side effect of getting sick. For example, in relation to drinking, Park (2004) found that students reported more “positive consequences” than “negative consequences.” This balance of positive over negative significantly lessens their motivation to change their drinking behavior. At what point would students see the illness burden as too great and feel motivated to alter their behavior? Students might happily tolerate an occasional runny nose, headache, or stomachache, but they might be more willing to change if the threat is contracting severe acute respiratory syndrome (SARS) or H1N1 or other serious health threats such as the recent (2014) meningitis outbreak at Princeton University (http://web.princeton.edu/sites/emergency/meningitis.html). College administrators have a vested interest in helping students find effective and feasible ways to avoid getting sick.

**Health Versus Other Valued Experiences**

Unfortunately, not only do students feel invulnerable, but some of the health-promoting behaviors that we recommend may directly clash with other valued aspects of “college culture.” For example, Wechsler, Dowdall, Davenport, and Castillo (1995) noted that “...drinking is tied to some of the most desired aspects of American college life—parties, social lines, dormitory living, athletics, and interaction with friends...” (p. 925), findings repeated more recently by Park (2004). Because drinking is embedded in college culture, we need to better understand the structure and culture of college drinking and its meaning during this rite of transition we call college life. Merely making the recommendation to “not drink,” or even, “drink less,” will likely prove ineffective. Likewise, recommending that students not stay up late to “party,” or to engage in reflective conversations with their friends, or to watch the sunrise, would impede other aspects of human development that students accomplish while in college during their transition to “adulthood.” Yet, these behaviors increase students’ chances of getting sick.

Extending on this notion of the wider impact of our social settings, Muto, Sistrom, and Farr (2000) argued that people mimic the health behavior of those around them—we are influenced by the social forces, in this case, by our peer groups. A number of different studies have identified this impact whether we are talking about our food choices (Contejo, Williams, Michela, & Franklin, 2006; Story, Kaphingst, Robinson-O’Brien, & Glanz, 2008; Wansink & Sobal, 2007; Yakushvea, Kapinosb, & Weissc, 2011), our levels of alcohol consumption (Dick et al., 2007; Real & Rimal, 2007), or our hygiene (Botta, Dunker, Fenson-Hood, Maltarich, & McDonald, 2008). College administrators including Student Affairs staff members could use these insights regarding peer group influences to either increase desired behaviors (i.e., good food choices) or minimize unwanted behaviors (i.e., binge drinking) through dorm room allocations/assignments and through the organization of seating in college dining facilities.

**A Sick-Free Existence—Is This Obtainable or Even Desirable? The Illness Experience in College**

All of this talk of “positive” behavior modification in the name of reducing illness and of increasing productivity indirectly raises a core question: Are there no benefits (physical, psychological, spiritual) to being sick every now and then with a mild acute illness, even for college students? Researchers have not paid sufficient attention to the possible short-term and long-term benefits that result from adopting the “sick role” (Parsons, 1975) and being relieved of your normal obligations, even for just a couple of days each year. As the “hygiene hypothesis” postulates, we may need to occasionally be physically sick for our immune systems to develop and function properly over the course of our lifetimes (Schaub, Lauener, & von Mutius, 2006; Strachan, 1989). Physicians and nurses have spoken eloquently about the art of healing, the promotion of psychological and spiritual well-being among their patients as they recover from physical ailments (e.g., see Lane, 2008). We also have yet to fully identify the benefits to the patient himself or herself that result from the very act of stepping back from our normal responsibilities and being taken care of by others. With new research, we might be able to identify some beneficial range or number of real sick days that people need each year to tap into the physical, psychological, and social benefits that come from being a patient. Our attempts to reduce sick days to 0 may be both completely unrealistic and in the end, counterproductive. Because our educational and work lives are unlikely to become less demanding in the future, we may all need to be sick every now and then. We need to consider the varied positive functions of being sick as we continue to develop our health behavior models.

Focusing on college student health, we need to think about how institutions of higher learning structure the experience of acute illness for the student population. For example, we could systematically analyze how different “sick day” policies affect students’ experience with illness episodes. “No tolerance” policies might exacerbate illness rates because sick students who will not be excused from class, exams, and so on, infect others by coming to class and/or delay their own recovery. This unfortunate scenario might also result if the college’s system to prove the legitimacy of an absence due to sickness is arduous such as requiring proof of illness from a health care center. We can investigate how institutions try to control the creation of either overly lenient or harsh sick day rules by the institution and by individual faculty and how the rules affect the sickness rates, illness
duration, and student stress. Transparent and consistent rules may themselves be an important part of minimizing the negative impact of inevitable student illness, increasing well-being, and promoting student productivity.

Method

Ninety students were chosen through stratified random sampling using class lists accessible from the school directory from a total of approximately 1,500 students from a liberal arts college in the mid-Atlantic region. Surveys were distributed in person to the students. Pretesting showed that the survey took about 10 min to complete. Students were asked to recall their health and illness profile from the previous 2 weeks. The survey was distributed at the beginning of April 2008. We limited the profile to 2 weeks due to challenges associated with recalling details for longer time periods (Mathiowetz, 2000). Pretesting of 20 students prior to the execution of the survey suggested that students felt comfortable recalling the details of their health and illness for the past 2 weeks, but beyond a 2-week period, details began to get “fuzzy” regarding recalling such details as runny noses, headaches, and upset stomachs. Of the 90 students originally contacted, 84 completed the survey for a total response rate of 93%. Upon completion of the survey, students received an organic/all natural chocolate bar in recognition of their service.

Results

Seventeen percent of students reported suffering with a chronic illness, and 27% reported an episode of an acute illness over the 14-day period. For the total student population, the average number of sick days was 0.83, and for students reporting an acute illness, the average number of days was 3.04. The most common complaints were in order of burden: runny nose (3.19 days), fatigue (2.46 days), sneezing (2.38 days), cough (1.52 days), and headache (1.42 days). All remaining symptoms/conditions were reported less than 1 day on average. Students with headaches were significantly likely to also report sneezing, while students with headaches were also significantly likely to report fatigue. Checking this illness profile with use rates at the institutions’ health center revealed no unusual increase or decrease of center use by students over this 2-week period as compared with the previous (middle to end of March) and post-2-week (last 2 weeks of April) period, so the period represents “normal” illness loads for the institution (e.g., there was no evidence of a flu outbreak on campus, nor was this an exam period).

In addition to incidence of acute illness, we also looked at “overall illness burden”—an accumulated burden of days with different conditions/symptoms regardless of whether or not the student identified as having an acute or chronic illness. The list of possible conditions/symptoms included sore throat, runny nose, headache, earache, intestinal discomfort, vomiting, diarrhea, coughing, pinkeye, sneezing, and fatigue. This list was generated from pretest interviews with the 20 aforementioned sample of students asking them to recall both their most common health complaints and about which they have heard their classmates complain. Other studies have identified urinary tract infections as common to college populations (e.g., Rimsza & Kirk, 2005). We did not find this complaint among our population.

Although the measure of illness burden is based on counting up total days with the different conditions, it should be interpreted as a “total burden” index. The average illness burden was 13.18 with a minimum of 0 and a maximum of 57. Sixty-two percent of students took over-the-counter medications during the 2-week period to treat their symptoms whereas 13% took a prescription medication. Variables distinguishing between taking over-the-counter and/or prescription medications were not significant in the statistical models.

Behavioral Impact on Health and Illness Profile

What behaviors/activities were associated with overall illness burden and acute illness? Table 1 shows the variables that remained significant in the full probit and regression models when predicting either an episode of acute illness or overall illness burden. We describe in detail the direction of the different effects below using $t$-test modeling.

Living arrangements. Students who lived in singles were significantly less likely to report being sick than students living in doubles. “Single” students reported 0.42 days of acute illness versus 1.23 days for “doubles” ($t$ test, $p = .014$), and single dwellers reported an overall illness burden of 9.76 versus 15.11 for double dwellers ($t$ test, $p = .035$). Students who lived off-campus reported a significantly higher average illness burden than on-campus dwellers. Single dwellers reported less runny noses and sneezing. Off-campus students reported significantly higher rates of sore throats, runny noses, earaches, sneezing, and fatigue.

Sleep. Students reported getting an average of 7.64 hr of sleep per night in the weekdays and 8.54 hr of sleep on the weekend. Total average per night for the week was 7.86. Thirty-two percent of the students reported taking naps at least once a week with the average length of a nap being just under 1.5 hr. We identified students getting less than 7 hr of sleep per night as sleep-deprived based on a review of the daily recommended amount of sleep for this age cohort as defined by the National Sleep Foundation. Students who averaged less than 7 hr of sleep reported an illness burden of 19.40 compared with students getting more than 7 hr whose average illness burden was 11.98 ($t$ test, $p = .023$). Sleep-deprived students were significantly more likely to report runny noses, coughing, and fatigue. The more students sleep, during the week, on average, with or without naps, the significantly less likely they were to report feeling fatigued.
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Ninety-five percent of students were on the institution’s meal plan. About 48% of students reported eating on average two meals a day, whereas 34% ate three. Students who ate on average less than two meals a day (about 9% of the population) reported a significantly higher illness burden than students who ate two or more meals per day (20.71 vs. 12.10, \( t \) test, \( p = .042 \)). There was no added benefit to eating three meals a day, nor from eating breakfast as opposed to lunch or dinner.

About 41% of students reported being between somewhat and very satisfied with the food options. About 12% was indifferent, and about 47% reported being between somewhat and very dissatisfied. Students who were satisfied (somewhat to very) reported a significantly lower illness burden than dissatisfied students (10.58 vs. 16.26, \( t \) test, \( p = .029 \)). There was no added benefit to eating three meals a day, nor from eating breakfast as opposed to lunch or dinner.

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Forty-four percent of students reported trying to eat a healthy meal at every meal, whereas another 30% do at least once a day, and another 20% do a couple times a week. Women were significantly more likely to report more frequently trying to eat a healthy meal. This corresponds to the findings of Levi, Chan, and Pence (2006) in their study on the importance of food decision to female students as compared with male students. The more often students reported trying to eat healthy, the less likely they were to report an episode of acute illness.

Twelve percent of students reported taking daily dietary supplement(s), most frequently, a multivitamin. Another 32% reported sometimes taking supplements, whereas 56% never took supplements. Students who took supplements did not report higher or lower rates of acute illness, but they did report greater intestinal discomfort and fatigue.

Social behaviors: Handshaking and sharing food and drink. Handshaking was significantly associated with reporting an acute illness, unlike other greeting behaviors that included hugging, kissing on cheek, and kissing on lips (the rarest form of greeting among the four). Students who reported shaking other students’ hands either daily or a couple times a week reported an average of 1.23 days of acute illness versus 0.56 days for students who never to occasionally shake other students’ hands (\( t \) test, \( p = .039 \)). Students who shook other students’ hands a couple times a week or daily were not more or less likely to wash their hands before eating. Only 14% of the students consistently washed their hands before meals, whereas about 45% do “sometimes,” 30% rarely, and 11% never. This variable, washing hands before eating, was not significantly associated with any of our general illness measures, a result that did not surprise us because it was such a limited hygiene question. However, as mentioned above, White et al. (2005) did find a reduction in upper-respiratory infections as a result

### Table 1. Variables Associated With an Episode of Acute Illness or Overall Illness Burden.

| Variable                          | Coefficient | SD  | Z   |
|----------------------------------|-------------|-----|-----|
| Eat healthy                      | -0.17       | 0.135 | 0.021 |
| Frequency of handshake           | 0.28        | 0.112 | 0.014 |

| Variable                          | Coefficient | SD  | Z   |
|----------------------------------|-------------|-----|-----|
| Single                           | -5.34       | 2.91 | 0.070 |
| Off-campus                       | 14.00       | 9.32 | 0.002 |
| Less than 7 hr of sleep          | 6.20        | 3.55 | 0.085 |
| Dissatisfied with food options   | 2.77        | 1.10 | 0.014 |
| Share food and drink             | 1.66        | 0.76 | 0.031 |
| No exercise                      | 8.64        | 4.49 | 0.058 |

**Note.** Number of observations: 80, \( F(6, 73) = 6.53, p > F = 0.0000, R^2 = .3494 \).
of increased hand washing. In the absence of an “increased” hand-washing program, however, Thumma, Aiello, and Foxman (2008) found that self-reported washing frequency was not associated with infectious illness reporting—only a small proportion of males (10%) and females (7%) reported “always” washing their hands before eating.

Males were significantly more likely to be “hand-shakers” than their female colleagues, as were members of sports teams (even after controlling for gender). “Happier” students were also more likely to be hand-shakers.

Seventy-seven percent of students regularly share food and drink with fellow students, with 64% sharing between a couple times a week to sharing at every meal. Only 23% of students reported either rarely or never sharing food/drink. The more often students reported sharing food/drink, the higher their illness burden. Food/drink sharers reported higher rates of runny noses, intestinal discomfort, and fatigue.

Infrequent showering (showering every other day or less) was significantly associated with reporting runny noses, headaches, cough, and fatigue, and infrequent teeth-brushing was associated with more sick days over the 14-day period (1.68 for those who brush less than twice a day, 0.57 for those who brushed more, \( p = .006 \)). However, neither of these variables remained significant when added to the full model.

**Exercise.** Thirty-three percent reported being on a collegiate sports team, with 17% currently in season. Twenty-three percent were on an intramural or club sports team, with 7% currently in season. And about 10% were on a rhythm or dance team. Some students reported more than one of these activities. As a result, 55% were not involved in any of these organized activities.

On average, students reported exercising about 3.3 times per week for an average of 3 hr per week. About 41% of students exercise less than 2 times per week, woefully below the current government recommendation that adults should get at least 150 min of moderate intensive aerobic activity per week (http://www.cdc.gov/physicalactivity/everyone/guidelines/ adults.html ). Running was the most often cited form of exercise, followed by weight lifting. Students who got no regular exercise per week had a significantly higher illness burden than all other students combined (21.55 vs. 11.53, \( p = .008 \)). Students getting no exercise reported a greater number of days with sore throats, headaches, intestinal discomfort, and fatigue.

**Variables not associated with acute illness episode or illness burden.** We had hypothesized that a number of other variables would be associated with acute illness and overall illness burden, but they did not meet the criteria for statistical significance. Below, we review the hypothesized relationship for this set of variables.

- **Credit load/extracurricular activities:** We hypothesized that students who experienced a more stressful credit load and/or were involved with more extracurricular activities would report higher rates of illness, but neither of these measures was associated with our illness measures. About 43% reported that at least two of their four courses were stressful or difficult, and 86% of students reported being involved with some extracurricular activity. This is contrary to what Largo-Wright et al. (2005) found in their study.

- **Alcohol consumption and cigarette smoking:** Alcohol consumption, whether measured as frequency (how many times per week), or amount consumed per sitting, was not associated with any illness measure. About 80% of the sample reported never smoking, and contrary to our hypothesis, smokers were not more likely to report an episode of acute illness or a greater overall illness burden.

**Discussion**

One of the reasons why we study illness is because we are curious about its impact on our social roles, including but not limited to our “productivity,” whether it is measured by the number of days we miss at work, or for the college student, by the impact of illness on academic performance. Although students, faculty, and administrators all have an interest in minimizing the rate and duration of student illness, we need to consider the structure and culture of student life so that we can develop feasible and appropriate programs that recognize that students are not only trying to excel academically, they are also pursuing other social goods such as camaraderie, companionship, and romance. We can encourage healthy behaviors while recognizing that no college student, not to mention very few people in general, lives his or her life solely in pursuit of health and productivity.

This study attempts to take a more comprehensive look at health behaviors and their effect on even minor illness complaints among a group of college students. To take a snapshot look, we used surveys to collect information about a variety of health behaviors. We recognize that by choosing this methodology, we were restricted in the amount of detail we could obtain. Despite this limitation, it is interesting to note the number of insights into the effects that sleep, living arrangements, food choices, and social behaviors have on our daily average health profiles.

It is interesting to note that if students were sick enough to miss an activity, they were most likely to miss a meal(s) (0.52 days), followed by social events (0.27 days). They were significantly less likely to miss classes (0.13 days) or job shifts (0.10 days). They were themselves responding to the idea that academic performance and employment (productivity measures) were the most important activities and therefore the last thing that could be excused due to illness.
Many of the findings made sense in terms of our overall understanding of the impact of our behaviors on health outcomes. This study suggests that students should live in single rooms, get at least 7 hr of sleep per night, get regular exercise, and enjoy the food that the institution provides, and they should restrict how much they share food and drink with others. In light of our understanding of the overall culture of college life, these findings do suggest some room for intervention. Colleges could try to see how feasible it would be to convert dorms to single rooms and provide students with more downtime away from other students. Getting more hours of sleep per night might require a reduction in average workload for students, but even with less work, there is no guarantee that students will use the extra time for sleep instead of on social activities. Trying to get students to engage in regular exercise might be achieved through some regular physical education requirement throughout the course of the college career and/or the creation and maintenance of a variety of intramural sports programs that might capture the attention of the students who are not collegiate athletes.

Regarding enjoying the food provided by the meal service contractor, colleges and universities can seek as much input from students as structures and budgets will allow to “please” the largest percent of students possible with the food choices. We can make sure students have access to nutritious and appealing food. We can make sure they can easily wash/disinfect their hands before eating by installing sanitizers throughout the campus but especially in dining halls. However, we may also need to recognize that there are some social benefits gained from sharing food and drink in our current college culture.

We also might be tempted to suggest that students do not greet each other through handshaking because handshaking was positively correlated with illness burden. Handshaking, however, was also positively correlated with happiness. However, perhaps it would not be a significant social cost to promote “fist-bumping” over shaking as a way to reduce students’ exposure to germs. Maybe we can promote social closeness while still reducing illness burdens.

The cost of social bonding activities such as sharing food and drink and handshaking may be the occasional intestinal discomfort and runny nose. In the name of camaraderie, we might accept these acute illness outcomes as necessary drawbacks from our normal “socially healthy” human interactions. The growing concern among health professionals, however, is that as the risk increases from the occasional discomfort and runny nose to the graver dangers of measles, H1N1, and meningitis, lack of proactive attempts to keep our populations safe could have terrible consequences—the cost of illness in these cases could certainly be greater than the social benefits from our interaction.

However, even in light of the recognition of significant health risks, we need to ask the question whether or not there are any benefits to occasionally being mildly sick, both physically (the immune system does need something to do every now and then) and socially (we need to take a break from our normal obligations and responsibilities, and we need to be taken care of by others). We should try to find more interesting ways to test and model this question so that we can develop an even more nuanced understanding of both the benefits and drawbacks of health and illness for human societies.

Appendix

Health and Illness Profile

We are currently conducting a survey to take a snapshot of health and illness at Institution X. Please take a few moments and complete this survey as completely as possible. Pretesting has shown that it takes less than 10 min to complete. Your responses will remain completely confidential and data will only be reported in the aggregate. Thank you for your time and participation. Upon completion of this survey, please place it in the envelope provided and hand it to the research associate. You will then be given an organic candy bar for your participation.

1. Overall, how happy are you at Institution X? Please circle your response.

| Very unhappy | Unhappy | Somewhat unhappy | Neither | Somewhat happy | Happy | Very happy |
|--------------|--------|------------------|---------|---------------|-------|-----------|
| 1            | 2      | 3                | 4       | 5             | 6     | 7         |

2. Do you suffer from a chronic illness?

☐ Yes
☐ No

3. Do you take medicine on a regular basis for your chronic condition?

☐ Yes
☐ No

The following questions in this next section refer to the past 2 weeks here at the college.

4. About how many days in the last 2 weeks were you sick with an acute illness?

__________

5. About how many days in the past 2 weeks did you have:
6. How many days were you sick enough that you missed:

| Condition               | No. of days |
|-------------------------|-------------|
| Sore throat             |             |
| Runny nose              |             |
| Headache                |             |
| Earache                 |             |
| Intestinal discomfort   |             |
| Vomiting                |             |
| Diarrhea                |             |
| Coughing                |             |
| Pinkeye                 |             |
| Sneezing                |             |
| Fatigue                 |             |

7. Did you visit the Health Center because you were sick?
   - Yes
   - No

8. Did you have to take a prescription medicine for an acute illness (antibiotics, decongestants, antivirals, etc.)?
   - Yes
   - No

9. Did you take any over-the-counter remedies (painkillers such as aspirin, ibuprofen, decongestants, etc.)?
   - Yes
   - No

Living Arrangements:

10. What is your current living arrangement? Check all that apply:
    - Single
    - Double
    - Triple
    - Quad
    - On campus
    - Off-campus
    - At home
    - Have a friend/significant other sharing my room

Course Load and Other Activities:

11. How many course credits are you taking this semester? __________
12. Of these
    - How many are lab courses: __________
    - How many have drills: __________
    - How many have attachments: __________
13. How many of the classes would you describe as stressful or difficult? __________
14. Do you participate in any extracurricular activities?
    - Yes
    - No
15. About how many hours a week do you spend on these activities? __________

Sleeping:

16. What time do you typically go to bed and wake up during the week and on the weekend?

   | Weekday | Weekend |
   |---------|---------|
   | To bed  |         |
   | Wake up |         |

17. Do you ever take naps?
    - Yes, at least once a week
    - Yes, sporadically
    - No
    If yes, for how long do you typically nap? __________

Eating:

18. Are you on a campus meal plan?
    - Yes
    - No
19. How many meals do you eat on average each day?

20. Where do you typically eat your meals?

   | Meal     | Dining Center 1 | Dining Center 2 | Other |
   |----------|-----------------|-----------------|-------|
   | Breakfast|                 |                 |       |
   | Lunch    |                 |                 |       |
   | Dinner   |                 |                 |       |
21. How satisfied are you with the food options at Institution X?
- Very satisfied
- Satisfied
- Somewhat satisfied
- Indifferent
- Somewhat dissatisfied
- Dissatisfied
- Very dissatisfied

22. How often do you make an effort to eat a healthy meal?
- Every meal
- Once a day
- A couple times a week
- A couple times a month
- Never

23. Do you take any dietary supplements?
- Yes, daily
- Yes, sometimes
- No, never
- If yes, what kinds of supplements do you take?

24. How often do you share food or drink with people around you?
- Every meal
- Once a day
- A couple times a week
- A couple times a month
- At parties
- Very rarely
- Never

Exercise:

25. Are you on a collegiate sports team?
- Yes, in season
- Yes, but off season
- No

26. Are you on an intramural sports team?
- Yes, in season
- Yes, but off season
- No

27. About how many times a week do you get a chance to exercise? _________

28. On average, how many minutes do you exercise each time you work out?
- 0-30 min
- 30-45 min
- 45-60 min
- 60-90 min
- More than 90 min

29. What activities do you usually do for exercise? Check all that apply.

| Running | Biking | Dancing |
|---------|--------|--------|
| Weight lifting | Cycling | Tennis |
| Walking | Swimming | Other: |
| Jogging | Yoga | Other: |

Alcohol and Cigarettes:

30. Do you consume alcoholic beverages?
- Yes
- No

31. About how many nights a week do you consume alcoholic beverages? _________

32. On nights that you drink, about how many drinks do you consume over a 4- to 5-hr period? _________

33. Do you smoke cigarettes?
- Yes, daily
- Yes, a couple times a week
- Yes, on the weekends
- Yes, on rare occasions
- No, never

Hygiene:

34. How many times do you shower every week? _________

35. How many times a day do you brush your teeth? _________

36. Do you wash your hands before meals?
- Yes, always
- Yes, sometimes
- Rarely
- Never

37. When you sneeze, do you usually sneeze into:
- Your hand, palm down
- Your hand, palm up
- Your arm
- The air
38. How would you rate the adequacy of the following facilities in the dorms:

| Facility          | Poor | Satisfactory | Very good | Excellent |
|-------------------|------|--------------|-----------|-----------|
| Bathrooms         | 1    | 2            | 3         | 4         |
| Showers           | 1    | 2            | 3         | 4         |
| Kitchens          | 1    | 2            | 3         | 4         |
| Laundry rooms     | 1    | 2            | 3         | 4         |

Human Interaction:

39. How often do you greet fellow students with any of the following actions? Please check appropriate box.

| Greeting        | Never | Rarely | Occasionally | times a week | Daily |
|-----------------|-------|--------|--------------|--------------|-------|
| Handshake       |       |        |              |              |       |
| Hugging         |       |        |              |              |       |
| Kiss on cheek   |       |        |              |              |       |
| Kiss on lips    |       |        |              |              |       |

40. Overall, how conscious are you of maintaining a healthy lifestyle?

☐ Very
☐ Somewhat
☐ None

41. Do you change your behavior when students start to get sick?

☐ Yes
☐ Sometimes
☐ No

If yes or sometimes, how do you alter your behavior in response to students getting sick around you?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

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